Do Hedge Funds Still Manipulate Stock Prices?

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Abstract

We find no evidence that hedge funds manipulate stock prices from 2011 to 2019, while confirming the portfolio-pumping manipulation pattern previously documented between 2000 and 2010. Hedge fund market discipline is related to two factors: lower rewards associated with portfolio pumping in the recent period as well as the proactive actions of regulators. Fund flows do not react positively anymore on the end-of-quarter return of hedge fund portfolios in the recent decade, while end-of-quarter stock price manipulation decreases with the number of the Security and Exchange Commission litigation cases involving hedge funds in that quarter.

Keywords: Hedge Funds, Stock Price Manipulation, Investor Flow, Regulations, SEC Litigations.
JEL Classification: G11, G14, G23.

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1. Introduction

The importance of monitoring the replicability of studies in finance and economics has been attracting more and more attention in the recent years (Camerer et al., 2016; Christensen and Miguel, 2018). Many findings cannot be replicated or reproduced out-of-sample due to problematic statistical inference, including p-hacking and short-sample biases (e.g. Harvey et al., 2016; Ioannidis et al., 2017; Harvey, 2017; Linnainmaa and Roberts, 2018; Chordia et al., 2020). Most importantly, however, the financial system is dynamic. Previously documented phenomena do change, and academic research contributes to such changes to a great extent.

In this paper, we focus on stock price manipulation by hedge funds – professional arbitrageurs seemingly skilled in market timing (Brunnermeier and Nagel, 2004; Cao et al., 2013) and stock picking (Kosowski et al., 2007; Agarwal et al., 2013). We show that the stock price manipulation pattern pronounced during the period from 2000q1 to 2010q3 as shown in Ben-David et al. (2013) has reduced substantially at both the market-aggregate and individual-fund levels, such that no significant pattern of stock price manipulation can be detected during recent years from 2011q1 to 2019q4.

During the earlier period, stock price manipulation manifests itself through a "blip" pattern in prices of stocks held by hedge funds: stocks in the top quartile of hedge fund holding experience a positive abnormal return on the last trading day of a quarter, most of which reverts the next trading day, suggesting portfolio pumping practices by hedge funds (i.e., strategies that artificially increases last-day-of-a-quarter returns at a cost of lower next-day returns). No such patterns remain statistically significant in the later period.

We consider two potential channels that could lead to the manipulation reduction, related to risk-return tradeoff of manipulation strategies. Benefits for a manipulator arise through a potentially higher investor flow to the fund in response to a better (reported or advertised)

performance,[1] while risks are related to regulatory scrutiny and possible regulatory actions against the fund.[2]

We show that hedge funds indeed used to benefit from stock price manipulation in the past by attracting higher flows. End of quarter fund-level "blip" used to predict a higher next quarter flow after controlling for other flow determinants including the overall quarterly hedge fund return. The effect was driven by a positive investor reaction on the last-day-of-a-quarter excess performance of a hedge fund equity portfolio, while the potentially poor portfolio performance on the first trading day of the current quarter remained unnoticed and it had no significant effect on flows. This pattern has made a portfolio pumping strategy beneficial for hedge funds. This result complements the findings in Brown et al. (2008) that investor flow has not been related to the operational risk factors of hedge funds. Remarkably, however, this pattern disappears in the later period, suggesting that investors may have recognised the effect of stock price manipulation on hedge fund returns. One reason for the changed investors' reaction might be indeed the academic "exposure" of stock price manipulation, after it was reported by Ben-David et al. on Feb 17, 2011.[3] Hence, from the investor-flow point of view, the incentives of hedge funds to manipulate stock prices have reduced over time.

As for the regulatory attention channel, we collect litigation cases involving hedge funds from the Security and Exchange Commission (SEC) litigation page[4] from 2000 to 2019. We show that the magnitude of end-of-quarter stock price manipulation by hedge funds decreases

[1] Bernhardt and Davies (2009), for example, show that investors' flows chase good performance.

[2] For example, on Feb 24, 2011, the SEC charged a hedge fund trader involved in a "portfolio pumping" scheme. See *SEC Charges Securities Professionals and Traders in International Hedge Fund Portfolio Pumping Scheme*, https://www.sec.gov/news/press/2011/2011-51.htm. On Sep 8, 2014, SEC also charged a Minneapolis-based hedge fund manager with "portfolio pumping". See *SEC Charges Minneapolis-Based Hedge Fund Manager With Bilking Investors and Portfolio Pumping*, https://www.sec.gov/news/press-release/2014-187.

[3] On that date the paper "Do Hedge Funds Manipulate Stock Prices?" was first published on the website of the Social Science Research Network (SSRN) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1763225.

[4] https://www.sec.gov/litigation/litreleases.htm

significantly for quarters with a higher faction and a higher number of reported SEC litigation cases involving hedge funds, and the effect is significant is both periods. Hence, regulatory actions seem to be important drivers of the change in hedge fund behavior.

Our findings contribute to the literature on the effects of regulations on hedge funds' business practices. Overall, regulatory oversight reduces misreporting by hedge funds.[5] In the international context, hedge funds tend to misreport less in jurisdictions with tighter regulations, such as minimum capitalisation requirements, restrictions on the geographical location of key service providers, and where fund distribution via wrappers is not allowed (Cumming and Dai, 2010). In the US context, misreporting by hedge funds that were required to register with the SEC in 2004 reduced. It subsequently increased for those funds that opted out from such registration when the rule was revoked in 2006 (Dimmock and Gerken, 2015). After the SEC adopted rules in 2011 requiring a majority of hedge funds to register with the regulator, hedge funds changed their auditing process and return misreporting reduced again (Honigsberg, 2019). These papers analyze the effects of a general regulatory framework and/or its changes on hedge fund reporting behavior. Our analysis complements these studies by focusing on direct stock price manipulation rather than return misreporting by hedge funds and its variation across regulatory regimes. We also use the actual litigation cases against hedge funds as a more direct measure of regulatory attention to this group of institutions. Our findings are consistent with the conclusions in experimental literature that the introduction of a "regulator" and penalties for manipulation leads to less aggressive trades by manipulators (Comerton-Forde and Putniņš, 2011).

Our paper is related to a strand of growing evidence on the impact of academic research on the behavior of market participants, regulators, and observed patterns in prices and returns. A prominent example here is the weakening of market anomalies: after an academic paper

[5]Hedge fund misreporting can be detected, for example, via return smoothing and return distribution discontinuity at zero, and other "red flags". See Bollen and Pool (2008, 2009, 2012); Agarwal et al. (2011); Aragon and Nanda (2017).

discussing a particular market anomaly is published, trading on this anomaly intensifies and, consequently, the anomaly weakens (McLean and Pontiff, 2016). Portfolio pumping and window dressing by mutual funds[6] has reduced following the publications of related academic papers (Duong and Meschke, 2020).

On a broader note, well-functioning financial markets assure that the observed prices correctly reflect (the best estimates of) assets' fair values, hence facilitating efficient capital allocation in the economy. Financial markets, however, may be manipulated in a way that prices change to the advantage of a manipulator (Cherian and Jarrow, 1995). Our evidence suggests that investor awareness and regulatory actions contribute to the reduction of manipulation practices.

2. Methodology

Throughout the paper, we use data from 2000q1 to 2010q3 as the benchmark sample, matching the one from Ben-David et al. (2013), and data from 2011q1 to 2019q4 as the true out-of-sample period[7], encompassing the period of generally tighter regulatory oversight. To quantify stock price manipulation and changes thereof, we closely follow the methodology of Ben-David et al. (2013) linking daily stock returns around a quarter-end and hedge fund ownership. We then evaluate two potential channels impacting hedge fund stock price manipulation: future hedge fund flow and regulatory attention.

[6] See Carhart et al. (2002); Ng and Wang (2004); Bhattacharyya and Nanda (2013); Agarwal et al. (2014); Hu et al. (2014), among others.

[7] As stock price manipulation is around a quarter-end, we regard 2011q1 as the first quarter of the later period.

2.1. Stock price manipulation

We first construct adjusted daily stock returns, following Daniel et al. (1997) (hereafter DGTW-adjusted returns). At the end of each June, we assign stocks into one of 125 portfolios constructed based on market capitalization using NYSE breakpoints, the industry-adjusted book-to-market ratio using the Fama-French 48 industries, and the prior 12-month return. Portfolios are held for one year and then rebalanced. For each of the 125 portfolios, we calculate the value-weighted daily returns as the benchmark. The DGTW-adjusted daily return is the difference between the stock's daily return and the return on the benchmark portfolio to which this stock belongs.

We then regress the DGTW-adjusted returns earned during the last trading day of a quarter and the first trading day of the subsequent quarter on the indicators of ownership by hedge fund companies (hereafter HFCs). We split the stock universe according to the ownership quartiles and halves as in Ben-David et al. (2013), and use robust standard errors in the regressions. Such stock-level regressions are estimated for two periods (2000q1–2010q3 and 2011q1–2019q4) separately. If the effect of hedge fund ownership on stock performance around a quarter-end reduces during the later periods, we would expect to observe a milder if not insignificant relation between hedge fund ownership and the DGTW-adjusted returns during 2011q1–2019q4.

Next, we move to the fund-level analysis and, following Ben-David et al. (2013), we calculate the fund-level "blip" measure. For each HFC j, we calculate the dollar-holding-weighted adjusted returns of their long equity portfolio on the last trading day of quarter q and the first trading day of quarter q+1, Adj $\text{Return}_{j,q}^{last}$ and Adj $\text{Return}_{j,q+1}^{first}$. The portfolio returns are adjusted by subtracting corresponding daily market returns proxied by the value-weighted return of all CRSP (Center for Research in Security Prices) firms incorporated in the U.S. and listed on NYSE, AMEX, or NASDAQ that have a CRSP share code of 10 or 11. Then, for HFC j at the end of quarter q, we calculate the adjusted fund-level "blip"

measure (Adj $\text{blip}_{j,q}$) as

$$\text{Adj blip}_{j,q} = \text{Adj Return}_{j,q}^{\text{last}} - \text{Adj Return}_{j,q+1}^{\text{first}}. \quad (1)$$

To control for the effect of stock return volatility on the size of the blip, the fund-level blip measure is then scaled by the portfolio daily volatility: Adj $\text{blip}/\text{vol}_{j,q}$. The volatility is calculated using the daily returns of the long equity portfolio weighted by the quarter-end dollar holdings on all trading days of the quarter q except for the very last trading day, to prevent the potential manipulation from artificially inflating the volatility of the portfolio. We compare the average sizes of blips in the two periods. Smaller values of blips during the later period would suggest a reduction of stock price manipulation by hedge funds.

2.2. Fund flow effect

One of the reasons why hedge funds may have engaged in stock price manipulation is that they have been benefiting from such practice by obtaining higher future capital flows from investors. The academic "exposure" of such behavior may have made investors aware of such practices. If during the earlier period investors rewarded stock-manipulating hedge funds with higher inflows but stopped doing this after they have learned about the potential "dark side" of hedge fund trades, hedge funds would have little incentive to manipulate stock prices. Such activity is risky from the regulatory-cost point of view and does not result in substantial benefits of inflows anymore.

To test the effect of stock price manipulation on future fund flow, we regress the average monthly net HFC flow in quarter q+1 on the volatility adjusted blip at the end of the previous quarter Adj $\text{blip}_{j,q}$ and its interaction with a dummy $D^{2011\text{-}2019}$, which takes the value of one during the second period. We control for HFC past quarterly returns and other factors known to impact hedge fund flow following Agarwal et al. (2004) and Getmansky

(2012), as well as HFC style fixed effect[8] (Ilerisoy et al., 2017). We use two specifications to control for the overall time variation in flow: the first one includes a dummy $D^{2011\text{-}2019}$ as illustrated in Equation (2) , and the second one includes year fixed effects instead.

$$\begin{aligned}
\text{flow}_{j,q+1} = \beta_0 &+ \beta_1 D^{2011\text{-}2019} + \beta_2 \text{Adj blip}_{j,q} + \beta_3 D^{2011\text{-}2019} \times \text{Adj blip}_{j,q} \\
&+ \beta_1 \text{Return}_{j,q} + \beta_4 \text{flow}_{j,q} + \beta_5 \text{Ln(TNA)}_{j,q} \\
&+ \beta_6 \text{Management fee}_{j,q} + \beta_7 \text{Incentive fee}_{j,q} \\
&+ \beta_8 \text{Notice period}_{j,q} + \beta_9 \text{Lock-up period}_{j,q} \\
&+ \beta_{10} \text{Young age}_{j,q} + \beta_{11} \text{Old age}_{j,q} \\
&+ \text{Style FE} + \varepsilon_{j,q+1}. \qquad (2)
\end{aligned}$$

To further understand the mechanism underlying investor reaction on portfolio blips, we substitute $\text{Adj blip}_{j,q}$ by two its components: the excess HFC portfolio return scaled by the volatility on the last trading day of the previous quarter ($\text{Adj Return}^{\text{last}}$/vol) and the first trading day of the current quarter ($\text{Adj Return}^{\text{first}}$/vol). This specification is estimated for the whole times series allowing the coefficients for $\text{Adj Return}^{\text{last}}$/vol and $\text{Adj Return}^{\text{first}}$/vol to change during the second period, and for two sub-samples separately for 2000q1–2010q3 and 2011q1–2019q4 periods.

To obtain the net flow of HFC j in quarter q ($\text{flow}_{j,q}$), we first calculate the monthly net fund flow of hedge fund k managed by HFC j in month t:

$$\text{flow}_{j,k,t} = \frac{\text{TNA}_{j,k,t} - \text{TNA}_{j,k,t\text{-}1} \times (1 + \text{R}_{j,k,t})}{\text{TNA}_{j,k,t\text{-}1}}, \qquad (3)$$

where $\text{TNA}_{j,k,t}$ and $\text{R}_{j,k,t}$ are the TNA and the monthly return, respectively, of hedge fund

[8]For HFCs with multiple hedge funds, the style is assigned based on the reported style of a hedge fund with the largest assets during the quarter of interest.

k managed by HFC j in month t. We then calculate the TNA-weighted average of the net fund flows of all hedge funds managed by HFC j in month t as the company-level monthly net flow. Next, the net flow of HFC j in quarter q is calculated as the average company-level monthly net flows within quarter q.

As a robustness check, we also substitute $\text{Return}_{j,q}$ with three levels of performance-rank variables (Brown et al., 2008; Getmansky, 2012). We calculate the fractional rank for HFC j in quarter q based on its returns, $F_{j,q}^{rank}$, and then construct the Low, Mid, and High rank variables as follows:

$$\text{Low rank}_{j,q} = \min(\frac{1}{3}, F_{j,q}^{rank}), \tag{4}$$

$$\text{Mid rank}_{j,q} = \min(\frac{1}{3}, F_{j,q}^{rank} - \text{Low rank}_{j,q}), \tag{5}$$

$$\text{High rank}_{j,q} = \min(\frac{1}{3}, F_{j,q}^{rank} - \text{Low rank}_{j,q} - \text{Mid rank}_{j,q}). \tag{6}$$

To assign HFC style fixed effects, we, first, assign individual hedge funds into three broad style categories, namely, directional, semi-directional, and non-directional following Ilerisoy et al. (2017).[9] Then, for each HFC each month, we sum the TNAs of managed funds in each if the style category. Each quarter, we assign the HFC to the style category with the highest total monthly TNA within this quarter. Style categories for HFC are reclassified every quarter. The definitions of all the other variables used in the regressions are listed in Table 1 in alphabetic order for reference.

[Place Table 1 about here]

[9]Directional category includes Emerging Markets, Global Macro, CTA/Managed Futures. Semi-directional category includes Event Driven, Long Short Equities, Multi-Strategy. Non-directional category includes Relative Value and Fixed Income funds. Other funds are classified as "Other" category.

2.3. Regulatory attention effect

Despite still being relatively lightly regulated, hedge funds have been kept under the radar of the SEC. Over the past decades, the reporting requirements for hedge funds were, first, tightened, then relaxed, and then tightened again. In 2004 more power was granted to the SEC to oversight hedge funds within Rule IA-2333, which required most hedge fund advisors to register with the SEC. The rule was subsequently revoked in 2006. In June 2011 the Dodd-Frank Act came into effect, with a majority of hedge funds being again required to register with the SEC, and the SEC obtaining authority to impose fines on fund managers, associated with securities' transactions. As part of the Dodd-Frank Act, SEC also introduce a program to financially reward whistleblowers - individuals who can provide critical information to the SEC.[10] The periods of tighter hedge fund regulations are associated with lower levels of return misreporting by hedge funds to their investors (see, e.g., Dimmock and Gerken, 2015; Honigsberg, 2019), hence one could expect some reduction in actual stock price manipulation as well.

Facing potential penalties from regulators, hedge funds may reduce portfolio pumping and stock price manipulation at a quarter-end. In our paper, we capture regulatory attention to hedge funds in a granular way using two measures. First, following Bollen and Pool (2012), we use the number of litigation cases involving hedge funds during a quarter. Second, we use the faction of hedge fund related cases in the total number of litigation cases, collected from the SEC litigation releases web page.[11] We search all the cases from 2000 to 2019 for the keyword "hedge fund", and recorded the quarterly number of cases involving hedge funds and their fraction of the total number of cases. The fraction of hedge-fund related litigation cases increased form 5.60% during 2000q1–2010q2 to 7.75% during 2011q1–2019q4, with the difference being significant at the 5% level, consistent with stronger regulatory attention

[10] https://www.sec.gov/news/press/2010/2010-213.htm

[11] https://www.sec.gov/litigation/litreleases.htm

towards hedge funds during the later period.

To assess the effect of regulatory attention on stock price manipulation by hedge funds, we regress stock price manipulation measures at the end of each quarter on a measure of SEC attention to hedge funds during this quarter, an indicator for the later period ($D^{2011-2019}$), as well as other characteristics of HFCs shown to impact the level of stock price manipulation by Ben-David et al. (2013). We also include fund flow-performance sensitivity (FPS) as an additional control variable. Some hedge funds may be more likely to engage in portfolio pumping, especially if they have been successfully using this approach in the past. To control for this possibility, we include the previous quarter's value of a manipulation measure. We estimate the following regression based on the complete period, and two sub-periods separately, omitting $D^{2011-2019}$ in subperiod specifications:

$$\begin{aligned}(\text{Manipulation Measure})_{j,q} = \beta_0 &+ \beta_1 D_q^{2011-2019} + \beta_2 \text{SEC Attention}_q + \beta_3 (\text{Manipulation Measure})_{j,q\text{-}1} \\ &+ \beta_4 \text{Net flow}_{j,q} + \beta_5 \text{Return}_{j,q} + \beta_6 \text{FPS}_{j,q} + \beta_7 \text{Ln(TNA)}_{j,q} + \beta_8 \#\text{Fund}_{j,q} \\ &+ \beta_9 \text{Management fee}_{j,q} + \beta_{10} \text{Incentive fee}_{j,q} \\ &+ \beta_{11} \text{Notice period}_{j,q} + \beta_{12} \text{Lock-up period}_{j,q} \\ &+ \beta_{13} \text{Young age}_{j,q} + \beta_{14} \text{Old age}_{j,q} \\ &+ \beta_{15} \text{HWM}_{j,q} + \beta_{16} \text{Leverage}_{j,q} \\ &+ \text{Style FE} + \varepsilon_{j,q}. \end{aligned} \tag{7}$$

where "SEC Attention" is either the number of SEC cased involving hedge funds (#SEC HF cases) or the percentage of such cases (%SEC HF cases). Our main specification uses a volatility-adjusted blip (Adj blip/$\text{vol}_{j,q}$) as a measure of stock price manipulation. As a robustness check, we estimate two alternative specifications. One is a Tobit regression with the dependent variable being the volatility-adjusted blip if it is positive, and zero otherwise (Adj blip/$\text{vol}^+_{j,q}$). Such specification closer corresponds to potential stock price manipulation, as it requires the adjusted return on the last trading day of a quarter to be larger than that on the first trading day of the following quarter. We also estimate a Logit regression for

the probability of observing a large volatility-adjusted blip. We call a blip large if it is above 50%, thus, if the difference between the last-trading-day return and the next-trading-day return exceeds half of the daily return volatility. If regulatory attention indeed reduces hedge fund stock price manipulation, we would observe a negative coefficient on the SEC Attention measures in all the regressions.

Any potential changes of hedge fund stock price manipulation patterns may be heterogeneous across hedge funds. For example, some funds may be ex-ante more law-obedient, while others may be more inclined to manipulation due to poor past performance (Gallagher et al., 2009). We consider operational risk (OR), fund flow, and fund return as potential factors impacting sensitivity to the SEC litigation cases. We construct the corresponding dummy variables assigning each HFC into a group with high or low factor value, and we include their interactions with the #SEC HF cases in Equation (7).

We evaluate hedge funds' operational risk (OR), and classify funds into high- and low-OR groups. We follow Brown et al. (2008), Bollen and Pool (2009) and Bollen and Pool (2012) and compute four proxies of OR for each individual hedge fund at the end of each month using their previous 24 returns. We compute (1) a fraction of repeated returns, (2) a fraction of negative returns, (3) a $Kink$ – the difference between the average number of return observations in two intervals [-4%,-2%) and (0, 2%], and the number of return observations that are between -2% and 0, (4) a test statistic for the discontinuity at zero in the distribution of hedge fund returns computed as

$$t_{Kink} = \frac{x - np}{\sqrt{np(1-p)}} \tag{8}$$

where x is the number of return observations between -2% and 0, n is the total number of observations, and p is the probability that a normally distributed variable with the same mean and standard deviation as that of the returns of a hedge fund in question lies in this bin.

Next, for each of the four proxies, we assign an indicator variable, taking a value of one for relatively high OR levels, and zero otherwise. For the fraction of repeated returns and $Kink$, the indicator takes the value of one if the corresponding measure lies above the median, while for the fraction of negative returns and t_{Kink} the indicator takes a value of one if the measure lies below the median. We sum up the four indicators to obtain the aggregate measure of OR for each hedge fund.

To construct a company-level OR measure, we calculate the monthly TNA-weighted value of constituent funds' ORs. For each company, we further calculate within-quarter averages of the company-level OR to match the quarterly frequency of 13f holding reports. HFCs with the within-quarter average OR measure above the median are considered as those with high operational risk (High OR), while those with the average OR measure below the median are classified as low OR companies (Low OR).

Similarly, we assign a HFC to the High Flow groups if the average monthly flow in a quarter is above the median, and we assign a HFC to a High Return group if the average monthly return in the quarter is above the median.

3. Data

Our hedge fund data are from the union of the Lipper TASS, BarclayHedge, and EurekaHedge databases, and institutional holding data are from the Thomson Reuters Institutional (13f) Holdings database (CDA/Spectrum s34). We follow Joenväärä et al. to merge the hedge fund databases and correct for duplicates. To identify HFCs that report to 13f, we follow Cui et al. (2023) and create a list of HFCs' 13f identifiers (i.e., manager numbers, hereafter MGRNOs), by matching the names of HFCs and those of the institutions reporting to 13f. We manually check that the identified companies do not have any mutual fund or insurance business as a side business, thus assuring that we obtain a list of pure HFCs. In total, from

2000q1 to 2019q4, we identify 538 HFCs reporting performance to any of the three databases.

To construct company-level control variables, we first calculate company-level TNA as the sum of the TNA of all managed hedge funds. Other HFC characteristics are computed as the TNA-weighted fund-level characteristics. To match the quarterly frequency of 13f holding reports, we further calculate within-quarter averages of the monthly TNA-weighted company-level characteristics.

Stock return data are from the CRSP Daily Stock File. We use daily returns of common stocks (those with CRSP share codes of 10, or 11) traded on NYSE, AMEX, or NASDAQ (those with CRSP exchange codes of 1, 2, or 3) from Jan 3, 2000 to Jan 2, 2020. We manually identify the last trading day of the quarter and the first trading day of the next quarter to exclude holidays or other market-closing days.[12] We impose the following filters for the stock-level data, to assure the comparability of our results with that of Ben-David et al. (2013): (1) Stocks with returns on the last trading day of a quarter or the first trading day of a quarter are included in the sample; they are not required to have both consecutive returns.[13] (2) The DGTW-adjusted daily stock returns are winsorized only from above at the 99% level using the complete sample.[14] (3) Small stocks with prices below $5 are excluded from the sample.[15]

Table 2 reports the day-level summary statistics of stocks for 2000-2010 (Panel A) and 2011-2019 (Panel B) sub-samples. The average last-trading-day of a quarter DGTW-adjusted

[12]For example, Mar 29, 2002, Mar 29, 2013, Mar 30, 2018 are Good Friday; Jan 02, 2006, Jan 02, 2012, Jan 02, 2017 are New Year Holiday; Jan 02, 2007 is a tribute to former US President Gerald Ford. On these weekday days, exchanges were closed.

[13]This is informed by the fact that in Ben-David et al. (2013) the number of DGTW-adjusted daily stock returns on the last trading day of the quarter is 128,841, and this is not equal to the number of returns on the first trading day of the following quarter of 122,804 (Ben-David et al. (2013), Tables II).

[14]The maximum value of DGTW-adjusted daily stock returns on different days as reported in Ben-David et al. (2013) is always the same at 14.469%, whereas the minimum value varies depending on the day (Ben-David et al. (2013), Table I).

[15]This filter matches well the mean market capitalization of 4.08E+09 and its 25th percentile of 1.60E+08 reported in Ben-David et al. (2013), Table I.

return in the more recent period of 1.5 bps is a bit smaller than that in the earlier period of 1.7 bps, while the average first-trading-day of a quarter DGTW-adjusted return shrinks by almost a half from -6.4 bps to -3.4 bps in the later sample. This pattern tentatively indicates a reduced stock price manipulation during the second period.

[Place Table 2 about here]

Table 3 reports the quarter-level summary statistics of HFCs for the two sub-samples. Overall, the descriptive statistics of HFCs are very similar during both periods. The strongest difference is in the net fund flow, which reduces in the later period. This is likely to be driven by substantial outflows from the hedge fund industry during recent years. Remarkably, the fund level adjusted blip decreases from 0.28% during 2000-2010 period to only 0.11% between 2011 and 2019, and the volatility-adjusted blip drops from 17.64% to 9.15%, indicating a substantial reduction of potential stock price manipulation at the individual hedge fund level during the later period.

[Place Table 3 about here]

4. Empirical Results

Table 4 reports the stock-level price manipulation results. The DGTW-adjusted returns on the last and the first trading days of a quarter are regressed on the dummies indicating different levels of hedge fund ownership. Panel A uses ownership quartiles, and Panel B uses the indicator for hedge fund ownership being above the median. The results in the earlier sample are consistent with those in Ben-David et al. (2013). The daily returns of stocks in the top ownership quartile, on average, increase by 15.2 bps on the last trading day of the quarter, and decrease by 7.2 bps on the first trading day of the following quarter.[16] A similar

[16]The magnitude of the effect is somewhat smaller than in the original paper, but the corresponding t-statistics are equally high, reaching 6.20 for the last-trading-day return and high HFC ownership quartile compared to 6.80 reported in Ben-David et al. (2013).

pattern can be seen using the above-the-median hedge fund ownership indicator in Panel B. In the later period from 2011q1 to 2019q4, the patterns in abnormal returns disappear. The loadings on the dummies for the top quartile and top half of ownership are closer to zero and they are not statistically significant.

As a robustness check, we test if the DGTW-adjusted stock returns and the changes across sub-samples may be driven by ownership of other, non-hedge fund (Non-HF) institutions. We repeat the analysis introducing three different dummies for the different levels of institutional ownership: (1) HF (top) ∩ Non-HF (top) captures stocks with hedge fund ownership above the median and Non-HF ownership above the median; (2) HF (top) ∩ Non-HF (bottom) captures stocks with hedge fund ownership above the median and Non-HF ownership below the median; and (3) HF (bottom) ∩ Non-HF (top) captures stocks with hedge fund ownership below the median and Non-HF ownership above the median. The results reported in Panel C of Table 4 confirm that the manipulation pattern is pronounced only during the earlier period and only for stocks with high hedge fund ownership. Ownership by Non-HF institutional investors does not seem to lead to a blip pattern of returns around a quarter-end. Other institutions seem to mitigate the adverse effects of potential hedge fund trading. The strongest blip pattern is observed for stocks with high hedge fund ownership and low ownership of other institutions.

[Place Table 4 about here]

Moving to the fund-level manipulation measure, we compare the average volatility-adjusted blip and positive volatility-adjusted blip during the two sub-periods (Table 5). The average volatility-adjusted blip of 19.22% in the earlier period reduces to 7.79% in the later period, with the difference being significant at the 10% level. Similarly, the average positive volatility-adjusted blip significantly decreases.

[Place Table 5 about here]

Overall, the stock-level and fund-level results indicate a significant reduction in stock

price manipulation by hedge funds during the last decade.

4.1. Fund flow effect

The results in Table 6 reveal that on average HFC stock price manipulation has been beneficial for HFCs during the earlier period, while it does not benefit hedge funds' flow in the later period. The volatility adjusted blip is positively (even though not statistically significantly) related to future flows during the earlier period, and its effect significantly reduces during the second period (columns (1) and (2)). Looking further into the components of the blip in columns (3) to (8), we see that the last-trading-day of quarter return is positively and significantly related to future fund flow in all specifications for 2000-2010, while the following first-trading-day of the next quarter return is not statistically significant. This effect disappears during the later period, and last-trading-day of quarter return has no effect on the future flow between 2011 and 2019, which reduces the potential benefits hedge funds could obtain through end-of-quarter stock price manipulation.[17]

Positive flow reaction on excess last-day-of-a-quarter return is a remarkable finding since the equity positions are disclosed to SEC with up to a 40 days delay, and the estimation of portfolio return blip requires substantial effort even for sophisticated investors. However, investors are likely to learn the positive news not from the official SEC holdings report, but through direct communication by hedge fund managers. Hedge fund managers who observe (and orchestrate) impressive end-of-quarter returns, may be inclined to share this "excellent news" with their current and prospective investors via direct emails and/or other social network channels, inducing a positive flow reaction. Such communications are common in the industry. For example, in 2017 SEC charged an investment advisor Hyaline Capital Management for "disseminating [via email] false information to prospective investors and

[17]The results using hedge fund performance terciles instead of return are qualitatively similar and are reported in Online Appendix.

clients in order to induce them to invest money with them" between 2012 and 2013.[18] It seems probable that when potential end-of-quarter stock price manipulation became "common knowledge" after the academic paper exposing it had been released, investors started taking any positive end-of-quarter news with a pinch of salt, and stopped rewarding managers with additional funds.[19]

[Place Table 6 about here]

4.2. Regulatory attention effect

Consistent with our findings of no significant stock price manipulation in the post-2011 period (Table 4) and the univariate analysis of the fund-level portfolio blips (Table 5), the levels of volatility-adjusted blips significantly decrease in the recent period, as captured by negative and significant coefficients on the time dummy for the recent period in columns (1) and (4) of Table 7.

Importantly, regulatory attention does have a significant disciplinary effect on hedge funds. Volatility-adjusted blips at the end of a quarter are negatively related to the number of SEC litigation cases involving hedge funds during that quarter and to the percentage of such cases in the total number of SEC litigations. The corresponding coefficients are always negative statistically significant. The effect is economically large. In the earlier sample from 2000q1 to 2010q3, one additional litigation case in a quarter reduces the average volatility-adjusted blip by 3.71 percentage points, and it is 1.36 percentage points during the more recent period from 2011q1 to 2019q4. The decline in the absolute values of the coefficients reflects, however, the general decrease in the magnitude of manipulation as previously discussed. In relative terms, the effect of SEC litigation cases is comparable across the two

[18] https://www.sec.gov/litigation/litreleases/lr-23808

[19] Additionally, hedge fund managers may have also turned more selective in releasing not completely genuine information. In such cases, potentially manipulated high end-of-quarter returns are not known to the investors, hence, there is no information to trigger extra flow.

periods amounting to 19.3% and 17.4% of the average level of the blip in the two periods, respectively (Table 5). The pattern is consistent when the percentage of SEC cases involving hedge funds is used instead of the number of cases. Increasing the percentage of cases by 1 percentage point leads to a reduction of blip by 1.40 percentage points (7.3% relative to the mean value) in the earlier period and 0.45 percentage points (5.8% relative to the mean value) in the second period.[20]

We also observe a reduction in manipulation persistence during the later period. Prior to 2010, stock price manipulation has been strongly persistent – a previous-quarter level of stock price manipulation by an HFC positively predicts the current-quarter level of manipulation in the 2000-2010 sample. During the later period, no consistent manipulation persistence pattern can be observed anymore. The estimated coefficient on Adj blip/vol (q-1) (the measure of manipulation at the end of the previous quarter) in the OLS regression turns negative in Table 7, indicating that previous period manipulators are less likely to attempt this strategy during the current quarter. The corresponding coefficients are virtually zero and not statistically significant for the Tobit specification (as reported in Online Appendix). The only instance, in which persistence is still observed, is for the probability of large volatility-adjusted blips. However, even in this case the magnitude and the statistical significance of the effect of past manipulation reduce substantially in the later period as reported in Online Appendix.[21] These results indicate that, in the later period, potential end-of-quarter portfolio pumping may be used by some HFC at random, while only "serious" manipulators somewhat persist in being "serial" manipulators.

[Place Table 7 about here]

The results in Table 8 provide further insights into the heterogeneity of hedge fund re-

[20]Similar results are obtained for positive volatility-adjusted blips and the probability of large blips, with the corresponding results tabulated in Online Appendix.

[21]The corresponding estimated coefficient declines from 0.52 with a t-statistics of 7.15 to 0.17 with the t-statistics of 1.99.

sponse to regulatory pressure. HFCs with lower operational risk and those having higher flow seem to react stronger to regulatory pressure in the earlier period. For example, one additional SEC cases involving hedge funds predicts a decline of the end-of-quarter find-level adjusted blip by 5.36 percentage points for low OR funds, while the decline is 2.06 percentage points for high OR funds. During the later period 2010-2019, neither the OR nor fund flow significantly impacts the sensitivity of HFC's level of manipulation to the number of SEC case involving hedge funds. In the later period we observe, however, that better-performing funds react stronger to the SEC litigation activity, as compared to poorly performing funds, as captured by the negative coefficient on the product High Return $\times$ # SEC cases (q). The results based on the percentage of SEC cases depict a consistent picture in Table 9.

[Place Tables 8 and 9 about here]

5. Conclusion

In early 2011, Ben-David et al. (2013) reported evidence that hedge funds manipulate stock prices at a quarter-end in order to "pump" their portfolios. Stocks held by hedge funds exhibited high positive abnormal returns on the last trading day in a quarter, and a significant negative abnormal return during the first trading day of a quarter between 2000q1 and 2010q3, forming a so-called return "blip". We replicate this result using a somewhat different sample of hedge funds and find a similarly strong pattern during the same period.

In the later period from 2011q1 to 2019q4, we no longer detect any significant pattern of end-of-quarter abnormal returns at the stock level, suggesting that hedge funds as a group have been engaging much less in stock price manipulation activities recently. On a fund level, stock price manipulation, measured as hedge fund equity-portfolio return blip around a quarter-end, similarly significantly decreases in the recent period compared to the earlier sample.

The reduction in stock price manipulation by hedge funds seems to be driven by the reduction of the benefits from manipulation for hedge funds, with regulatory attention putting additional pressure on the industry. In the earlier period, future fund flow reacts positively on the last-day-of-the-quarter return, providing hedge funds incentives to manipulate end-of-quarter stock prices. The relation turns insignificant during the later period, hence, reducing incentives to manipulate. As for direct regulatory attention, end-of-quarter stock price manipulation by hedge funds reduces substantially during quarters with more litigation cases of SEC involving hedge funds. Despite some changes in the regulatory environment (in particular, the Dodd-Frank Act of 2011, which requires most hedge fund advisors to register), hedge funds remain only lightly regulated. Our results suggest that proactive investigations and prosecutions by regulators of suspicious/unlawful activities of hedge funds are of paramount importance for assuring market discipline.

Acknowledgements

We thank Ferhat Akbas, Vikas Agarwal, Martijin Boons, Philip Howard, Jens Jackwerth, Juha Joenväärä, Michael Rebello, Ania Zalewska, and the participants at the 7th International Young Finance Scholar's Conference, IFABS 2021 Oxford Conference, 52nd Annual Conference of the Money, Macro and Finance Society (MMF) 2021, and Financial Management Association (FMA) Annual Meeting 2021 for helpful comments.

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Table 1: Variables and definitions

This table lists all the variables used in the analysis and their definitions in alphabetic order.

Variables	Definitions
Adj blip (%)	Adjusted blip: (Adj Return$^{\text{last}}$ − Adj Return$^{\text{first}}$) × 100.
Adj blip/vol (%)	Adjusted blip scaled by the volatility: Adj blip/Volatility.
Adj blip^{+}/vol (%)	Positive adjusted blip scaled by the volatility: Adj blip/vol if Adj blip/vol > 0, and 0 otherwise.
Adj Return$^{\text{last}}$	The dollar-holding-weighted adjusted daily return of the long equity portfolio of a hedge fund company on the last trading day of quarter q. Returns are adjusted by subtracting the corresponding daily value-weighted return of all CRSP firms incorporated in the U.S. and listed on NYSE, AMEX, or NASDAQ that have a CRSP share code of 10 or 11.
Adj Return$^{\text{last}}$/vol (%)	Volatility scaled last-trading-day return: Adj Return$^{\text{last}}$ × 100/Volatility.
Adj Return$^{\text{first}}$	The dollar-holding-weighted adjusted daily return of the long equity portfolio of a hedge fund company on the first trading day of quarter q+1. Returns are adjusted by subtracting the corresponding daily value-weighted return of all CRSP firms incorporated in the U.S. and listed on NYSE, AMEX, or NASDAQ that have a CRSP share code of 10 or 11.
Adj Return$^{\text{first}}$/vol (%)	Volatility scaled first-trading-day return: Adj Return$^{\text{first}}$ × 100/Volatility.
$D^{2011-2019}$	A dummy that equals one after Feb 17, 2011 and zero otherwise.
FPS	Average company-level flow-performance sensitivity (FPS) in a quarter. The company-level flow-performance sensitivity is calculated as the asset-weighted average of the flow-performance sensitivities of managed hedge funds. For a hedge fund, the flow-performance sensitivity in month t is measured using the estimated coefficient θ_1 of the regression for the past 24 months: $\text{flow}_t = \theta_0 + \theta_1 R_{t-1} + \varepsilon_t$, where R_{t-1} is the fund return.
HWM (fraction)	A quarterly average fraction of assets in a hedge fund company in funds with a high-water mark.
Incentive fee (%)	Average monthly company-level incentive fee rate (expressed in %) in a quarter. The company-level incentive fee rate is calculated as the asset-weighted average of the incentive fee rate of managed hedge funds.
Leverage (fraction)	A quarterly average fraction of assets in a hedge fund company in funds that report using leverage.
Lock-up period (month)	Average company-level lock-up period (expressed in months) in a quarter, calculated as the asset-weighted average of the lock-up periods of managed hedge funds.
Ln(TNA)	Natural logarithm of the average monthly company-level total net assets (TNA) in a quarter. The company-level total net assets are calculated as the sum of assets (expressed in $) of all managed hedge funds.
Management fee (%)	Average company-level management fee (expressed in %) in a quarter. The company-level management fee rate is calculated as the asset-weighted average of the management fees of managed hedge funds.
Net flow (%)	Average monthly company-level net flow (expressed in %) in a quarter. The company-level net flow is calculated as the asset-weighted average of the net fund flows of managed hedge funds. For a hedge fund, the net fund flow in month t is calculated using the formula: $[\text{TNA}_t - \text{TNA}_{t-1} \times (1 + R_t)] \times 100/\text{TNA}_{t-1}$, where R_t is the fund return.
Notice period (day)	Average company-level redemption notice period (expressed in days) in a quarter. The company-level redemption notice period is calculated as the asset-weighted average of the redemption notice periods of managed hedge funds.
Old age	A dummy that equals to one if the average company-level fund age is in the top 30% in a quarter. The company-level fund age is calculated as the asset-weighted average of the ages of managed hedge funds.
OR	Average company-level operational risk measure in a quarter.
Return (%)	Average monthly company-level return (expressed in %) in a quarter. The company-level return is calculated as the asset-weighted average of fund returns of managed hedge funds.
Volatility	Daily return volatility of a company holding-weighted stock portfolio, computed using all trading days of the quarter q except for the very last trading day.
Young age	A dummy that equals one if the average company-level fund age is in the bottom 30% in a quarter.
#Fund	Average number of hedge funds managed by a hedge fund company in a quarter.
%SEC HF cases	Percentage of SEC litigation cases involving hedge funds in the total number of SEC litigation cases in a quarter.
#SEC HF cases	Average monthly number of SEC litigation cases (zero if no cases) involving hedge funds in a quarter.

Table 2: Summary statistics: Stocks (day-level)

This table reports the summary statistics of the sample of stocks, including returns on the last trading day and the first trading day of a quarter, market capitalization on the last trading day of a quarter, and ownership of hedge fund companies (HFCs). We use common stocks (CRSP share codes of 10, or 11) traded on NYSE, AMEX, or NASDAQ (CRSP exchange codes of 1, 2, or 3). Returns are adjusted following procedures detailed in Daniel et al. (1997) (DGTW). Panel A uses 2000q1 to 2010q3 sample, while Panel B uses 2011q1 to 2019q4 sample. Stocks with market prices below $5 are excluded and returns winsorized at the 99% level.

	N	Mean	Std.Dev	Min	P25	P50	P75	Max
				Panel A: 2000q1 to 2010q3				
DGTW-Return last day (%)	142,873	0.017	3.117	-53.188	-1.255	-0.075	1.130	13.563
DGTW-Return first day (%)	141,794	-0.064	3.032	-64.129	-1.384	-0.054	1.298	13.563
HF ownership last day (%)	142,873	5.206	5.690	0.000	0.819	3.555	7.741	96.032
Market capitalization last day	142,873	3.67E+09	1.66E+10	1.80E+06	1.43E+08	4.72E+08	1.67E+09	5.72E+11
				Panel B: 2011q1 to 2019q4				
DGTW-Return last day (%)	94,321	0.015	1.870	-67.549	-0.831	-0.037	0.790	8.679
DGTW-Return first day (%)	93,772	-0.034	2.059	-55.228	-1.016	-0.043	0.933	8.679
HF ownership last day (%)	94,321	6.618	5.558	0.000	2.840	5.419	9.060	82.413
Market capitalization last day	94,321	7.83E+09	3.15E+10	2.19E+06	3.25E+08	1.14E+09	3.97E+09	1.29E+12

Table 3: Summary statistics: Hedge fund company (quarter-level)

This table reports the summary statistics of characteristics of hedge fund companies (HFCs). We calculate the mean of the monthly TNA-weighted company-level fund characteristics as the proxies of HFC characteristics in a quarter. Adj blip/vol denotes the volatility-adjusted blip; Adj blip^{+}/vol denotes the volatility-adjusted blip if it is positive (and zero otherwise). Adj Return$^{\text{last}}$/vol and Adj Return$^{\text{first}}$/vol are the dollar-holding-weighted adjusted returns of the HFC long equity portfolio on the last trading day of quarter q and the first trading day of quarter q+1. Panel A reports the statistics from 2000q1 to 2010q3, whereas Panel B reports those from 2011q1 to 2019q4. Blip measures, fund return, and net fund flow are winsorized at 1% and 99% levels.

	N	Mean	Std.Dev	Min	P25	P50	P75	Max
	Panel A: 2000q1 to 2010q4							
Adj blip (%)	6,597	0.279	1.291	-3.236	-0.318	0.131	0.730	5.084
Adj blip/vol (%)	6,597	17.643	79.487	-211.104	-25.740	11.019	56.740	257.795
Adj blip^{+}/vol (%)	6,597	38.219	56.567	0.000	0.000	11.019	56.740	257.795
Adj Return$^{\text{last}}$/vol (%)	6,597	13.595	48.840	-127.099	-11.723	8.662	36.314	166.632
Adj Return$^{\text{first}}$/vol (%)	6,597	-3.994	57.295	-171.215	-34.167	-2.467	26.305	166.779
Net flow (%)	6,597	0.304	7.450	-56.339	-1.828	0.143	2.364	55.364
Return (%)	6,597	0.636	2.520	-11.788	-0.371	0.681	1.768	12.533
Ln(TNA)	6,597	5.546	1.789	-2.303	4.400	5.592	6.780	11.103
#Fund	6,597	3.454	3.686	1.000	1.000	2.000	4.000	43.000
Management fee (%)	6,597	1.332	0.753	0.000	1.000	1.253	1.500	20.000
Incentive fee (%)	6,597	18.251	4.532	0.000	19.880	20.000	20.000	40.000
Notice period (day)	6,597	38.328	27.182	0.000	20.000	30.000	60.000	177.607
Lockup period (month)	6,597	5.637	6.470	0.000	0.000	3.000	12.000	36.000
HWM (fraction)	6,597	0.837	0.308	0.000	0.823	1.000	1.000	1.000
Leverage (fraction)	6,597	0.654	0.400	0.000	0.313	0.843	1.000	1.000
FPS	6,597	0.321	1.860	-9.147	-0.126	0.113	0.582	13.847
OR	6,597	1.766	1.193	0.000	0.854	1.688	2.905	4.000
	Panel B: 2011q1 to 2019q4							
Adj blip (%)	5,811	0.111	1.009	-3.236	-0.304	0.066	0.513	5.084
Adj blip/vol (%)	5,811	9.153	76.411	-211.104	-29.019	6.488	46.828	257.795
Adj blip^{+}/vol (%)	5,811	32.356	49.962	0.000	0.000	6.488	46.828	257.795
Adj Return$^{\text{last}}$/vol (%)	5,811	7.587	47.481	-127.099	-17.718	5.137	32.551	166.632
Adj Return$^{\text{first}}$/vol (%)	5,811	-1.461	57.412	-171.215	-31.423	-1.203	28.967	166.779
Net flow (%)	5,811	-0.207	5.883	-56.339	-1.596	-0.177	0.941	58.874
Return (%)	5,811	0.396	2.008	-11.788	-0.374	0.480	1.361	13.609
Ln(TNA)	5,811	5.814	1.819	-0.511	4.697	5.795	6.954	11.579
#Fund	5,811	2.809	2.767	1.000	1.000	2.000	4.000	23.000
Management fee (%)	5,811	1.402	0.701	0.000	1.000	1.466	1.500	20.000
Incentive fee (%)	5,811	17.094	5.691	0.000	16.121	20.000	20.000	40.000
Notice period (day)	5,811	34.285	30.709	0.000	5.742	30.000	54.057	180.000
Lockup period (month)	5,811	5.737	6.666	0.000	0.000	0.857	12.000	36.000
HWM (fraction)	5,811	0.850	0.317	0.000	0.970	1.000	1.000	1.000
Leverage (fraction)	5,811	0.704	0.405	0.000	0.369	1.000	1.000	1.000
FPS	5,811	0.151	1.644	-9.147	-0.135	0.041	0.358	13.847
OR	5,811	1.902	1.184	0.000	1.000	2.000	3.000	4.000

Table 4: Stock-level manipulation

This table reports the estimation results for the regression of stock abnormal returns (measured as DGTW-adjusted returns) during the last trading day of a quarter and the last-trading-day-plus-1 day on indicators of hedge fund ownership quartiles (HF Q4, HF Q3, and HF Q2 in Panel A) and halves (HF (top half) in Panel B) following Ben-David et al. (2013) using two time periods. The first period is from 2000q1 to 2010q3; the second period is from 2011q1 to 2019q4. Panel C includes ownership dummies capturing stocks with top/bottom halves of HF ownership and top/bottom halves of ownership by other non-HF institutional investors. t-statistics with robust standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	2000q1-2010q3		2011q1-2019q4	
	Last day	Last day + 1	Last day	Last day + 1
Panel A: Regression on Hedge Fund Ownership Quartiles				
HF Q4 (high)	0.152***	-0.072***	0.021	0.005
	(6.199)	(-3.061)	(1.094)	(0.229)
HF Q3	0.119***	-0.003	0.001	0.020
	(4.940)	(-0.109)	(0.055)	(1.014)
HF Q2 (low)	0.110***	0.023	0.024	0.027
	(4.488)	(1.003)	(1.339)	(1.392)
Constant	-0.078***	-0.051***	0.004	-0.047***
	(-4.149)	(-2.974)	(0.259)	(-3.032)
Observations	142,873	141,794	94,321	93,772
R-squared	0.000	0.000	0.000	0.000
Panel B: Regression on Hedge Fund Ownership Halves				
HF (top half)	0.081***	-0.049***	-0.001	-0.001
	(4.930)	(-3.026)	(-0.102)	(-0.095)
Constant	-0.024*	-0.040***	0.016*	-0.033***
	(-1.907)	(-3.422)	(1.759)	(-3.404)
Observations	142,873	141,794	94,321	93,772
R-squared	0.000	0.000	0.000	0.000
Panel C: Regression on Hedge Fund and Other Institutional Ownership				
HF (top) U Non-HF (top)	0.042**	-0.030	0.011	0.007
	(2.073)	(-1.531)	(0.709)	(0.392)
HF (top) U Non-HF (bottom)	0.152***	-0.056**	-0.005	0.011
	(5.689)	(-2.147)	(-0.261)	(0.510)
HF (bottom) U Non-HF (top)	-0.017	0.035	0.016	0.025
	(-0.698)	(1.476)	(0.910)	(1.311)
Constant	-0.018	-0.051***	0.010	-0.043***
	(-1.157)	(-3.436)	(0.751)	(-3.119)
Observations	142,873	141,794	94,321	93,772
R-squared	0.000	0.000	0.000	0.000

Table 5: Average fund-level blip

This table reports the descriptive statistics of fund-level blips, as well as the corresponding differences across two periods from 2000q1 to 2010q3, as used in Ben-David et al. (2013), and from 2011q1 to 2019q4. Fund-level blip is measured using: (1) volatility-adjusted blip (Adj blip/vol), and (2) positive volatility-adjusted blip (Adj blip$^+$/vol), i.e. the volatility-adjusted blip if it is positive (and zero otherwise). *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Number of	Average #HFs	Adj blip/vol (%)		Average #HFs with	Adj blip$^+$/vol (%)	
	quarter	per quarter	Mean	Std.Dev	Adj blip$^+$/vol per quarter	Mean	Std.Dev
(I) 2000q1-2010q3	43	237.35	19.222***	29.154	136.49	67.943***	29.749
			(4.324)			(14.977)	
(II) 2011q1-2019q4	36	294.75	7.792*	25.969	161.75	57.465***	19.531
			(1.800)			(17.654)	
(I) − (II)	7	-57.40	11.429*		3.576	10.478*	
			(1.823)			(1.811)	

Table 6: Stock price manipulation and future fund flows

This table reports the estimation results of regressions for the average monthly company-level net flow (Net flow, %) in q+1 for the full sample (All) and two sub-periods 2000q1-2010q3 (Before) and 2011q1-2019q4 (After). The time period dummy ($D_{2011-2019}$) takes a value of one after 2011q1 and zero otherwise. Adj blip/vol is the fund-level volatility adjusted blip. Adj $\text{Return}^{\text{last}}$/vol and Adj $\text{Return}^{\text{first}}$/vol are the dollar-holding-weighted adjusted returns of the HFC long equity portfolio on the last trading day of quarter q and the first trading day of quarter q+1. Other HFC characteristics are defined in Table 1. Standard errors are corrected for heteroskedasticity and fund-level clustering with t-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level respectively.

Dependent: Net flow (q+1)	All				Before		After	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$D^{2011\text{-}2019}$	-0.029		0.004					
	(-0.189)		(0.028)					
Adj blip/vol	0.002	0.002						
	(1.565)	(1.269)						
$\times$ $D^{2011\text{-}2019}$	-0.004**	-0.003*						
	(-2.041)	(-1.790)						
Adj $\text{Return}^{\text{last}}$/vol			0.005**	0.005**	0.005**	0.005**	-0.001	-0.001
			(2.427)	(2.285)	(2.420)	(2.317)	(-0.630)	(-0.879)
$\times$ $D^{2011\text{-}2019}$			-0.006**	-0.007**				
			(-2.358)	(-2.344)				
Adj $\text{Return}^{\text{first}}$/vol			0.000	0.001	0.000	0.001	0.001	0.001
			(0.031)	(0.309)	(0.045)	(0.345)	(0.874)	(0.681)
$\times$ $D^{2011\text{-}2019}$			0.001	0.001				
			(0.583)	(0.242)				
Net flow (q)	0.262***	0.254***	0.262***	0.254***	0.302***	0.294***	0.180***	0.172***
	(11.355)	(10.964)	(11.338)	(10.955)	(11.078)	(10.711)	(4.510)	(4.301)
Return	0.354***	0.320***	0.352***	0.319***	0.390***	0.330***	0.281***	0.304***
	(10.051)	(8.675)	(9.983)	(8.665)	(8.269)	(6.723)	(6.254)	(6.496)
Log(TNA)	-0.156***	-0.145***	-0.158***	-0.146***	-0.203***	-0.185***	-0.103	-0.098
	(-3.043)	(-2.799)	(-3.070)	(-2.820)	(-3.095)	(-2.810)	(-1.449)	(-1.367)
Management fee	0.002	0.027	0.003	0.025	-0.080	-0.043	0.176*	0.169*
	(0.029)	(0.347)	(0.041)	(0.329)	(-0.804)	(-0.452)	(1.761)	(1.716)
Incentive fee	-0.016	-0.016	-0.016	-0.016	-0.036	-0.033	-0.003	-0.005
	(-0.930)	(-0.932)	(-0.935)	(-0.922)	(-1.282)	(-1.151)	(-0.121)	(-0.229)
Notice period	-0.004	-0.003	-0.004	-0.003	-0.000	0.001	-0.007**	-0.007**
	(-1.548)	(-1.257)	(-1.529)	(-1.264)	(-0.114)	(0.137)	(-2.327)	(-2.256)
Lock-up period	0.026**	0.028**	0.026**	0.027**	0.028*	0.030*	0.020	0.021
	(2.157)	(2.302)	(2.151)	(2.289)	(1.684)	(1.804)	(1.270)	(1.328)
Young age	0.752***	0.771***	0.755***	0.773***	0.775***	0.801***	0.733***	0.726***
	(3.956)	(4.021)	(3.970)	(4.029)	(2.787)	(2.877)	(2.803)	(2.752)
Old age	-0.350*	-0.347*	-0.351*	-0.350*	-0.449	-0.440	-0.189	-0.198
	(-1.821)	(-1.775)	(-1.825)	(-1.788)	(-1.576)	(-1.519)	(-0.826)	(-0.860)
Constant	0.703	0.930	0.677	0.826	0.973	1.000	0.274	0.386
	(1.152)	(0.976)	(1.105)	(0.860)	(1.002)	(0.829)	(0.344)	(0.469)
HFC Style FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	11,368	11,368	11,368	11,368	6,188	6,188	5,180	5,180
R-squared	0.076	0.082	0.077	0.083	0.096	0.101	0.048	0.054

Table 7: Regulatory attention and stock price manipulation

This table reports the estimation results for the OLS regressions of fund-level stock price manipulation at the end of quarter q for the full sample (All) and two sub-periods 2000q1-2010q3 (Before) and 2011q1-2019q4 (After). Stock price manipulation is measured as volatility-adjusted blip (Adj blip/vol). #SEC HF cases is the number of SEC litigation cases involving hedge funds during quarter q. %SEC HF cases is the percentage of SEC litigation cases involving hedge funds in the total number of SEC litigation cases in a quarter. Other control variables are defined in Table 1. Adj blip/vol, fund return, and net fund flow are winsorized at 1% and 99% levels. Standard errors are corrected for heteroskedasticity and fund-level clustering with t-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent: Adj blip/vol (q)	All	Before	After	All	Before	After
	(1)	(2)	(3)	(4)	(5)	(6)
$D^{2011\text{-}2019}$	-7.796***			-5.932***		
	(-4.459)			(-3.316)		
#SEC HF cases	-2.357***	-3.714***	-1.355**			
	(-4.752)	(-4.312)	(-2.320)			
%SEC HF cases				-0.777***	-1.396***	-0.450**
				(-4.706)	(-4.531)	(-2.333)
Adj blip/vol (q−1)	0.040***	0.101***	-0.038**	0.040***	0.101***	-0.039***
	(3.338)	(6.124)	(-2.581)	(3.293)	(6.090)	(-2.609)
Net flow	15.549	14.134	12.214	15.709	14.035	12.225
	(1.518)	(1.060)	(0.705)	(1.533)	(1.052)	(0.707)
Return	-0.827**	-1.516***	0.329	-0.827**	-1.502***	0.332
	(-2.570)	(-3.521)	(0.716)	(-2.562)	(-3.483)	(0.718)
FPS	0.254	0.939	-0.742	0.251	0.929	-0.744
	(0.623)	(1.608)	(-1.248)	(0.615)	(1.600)	(-1.250)
Log(TNA)	-0.398	0.032	-0.735	-0.388	0.072	-0.736
	(-0.837)	(0.050)	(-1.049)	(-0.816)	(0.112)	(-1.054)
#Fund	-0.118	-0.242	-0.163	-0.120	-0.254	-0.160
	(-0.397)	(-0.638)	(-0.443)	(-0.406)	(-0.669)	(-0.436)
Management fee	-2.649***	-2.546**	-2.871*	-2.662***	-2.544**	-2.867*
	(-3.082)	(-2.177)	(-1.939)	(-3.106)	(-2.205)	(-1.927)
Incentive fee	-0.095	0.036	-0.370*	-0.091	0.042	-0.370*
	(-0.545)	(0.123)	(-1.800)	(-0.525)	(0.141)	(-1.807)
Notice period	0.011	0.026	-0.001	0.010	0.025	-0.001
	(0.333)	(0.521)	(-0.032)	(0.319)	(0.519)	(-0.032)
Lock-up period	-0.075	-0.378**	0.356*	-0.074	-0.376**	0.357*
	(-0.517)	(-2.081)	(1.677)	(-0.512)	(-2.073)	(1.679)
HWM dummy	-0.465	-1.848	2.701	-0.536	-1.775	2.705
	(-0.168)	(-0.439)	(0.776)	(-0.194)	(-0.422)	(0.778)
levered dummy	1.992	3.920	-0.273	1.970	3.809	-0.279
	(0.950)	(1.382)	(-0.079)	(0.939)	(1.346)	(-0.081)
Young age	-5.212**	-5.648**	-4.432	-5.222**	-5.675**	-4.425
	(-2.587)	(-2.083)	(-1.436)	(-2.586)	(-2.093)	(-1.432)
Old age	-3.011	-2.415	-4.244	-3.019	-2.409	-4.239
	(-1.442)	(-0.858)	(-1.323)	(-1.443)	(-0.857)	(-1.319)
Constant	30.458***	28.995***	26.777***	29.440***	28.316***	27.296***
	(5.341)	(3.174)	(4.286)	(5.245)	(3.136)	(4.369)
HFC Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,067	5,887	5,180	11,067	5,887	5,180
R-squared	0.010	0.025	0.006	0.010	0.025	0.006

Table 8: Regulatory attention and stock price manipulation: OR, flow and returns I

This table reports the estimation results for the OLS regressions of fund-level stock price manipulation at the end of quarter q for two sub-periods 2000q1-2010q3 (Before) and 2011q1-2019q4 (After). Stock price manipulation is measured as volatility-adjusted blip (Adj blip/vol). #SEC HF cases is the number of SEC litigation cases involving hedge funds during quarter q. Low OR is a dummy variable taking a value of one for HFCs with the OR below the median. High Flow is a dummy variable taking a value of one for HFCs with the average monthly flow over the quarter q above the median. High Return is a dummy variable taking a value of one for HFCs with the average monthly return over the quarter q above the median. Other control variables are defined in Table 1. Adj blip/vol, fund return, and net fund flow are winsorized at 1% and 99% levels. Standard errors are corrected for heteroskedasticity and fund-level clustering with t-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent: Adj blip/vol (q)	Before	After	Before	After	Before	After
	(1)	(2)	(3)	(4)	(5)	(6)
#SEC HF cases	-2.059*	-1.690*	-2.389**	-1.683**	-3.493***	-0.182
	(-1.895)	(-1.906)	(-2.103)	(-2.041)	(-3.262)	(-0.233)
Low OR	6.743	0.595				
	(1.312)	(0.156)				
× #SEC HF cases	-3.305**	0.623				
	(-2.018)	(0.546)				
High Flow			7.677	-0.932		
			(1.587)	(-0.239)		
× #SEC HF cases			-2.781*	0.696		
			(-1.828)	(0.559)		
High Return					0.045	5.405
					(0.009)	(1.532)
× #SEC HF cases					-0.872	-2.290**
					(-0.564)	(-2.061)
Adj blip/vol (q−1)	0.100***	-0.038**	0.102***	-0.038**	0.103***	-0.038***
	(6.089)	(-2.574)	(6.156)	(-2.589)	(6.234)	(-2.610)
Net flow	13.757	13.806			12.131	13.151
	(1.023)	(0.800)			(0.908)	(0.759)
Return	-1.491***	0.343	-1.517***	0.327		
	(-3.464)	(0.744)	(-3.546)	(0.713)		
FPS	0.932	-0.758	0.978*	-0.750	0.945	-0.750
	(1.595)	(-1.272)	(1.682)	(-1.256)	(1.613)	(-1.257)
Log(TNA)	0.056	-0.684	0.016	-0.733	-0.032	-0.730
	(0.088)	(-0.985)	(0.025)	(-1.046)	(-0.051)	(-1.032)
#Fund	-0.255	-0.162	-0.247	-0.155	-0.209	-0.173
	(-0.675)	(-0.443)	(-0.644)	(-0.423)	(-0.551)	(-0.466)
Management fee	-2.608**	-2.838*	-2.572**	-2.893*	-2.544**	-2.898*
	(-2.243)	(-1.953)	(-2.196)	(-1.953)	(-2.136)	(-1.958)
Incentive fee	0.043	-0.370*	0.026	-0.372*	0.022	-0.371*
	(0.144)	(-1.782)	(0.089)	(-1.806)	(0.076)	(-1.793)
Notice period	0.021	-0.001	0.024	-0.001	0.027	-0.002
	(0.420)	(-0.013)	(0.480)	(-0.032)	(0.546)	(-0.040)
Lock-up period	-0.366**	0.360*	-0.373**	0.356*	-0.375**	0.359*
	(-2.018)	(1.704)	(-2.043)	(1.678)	(-2.075)	(1.683)
HWM dummy	-1.743	2.690	-1.777	2.767	-1.690	2.799
	(-0.405)	(0.769)	(-0.421)	(0.798)	(-0.407)	(0.806)
levered dummy	3.719	-0.225	4.005	-0.212	3.833	-0.228
	(1.311)	(-0.065)	(1.413)	(-0.062)	(1.356)	(-0.066)
Young age	-5.653**	-4.531	-5.389**	-4.332	-5.674**	-4.346
	(-2.099)	(-1.469)	(-1.976)	(-1.409)	(-2.099)	(-1.406)
Old age	-2.422	-4.272	-2.304	-4.253	-2.258	-4.178
	(-0.867)	(-1.333)	(-0.816)	(-1.319)	(-0.807)	(-1.299)
Constant	25.736***	25.737***	25.749***	27.058***	28.817***	24.034***
	(2.752)	(3.796)	(2.807)	(4.247)	(3.190)	(3.766)
HFC Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,887	5,180	5,887	5,180	5,887	5,180
R-squared	0.026	0.006	0.025	0.006	0.023	0.006

Table 9: Regulatory attention and stock price manipulation: OR, flow and returns II

This table reports the estimation results for the OLS regressions of fund-level stock price manipulation at the end of quarter q for two sub-periods 2000q1-2010q3 (Before) and 2011q1-2019q4 (After). Stock price manipulation is measured as volatility-adjusted blip (Adj blip/vol). %SEC HF cases is the percentage of SEC litigation cases involving hedge funds in the total number of SEC litigation cases in a quarter. Low OR is a dummy variable taking a value of one for HFCs with the OR below the median. High Flow is a dummy variable taking a value of one for HFCs with the average monthly flow over the quarter q above the median. High Return is a dummy variable taking a value of one for HFCs with the average monthly return over the quarter q above the median. Other control variables are defined in Table 1. Adj blip/vol, fund return, and net fund flow are winsorized at 1% and 99% levels. Standard errors are corrected for heteroskedasticity and fund-level clustering with t-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent: Adj blip/vol (q)	Before	After	Before	After	Before	After
	(1)	(2)	(3)	(4)	(5)	(6)
%SEC HF cases	-0.759*	-0.562*	-0.818**	-0.556**	-1.367***	-0.125
	(-1.895)	(-1.968)	(-2.011)	(-2.029)	(-3.500)	(-0.492)
Low OR	6.506	0.338				
	(1.347)	(0.085)				
× %SEC HF cases	-1.270**	0.209				
	(-2.116)	(0.582)				
High Flow			8.363*	-1.146		
			(1.843)	(-0.262)		
× %SEC HF cases			-1.212**	0.225		
			(-2.203)	(0.539)		
High Return					-0.738	5.234
					(-0.156)	(1.318)
× %SEC HF cases					-0.228	-0.633*
					(-0.407)	(-1.706)
Adj blip/vol (q−1)	0.100***	-0.038***	0.101***	-0.039***	0.102***	-0.039***
	(6.052)	(-2.604)	(6.099)	(-2.619)	(6.188)	(-2.620)
Net flow	13.685	13.793			12.056	12.970
	(1.018)	(0.801)			(0.903)	(0.751)
Return	-1.474***	0.345	-1.503***	0.330		
	(-3.422)	(0.745)	(-3.505)	(0.715)		
FPS	0.926	-0.761	0.974*	-0.753	0.932	-0.749
	(1.595)	(-1.276)	(1.687)	(-1.260)	(1.603)	(-1.254)
Log(TNA)	0.112	-0.682	0.066	-0.730	0.013	-0.732
	(0.176)	(-0.986)	(0.104)	(-1.045)	(0.020)	(-1.040)
#Fund	-0.269	-0.160	-0.265	-0.153	-0.221	-0.165
	(-0.711)	(-0.439)	(-0.691)	(-0.419)	(-0.583)	(-0.447)
Management fee	-2.620**	-2.836*	-2.574**	-2.885*	-2.535**	-2.879*
	(-2.263)	(-1.941)	(-2.233)	(-1.936)	(-2.158)	(-1.934)
Incentive fee	0.049	-0.370*	0.032	-0.372*	0.027	-0.372*
	(0.165)	(-1.791)	(0.108)	(-1.814)	(0.093)	(-1.812)
Notice period	0.020	-0.001	0.023	-0.002	0.026	-0.002
	(0.401)	(-0.016)	(0.475)	(-0.034)	(0.539)	(-0.041)
Lock-up period	-0.361**	0.360*	-0.369**	0.357*	-0.372**	0.360*
	(-1.992)	(1.701)	(-2.030)	(1.681)	(-2.067)	(1.687)
HWM dummy	-1.646	2.690	-1.720	2.773	-1.595	2.838
	(-0.384)	(0.769)	(-0.408)	(0.800)	(-0.385)	(0.820)
levered dummy	3.586	-0.239	3.896	-0.223	3.722	-0.243
	(1.265)	(-0.070)	(1.378)	(-0.065)	(1.319)	(-0.071)
Young age	-5.675**	-4.528	-5.382**	-4.318	-5.692**	-4.347
	(-2.109)	(-1.466)	(-1.976)	(-1.403)	(-2.108)	(-1.406)
Old age	-2.410	-4.270	-2.265	-4.245	-2.264	-4.185
	(-0.865)	(-1.331)	(-0.804)	(-1.315)	(-0.810)	(-1.299)
Constant	25.120***	26.381***	24.728***	27.657***	28.521***	24.607***
	(2.719)	(3.915)	(2.721)	(4.319)	(3.197)	(3.819)
HFC Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,887	5,180	5,887	5,180	5,887	5,180
R-squared	0.026	0.006	0.026	0.006	0.023	0.006

Appendices

Do Hedge Funds Still Manipulate Stock Prices? SUPPLEMENTARY RESULTS

This Online Appendix tabulates additional results mentioned in the main body of the paper.

- Table A1 reports the estimation results for the regression for the future fund flow using HFC performance terciles as a measure of past performance, instead of past quarterly returns.
- Table A2 reports the estimation results for the regression capturing regulatory attention to hedge funds using a tobit specification for positive volatility adjusted blips.
- Table A3 reports the estimation results for the regression capturing regulatory attention to hedge funds using a logit specification for the probability of a volatility adjusted blip being above 50%.

Table A1: Stock price manipulation and future fund flows: Performance terciles

This table reports the estimation results of regressions for the average monthly company-level net flow (Net flow, %) in q+1 for the full sample (All) and two sub-periods 2000q1-2010q3 (Before) and 2011q1-2019q4 (After). The time period dummy ($D_{2011-2019}$) takes a value of one after 2011q1 and zero otherwise. Adj blip/vol is the fund-level volatility adjusted blip. Adj $\text{Return}^{\text{last}}$/vol and Adj $\text{Return}^{\text{first}}$/vol are the dollar-holding-weighted adjusted returns of the HFC long equity portfolio on the last trading day of quarter q and the first trading day of quarter q+1. Past HFC performance is captured via performance terciles. Other HFC characteristics are defined in Table 1. Standard errors are corrected for heteroskedasticity and fund-level clustering with t-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level respectively.

Dependent: Net flow (q+1)	All				Before		After	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$D^{2011\text{-}2019}$	-0.194		-0.160					
	(-1.265)		(-1.026)					
Adj blip/vol	0.002	0.001						
	(1.155)	(0.982)						
$\times$ $D^{2011\text{-}2019}$	-0.003*	-0.003*						
	(-1.832)	(-1.752)						
Adj $\text{Return}^{\text{last}}$/vol			0.005**	0.004*	0.005**	0.004*	-0.001	-0.001
			(2.208)	(1.949)	(2.128)	(1.905)	(-0.566)	(-0.851)
$\times$ $D^{2011\text{-}2019}$			-0.006**	-0.006**				
			(-2.151)	(-2.089)				
Adj $\text{Return}^{\text{first}}$/vol			0.001	0.001	0.001	0.001	0.002	0.001
			(0.364)	(0.374)	(0.382)	(0.370)	(1.074)	(0.917)
$\times$ $D^{2011\text{-}2019}$			0.001	0.001				
			(0.486)	(0.393)				
Net flow (q)	0.263***	0.254***	0.263***	0.254***	0.304***	0.294***	0.180***	0.172***
	(11.345)	(10.930)	(11.328)	(10.922)	(11.094)	(10.676)	(4.478)	(4.276)
Low rank	9.541***	9.773***	9.565***	9.802***	12.025***	12.553***	7.088***	6.922***
	(4.822)	(4.828)	(4.844)	(4.853)	(4.159)	(4.206)	(2.892)	(2.762)
Mid rank	2.201***	2.441***	2.132***	2.365***	3.012***	3.078***	1.247	1.620*
	(3.309)	(3.525)	(3.225)	(3.430)	(2.984)	(2.952)	(1.518)	(1.876)
High rank	2.078	2.436	2.095	2.460	1.967	2.715	2.088	2.090
	(1.401)	(1.603)	(1.415)	(1.622)	(0.818)	(1.097)	(1.147)	(1.124)
Log(TNA)	-0.166***	-0.153***	-0.168***	-0.154***	-0.224***	-0.198***	-0.104	-0.102
	(-3.198)	(-2.926)	(-3.226)	(-2.944)	(-3.432)	(-3.027)	(-1.442)	(-1.388)
Management fee	0.004	0.038	0.005	0.036	-0.099	-0.043	0.189*	0.185*
	(0.041)	(0.462)	(0.053)	(0.450)	(-1.002)	(-0.461)	(1.740)	(1.753)
Incentive fee	-0.016	-0.016	-0.016	-0.016	-0.038	-0.034	-0.003	-0.005
	(-0.930)	(-0.900)	(-0.937)	(-0.894)	(-1.334)	(-1.179)	(-0.138)	(-0.222)
Notice period	-0.004	-0.003	-0.004	-0.003	-0.001	0.001	-0.007**	-0.007**
	(-1.512)	(-1.159)	(-1.494)	(-1.167)	(-0.202)	(0.147)	(-2.205)	(-2.126)
Lock-up period	0.026**	0.028**	0.026**	0.028**	0.025	0.029*	0.022	0.023
	(2.156)	(2.366)	(2.152)	(2.356)	(1.520)	(1.753)	(1.413)	(1.459)
Young age	0.759***	0.779***	0.762***	0.782***	0.789***	0.818***	0.740***	0.735***
	(3.954)	(4.049)	(3.972)	(4.059)	(2.804)	(2.931)	(2.806)	(2.771)
Old age	-0.349*	-0.341*	-0.350*	-0.343*	-0.443	-0.425	-0.192	-0.200
	(-1.805)	(-1.741)	(-1.807)	(-1.750)	(-1.559)	(-1.473)	(-0.827)	(-0.857)
Constant	-2.419***	-2.094*	-2.444***	-2.185**	-2.866**	-2.821*	-2.179**	-2.199**
	(-2.847)	(-1.926)	(-2.879)	(-2.000)	(-2.210)	(-1.963)	(-2.018)	(-1.990)
HFC Style FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	11,368	11,368	11,368	11,368	6,188	6,188	5,180	5,180
R-squared	0.072	0.082	0.072	0.082	0.091	0.102	0.045	0.051

Table A2: Regulatory attention and stock price manipulation: Tobit specification

This table reports the estimation results of a Tobit regression for fund-level stock price manipulation at the end of quarter q for the full sample (All) and two sub-periods 2000q1-2010q3 (Before) and 2011q1-2019q4 (After). Stock price manipulation is measured as as a positive volatility-adjusted blip (Adj blip^{+}/vol). #SEC HF cases is the number of SEC litigation cases involving hedge funds. %SEC HF cases is the fraction of SEC litigation cases involving hedge funds in the total number of cases during quarter q. $D_{2011-2019}$ is a time period dummy taking a value of one after 2011q1 and zero otherwise. Other control variables are defined in Table 1. Standard errors are corrected for heteroskedasticity and fund-level clustering with t-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent: Adj blip^{+}/vol (q)	All	Before	After	All	Before	After
	(1)	(2)	(3)	(4)	(5)	(6)
$D^{2011\text{-}2019}$	-6.579***			-3.353		
	(-3.202)			(-1.622)		
#SEC HF cases	-3.944***	-4.800***	-3.334***			
	(-6.951)	(-4.957)	(-4.789)			
%SEC HF cases				-1.355***	-1.950***	-1.069***
				(-7.157)	(-5.537)	(-4.729)
Adj blip^{+}/vol (q−1)	0.122***	0.208***	-0.019	0.121***	0.206***	-0.021
	(6.037)	(8.466)	(-0.686)	(5.958)	(8.397)	(-0.748)
Net flow	21.319*	13.321	29.404	21.554*	12.709	29.384
	(1.732)	(0.856)	(1.400)	(1.752)	(0.817)	(1.404)
Return	-0.450	-1.205**	0.853	-0.444	-1.172**	0.856
	(-1.190)	(-2.475)	(1.535)	(-1.169)	(-2.411)	(1.527)
FPS	0.542	1.042	-0.055	0.536	1.019	-0.063
	(1.075)	(1.460)	(-0.084)	(1.063)	(1.443)	(-0.097)
Log(TNA)	-0.285	0.234	-0.876	-0.275	0.288	-0.871
	(-0.451)	(0.275)	(-0.926)	(-0.435)	(0.342)	(-0.924)
#Fund	-0.188	-0.222	-0.399	-0.190	-0.235	-0.400
	(-0.534)	(-0.520)	(-0.740)	(-0.541)	(-0.552)	(-0.743)
Management fee	-2.938***	-3.624**	-2.051	-2.929***	-3.565**	-2.029
	(-2.629)	(-2.176)	(-1.118)	(-2.609)	(-2.168)	(-1.102)
Incentive fee	0.004	0.035	-0.252	0.012	0.036	-0.254
	(0.014)	(0.092)	(-0.778)	(0.045)	(0.096)	(-0.785)
Notice period	0.085**	0.088	0.092	0.085**	0.089	0.092
	(1.980)	(1.407)	(1.536)	(1.978)	(1.433)	(1.536)
Lock-up period	0.093	-0.232	0.549**	0.095	-0.227	0.552**
	(0.521)	(-1.048)	(2.085)	(0.530)	(-1.026)	(2.090)
HWM dummy	-1.664	-5.350	4.830	-1.763	-5.038	4.862
	(-0.421)	(-1.026)	(0.922)	(-0.445)	(-0.970)	(0.929)
levered dummy	4.784*	6.449*	3.543	4.732*	6.260*	3.553
	(1.701)	(1.760)	(0.837)	(1.683)	(1.713)	(0.839)
Young age	-8.161***	-7.441**	-8.446**	-8.184***	-7.491**	-8.425**
	(-3.247)	(-2.256)	(-2.250)	(-3.250)	(-2.276)	(-2.240)
Old age	-2.516	-2.467	-3.245	-2.523	-2.426	-3.253
	(-0.960)	(-0.725)	(-0.838)	(-0.963)	(-0.716)	(-0.838)
Constant	16.136*	15.870	15.717	14.732*	15.833	16.674*
	(1.915)	(1.309)	(1.631)	(1.764)	(1.319)	(1.722)
HFC Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,067	5,887	5,180	11,067	5,887	5,180
R-squared	0.003	0.005	0.002	0.003	0.005	0.002

Table A3: Regulatory attention and stock price manipulation: Logit specification

This table reports the estimation results for logit regression for fund-level stock price manipulation at the end of quarter q for the full sample (All) and two sub-periods 2000q1-2010q3 (Before) and 2011q1-2019q4 (After). Stock price manipulation is measured as a dummy variable that equals one if the volatility-adjusted blip being larger than 50%. #SEC HF cases is the number of SEC litigation cases involving hedge funds. %SEC HF cases (q) is the fraction of SEC litigation cases involving hedge funds in the total number of cases during quarter q. $D_{2011-2019}$ is a time period dummy taking a value of one after 2011q1 and zero otherwise. Other control variables are defined in Table 1. Standard errors are corrected for heteroskedasticity and fund-level clustering with t-statistics reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent: $D_{\text{Adj blip/vol>50\%}}$ (q)	All	Before	After	All	Before	After
	(1)	(2)	(3)	(4)	(5)	(6)
$D^{2011\text{-}2019}$	-0.150***			-0.055		
	(-2.848)			(-1.030)		
#SEC HF cases	-0.120***	-0.147***	-0.098***			
	(-7.654)	(-6.230)	(-4.669)			
%SEC HF cases				-0.041***	-0.063***	-0.028***
				(-7.580)	(-7.131)	(-4.155)
$D_{\text{Adj blip/vol>50\%}}$ (q−1)	0.379***	0.515***	0.170**	0.376***	0.505***	0.171**
	(6.605)	(7.146)	(1.991)	(6.545)	(7.003)	(1.990)
Net flow	0.447	0.147	0.917	0.454	0.121	0.908
	(1.233)	(0.322)	(1.474)	(1.250)	(0.266)	(1.463)
Return	-0.010	-0.032***	0.034**	-0.010	-0.031**	0.033**
	(-1.015)	(-2.595)	(2.214)	(-0.982)	(-2.493)	(2.185)
FPS	0.006	0.018	-0.013	0.005	0.017	-0.014
	(0.450)	(1.090)	(-0.677)	(0.427)	(1.048)	(-0.697)
Log(TNA)	0.003	0.026	-0.016	0.003	0.027	-0.015
	(0.150)	(1.097)	(-0.510)	(0.165)	(1.170)	(-0.477)
#Fund	-0.004	0.001	-0.028	-0.004	0.000	-0.028
	(-0.427)	(0.069)	(-1.408)	(-0.436)	(0.027)	(-1.429)
Management fee	-0.081	-0.168*	-0.034	-0.080	-0.161*	-0.035
	(-1.588)	(-1.898)	(-0.517)	(-1.582)	(-1.857)	(-0.525)
Incentive fee	0.011	0.005	0.011	0.011	0.005	0.011
	(1.227)	(0.458)	(1.061)	(1.252)	(0.445)	(1.038)
Notice period	0.003**	0.002*	0.003*	0.003**	0.002*	0.003*
	(2.435)	(1.717)	(1.953)	(2.425)	(1.762)	(1.930)
Lock-up period	0.004	-0.001	0.010	0.004	-0.001	0.011
	(0.796)	(-0.260)	(1.469)	(0.801)	(-0.241)	(1.476)
HWM dummy	-0.029	-0.066	0.026	-0.032	-0.051	0.029
	(-0.236)	(-0.415)	(0.168)	(-0.260)	(-0.321)	(0.182)
levered dummy	0.066	0.070	0.076	0.064	0.064	0.077
	(0.869)	(0.744)	(0.676)	(0.846)	(0.674)	(0.687)
Young age	-0.240***	-0.181*	-0.286**	-0.240***	-0.182*	-0.286**
	(-3.226)	(-1.934)	(-2.565)	(-3.230)	(-1.951)	(-2.563)
Old age	-0.065	-0.076	-0.068	-0.065	-0.074	-0.068
	(-0.912)	(-0.859)	(-0.669)	(-0.913)	(-0.834)	(-0.670)
Constant	-1.117***	-0.979***	-1.159***	-1.161***	-0.972***	-1.157***
	(-4.291)	(-2.933)	(-3.660)	(-4.485)	(-2.931)	(-3.647)
HFC Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,067	5,887	5,180	11,067	5,887	5,180
R-squared	0.019	0.026	0.016	0.018	0.028	0.015