Hedge Fund Activists: Do They Take Cues from Institutional Exit?[◆]

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ABSTRACT

This paper investigates the role of institutional trading in the emergence of hedge fund activism – an important corporate governance device. We find that institutional selling volume raises a firm's probability of becoming an activist target. Institutional sales appear to accelerate the timing of a campaign at firms whose potential benefits from monitoring have already been recognized by activists rather than bring attention to firms that are outside the activists' radar screen. Further, we study the hedge funds' accumulation of target shares at the daily frequency and find that: (i) institutional selling volume increases hedge fund buying volume, and (ii) this effect is significantly stronger for firms with lower expected benefits from activism. For identification, we exploit each individual institution's funding circumstances as an exogenous determinant of institutional trading volume. Taken together, our results provide empirical support to theoretical predictions that expected gains from trading with uninformed investors supplement expected gains from monitoring in determining the activist's targeting decision.

Keywords: Shareholder activism, Corporate governance, Hedge funds, Institutional investors

JEL classification: G11, G12, G23, G34

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1. Introduction

Hedge fund activism is an important governance mechanism associated with significant improvements in the performance and governance of target firms (see Brav, Jiang, Partnoy, and Thomas, 2008; Becht, Franks, Mayer, and Rossi, 2008; Brav, Jiang, and Kim, 2012).[1] Hedge fund activists typically target firms with large institutional ownership. It has been argued that the rationale for this is twofold: first, institutional investors are better equipped to evaluate the success of an activist intervention and facilitate a faster convergence of the target's share price to its improved fundamental value; second, institutional voting directly impacts a campaign's success in its more confrontational stages. However, the extant literature has not examined the role of institutions in the emergence of activism.

In this paper, we empirically investigate the impact of institutional trading on an activist's decision to acquire shares in a target firm and initiate a campaign. Our research motivation comes from the theoretical contribution of Maug (1998) and other similar *liquidity* theories (Kahn and Winton, 1998; Kyle and Vila, 1991; Back, Li, and Ljungqvist, 2014; and others). Though different in their assumptions and (in some cases) predictions, these theories share the premise that non-activist shareholders are noise traders whose liquidity trades allow the activist to camouflage his purchases and gain on his newly acquired shares once he declares his activist intentions. These (expected) trading gains are critical in covering the activist's monitoring costs, making a campaign financially viable, and hence, raising the probability of an intervention.

Our paper provides a *direct* test of the liquidity theories, focusing on their shared mechanism in which noise trading facilitates the formation of an activist block. We take non-activist institutions, rather than retail investors, as the representative noise traders for a number of reasons. First, institutions hold the majority of shares in public firms, particularly firms targeted by activist hedge funds.[2] Second, retail investors are small but many; consequently, unless there is an aggregate macro shock (affecting all firms), retail investors' liquidity trades in a particular stock are likely to have little impact on overall order imbalances. Finally, institutional transaction data are more readily available and representative, while retail transaction data often come from a very small group of investors over a short period of time.

We proceed as follows. First, we show that non-activist institutional selling raises a firm's probability of becoming an activist target. In economic terms, a one standard deviation increase in institutional selling volume (as a percentage of shares outstanding) results in a 0.58% increase

[1] Prior work has shown that among activist investors, hedge funds achieve better success as monitors than mutual funds, pension funds, and labor unions (see Karpoff, 2001; Kahan and Rock, 2007; Gillan and Starks, 2007).

[2] For example, the Federal Reserves' flow of funds report dated 12/7/2001 shows that the total market value of corporate equities is $13,625 billion in 2001Q3, of which the household sector directly holds $5,472 billion. In relative terms, the direct holdings of corporate equities by households have been stable over time.

in the probability of being targeted (a quarter of the unconditional probability of 2.33%). This effect is robust to the inclusion of a variety of firm characteristics shown in the literature to affect targeting, including general stock liquidity as captured by the Amihud ratio. Next, we zoom in on the hedge fund's accumulation of target shares at the daily frequency, and demonstrate that institutional sales and hedge fund purchases are synchronous in time, which is consistent with the idea that institutional sales allow the activist to hide his trades. In economic terms, a 1% increase in daily institutional selling volume raises hedge fund buying volume by 0.26%.

In addition to the camouflage mechanism postulated by the liquidity theories, two alternative explanations could explain the demonstrated relationship between institutional sales and hedge fund activism. First, institutions may be informed and trade to signal to activists that a particular firm needs an intervention (see Attari, Banerjee, and Noe, 2006, for a dynamic model of this *signaling* mechanism). Second, someone buys so someone else must sell; therefore, the positive relationship between institutional sales and the activist's purchases may be purely *mechanical*.

We rely on their underlying assumptions about institutional selling to distinguish among the three alternative explanations. The liquidity theories assume that institutional selling is exogenous to the activism event as institutions sell in response to their own liquidity shocks. In contrast, the alternatives posit that institutional selling is endogenous, caused either by private information that a particular firm needs an intervention (signaling theories) or by the activist's accumulation of target shares to launch a campaign (mechanical explanation). Thus, we identify the liquidity channel by extracting the institutions' trades that are driven by institution-specific funding constraints and exogenous to activism. Building on Coval and Stafford (2007)[3], we predict the buying and selling of each institution in a *generic* firm's stock as a function of its trading in *other stocks* outside the generic firm's industry. We then use the predicted buying and selling as instruments to establish that it is through the liquidity channel that institutional trading affects the activist's decision to purchase target shares and intervene.

Our empirical setup also allows us to explore the liquidity theories' conditional prediction that activism benefits and trading gains are substitutes in the activist's targeting decision. In firms with higher per-share benefits (and/or lower fixed monitoring costs), the activist will be less reliant on trading gains to justify a campaign launch. We test this prediction by studying the sample of targets (for which the activism benefits are presumably positive) to determine whether the synchronicity between institutional sales and activist purchases is lower among firms with higher expected fundamental improvements. Our results show that a 1% decrease in institutional net

[3] Coval and Stafford (2007) show that mutual funds, experiencing large inflows (outflows), tend to proportionally scale up (down) their stock holdings. Thus, if an institution trades a firm in response to its funding shocks, then its trading in that firm must be proportional to its trading in other firms. Exploring the trading of top sellers of targets, we show that they also sell a large fraction of other firms. In addition, these institutions' trading behavior in targets and non-targets is strikingly similar, implying that their trades in targets are likely exogenous to the activism events.

volume increases hedge fund purchase volume by 0.20-0.22% in the sample with below median expected benefits but by only 0.10-0.12% in the sample with above median benefits.

Finally, we study two different economic mechanisms that underlie the signaling and the liquidity theories. Under the signaling theories, institutional selling informs potential activists that a particular firm needs an intervention, thus directing the activists' *attention* to firms that are not initially considered as target candidates. Therefore, we should find a positive association between institutional selling and an activist's acquisition of an initial stake. On the other hand, the liquidity theories posit that institutional selling allows the activist, who already knows that his monitoring will improve fundamental value, to rapidly purchase additional shares in the firm with limited price impact, thus accelerating the *timing* of the campaign.

We investigate the two mechanisms by estimating discrete-time proportional hazard models and find evidence in support of the timing explanation. Specifically, our results show that a one standard deviation decrease in institutional net volume (i.e., increase in institutional sell volume) reduces the time in which one in ten firms will be targeted by about one year (from 4.32 to 3.49 years). In contrast, the attention explanation does not seem to describe activist targeting in our sample. We find that an activist is more likely to acquire an initial stake in a given firm when other institutions also purchase, rather than sell, shares of that firm. This is inconsistent with the idea that institutions convey their private information to the hedge funds through their selling.

Overall, our results provide empirical support to Maug (1998) and other similar liquidity theories, which study the role of noise trading as a mechanism that allows a large shareholder to assemble (dispose of) a block and become more (less) active. Our paper contributes to several strands of the finance literature. First, we directly contribute to the growing literature on hedge fund activism (see Brav, Jiang, and Kim, 2010, for a survey), which has shown that institutional investors are important in the evolution and success of an activist campaign. We provide new evidence that as large noise traders, institutions also play a critical role in the activist's decision to initiate a campaign in the first place. Our findings suggest that of several target candidates with fundamental characteristics conducive to an intervention (such as high institutional ownership, low valuation, suboptimal firm policies, etc.), the specific choice and time of entry crucially depend on the prevailing market conditions induced by institutional selling.

Second, our paper complements the broader corporate governance literature, particularly as it relates to the role of liquidity in determining a blockholder's incentives to monitor a firm. In this literature, blockholders use either voice or the threat of exit to bring about change. Edmans, Fang, and Zur (2013) demonstrate that unconditionally stock liquidity improves governance by voice but conditional on a block being formed, is more conducive to governance by exit. Norli, Ostergaard, and Schindele (2014) show that cross-sectional differences in liquidity are positively correlated with both the likelihood of shareholder activism and the accumulation of target shares immediately preceding the activism announcement.[4] However, in the context of corporate acquisitions, Roosenboom, Schlingemann, and Vasconcelos (2013) show that acquirers' returns are negatively related to their stock liquidity, suggesting that liquidity weakens blockholders' incentives to monitor through voice (consistent with Coffee, 1991; and Bhide, 1993).

The existing studies consider liquidity as a persistent firm characteristic (measured at the annual frequency) that affects a blockholder's incentives to become active. In contrast, we focus on the transient market conditions generated by institutional funding needs in the days before an activist event, and provide novel evidence that institutional sales, induced by negative funding shocks, facilitate the emergence of activism (above and beyond the effects of fundamental characteristics, including liquidity). Thus, our findings map directly to the theoretical argument of Maug (1998) and other liquidity theories.[5] For large shareholders such as activist hedge funds, liquidity shocks are more important than trade-by-trade liquidity measures (e.g., bid-ask spreads) because they determine market depth and ultimately the price impact of large trades. Thus, our findings also complement those of Collin-Dufresne and Fos (2015a), who show that informed traders strategically trade stocks on days with better liquidity.

Third, we also contribute to the literature on the trading behavior of hedge funds.[6] Chen, Hong, and Stein (2008) provide evidence that hedge funds profit from front-running distressed mutual funds. Shive and Yun (2013) find that hedge funds profitably trade on predicted mutual fund flows, especially in small and illiquid stocks. Campbell, Ramadorai, and Schwartz (2009) infer daily institutional trading from TAQ data and show that institutions demand liquidity, especially when they sell. Unlike these authors, we focus on hedge fund activism and rely on daily trading data to identify the effects of institutional trading on the hedge fund's purchases of target shares.

The remainder of the paper is organized as follows. Section 2 reviews the theoretical literature and develops specific empirical hypotheses. Section 3 describes the hedge fund activism sample. Section 4 investigates the role of institutional trading in an activist's decision to acquire target shares and initiate a campaign. In this section, we also present our instrumental variables analysis. Section 5 examines the relative importance of institutional trading in the cross section of targets with varying expected benefits from activism. In Section 6, we study the underlying economic

[4] See also Bharath, Jayraman, and Nagar (2013) for evidence that plausibly exogenous liquidity shocks increase the effectiveness of exit threat, especially in firms whose managers have performance-sensitive compensation.
[5] Edmans, Goldstein, and Jiang (2012) demonstrate a similar mechanism in the context of mergers and acquisitions.
[6] Another strand of the hedge fund literature considers the relation between the ownership of hedge funds and other institutional investors (see Griffin and Xu, 2009; Jiao, 2012; Ben-David, Franzoni, and Moussawi, 2012).

mechanism, and present supporting order-level evidence that institutional trading in target stocks is likely exogenous to activism. Section 7 concludes.

2. Theoretical Foundations and Hypotheses Development

We rely primarily on Maug (1998) for providing theoretical guidance in investigating the role of institutional selling in hedge fund activism.[7] Maug (1998) develops a model in which the decision of a large shareholder (an activist) to monitor a firm depends critically on his gains from trading with uninformed households. The households trade in response to their own liquidity or funding needs. Their trades, particularly sales, enable the activist to camouflage his purchases, i.e., buy shares in the firm at prices that are not fully revealing of his intentions. Once the activist intervenes, these shares increase in price, resulting in trading gains that help offset his monitoring costs. Therefore, the larger the households' *liquidity shocks*, the higher the activist's expected trading gains and the larger his incentives to intervene.

The role of the households' liquidity shocks in the formation of a block is shared by other *liquidity theories*, including the static models of Kahn and Winton (1998) and Kyle and Vila (1991) as well as the dynamic model of Back, Li, and Ljungqvist (2014).[8] However, due to their different modeling assumptions, these theories arrive at different conclusions about the effects of liquidity on governance. For example, Maug (1998) assumes that the activist acquires his initial ownership, or toehold, in the open market, and shows that he will optimally choose a small toehold and rely on the households' liquidity shocks to assemble a monitoring block. In contrast, Back et al. (2014) assume that the firm allocates its ownership at its IPO, and show that it will optimally give the activist a large ownership stake to encourage monitoring. In this case, the activist is more likely to exploit the households' liquidity shocks to disassemble his existing block, yielding the conclusion that liquidity harms governance.

We formulate and test our hypotheses in the context of hedge fund activism where the activist is a hedge fund and the households are other non-activist institutions. In this context, the hedge fund typically begins with a zero or very small toehold (as our data will later demonstrate) and therefore it is the assembling, rather than the disassembling, of an activist block that matters.[9] Furthermore, despite their differences, all of the above models, including Back et al. (2014)'s, are in agreement that a hedge fund is more likely to buy shares and intervene when the institutions experience

[7] The Internet Appendix provides additional theoretical details on the development of our empirical hypotheses.
[8] Collin-Dufresne and Fos (2015b) also develop a dynamic model in which the large shareholder can affect the liquidation value of the firm through his monitoring effort, and study the effect of noise trading on the shareholder's share accumulation and effort.
[9] As pointed out by Back at al. (2014), their model applies to cases, in which shareholders with pre-existing blocks choose to become active whereas Maug (1998)'s model applies to cases in which a shareholder accumulates a new block in the secondary market right before the start of a campaign.

negative liquidity shocks. This follows from the shared idea that institutions' liquidity trades help camouflage the hedge fund's informed trades, and this camouflage mechanism is most effective when the liquidity and informed trades are in opposite directions. Therefore, we distinguish between positive liquidity shocks, associated with institutional buys, and negative liquidity shocks, associated with institutional sales, and cast our main hypothesis, as predicted by the liquidity theories, as:

Main Hypothesis: *The probability of a firm becoming an activist target increases in institutional selling.*

Two alternative explanations are also consistent with our main hypothesis. First, institutions may trade in order to signal to activists that a particular firm needs an intervention. For example, Attari, Banerjee, and Noe (2006) develop a dynamic model, in which (randomly) informed institutions, standing to gain on their unsold shares, sometimes sell a fraction of their holdings to induce activism. In such *signaling theories*, institutional selling conveys information about the firm's fundamentals and therefore affects the activist's assessment that his intervention will be profitable.

Second, the relationship between institutional sales and an activist intervention may be purely mechanical. Activist targets typically have large institutional ownership; therefore, when an activist accumulates target shares in order to intervene, he must purchase a large fraction of these shares from incumbent institutional owners; that is, the activist demands target shares and institutions simply supply them. Consequently, under the *mechanical* explanation, institutional trading responds to the activist's decision to intervene, rather than the other way around.

The three alternative explanations significantly differ in their underlying assumptions. First, both the liquidity and mechanical explanations assume that activist investors already know that a particular firm needs monitoring while the signaling theories assume that activists learn about the potential benefits of an intervention from share prices, which are determined in part by the trading of (randomly) informed institutions. Second, while both the liquidity and mechanical theories assume that institutional trading is uninformed, they posit a subtly different nature of the trading. The liquidity theories assume that institutions trade in response to their own liquidity shocks. On the other hand, the mechanical explanation assumes that the activist demands target shares and institutions respond by selling such shares, given the latter's supply curve and the market conditions created by the activist's demand.

Based on the underlying assumptions of the three explanations, we develop a series of empirical hypotheses to distinguish the liquidity theories from the alternatives. Note that these hypotheses should be considered collectively, as none of them rule out the signaling and mechanical alternatives on their own.

H1 (Funding Shocks)*: The probability of a firm becoming an activist target increases in institutional selling that is induced by individual institutions' funding shocks.*

H2 (Synchronicity)*: Target firms experience net funding-induced institutional selling before campaign announcement, and institutional sales and activist purchases are synchronous in time.*

The liquidity theories assume that institutions sell in response to their own funding shocks, and therefore, institutional selling is exogenous to the activism event. In addition, to camouflage his intentions, the activist's purchases must closely track institutional sales so that that the market maker is unable to differentiate, with certainty, between informed and uninformed orders. At the daily frequency with continuous trading, this amounts to observing synchronicity between institutional sales and activist purchases.

What differentiates our analysis from other related studies is not only our direct test of the general effect of liquidity shocks on activist monitoring, but also our ability to explore Maug (1998)'s *conditional* prediction about the relative importance of trading gains across activist targets.

H3 (Substitution)*: The synchronicity between institutional sales and activist purchases is lower among target firms with higher net benefits from activism.*

Under the liquidity theories, the net benefits from activism (that accrue to the activist's toehold) and the trading gains (from buying additional target shares at prices that are not fully revealing) are substitutes. If the activist can reap larger benefits from activism and/or the fixed monitoring costs are smaller, then he needs smaller gains from informed trading to justify launching the campaign. This suggests that for target firms with high (low) expected activism benefits, the activist's ability to camouflage his trades is less (more) critical, and therefore the observed synchronicity between institutional sales and activist purchases is lower (higher).

Finally, we dig deeper into the economic mechanisms that underlie the signaling and the liquidity theories. We exploit the typical timeline of activism for an average firm from becoming a target candidate to being held by some hedge funds to finally being targeted. The signaling and liquidity theories highlight the effects of institutional sales in different parts of this timeline.

H4a (Attention): *Conditional on the activist's not recognizing the benefits of monitoring at a given firm, institutional selling accelerates the recognition of such benefits, and hence, the acquisition of an activist toehold.*

H4b (Timing): *Conditional on the activist's recognizing the benefits of monitoring at a given firm, institutional selling accelerates the timing of a campaign.*

As suggested by Attari et al. (2006), institutional sales may inform the activist of the potential benefits of monitoring. In their model, institutions receive a signal and will sell the firm's shares only if the signal is low (i.e., activism is beneficial), or at least uninformative. Observing the order flow and the market-clearing price, the activist then decides whether to buy shares and become active, which is more likely following the noisy signal provided by institutional sales. Thus, to the extent that a toehold reflects the activist's recognition of the benefits of monitoring, we should observe that institutional sales accelerate the first acquisition of an activist toehold.

In contrast, the liquidity theories assume that the activist investor already recognizes the potential improvement in firm value as a result of his intervention. However, he needs additional trading gains to help offset his monitoring costs. Thus, institutional selling speeds up a campaign launch by providing an opportunity for the activist to quickly accumulate target shares without fully revealing his intentions. It is important to note that the *Attention* and *Timing* hypotheses pertain to different parts of the activism process and therefore are not mutually exclusive.

3. Hedge Fund Activism Sample

The primary dataset in this paper is a comprehensive list of hedge fund activist campaigns from 2000 to 2007. The data are hand-collected from regulatory filings and SharkRepellent.net, as described in Gantchev (2013). The main source is Schedule 13D, which must be filed with the US Securities and Exchange Commission (SEC) by any investor who acquires more than 5% of the voting stock of a public company with the intention of influencing its operations or management. The activist sample consists of 1,191 distinct campaigns involving 981 unique targets and 130 hedge fund families.

We merge the activism dataset with the universe of CRSP-Compustat firms to create an annual firm-year panel. We count multiple campaigns in the same firm-year as one target observation. The full panel consists of 33,919 firm-years, including 755 target-years. Table 1 compares the typical target to non-target firms. All variables are defined in Appendix A and their measurement follows closely Edmans, Fang, and Zur (2013) and Brav, Jiang, and Kim (2010).

[Insert Table 1]

Hedge fund targets in our sample have fundamental characteristics that are similar to those reported in the activism literature. For example, compared to other CRSP-Compustat firms, the targets have lower market equity (difference in mean *log(MV)* = -0.407, significant at 1%), lower *Tobin's Q* (difference in mean = -0.879, significant at 1%), slightly lower book *Leverage* (difference in mean = -0.024, significant at 5%), and slightly lower *Dividend Yield* (difference in mean = -0.002, not statistically significant). Typical targets operate in industries that are not more or less competitive than those of other firms (as measured by the *Herfindahl index* of segment sales) and are not poorly performing in terms of their returns on assets (*ROA*), even though they seem to suffer from lower *Sales Growth* (difference in mean = -0.093, significant at 1%). They also have higher analyst following (difference in mean *log(Analysts)* = 0.056, not statistically significant), measured with data from the Institutional Brokers' Estimate System (I/B/E/S). Finally, as discussed earlier, hedge funds tend to approach firms with large institutional holdings (difference in mean *Inst. Ownership* = 0.075, significant at 1%) as reported by Thomson Reuters.

Our study investigates the role of institutional trading in an activist's decision to acquire target shares and initiate a campaign. Therefore, we merge the above firm-year panel with institutional trading data. We measure institutional trading in two different ways. First, we aggregate all buy and sell transactions in each firm by all institutions reporting to Ancerno (formerly known as the Abel/Noser Corporation).[10] Ancerno provides transaction cost analysis to mutual funds, pension plan sponsors, and brokers representing (on average) 13.47% of total CRSP volume during 2000-2007. As seen in Table 1, this data requirement reduces our universe to 31,374 firm-years and our activism sample to 731 target-years. Second, to provide a robustness check to our first measure of institutional trading, we calculate changes in mutual fund holdings using data from Thomson Reuters Mutual Funds (formerly CDA Spectrum). We focus on mutual funds rather than other institutions since we can use mutual fund flows from CRSP to identify liquidity shocks. Requiring that the sample firms also have mutual fund holdings data reduces our universe to 25,982 firm-years and our activism sample to 636 firm-years.

As seen at the bottom of Table 1, activist targets see substantially lower (average quarterly) net institutional trading volume in the year before the start of a campaign (difference in mean *Inst. net volume/SHROUT* = -0.007, significant at 1%), driven by both lower buying volume (*Inst. buy volume/SHROUT*) and higher selling volume (*Inst. sell volume/SHROUT*). We find a similar result using the average change in quarterly mutual fund holdings (*ΔMF holding/*SHROUT). These summary statistics suggest that institutional trading may have an impact on an activist's decision to target a specific firm.

Finally, we also merge the firm-year panel data with activist hedge fund holdings to measure the extent to which activists recognize each firm as a viable target. We identify activist hedge funds by name from the 13F data. 61% (461/755) of targets and 48% (16,032/33,164) of non-targets have at least one activist hedge fund owner at the beginning of the year, suggesting that hedge funds recognize the potential for improvement in a given target some time before launching a campaign. Moreover, in the sample of firms with hedge fund toeholds, we see that more hedge funds have toeholds (*No. HFs with toehold*) in targets than in other firms, with the median target toehold (*HF toehold/SHROUT*) being almost six times as large (0.034 for targets vs. 0.006 for non-

[10] See Puckett and Yan (2011) for a broad description of the data. Anand et al. (2012) show that Ancerno institutions are representative of 13F institutions in terms of the characteristics of their holdings.

targets, significantly different at 1%).

4. Effect of Institutional Trading on Hedge Fund Activism

Before proceeding with our empirical analysis, we outline a brief sketch of the activism process, highlighting the role of institutional selling in target selection. Our sketch is consistent with the evidence presented in this paper and in the previous literature but should not be taken literally.

We view activist targeting as a *three-step screening process*:

Step 1: The activist identifies *N1* firms that may benefit from activism, given their fundamental characteristics and corporate policies, such as leverage, payout, etc. *N1* is likely to be large. For example, we find that over a thousand firms in any given year look like viable targets as they have predicted target probabilities[11] at least as high as the 25th percentile of the targeted sample.

Step 2: The activist identifies *N2* < *N1* candidates that have sufficient liquidity, considering liquidity as a persistent characteristic as in Edmans et al. (2013) and Norli et al. (2014). *N2* is likely to still be large, as the univariate statistics in Table 1 suggest that targeted firms are not much more liquid than other firms.

Step 3: The activist follows *N2* target candidates, and ultimately targets *N3* << *N2* firms whose shares experience large institutional sales and hence a surge in liquidity.

The literature has shown that the first two steps are important (e.g., Brav et al., 2008, Edmans et al., 2013). We argue that the third step is also necessary because both fundamentals and stock liquidity are persistent[12] and therefore the first two steps alone cannot explain why so few firms (less than 3% of public firms) are targeted and why they are targeted at a particular time but not earlier. Our empirical tests aim to justify this argument by referring to the liquidity theories.

4.1 Institutional Trading and a Firm's Likelihood of Becoming a Target

We first test our *main hypothesis* that the probability of becoming an activist target increases in institutional selling. We do so by estimating linear probability models of activist targeting, with institutional trading volumes as the main explanatory variables. We use the full firm-year panel of CRSP-Compustat firms with available trading data. Under the main hypothesis, we expect that the coefficient of institutional sales will be positive. Table 2 reports the results. All regressions

[11] This is based on the estimated model in column (4) of Table 2.
[12] For example, both liquidity measures in Edmans et al. (2013) are highly auto-correlated with Pearson and Spearman autocorrelations between 0.85–0.94. We obtain similar findings for other fundamentals. For example, the autocorrelations of book leverage and ROA are 0.87 and 0.58, respectively.

include industry and year fixed effects. Standard errors are clustered by firm.

[Insert Table 2]

Columns (1) and (2) include only institutional trading volumes from Ancerno as independent variables. The institutional net (sell and buy) volume(s) is (are) calculated as the quarterly average(s) for each firm-year and presented as a percent of shares outstanding (*SHROUT*). Column (1) shows that net (buy minus sell) institutional volume has a negative effect (significant at 1%) on the probability of being targeted by hedge funds. Column (2) includes separately institutional selling and buying volumes as covariates. The estimates show that a one standard deviation increase in institutional selling volume results in a 0.58% (0.034 x 0.172) increase in the probability of becoming an activist target whereas a one standard deviation increase in institutional buying volume leads to a 0.75% (0.038 x -0.198) decrease in that probability. Both effects are statistically significant at 1% and economically significant given that the unconditional probability of becoming an activist target is 2.33%.

In Column (3), we use an alternative measure of institutional trading calculated as the change in mutual fund holdings as a percent of shares outstanding. This variable is the quarterly average in a given firm-year of the change in the holdings of all mutual funds in the Thomson Reuters Mutual Funds data. Confirming the results in Column (2), we find that a one standard deviation increase in mutual fund holdings decreases the probability of being targeted by 0.87%.

In Column (4), we estimate the probability model, using as explanatory variables only firm characteristics that the extant literature has shown may affect activist targeting (all variables are described in Appendix A).[13] The coefficient estimates of these characteristics, including liquidity, are largely similar to those previously reported in the literature.[14] Columns (5)-(7) repeat the analysis in the first three columns with the additional controls from Column (4). We find that institutional trading volumes remain both statistically and economically significant. Consistent with the three-step activism process we outline above, the effects of institutional trading on activist targeting are distinct from those of firm characteristics, including corporate policies, valuation as proxied by Tobin's *Q* and previous year's stock return, as well as general stock liquidity as proxied by (average) Amihud ratio.

Finally, it is important to emphasize that the results here are only indicative of Maug (1998)'s postulated camouflage mechanism; they are also consistent with the predictions of the signaling

[13] In unreported results, we use the estimated target probabilities to sort firms in each industry-year into terciles. We find that (i) 76.6% of the firms in the highest tercile in a given year (i.e., those with least optimal policies from a targeting perspective) remain in the same tercile in the following year, and (ii) firms remain in that tercile an average of 3 years before being targeted. This evidence suggests that firm policies are generally persistent.

[14] For example, we see that targeting is positively correlated with liquidity (*-log(Amihud)*) and institutional ownership but negatively correlated with size (*log(MV)*) and market-to-book (*Tobin's Q*).

and mechanical theories. In Section 4.6, we will identify the liquidity theories from the other two alternatives and formally establish that the probability of a firm becoming an activist target increases in institutional liquidity sales.

4.2 How Do Institutions Trade Target Stocks?

In this subsection, we investigate at the daily frequency the general relationship between the activist's accumulation of target shares and the trading of other institutions.

As part of Schedule 13D, the activist is required to report all transactions in the target's stock in the 60 days before the file date. We manually collect the date of each transaction; the number of shares purchased or sold; the price per share and the type of each transaction (open market, private or other). We have the hedge fund transaction history for about two-thirds of the initial sample of activist events; the remaining campaigns do not provide transaction details because of previous Schedule 13G filings[15], private placement or IPO distributions, missing share or price information, etc. We also require that an activist event be matched to institutional trading data from Ancerno in order to investigate the effects of institutional trading on the activist's purchases at the daily frequency. This further reduces our activism sample to 643 campaigns.

Figure 1 shows that the average hedge fund activist acquires the majority of his stake in the target in the 60 days immediately preceding the campaign announcement (file date).[16] During the same period, the mutual and pension funds in our sample sell a substantial number of target shares. These institutions start selling about 8 months before the activist's filing but their selling dramatically accelerates during the 60 days closer to the file date.[17]

[Insert Figure 1]

Figure 2 shows that the trading of hedge funds and other institutions is highly synchronized in time (the correlation between net hedge fund and institutional volumes is -0.94). This pattern is widespread among the campaigns in our sample (see Figure IA.3 in the Internet Appendix), suggesting that institutional selling and hedge fund purchases may not be coincidental. On the day the activist crosses the 5% threshold (event date), he purchases on average 1.02% and institutions sell a net of 0.34% of the target's outstanding shares.

[Insert Figure 2]

[15] The 13G filing is considered a more passive version of the 13D filing, and has fewer reporting requirements. Activist practices are not permitted by 13G filers unless they refile as 13D owners.
[16] An investor is allowed up to 10 days after crossing the 5% ownership threshold to report his activist intentions.
[17] Figure IA.1 in the Internet Appendix uses quarterly 13F data from Thomson Reuters to show a significant churning of institutional investors before the start of a campaign, with hedge funds (including both activists and non-activists) replacing other institutions as major blockholders of target firms.

Panel A of Table 3 summarizes the trading in target stocks by activist hedge funds. On the days that they trade, the activists account for an average of 15.78% of the total CRSP volume in the target's shares. Almost all of the hedge fund purchases (97.51%) are executed in the open market. In the two months before filing, the average activist purchases 4.25% of the target's outstanding shares, representing 61.89% of his total ownership on the file date. About one third of activists acquire more than 5% of the target's outstanding shares in this period.

[Insert Table 3]

Hedge funds trade very actively on the event date; the activist's volume represents 41.24% of the target's total market volume. On that single day, the activist acquires, on average, more than 1% of the target's outstanding shares, representing 13.68% of his total ownership on the file date.[18] This raises the question whether these large purchases are arbitrarily decided or driven by certain market conditions. In addition, hedge funds continue to purchase shares after crossing the 5% threshold and accumulate another 1.28% of outstanding shares until the file date.

We also document a significant price run-up in the 60 days before the start of a campaign.[19] The average hedge fund's purchase price in that period is 94.12% of the target's share price on the file date. On the event date, activists acquire shares at an average discount of 2.42% to the price on the file date. As prices of target shares do not appear to fully reflect the impending activism before the file date, hedge funds often enjoy significant trading gains on the additional shares they accumulate after their decision to intervene.

Panel B of Table 3 reports the trading of Ancerno institutions in the 240 days before a campaign. These institutions include mostly mutual and pension funds such as Barclays Global Investors, State Street, Vanguard, Putnam, Alliance Bernstein, and Wellington Management. Their trading volume represents 13.46% of the average target's market volume in the period from 240 to 60 days before the campaign and 14.36% in the 60 days immediately preceding the campaign. Together, activists and Ancerno institutions account for 30.14% of the target's market volume in the 60 days before the file date and 61.59% of the market volume on the event date, suggesting that these two market players likely trade (indirectly) with each other.

Ancerno institutions sell a net of 2.52% of the average target's outstanding shares in the 240 days before the activist's filing. Most of this selling (1.50% of shares outstanding) occurs in the 60 days immediately before the file date. On the event date, institutions sell a net of 0.34% of the target's outstanding shares, thus appearing to provide a large fraction of the shares purchased by

[18] Across the campaigns in our sample, the activists' purchases on the event date are highly positively skewed. The mean and median are 1.02% and 0.40% of shares outstanding, respectively.

[19] Figure IA.2 in the Internet Appendix shows the average cumulative abnormal returns (CARs) of targeted stocks in the 240 days leading up to the start of a campaign.

the activist. The mean (median) of the ratio of institutional sales to hedge fund purchases on the event date is 1.41 (0.44) (these statistics are 1.33 (0.39) for the 60 days before the event date).[20]

The mean number of selling institutions exceeds the mean number of buying institutions in all event periods. On the event date, the median number of selling institutions is 2 and the median number of trades per institution is 1.[21] For most campaigns, only one or two institutions are responsible for most event-date trading, and only a handful account for most trading in the prior months (Table IA.II in the Internet Appendix). We interpret this as evidence that institution-specific (rather than target-specific) circumstances may be driving institutional trading.

4.3 Institutional Trading and the Activist's Acquisition of Target Shares

In this subsection, we investigate the daily synchronicity between institutional trading and hedge fund purchases in the period before the hedge fund's ownership crosses the 5% reporting threshold (event date).[22] Such synchronicity is suggestive of the activist's attempt to camouflage his purchases among other institutions' liquidity trades.

Table 4 reports OLS regressions of daily net hedge fund volume on institutional net (sell and buy) volume(s), measured as a percentage of shares outstanding. Each observation is a campaign-day. As general market controls, we include the daily CRSP value-weighted return, VIX[23], and target share turnover[24]. To control for the liquidity effects in Edmans et al. (2013) and Norli at al. (2014), we also include in some specifications five lags of the target's abnormal Amihud ratio, calculated by the mean-adjustment approach (the estimation period is from t-600 to t-240). To absorb potential confounding effects of the target's valuation, we include five lags of the target's abnormal returns, calculated by the market-model adjustment approach using the CRSP value-weighted index as the market portfolio. We cluster standard errors by campaign.

[Insert Table 4]

Column (1) shows that hedge funds acquire more target shares on days with lower (i.e., more

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[20] The statistics are calculated by taking the median across all days in the period for each campaign and then the mean or median across all campaigns.

[21] We conservatively define an institution as the unique combination of client code and client manager code from Ancerno. However, multiple client manager codes are typically associated with the same client code, implying that the number of institutions (client codes) responsible for the majority of trading is even less than reported.

[22] We exclude the up-to-ten-day grace period between the event and file dates from this analysis based on the assumption that the activist's expected return on his 5% ownership is already sufficient to cover his monitoring costs and therefore any additional purchases in that period are executed with less concern about revealing the impending campaign. All of our results, however, are robust to the inclusion of this grace period.

[23] Nagel (2012) uses a reversal strategy to proxy for the returns from liquidity provision and shows that the time variation in this strategy can be predicted with the VIX index.

[24] To avoid collinearity, we adjust turnover by subtracting total hedge fund volume and institutional buy and sell volumes.

negative) institutional net volume. A 1% decrease in institutional net volume (as a percentage of shares outstanding) increases net hedge fund volume by 0.17% (statistically significant at 1%). Column (2) separately identifies the effects of institutional selling and buying volumes. We find that the negative correlation between net institutional trading and hedge fund trading is primarily driven by institutional selling volume, whose coefficient is statistically significant at 1% and highly economically significant. A 1% increase in institutional selling volume raises net hedge fund volume by 0.26%. The coefficient on institutional buying volume is close to zero and statistically insignificant.[25] Turnover is positive and significant, implying that activist hedge funds tend to buy more on days with high volume (and potentially high liquidity, as shown by Collin-Dufresne and Fos, 2015a). Columns (3) and (4) confirm the results in Columns (1) and (2) after the inclusion of five lags of net hedge fund volume and abnormal Amihud ratio.

Columns (1)-(4) include campaign dummies to absorb time-invariant characteristics specific to each target. However, OLS estimates of our models in Columns (3) and (4) may be biased due to possible correlation between the lags of net hedge fund volume (dependent variable) and the error terms (Arellano and Bond, 1991). This problem is severe in settings with a very small number of time-series observations, which is not the case here because we use a daily firm panel with about 60 observations per firm. Nevertheless, to ensure that our results are not biased, in Columns (5) and (6), we repeat the analysis by using cumulative abnormal returns (CAR), cumulative abnormal turnover (CAT), and cumulative abnormal Amihud ratio (CAA) in the period from t-240 to t-60 as campaign-level controls. Abnormal returns are calculated by the market-model adjustment approach using the CRSP value-weighted index as the market portfolio. Abnormal turnover and Amihud ratio are calculated by the mean-adjustment approach (the estimation period is from t-600 to t-240). The results suggest that the bias, if any, is minimal; institutional net (sell) volume remains significant at 1%, with largely unchanged coefficient magnitude. The coefficient on institutional buy volume remains close to zero.

Our results have established that at the daily frequency, hedge fund purchases and institutional sales are synchronous in time. As discussed, this pattern is consistent with both the liquidity theories and the two alternatives – signaling and mechanical explanations. In Section 4.5, we will revisit the synchronicity study and identify the liquidity channel using instrumental variables based on funding shocks. The next subsection motivates the instruments.

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[25] We further investigate the effects of institutional sell and buy volumes on activist purchases by estimating several piecewise linear specifications. While the effects of institutional sell volume are significantly positive in all ranges, the effects of institutional buy volumes are negative (though mostly insignificant) at volumes below the 60^{th} percentile (0.03% of shares outstanding) and turn to zero in the higher ranges. Therefore, our linear specifications show largely zero coefficients on institutional buy volume.

4.4 Instrumental Variables Based on Funding Shocks

The liquidity theories assume that institutional selling is exogenous to the activism event as institutions sell in response to their own liquidity shocks. Therefore, we identify the liquidity channel by extracting the institutions' trading in a target that is driven by institution-specific funding needs. Below, we justify our measures of "liquidity trades" and outline a broad set of steps to calculate them. Additional details are in the Internet Appendix.

Specifically, we identify the liquidity trades of each institution in a *generic* firm's stock by its trading in *other stocks* outside the firm's industry. The intuition is similar to the use of extreme mutual fund flows to isolate valuation changes that may drive some endogenous events, such as mergers, but are unrelated to firm fundamentals and hence exogenous to the events. As shown by Coval and Stafford (2007) and others, an institution experiencing large inflows (outflows) often scales its existing stock positions up (down) proportionally. Thus, if an institution trades in response to funding shocks, we should see that it trades most stocks in the same direction and its trading in one stock should be positively related to its trading in others. Since we do not have daily flow data, we infer an institution's funding circumstances by studying its trading behavior across a large set of stocks.

We begin with a simple univariate exploration to confirm the fire-sales trading patterns in our daily data. We calculate the average frequency that an institution will buy or sell a firm's stock conditional on its fraction of other stocks sold (Figure IA.4 in the Internet Appendix). For each institution and each firm, we measure the fraction of other stocks sold, *Sell fraction*, in two ways: (i) the fraction of sell principal calculated as the dollar principal of all stocks sold divided by the dollar principal of all stocks bought and sold, and (ii) the fraction of stocks sold calculated as the number of individual stocks (not shares) sold divided by the number of individual stocks bought or sold. We exclude trading in other stocks in the firm's SIC-2 industry to isolate the trading that is orthogonal to industry-specific information. Our univariate results, based on all relevant institutions and all CRSP-Compustat firms, confirm the fire-sales trading pattern: an institution is more (less) likely to sell (buy) a stock when its fraction of other stocks sold is higher.

Motivated by the univariate evidence, we begin the formal construction of our funding-shock based instruments for institutional sell and buy volumes by estimating the propensity that *each* institution will sell or buy a given stock as a function of its funding needs. In addition to our main variable, *Sell fraction*, we also include a host of other variables that describe institution-specific trading behavior (see Appendix A for definitions). First, we include *Dummy[trade other stocks]* because an institution is unlikely to trade a particular stock for funding reasons if it trades no other stocks. Second, we include *Dummy[trade other stocks] x Sell fraction* because *Sell fraction* can only be calculated if the institution trades other stocks. Third, we include *Dummy[trade only one* *other stock]* since we find that *Sell fraction* is extreme and less meaningful when it reflects the trading in only one other stock. Finally, we include *Fraction of trading days during sample* to capture the institution's typical turnover. In addition to these institution-specific variables, we also control for the institution's lagged trading in the stock and in other stocks, lagged stock return, CRSP value-weighted return, and VIX.

[Insert Table 5]

We use a linear probability model and estimate its parameters separately for buys and sells, using all relevant institutions and all CRSP-Compustat stocks.[26] Each observation is institution-stock-day. Due to the prohibitively large number of observations, we run our estimation for each quarterly subsample and average the parameters across all quarters in our sample period. We calculate the standard errors using the approach of Fama and MacBeth (1973). Table 5 reports the results. In Columns (1) and (2), *Sell fraction* is the fraction of sell principal, and in Columns (3) and (4), *Sell fraction* is the fraction of individual stocks sold. All models fit the data well, with average R^2 around 15%. Consistent with the univariate findings, an institution is more (less) likely to sell (buy) a particular stock if it sells a larger fraction of other stocks. In economic terms, our coefficient estimates for *Dummy[trade other stocks] x Sell fraction* in Columns (3) and (4) suggest that the probability that an institution will sell (buy) a particular stock increases (decreases) by 0.075 (0.114) if its fraction of other stocks sold increases by 0.5 (e.g., from 0.25 to 0.75). These effects are statistically significant at 1%[27] and economically significant, given that the average sell (buy) probability across all institution-stock-days, conditional on an institution's trading at least one other stock, is only about 0.067 (0.137).

In the next step, we take the estimated models in Table 5 (Columns (3) and (4)), based on the institutions' trading behavior in *all* CRSP-Compustat stocks, to calculate the probabilities that institution i will buy or sell target stock j on day t ($Pr_i[buy_{j,t}]$ or $Pr_i[sell_{j,t}]$). We then multiply these probabilities by the institution's conditional average trade size per day to obtain its expected buying and selling volumes:

$$E_i[trade\ volume_{j,t}] = Pr_i[trade_{j,t}] \times E_i[trade\ volume_j | trade_j],\ \ trade \in \{buy, sell\}.$$

Finally, we sum the above expected buying and selling volumes across all N institutions to get the expected *total* buying and selling volume in stock j on day t:

[26] In Table IA.IV in the Internet Appendix, we report the multinomial logistic estimates for a similar model using only the sample of target stocks. The multinomial logit models consider buy, sell, and no trade simultaneously. The results are qualitatively similar to those obtained through OLS for a linear model.

[27] In the Internet Appendix, we plot the quarterly estimates of these coefficients and show that they are all statistically significant and in the same direction as those reported in Table 5.

$$E\left[trade\ volume_{j,t}\right] = \sum_{i=1}^{N} E_i\left[trade\ volume_{j,t}\right],\ trade \in \{buy, sell\}.$$

In the next subsection, we use these expected volumes as our instruments to identify the liquidity role of institutional trading in the hedge funds' accumulation of target shares. First, however, we address a few concerns about whether our instruments fulfill the exclusion restriction. In the context of hedge fund activism, the exclusion requirement is only that institutions' funding needs and hence expected trades are orthogonal to the activist's action. First, we address the reverse-causality concern by noting that the expected volumes are just linear combinations of such variables as *Sell fraction* etc. that reflect institution-specific funding circumstances and trading characteristics, unrelated to any particular stock and by extension not driven by the impending activist campaign. In addition, we estimate the loadings in Table 5 using *all stocks*, not just targets, to ensure that we capture the general patterns of trading due to funding shocks and that our estimates are not biased by the ex-post classification of stocks into targets and non-targets.[28]

Second, we address concerns about omitted variable bias by controlling for common drivers of the institutions' funding needs and the hedge funds' trades at the economy, industry, and firm levels. Economic conditions and investor sentiment may drive both mutual fund flows and hedge fund activism, although the likely correlations would be positive (since both are pro-cyclical), not negative as we have shown in Table 5. Nevertheless, we include CRSP value-weighted market returns and VIX both in the construction of the instruments and in the subsequent empirical models in which these instruments are used. These variables capture high-frequency variation in economic conditions. In addition, we absorb low-frequency variation in economic conditions by using campaign fixed effects in the models of hedge fund purchases (each campaign spans about 60 days) and year fixed effects in the models of hedge fund targeting. Our instruments are also orthogonal to any industry-specific conditions that may drive away institutions but attract hedge funds. By construction, our key identifying variable, *Sell fraction,* only captures the trading in other stocks *outside* a given stock's industry.

At the firm level, valuation, possibly driven by recent stock performance, may drive outflows from the funds holding a given firm's stock and at the same time make that stock more attractive to an activist. To address this concern, we include lagged stock returns both in the construction of the instruments and in the subsequent empirical models in which these instruments are used. Returns have little effect on our IV results since they are firm-specific and largely orthogonal to our key identifying variable, *Sell fraction*. Most institutions hold many stocks and hence each individual

[28] This also addresses a specific concern that institutions may indeed trade in response to their own funding shocks but they may sell disproportionately more shares in targets than in other stocks. This can be the case if, for example, the activist's purchases drive up prices and improve the liquidity of target shares making selling the target relatively more attractive to distressed institutions than selling other stocks.

stock contributes little to their performance and funding conditions.

4.5 Does Institutional Trading Affect the Activist's Acquisition of Target Shares?

We now formally test the *Synchronicity* hypothesis, using the instruments developed in the previous subsection to identify the institutions' liquidity trades. Table 6 reports instrumental variables (IV-LIML) estimates of the models in Columns (3) and (4) of Table 4. Columns (1) and (3)-(4) present the first-stage results relating the endogenous regressors – institutional net (buy and sell) volume(s) – to the instruments, and Columns (2) and (5) report the second-stage results predicting net hedge fund volume as a function of the endogenous regressors. All specifications control for the CRSP value-weighted return, VIX, adjusted turnover, five lags of the target's abnormal return and Amihud ratio, and include campaign fixed effects. We cluster standard errors by campaign and further adjust them for errors in constructing the instruments.

[Insert Table 6]

Before we discuss the results, we note that our instruments are statistically valid. All specifications pass the Kleibergen-Paap rank Wald test, indicating that our instruments sufficiently explain the variation in the endogenous regressors and hence are relevant (see Stock and Yogo, 2005). In addition, the overidentified models in Columns (1) and (2) pass the test of overidentifying restrictions (based on Hansen's *J* statistic) at conventional levels, providing comfort that our instruments are generally orthogonal to the second-stage errors.[29]

The first-stage estimates in Column (1) show that actual institutional net volume significantly loads on both expected institutional buy and sell volumes. Intuitively, *actual* net volume decreases in *expected* sell volume and increases in *expected* buy volume. Columns (3) and (4) confirm these relationships. For example, Column (3) shows that *actual* institutional selling volume is significantly positively correlated with *expected* institutional selling volume. Even though the coefficient on expected buy volume is also positive and significant, its magnitude is only a quarter of the magnitude of the coefficient on expected institutional selling. Thus, within the variation of actual institutional buys and sells explained by our model, it is largely the expected buys that drive actual buys and the expected sells that drive actual sells.

The second-stage regressions in Columns (2) and (5) show that institutional trading volumes have a statistically significant effect on net hedge fund volume. Column (2) shows that hedge fund purchases decrease in institutional net volume. Separating institutional buy and sell volumes in Column (5), we see that selling rather than buying drives the effect of institutional trading;

[29] Here, the *J* test can only be interpreted as a test of orthogonality conditions if at least one of the instruments is valid from the exogeneity standpoint. In Section 4.4, we argue in economic terms why our instruments are very likely exogenous to a model of hedge fund purchases.

institutional selling raises hedge fund purchases, consistent with the *Synchronicity* hypothesis. Our instruments, based on each institution's funding shocks, help identify the effects of the liquidity channel from those of the signaling and mechanical alternatives.

4.6 Does Institutional Trading Affect a Firm's Likelihood of Becoming a Target?

We now formally test the *Funding Shocks* hypothesis. We use a modified version of our daily instruments at the *annual* frequency to replace the endogenous institutional trading volumes in the targeting regressions in Table 2. Specifically, we first estimate the probabilities that each institution will buy or sell a *generic* stock in a given week as a function of the institution's trading in *other stocks* outside the generic stock's industry. We then calculate the expected institutional buy and sell volumes for each stock-week by multiplying the predicted probabilities by each institution's average weekly volume and sum the expected volumes across institutions. These volumes are then aggregated to the quarterly and ultimately the annual frequencies.[30]

Table 7 reports the instrumental variables (IV-LIML) estimates for linear models of the probability that a firm will become an activist target. The observations are firm-year. Columns (1) and (3)-(4) present the first-stage results relating the endogenous regressors – institutional net (buy and sell) volume(s) – to the instruments, and Columns (2) and (5) report the second-stage results predicting the probability of becoming an activist target as a function of the endogenous regressors. The control variables are the same as those in Table 2. All specifications include year and industry fixed effects and pass the Kleibergen-Paap rank Wald test. The overidentified model in Columns (1) and (2) also passes the test of overidentifying restrictions.

[Insert Table 7]

The first-stage results in Columns (1) and (3)-(4) show that our instruments are significant in explaining the endogenous regressors, and their coefficients have the expected signs. In Column (1), *actual* institutional net volume loads negatively on *expected* institutional selling volume and positively on *expected* institutional buying volume. Columns (3) and (4) confirm these relationships; actual institutional selling (buying) volume depends most strongly on its expected counterpart. Most importantly, the second-stage results in Columns (2) and (5) confirm our findings from Table 2 that institutional trading is a critical determinant of a firm's probability of becoming a target; institutional liquidity sales raise a firm's probability of being targeted while institutional liquidity buys decrease it, consistent with the *Funding Shocks* hypothesis.

To provide a robustness check, we also examine an alternative measure of institutional trading calculated as the change in mutual fund holdings as a percent of shares outstanding and instrument

[30] The Internet Appendix provides a detailed description of the instrument construction at the annual frequency.

this measure using expected fire sales and purchases, calculated as in Edmans, Goldstein, and Jiang (2012). Specifically, we calculate the expected fire sales (purchases) for each individual mutual fund in each reporting quarter as the product of the percentage outflows (inflows) and the beginning-of-quarter share holdings if the flows are larger than 5% in magnitude; otherwise, the expected fire sales (purchases) are zero. We then sum the expected fire sales and purchases across all mutual funds holding each stock, divide the sum by the number of shares outstanding at the beginning of the quarter, and average across all quarters to obtain the expected fire sales and purchases for each firm-year. The results in Columns (6) and (7) of Table 7 confirm that an exogenous increase in mutual fund holdings reduces the probability of a firm being targeted in an activist campaign. That is, a firm experiencing flow-driven fire sales (purchases) is more (less) likely to be targeted.

The instrumental variables analyses in Tables 6 and 7 provide the formal tests of the *Funding Shocks* and *Synchronicity* hypotheses. In the remaining sections, we examine further the economic mechanism behind these relationships to confirm that the liquidity theories are indeed at work.

5. Substitutability between Activism Benefits and Trading Gains

In this section, we investigate Maug (1998)'s conditional prediction that activism benefits and trading gains are substitutes in the activist's targeting decision. In the context of the hedge funds' accumulation of target shares, this *Substitutability* hypothesis posits that the synchronicity between institutional sales and activist purchases will be lower among targets with higher expected fundamental improvements from activism.[31]

We propose two measures of the potential benefits from activism. Our first measure is a firm's predicted probability of becoming an activist target (*baseline target probability*), which is a linear combination of observable fundamentals and policies, including leverage, payout, ROA, etc., shown by the literature to determine targeting. To the extent that targets are chosen for their expected benefits from activism, the baseline target probability should capture these benefits. Our second measure is the sum of all toeholds in a target by known activist hedge funds before a campaign launch. We use this alternative proxy to capture *unobserved* determinants of activism benefits, which by construction are not reflected in the baseline target probability. The idea is to exploit "revealed preference" – activist hedge funds are attracted to firms that are likely to benefit from activism, and their toeholds reflect this attraction. Firms with higher potential benefits draw a larger number of activist hedge funds, each with a larger toehold.

[31] This hypothesis follows from Maug (1998)'s starting assumption that the firm in question is a natural target, i.e. the fundamental improvement in firm value as a result of activism is higher than the activist's monitoring costs. Therefore, our tests focus on the sample of activist targets, for which the above assumption is presumably satisfied.

Table 8 reports OLS regressions of daily net hedge fund volume on institutional net volume by level of activism benefits. All specifications control for but do not report (for brevity) the CRSP value-weighted return, VIX, adjusted turnover, five lags of abnormal return and Amihud ratio, and five lags of net hedge fund volume. We also include campaign fixed effects and cluster standard errors by campaign.

[Insert Table 8]

In Panel A of Table 8, we rely on our first measure of expected activism benefits – baseline target probability, calculated using the specification in Column (4) of Table 2, with the industry and year fixed effects set to zero, and size and institutional ownership set to their sample means as they may be correlated with liquidity and institutional trading. Each coefficient reflects the contribution of each fundamental characteristic to the overall activism benefits. For example, the baseline target probability loads negatively on ROA; therefore, all else being equal, firms with low ROA are considered firms with high activism benefits.

Columns (1) and (2) split activist targets into those with below and above median baseline target probabilities, respectively. Consistent with the *Substitution* hypothesis, the effects of institutional net volume on hedge fund purchases decrease with activism benefits. A 1% decrease in institutional net volume increases net hedge fund volume (as a percent of shares outstanding) by 0.20% in the sample with below median baseline target probability but by only 0.10% in the sample with above median baseline target probability. The difference is statistically significant at 5%, as indicated by the coefficient of the interaction term between institutional net volume and a dummy for above median baseline target probability in Column (3). As a robustness check, in Column (4), we interact institutional net volume directly with baseline target probability. The coefficient of the interaction term is positive and statistically significant at 1%.

Panel B of Table 8 measures potential benefits from activism by the total toehold in a target of all known activist hedge funds.[32] We match 61% of the targets to hedge fund holdings from the Thomson Reuters 13F Database and use the hedge funds' toeholds in the most recent quarter before a campaign. To avoid potential mechanical relationships, we sum the toeholds across all hedge funds, excluding the hedge fund that launches the campaign. Columns (1)-(3) split the activist targets into those with zero total hedge fund toehold (Column (1)) and those with below/above median (non-zero) total hedge fund toehold (Columns (2) and (3), respectively).

[32] On average, activist hedge funds hold about 135 different stocks on each report date and intervene in only 0.7% within the following 6 months, 1.0% within the following year, and 1.5% within the following three years. In Table IA.VI in the Internet Appendix, we assume that the activist's toehold is exogenously given and test whether the activist relies less on trading gains if he has a larger toehold to which his intervention benefits accrue. We find that the answer is yes. If the activist increases his toehold from 0% to 2%, the effect of a 1% decrease in institutional net volume on hedge fund purchase volume decreases from 0.16% to 0.08%. The difference is significant at 1%.

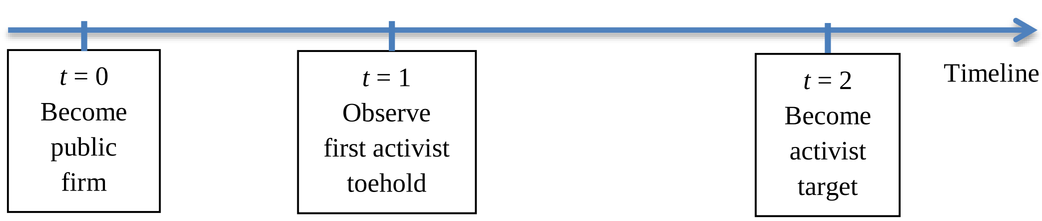
Consistent with the *Substitution* hypothesis and the results in Panel A, we find that the effects of institutional net volume on hedge fund purchases decrease in magnitude with our second measure of activism benefits. Column (1) shows that for targets in which no hedge funds (other than the activist) hold a stake, institutional net volume has the largest negative effects on net hedge fund volume. These effects decline monotonically in Columns (2) and (3) for the targets with below and above median (non-zero) total hedge fund toeholds. In Column (4), we formally test the difference between the effects of institutional net volume in targets with below (Columns (1)-(2)) and above median (Column (3)) activism benefits by interacting institutional net volume with a dummy for above median total hedge fund toehold. The coefficients of the main and interaction terms show that a 1% decrease in institutional net volume increases net hedge fund volume by 0.22% in the sample with low activism benefits but by only 0.11% in the sample with high benefits. The difference is statistically significant at 5%. As a robustness check, in Column (5), we interact institutional net volume directly with total hedge fund toehold. The coefficient of the interaction term is positive and statistically significant at 5%, confirming our earlier findings.

As before, a potential criticism of the results in Table 8 is that they may also be explained by the signaling and mechanical theories. For example, signaling may be more important among targets in which the ex-ante benefits from activism are less obvious to activist hedge funds. To address this criticism, we test the *Substitution* hypothesis again using funding-shock based instrumental variables. For brevity, we report the IV-LIML results in Table IA.V in the Internet Appendix. The results confirm that the liquidity theories are indeed at work.

6. Economic Mechanism

6.1 Does Trading Attract Activist Attention or Accelerate Activist Targeting?

In this section, we explore the underlying economic mechanism behind the relationship between institutional selling and activist targeting. We consider two non-mutually exclusive mechanisms that likely operate at different stages of the activist targeting timeline (see below) – (i) institutional selling may attract activist attention to firms that are not initially considered as target candidates (*Attention* hypothesis), as suggested by the signaling theories, and/or (ii) institutional selling may accelerate the start of a campaign at firms whose potential benefits from activism have already been recognized by activists (*Timing* hypothesis), in line with the liquidity theories.



We divide the above activist targeting timeline into two periods at $t = 1$, when the first activist arrives as indicated by his toehold. We take the first acquisition of a toehold by an activist as a proxy for his recognition that a particular firm may benefit from activism. Under this assumption, the *Attention* hypothesis would predict that institutional selling increases the arrival rate of the first activist and hence shortens the time between $t = 0$ and $t = 1$. The *Timing* hypothesis, on the other hand, would predict that institutional selling shortens the time between $t = 1$ and $t = 2$, i.e., increases the arrival rate of a campaign, conditional on the activist's already recognizing the benefits of an intervention.

In Table 9, we test the *Attention* and *Timing* hypotheses by estimating discrete-time proportional hazard (complementary log-log) models for first acquisition of a toehold by a known activist hedge fund and for first activist campaign. We report the coefficient estimates. Each observation is a firm-quarter. All specifications include the firm controls from Table 2 and four types of fixed effects: (i) survival duration (in quarters) fixed effects to control for the length of time a firm has survived in the sample and absorb the baseline hazard rates, (ii) vintage fixed effects to absorb any regularities associated with the quarter in which a firm enters the sample, (iii) calendar year-quarter fixed effects to control for potential cyclicality in activism (Burkart and Dasgupta, 2014), and (iv) industry fixed effects.

[Insert Table 9]

In Panel A, we examine the *Attention* hypothesis. The dependent variable is a "recognition" dummy, which equals one in the quarter in which at least one known activist acquires a toehold in a firm, and zero otherwise. We define a spell for a given firm as beginning at $t = 0$, when the firm becomes public and an activist hedge fund can purchase the firm's shares, and being complete at $t = 1$, when at least one hedge fund acquires a toehold for the first time. Thus, the sample includes only firms in which no activist hedge funds have had a toehold until at some point during our sample period or until being right-censored at the end of our sample in 2007Q4.

As our sample begins in 2000Q1, many firms that already exist at that point suffer from left censoring. We address this problem using two alternative approaches, to which we refer as Correction 1 (Columns (1) and (2)) and Correction 2 (Columns (3) and (4)). Under Correction 1, we collect each firm's first date in CRSP, and set the beginning of a left-censored spell to that first date or 1994Q1, whichever comes later. The 1994Q1 cutoff is imposed because hedge fund activism in its current form only took off at that time due to a change in the regulation of proxy communications (see Fos, 2014). Thus, even firms that may have existed before 1994 only became exposed to the risk of an activist toehold acquisition in 1994Q1. Under Correction 2, we simply drop all left-censored spells. This approach can incur a substantial loss of power but yields asymptotically consistent estimates, and is very common in practice.[33]

Column (1) shows that institutional net trading increases the arrival rate of an activist hedge fund. This effect is only statistically significant at 10% and not robust, as it turns statistically insignificant in Column (3) when all left-censored spells are dropped. It is also weak in economic terms and driven primarily by institutional buy volume, as seen in Column (2), although the statistical significance of institutional buy volume disappears in Column (4). The unconditional average hazard rate of 0.082 implies that 50% of firms will see an acquisition by at least one known activist hedge fund within about 2.12 years. The estimates in Column (2) suggest that a one standard deviation increase in institutional buy volume increases (as opposed to decreases) the average hazard rate by just 6.83% (*exp*(1.388 x 0.048) – 1), i.e., reduces the time in which 50% of firms will see an acquisition by an activist by about 0.13 years.[34] This result implies that an activist hedge fund is more likely to acquire a position in a given firm for the first time when other institutional investors also purchase shares of that firm, contrary to the mechanism postulated by the signaling theories.

In Panel B, we examine the *Timing* hypothesis. Here, the dependent variable is a "target" dummy, which equals one in the quarter in which a firm is targeted, and zero otherwise. We define a spell for a given firm as beginning at $t = 1$, when at least one activist hedge fund acquires a toehold in the firm (i.e., when the firm is first viewed as a target candidate), and being complete at $t = 2$, when the firm is targeted. Thus, the sample includes only firms in which at least one hedge fund has a toehold and tracks these firms until they get targeted at some point during our sample period or until being right-censored at the end of our sample in 2007Q4.

Again, firms in which hedge funds already have toeholds in 2000Q1 suffer from left censoring. As before, we deal with this problem using two alternative approaches, to which we refer as Correction 1 (Columns (1) and (2)) and Correction 2 (Columns (3) and (4)). Under Correction 1, we collect a firm's 13F ownership reports dating back to the 1980s, and set the beginning of a left-censored spell to the first date on which we observe any toehold by a known activist or 1994Q1, whichever comes later. The 1994Q1 cutoff is chosen for the reason above. For example, Carl Icahn was in business long before 1994 as a corporate raider, engaging mostly in hostile takeovers. He turned into an activist investor around 1994, and since then has undertaken over 100 campaigns. Thus, even firms in which Carl Icahn had a toehold prior to 1994Q1 only became exposed to the risk of activist targeting after 1994Q1. Under Correction 2, we simply drop all left-censored spells.

The results in Column (1) show that institutional net volume negatively affects the arrival rate of

[33] Dropping left-censored spells is a suggested approach by many statistics textbooks, including SAS and Stata textbooks by Allison (2010) and Rabe-Hesketh and Skrondal (2008).

[34] This is a static interpretation of the hazard probability, which assumes that a firm experiences a similar level of institutional trading in every quarter.

an activist campaign. Column (2) includes separately institutional selling and buying volumes as covariates and confirms our findings – institutional sell (buy) volume is positively (negatively) associated with the arrival rate of a campaign. These results are all statistically significant at 1%, and robust to changes in the correction for left-censorship, as illustrated in Columns (3) and (4). The average unconditional hazard rate of 0.006 implies that in about 11.79 years, a quarter of the firms with activist toeholds will be targeted. From this baseline hazard rate, the estimates in Column (2) suggest that a one standard deviation increase in institutional selling (buying) volume decreases (increases) the average hazard rate by about 25%, effectively reducing (extending) the time in which a quarter of the firms will be targeted by about 2.38 years.

To summarize, the results in Panel A of Table 9 do not support the *Attention* hypothesis, suggested by the signaling theories, i.e., institutional selling does not appear to attract activist attention to firms that are not considered ex-ante as viable targets. On the other hand, the results in Panel B are in line with the *Timing* hypothesis, postulated by the liquidity theories, i.e., institutional selling creates market conditions that facilitate the activist's accumulation of an ownership block and accelerate the campaign launch. As before, a potential criticism of our results is that institutional trades may be endogenous to the activism events. In Table IA.VII in the Internet Appendix, we perform an IV-2SLS analysis using our funding-shock based instrumental variables.[35] Our IV results confirm the *Timing* hypothesis.

6.2 How Do Institutions Trade around the Event Date?

Our analysis so far has relied on our instruments, *expected* institutional trading driven by *funding shocks*, to identify the effects predicted by the liquidity theories from those suggested by the signaling and mechanical explanations. We carefully develop our instruments to ensure that they are free from fundamental information associated with the impending activist campaigns and not induced by the market conditions generated by the activists' purchases. Still, we cannot formally test the exogeneity requirement and therefore seek to provide further evidence to address any remaining concerns. In this subsection, we offer additional *circumstantial* evidence and discussion to broadly characterize the institutions' trading behavior in target and non-target stocks and confirm that the institutions' trades in targets are likely to be exogenous.

We focus on the top two institutional sellers (defined by Ancerno *clientcode*) of target stocks on the event date, as these institutions are most critical in enabling the activist to cross the 5% threshold and subsequently launch the campaign. First, we study the institutions' trading process

[35] We also perform a reduced-form analysis by simply replacing the potentially endogenous institutional trading variables by their corresponding instruments. The highly non-linear nature of our proportional hazard models renders usual IV estimation methods inefficient and hard to interpret due to the unknown true functional form of the first-stage equation. We are comforted by the fact that both the IV and reduced-form results provide consistent support for the *Timing* hypothesis.

by comparing the decision, placement and execution times across targets and non-targets. Table IA.VIII in the Internet Appendix shows that Ancerno institutions trade target stocks around the activism event in virtually the same manner as they do other stocks. Thus, the institutions' trading process does not appear to vary with intraday market conditions that may be induced by the hedge funds' purchases of target shares. This is true even on the event date on which these institutions sell, on average, 0.44% of shares outstanding.

Next, we investigate transaction costs to study the dynamics of liquidity demand and supply by institutions and hedge funds. The microstructure literature often relies on order type classification to differentiate liquidity demand from supply; limit orders are generally associated with supplying liquidity whereas market orders are related to demanding liquidity. However, Ancerno does not provide such order classification. Moreover, the differentiation based on market and limit orders has a strict interpretation only when the trade horizon is very short or when the trade quantity is flexible, which is often not the case for most plain-vanilla institutions (such as mutual and pension funds). For most Ancerno institutions, the trade quantities are determined early in the day and sell-side brokers have a few hours to a few days to execute the trades, using a combination of market orders, limit orders, dark pools, and block matching. Thus, we generally cannot infer whether institutions demand or supply liquidity on a transaction-by-transaction basis.

We adopt the approach in Puckett and Yan (2011) and Franzoni and Plazzi (2013) who estimate an institution's liquidity provision by the price impact of its trades. This approach is also used by Ancerno and by practitioners to evaluate execution quality. Specifically, we estimate a buy (sell) order's price impact as its execution price minus the stock's daily VWAP (the stock's daily VWAP minus the order's execution price), expressed as a percentage of the VWAP. Trades that demand liquidity are expected to have positive price impact or transaction costs. As argued by Franzoni and Plazzi (2013), "using VWAP as a benchmark has the advantage of bearing a close relationship to the theoretical concept of liquidity provision…" (p. 17).

Table 10 reports summary statistics of transaction costs for target and non-target stocks around the public announcement of activism. Columns (1) – (5) focus on the Ancerno institutions and the last column on the activist hedge funds. Columns (2) and (3) show that institutions generally demand liquidity when selling both target and non-target stocks (i.e., their transaction costs are positive and statistically significant), consistent with the findings of Campbell, Ramadorai, and Schwartz (2009). The average price impact of institutional sales is highest on the activism event date for both target and non-target stocks (two to three times the typical price impact), suggesting that these institutions trade impatiently when selling and are willing to bear transaction costs.[36] In

[36] In contrast, institutional buy transactions are usually associated with lower transaction costs (Column (1)), which turn negative on the activism event date. This implies that these institutions are patient in their buy decisions.

Column (5), we formally test the difference in the transaction costs of selling target and non-target stocks, and find that by and large, the differences are not statistically significant.

[Insert Table 10]

To ease the comparison with institutional trades, we benchmark hedge fund transaction costs against the same VWAP. The last column shows that hedge funds may have different trading procedures and transact at prices that are quite different from the VWAP. They seem to trade patiently, providing liquidity during the 60 days before the start of a campaign and on the event date (even though the latter lacks statistical significance). This appearance of liquidity provision may be a result of the hedge funds' attempting to camouflage their intentions, as predicted by the liquidity theories, by buying when institutions sell and prices hobble near daily lows. This way, the market cannot be certain whether the hedge funds are accumulating target shares to launch an activist campaign or just buying mispriced stocks.[37] It is also interesting to note that the average activist seems to demand liquidity in the days between the event and file dates when he acquires an additional 1.28% of the target's outstanding shares. Even though the estimate of transaction costs here is not statistically significant, its large positive magnitude suggests that the average activist is impatient, consistent with the idea that once he has obtained a large enough stake to cover his monitoring costs, he has less need to camouflage his intent and rushes to buy as many target shares as possible to maximize his expected return from activism.

One remaining question is why one or two institutions sell such a large quantity of target shares on the event date (Figure 2). In a frictionless world, only investors with short-lived information would rush to trade a large quantity of stocks and incur large price impact. In reality, institutions face a number of constraints ranging from funding requirements in the case of mutual funds (Coval and Stafford, 2007) to capital regulations (Ellul, Jotikasthira, and Lundblad, 2011). The literature has convincingly shown that these institutional constraints may sometimes force institutions to immediately buy or sell assets and concede on price to compensate counterparties for liquidity provision. We argue that negative funding shocks are likely the reason why the top selling institutions sell a lot of target shares on the event date. First, these institutions sell a disproportionately large fraction of their stock holdings, consistent with the behavior of distressed mutual funds facing large outflows, as shown by Coval and Stafford (2007). Second, these institutions incur a significantly larger price impact on their sales than on their buys. Third, these institutions' trading behavior in target and non-target stocks is strikingly similar, implying that they do not spontaneously respond to new information about the targets or to favorable market

[37] The relationship between the trading costs of institutions and hedge funds also suggests that hedge fund purchases may help mitigate the price impact of institutional sales. Our conversations with a former Barclays trader responsible for handling a large number of activist hedge fund trades confirm that hedge funds often act as a "natural" counterparty to institutions that are impatient to offload stocks in response to funding shocks.

conditions created by the activists' purchases. Finally, these institutions' sales of the targets are relatively small in dollar terms compared to their usual trading volumes. For example, an average top seller sells a total of $1,079.82 million worth of stocks on the event date, and the target stocks account for only $1.89 million (< 0.20% of total selling volume).

To summarize, the results in Table 10 and the Internet Appendix imply that for the most part, institutional trading of target firms is not driven by hedge fund trading, and hence is likely exogenous to the activism events. Overall, our results provide empirical support for the liquidity theories; institutional selling in a stock helps camouflage hedge fund purchases and ultimately raises the probability that the stock will be targeted.

7. Conclusion

In this paper, we investigate the impact of institutional trading on an activist's decision to acquire shares in a target firm and initiate a campaign. We show that of several target candidates with fundamental characteristics conducive to an intervention, the specific choice and time of entry crucially depend on the prevailing market conditions induced by institutional selling.

Our empirical results provide a direct test of the theoretical model of Maug (1998) and other similar liquidity theories, focusing on their shared mechanism in which noise trading facilitates the formation of an activist block. We find that institutional selling is positively associated with a firm's probability of becoming an activist target. Zooming in on the activist's accumulation of target shares at the daily frequency, we show that institutional selling volume is positively correlated with net hedge fund buying volume. By extracting the institutions' trades that are driven by institution-specific funding constraints and exogenous to activism, we establish that institutional trading affects the activist's decision to purchase target shares and intervene through the liquidity channel.

In the cross-section of targets, we demonstrate that activism benefits and trading gains are substitutes in the activist's targeting decision, consistent with the predictions of the liquidity theories. Finally, we examine the underlying economic mechanism and show that institutional selling accelerates the launch of a campaign but does not appear to bring attention to firms that are not ex-ante viable targets. Overall, our results indicate that activist hedge funds use institutional sales to camouflage their purchases. This allows the hedge funds to obtain additional trading gains, which help cover their monitoring costs and make activist campaigns financially feasible.

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Appendix A: Definitions of Variables

Firm-Year and Firm-Quarter Panels

Variable	Definition
Dividend yield	Common plus preferred dividends divided by market value of common plus preferred stocks. Source: Compustat.
Exp[inst. buy (sell) volume]/SHROUT	Expected buy (sell) volume as a percentage of shares outstanding. Calculation at the quarterly/annual frequency is as follows: First, the expected weekly buy (sell) volume is calculated by multiplying each institution's predicted probability of buying (selling) a given firm by the institution's average volume and then summing the product across all institutions in each week. Second, the expected buy (sell) volume for each firm-quarter is obtained by taking the 90th percentile of the expected weekly buy (sell) volume within the quarter. Third, the expected buy (sell) volume for each firm-year is the maximum of the expected quarterly buy (sell) volume within the year. More details are in the Internet Appendix. Source: CRSP and Ancerno.
Exp[MF fire purchases (sales)]/SHROUT	Expected mutual fund fire purchases (sales) as a percentage of shares outstanding. Calculation is as follows: First, the expected fire purchases (sales) for each individual mutual fund in each reporting quarter are calculated as the product of the percentage inflows (outflows) and beginning-of-quarter share holdings if the flows are larger than 5% in magnitude; otherwise, the expected fire purchases (sales) are zero. These expected fire purchases (sales) are then summed across all mutual funds holding each firm, divided by the number of shares outstanding at the beginning of the quarter, and averaged across all quarters to obtain the expected fire purchases (sales) for each firm-year. Source: CRSP and Thomson Reuters.
HF toehold/SHROUT	Total ownership in a firm of all known activist hedge funds that file Schedule 13F, measured at the end of the preceding year. Source: Thomson Reuters.
Herfindahl index	Herfindahl index of market concentration for each Fama-French 12 industry.
Inst buy (sell) volume/SHROUT	Annual average of cumulative quarterly institutional buy (sell) volume as a percentage of shares outstanding. Source: Ancerno.
Inst. net volume/SHROUT	*Inst. buy volume/SHROUT* minus *Inst. sell volume/SHROUT*.
Inst. ownership	Total ownership of all institutions that file Schedule 13F as a percentage of shares outstanding. Source: Thomson Reuters.
Leverage	Book value of debt divided by book value of total assets. Source: Compustat.
-log(Amihud)	Negative of natural logarithm of one plus Amihud ratio, calculated as yearly average of [1000* SQRT(|Daily Return| /(Daily Dollar Trading Volume))]. Daily ratios are capped at 30% before averaging, as in Acharya and Pedersen (2005). Source: CRSP.
log(Analysts)	Natural logarithm of one plus number of analysts following a firm over the preceding year. Source: I/B/E/S.
log(MV)	Natural logarithm of market capitalization. Source: Compustat.
ΔMF holdings/SHROUT	Annual average of quarterly change in the ownership of all mutual funds. Source: Thomson Reuters.
No. HFs with toehold	Number of known activist hedge funds reporting an ownership stake in a firm through Schedule 13F. Source: Thomson Reuters.
R&D/Assets	Research and development expense divided by lagged book value of assets. Missing = 0. Source: Compustat.
Return	Stock return, including dividends, over the preceding year. Source: CRSP.
ROA	Operating income before depreciation divided by lagged book value of assets. Source: Compustat.
Sales growth	Sales less lagged sales divided by lagged sales. Source: Compustat.
Tobin's Q	Market value of equity plus book value of debt divided by book value of total assets. Source: Compustat.

Firm-Day, Campaign-Day, and Institution-Firm-Day Panels

Variable	**Definition**
Abnormal Amihud ratio and Cumulative abnormal Amihud ratio (CAA)	Mean-adjusted Amihud ratio, calculated as |Daily Return|/(Daily Dollar Trading Volume). The estimation period is from t-600 to t-240. *CAA* is calculated as the sum of abnormal Amihud ratios during the period from t-240 to t-60. Source: CRSP.
Abnormal return and Cumulative abnormal return (CAR)	Market-model-adjusted return. CRSP value-weighted index is used as the market portfolio and the estimation period is t-600 to t-240. *CAR* is calculated as the sum of abnormal returns during the period from t-240 to t-60. Source: CRSP.
Abnormal turnover and Cumulative abnormal turnover (CAT)	Mean-adjusted turnover, calculated as trading volume divided by shares outstanding. The estimation period is from t-600 to t-240. *CAT* is calculated as the sum of abnormal turnover during the period from t-240 to t-60. Source: CRSP.
Adjusted turnover	Total trading volume minus the sum of hedge fund activist's and institutional trading volumes, divided by shares outstanding. Source: CRSP, Schedule 13D, and Ancerno.
Campaign dummies	Set of dummy variables, each equal to one for each individual campaign.
CRSP value-weighted return	Daily return, including all distributions, of the CRSP value-weighted market portfolio.
Dummy[buy (sell)]	Dummy variable equal to one if the institution buys (sells) the firm's stock on a given day. Source: Ancerno.
Dummy[trade only one other stock]	Dummy variable equal to one if the institution buys or sells *only one other stock outside the firm's SIC-2 industry* on a given day. Source: Ancerno.
Dummy[trade other stocks]	Dummy variable equal to one if the institution buys or sells *other stocks outside the firm's SIC-2 industry* on a given day. Source: Ancerno.
Exp[inst. buy (sell) volume]/SHROUT	Expected buy (sell) volume as a percentage of shares outstanding, calculated by multiplying each institution's predicted probability of buying (selling) the firm's stock by the institution's average volume and then summing the product across all institutions. More details are in the Internet Appendix. Source: CRSP and Ancerno.
Fraction of trading days during sample	Number of days on which the institution trades at least one stock divided by the total number of days during the sample period. Source: Ancerno.
Fraction of sell principal	Dollar principal of all other stocks sold divided by total dollar principal of all stocks bought and sold. Only *other stocks outside the firm's SIC-2 industry* are included in the calculation. Source: Ancerno.
Fraction of stocks sold	Number of individual stocks (not shares) sold divided by total number of individual stocks bought or sold. Only *other stocks outside the firm's SIC-2 industry* are included in the calculation. Source: Ancerno.
Inst. buy (sell) volume/SHROUT	Total daily institutional buy (sell) volume as a percentage of shares outstanding. Source: Ancerno.
Inst. net volume/SHROUT	*Inst. buy volume/SHROUT* minus *Inst. sell volume/SHROUT*.
Net HF volume/SHROUT	Net hedge fund activist's trading volume (buy minus sell) as a percentage of shares outstanding. Source: Schedule 13D.
Return	Stock return, including all distributions. Source: CRSP.
VIX	CBOE volatility index, constructed using the implied volatilities of near- and next-term put and call options with 23-37 days to expiration and various strike prices. Source: CBOE.

Figure 1: Cumulative Ownership of Activist Hedge Funds and Other Institutions

The figure plots the target firms' mean cumulative ownership (as a percentage of shares outstanding) of activist hedge funds and other institutions in the one-year period (starting from 0% on day t-360) before the public announcement of activism. *Event date* (day 0) refers to the date on which the hedge fund's ownership crosses the 5% reporting threshold. The mean is calculated across 643 campaigns with available trading data in 2000-2007. Hedge fund trading data are collected from SEC filings and non-hedge fund institutional trades come from Ancerno.

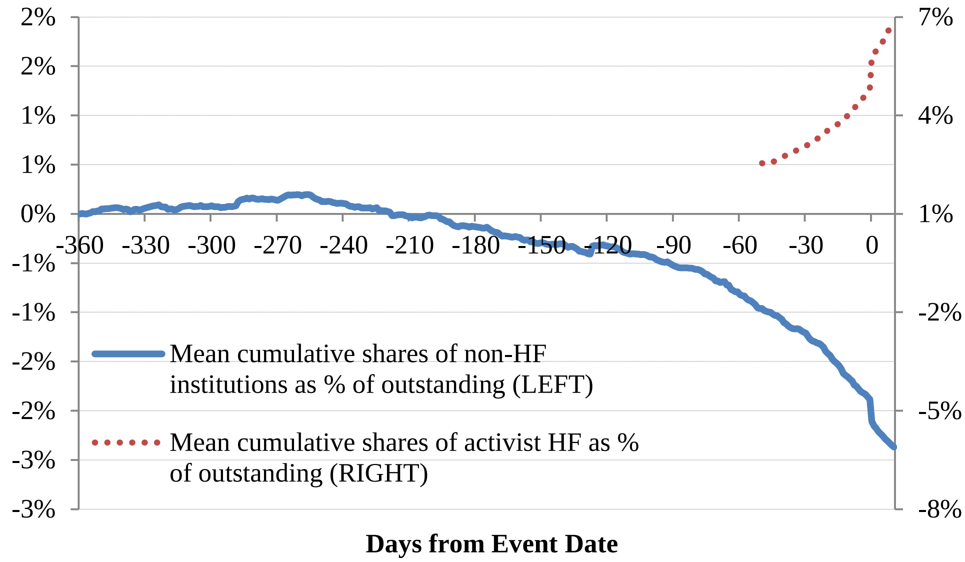

Figure 2: Net Trading Volume of Activist Hedge Funds and Other Institutions

The figure plots the target firms' mean daily net trading volume (as a percentage of shares outstanding) of activist hedge funds and other institutions during the 60 days before the public announcement of activism. The mean is calculated across 643 campaigns with available trading data in 2000-2007. *Event date* (day 0) refers to the date on which the hedge fund's ownership crosses the 5% reporting threshold. Hedge fund trading data are collected from SEC filings and non-hedge fund institutional trades come from Ancerno.

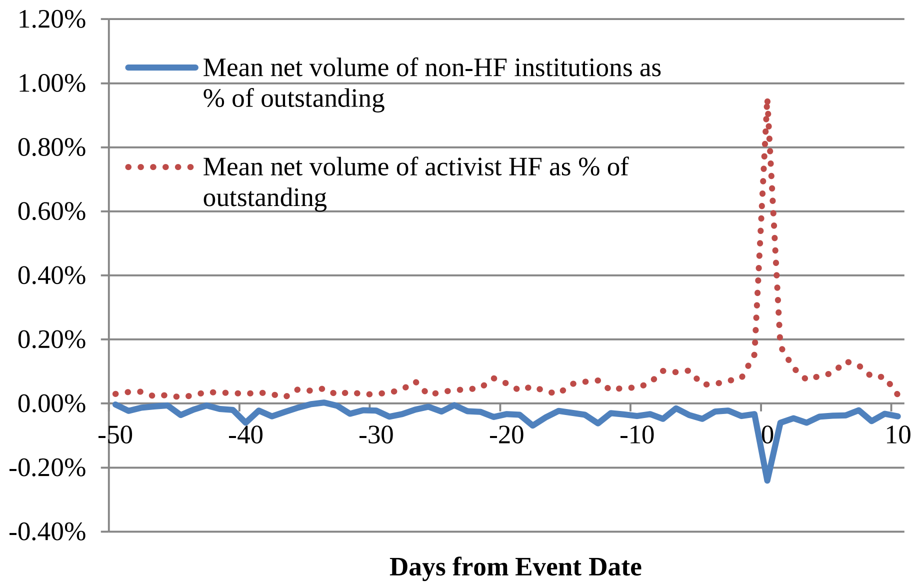

Table 1: Characteristics of Target and Non-Target Firms

This table reports summary statistics of firm characteristics for the sample of CRSP-Compustat firms that are targeted/ not targeted by hedge fund activists in 2000-2007. All variables are defined in Appendix A. Institutional trading data are from Ancerno. Institutional ownership and holdings data are from Thomson Reuters-13F. Mutual fund holdings data are from Thomson Reuters-Mutual Funds. *, **, and *** refer to statistical significance (of the difference in means or medians) at 10%, 5%, and 1% levels, respectively. Additional statistics including standard deviation and various percentiles are reported in the Internet Appendix.

	Target Firms			Non-Target Firms			Difference	
	N	Mean	Median	N	Mean	Median	Mean	Median
log(MV)	755	5.203	5.057	33,164	5.611	5.556	-0.407***	-0.499***
Tobin's Q	755	1.914	1.324	33,164	2.793	1.530	-0.879***	-0.206***
Leverage	755	0.276	0.231	33,164	0.300	0.258	-0.024**	-0.027
Dividend yield	755	0.008	0.000	33,164	0.010	0.000	-0.002	0.000
Sales growth	755	0.168	0.062	33,164	0.262	0.098	-0.093***	-0.036***
ROA	755	0.049	0.095	33,164	0.044	0.095	0.005	0.000
R&D/Assets	755	0.056	0.000	33,164	0.082	0.000	-0.025*	0.000
Inst. ownership	755	0.513	0.507	33,164	0.438	0.424	0.075***	0.083***
log(Analysts)	755	1.355	1.386	33,164	1.300	1.386	0.056	0.000
-log(Amihud)	755	-1.259	-1.074	33,164	-1.245	-0.973	-0.014	-0.101
Herfindahl index	755	0.037	0.028	33,164	0.036	0.027	0.000	0.001***
Return	755	0.057	-0.028	33,162	0.214	0.044	-0.157***	-0.072***
Inst. buy volume/SHROUT	731	0.024	0.015	30,643	0.028	0.017	-0.004***	-0.002**
Inst. sell volume/SHROUT	731	0.030	0.019	30,643	0.027	0.017	0.003***	0.002**
Inst. net volume/SHROUT	731	-0.006	-0.002	30,643	0.001	0.000	-0.007***	-0.002***
No. HFs with toehold	461	3.291	3.000	16,032	2.694	2.000	0.596***	1.000***
HF toehold/SHROUT	461	0.053	0.034	16,032	0.021	0.006	0.032***	0.029***
ΔMF holdings/SHROUT	636	-0.002	0.000	25,346	0.001	0.000	-0.003***	-0.001***

Table 2: Effect of Institutional Trading on Activist Targeting

This table reports OLS estimates for linear probability models of hedge fund activist targeting. Observations are firm-years and the sample period is 2000-2007. All variables are defined in Appendix A. The dependent variable is a dummy equal to one if a firm is targeted in an activist campaign. Institutional trading data are from Ancerno. Institutional holdings data are from Thomson Reuters-13F. Mutual fund holdings data are from Thomson Reuters-Mutual Funds. Inst. net (sell/buy) volume/SHROUT and ΔMF holdings/SHROUT are winsorized at 1%. All control variables are as of the end of the prior year. All columns include year and industry fixed-effects. Robust standard errors, clustered by firm, are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Inst. net volume/SHROUT	-0.189***				-0.168***		
	(0.049)				(0.045)		
Inst. sell volume/SHROUT		0.172***				0.135***	
		(0.049)				(0.045)	
Inst. buy volume/SHROUT		-0.198***				-0.185***	
		(0.055)				(0.055)	
ΔMF holdings/SHROUT			-0.959***				-0.868***
			(0.126)				(0.126)
-log(Amihud)				0.006***	0.004*	0.004**	0.005*
				(0.002)	(0.002)	(0.002)	(0.003)
log(MV)				-0.008***	-0.008***	-0.008***	-0.008***
				(0.001)	(0.001)	(0.001)	(0.001)
Tobin's Q				-0.000*	-0.000	-0.000	-0.000
				(0.000)	(0.000)	(0.000)	(0.000)
Inst. ownership				0.039***	0.039***	0.041***	0.034***
				(0.004)	(0.005)	(0.005)	(0.005)
Sales growth				-0.002*	-0.002*	-0.002	-0.003***
				(0.001)	(0.001)	(0.001)	(0.001)
ROA				-0.002	-0.003	-0.003	-0.008**
				(0.003)	(0.003)	(0.003)	(0.004)
Leverage				-0.000	0.000	0.000	-0.001
				(0.004)	(0.004)	(0.004)	(0.004)
Dividend yield				-0.001	0.002	0.002	-0.001
				(0.005)	(0.010)	(0.010)	(0.010)
R&D/Assets				-0.000**	-0.000**	-0.000**	-0.002
				(0.000)	(0.000)	(0.000)	(0.002)
Herfindahl index				0.131	0.090	0.091	0.062
				(0.233)	(0.245)	(0.245)	(0.271)
log(Analysts)				-0.001	-0.001	-0.001	-0.002
				(0.001)	(0.001)	(0.001)	(0.002)
Return				-0.001	-0.001	-0.000	-0.000
				(0.001)	(0.001)	(0.001)	(0.001)
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES
Observations	31,374	31,374	25,982	33,919	31,374	31,374	25,982
R-squared (within)	0.009	0.009	0.011	0.012	0.014	0.014	0.017

Table 3: Activist and Non-Activist Institutional Trading in Target Firms

This table presents cross-sectional mean statistics of activist and non-activist institutional trading in firms targeted by hedge fund activists in 2000-2007. Only campaigns with available trading data are included. Panel A reports hedge fund trades for the entire 60-day period for which the activists report their trades in SEC Schedule 13D. Panel B reports institutional trades both for the 60-day period in which the activists report their trades and for the prior 180 days. For each campaign, day t-60 (t-240) refers to day -60 (-240) from the file date, and event date refers to the date on which the hedge fund's ownership crosses the 5% reporting threshold. Institutional trading data are from Ancerno. An institution is a unique combination of client code and client manager code in the Ancerno dataset.

Panel A: Hedge Fund Trading

			Shares Purchased as % of			Number of Trades		
Period	N	Trade as % of Market Volume	Shares Outstanding	Total Shares on File Date	Average Price as % of Price on File Date	Total	Open Market	% of Shares Purchased in Open Market
[t-60, Event Date)	589	12.53%	2.65%	41.08%	94.12%	185	185	98.79%
Event Date	581	41.24%	1.02%	13.68%	97.58%	14	14	97.28%
(Event Date, File Date]	452	17.63%	1.28%	16.93%	98.61%	72	71	98.70%
[t-60, File Date]	643	15.78%	4.25%	61.89%	98.17%	232	232	97.51%

Panel B: Institutional Trading

			Volume/ Shares Outstanding			Number of Institutions		Number of Trades per Institution	
Period	N	Trade as % of Market Volume	Buy	Sell	Net	Net Buy	Net Sell	Buy	Sell
[t-240, t-60)	682	13.46%	6.41%	-7.43%	-1.02%	56	70	13	11
[t-60, Event Date)	625	15.14%	1.93%	-2.93%	-1.00%	25	33	9	10
Event Date	447	20.35%	0.12%	-0.46%	-0.34%	3	5	3	3
(Event Date, File Date]	518	14.53%	0.92%	-1.28%	-0.36%	14	15	5	5
[t-60, File Date]	643	14.36%	2.71%	-4.21%	-1.50%	30	40	10	10

Table 4: Effect of Institutional Trading on Activist Purchases of Target Shares

This table reports OLS estimates for regressions of activist purchases of target shares on institutional trades. The sample consists of firms targeted by hedge fund activists in 2000-2007, for which both hedge fund transaction data from SEC Schedule 13D and institutional transaction data from Ancerno are available. Observation are campaign-days. All variables are defined in Appendix A. The dependent variable is net hedge fund volume as a percentage of shares outstanding. Columns (1)-(4) include campaign fixed effects whereas columns (5)-(6) include cumulative abnormal return (CAR), cumulative abnormal turnover (CAT), and cumulative abnormal Amihud ratio (CAA) in the period from t-240 to t-60 as campaign-level controls. Net hedge fund volume/SHROUT and Inst. net (sell/buy) volume/SHROUT are winsorized at 1%. Robust standard errors, clustered by campaign, are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Inst. net volume/SHROUT	-0.166***		-0.167***		-0.154***	
	(0.024)		(0.026)		(0.024)	
Inst. sell volume/SHROUT		0.263***		0.268***		0.229***
		(0.030)		(0.033)		(0.029)
Inst. buy volume/SHROUT		0.012		0.014		-0.005
		(0.023)		(0.025)		(0.024)
Net HF volume/SHROUT l1			0.127***	0.125***	0.155***	0.152***
			(0.019)	(0.019)	(0.019)	(0.019)
Net HF volume/SHROUT l2			0.045***	0.044***	0.067***	0.065***
			(0.011)	(0.011)	(0.011)	(0.011)
Net HF volume/SHROUT l3			0.004	0.002	0.023**	0.021*
			(0.012)	(0.012)	(0.012)	(0.012)
Net HF volume/SHROUT l4			0.023**	0.023**	0.044***	0.042***
			(0.010)	(0.010)	(0.010)	(0.010)
Net HF volume/SHROUT l5			0.006	0.006	0.029**	0.027**
			(0.011)	(0.011)	(0.011)	(0.011)
CRSP value-weighted return	-0.004**	-0.004**	-0.003*	-0.004*	-0.005**	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
VIX	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted turnover	0.025***	0.022***	0.025***	0.022***	0.021***	0.018***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.006)	(0.006)
Market condition controls	NONE		Lags 1 to 5 of abnormal return and abnormal Amihud		Lags 1 to 5 of abnormal return and abnormal Amihud	
Campaign-level controls	Campaign dummies		Campaign dummies		CAR (t-240 to t-60), CAT (t-240 to t-60), CAA (t-240 to t-60)	
N	22,809	22,809	18,117	18,117	18,091	18,091
R-squared (within)	0.039	0.048	0.063	0.072	0.082	0.088

Table 5: Institution's Probabilities of Buying and Selling a Generic Stock as Function of Its Trading in Other Stocks Outside the Generic Stock's Industry

This table reports OLS estimates for linear models of the probability that an institution buys or sells a *generic* stock conditional on its trading in *other stocks outside the generic stock's SIC-2 industry*. Observations are institution-stock-days. All variables are defined in Appendix A. The probabilities of buying and selling are estimated separately. The sample covers (i) all institutions that trade target stocks at least twice during the 60-day period before a campaign file date, and (ii) all stocks traded at least once by these institutions during the 60-day period. For computational reasons, the estimation is performed separately for each calendar quarter during the sample period 2000-2007. Coefficient estimates, averaged across all quarters, are reported. Standard errors, calculated as in Fama and Macbeth (1973), are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively.

	Sell Fraction = Fraction of Sell Principal		Sell Fraction = Fraction of Stocks Sold	
	(1)	(2)	(3)	(4)
	Buy	Sell	Buy	Sell
Dummy[trade other stocks]	0.201***	0.038***	0.226***	0.023***
	(0.013)	(0.005)	(0.013)	(0.005)
Dummy[trade other stocks]	-0.172***	0.119***	-0.228***	0.150***
x Sell fraction	(0.013)	(0.007)	(0.016)	(0.010)
Dummy[trade only one other stock]	-0.110***	-0.065***	-0.105***	-0.067***
	(0.008)	(0.006)	(0.008)	(0.006)
Dummy[sell] l1	0.006	0.306***	0.011*	0.304***
	(0.006)	(0.010)	(0.006)	(0.010)
Dummy[buy] l1	0.272***	0.006**	0.267***	0.008**
	(0.009)	(0.003)	(0.009)	(0.003)
Dummy[trade other stocks] l1	-0.063***	-0.025***	-0.069***	-0.019***
	(0.006)	(0.005)	(0.006)	(0.004)
Dummy[trade other stocks] l1	0.018***	-0.022***	0.040***	-0.040***
* Sell fraction l1	(0.004)	(0.004)	(0.004)	(0.004)
Fraction of trading days during sample	0.003	-0.028***	-0.005	-0.023***
	(0.009)	(0.006)	(0.008)	(0.005)
Return l1	0.004	-0.004	0.008	-0.005
	(0.010)	(0.008)	(0.008)	(0.009)
CRSP value-weighted return	0.322***	-0.041	0.254**	0.004
	(0.113)	(0.060)	(0.106)	(0.056)
VIX	0.000	0.000	0.000	0.000
	(0.001)	(0.000)	(0.001)	(0.000)
Average N	11,367,529	11,367,529	11,367,529	11,367,529
Average R-squared	0.150	0.144	0.158	0.153

Table 6: Effect of Institutional Trading on Activist Purchases of Target Shares (IV Analysis)

This table reports limited information maximum likelihood (LIML) estimates of the effects of institutional trading on activist purchases of target shares. The OLS counterparts are in Table 4. Observations are campaign-days. All variables are defined in Appendix A. The dependent variable is net hedge fund volume as a percentage of shares outstanding, and the endogenous regressors are institutional net volume (column (2)) and institutional buy and sell volumes (column (5)). Columns (1) and (3)-(4) report estimates of the first-stage equations, in which the endogenous regressors are expressed as a function of the excluded instruments – expected institutional buy and sell volumes calculated as the sums of *individual* institutions' expected buying and selling in target stocks, conditional on their trading in *non-target* stocks *outside the target's SIC-2 industry* (models in columns (3) and (4) of Table 5). All columns include campaign fixed-effects. Net hedge fund volume/SHROUT and Inst. net (sell/buy) volume/SHROUT are winsorized at 1%. Robust standard errors, clustered by campaign and corrected by Monte Carlo simulation for errors in estimating the expected institutional buy and sell volumes, are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively.

	Inst. net volume /SHROUT *(1st stage)*	Net HF volume /SHROUT *(2nd stage)*	Inst. sell volume /SHROUT *(1st stage)*	Inst. buy volume /SHROUT *(1st stage)*	Net HF volume /SHROUT *(2nd stage)*
	(1)	(2)	(3)	(4)	(5)
Inst. net volume/SHROUT		-0.147**			
		(0.070)			
Inst. sell volume/SHROUT					0.205**
					(0.093)
Inst. buy volume/SHROUT					-0.051
					(0.131)
Exp. (inst. sell volume)/SHROUT	-0.563***		0.632***	0.063**	
	(0.060)		(0.056)	(0.026)	
Exp. (inst. buy volume)/SHROUT	0.326***		0.157***	0.489***	
	(0.068)		(0.039)	(0.059)	
Net HF volume/SHROUT l1	-0.015**	0.128***	0.013**	-0.002	0.127***
	(0.006)	(0.020)	(0.006)	(0.003)	(0.020)
Net HF volume/SHROUT l2	-0.003	0.046***	0.005	0.001	0.046***
	(0.005)	(0.011)	(0.005)	(0.003)	(0.011)
Net HF volume/SHROUT l3	-0.001	0.000	0.005	0.003	-0.000
	(0.005)	(0.012)	(0.005)	(0.003)	(0.012)
Net HF volume/SHROUT l4	-0.007	0.024**	0.005	-0.000	0.024**
	(0.006)	(0.010)	(0.006)	(0.003)	(0.010)
Net HF volume/SHROUT l5	0.007	0.007	-0.004	0.005	0.006
	(0.006)	(0.011)	(0.004)	(0.004)	(0.011)
Market condition controls	CRSP value-weighted return, VIX, adjusted turnover, and lags 1 to 5 of abnormal return and abnormal Amihud				
Campaign-level controls	Campaign dummies				
Kleibergen-Paap rank Wald statistic	F(2, 618) = 67.247 (S-Y crit. val. at 10% maximal size = 8.68)		F(1, 618) = 51.778 (S-Y crit. val. at 10% maximal size = 7.03)		
Hansen J statistic	$\chi^2(1) = 0.824$		N/A		
N	18,117	18,117	18,117	18,117	18,117
R-squared (within)	0.044	0.038	0.087	0.063	0.046

Table 7: Effect of Institutional Trading on Activist Targeting (IV Analysis)

This table reports limited information maximum likelihood (LIML) estimates of the effects of institutional trading on the probability that a firm will become an activist target. The OLS counterparts are in Table 2. Observations are firm-years. All variables are defined in Appendix A. The dependent variable is a dummy equal to one if a firm is targeted in an activist campaign in a given year, and the endogenous regressors are institutional net volume (column (2)), institutional buy and sell volumes (column (5)), and change in mutual fund holdings (column (7)). Columns (1) and (3)-(4) report estimates of the first-stage equations, in which the endogenous regressors are expressed as a function of the excluded instruments – expected institutional buy and sell volumes calculated as the sums of *individual* institutions' expected buying and selling in a given stock, conditional on their trading in *other stocks outside the given stock's SIC-2 industry* (see the Internet Appendix for a detailed description). Columns (2) and (5) report estimates of the corresponding second-stage equations. Columns (6) and (7) provide a robustness check whereby institutional net volume is replaced by the change in mutual fund holdings and expected flow-induced fire sales and purchases are used as instruments. Inst. net (sell/buy) volume/SHROUT and ΔMF holdings/SHROUT are winsorized at 1%. All columns include year and industry fixed-effects. Robust standard errors, clustered by firm and corrected by Monte Carlo simulation for errors in estimating the expected trading volumes, are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively.

	Inst. net volume /SHROUT *(1st stage)*	Target Dummy *(2nd stage)*	Inst. sell volume /SHROUT *(1st stage)*	Inst. buy volume /SHROUT *(1st stage)*	Target Dummy *(2nd stage)*	ΔMF holdings/ SHROUT *(1st stage)*	Target Dummy *(2nd stage)*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Inst. net volume/SHROUT		-0.118***					
		(0.035)					
Inst. sell volume/SHROUT					0.127***		
					(0.049)		
Inst. buy volume/SHROUT					-0.153***		
					(0.037)		
Exp. (inst. sell volume)/SHROUT	-1.712***		1.761***	0.300**			
	(0.243)		(0.358)	(0.146)			
Exp. (inst. buy volume)/SHROUT	2.379***		0.628***	2.464***			
	(0.219)		(0.240)	(0.303)			
ΔMF holdings/ SHROUT							-2.425**
							(1.152)
Exp. (MF fire sales)/SHROUT						-0.133***	
						(0.048)	
Exp. (MF fire purchases)/SHROUT						0.195***	
						(0.017)	

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	Inst. net volume /SHROUT *(1st stage)*	Target Dummy *(2nd stage)*	Inst. sell volume /SHROUT *(1st stage)*	Inst. buy volume /SHROUT *(1st stage)*	Target Dummy *(2nd stage)*	ΔMF holdings/ SHROUT *(1st stage)*	Target Dummy *(2nd stage)*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
-log(Amihud)	0.000	0.004*	0.002***	0.003***	0.004*	0.001***	0.006**
	(0.000)	(0.002)	(0.000)	(0.001)	(0.002)	(0.000)	(0.003)
log(MV)	0.001***	-0.008***	-0.000	0.000	-0.008***	0.000***	-0.008***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Tobin's Q	0.000	-0.000	0.000**	0.000**	-0.000	0.000**	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inst. ownership	-0.010***	0.039***	0.031***	0.023***	0.040***	-0.004***	0.029***
	(0.001)	(0.005)	(0.002)	(0.001)	(0.005)	(0.000)	(0.007)
Sales growth	0.000	-0.002*	0.001***	0.001***	-0.002	0.000	-0.003***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
ROA	0.001**	-0.003	0.004***	0.005***	-0.003	0.001***	-0.006
	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)	(0.000)	(0.005)
Leverage	0.000	0.001	-0.000	0.000	0.000	-0.000	-0.001
	(0.000)	(0.004)	(0.001)	(0.001)	(0.004)	(0.000)	(0.004)
Dividend yield	0.000	0.003	-0.004	-0.004	0.002	-0.000	-0.001
	(0.001)	(0.010)	(0.003)	(0.003)	(0.010)	(0.000)	(0.010)
R&D/Assets	0.000	-0.000**	0.000**	0.000*	-0.000**	0.001**	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Other control variables	Herfindahl index, log(Analysts), and return						
Year and industry fixed effects	YES	YES	YES	YES	YES	YES	YES
Kleibergen-Paap rank Wald statistic	F(2, 7072) = 60.560 (S-Y crit. val. at 10% maximal size = 8.68)		F(1, 7072) = 19.544 (S-Y crit. val. at 10% maximal size = 7.03)			F(2, 6159) = 65.057 (S-Y crit. val. at 10% maximal size = 8.68)	
Hansen J statistic	$\chi^2(1) = 0.191$		N/A			$\chi^2(1) = 1.628$	
Observations	31,374	31,374	31,374	31,374	31,374	25,982	25,982
R-squared (within)	0.463	0.014	0.696	0.723	0.015	0.026	0.010

Table 8: Effect of Institutional Trading on Activist Purchases by Level of Activism Benefits

This table reports OLS estimates for regressions of activist purchases of target shares for targets with varying levels of activism benefits. Observations are campaign-days. The dependent variable is net hedge fund volume as a percentage of shares outstanding. Panel A measures potential benefits from activism by a firm's propensity to be targeted estimated as in column (4) of Table 2 (without institutional trading variables). Columns (1) and (2) split the targets into those with below/above median target propensities, respectively. Columns (3)-(4) interact institutional net volume with a dummy for above median target propensity (*High benefits dummy*) and with a firm's target propensity (*Benefits*), respectively. Panel B measures activism benefits by the total toehold of known activist hedge funds in a target at the end of the most recent quarter before the campaign start. Columns (1)-(3) split the targets into those with no toehold and those with below/above median (non-zero) total toeholds, respectively. Columns (4)-(5) interact institutional net volume with a dummy for above median total toehold (*High benefits dummy*) and with total toehold (*Benefits*), respectively. All other variables are defined in Appendix A. Net hedge fund volume/SHROUT and Inst. net volume/SHROUT are winsorized at 1%. All models include campaign fixed-effects. Robust standard errors, clustered by campaign, are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively. For brevity, IV counterparts of the results are reported in the Internet Appendix.

Panel A: Benefits Defined as Target Propensity Score

	(1) Propensity < Median	(3) Propensity ≥ Median	(3) All	(4) All
Inst. net volume/SHROUT	-0.199***	-0.102***	-0.201***	-0.155***
	(0.036)	(0.024)	(0.035)	(0.022)
Inst. net volume/SHROUT			0.090**	
x High benefits dummy			(0.042)	
Inst. net volume/SHROUT x Benefits				11.959***
				(4.161)
Market condition controls	Lags 1 to 5 of net HF volume/SHROUT, CRSP value-weighted return, VIX, adjusted turnover, and lags 1 to 5 of abnormal return and abnormal Amihud			
Campaign-level controls	Campaign dummies			
N	7,930	8,344	16,274	16,274
R-squared (within)	0.079	0.070	0.071	0.072

Panel B: Benefits Defined as Total Hedge Fund Toehold

	(1) TOE(HF) = 0	(2) TOE(HF) < Median	(3) TOE(HF) ≥ Median	(4) All	(5) All
Inst. net volume/SHROUT	-0.258***	-0.182***	-0.120***	-0.223***	-0.226***
	(0.092)	(0.039)	(0.036)	(0.043)	(0.039)
Inst. net volume/SHROUT				0.110**	
x High benefits dummy				(0.048)	
Inst. net volume/SHROUT x Benefits					1.481**
					(0.646)
Market condition controls	Lags 1 to 5 of net HF volume/SHROUT, CRSP value-weighted return, VIX, adjusted turnover, and lags 1 to 5 of abnormal return and abnormal Amihud				
Campaign-level controls	Campaign dummies				
N	5,116	6,484	6,517	18,117	18,117
R-squared (within)	0.063	0.128	0.068	0.063	0.064

Table 9: Effect of Institutional Trading on Activist Toehold Acquisition and Targeting

This table reports pseudo maximum likelihood estimates of discrete-time proportional hazard (complementary log-log) models for first acquisition of a toehold by a known activist hedge fund (Panel A) and for activist targeting (Panel B). Observations are firm-quarters. All variables are defined in Appendix A. In Panel A, the dependent variable is a "recognition" dummy, which equals one in the quarter in which at least one hedge fund acquires a toehold in a firm, and 0 in all prior quarters. For each firm, the spell starts when the firm becomes public and an activist hedge fund can purchase the firm's shares, and ends when at least one hedge fund has a toehold in the firm (i.e., the spell is complete) or when the sample ends (i.e., the spell is right-censored), whichever comes first. Firms that already exist but are without any hedge fund toeholds at the beginning of the sample period in 2000 suffer from left censorship, which is corrected by two alternative approaches to ensure robustness. CORRECTION 1 sets the start of a left-censored spell to the first quarter in which the firm appears in CRSP or the first quarter of 1994, whichever comes later. CORRECTION 2 drops all left-censored spells. In Panel B, the dependent variable is a "target" dummy, which equals one in the quarter in which a firm is targeted, and 0 in all prior quarters. For each firm, the spell starts when at least one activist hedge fund acquires a toehold in the firm, and ends when the firm is targeted (i.e., the spell is complete) or when the sample ends (i.e., the spell is right-censored), whichever comes first. Firms with hedge fund toeholds at the beginning of the sample period in 2000 suffer from left censorship, which is corrected by two approaches to ensure robustness. CORRECTION 1 recovers the first acquisition of a toehold through 13F reports dated back to the first quarter of 1994. CORRECTION 2 drops all left-censored spells. Inst. net (sell/buy) volume/SHROUT is winsorized at 1%. All models specify baseline hazards as piecewise-constant, by including survival duration fixed effects. Survival duration is discrete and measured as the number of quarters from the beginning of the spell. Robust standard errors, clustered by survival duration, are in parentheses. *, **, *** denote significant at 10%, 5%, and 1%, respectively. For brevity, IV counterparts of the results are reported in the Internet Appendix.

(See next page)

Table 9, cont'd: Effect of Institutional Trading on Activist Toehold Acquisition and Targeting

Panel A: Failure = First Activist Acquiring Toehold

	CORRECTION 1 for Left Censorship		CORRECTION 2 for Left Censorship	
	(1)	(2)	(3)	(4)
Inst. net volume/SHROUT	0.757*		0.815	
	(0.387)		(1.000)	
Inst. sell volume/SHROUT		0.069		-0.071
		(0.375)		(0.832)
Inst. buy volume/SHROUT		1.388***		1.162
		(0.395)		(1.308)
-log(Amihud)	0.502***	0.488***	0.793***	0.776***
	(0.063)	(0.062)	(0.169)	(0.162)
log(MV)	0.068***	0.070***	-0.095***	-0.090***
	(0.016)	(0.016)	(0.030)	(0.029)
Tobin's Q	-0.003	-0.003	-0.006*	-0.006*
	(0.002)	(0.002)	(0.003)	(0.003)
Inst. ownership	0.405***	0.339***	0.276	0.224
	(0.095)	(0.105)	(0.380)	(0.444)
Sales growth	-0.018	-0.020	-0.008	-0.008
	(0.016)	(0.015)	(0.035)	(0.035)
ROA	0.251***	0.245***	0.091	0.084
	(0.053)	(0.052)	(0.171)	(0.163)
Leverage	0.038	0.046	0.047	0.056
	(0.070)	(0.069)	(0.143)	(0.137)
Dividend yield	-0.233	-0.212	0.030	0.021
	(0.326)	(0.316)	(0.741)	(0.737)
R&D/Assets	-0.000	-0.000	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Herfindahl index	3.218	3.017	-5.366	-5.666
	(5.844)	(5.800)	(12.054)	(11.900)
log(Analysts)	-0.115***	-0.122***	0.125***	0.119***
	(0.038)	(0.038)	(0.040)	(0.043)
Return	0.040***	0.036***	0.007	0.000
	(0.009)	(0.009)	(0.052)	(0.053)
Survival duration (in quarters) fixed effects	YES	YES	YES	YES
Vintage fixed effects	YES	YES	YES	YES
Year-quarter fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES
Observations	41,223	41,223	5,171	5,171
Pseudo-likelihood ratio statistic	4,832	4,846	624	624

Table 9, cont'd: Effect of Institutional Trading on Activist Toehold Acquisition and Targeting

Panel B: Failure = First Activist Targeting Firm

	CORRECTION 1 for Left Censorship		CORRECTION 2 for Left Censorship	
	(1)	(2)	(3)	(4)
Inst. net volume/SHROUT	-4.213***		-4.042***	
	(0.470)		(0.642)	
Inst. sell volume/SHROUT		4.666***		4.515***
		(0.603)		(0.837)
Inst. buy volume/SHROUT		-6.163***		-4.058*
		(1.857)		(2.304)
-log(Amihud)	0.008	0.020	0.011	0.003
	(0.141)	(0.144)	(0.198)	(0.201)
log(MV)	-0.440***	-0.438***	-0.581***	-0.576***
	(0.076)	(0.076)	(0.115)	(0.115)
Tobin's Q	-0.055	-0.052	-0.048	-0.047
	(0.036)	(0.036)	(0.039)	(0.038)
Inst. ownership	1.432***	1.473***	1.733***	1.704***
	(0.260)	(0.250)	(0.341)	(0.332)
Sales growth	-0.179*	-0.174*	-0.185*	-0.185*
	(0.098)	(0.095)	(0.106)	(0.104)
ROA	-0.377	-0.370	-0.550**	-0.568**
	(0.235)	(0.248)	(0.259)	(0.262)
Leverage	-0.168	-0.167	-0.121	-0.124
	(0.236)	(0.236)	(0.332)	(0.332)
Dividend yield	0.505*	0.498*	0.580*	0.589*
	(0.296)	(0.303)	(0.311)	(0.316)
R&D/Assets	-0.662	-0.636	-0.653*	-0.641*
	(0.434)	(0.430)	(0.336)	(0.327)
Herfindahl index	-4.569	-4.757	-11.573	-11.209
	(13.075)	(13.057)	(17.341)	(17.303)
log(Analysts)	0.029	0.036	0.080	0.077
	(0.063)	(0.065)	(0.099)	(0.100)
Return	-0.068	-0.058	0.088	0.085
	(0.137)	(0.134)	(0.095)	(0.094)
Survival duration (in quarters) fixed effects	YES	YES	YES	YES
Vintage fixed effects	YES	YES	YES	YES
Year-quarter fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES
Observations	75,732	75,732	40,149	40,149
Pseudo-likelihood ratio statistic	482	486	298	298

Table 10: Analysis of Institutional and Hedge Fund Transaction Costs of Trading Target and Other Stocks

This table reports mean statistics for transaction costs of institutional and hedge fund trading in activist targets and other stocks. The sample period is 2000-2007, and the sample includes all firms with available trading data from Ancerno. Institutional transactions include all transactions of the top two selling *clientcodes* (in the target stocks) on each campaign event date. Hedge fund transactions are available only for the 60-day period immediately preceding the filing date of SEC Schedule 13D. Observations are institution-firm-days or hedge fund-firm-days. For each campaign, day t-60 (t-240) refers to day -60 (-240) from the file date, and event date refers to the date on which the hedge fund's ownership crosses the 5% threshold. Transaction costs are measured as the difference between transaction price and volume-weighted average price (VWAP) on the day of the transaction, expressed as a percentage of VWAP. *, **, and *** refer to statistical significance (of the difference in means, based on standard errors clustered by firm) at 10%, 5%, and 1% levels, respectively.

		Institutions					
		(1)	(2)	(3)	(4)	(5)	
Period		BUY Other Stocks	SELL Other Stocks	SELL Target Stocks	Difference (2) - (1)	Difference (3) - (2)	Hedge Funds
(A)	[t-240 to t-60)	0.016	3.255***	2.854***	3.239***	-0.401	-
(B)	[t-60 to Event Date)	1.721***	3.003***	2.257	1.282***	-0.746	-50.150**
(C)	Event Date	-1.014***	7.489***	10.709***	8.503***	3.220	-7.302
(D)	(Event to File Dates]	1.689***	2.881***	-0.236	1.192***	-3.118*	35.765
(E)	(File Date to t+30]	0.646***	3.234***	4.050***	2.588***	0.816	-
(F)	Difference (B) - (A)	1.705***	-0.252**	-0.597	-1.957***	-0.345	
(G)	Difference (C) - (A)	-1.030***	4.233***	7.855**	5.264***	3.621	
(H)	Difference (D) - (A)	1.673***	-0.374*	-3.090	-2.047***	-2.716	
(I)	Difference (E) - (A)	0.629***	-0.021	1.196	-0.650***	1.217	

Internet Appendix for

Hedge Fund Activists: Do They Take Cues from Institutional Exit

This Internet Appendix provides supplemental information and analyses to the main tables and figures. The first section describes:

(1) Additional theoretical details on the development of the paper's hypotheses.

(2) The construction of *firm-day* expected institutional trading volumes used as excluded instruments in the hedge fund *purchasing* regressions in Tables 6, IA.V, and IA.VI.

(3) The construction of *firm-year* and *firm-quarter* expected institutional trading volumes used as excluded instruments in the hedge fund *targeting* regressions in Table 7 and the proportional hazard analyses of activist toehold acquisition and targeting in Table IA.VII.

The second section presents supplemental figures and tables:

Additional Theoretical Details on the Development of Hypotheses

<u>*H1* (Funding Shocks)</u>*: The probability of a firm becoming an activist target increases in institutional selling that is induced by individual institutions' funding shocks.*

Start with Maug (1998)'s equation (14), reproduced below:

$$q = \frac{1}{2} - \frac{c}{\emptyset(H - L)}$$

where q is the probability of monitoring, c represents monitoring costs (borne by the activist), $(H - L)$ is the improvement in total firm value due to monitoring, and $\emptyset$ is the size of liquidity shocks experienced by other uninformed shareholders (see Mello and Repullo, 2003). Differentiating this equation, we obtain:

$$\frac{\partial q}{\partial \emptyset} = \frac{c}{\emptyset^2 (H - L)} > 0,$$

which shows that the larger the liquidity shocks, the higher the probability that the activist will initiate a campaign and monitor. For a typical firm targeted by activists, the majority of other uninformed shareholders are institutions, and therefore it is the funding shocks experienced by these institutions that matter the most. Negative funding shocks induce institutional sales (see Coval and Stafford, 2007), which offset the activist's informed purchases and therefore camouflage the increased probability of an upcoming campaign.

The same block formation mechanism is shared by other liquidity theories although their market structures and initial setups may be different. For example, Back, Li, and Ljungqvist (2014)'s Theorem 1 shows that *H1* is obtained if and only if the expected return on the activist's initial stake is not sufficient to cover his monitoring costs. We find that this condition, though off-equilibrium in their model, appears to be true for most activist hedge funds; their average initial ownership in the (ex-post) targets is less than 2% at the quarter-end immediately preceding the campaign announcement (< 3 months) and less than 1% at the prior quarter-end (between 3 and 6 months).

<u>*H2* (Synchronicity)</u>*: Target firms experience net funding-induced institutional selling before campaign announcement, and institutional sales and activist purchases are synchronous in time.*

As shown in Table I of Maug (1998) and discussed by Back, Li, and Ljungqvist (2014), the non-revealing scenario occurs when the activist buys (and monitors), other institutions sell, and the net order imbalance is close to zero. Thus, if the activist is successful in camouflaging his purchases, then we should observe *ex post* that most activist targets experience large institutional selling prior to the campaign announcement. Moreover, for the activist's purchases and institutional sales to be anonymously batched together, they have to occur close enough in time.

<u>*H3* (Substitution)</u>*: The synchronicity between institutional sales and activist purchases is lower among target firms with higher net benefits from activism.*

Again, start with Maug (1998)'s equation (14), reproduced above, and denote the net benefit from activism $(H - L)/c$ by X. Taking the partial derivative of this equation with respect to $\emptyset$ and then to X, we obtain:

$$\frac{\partial q}{\partial \emptyset \partial X} = -\frac{1}{\emptyset^2 X^2} < 0,$$

which shows that the positive effect of funding shocks $\emptyset$ on activism, as demonstrated by *H1*, decreases in the level of activism benefits $(H - L)/c$. Intuitively, if the activist can reap larger per-share monitoring benefits and/or the fixed monitoring costs are smaller, then he needs lower gains from informed trading to justify launching the campaign.

H4a (Attention): *Conditional on the activist's not recognizing the benefits of monitoring at a given firm, institutional selling accelerates the recognition of such benefits, and hence, the acquisition of an activist toehold.*

Under the signaling theories, such as Attari, Banerjee, and Noe (2006)'s, institutions sell a firm's shares to signal to potential activists that the firm would benefit from monitoring. Thus, institutional selling draws the attention of an activist who otherwise would be unaware of the monitoring benefits. To the extent that a toehold reflects the activist's interest in a firm, we should then observe that institutional selling precedes the first acquisition of an activist toehold.

H4b (Timing): *Conditional on the activist's recognizing the benefits of monitoring at a given firm, institutional selling accelerates the timing of a campaign.*

The liquidity theories, such as those of Maug (1998) and Back, Li, and Ljungqvist (2014), implicitly assume that the net benefits of activism are public information. Recognizing these benefits, the activist looks for an opportunity to form an activist block and launch a campaign. Recognizing also that other market participants know of the possibility of a campaign, the activist needs to purchase target shares in a manner that does not reveal his intentions so that he can achieve trading gains necessary to cover his monitoring costs. Large institutional selling provides an opportunity for the activist to purchase in such a manner, thereby speeding up the campaign launch.

Construction of *Firm-Day* Expected Institutional Trading Volumes

We use firm-day expected institutional trades to identify the liquidity effects of institutional selling and buying volumes on hedge fund purchases. While the analysis only applies to target firms, we estimate the institutions' trading behavior from *all* CRSP-Compustat firms that the institutions trade. This is to avoid any potential bias or violation of the exclusion restrictions that may result from the *ex-post* assignment of firms into targets and non-targets. For example, in response to negative funding shocks, institutions may sell disproportionately more shares in a target than in other stocks because the activist's purchases drive up prices and improve the liquidity of target shares, making selling the target stock relatively more attractive than selling other stocks.

We begin with the universe of all institution-firm-days during our sample period from 2000 to 2007. This universe contains tens of billions of observations, rendering any statistical estimation practically infeasible. To economize on computational resources, we limit the sample to include (i) all institutions that trade target stocks at least twice during the 60-day period before a campaign file date (to represent the institutions that hold these firms' stocks during the period of activist block formation) and (ii) all firms that are traded at least once by these institutions during that period (to represent all firms held by the relevant institutions).

Our calculation of firm-day expected institutional buy and sell volumes is as follows. First, we estimate the parameters of linear models that relate the probabilities that each individual institution will buy or sell a *generic* firm's stock to the institution's trading in other stocks *outside the generic firm's SIC-2 industry*. Figure IA.4 presents the univariate relationships. Table 5 presents the multivariate model specifications and the average parameter estimates. In Columns (1) and (2), we proxy for the institution's trading in other stocks using the fraction of sell principal [= dollar volume of other stocks sold/(dollar volume of other stocks sold + dollar volume of other stocks purchased)]. In Columns (3) and (4), we use the fraction of stocks sold [= number of other stocks sold/(number of other stocks sold + number of other stocks purchased)]. Since our sample contains over three million institution-firm-day observations, we perform the estimation separately for each calendar quarter for computational efficiency. The results are similar across the two proxies; therefore, we only plot here the estimated coefficients of the variable *Dummy (trade other stocks) x Fraction of other stocks sold* from the models in Columns (3) and (4). The estimates are significant and positive for selling probability and significant and negative for buying probability in all quarters, and seem to become larger in magnitude towards the end of the sample period.

Second, we proceed to calculate the expected selling (or similarly buying) volume of institution *i* in target stock *j* on day *t* as

$$E_i\left[sell\ volume_{j,t}\right] = Pr_i\left[sell_{j,t}\right] \times E_i\left[sell\ volume_j | sell_j\right]$$

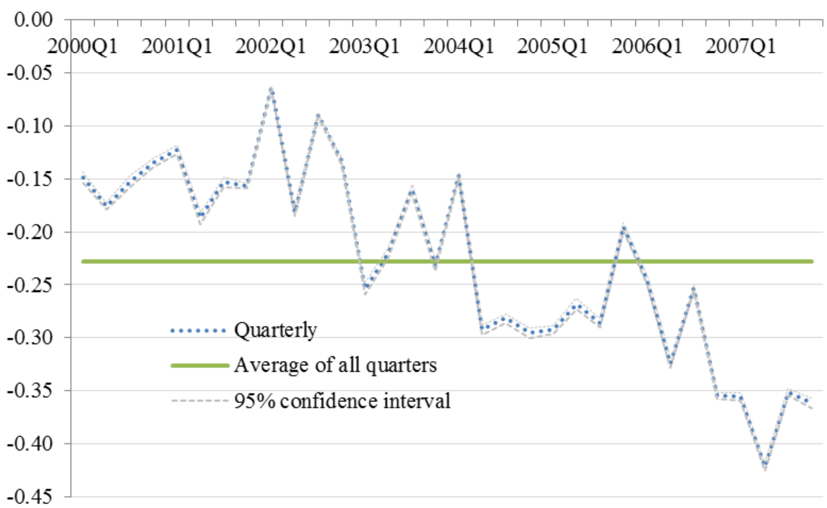
where the sell probability, $Pr_i\left[sell_{j,t}\right]$, is calculated using the parameter estimates obtained in the first step from the sample of all institutions and firms, and the conditional expected trade size of institution *i* in stock *j*, $E_i\left[sell\ volume_j | sell_j\right]$, is the average volume of institution *i* in stock *j* conditional on buying or selling it during the period *t-240 to t-60* (or, the period before hedge funds actively accumulate target shares to launch a campaign).

Finally, we aggregate the expected sell (or similarly buy) volumes across all institutions $i \leq N$,

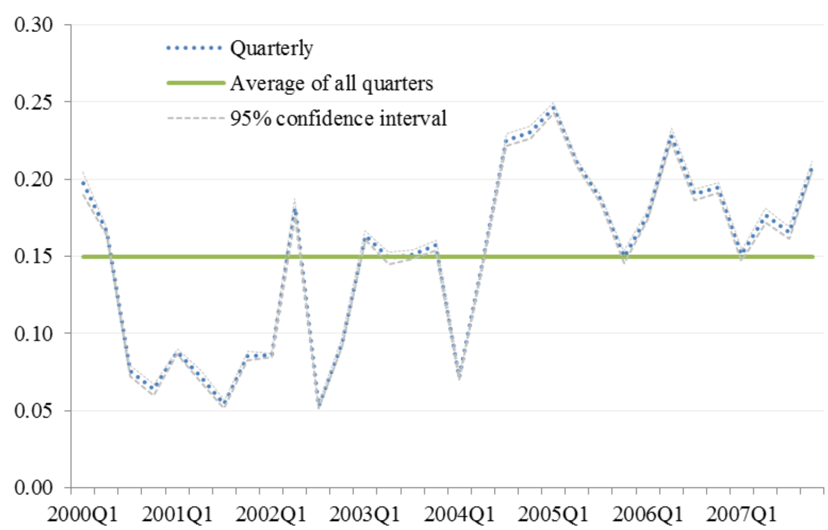
$$E\left[sell\ volume_{j,t}\right] = \sum_{i=1}^{N} E_i\left[sell\ volume_{j,t}\right],$$

to obtain the expected *total* selling volume in stock *j* on day *t*, $E\left[sell\ volume_{j,t}\right]$.

Coefficients of *Dummy[trade other stocks] x Fraction of other stocks sold* in Buying Probability Model



Coefficients of *Dummy[trade other stocks] x Fraction of other stocks sold* in Selling Probability Model

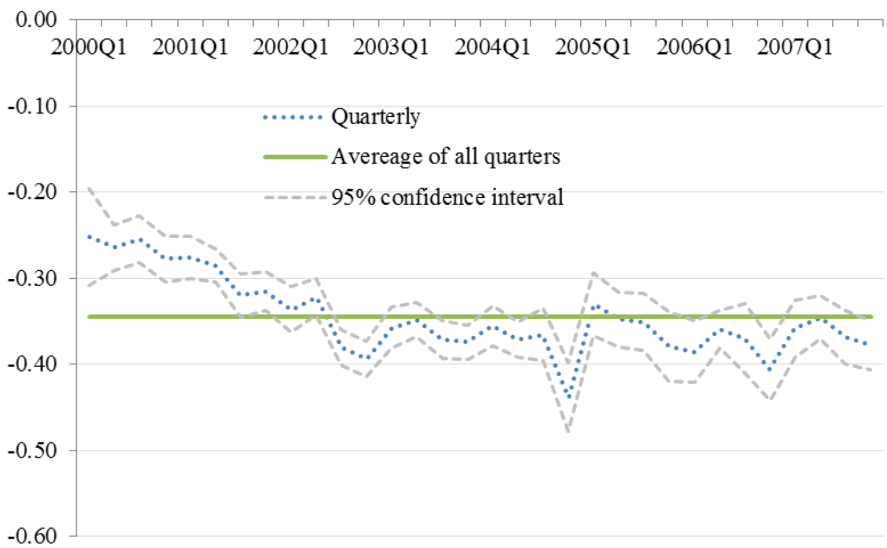


Construction of *Firm-Year* Expected Institutional Trading Volumes

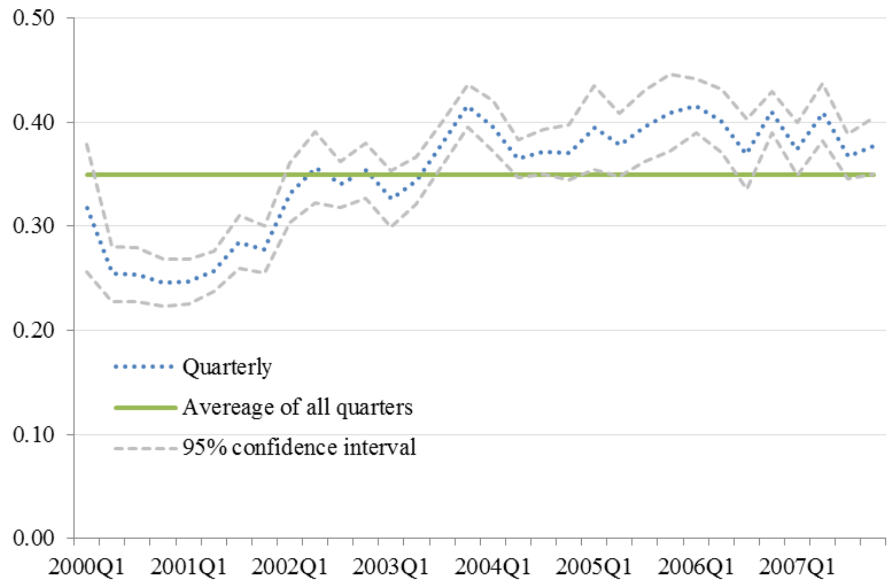
We use firm-year expected institutional trades to identify the liquidity effects of institutional selling and buying volumes on the probability of activism. The sample includes all CRSP-Compustat firm-years, about 2.5% of which experience activism events while the rest do not. Therefore, unlike the analysis of hedge fund purchases of target shares, which naturally only applies to target firms, here we need expected trades for all firm-years, i.e., for targets and non-targets. Since the expected trades are constructed at the institution level, the observational unit in our estimation is institution-firm-time period (day or week). If we follow the same construction as in the analysis of hedge fund purchases, then we will need to estimate model parameters using several billion institution-firm-day observations over the eight-year sample period. To economize on computational resources, we resort to the weekly frequency, and again perform the estimation separately for each calendar quarter. Otherwise, the construction of firm-year expected institutional trades follows the same process as that of firm-day expected institutional trades.

We begin by estimating the propensity that *each* institution will sell or buy a *generic* firm's stock in *each* week as a function of its trading in other stocks *outside the generic firm's SIC-2 industry*. We use the same specifications as in Table 5. We plot below the quarterly estimated coefficients of the variable *Dummy [trade other stocks] x Fraction of other stocks sold* from the models in Columns (3) and (4). Consistent with the estimates at the daily frequency, the estimates here are all significant and positive for selling probability, and significant and negative for buying probability.

Coefficients of *Dummy[trade other stocks] x Fraction of other stocks sold* in Buying Probability Model



Coefficients of *Dummy[trade other stocks] x Fraction of other stocks sold* in Selling Probability Model



We then use the average quarterly estimates to calculate the predicted propensities that each institution will sell and buy each firm's stock in each week, and multiply these predicted propensities by the institution's average trade size per week to obtain the institution's expected buy and sell volumes for that firm-week. We then sum these institution-level expected buy and sell volumes across all institutions in each week to obtain the expected buy and sell volumes for each firm-week. Finally, we take the 90th percentile of the expected weekly volumes within a quarter and the maximum of these 90th percentiles across all quarters within a year to get to the expected buy and sell volumes for each firm-year. Note that the magnitudes of these expected volumes are still based on the weekly trades. The reason for taking the high end of the distribution is that hedge funds often accumulate the majority of their activist stakes in just a few weeks, and therefore what is relevant for our analysis should be not the average or median institutional trading over the entire year but rather the most intense trading that may concentrate in just a few weeks.

Figure IA.1: Ownership of Hedge Funds and Other Institutions around the Announcement of Activism (Quarterly 13F Reports)

The figure plots changes in the target firms' mean and median ownership of hedge funds and other institutions over the four quarters surrounding the start of an activist campaign. The sample includes 937 campaigns in 2000-2007, for which hedge fund and institutional quarterly ownership data are available from Thomson Reuters-13F. The reference quarter (*Quarter 0*) contains the date of the public announcement (in Schedule 13D filing).

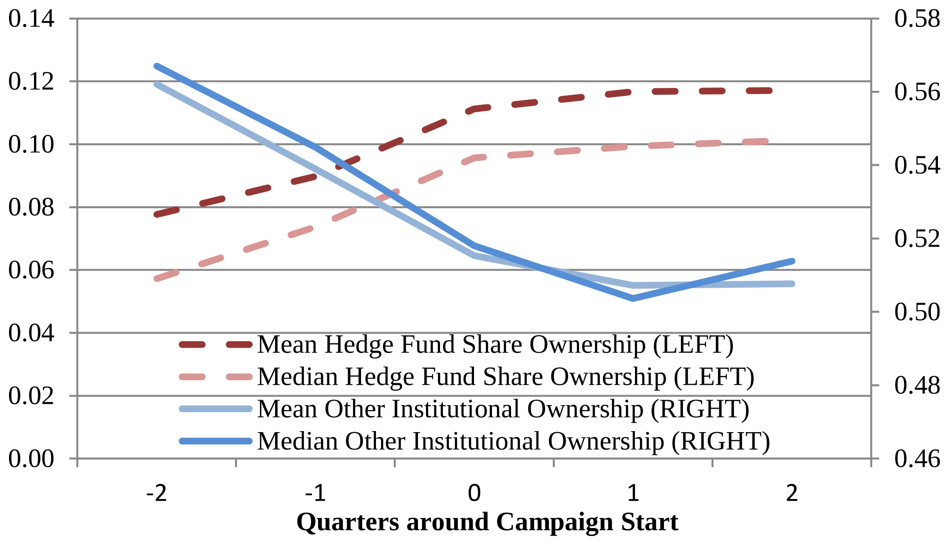


Figure IA.2: Cumulative Abnormal Returns and Hedge Fund Trade Prices

The figure plots the target firms' mean cumulative abnormal returns (CARs) and mean ratio of the hedge fund's (trade size-weighted) trade price to the closing price on the Schedule 13D file date. CARs are calculated by the market-model adjustment approach, in which the CRSP value-weighted index is used as the market portfolio and the loading of each target stock return on the market return is estimated using the period from t-600 to t-240 days before 13D filing. The mean is calculated across 643 campaigns with available hedge fund trading data in 2000-2007. Hedge fund trading data are collected from 13D reports.

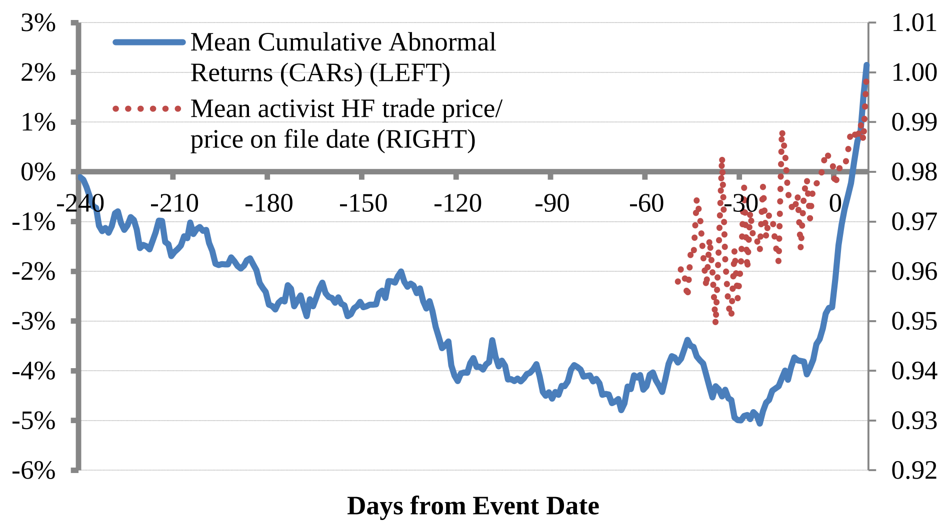


Figure IA.3: Net Trading Volume of Hedge Funds and Other Institutions by Quartiles of Total Hedge Fund Purchases

The figure plots the target firms' mean daily net trading volume (as a percentage of shares outstanding) of activist hedge funds and other institutions during the 60 days before the public announcement of activism in Schedule 13D. The sample period is 2000-2007. The mean is calculated across 643 campaigns sorted into quartiles by the total fraction of shares outstanding purchased by the activist hedge fund (Q1 includes the campaigns with the largest hedge fund purchases). *Event date* (day 0) refers to the date on which the hedge fund's ownership crosses the 5% reporting threshold. Hedge fund trading data are collected from 13D reports and non-hedge fund institutional trades come from Ancerno.

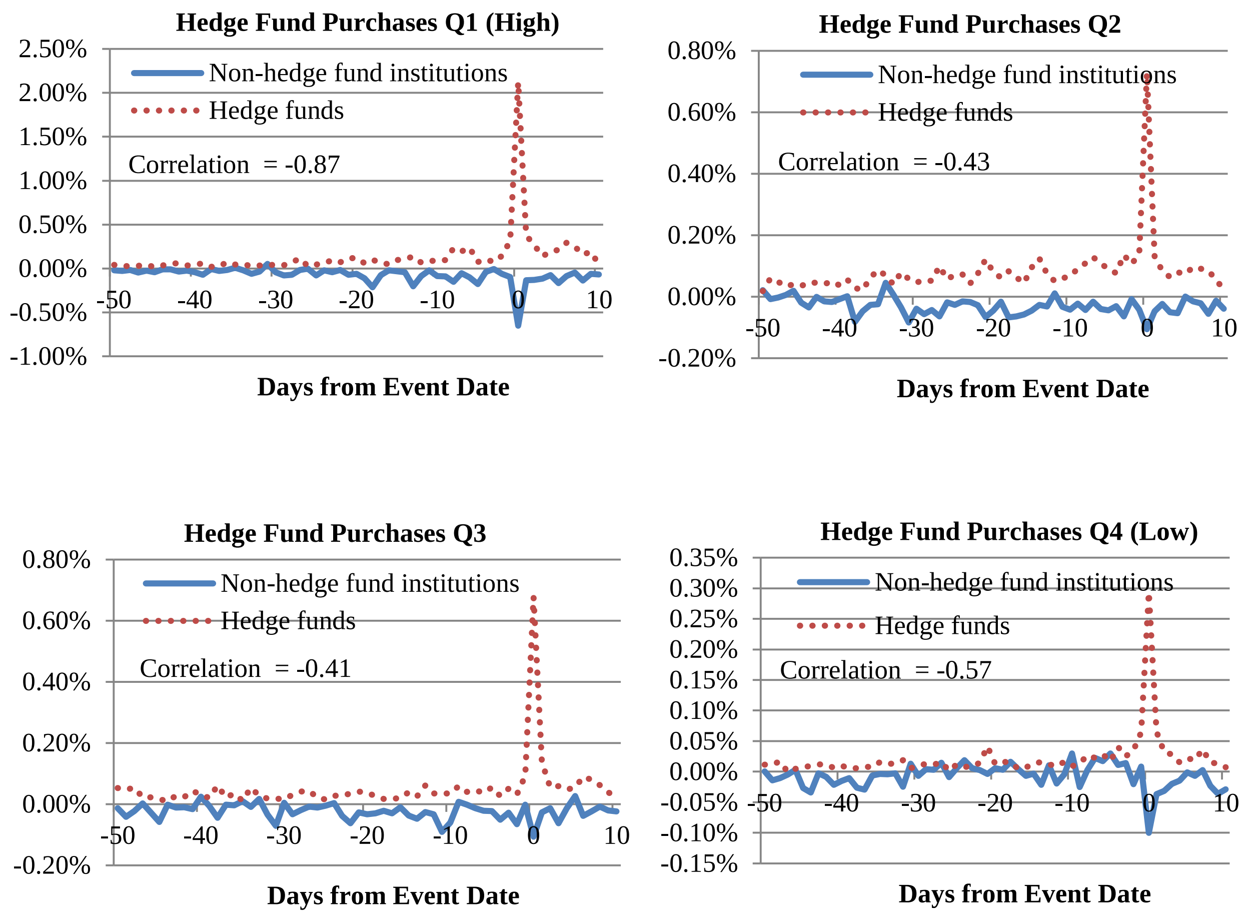
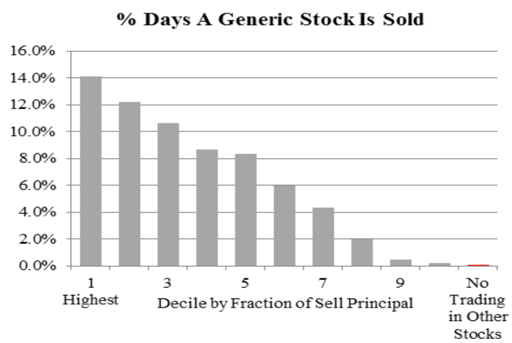
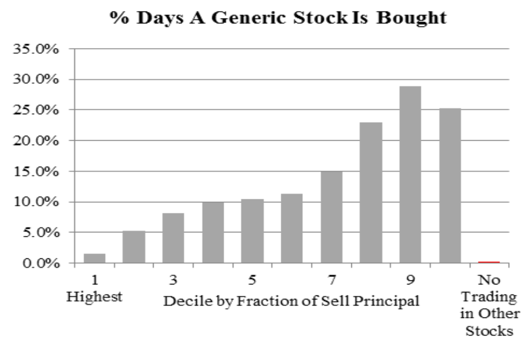


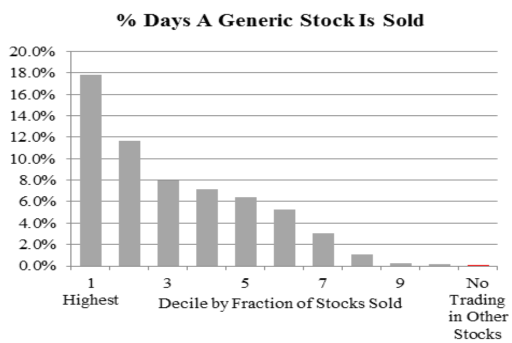
Figure IA.4: Individual Institution's Trading in a Generic Stock as Function of Its Trading in Other Stocks Outside the Generic Stock's Industry

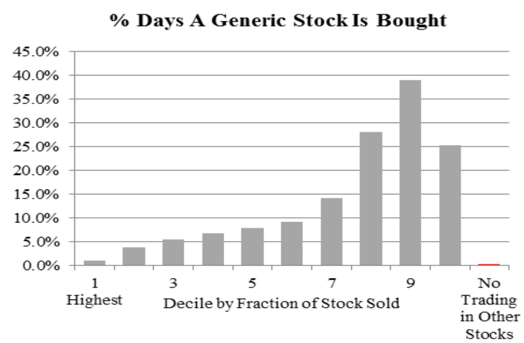
These figures plot the percentages of institution-firm-days (Panel A) and institution-firm-weeks (Panel B) in which a *generic* firm's stock is sold or bought conditional on the institutions' contemporaneous trading patterns in other stocks *outside of the generic firm's SIC-2 industry*. Observations are sorted into deciles by the fraction of other stocks sold measured in terms of $ principal or number of individual stocks.

Panel A: Daily Frequency

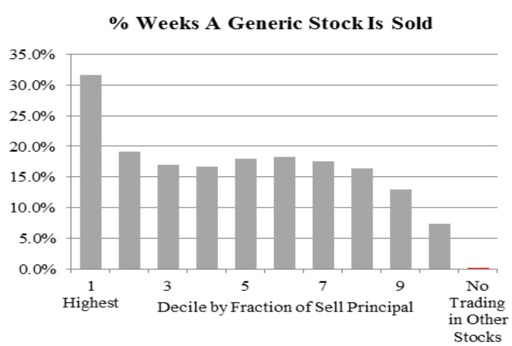


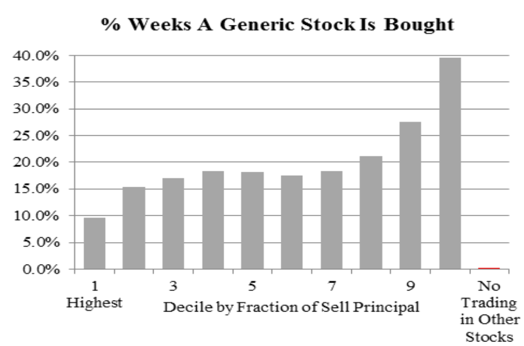


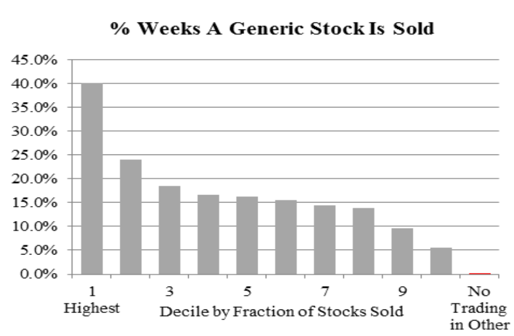




Panel B: Weekly Frequency







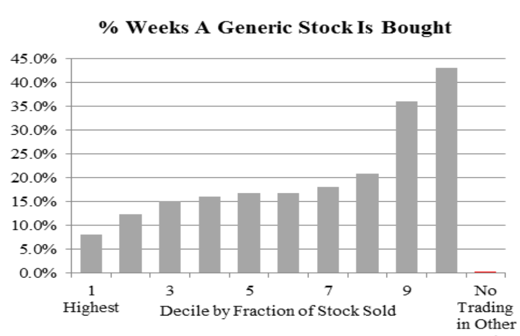


Table 1: Characteristics of Target and Non-Target Firms (Full Version of Table 1)

This table reports summary statistics of firm characteristics for the full sample of CRSP-Compustat firms and the subsample of firms targeted by hedge fund activists in 2000-2007. All variables are defined in Appendix A of the paper. Institutional trading data are from Ancerno. Institutional ownership and holdings data are from Thomson Reuters-13F. Mutual fund holdings data are from Thomson Reuters-Mutual Funds.

Panel A: Target Firms

Variable	N	Mean	St. Dev.	5%	25%	Median	75%	95%
log(MV)	755	5.203	1.805	2.397	3.892	5.057	6.440	8.383
Tobin's Q	755	1.914	1.882	0.584	0.971	1.324	2.211	4.736
Leverage	755	0.276	0.269	0.000	0.006	0.231	0.469	0.787
Dividend yield	755	0.008	0.051	0.000	0.000	0.000	0.000	0.033
Sales growth	755	0.168	0.682	-0.399	-0.033	0.062	0.198	0.787
ROA	755	0.049	0.261	-0.314	0.015	0.095	0.167	0.302
R&D/Assets	755	0.056	0.132	0.000	0.000	0.000	0.073	0.245
Inst. ownership	755	0.513	0.289	0.057	0.260	0.507	0.772	0.940
log(Analysts)	755	1.355	1.063	0.000	0.000	1.386	2.197	3.091
-log(Amihud)	755	-1.259	0.924	-3.092	-1.853	-1.074	-0.468	-0.160
Herfindahl index	755	0.037	0.035	0.015	0.024	0.028	0.033	0.133
Return	755	0.057	0.836	-0.693	-0.356	-0.028	0.240	1.016
Inst. buy volume/SHROUT	731	0.024	0.028	0.000	0.003	0.015	0.036	0.081
Inst. sell volume/SHROUT	731	0.030	0.032	0.000	0.005	0.019	0.045	0.094
Inst. net volume/SHROUT	731	-0.006	0.021	-0.041	-0.013	-0.002	0.003	0.022
No. HFs with toehold	461	3.291	2.360	1.000	1.000	3.000	5.000	8.000
HF toehold/SHROUT	461	0.053	0.057	0.001	0.009	0.034	0.076	0.169
ΔMF holdings/SHROUT	636	-0.002	0.011	-0.026	-0.007	0.000	0.002	0.014

Panel B: Non-Target Firms

Variable	N	Mean	St. Dev.	5%	25%	Median	75%	95%
log(MV)	33,164	5.611	2.151	2.191	4.094	5.556	7.014	9.340
Tobin's Q	33,164	2.793	8.744	0.625	1.053	1.530	2.714	7.692
Leverage	33,164	0.300	0.271	0.000	0.024	0.258	0.508	0.796
Dividend yield	33,164	0.010	0.091	0.000	0.000	0.000	0.009	0.041
Sales growth	33,164	0.262	0.822	-0.321	-0.017	0.098	0.270	1.155
ROA	33,164	0.044	0.305	-0.426	0.017	0.095	0.173	0.338
R&D/Assets	33,164	0.082	2.196	0.000	0.000	0.000	0.068	0.306
Inst. ownership	33,164	0.438	0.296	0.014	0.163	0.424	0.696	0.911
log(Analysts)	33,164	1.300	1.093	0.000	0.000	1.386	2.197	3.178
-log(Amihud Brav et al.)	33,164	-1.245	0.980	-3.154	-1.889	-0.973	-0.431	-0.126
Herfindahl index	33,164	0.036	0.037	0.015	0.020	0.027	0.032	0.148
Return	33,162	0.214	1.100	-0.728	-0.261	0.044	0.379	1.618
Inst. buy volume/SHROUT	30,643	0.028	0.038	0.000	0.004	0.017	0.041	0.090
Inst. sell volume/SHROUT	30,643	0.027	0.034	0.000	0.004	0.017	0.039	0.087
Inst. net volume/SHROUT	30,643	0.001	0.029	-0.026	-0.005	0.000	0.007	0.029
No. HFs with toehold	16,032	2.694	2.156	1.000	1.000	2.000	4.000	7.000
HF toehold/SHROUT	16,032	0.021	0.036	0.000	0.002	0.006	0.021	0.102
ΔMF holdings/SHROUT	25,346	0.001	0.009	-0.014	-0.002	0.000	0.004	0.016

Table IA.II: Trading in *Target* Stocks by Top Institutional Sellers and Buyers

This table presents statistics on the top non-activist institutions' combined trading, as a percentage of shares outstanding, in *targets* of activist campaigns. The sample includes 643 campaigns in 2000-2007. In Panel A (Panel B), top institutions are the two largest sellers (buyers) in each target on the event date. In Panel C (Panel D), top institutions are the five largest sellers (buyers) in each target during the 60-day period in which the hedge funds report their trades. For each campaign, days t-60, t-240, and t+30 refer to days -60, -240, and +30 from the Schedule 13D file date, and event date refers to the date on which the hedge fund's ownership crosses the 5% reporting threshold. Institution is a unique combination of client and client manager code in Ancerno.

Event Window	N	Mean	St. Dev.	10%	25%	Median	75%	90%
Panel A: Top 2 sellers (combined) on the event date								
[t-240, t-60)	278	0.00%	1.81%	-0.74%	-0.04%	0.03%	0.28%	1.01%
[t-60, Event Date)	309	-0.44%	1.31%	-1.55%	-0.43%	-0.05%	0.00%	0.11%
Event Date	365	-0.44%	1.72%	-0.96%	-0.29%	-0.07%	-0.02%	0.00%
(Event Date, File Date]	224	-0.35%	0.67%	-1.12%	-0.35%	-0.08%	-0.01%	0.00%
[t-60, File Date]	365	-1.02%	2.72%	-2.79%	-0.95%	-0.25%	-0.03%	0.00%
(File Date, t+30]	207	-0.38%	0.88%	-1.21%	-0.45%	-0.05%	0.00%	0.02%
Panel B: Top 2 buyers (combined) on the event date								
[t-240, t-60)	242	0.26%	1.19%	-0.08%	0.00%	0.05%	0.20%	0.68%
[t-60, Event Date)	298	0.32%	1.21%	-0.01%	0.01%	0.05%	0.21%	0.72%
Event Date	343	0.13%	0.33%	0.00%	0.00%	0.02%	0.10%	0.32%
(Event Date, File Date]	241	0.17%	0.62%	0.00%	0.00%	0.01%	0.09%	0.46%
[t-60, File Date]	343	0.53%	1.55%	0.00%	0.02%	0.08%	0.43%	1.11%
(File Date, t+30]	266	0.09%	0.57%	-0.13%	0.00%	0.01%	0.04%	0.22%
Panel C: Top 5 sellers (combined) during t-60 to the file date								
[t-240 to t-60)	536	0.26%	2.30%	-1.62%	-0.35%	0.06%	0.81%	2.32%
[t-60 to Event Date)	578	-2.11%	3.08%	-5.13%	-2.62%	-1.11%	-0.38%	-0.06%
Event Date	237	-0.69%	2.48%	-1.72%	-0.44%	-0.13%	-0.04%	-0.01%
(Event to File Dates]	371	-0.85%	1.88%	-2.25%	-0.72%	-0.24%	-0.05%	-0.01%
[t-60 to File Date]	595	-2.86%	4.03%	-6.72%	-3.70%	-1.59%	-0.51%	-0.13%
(File Date to t+30]	367	-0.50%	1.14%	-1.46%	-0.57%	-0.09%	0.00%	0.05%
Panel D: Top 5 buyers (combined) during t-60 to the file date								
[t-240, t-60)	489	0.72%	1.63%	-0.32%	0.01%	0.23%	0.96%	2.64%
[t-60, Event Date)	570	1.36%	2.21%	0.06%	0.23%	0.65%	1.64%	3.56%
Event Date	235	0.16%	0.41%	0.00%	0.00%	0.03%	0.15%	0.38%
(Event Date, File Date]	409	0.44%	1.20%	0.00%	0.01%	0.10%	0.36%	1.05%
[t-60, File Date]	587	1.69%	2.56%	0.09%	0.28%	0.84%	2.09%	4.40%
(File Date, t+30]	464	0.01%	0.82%	-0.57%	-0.09%	0.01%	0.16%	0.62%

Table IA.III: Trading in *Non-Target* Stocks by Top Institutional Sellers and Buyers

This table presents statistics on the top non-activist institutions' trading in stocks *not targeted* in activist campaigns in 2000-2007. In Panel A (Panel B), top institutions are the two largest sellers (buyers) in each target on the event date. In Panel C (Panel D), top institutions are the five largest sellers (buyers) in each target during the 60-day period in which the hedge funds report their trades. For each campaign, days t-60, t-240, and t+30 refer to days -60, -240, and +30, respectively, from the Schedule 13D file date, and event date refers to the date on which the hedge fund's ownership crosses the 5% reporting threshold. Institution is a unique combination of client and client manager code in Ancerno.

Event Window	N	Days Traded in Period	Sell Principal/ Total Principal	# Stocks Sold/ # Stocks Traded	Buy Trade Size ($ Million)	Sell Trade Size ($ Million)	# Days Traded/ Total # Days in Sample
Panel A: Top 2 sellers (combined) on the event date							
[t-240, t-60)	343	84	49.54%	48.47%	0.418	0.492	53.39%
[t-60, Event Date)	364	28	49.59%	49.25%	0.395	0.448	52.92%
Event Date	356	1	56.47%	58.12%	0.390	0.366	54.26%
(Event Date, File Date]	346	7	51.11%	50.44%	0.404	0.429	54.41%
[t-60, File Date]	365	35	50.41%	49.98%	0.393	0.436	53.27%
(File Date, t+30]	350	17	50.91%	50.94%	0.420	0.476	53.75%
Panel B: Top 2 buyers (combined) on the event date							
[t-240, t-60)	325	87	40.83%	39.68%	0.342	0.719	53.38%
[t-60, Event Date)	340	28	39.34%	37.62%	0.360	0.850	53.36%
Event Date	336	1	31.46%	28.10%	0.311	0.727	53.85%
(Event Date, File Date]	332	8	38.21%	35.61%	0.354	0.965	53.99%
[t-60, File Date]	343	36	38.77%	36.85%	0.340	0.858	53.25%
(File Date, t+30]	337	17	40.11%	38.31%	0.392	1.231	53.59%
Panel C: Top 5 sellers (combined) during t-60 to the file date							
[t-240, t-60)	586	83	49.44%	48.36%	0.459	0.688	52.32%
[t-60, Event Date)	592	28	50.32%	49.81%	0.466	0.543	52.20%
Event Date	572	1	50.58%	50.04%	0.422	0.455	56.26%
(Event Date, File Date]	565	11	50.42%	49.98%	0.449	0.517	53.62%
[t-60, File Date]	595	38	50.55%	50.10%	0.460	0.533	52.11%
(File Date, t+30]	580	17	49.62%	49.22%	0.493	0.561	52.95%
Panel D: Top 5 buyers (combined) during t-60 to the file date							
[t-240, t-60)	578	83	43.53%	41.86%	0.396	0.685	52.53%
[t-60, Event Date)	585	28	43.11%	41.18%	0.446	0.896	52.17%
Event Date	558	1	44.22%	41.89%	0.415	0.625	56.21%
(Event Date, File Date]	557	9	43.20%	41.42%	0.451	1.102	53.83%
[t-60, File Date]	587	36	43.07%	41.14%	0.444	1.205	52.03%
(File Date, t+30]	579	17	44.19%	42.93%	0.445	1.275	52.61%

Table IA.IV: Institution's Probabilities of Buying and Selling a *Target* Stock as Function of Its Trading in *Non-Target* Stocks (Estimates of Models in Table 5 from Sample of Targets)

This table reports multinomial logistic (Panel A) and OLS (Panel B) coefficient estimates for models of the probability that an institution will buy, sell, or not trade a *target* stock conditional on its trading in other *non-target* stocks *outside the target's SIC-2 industry*. Observations are institution-stock-days. All variables are defined in Appendix A of the paper. The sample includes 6,035 institutions that trade in 643 activist campaigns over the period from 2000 to 2007. For each campaign, institutions are included only if they trade at least twice during the 60-day period in which the hedge funds report their trades. In Panel A, the odds of buying and selling are estimated relative to no trading (reference outcome). Campaign characteristics are controlled for using the target's prior six-month cumulative abnormal return (CAR), cumulative abnormal turnover (CAT), and cumulative abnormal Amihud ratio (CAA). In Panel B, the probabilities of buying and selling are estimated separately. Campaign characteristics are controlled for using campaign fixed-effects. Standard errors, clustered by campaign, are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: Multinomial Logistic Models

	Sell Fraction = Fraction of Sell Principal		Sell Fraction = Fraction of Stocks Sold	
	(1) Buy	(2) Sell	(3) Buy	(4) Sell
Dummy (trade other stocks)	4.166***	2.281***	4.449***	1.794***
	(0.030)	(0.027)	(0.030)	(0.028)
Dummy (trade other stocks) x Sell fraction	-1.811**	1.111***	-2.853**	1.917***
	(0.019)	(0.017)	(0.022)	(0.020)
Dummy (trade only one other stock)	-1.750**	-1.334**	-1.931**	-1.475**
	(0.027)	(0.024)	(0.027)	(0.025)
Dummy (sell target) l1	0.223***	2.958***	0.160***	3.019***
	(0.026)	(0.011)	(0.027)	(0.012)
Dummy (buy target) l1	2.638***	0.252***	2.658***	0.159***
	(0.012)	(0.026)	(0.013)	(0.026)
Dummy (trade other stocks) l1	-1.064**	-0.515**	-1.210**	-0.252**
	(0.019)	(0.020)	(0.019)	(0.020)
Dummy (trade other stocks) l1 x Sell fraction l1	0.197***	-0.365**	0.679***	-0.804**
	(0.019)	(0.018)	(0.020)	(0.020)
Fraction of trading days during sample	-0.291**	-0.379**	-0.273**	-0.319**
	(0.037)	(0.035)	(0.037)	(0.036)
CRSP value-weighted return	3.532***	-0.035	2.772***	0.267
	(0.600)	(0.586)	(0.606)	(0.590)
VIX	-0.018**	-0.015**	-0.016**	-0.016**
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-4.865**	-4.576**	-4.911**	-4.605**
	(0.034)	(0.030)	(0.034)	(0.030)
Other controls	CAR (t-240 to t-60), CAT (t - 240 to t-60), CAA (t-240 to t-60)			
N	945,819		945,819	
Pseudo R-squared	0.247		0.267	

Table IA.IV, cont'd: Institution's Probabilities of Buying and Selling a *Target* Stock as Function of Its Trading in *Non-Target* Stocks (Estimates of Models in Table 5 from Sample of Targets)

Panel B: Linear Probability Models

	Sell Fraction = Fraction of Sell Principal		Sell Fraction = Fraction of Stocks Sold	
	(1) Buy	(2) Sell	(3) Buy	(4) Sell
Dummy (trade other stocks)	0.143***	0.045***	0.165***	0.026***
	(0.009)	(0.004)	(0.010)	(0.003)
Dummy (trade other stocks)	-0.102**	0.070***	-0.151**	0.113***
x Sell fraction	(0.007)	(0.005)	(0.009)	(0.007)
Dummy (trade only one other stock)	-0.062**	-0.051**	-0.060**	-0.052**
	(0.004)	(0.004)	(0.004)	(0.004)
Dummy (sell target) l1	-0.011**	0.368***	-0.011**	0.369***
	(0.002)	(0.012)	(0.002)	(0.012)
Dummy (buy target) l1	0.314***	-0.006**	0.312***	-0.006**
	(0.009)	(0.002)	(0.010)	(0.002)
Dummy (trade other stocks) l1	-0.051**	-0.022**	-0.061**	-0.012**
	(0.004)	(0.002)	(0.005)	(0.002)
Dummy (trade other stocks) l1	0.011***	-0.022**	0.031***	-0.045**
x Sell fraction l1	(0.002)	(0.003)	(0.003)	(0.004)
Fraction of trading days during sample	-0.002	-0.012**	-0.003	-0.012**
	(0.003)	(0.003)	(0.003)	(0.003)
CRSP value-weighted return	0.178***	0.043	0.154***	0.051
	(0.054)	(0.066)	(0.052)	(0.065)
VIX	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Other controls	Campaign dummies			
N	945,819	945,819	945,819	945,819
R-squared (within)	0.161	0.197	0.173	0.204

Table IA.V: Effect of Institutional Trading on Activist Purchases by Level of Activism Benefits – IV Analysis (IV Estimates of Models in Table 8)

This table reports limited information maximum likelihood (LIML) estimates for regressions of activist purchases of target shares for targets with varying levels of activism benefits. The OLS counterparts are presented in Table 8 of the paper. The sample includes firms targeted by hedge fund activists in 2000-2007. Observations are campaign-days. The dependent variable is net hedge fund volume as a percentage of shares outstanding, and the endogenous regressors are institutional net volume and its interaction with *High benefits dummy*. In Columns (1)-(3), potential benefits from activism are proxied by a firm's propensity to be targeted estimated as in Column (4) of Table 2 of the paper (without institutional trading variables). *High benefits dummy* equals one if the target propensity is greater than the sample median, and zero otherwise. In Columns (4)-(6), the potential benefits are proxied by the total toehold of known activist hedge funds at the end of the most recent quarter before the campaign start. *High benefits dummy* equals one if the total toehold is greater than the sample median, and zero otherwise. Columns (1)-(2) and (4)-(5) report estimates of the first-stage equations, in which the endogenous regressors are expressed as a function of the excluded instruments – (i) expected institutional net volume calculated as the sums of *individual* institutions' expected net trading volume in target stocks, conditional on their trading in *non-target* stocks *outside the target's SIC-2 industry* (models in Columns (3) and (4) of Table 5 of the paper), and (ii) interaction between the expected institutional net volume and *High benefits dummy*. Columns (3) and (6) report estimates of the second-stage equations. All other variables are defined in Appendix A of the paper. Net hedge fund volume/SHROUT and Inst. net volume/SHROUT are winsorized at 1%. All models include campaign fixed-effects. Standard errors, clustered by campaign and corrected by Monte Carlo simulation for errors in estimating the expected trading volumes, are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively.

	Benefits: Target Propensity Score			*Benefits: Total Hedge Fund Toehold*		
	Inst. net volume /SHROUT *(1st stage)*	Inst. net volume /SHROUT x High benefits dummy *(1st stage)*	Net HF volume /SHROUT *(2nd stage)*	Inst. net volume /SHROUT *(1st stage)*	Inst. net volume /SHROUT x High benefits dummy *(1st stage)*	Net HF volume /SHROUT *(2nd stage)*
	(1)	(2)	(3)	(4)	(5)	(6)
Inst. net volume/SHROUT			-0.293***			-0.266*
			(0.112)			(0.137)
Inst. net volume/SHROUT			0.193**			0.149*
x High benefits dummy			(0.097)			(0.076)
Exp. (inst. net volume)/SHROUT	0.420***	-0.004		0.384***	-0.001	
	(0.054)	(0.003)		(0.043)	(0.002)	
Exp. (inst. net volume)/SHROUT	-0.009	0.419***		0.079	0.473***	
x High benefits dummy	(0.071)	(0.046)		(0.073)	(0.060)	
Market condition controls	Lags 1 to 5 of net HF volume/SHROUT, CRSP value-weighted return, VIX, adjusted turnover, and lags 1 to 5 of abnormal return and abnormal Amihud					
Campaign-level controls	Campaign dummies					
Kleibergen-Paap rank Wald statistic	F(1, 618) = 40.336 (S-Y crit. val. at 10% maximal size = 7.03)			F(1, 618) = 54.685 (S-Y crit. val. at 10% maximal size = 7.03)		
N	16,274	16,274	16,274	18,117	18,117	18,117
R-squared (within)	0.042	0.035	0.033	0.042	0.044	0.038

Table IA.VI: Effect of Institutional Trading on Activist Purchases by Level of Activist Toehold – OLS and IV Analyses

This table reports OLS (Panel A) and limited information maximum likelihood (Panel B) estimates for regressions of activist purchases of target shares on institutional trades for targets with varying levels of the targeting activist's initial ownership (toehold). The sample includes firms targeted by hedge fund activists in 2000-2007. Observations are campaign-days. The dependent variable is net hedge fund volume as a percentage of shares outstanding. In Panel A, Columns (1)-(3) split the targets into those in which the targeting activists have no toehold at the end of the year before the start of the campaign and those in which the targeting activists have below/above median (non-zero) toeholds, respectively. Columns (4)-(5) interact institutional net volume with the activist's percentage initial ownership (*HF ownership*) and with a dummy for above median activist's toehold (*High HF ownership dummy*). In Panel B, institutional net volume is instrumented by expected institutional net volume, calculated by aggregating *individual* institutions' expected trading in target stocks conditional on their trading in *non-target* stocks *outside the target's SIC-2 industry* (models in Columns (3) and (4) of Table 5 of the paper). Both the main term and its interactions with *HF ownership* and *High HF ownership dummy* are instrumented. All other variables are defined in Appendix A of the paper. Columns (1)-(2) and (4)-(5) report estimates of the first-stage equations. Columns (3) and (6) report estimates of the second-stage equations. Net hedge fund volume and Inst. net volume/SHROUT are winsorized at 1%. All models include campaign fixed-effects. Robust standard errors, clustered by campaign and corrected by Monte Carlo simulation for errors in estimating the expected trading volumes (wherever applicable), are in parentheses. *, **, and *** refer to statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: OLS

	(1)	(2)	(3)	(4)	(5)
	Toehold = 0	Toehold ϵ (0, Median)	Toehold ≥ Median	All	All
Inst. net volume/SHROUT	-0.168***	-0.117*	0.006	-0.161***	-0.158***
	(0.031)	(0.059)	(0.033)	(0.029)	(0.028)
Inst. net volume/SHROUT x HF ownership				4.250***	
				(1.230)	
Inst. net volume/SHROUT x High HF ownership dummy					0.167***
					(0.042)
Market condition controls	Lags 1 to 5 of net HF volume/SHROUT, CRSP value-weighted return, VIX, adjusted turnover, and lags 1 to 5 of abnormal return and abnormal Amihud				
Campaign-level controls	Campaign dummies				
N	8,355	1,809	2,274	12,438	12,438
R-squared (within)	0.136	0.096	0.128	0.124	0.125

Table IA.VI, cont'd: Effect of Institutional Trading on Activist Purchases by Level of Activist Toehold – OLS and IV Analyses

Panel B: IV-LIML

	Interaction with HF Ownership			*Interaction with High HF Ownership Dummy*		
	(1)	(2)	(3)	(4)	(5)	(6)
	Inst. net volume /SHROUT *(1st stage)*	Inst. net volume /SHROUT x HF ownership *(1st stage)*	Net HF volume /SHROUT *(2nd stage)*	Inst. net volume /SHROUT *(1st stage)*	Inst. net volume /SHROUT x High HF ownership dummy *(1st stage)*	Net HF volume /SHROUT *(2nd stage)*
Inst. net volume/SHROUT			-0.189*			-0.206*
			(0.105)			(0.110)
Inst. net volume/SHROUT x HF ownership			5.665*			
			(2.857)			
Inst. net volume/SHROUT x High HF ownership dummy						0.359**
						(0.141)
Exp. (inst. net volume)/SHROUT	0.374***	-0.000		0.374***	-0.001	
	(0.044)	(0.000)		(0.043)	(0.001)	
Exp. (inst. net volume)/SHROUT x HF ownership	6.428**	0.631***				
	(2.585)	(0.096)				
Exp. (inst. net volume)/SHROUT x High HF ownership dummy				0.305***	0.682***	
				(0.088)	(0.077)	
Market condition controls	Lags 1 to 5 of net HF volume/SHROUT, CRSP value-weighted return, VIX, adjusted turnover, and lags 1 to 5 of abnormal return and abnormal Amihud					
Campaign-level controls	Campaign dummies					
Kleibergen-Paap rank Wald statistic	F(1, 412) = 38.540 (10% S-Y crit. val. = 7.03)			F(1, 412) = 37.984 (10% S-Y crit. val. = 7.03)		
N	12,438	12,438	12,438	12,438	12,438	12,438
R-squared (within)	0.045	0.087	0.124	0.046	0.085	0.122

Theoretical foundation: An important contribution of Maug (1998)'s theory is to endogenize the toehold, which leads to our *Main Hypothesis*. However, assuming that the activist's toehold is exogenously given but still in the range where the *Main Hypothesis* is true, the liquidity theories would generally predict that the positive effect of institutional sales on activism decreases in the activist's toehold. Simply put, the larger the toehold, the higher the benefits from monitoring expected by the activist and the lower his reliance on trading gains. Differentiating Maug (1998)'s equation (5) with respect to $\emptyset$, size of liquidity shocks, and then to α, the activist's initial stake, we obtain:

$$\frac{\partial q}{\partial \emptyset \partial \alpha} = \frac{2}{X(1-\alpha)\emptyset^2}\left[\frac{1-\alpha X}{1-\alpha} - X\right] = \frac{2(1-X)}{X(1-\alpha)^2\emptyset^2} ,$$

where $X = (H - L)/c$, the ratio of improvement in firm value as a result of activism to the activist's monitoring costs. For activist monitoring to be socially desirable, $X > 1$ and the above expression is always negative, implying that the effect of institutional selling (or negative liquidity shocks) on the probability of activism decreases in the toehold α. As discussed by Maug, for the range $\alpha < 1/X$, as is true for the optimal α, activism increases in institutional selling but this effect decreases in α and turns negative as α increases above this range.

Table IA.VII: Effect of Institutional Trading on Activist Toehold Acquisition and Targeting – IV Analysis (IV Estimates of Models in Table 9)

This table reports two-stage pseudo maximum likelihood estimates of discrete-time proportional hazard (complementary log-log) models for first acquisition of a toehold by a known activist hedge fund (Panel A) and for activist targeting (Panel B). The uninstrumented counterparts are presented in Table 9 of the paper. Observations are firm-quarters. All variables are defined in Appendix A of the paper. In Panel A, the dependent variable is a "recognition" dummy, which equals one in the quarter in which at least one hedge fund acquires a toehold in a firm, and 0 in all prior quarters. For each firm, the spell starts when the firm becomes public and an activist hedge fund can purchase the firm's shares, and ends when at least one hedge fund has a toehold in the firm (i.e., the spell is complete) or when the sample ends (i.e., the spell is right-censored), whichever comes first. Firms that already exist but are without any hedge fund toeholds at the beginning of the sample period in 2000 suffer from left censorship, which is corrected by two approaches to ensure robustness. CORRECTION 1 sets the start of a left-censored spell to the first quarter in which the firm appears in CRSP or the first quarter of 1994, whichever comes later. CORRECTION 2 drops all left-censored spells. In Panel B, the dependent variable is a "target" dummy, which equals one in the quarter in which a firm is targeted, and 0 in all prior quarters. For each firm, the spell starts when at least one activist hedge fund acquires a toehold in the firm, and ends when the firm is targeted (i.e., the spell is complete) or when the sample ends (i.e., the spell is right-censored), whichever comes first. Firms with hedge fund toeholds at the beginning of the sample period in 2000 suffer from left censorship, which is corrected by two approaches to ensure robustness. CORRECTION 1 recovers the first acquisition of a toehold through 13F reports dated back to the first quarter of 1994. CORRECTION 2 drops all left-censored spells. In both panels, the endogenous regressor is institutional net volume. Columns (1) and (3) report estimates of the first-stage equations, in which the institutional net volume is expressed as a function of the excluded instruments – expected institutional buy and sell volumes calculated as the sums of *individual* institutions' expected buying and selling in a given stock, conditional on their trading in *other stocks outside the given stock's SIC-2 industry* (models in Columns (3) and (4) of Table 5 of the paper). Columns (2) and (4) report estimates of the second-stage equations. Inst. net (sell/buy) volume/SHROUT is winsorized at 1%. All models specify baseline hazards as piecewise-constant, by including survival duration fixed effects. Survival duration is discrete and measured as the number of quarters from the beginning of the spell. Robust standard errors, clustered by survival duration and corrected by Monte Carlo simulation for errors in estimating the expected trading volumes, are in parentheses. *, **, *** denote significant at 10%, 5%, and 1%, respectively.

(See next page)

Table IA.VII, cont'd: Effect of Institutional Trading on Activist Toehold Acquisition and Targeting – IV Analysis (IV Estimates of Models in Table 9)

Panel A: Failure = First Activist Acquiring Toehold

	CORRECTION 1 for Left Censorship		CORRECTION 2 for Left Censorship	
	(1)	(2)	(3)	(4)
Inst. net volume/SHROUT		-0.271		0.521
		(0.841)		(2.934)
Exp. (inst. sell volume)/SHROUT	-4.338***		-5.633***	
	(0.559)		(0.493)	
Exp. (inst. buy volume)/SHROUT	3.381***		6.104***	
	(0.500)		(0.354)	
-log(Amihud)	0.001**	0.522***	-0.001	0.769***
	(0.000)	(0.054)	(0.001)	(0.132)
log(MV)	0.001***	0.069***	0.000	-0.076***
	(0.000)	(0.016)	(0.001)	(0.027)
Tobin's Q	0.000***	-0.003	0.000	-0.006*
	(0.000)	(0.002)	(0.000)	(0.003)
Inst. ownership	-0.002	0.514***	-0.002	0.381
	(0.002)	(0.102)	(0.006)	(0.364)
Sales growth	0.001***	-0.031	0.000	-0.003
	(0.000)	(0.019)	(0.000)	(0.032)
ROA	0.002***	0.248***	0.004**	0.059
	(0.000)	(0.048)	(0.001)	(0.156)
Leverage	-0.000	0.045	0.004**	0.093
	(0.001)	(0.068)	(0.002)	(0.132)
Dividend yield	-0.001	-0.215	0.010	-0.013
	(0.001)	(0.246)	(0.008)	(0.691)
R&D/Assets	0.000	-0.004	0.000	-0.004**
	(0.000)	(0.005)	(0.000)	(0.002)
Herfindahl index	0.010	3.123	-0.089	-5.772
	(0.041)	(5.911)	(0.089)	(10.641)
log(Analysts)	0.001**	-0.101**	0.001	0.142***
	(0.000)	(0.048)	(0.001)	(0.045)
Return	0.001***	0.048***	0.002***	0.031
	(0.000)	(0.009)	(0.000)	(0.051)
Survival duration (in quarters) fixed effects	YES	YES	YES	YES
Vintage fixed effects	YES	YES	YES	YES
Year-quarter fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES
Kleibergen-Paap rank Wald statistic	F(2, 55) = 32.772 (S-Y crit. val. at 10% maximal size = 19.93)		F(2, 27) = 198.703 (S-Y crit. val. at 10% maximal size = 19.93)	
Hansen J statistic	$\chi^2(1) = 2.150$		$\chi^2(1) = 2.369$	
Observations	41,223	41,223	5,171	5,171
Pseudo-likelihood ratio statistic	N/A	2,930	N/A	304

Table IA.VII, cont'd: Effect of Institutional Trading on Activist Toehold Acquisition and Targeting – IV Analysis (IV Estimates of Models in Table 9)

Panel B: Failure = First Activist Targeting Firm

	CORRECTION 1 for Left Censorship		CORRECTION 2 for Left Censorship	
	(1)	(2)	(3)	(4)
Inst. net volume/SHROUT		-2.551***		-4.387***
		(0.684)		(1.674)
Exp. (inst. sell volume)/SHROUT	-2.939***		-2.916***	
	(0.496)		(0.645)	
Exp. (inst. buy volume)/SHROUT	3.876***		4.114***	
	(0.490)		(0.754)	
-log(Amihud)	0.000	0.004	-0.001	0.016
	(0.001)	(0.141)	(0.001)	(0.200)
log(MV)	0.001**	-0.440***	0.001***	-0.582***
	(0.000)	(0.076)	(0.000)	(0.116)
Tobin's Q	0.000	-0.051	0.000*	-0.052
	(0.000)	(0.035)	(0.000)	(0.040)
Inst. ownership	-0.009***	1.479***	-0.010***	1.759***
	(0.002)	(0.253)	(0.001)	(0.341)
Sales growth	0.000	-0.176*	0.000	-0.184*
	(0.000)	(0.096)	(0.000)	(0.106)
ROA	0.003***	-0.401*	0.004***	-0.577**
	(0.001)	(0.235)	(0.001)	(0.260)
Leverage	0.001*	-0.169	0.002**	-0.116
	(0.001)	(0.234)	(0.001)	(0.329)
Dividend yield	0.001	0.488	0.002	0.558*
	(0.002)	(0.298)	(0.003)	(0.310)
R&D/Assets	0.002**	-0.703	0.002	-0.692**
	(0.001)	(0.443)	(0.001)	(0.343)
Herfindahl index	-0.050*	-4.529	-0.053	-11.961
	(0.026)	(13.025)	(0.032)	(17.270)
log(Analysts)	-0.001***	0.036	-0.001*	0.085
	(0.000)	(0.062)	(0.000)	(0.099)
Return	0.001*	-0.079	0.000	0.089
	(0.000)	(0.139)	(0.000)	(0.094)
Survival duration (in quarters) fixed effects	YES	YES	YES	YES
Vintage fixed effects	YES	YES	YES	YES
Year-quarter fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES
Kleibergen-Paap rank Wald statistic	F(2, 55) = 30.270 (S-Y crit. val. at 10% maximal size = 19.93)		F(2, 30) = 26.253 (S-Y crit. val. at 10% maximal size = 19.93)	
Hansen J statistic	$\chi^2(1) = 0.063$		$\chi^2(1) = 0.158$	
Observations	75,732	75,732	40,149	40,149
Pseudo-likelihood ratio statistic	N/A	454	N/A	284

Table IA.VIII: Analysis of Institutional Transaction Times in Trading Target and Other Stocks

This table reports mean statistics for institutions' order decision, placement, and execution times in trading activist targets and other stocks. The sample period is 2000-2007, and the sample includes all firms with available trading data from Ancerno. Institutional transactions include all transactions of the top two selling *clientcodes* (in the target stocks) on each campaign event date. Observations are institution-firm-days. For each campaign, day t-60 (t-240) refers to day -60 (-240) from the file date, and event date refers to the date on which the hedge fund's ownership crosses the 5% threshold. Decision time is the time at which the decision to trade is made. Placement time is the time at which the sell-side broker receives the order from the institution. Execution time is the time at which the order is completely executed.

Panel A: Institutional SELL Transactions in Target Stocks

Period	N	Decision Time	Placement Time	Execution Time
[t-240, t-60)	6,624	9:37	10:53	14:34
[t-60, Event Date)	1,337	9:37	10:31	15:06
Event Date	494	9:33	10:21	15:10
(Event Date, File Dates]	497	9:34	10:22	15:06
(File Date, t+30]	1,564	9:37	10:40	14:55

Panel B: Institutional SELL Transactions in Other Stocks

Period	N	Decision Time	Placement Time	Execution Time
[t-240, t-60)	3,547,297	9:38	10:45	14:49
[t-60, Event Date)	594,585	9:42	10:42	14:58
Event Date	187,135	9:38	10:40	15:00
(Event Date, File Dates]	205,183	9:38	10:53	14:48
(File Date, t+30]	923,432	9:39	10:40	14:59

Panel C: Institutional BUY Transactions in Other Stocks

Period	N	Decision Time	Placement Time	Execution Time
[t-240, t-60)	3,863,946	9:38	10:29	15:07
[t-60, Event Date)	666,511	9:38	10:24	15:14
Event Date	191,436	9:38	10:34	15:08
(Event Date, File Dates]	253,084	9:34	10:30	15:13
(File Date, t+30]	1,046,921	9:37	10:26	15:15