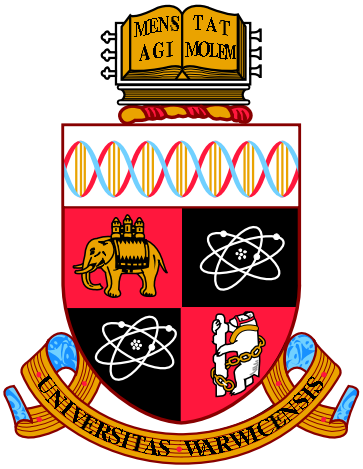

Institutional Investors and Hedge Fund Activism

by

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Thesis

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May knowledge be the eternal light.

Declarations

I declare that any material contained in this thesis has not been submitted for a degree to any other university. I further declare that Chapters 3 of the this thesis is a product of joint work with Dr. Tao Li. We jointly edited the texts while I conducted the data collection and data analysis.

Abstract

This thesis studies the institutional investor background in order to understand the working of hedge fund activism: how institutional investors affect hedge fund activists target selection and how activists share information and build alliances through social connections to achieve their goals.

Chapter 2 utilizes a rich literature on institutional investors' governance roles and develops simple measures of institutional discontent expressed through holding, trading and voice channels, to predict hedge fund activism target selection. Discontent expressed through all three channels leads to subsequent targeting. Medium sized dissatisfied owners and sellers seem to be the main driving force, and institutions' discretionary disagreements on management compensation and governance related proposals have the highest explanatory power among other voice channels. Activists are more likely to gain higher announcement returns and threaten to take hostile actions against management with more discontented institutional investors in the target companies. Discontented institutions are more likely to vote pro-activist in the subsequent annual meetings after campaigns.

Chapter 3 uses a social network framework to study information dissemination during activist campaigns. Actively managed funds whose managers are socially connected to the lead activist are more likely to increase their ownership in the target firms around the activist disclosure. In the cross sectional analysis, we find that the effect is stronger if the activists have better track records and if the ties are established via club membership, charity works, and other small circles. Connected institutions also earn significantly higher announcement returns relative to non-connected funds. The presence of connected institutions contributes to the activist's campaign success. Additional tests are performed to rule out alternative explanations such as fund manager ability or similarity in portfolio choices.

Chapter 4 goes one step further to study alliance building among activist investors and institutional investors during the campaign period. A socially connected institution is 1.1 percentage points more likely to increase its ownership in the target firm during the campaign period, compared to funds that are not socially connected to the activist. We use a subsample that includes all institutions subject to M&As before activism events to identify plausibly exogenous shocks to social connections and find similar results. Furthermore, connected institutions also perform significantly better on their investments than non-connected institutions and they

are more likely to vote pro-activist in routine proposals, especially director election proposals. The effect is stronger if connected institutions also purchase target stocks during a campaign.

The thesis contributes to the literature by developing measures of revealed institutional governance preference based on theoretical and survey evidence in the literature. It also uncovers a channel through which hedge fund activists share information and build alliances and push for corporate changes facilitated by mutual benefits amongst their fellow institutional allies.

Chapter 1

Introduction

The playing field of corporate governance is ever-changing, from the merger waves in the eighties and nineties followed by the emergence of shareholder activism dominated by large mutual funds and pension funds, to today. The huge yet puzzling success of hedge fund activism fascinates both industry and academia, and raises concerns about the nature and the prevalence of agency problem embedded deep in the making of a firm. The phenomenon of hedge fund activism is a recent development in corporate governance, but there have already been debates on fundamental issues such as activists' real intentions, their effectiveness, and potential long term and external consequences. Nonetheless, the headline news of corporate battles, such as Icahn versus Herbalife, and Bill Ackmans' loss of $4.6 billion dollars on Valeant, opens up windows for people to peep into the world of investing and governance. Regardless of the never ending debates on welfare, we have learnt once more about corporate governance, and to a large extent how it affects shareholder values from the hundreds of campaigns each year. But we know very little about the working of a campaign, how activists select target companies and how they gain supports from other shareholders. This thesis tries to understand how institutional investors matter in the case of target selection and alliance building by the hedge fund activists.

Hedge fund activism is different from its predecessor governance form (take over and shareholder activism by mutual funds and pension funds) in that activists only acquire around 5% target firm stock (Brav, Jiang, Partnoy, and Thomas, 2008) whereas a takeover bid requires at least 50% ownership, and generally hedge funds have fewer investing restrictions than mutual funds or pension funds (Brav, Jiang, Kim, 2010). Hedge funds can short sell and utilize various finance derivatives; they are also less regulated by the SEC whereas mutual funds and pension funds can only invest in limited pools of securities and have a more comprehensive disclosure requirement. Brav, Jiang, and Kim (2010) also argue that hedge fund managers do not suffer from conflict of interest as much as mutual fund managers with their invested companies. All these features make it interesting to examine how activist hedge funds select campaign targets and subsequently how they pursue their goals.

So far the literature on hedge fund activism is expanding rapidly. Most papers focus on the *ex post* performance of target firms. It is well documented that,

upon announcement, the share price of target companies jumps about 6% during the 20-day window (Brav, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009; Becht, Franks, Mayer, and Rossi, 2008; Clifford, 2008; Becht, Franks, Grant, and Wagner, 2015). Both Brav, Jiang, Partnoy, and Thomas (2008) and Klein and Zur (2009) have characterized targeted companies to be small and value stocks with a high concentration of institutional investors. There is a small body of literature on the role of institutional investors and hedge fund activism. Gantchev and Jotikasthira (2016) found that institutional selling facilitates activist block building and Appel, Gomley and Keim (2016) found that passive ownership influences campaign outcome. Wong (2016) documented excessive abnormal trading volumes before campaign announcements and suggested evidence related to the wolf pack activism theory built by Brav, Dasgupta, and Mathews (2016). A recent paper by Kedia, Starks and Wang (2016) proxies for pro-activist institutions using evidence on past voting and campaign support. Brav, Jiang, and Li (2017) estimate jointly how institutional investors vote in proxy contests and how activists target firms in proxy contests.

The fruitful research findings help us to understand the economics behind hedge fund activism. According to Shleifer and Vishny (1986), a large shareholder will not intervene as it bares all costs of the campaigns but only shares a fraction of the benefits. Only when the benefit exceeds the cost will the shareholder intervene. In chapter 2, we model the revealed governance preference of institutional investors based on Edmans (2009), Admati and Pfleiderer (2009), and McCahery, Sautner and Starks (2016), and proxy for institutional dissatisfaction by aggregating annual voting outcomes, ownerships that experience negative holding period returns, and exited ownerships due to poor holding period performances. We find that the revealed dissatisfaction of institutional shareholders can predict subsequent activism targeting on a quarterly frequency. A 1 percentage point institutional ownership exited due to loss increases the probability of subsequent targeting by 10 percent. Voice expressed by voting against management in routine compensation and governance related proposals are more likely to predict subsequent targeting than other voice channels. With a dissatisfied shareholder base, the activists may face a lower cost of persuading shareholders to support them. In the cross sectional analysis of activism targets, we find activists are more likely to use the threat of a lawsuit and shareholder proposal when there are more dissatisfied owners. The higher the concentration of dissatisfied ownership, the higher the perceived success of activists based on announcement returns is. We further look for direct evidence to support the conjecture that dissatisfied owners are more likely to support activist by investigating how the dissatisfied owners vote during the campaign year and find the institutions that experienced negative holding period returns up to campaign announcement are more likely to vote against management in subsequent annual voting in management sponsored proposals, and especially compensation related proposals.

In chapter 3, we study specifically an information channel through which activists may communicate with institutional investors and, based on mutual benefits, how they rely on this alliance of socially connected institutions to achieve their

goals. We find that institutions that are socially connected to the activist via their top personnel are more likely to increase their portfolio weights as well as ownership in target stocks around the campaign quarter. Social connections between the top personnel are established before the campaign quarter but remain active when both still serve top roles in their institutions. We strictly require that both the two personnel studied, worked, or belonged to the same organization in the past with an overlapped period of time as the establishment of a social tie, and present our results by separating institutions into mutual funds, non-activist hedge funds and non-campaign activists, and find that the results are similar in all three groups. A connection leads to the likelihood of increasing portfolio weights of target stocks by 2.9% percent while the unconditional probability for an increase in the target stock is 3.8%. In the cross sectional analysis, we find that the effect is stronger if the activists have better track records and if the ties are established via club membership, charity works, and other small circles. We rule out alternative explanations such as skills by separating ties established via elite school attendance, and in a placebo test on activists' *non-target* stocks, we rule out similar investment styles and portfolio choices. We investigate institutional trading before public announcements of campaigns to look for evidence of information sharing between socially connected institutions, and both the quarterly 13F reports and Ancerno transaction data support the information channel hypothesis. To investigate the economics behind our findings, we look for mutual benefits for both the activists and the institutions. We find that, on average, connected institutions earn monthly 1.56 percentage point higher returns on target stocks during a campaign quarter. More interestingly, we find that activists are more likely to succeed proxied by achieving at least one stated goal in their campaign, gaining board seats and earning higher announcement returns, in the presence of connected institutions. This chapter studies in detail how the activist may utilize the social connections among institutional investors as an information dissemination channel to build an alliance for their campaigns and such an alliance is based on mutual benefits. It is the first and only paper pinning down the exact channels of information sharing and alliance building.

Chapter 4 takes a step further to study the alliance building among activist investors and institutional investors during the campaign period. We find that actively managed institutions whose managers are socially connected to the activist tend to increase their stakes in the target firm during the activist's campaign. More specifically, a connected institution is 1.1 percentage points more likely to increase its ownership in the target firm, compared to funds that are not socially connected to the activist. When examining three types of social connections — school ties, employment ties and other ties — we find that school ties positively affect connected institutions' propensity to trade the target stock during a campaign (the incremental probability is 36%), whereas employment or other ties are associated with a higher incremental probability of trading, potentially attributed to ties established in more recent years or the close-knit nature of the connections, such as club membership and charity work. To address endogeneity, we follow He and Huang (2017) to use mergers and acquisitions ("M&As") among financial institutions as plausibly exogenous shocks to social connections. By using a subsample that includes all insti-

tutions subject to M&As before activism events, we find that a connected institution is 1.7 percentage points more likely to raise stakes in a target firm (the incremental probability is 47%). This is qualitatively similar to our main analysis. Connected institutions also perform significantly better on their investment than non-connected institutions, generating a risk-adjusted long-short portfolio return of 0.42% to 0.51% per month. Finally, we explore how higher success rates are achieved when target firms are held by more connected institutions. We find that connected institutions' votes against management proposals (management-sponsored directors) are 0.9 (1.3) percentage points more than those by non-connected funds, representing an increase of 9% (13%) in the disapproval rate. Furthermore, connected institutions that purchase target stocks during a campaign are more likely to challenge management in shareholder meetings, which presumably will benefit them more if campaigns are successful. We also confirm that the effects exist only for meetings during activist campaigns, but not for meetings after outcome dates. The chapter studies specifically alliance building during the campaign period based on social ties among activists and institutional investors. It also utilizes mergers and acquisitions among financial institutions as exogenous shocks to social connections and connects institutional trading and voting during activism campaigns.

In summary, the thesis empirically examines the institutional investor environment of activism target selection, information sharing, and alliance building of hedge fund activists through past social connections. Institutional investors are important players in corporate governance and with the introduction of various corporate defence tools such as poison pills, a clever and effective way of utilising and aligning with them is a key part in campaign success. The characterization of institutional voting and trading may further shed light on new external governance measures and the trade-offs of exiting or remaining to wait for activists may induce further theory development. The social network channel of information sharing and alliance building may be of interest to policy making when investigating activists' joint actions against firms without disclosure.

Chapter 2

The selection of target companies

2.1 Introduction

Shareholder activism has seen its rises and falls in the past three decades and the landscape is rapidly changing, from the early corporate raiders who swept the boardrooms and dominated several M&A waves, to pension funds and mutual funds striving for entrenched management to change, to recently groups of hedge fund activists tactically pushing changes in every aspect of governance and operations of public and private entities on a global scale. Their force seems unstoppable yet their success lacks explanations, and we know little about their next targets. As the landscape changes, the players remain. The old mutual funds and pension funds are still the dominate forces of institutional investors and their power behind the board room cannot be ignored. This paper investigates the institutional investor background to relate it to activist target selection by developing measures drawn from the theoretical models in Edmans (2009) and Admati and Pfleiderer (2009) and survey findings in McCahery, Sautner and Starks (2016).

The literature of institutional investors' roles in governance is fruitful. Voice is the traditional channel through which advice and discipline can be exerted by shareholders through annual meetings, private meetings and media channels (Shleifer and Vishny, 1986; Edmans and Holderness, 2017; Brav and Mattews, 2011). Edmans (2009) and Admati and Pfleiderer (2009) innovatively modelled trading or the threat of exit as an effective mechanism in disciplining management. McCahery, Sautner and Starks (2016) recently surveyed institutional investors' governance preferences and showed that value-oriented institutional investors do use both mechanisms in the real world: the most common means to express voice is through annual voting against management, and exit usually happens after poor stock performance. Apart from voice and exit, the silent owners are also an important governance force as modelled in Hirschman's (1972) theoretical framework of exit, voice and loyalty. This paper is based on these theoretical models as well as survey results to construct proxies for voice, exit and remaining to capture institutional investors' revealed pref-

erences and to investigate whether hedge fund activists pick up such signals when targeting stocks.

More specifically, we model institutional investor backgrounds of firms through their annual voting behaviours and their trading and holding on the firms. These measures are observable across all institutional holders and there are several reasons why activists will pick up their signals. Firstly, institutions' voting and trading reflect both the fundamentals of the companies as well as investors' perceptions. Trading itself contains information, which is different from raw fundamentals from company accounting reports, but rather is processed through either sophisticated algorithms or through experiences and research. Secondly, activists usually target companies with governance issues but generally have a good fundamental performance (Brav, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009). Governance quality is very hard to observe and traditional measures, such E-index (Bebchuk, Cohen, and Ferrell, 2008) or G-index (Gompers, Ishii, and Metrick, 2003) are almost static. The literature has shown that disagreement with management and their selling due to company poor performance from institutional investors are important channels through which they exert governance. Both trading and voting data are more frequent and observable than existing firms' internal governance measures. Thirdly, activists generally only have a small fraction of shares in a company: their reliance on existing shareholders is unquestionable. Institutional holders tend to have large ownership, and compared with retail owners, they are the group that activists will aim to build an alliance with. Selecting companies with dissatisfied holders will gain them more popularity and give them a higher chance and more negotiating power in tackling management.

We first proxy for dissatisfied owners based on each institution's holding period returns and find that institutional dissatisfaction predicts activist target selection in the following quarter. Institutional dissatisfaction is measured in terms of ownership as well as the proportion of owners. Adding the dimension of dissatisfaction has more power than simple institutional ownership measure. It indicates that a 1 percentage point increase in the dissatisfied ownership in the present quarter will lead to a 0.012 percentage point increase in the probability of being targeted in the next quarter. The frequency of (unconditional mean) targeting is 0.007 per quarter. The magnitude is 1.5 times the effect of total institutional ownership in the baseline model. When we further decompose dissatisfied owners in terms of their stake size, we find that the medium sized owners matter the most, i.e. those between 0.5%-2% ownership owners. There has been no specific theoretical justification for this range but Noe (2002) finds small owners are the most active in exerting governance. We can conjecture that these are influential owners but their stakes are also not big enough to trigger another SEC filing or a campaign. As any cut-off points to capture influential institutions are arbitrary, we use an alternative measure of dissatisfied above-the-average owners and find similar results.

As is documented in the survey by McCahery, Sautner and Starks (2016), institutions often use actual exit as a means to express their dissatisfaction with companies especially after losses. We thus model both exit and dissatisfied exit to predict activism targeting. We define an exit if the institution sells all its stakes

in the company and makes no purchase in the following quarter. For dissatisfied exit, we check if the institution has made a negative holding period return up to its exit. To differentiate our paper from Gantchev and Jotikasthira (2016) and avoid proxying for stock liquidity, we measure exit in the lagged quarter, i.e., for each quarter of interest, the exit is measured at the quarter prior to it. Thus by construction, the institutions in the exit group and those in the existing owners' group are mutually exclusive. We therefore include total institutional ownership as a control variable in the baseline model. We find that institutional exit has a substantial impact on activism targeting: 1 percentage point ownership exited is associated with a 0.042 percentage point increase in the likelihood of targeting while the unconditional mean of targeting is 0.007. More importantly, when we include dissatisfied exited ownership, the coefficient is 0.065 and is statistically significant at 1%. Its magnitude is 1.5 times that of the simple exit measure: 1 percentage point dissatisfied ownership exited is associated with about 10% increase in the likelihood of being targeted. Similar to the prior investigation, when we classify influential institutions using their stake sizes, we find that the 0.5%-2% of sellers predict targeting better. We conjecture that their selling of medium sized stakes may help activist stake building and signal to the market, but their stake is still not big enough to make a huge reverse impact on price to impede their selling in the first place. To reduce the problem of arbitrary cut-off points, we also use the large dissatisfied sellers and find similar results.

Finally we use institutions' past voting records to measure directly their disagreement with management during annual voting. As is documented in the literature, institutional investors reply on third party consultancy extensively to vote on proposals (Cotter, Palmiter, and Thomas, 2010; Chio, Fisch, and Kaham, 2009). The main service provider is institutional shareholder service (ISS). We thus use a more rigorous measure to capture institutions' disagreement at their own discretion even if ISS recommends to vote with management. We find that the more dissatisfied institutions revealed the past voting, the more likely the company is to be targeted. When we decompose voting into different categories similar to Li (2016) we find that management compensation related dissatisfaction has the most power among all in predicting subsequent activism targeting. A 1 percentage point increase in the number of dissatisfied voters in relative to total voters is associated with a 0.012 percentage increase in the probability of subsequent quarter targeting.

When combining both three measures we find all of them have power to predict activism targeting and the magnitude remains similar to that from separate analyses. So far, we have studied target selection *ex ante*. Based on the conjecture that dissatisfied owners can be the potential allies or are easier to persuade for the activists, we study *ex post* how the existence of dissatisfied owners affect activists' tactics and success.

To study the cross-section of activists' tactics after targeting, we find that when the target has a large dissatisfied owner base, the activists tend to threaten more often to sue management, submit shareholder proposals or other hostile actions. Since the nature of the firm should be the first order determinant for campaigns, we don't find our variables have power in predicting activists' agendas such

as seeking board representation, submitting proposals, or issuing a takeover bid. To validate our conjecture that the more dissatisfied owners, the more likely the activists may gain support from them, we use announcement return as an indicator of investors' perceived success of campaigns. We find that 1 percentage point increase in the dissatisfied ownership before a campaign is associated with a 0.029 (0.041) basis point increase in the market adjusted returns during the 10 (20) days around the announcement. The returns are not reversed in the following quarter. Finally we show direct evidence how dissatisfied owners vote in the annual meetings during activism campaigns and we find that they tend to me more pro-activist especially in management sponsored compensation related proposals.

Our results are obtained after controlling for time and firm (or industry) fixed effects and a set of firm-level variables. We include all COMPUSTAT firms and model activism targeting on a quarterly basis. We contribute to the literature by modelling the revealed institutional governance preferences and relate them to the likelihood of activism targeting. In the hedge fund activism literature, emphases were mainly on the outcomes of campaigns. Most authors have found positive market reaction upon campaign announcement (Brav, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009; Becht, Franks, Mayer, and Rossi, 2008; Clifford, 2008; Becht, Franks, Grant, and Wagner, 2015). Klein and Zur (2011) investigated how hedge fund activism affects creditors while Brav, Jiang, and Kim (2015) and Brav, Jiang, Ma, and Tian (2017) drew attention to production and innovation. However, the debate is on-going in the industry. The focus on campaign target selection has only been developed recently. Appel, Gomley and Keim (2016) investigated how the existence of passive investors influence campaign outcome. Gantchev and Jotikasthira (2016) used institutional trading volume to predict activism targeting and they found institutional selling provides the activist liquidity. Our paper is different from theirs in that we focus on the governance implication of exit and thus measure exit at the pre-announcement quarter instead of contemporaneous trading volume.

In a recent working paper by Kedia, Starks and Wang (2016), the authors use institutional investors' voting patterns and past support to the activist as proxies for activism-friendly institutions and find a positive association of market reaction upon activism and subsequent firm value increase with the existence of these institution. Our paper is different from it in that we measure the discontent of existing shareholders by focusing on their trading and especially selling in the target companies. Their model classifies institutional holders using the portfolio turnover measure in Bushee (1998). As campaign length is over a few quarters and campaign aim and main players often alter. In Brav, Jiang, Partnoy, and Thomas (2008), the median of campaign length is 369 days and the 25% percentile is 169 days. We also place more emphasis on target selection instead of long term outcome. We further explore in detail how institutional ownership size may influence activism. Both papers complement each other by drawing attention to the institutional background of firms being a crucial point for activism targeting.

2.2 Literature review and hypotheses development

2.2.1 Hedge fund activism

In recent years, hedge fund activism has become so successful that it has gained substantial industrial as well as academic interest. Early papers have documented this phenomenon and concluded that activists on average gain abnormal returns upon their campaign announcement (Brav, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009), as well as improve target firm performance in the long run, improve innovation, and product market competitiveness (Becht, Brav, Jiang, and Kim, 2015; Aslan and Kumar, 2016). Researchers have also investigated the institutional investor background of target firms: Appel, Gomley and Keim (2016) studied the presence of passive holders using a discontinuity design in index inclusion/exclusion. Gantchev and Jotikasthira (2016) found that institutional selling that provides liquidity induces activist block building. Kedia, Starks and Wang (2016) proxied for pro-activist institutions using evidence on past voting and campaign support. Brav, Jiang, and Li (2017) estimate jointly how institutional investors vote in proxy contests and how activists target firms in proxy contests. In terms of answering how the activists interact with other institutional holders, Brav, Dasgupta, and Mathews (2017) modeled implicit coordination and He and Tao (2017) studied activists' alliance building through social connections. Wong (2017) used abnormal trading volume as proxy for wolf packing formation during campaign announcement. All these papers have the flavour that the institutional shareholders are a non-negligible force for the activist. In this paper we are trying to capture the institutional characteristics based on their revealed governance preference of the target company and investigate how they are associated with targeting decisions.

2.2.2 Governance through holdings

Institutional ownership has long been used as a proxy for external governance force. An earlier study by Bushee (1998) classified institutions into "transient, dedicated, and quasi-indexes" in terms of their pasting trading behaviour. A strand of literature recognizes the presence of passive ownership as an important governance force (Romano, 1993; Carleton, Nelson, and Weisbach, 1998; Appel, Gormley, and Keim, 2016) due to their block size as well as the fact that easy exit is not possible for certain institutional investors such as index funds. The traditional measure of institutional governance using institutional ownership assumes that the bigger the block size is, the more influence the holder exerts. However, identification is difficult as institutional ownership may well be associated with other variables that will influence governance outcome. Also Noe (2002) found that there is no monotonic relationship between stake size and activism. To tackle the endogeneity problem, several authors have used index inclusion and exclusion to study the causal effect of exogenous institutional ownership change on firm outcomes (Appel, Gormley, and Keim, 2016; Chang, Hong, and Liskovich, 2015). Recently more direct survey evidence has confirmed institutional shareholders' governance preferences. Brown, Call, Clement, and Sharp's (2017) survey on investor relation officers showed that large institutions

such as mutual funds are likely to be granted access to management, and institutional holders with large stakes are more likely to receive private call-backs than analysts after company public disclosure events (i.e., conference calls). The purpose of the call-backs is to "convey their company's message" (Brown, Call, Clement, and Sharp, 2017). Interestingly, the IR officers also point out that hedge funds are unlikely to gain access to management as they can short sell stocks.

This supports our view that hedge fund activists may utilize various channels to gather information on companies including investigating their institutional holders' base. Prior literature on hedge fund activism has all documented that, holding else equal, the more institutional ownership there is in a firm, the higher the likelihood that the activist will target this firm (Brav, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009). However, the heterogeneity among institutional holders is ignored in this setting. Naturally, if the existing shareholders are dissatisfied with their portfolio companies due to poor stock performance, they will be more likely to support an activist shareholder in making changes. Thus we hypothesize that hedge fund activists are more likely to target firms with more dissatisfied institutional owners. To provide further evidence that activists selectively target such firms with dissatisfied owners as they may be the potential supporters, we further proxy for activists' perceived success using announcement returns, and study whether dissatisfied owners are more likely to vote pro-activist in the annual meetings during campaigns.

2.2.3 Active governance through trading

For their influence on corporate governance through trading, the theoretical development started in Edmans (2009) and Admati and Pfleiderer (2009). Both argue that the force of true governance comes from the threat of blockholder exit and Admati and Pfleiderer (2009) further noted that the credibility of exit depends on the nature of the agency problem and the information structure. Blockholders' exit in these models will exert downward pressure on the stock price, which hurts management through its equity interest in the firm. Management therefore wants to make sure its actions are such that blockholders are willing to stay with the firm. Dasgupta and Piacentino (2015) further introduced the agency problem from the blockholder side and their model showed that the incentive structure for fund managers may impede them to exit, making their threat of exit less credible or effective. In McCahery, Sautner and Starks (2016), the authors surveyed institutional investors and tried to provide direct evidence on institutional preference of trading as governance mechanism. They found that both exit and threat of exit are used by institutional shareholders and the actual exit usually comes after poor performance of the firm. As threat of exit for governance purposes is unobservable, we use actual exit and actual exit due to loss to proxy for governance through trading. Empirically, the actual institutional exit is often associated with unobserved variables that may also affect governance outcome, thus making it difficult to establish causality. Early papers found association with institutional exit with subsequent CEO replacement (Parrino, Sias, and Starks, 2003). More recently, several papers

have used quasi-experimental design to empirically test the threat of exit hypothesis. Bharath, Jayaraman, and Nagar (2013) used foreign financial crises which led to liquidity decreases in the US, and US stock market decimalization which increases liquidity to model for the liquidity-sensitivity of firms. The presence of large shareholder in liquidity-sensitive firms are more likely to exert credibility of exit and thus their performance in terms of Tobin's Q decreases more during liquidity shocks.

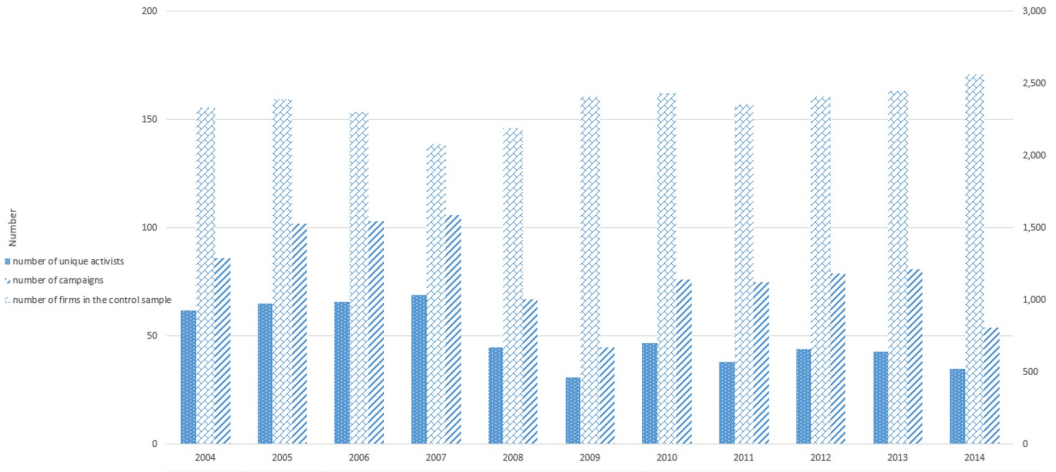
In our paper, instead of studying the governance outcome of institutional trading, we base our work on the prior literature and take their trading, especially exiting due to poor performance, as a signal of shareholder dissatisfaction. This has several advantages. Firstly the trading is continuous and reported on a quarterly basis which is much higher frequency than conventional measures such as G-index or E-index to signal governance quality. Secondly, institutional trading (or exiting) contains information not only associated with company fundamentals but also the institution's perception of its prospects. Thirdly, we focus on institutional trading instead of trading volumes in that institutional investors as a whole are more governance-oriented than retail investors and their consensus movement is more informative than that of retail investors. As selling can be due to various reasons, to be consistent with the survey evidence, we focus on studying the signal of dissatisfied exit. We hypothesize that the more dissatisfied sellers of a company are, the more likely the activist will target it.

2.2.4 Active governance through voice

Active governance through voice takes various forms: annual voting, shareholder days, private meetings, and so on. McCahery, Sautner and Starks' (2011) survey listed these specific channels their sample institutions have undertaken. The most frequent form is to vote against management at the annual meeting, followed by discussing with the executive board and supervisory board, submitting shareholder proposals, initiating lawsuits against managers, and publicly criticizing executive board members (McCahery, Sautner and Starks, 2011).

Among all the channels, voting is most common and can be widely observed. During annual meetings, shareholders directly exert their rights and make decisions on firms' strategy, governance, executive compensation and other issues. Their votes reveal their preference on various aspects of the running of the firm and their satisfaction of the in-charge management and board. By comparing their votes and management recommendations, we can easily measure shareholders' disagreement with management and use it as a proxy for shareholder discontent. Other voice channels, especially private meetings and actual discussions, are unobservable. We thus take voting as the main voice channel. We hypothesize that the more institutions that disagree with the company management during the annual meeting, the more likely the activist will target this company.

Figure 2.1: Hedge fund campaigns from 2004 to 2014
This figure plots the number of campaigns issued by hedge funds activists from 2004 to 2014 and the number of unique activists. They are aligned with the left axis. Total number of firms in the control sample from the same period are plotted according to the right axis.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
number of unique activists	62	65	66	69	45	31	47	38	44	43	35
number of campaigns	86	102	103	106	67	45	76	75	79	81	54
number of firms in the control sample	2,335	2,394	2,304	2,086	2,191	2,408	2,436	2,355	2,411	2,452	2,566

2.3 Data

2.3.1 Hedge fund activism campaigns

Hedge fund activism is defined in Brav, Jiang, Partnoy, and Thomas (2008) as when an investor acquires 5% or more of a publicly traded firm with the intention to influence its operation, strategy or management. A Schedule 13D is required to be filed to the SEC within 10 days of exceeding 5% ownership where the activist is required to disclose their purpose of transaction in item 4. We obtain hedge fund activism data from Schedule 13D filings and SharkRepellent which also contains campaigns that are announced in the media without the lead activist exceeding 5% ownership. Our comprehensive list of campaigns launched by activist hedge funds spans 1994 to 2014. Our sample starts in 2004 after matching with ISS voting analytics. We manually collect the following information: the activist's filing date or press release date, the activist's name and its ownership in the target company at disclosure, the tactics the activist uses, and the name and CUSIP of the target firm. A detailed definition and description of tactics can be found in sub section 2.8.1 when we investigate campaigns at cross section.

Our campaign sample starts with 3,101 unique activism events from fiscal year 1994 to 2014. Since the annual voting data range from 2004 to 2014, by merging with them, we reduce the sample period from quarter ending 30 June 2004 to quarter ending 31 March 2015. There are initially 2,144 campaigns with 465 unique activists during this period and the sample is reduced to 1,021 unique campaigns with 286 unique activists after it is merged with ISS voting analytics, CRSP, Compustat, and the Thomson Reuters institutional ownership database. After teasing out missing

values, negative book values and over-100% institutional aggregated ownership, we obtain the final sample with 874 (892) target-quarter pairs (unique campaigns) with 257 unique activists.

We take all COMPUSTAT firms with data available in the ISS voting analytics database, CRSP, and the Thomson Reuters institutional ownership database as the control sample. All our variables are constructed on a firm-quarter basis. Figure 2.1 plots the fiscal frequency of activist campaigns and the number of unique lead activists from 2004 to 2014. They are aligned with the left axis. Total number of firms in the control sample from the same period are plotted according to the right axis. Consistent with past papers on hedge fund activism, campaign activity peaked in 2007 (He and Tao, 2017), before dropping significantly during the financial crisis and then increased in more recent years. On average the occurrence of activism campaign is 3.4% annually and 0.7% quarterly.

We present the summary statistics of a set of company characteristics of target firms in comparisons to that of controls firms in Table 2.1. For both samples, we report mean, standard deviation and median of the quarterly reported market capitalization (MV), book-to-market (BM), dividend yield, past returns, Amihuld illiquitidy (Amihud, 2002) and E-index in Bebchuk, Cohen, and Ferrell (2008). Column (1) and (2) are correspondent to the target and control sample respectively. Column (3) reports the difference and t-statistics between the two samples. Consistent with past literature that target firms are significantly smaller than control firms, have a higher book-to-market ratio, pay less dividend, and underperform during the quarter before targeting. There is no significant difference between the target and the control sample in terms of governance quality measured as E-index.

2.3.2 Institutional ownership

We obtain ownership data from Thomson Reuters 13F institutional ownership database. Under the Securities and Exchange Act of 1934, investment firms with over $100 million of US equities are required to report their US equity holdings in a Form 13F within 45 days of calendar quarter ending March 31, June 30, September 30 and December 31. Thus our institutional trading measures are on a quarterly basis. We obtain the following information: the reporting quarter end, the identity of the institutional holders, the stock information including the CUSIP, the name, the number of shares outstanding, the end of quarter share price, and the total number of shares of the company they hold. We delete companies with institutional ownership over 100% which may be due to data error. For companies without end of quarter share price and shares outstanding reported in 13F, we match them with CRSP and COMPUSTAT to obtain the information.

Table 2.1: Summary statistics of firm fundamentals
This table reports the characteristics of fundamentals of sample firms. Column (1) presents the means, standard deviations, and medians of characteristics for the target companies. Column (2) reports the means, standard deviations, and medians of characteristics for the firms in the control sample which covers all COMPUSTAT firms with data available on CRSP, ISS voting analytics, and 13F database. Column (3) reports the differences between the target and control sample. MV is the market value of equity measured in billions of dollars. B/M is book value of equity divided by market value of equity. *Dividend yield* is (common dividend + preferred dividend)/(market value of common stock + book value of preferred stock). *Past return* is the buy-and-hold stock quarterly return. *Illiquidity* is the Amihud (2002) illiquidity measure computed as quarterly average (using daily data) of $1000\sqrt{|ret|}$/dollar trading volume. *E-index* is the entrenchment index based on six provisions in Bebchuk, Cohen, and Ferrel (2008) and the higher the index value, the more entrenched the management. The rest of the variables are campaign related and reported for target companies only. $Takeover = 1$ if the activist issues a takeover bid. $Threat = 1$ when the activist threat to sue the management or submit shareholder proposals. $Boardrep = 1$ when the activist seeks position on the board of directors and $pro = 1$ if the activist actually submit shareholder proposal to the target companies. *Return* $[-5, +5]$ (*Return* $[-10, +10]$) is the cumulative abnormal return during the $[-5, +5]$ ($[-10, +10]$) trading day window around campaign announcement and emph Return $[-2, +60]$ is the long term cumulative abnormal returns from two trading days prior to announcement till a quarter afterwards. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

VARIABLES	Target sample			Control sample			Comparison	
	Mean (1a)	SD (1b)	Median (1c)	Mean (2a)	SD (2b)	Median (2c)	Difference (3a)	t-statistics (3b)
MV ($ billions)	1.719	4.139	0.412	4.939	13.109	0.884	3.219***	7.23
BM	0.779	0.593	0.638	0.659	0.528	0.536	-0.120***	-6.68
Dividend yield	0.002	0.004	0	0.004	0.006	0	0.002***	9.15
Past return	-0.035	0.202	-0.039	0.005	0.188	-0.005	0.040***	6.28
Illiquidity	0.152	0.246	0.075	0.127	0.242	0.053	-0.025**	-2.97
E_index	2.957	1.351	3	2.953	1.393	3	-0.004	-0.05
takeover	0.034	0.180	0					
threat	0.112	0.316	0					
boardrep	0.209	0.406	0					
pro	0.141	0.348	0					
Ret [-5,+5]	0.041	0.107	0.032					
Ret [-10,+10]	0.043	0.148	0.032					
Ret [-2,+60]	0.027	0.205	0.020					

2.4 Dissatisfied owners

2.4.1 Measures

Our measure of institution dissatisfaction is not a simple company performance measure as different institutions purchase and sell the companies at different times and the actual gain and loss is dependent on the timing. We measure dissatisfied institution based on the basis adjusted price developed in Frazzini (2006). For each institution j and its portfolio company i at quarter end t, we compute:

$$\text{Basis adjusted price}_{i,j,t} = \frac{\sum_{n=0}^{t} S_{i,j,t-n,t} P_{i,t-n}}{\sum_{n=0}^{t} S_{i,j,t-n,t}} \tag{2.1}$$

In the equation, $S_{i,j,t-n,t}$ is the number of shares at quarter end t held by the institution j in the company i which had been initially purchased at quarter end $t-n$.$P_{i,t-n}$ is the share price of company i at the initial purchase quarter end $t-n$. We require that $S_{i,j,t-n,t} > 0$ for $n = 0, 1, , t$, which means continuous holding from quarter end $t-n$ to t.

Intuitively, shares of a company owned at each quarter end are treated as inventories with end of quarter share price as a proxy for its unit value. Based on a first-in-first-out principle, at the end of each quarter, we calculate the average unit price from all past holdings history and compare this bases adjusted price with the actual end of quarter share price. For each quarter end t, company i and institution j, we define:

$$\text{Dissatisfaction}_{i,j,t} = \begin{cases} 1 & \text{if Basis adjusted price}_{i,j,t} < P_{i,t} \\ 0 & \text{if Basis adjusted price}_{i,j,t} >= P_{i,t} \end{cases} \tag{2.2}$$

where $P_{i,t}$ is the share price of company i at quarter end t.

One thing to notice, in order to calculate basis adjusted price, we require that the ownership exist for at least two consecutive quarters. Since we do not observe the exact time in a quarter when the stakes are acquired, we cannot easily classify dissatisfied owners if they only acquire the shares for less than one quarter. We address this problem by classifying them into $Dissatisfaction = 0$ group and argue that these new owners, on average, should not determine the institutional governance profile of companies. New holders may not have as much information on the company as other long term holders: this information can be soft information such as access to management and so on. As is shown in McCahery, Sautner and Starks (2016), long term holders engage more with companies and intervene more intensively than short term owners. Thus short term owners, their existence and trading may not matter as much as long term holders to the activist.

Next we aggregate individual institutional dissatisfaction to the firm level. First we aggregate the total dissatisfied ownership:

$$\text{Dissatisfied ownership}_{i,t} = \sum_{j=1}^{J} \text{dissatisfaction}_{i,j,t} \times \text{ownership}_{i,j,t} \tag{2.3}$$

We also create an alternative proxy to capture the proportion of dissatisfied owners of all owners:

$$\%\ \text{Dissatisfied owners}_{i,t} = \frac{\sum_{j=1}^{J} \text{dissatisfaction}_{i,j,t}}{J} \tag{2.4}$$

where J is the total number of institutional holders.

As is shown both in theory and in empirical work, the stake size does not necessarily matter linearly in exerting governance power (Noe, 2002), instead of studying all institutional holders, we impose some restrictions on their ownership stakes. The dummy variable $I^{\phi}_{i,j,t} = 1$ for fund j's stake in company i at the end of quarter t if it satisfies certain restrictions ϕ. We explore different restrictions by setting the minimum ownerships (ϕ) to be included in the sample as 0.5%, 2%, 5%, and 10% respectively. Thus we modify the two measures as:

$$> \phi \text{ dissatisfied ownership}_{i,t} = \sum_{j=1}^{J} \text{dissatisfaction}_{i,j,t} \times \text{ownership}_{i,j,t} \times I^{\phi}_{i,j,t} \tag{2.5}$$

$$> \phi\%\ \text{dissatisfied owners}_{i,t} = \frac{\sum_{j=1}^{J} \text{dissatisfaction}_{i,j,t} \times I^{\phi}_{i,j,t}}{J} \tag{2.6}$$

2.4.2 Summary statistics of (dissatisfied) owners

We report a summary of institutional ownership in Table 2.2. Panel A reports ownership as the proportion of shares held by institutional investors and panel B reports the fraction of certain institutional owners out of all institutional owners. Panels (A1) and (B1) measure all institutional owners and panels (A2) and (B2) report dissatisfied institutional owners only. Column (1) and (2) presents the mean, standard deviation, and medium of characteristics for the target sample and control sample respectively. Column (3) reports the difference and t-statistics between them. *O_total* (*O_neg*) is the total (dissatisfied) institutional ownership. *O_*ϕ (*O_neg_*ϕ) is the aggregated (dissatisfied) institutional ownership if the (dissatisfied) institution hold more than ϕ shares of the company (defined in equation 2.5). *PO_*ϕ (*PO_neg_*ϕ) is the proportion of (dissatisfied) institutional owners with more than ϕ shares of the company out of total number of institutional investors (defined in equation 2.6). ϕ equals to 0.5%, 2%, 5%, and 10% respectively.

Table 2.2: Summary statistics of institutional ownership
This table reports the characteristics of institutional ownership of sample firms. Panel A reports ownership as the proportion of shares held by institutional investors and panel B reports the fractions of certain institutional owners out of all institutional owners. Panel (A1) and (B1) measures all institutional owners and panel (A2) and (B2) reports dissatisfied institutional owners only. The definition of dissatisfied institutional owners can be found in equation 2.2. Column (1) presents the means, standard deviations, and medians of characteristics for the target companies. Column (2) reports the means, standard deviations, and medians of characteristics for the firms in the control sample which covers all COMPUSTAT firms with data available on CRSP, ISS voting analytics, and 13F database. Column (3) reports the differences between the target and control sample. O_total (O_neg) is the total (dissatisfied) institutional ownership. O_ϕ (O_neg_ϕ) is the aggregated (dissatisfied) institutional ownership if the (dissatisfied) institution hold more than ϕ shares of the company defined in equation 2.5. PO_ϕ (PO_neg_ϕ) is the proportion of (dissatisfied) institutional owners with more than ϕ shares of the company out of total number of institutional investors defined in equation 2.6. ϕ equals to 0.5%, 2%, 5%, and 10% respectively. O_neg_large is defined in equation 2.7 as the aggregated large dissatisfied institutional ownership. PO_neg_large is defined in equation 2.8 as the proportion of large (owners more than average) dissatisfied owners out of all institutional owners. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: owners (ownership)								
VARIABLES	Target			Control			Comparison	
	Mean	SD	Median	Mean	SD	Median	Difference	t-statistics
A1: Owner	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)
O_total	0.694	0.211	0.736	0.634	0.243	0.686	-0.061***	-7.33
O_0.5%	0.602	0.187	0.632	0.525	0.214	0.553	-0.077***	-10.60
O_2%	0.445	0.160	0.457	0.366	0.176	0.372	-0.079***	-13.10
O_5%	0.240	0.141	0.231	0.190	0.142	0.175	-0.050***	-10.35
O_10%	0.0778	0.106	0	0.0631	0.106	0	-0.015***	-4.07
A2: Dissatisfied owner	Mean	SD	Median	Mean	SD	Median	difference	t-statistics
O_neg	0.350	0.294	0.324	0.243	0.269	0.137	-0.107***	-11.68
O_neg_0.5%	0.310	0.267	0.277	0.207	0.236	0.108	-0.104***	-12.88
O_neg _2%	0.238	0.219	0.191	0.151	0.186	0.063	-0.088***	-13.80
O_neg _5%	0.136	0.152	0.083	0.081	0.125	0	-0.055***	-12.84
O_neg _10%	0.047	0.090	0	0.028	0.076	0	-0.018***	-7.03
O_neg_large	0.300	0.256	0.271	0.208	0.234	0.112	-0.092***	-11.48
Panel B: owners (number %)								
B1: Owner	Mean	SD	Median	Mean	SD	Median	difference	t-statistics
PO_0.5%	0.263	0.114	0.260	0.204	0.109	0.201	-0.059***	-15.84
PO _2%	0.108	0.066	0.100	0.075	0.057	0.064	-0.034***	-17.42
PO_5%	0.039	0.037	0.028	0.024	0.028	0.016	-0.015***	-15.39
PO_10%	0.008	0.015	0	0.005	0.012	0	-0.003***	-6.99
B2: Dissatisfied owner	Mean	SD	Median	Mean	SD	Median	difference	t-statistics
PO_neg	0.467	0.339	0.542	0.364	0.335	0.305	-0.103***	-9.06
PO_neg_0.5%	0.140	0.127	0.124	0.087	0.105	0.043	-0.053***	-14.82
PO_neg _2%	0.062	0.068	0.043	0.035	0.050	0.011	-0.028***	-16.11
PO_neg _5%	0.024	0.034	0.009	0.012	0.023	0	-0.012***	-14.97
PO_neg _10%	0.005	0.013	0	0.003	0.009	0	-0.003***	-8.63
PO_neg_large	0.111	0.090	0.114	0.082	0.085	0.057	-0.030***	-10.35

On average, the total institutional ownership of the campaign sample is 69.4%, 6.1 percentage points higher than that of the control sample. This is consistent with the literature, that activists tend to target companies with a higher concentration of institutional ownership. When we only consider the aggregated owner-

ship that exceeds a certain threshold ($> \phi$ ownership$_{i,t} = \sum_{j=1}^{J}$ ownership$_{i,j,t} \times I^{\phi}_{i,j,t}$ where $I^{\phi}_{i,j,t} = 1$ if ownership$_{i,j,t} > \phi$, and $\phi = 0.5\%, 2\%, 5\%,$ and10% respectively), all measures of the target companies are significantly higher than those of the control sample. Interestingly, it seems that the difference of total ownership between target and control samples is mostly from the lower end of the thresholds: the difference of aggregated ownership from over 0.5%-owners (2%-owners) between the target and control group is 7.7% (7.9%), higher than the 6.1% difference when we consider all owners regardless of stake size. These medium sized holders with 0.5% to 2% ownership are the main driving force behind the difference in institutional ownership between the target and control sample and may be the main potential allies or supporters the activists need to rely on. This is reasonable in that the activists' stakes are relatively larger and their medium sized stakes are influential but will not be big enough to de-incentivize activists' costly campaigns. This can also be shown in the ratio of the number of large owners relative to the number of total instuitional owners. There are 0.059% (0.034%) owners of over 0.5% (2%) ownership of the target companies, significantly higher than the control group. The difference becomes much smaller when we increase the threshold. It shows that there is a majority of institutional owners with ownership between 0.5% to 2% who are driving the total ownership difference between the target sample and control sample.

When comparing our main variable, the dissatisfied ownership, between the target and control sample, we find that the difference is 10.7 percentage points and is statistically significant. The ratio of dissatisfied owners to total owners is also significantly higher in target companies. Almost half (46.7%) of the institutional owners in the target company before the campaign quarter experienced negative holding period return while that of the control sample is 36.4%. When we further restrict to large dissatisfied owners with different cut-off points, we find the significant difference in terms of ownership as well as the fraction of owners exists across all ownership size groups. Consistent with the previous findings, the difference in the dissatisfied ownership between the target and control samples also comes from medium sized owners with between 0.5% to 2% ownership. Interestingly, in terms of the number of dissatisfied owners, it seems that there are more small dissatisfied owners (ownership less than 0.5%) as the difference of the proportion of dissatisfied over 0.5%-owners out of total owners between the target and control sample is 0.053 while that without ownership restriction is 0.103.

Since the ownership threshold seems to be arbitrary, we also calculate the average institutional ownership in company i at the end of quarter t and only include those exceeding the average. In this specification, $I^{A}_{i,j,t} = 1$if ownership$_{i,j,t} >= \overline{\text{ownership}_{i,t}}$ and we modify the two measures as:

$$\text{Large dissatisfied ownership}_{i,t} = \sum_{j=1}^{J} \text{dissatisfaction}_{i,j,t} \times \text{ownership}_{i,j,t} \times I^{A}_{i,j,t} \tag{2.7}$$

$$\%\text{Large dissatisfied owners}_{i,t} = \frac{\sum_{j=1}^{J} \text{dissatisfaction}_{i,j,t} \times I^{A}_{i,j,t}}{J} \tag{2.8}$$

The summary statistics of large dissatisfied owners are also presented in table 2.2 where O_neg_large as defined in equation 2.7 is the aggregated large dissatisfied institutional ownership and PO_neg_large as defined in equation 2.8 is the proportion of large (owners more than average) dissatisfied owners out of all institutional owners.The difference of large dissatisfied ownership between the target and control sample is 0.092 and is statistically significant at 1%, similar to that when we use all institutions regardless of their stakes. In terms of the proportions, 11.1% of all owners in the target companies are large and dissatisfied ones compared with 8.2% in the control sample. The 3.1% difference between them is still smaller than 10.3% when using all dissatisfied owners, which further confirms that the target firms have more small owners (stake <0.5%) in terms of numbers than the control firms.

The simple decomposition of ownership in terms of dissatisfaction and stake size has revealed that target firms have a higher concentration of dissatisfied institutional holders. Medium sized dissatisfied owners (ownerships between 0.5% to 2%) are the driving force of ownership difference while, in numbers, there are more small sized dissatisfied owners (ownerships less than 0.5%) concentrated in target firms before a campaign announcement.

2.4.3 Regression results for dissatisfied owners

Are activists more likely to target companies with more dissatisfied institutional owners?

In this sub section, we investigate whether the existence of dissatisfied owners affect activists' target selection by running the following regression:

$$\text{Target}_{i,t+1} = \alpha + \beta \times \text{dissatisfied owners}_{i,t} + \gamma \times Z_{i,t} + \theta_t + \delta_i + \varepsilon_{i,t} \tag{2.9}$$

$\text{Target}_{i,t+1} = 1$ if company i is targeted during the quarter that ends at $t+1$. $Z_{i,t}$ is a set of firm controls measured at the end of the quarter t, including the logarithm of market capitalization, book-to-market value, dividend yield, E-index, stock return and Amihuld illiquidity (Amihuld, 2002). For our main variable of interest, dissatisfied $\text{owners}_{i,t}$, we use two different specifications discussed in the previous subsection and the results are discussed in the next paragraph. We also include firm (industry) fixed effect δ_i and time fixed effect θ_t.

To explore how different decomposition of institutional ownership is associated with subsequent activism targeting, we present the regression coefficient in Table 2.3. Columns (1) to (5) report the results for baseline models using different specifications of institutional owners and columns (6) to (10) report the results for different specifications of *dissatisfied* owners. O_rest is the difference between total institutional ownership and certain ownership decomposition. For example, in col-

umn (1) *O_rest* is the difference between *O_total* and *O_0.5%*. All other independent variables are as defined in Table 2.1 and 2.2. In each column we report coefficients and their clustered standard errors.

Table 2.3: An analysis of institutional owners and target selection
This table applies a linear probability model to examine how different institutional ownership decomposition, especially how dissatisfied ownership, predicts the activist target selection. *O_rest* is the difference between total institutional ownership and certain ownership decomposition. For example, in column (1) *O_rest* is the difference between *O_total* and *O_0.5%*. All other independent variables are as defined in Table 2.1 and 2.2. In each column we report coefficients and their clustered standard errors. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

VARIABLES	(1) target	(2) target	(3) target	(4) target	(5) target	(6) target	(7) target	(8) target	(9) target	(10) target
O_total	0.008***									
	(0.003)									
O_rest		0.005	0.002	0.016***	0.011***	0.005*	0.005*	0.005*	0.007**	0.008***
		(0.014)	(0.006)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
O_0.5%		0.008***								
		(0.003)								
O_2%			0.010***							
			(0.003)							
O_5%				0.000						
				(0.004)						
O_10%					-0.000					
					(0.005)					
O_neg						0.012***				
						(0.003)				
O_neg_0.5%							0.012***			
							(0.003)			
O_neg_2%								0.014***		
								(0.004)		
O_neg_5%									0.012***	
									(0.004)	
O_neg_10%										0.007
										(0.006)
LogMV	-0.004***	-0.004***	-0.004***	-0.005***	-0.004***	-0.003***	-0.003***	-0.003***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
BM	0.003**	0.003**	0.003**	0.003**	0.003**	0.002*	0.002*	0.002*	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Dividend	-0.140*	-0.140*	-0.141*	-0.138*	-0.142*	-0.155**	-0.154**	-0.151**	-0.143*	-0.140*
yield	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)	(0.076)	(0.076)	(0.076)	(0.076)	(0.075)
Past return	-0.004**	-0.004**	-0.004**	-0.004**	-0.004**	-0.002	-0.002	-0.002	-0.004**	-0.004**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Illiquidity	-0.005**	-0.005**	-0.005**	-0.005*	-0.005**	-0.005*	-0.005*	-0.005*	-0.005**	-0.005**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Constant	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	116,412	116,412	116,412	116,412	116,412	116,412	116,412	116,412	116,412	116,412
R-squared	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

Consistent with the literature (Brav, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009), the baseline model in column (1) shows that activists tend to target small, value firms with poor past performance and good liquidity (this is different from what is shown in the summary statistics table as we impose firm and time fixed effects). The positive significant coefficient of total ownership shows

that the higher the total institutional ownership, the more likely the company is to be a target. This is consistent with our summary statistics and previous literature (Brav, Jiang, Partnoy, and Thomas, 2008). When we restrict to large institutional ownership using different cut-off points (ownership over 0.5%, 2%, 5%, and 10% respectively), the coefficient on ownership become both statistically and economically insignificant for over-5% and over-10% owners, while it remains similar to that of the baseline model for over-0.5% and over-2% owners. This is consistent with the findings in the previous subsection that activists tend to target firms with more institutional ownership and it comes from many medium-sized stake holders rather than from large owners. More importantly, when we include dissatisfied ownership in column (6), the coefficient of the rest of institutional ownership becomes smaller and significant at 10%. The coefficient of dissatisfied ownership is 0.012 and significant at 1%. The magnitude is 1.5 times the effect of total institutional ownership in the baseline model. When we decompose dissatisfied ownership further into different size-cut-off points from columns (7) to (10), the effect of dissatisfied ownership persists in all specifications apart from over-10% dissatisfied owners' group.

Drawn from the findings in the exploratory stage in the previous paragraph, we present the main results of how dissatisfied ownership affects targeting selection in Table 2.4. In panel A, we use measures of dissatisfied owners as fractions of shares while panel B uses the proportion of certain institutions out of all institutions. In column (1) of each panel, we use all dissatisfied owners and in column (2) we restrict to large owners whose ownership exceeds the average. In each specification, we also include E-index as a governance quality measure and the sample size is reduced substantially due to data availability but the results remain unchanged. We include firm (industry) fixed effect and time fixed effects. The coefficients on (large) dissatisfied ownership and the fraction of (large) owners are both statistically significant and economically meaningful. A 1 percentage point increase in the (large) dissatisfied ownership in the present quarter will lead to the increase in the probability of being targeted by 0.016 (0.017) percentage points in the next quarter (columns (1b) and (2b)). As the unconditional mean of targeting is 0.007, 1 standard deviation increase of the fraction of (large) dissatisfied owners leads to the increase in the targeting probability by 24% (25%).

Table 2.4: An analysis of dissatisfied institutional owners and target selection
This table applies a linear probability model to examine how (large) dissatisfied institutional ownership predicts the activist target selection. Panel A measures dissatisfaction from owners as fraction of shares while panel B uses the proportion of certain institutions out of all institutional investors. O_rest is the difference between total institutional ownership and certain ownership decomposition. For example, in panel A, column (1a) O_rest is the difference between total institutional ownership and O_neg. All other independent variables are as defined in Table 2.1 and 2.2. In each column we report coefficients and we report coefficients and their clustered standard errors. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: aggregated dissatisfied ownership

VARIABLES	(1a) target	(1b) target	(1c) target	(1d) target	(2a) target	(2b) target	(2c) target	(2d) target
O_neg	0.012***	0.016***	0.013***	0.013***				
	(0.003)	(0.002)	(0.005)	(0.002)				
O_neg_large					0.013***	0.017***	0.014***	0.013***
					(0.003)	(0.002)	(0.005)	(0.002)
LogMV	-0.003***	-0.002***	-0.003**	-0.002***	-0.003***	-0.002***	-0.003**	-0.002***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
BM	0.002*	0.004***	0.006**	0.006***	0.002*	0.004***	0.006**	0.006***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Dividend yield	-0.155**	-0.134***	-0.135	-0.126*	-0.154**	-0.133***	-0.135	-0.126*
	(0.076)	(0.047)	(0.089)	(0.068)	(0.076)	(0.047)	(0.089)	(0.068)
Past return	-0.002	-0.002	0.000	-0.001	-0.002	-0.002	-0.000	-0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Illiquidity	-0.005*	-0.000	-0.007	-0.005	-0.005*	-0.000	-0.007	-0.005
	(0.003)	(0.001)	(0.010)	(0.003)	(0.003)	(0.001)	(0.011)	(0.003)
O_rest	0.005*	0.010***	0.007	0.008***	0.006*	0.010***	0.007	0.008***
	(0.003)	(0.001)	(0.005)	(0.002)	(0.003)	(0.001)	(0.005)	(0.002)
E_index			0.001***	0.000			0.001***	0.000
			(0.001)	(0.000)			(0.001)	(0.000)
Constant	Y	Y	Y	Y	Y	Y	Y	Y
Observations	116,412	116,412	59,101	59,101	116,412	116,412	59,101	59,101
R-squared	0.065	0.008	0.069	0.008	0.065	0.008	0.069	0.008
Firm FE	Y		Y		Y		Y	
Industry FE		Y		Y		Y		Y
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

Panel B: proportions of dissatisfied owners

VARIABLES	(1a) target	(1b) target	(1c) target	(1d) target	(2a) target	(2b) target	(2c) target	(2d) target
PO_neg	0.005***	0.005***	0.006***	0.004***				
	(0.001)	(0.001)	(0.002)	(0.001)				
PO_neg_large					0.020***	0.019***	0.031***	0.022***
					(0.005)	(0.004)	(0.007)	(0.007)
LogMV	-0.003***	-0.002***	-0.003**	-0.002***	-0.003***	-0.002***	-0.002**	-0.001***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
BM	0.002*	0.004***	0.006**	0.006***	0.002*	0.004***	0.006**	0.006***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Dividend yield	-0.161**	-0.132***	-0.145	-0.128*	-0.155**	-0.129***	-0.139	-0.122*
	(0.076)	(0.047)	(0.089)	(0.068)	(0.075)	(0.047)	(0.089)	(0.068)
Past return	-0.001	-0.002	0.002	-0.000	-0.002	-0.002	0.001	-0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Illiquidity	-0.005**	-0.001	-0.008	-0.005	-0.006**	-0.001	-0.008	-0.006
	(0.003)	(0.001)	(0.011)	(0.003)	(0.003)	(0.001)	(0.011)	(0.003)
E_index			0.001***	0.000			0.001***	0.000
			(0.001)	(0.000)			(0.001)	(0.000)
O_total	0.008**	0.013***	0.009*	0.010***	0.008***	0.013***	0.009*	0.010***
	(0.003)	(0.001)	(0.005)	(0.002)	(0.003)	(0.001)	(0.005)	(0.002)
Constant	Y	Y	Y	Y	Y	Y	Y	Y
Observations	116,412	116,412	59,101	59,101	116,412	116,412	59,101	59,101
R-squared	0.065	0.008	0.069	0.008	0.065	0.008	0.069	0.008
Firm FE	Y		Y		Y		Y	
Ind FE		Y		Y		Y		Y
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

2.5 Dissatisfied sellers

2.5.1 Measures

A few theoretical papers (Edmans, 2009; Admati and Pfleiderer, 2009; Dasgupta and Piacentino, 2015) have established that institutional exit or threat of exit is also an effective way of institutional investors exerting external governance. According to McCahery, Sautner and Starks (2016), a majority of institutional holders have exited due to poor performance and they have also documented that the number of institutions that exited is as important as the amount of ownership sold for the threat of exit to be effective. As selling can be due to various reasons such as portfolio rebalancing, we concentrate on *total exit due to dissatisfied performance*. For each quarter end t, we define fund j as a seller if it exits all its ownership of company i at the end of quarter $t-1$ and holds 0 shares at quarter ending t:

$$\text{Total exit}_{i,j,t} = \begin{cases} 1 & \text{if ownership}_{i,j,t-1} = \text{ownership}_{i,j,t} = 0 \text{ and ownership}_{i,j,t-2} > 0 \\ 0 & \text{otherwise} \end{cases} \tag{2.10}$$

For each company i at the end of each quarter t, we first calculate:

$$\text{Sold dissatisfied ownership}_{i,t} = \sum_{j=1}^{J} \text{total exit}_{i,j,t} \times \text{dissatisfaction}_{i,j,t-2} \times \text{ownership}_{i,j,t-2} \tag{2.11}$$

And according to McCahery, Sautner and Starks (2016), institutional investors regard selling by other institutions for the same reason as imposing more threat of exit on companies, we thus calculate the alternative proxy to capture the group pressure:

$$\%\ \text{Dissatisfied sellers}_{i,t} = \frac{\sum_{j=1}^{J} \text{total exit}_{i,j,t} \times \text{dissatisfaction}_{i,j,t}}{\sum_{j=1}^{J} \text{total exit}_{i,j,t}} \tag{2.12}$$

We emphasize that the sample of sellers is mutually exclusive from that of owners by construction, as we require the sale happen before the quarter t thus the ownership of sellers is 0 throughout quarter t.

Stake size also matters in the effect of exit or threat of exit: the larger the size, the bigger the price impact, and thus the disciplinary effect, but if the size is too big, selling becomes difficult and the negative price impact due to illiquidity increases the cost of selling. Thus we impose the same restrictions on sellers' stakes. The dummy variable $I^{\phi}_{i,j,t} = 1$ if fund j's stake sold in company i at the end of quarter $t-1$ satisfies certain restrictions ϕ. We set the minimum stake (ϕ) sold to be included in the sample as 0.5%, 2%, 5%, and 10% respectively. Thus we modify

the two measures as:

$$> \phi \text{ sold dissatisfied ownership}_{i,t} = \sum_{j=1}^{J} \text{total exit}_{i,j,t} \times \text{dissatisfaction}_{i,j,t} \times \text{ownership}_{i,j,t} \times I^{\phi}_{i,j,t} \tag{2.13}$$

$$> \phi\% \text{ dissatisfied sellers}_{i,t} = \frac{\sum_{j=1}^{J} \text{total exit}_{i,j,t} \times \text{dissatisfaction}_{i,j,t} \times I^{\phi}_{i,j,t}}{\sum_{j=1}^{J} \text{total exit}_{i,j,t}} \tag{2.14}$$

2.5.2 Summary statistics of (dissatisfied) sellers

To be consistent with the previous analysis, we report both sold ownership and sold dissatisfied ownership with different threshold cut-off points in Table 2.5. Panel A reports sold ownership as the proportion of shares and panel B reports the fraction of certain institutional sellers out of all institutional sellers. Panels (A1) and (B1) report all institutional sellers and panel (A2) and (B2) report only dissatisfied institutional sellers. Columns (1) and (2) present the means, standard deviations, and medians of characteristics for the target sample and control sample. Column (3) reports the difference and t-statistics between the target and control sample. S_ϕ (S_neg_ϕ) is the aggregated (dissatisfied) institutional ownership sold if the (dissatisfied) institution holds more than ϕ shares of the company (defined in equation 2.13). PS_ϕ (PS_neg_ϕ) is the proportion of (dissatisfied) institutional sellers with over ϕ shares of the company out of total number of institutional sellers (defined in equation 2.14). ϕ equals to 0.5%, 2%, 5%, and 10% respectively.

Table 2.5: Summary statistics of institutional sellers

This table reports the characteristics of institutional sellers of sample firms. Panel A reports sold ownership as the proportion of shares and panel B reports the fractions of certain institutional sellers out of all institutional sellers. At the quarter end t, a seller is defined as the institution which has sold all its ownership before the quarter starts and the ownership remain 0 during the quarter (equation 2.10). Panels (A1) and (B1) report all institutional sellers and panels (A2) and (B2) report only dissatisfied institutional sellers. The definition of dissatisfaction can be found in equation (2). Column (1) presents the means, standard deviations, and medians of characteristics for the target companies. Column (2) reports the means, standard deviations, and medians of characteristics for the firms in the control sample which covers all COMPUSTAT firms with data available on CRSP, ISS voting analytics, and 13F database. Column (3) reports the differences between the target and control samples. S_total (S_neg) is the total (dissatisfied) institutional ownership sold. S_ϕ (S_neg_ϕ) is the aggregated (dissatisfied) institutional ownership sold if the (dissatisfied) institution holds more than ϕ shares of the company. S_neg_large is defined in equation 2.15 as the aggregated large dissatisfied institutional ownership sold if the institution owns more than the average. PS_ϕ (PS_neg_ϕ) is the proportion of (dissatisfied) institutional sellers with over ϕ shares of the company out of total number of institutional sellers. PS_neg_large is defined in equation 2.16 as the proportion of large dissatisfied sellers out of all institutional sellers. ϕ equals to 0.5%, 2%, 5%, and 10% respectively. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: sellers (units measured in ownership)								
VARIABLES	Target			Control			Comparison	
	Mean	SD	Median	Mean	SD	Median	Difference	t-statistics
A1: Sellers	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)
S_total	0.064	0.068	0.047	0.043	0.046	0.029	-0.022***	-13.64
S_0.5%	0.048	0.061	0.030	0.029	0.042	0.016	-0.018***	-12.88
S_2%	0.026	0.049	0	0.015	0.034	0	-0.011***	-9.75
S_5%	0.011	0.036	0	0.006	0.025	0	-0.005***	-5.51
S_10%	0.001	0.015	0	0.001	0.016	0	-0.000	-0.19
A2: Dissatisfied sellers	Mean	SD	Median	Mean	SD	Median	difference	t-statistics
S_neg	0.027	0.043	0.010	0.014	0.029	0.002	-0.013***	-12.97
S_neg_0.5%	0.021	0.040	0	0.010	0.026	0	-0.011***	-12.02
S_neg _2%	0.012	0.034	0	0.006	0.021	0	-0.007***	-8.99
S_neg _5%	0.005	0.026	0	0.002	0.016	0	-0.003***	-5.03
S_neg _10%	0.001	0.011	0	0.001	0.010	0	-0.000	-0.88
S_neg_large	0.019	0.038	0	0.010	0.025	0	-0.009***	-10.72
Panel B: sellers (number %)								
B1: Sellers	Mean	SD	Median	Mean	SD	Median	difference	t-statistics
PS_0.5%	0.145	0.132	0.120	0.098	0.114	0.067	-0.047***	-12.11
PS_2%	0.038	0.072	0	0.022	0.056	0	-0.016***	-8.49
PS_5%	0.008	0.030	0	0.005	0.026	0	-0.003***	-3.41
PS_10%	0.000	0.005	0	0.001	0.010	0	0.000	0.39
B2: Dissatisfied sellers	Mean	SD	Median	Mean	SD	Median	difference	t-statistics
PS_neg	0.350	0.297	0.357	0.268	0.284	0.174	-0.082***	-8.47
PS_neg_0.5%	0.064	0.095	0	0.034	0.075	0	-0.030***	-11.84
PS_neg _2%	0.019	0.049	0	0.009	0.037	0	-0.010***	-7.72
PS_neg _5%	0.004	0.024	0	0.002	0.018	0	-0.002***	-3.71
PS_neg _10%	0.000	0.005	0	0.000	0.007	0	-0.000	-0.39
PS_neg_large	0.049	0.072	0	0.031	0.062	0	-0.018***	-8.60

On average, the total exited ownership of the campaign sample is 6.4%, while that of the control sample is 4.3%, the difference is statistically significant at 1%. When we only consider the aggregated ownership sold if it exceeds certain

threshold (Large sold ownership$_{i,t} = \sum_{j=1}^{J}$ total exit$_{i,j,t} \times$ownership$_{i,j,t} \times I^{\phi}_{i,j,t}$ where $I^{\phi}_{i,j,t} = 1$ if ownership$_{i,j,t} > \phi$, and $\phi = 0.5\%, 2\%, 5\%,$ and10% respectively), all the target companies' large exited ownership is higher than that of the control sample and statistically significant apart from the over-10% sellers. By comparing the magnitude of the difference between the target and control sample for different cut-off points, it seems that it is the lower bound (0.5% to 2%) sellers who are driving the difference. This becomes more obvious when we look at the ratio of large sellers to all sellers. 14.5% (9.8%) of all sellers are those who had ownership over 0.5% in the target sample (control sample), while over-2% sellers only count for 3.8% (2.2%) of all sellers. This is consistent with the price impact theory that investors tend not to sell large stakes due to the adverse price impact. By comparing the sellers of different stake sizes, it seems that the medium-sized (0.5%-2%) sellers drive the difference in ownership sold between the target and control samples. This is plausible in that these sellers were relatively large holders and their exiting can signal for the future prospect of the company but their stakes were also not large enough to make excess price impact adversely impede their selling decision.

When comparing our main variable, the dissatisfied sold ownership, between the target and control sample, we find that there is 1.3% more dissatisfied ownership sold before the targeting quarter than the other quarters. The difference is statistically significant. In correspondence, 35.0% (26.8%) of all sellers for the target sample (control sample) are dissatisfied sellers. When we further restrict to large dissatisfied ownership sold with different cut-off points to investigate the impact of stake sizes, we find similar significant differences between the target and control samples across all groups apart from the over-10% group. Consistent with the previous findings, the difference in the dissatisfied sold ownership between the target and control sample also comes from medium size stakes (between 0.5% to 2%). The difference of dissatisfied ownership sold if the seller has over 0.5% stakes between the target and control sample is 1.1%, close to that without size constraints and is statistically significant. This can also be seen in analysing the portion of dissatisfied sellers with different stake sizes. In the control sample, only 3.4% of all sellers had owned more than 0.5% ownership and sold all their stakes due to dissatisfaction, while 26.8% of all sellers regardless their stake size sold their stakes due to satisfaction. However, in the target sample, there are 6.39% of all sellers who had owned more than 0.5% ownership and exited due to dissatisfaction while the portion of all dissatisfied sellers regardless of stake is 35.0%. The comparisons using different ownership threshold shows that sold ownership size does matter and since the threshold seems to be arbitrary, we also calculate the average institutional ownership exited in company i at the end of quarter t and only include those exceed the average. In this specification, $I^{A}_{i,j,t} = 1$if exited ownership$_{i,j,t} >= \overline{\text{exited ownership}_{i,t}}$ and we modify the two measures as:

$$\text{Large sold dissatisfied ownership}_{i,t} = \sum_{j=1}^{J} \text{total exit}_{i,j,t} \times \text{dissatisfaction}_{i,j,t} \times \text{ownership}_{i,j,t} \times I^{A}_{i,j,t} \tag{2.15}$$

$$\%\text{ large dissatisfied sellers}_{i,t} = \frac{\sum_{j=1}^{J} \text{total exit}_{i,j,t} \times \text{dissatisfaction}_{i,j,t} \times I^{A}_{i,j,t}}{J} \tag{2.16}$$

The summary statistics are also presented in Table 2.5. S_neg_large is defined in equation 2.15 as the aggregated large dissatisfied institutional ownership sold if the institution owns more than the average. PS_neg_large is defined in equation 2.16 as the proportion of large dissatisfied sellers out of all institutional sellers. On average, the large dissatisfied ownership sold in the target firm is 0.9 percentage points higher than that in the control firm which takes almost half of the difference of total sold ownership regardless of dissatisfaction between target and control sample. 4.9% of all sellers in the target sample are dissatisfied and large sellers while that in the control sample is 3.1%. This shows that there is a concentration of small sellers in the target companies in terms of numbers.

2.5.3 Regression results for dissatisfied sellers

Are activists more likely to pick up signals from dissatisfied sellers?

Institutional investors often use exit as means of governance if their stock performance is dissatisfying and we investigate whether activists can pick up these signals to target companies. The regression specification is as follows:

$$\text{Target}_{i,t+1} = \alpha + \beta \times \text{dissatisfied sellers}_{i,t} + \gamma \times Z_{i,t} + \theta_t + \delta_i + \varepsilon_{i,t} \tag{2.17}$$

$\text{Target}_{i,t+1} = 1$ if company i is targeted during the quarter that ends at $t+1$. $Z_{i,t}$ is a set of firm controls discussed in the previous subsection and δ_i is firm (industry) fixed effect and we also include time fixed effect θ_t. Our variable of interest, $\text{dissatisfied sellers}_{i,t}$, is calculated based on institutions that had already exited (sold all their stakes) at the beginning of quarter t and remain non-owners throughout the quarter. By construction, this measure will capture the institutional selling one quarter prior to targeting. Due to the time difference between selling and targeting we argue that our measure is not the liquidity measure upon targeting. We use Amihuld (2002) illiquidity during the quarter to measure liquidity.

We first explore how different decomposition of sold institutional ownership is associated with subsequent activism targeting, and we present the regression coefficient in Table 2.6. Columns (1) to (5) report the results for baseline models using different specifications of exited institutional ownerships and columns (6) to

(10) report the results for different specifications of exited *dissatisfied* ownership only. Clustered standard errors are reported in parentheses.

Table 2.6: An analysis of institutional sellers and target selection
This table applies a linear probability model to examine how different decompositions of institutional sellers, especially dissatisfied sellers, predict the activist target selection. All independent variables are as defined in Table 2.1 and 2.5. In each column we report coefficients and their clustered standard errors. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

VARIABLES	(1) target	(2) target	(3) target	(4) target	(5) target	(6) target	(7) target	(8) target	(9) target	(10) target
S_total	0.042***									
	(0.011)									
S_0.5%		0.038***								
		(0.011)								
S_2%			0.033**							
			(0.013)							
S_5%				0.021						
				(0.016)						
S_10%					-0.013					
					(0.016)					
S_neg						0.065***				
						(0.015)				
S_neg_0.5%							0.059***			
							(0.017)			
S_neg_2%								0.045**		
								(0.021)		
S_neg_5%									0.030	
									(0.028)	
S_neg_10%										-0.000
										(0.031)
LogMV	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
BM	0.002*	0.003**	0.003**	0.003**	0.003**	0.002*	0.002*	0.003**	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Dividend	-0.139*	-0.139*	-0.140*	-0.140*	-0.140*	-0.151**	-0.146*	-0.143*	-0.141*	-0.140*
yield	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)	(0.076)	(0.075)	(0.076)	(0.075)	(0.075)
Past return	-0.003*	-0.003**	-0.004**	-0.004**	-0.004**	-0.004**	-0.004**	-0.004**	-0.004**	-0.004**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Illiquidity	-0.004*	-0.005*	-0.005*	-0.005**	-0.006**	-0.004	-0.005*	-0.005**	-0.005**	-0.006**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
O_total	0.009***	0.009***	0.009***	0.009***	0.008**	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Constant	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	116,412	116,412	116,412	116,412	116,412	116,412	116,412	116,412	116,412	116,412
R-squared	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065	0.065
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

The baseline model in column (1) shows that, even after controlling for total ownership, institutional exit has a great impact on activism targeting: 1 percentage point ownership sold is associated with 0.042 percentage point increase in the likelihood of targeting while the unconditional mean of targeting is 0.007. Interestingly, when we restrict to sold ownership using different cut-off points (sold ownership over 0.5%, 2%, 5%, and 10% respectively) the coefficient is only statistically significant at 5% for over-5% and over-2% sellers and the magnitude decreases. This is consistent with the findings in the previous subsection that medium sized (0.5% to 2%) sellers

matter instead of large sellers.

More importantly, when we include dissatisfied exited ownership, the coefficient on total sold dissatisfied ownership$_{i,t}$ is 0.065 and statistically significant at 1%. Its magnitude is more than 1.5 times that of the simple exit measure: 1 percentage point ownership exited is associated almost 10% increase in the likelihood of being targeted. When we study the effect of different sizes of dissatisfied stakes exited, we find the coefficient is both statistically and economically significant for over-0.5% and over-2% dissatisfied sellers but insignificant for over-5% and over-10% ones. These evidence show that dissatisfied sellers are a better measure than pure exiting, and medium-sized dissatisfied sellers matter most.

To avoid the arbitrary selection of size cut-off points, we present the main results in Table 2.7. Panel A measures dissatisfaction from sellers as fraction of shares sold while panel B uses the proportion of certain sellers out of all institutional sellers. In column (1) of each panel, we use all dissatisfied sellers and in column (2) we restrict to large sellers whose ownership exceeds the average. In each specification, we also include E-index as governance quality measure, and the sample size is reduced substantially due to data availability but the results remain unchanged. We include firm (industry) fixed effect and time fixed effects. The coefficients on (large) dissatisfied ownership sold and the fraction of (large) sellers are both statistically significant and economically meaningful, even after controlling for total institutional ownership. 1 percentage point increase in the (large) dissatisfied sold ownership in the present quarter is associated with a 0.078 (0.072) percentage point increase in the likelihood of subsequent targeting, which is equivalent to increasing the probability of being targeted by (9.7%) 10.5%. 1 standard deviation increase of the fraction of (large) sellers out of total sellers leads to the subsequent targeting probability increase by (24.7%) 25.5%.

Table 2.7: An analysis of dissatisfied institutional sellers and target selection
This table applies a linear probability model to examine how (large) dissatisfied institutional sellers predict the activist target selection. Panel A measures dissatisfaction from sellers as a fraction of shares sold while panel B uses the proportion of certain sellers out of all institutional sellers. All independent variables are as defined in Table 2.1 and 2.5. In each column we report coefficients and we report coefficients and their clustered standard errors. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: aggregated dissatisfied exited ownership								
VARIABLES	(1a) target	(1b) target	(1c) target	(1d) target	(2a) target	(2b) target	(2c) target	(2d) target
S_neg	0.065***	0.078***	0.068***	0.079***				
	(0.015)	(0.014)	(0.024)	(0.021)				
S_neg_large					0.058***	0.072***	0.061**	0.075***
					(0.017)	(0.016)	(0.026)	(0.023)
LogMV	-0.004***	-0.002***	-0.003**	-0.001***	-0.004***	-0.002***	-0.003**	-0.001***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
BM	0.002*	0.003***	0.005**	0.006***	0.002*	0.004***	0.006**	0.006***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Dividend yield	-0.151**	-0.121***	-0.130	-0.112*	-0.147*	-0.121**	-0.128	-0.113*
	(0.076)	(0.047)	(0.089)	(0.068)	(0.076)	(0.047)	(0.089)	(0.068)
Past return	-0.004**	-0.004**	-0.003	-0.003	-0.004**	-0.004***	-0.003	-0.003
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Illiquidity	-0.004	0.000	-0.005	-0.004	-0.004*	-0.000	-0.006	-0.004
	(0.003)	(0.001)	(0.010)	(0.003)	(0.003)	(0.001)	(0.010)	(0.003)
O_total	0.008***	0.011***	0.009*	0.009***	0.008***	0.012***	0.009*	0.009***
	(0.003)	(0.001)	(0.005)	(0.002)	(0.003)	(0.001)	(0.005)	(0.002)
E_index			0.001***	0.000			0.001***	0.000
			(0.001)	(0.000)			(0.001)	(0.000)
Constant	Y	Y	Y	Y	Y	Y	Y	Y
Observations	116,412	116,412	59,101	59,101	116,412	116,412	59,101	59,101
R-squared	0.065	0.008	0.069	0.008	0.065	0.008	0.069	0.008
Firm FE	Y		Y		Y		Y	
Ind FE		Y		Y		Y		Y
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

Panel B: proportions of dissatisfied owners and sellers								
VARIABLES	(1a) target	(1b) target	(1c) target	(1d) target	(2a) target	(2b) target	(2c) target	(2d) target
PS_neg	0.006***	0.006***	0.008***	0.006***				
	(0.001)	(0.001)	(0.002)	(0.002)				
PS_neg_large					0.019***	0.024***	0.040***	0.043***
					(0.005)	(0.005)	(0.013)	(0.012)
LogMV	-0.003***	-0.002***	-0.003**	-0.002***	-0.004***	-0.002***	-0.003**	-0.001***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
BM	0.002	0.004***	0.005**	0.006***	0.002*	0.004***	0.006**	0.006***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Dividend yield	-0.166**	-0.139***	-0.155*	-0.139**	-0.149**	-0.125***	-0.134	-0.120*
	(0.076)	(0.047)	(0.089)	(0.068)	(0.076)	(0.047)	(0.089)	(0.068)
Past return	-0.004***	-0.005***	-0.004	-0.004	-0.004**	-0.005***	-0.003	-0.004
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Illiquidity	-0.005**	-0.001	-0.008	-0.005	-0.005*	-0.001	-0.006	-0.005
	(0.003)	(0.001)	(0.011)	(0.003)	(0.003)	(0.001)	(0.011)	(0.003)
O_total	0.008**	0.012***	0.009*	0.010***	0.008***	0.013***	0.009*	0.010***
	(0.003)	(0.001)	(0.005)	(0.002)	(0.003)	(0.001)	(0.005)	(0.002)
E-index			0.001**	0.000			0.001***	0.000
			(0.001)	(0.000)			(0.001)	(0.000)
Constant	Y	Y	Y	Y	Y	Y	Y	Y
Observations	116,412	116,412	59,101	59,101	116,412	116,412	59,101	59,101
R-squared	0.065	0.008	0.069	0.008	0.065	0.008	0.069	0.008
Firm FE	Y		Y		Y		Y	
Ind FE		Y		Y		Y		Y
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

2.6 Different voices

2.6.1 Measure

Apart from trading, the traditional channel through which institutional investors exert governance or express their (dis)satisfaction is through voice (Shleifer and Vishny, 1986; Brav and Mattews, 2011). More than half of the respondents in McCahery, Sautner and Starks (2016) reported voting against management as a channel of voice. During the annual meeting or special meeting, registered shareholders will need to vote for regular issues such as electing the Board of Directors and approving management compensation, as well as non-regular issues such as change of corporate strategies and mergers and acquisitions, and shareholder sponsored proposals. Proxy advisors such as Institutional Shareholder Service (ISS) and Glass Lewis will also conduct independent research and make recommendations for each proposal. Large investment houses such as pension funds and mutual funds, or those who hold a diversified portfolio of companies, usually rely heavily on their services (Cotter, Palmiter, and Thomas, 2010; Chio, Fisch, and Kaham, 2010).

We use the ISS Voting Analytics database from 2004 to 2014 whichit covers all Russell 3000 companies and keeps the voting records from mutual funds. This dataset provides us with the following information: the meeting date, company name and its ticker, fund name and fund family name, the sponsor of the proposal (management or shareholder), the detailed description of the proposal, the vote the fund casts, ISS recommendation and management recommendation. The majority of the companies use a plurality voting system for director elections where shareholders can vote "For", "Withhold" or "Abstain" while ISS and management will recommend "For" or "Withhold". Under majority voting rule, ISS and management will recommend "For" or "Against" (Li, 2016).

We first fuzzy match the company names with COMPUSTAT and then manually check the accuracy. This step gives us 4,710 unique firms with information on COMPUSTAT during the sample period. As the frequency of annual meetings is yearly but our main variables are constructed on a quarterly basis, we take (1) all past voting results and (2) the closest past voting results before each quarter to construct a disagreement with management measure. For each individual fund j that votes for each proposal s in company i's meeting which takes place at time t, we donate $disagree\ with\ mgt_{s,i,j,t} = 1$ if the vote it casts is different from the management recommendation. As is well documented, the majority of funds will follow the ISS recommendation (Cotter, Palmiter, and Thomas, 2010; Chio, Fisch, and Kaham, 2010). We use a stricter definition of disagreeing management by taking the ISS recommendation into consideration. We donate $disagree\ with\ mgt\&ISS_{s,i,j,t} = 1$ if the vote a fund casts is different from both the management and the ISS recommendation: it captures the cases where the fund votes against the management recommendation even if the ISS agrees with management. This variable will better capture the discontent expressed through the fund's discretionary voting deviating from the the ISS recommendation to go against management. As the variable is constructed on a fund-proposal level, we first aggregate all proposals in a meeting to fund-meeting level by defining

disagree with $\text{mgt}_{i,j,t} = 1$ if $\sum_s^S$ disagree with $\text{mgt}_{s,i,j,t} > 0$, namely, if the fund has disagreed with management once for any proposals during the meeting, we count the fund as a disagreeing fund. For the strict measure, disagree with $\text{mgt\&ISS}_{i,j,t} = 1$ if $\sum_s^S$ disagree with $\text{mgt\&ISS}_{s,i,j,t} > 0$. We also separate different proposal types and this will be discussed below.

Finally we calculate the percentage of disagreeing funds out of the total voting funds:

$$\%\text{ Disagree with mgt}_{i,t} = \frac{\sum_{j=1}^{J} \text{disagree with mgt}_{i,j,t}}{J} \tag{2.18}$$

For the strict measure:

$$\%\text{ Disagree with mgt\&ISS}_{i,t} = \frac{\sum_{j=1}^{J} \text{disagree with mgt\&ISS}_{i,j,t}}{J} \tag{2.19}$$

where J is the total number of voting funds.

In unreported analyses, we also match the 13F institution name with the ISS voting analytics institution name and use ownership as weights to construct voice measures and the results remain similar. As the data contain detailed proposal descriptions, we can also investigate different types of proposals where the disagreement is expressed. We first separate proposal types by sponsors: management and shareholder sponsored proposals. Most management sponsored proposals are routine ones such as director election, management compensation, annual report, and so on. Shareholder sponsored proposals address various issues such as director election, mergers and acquisitions, corporate social responsibility, and so on. We further break down proposal types by separating governance related, compensation related, capital structure and strategy related, and others. We adopt the characterization similar to that of Li (2016). Governance proposals include proposals related to the Board of Directors and anti-takeover issues. Compensation proposals involve equity-based and cash incentive plans, deferred compensation, and stock purchase plans. Capital structure and strategy related proposals are related to stock authorization, share repurchases/dividends, and takeover/reorganization. Proposals in the "other" category include routine proposals such as auditor ratification and miscellaneous proposals.

2.6.2 Summary statistics of voices

We report the summary statistics of institutional voices in Table 2.8. Panel A (B) reports the aggregated disagreement with management (&ISS) recommendations from voting funds during the annual meetings. The aggregated disagreement with management (&ISS) recommendation is defined in equation 2.18 (2.19). Columns (1) and (2) present the means, standard deviations, and medians of characteristics for the target sample and control sample. Column (3) reports the differ-

ence and t-statistics between the two samples. $(S)Voice\_all$ is the disagreement with management (&ISS) recommendations for all proposals. $(S)Voice\_mgt$ and $(S)Voice\_shr$ separates proposals as management sponsored and shareholder sponsored. $(S)Voice\_class$ further separates proposals to be management sponsored compensation related (C1), management sponsored governance related (C2), management sponsored miscellaneous and other items (C3), management sponsored capital structure and strategy related (C4), shareholder sponsored compensation related (C5), shareholder sponsored governance related (C6), and shareholder sponsored other proposals (C7).

Table 2.8: Summary statistics of institutional voices
This table reports the characteristics of institutional voice expressed through voting in the annual meetings of sample firms. Panel A (B) reports the aggregated disagreement with management (&ISS) recommendations from voting funds during the annual meetings. The aggregated disagreement with management (&ISS) recommendations is defined in equation 2.18 (2.19). Column (1) presents the means, standard deviations, and medians of characteristics for the target companies. Column (2) reports the means, standard deviations, and medians of characteristics for the firms in the control sample which covers all COMPUSTAT firms with data available on CRSP, ISS voting analytics, and 13F database. Column (3) reports the differences between the target and control samples. $(S)Voice\_all$ is the disagreement with management (&ISS) recommendations for all proposals. $(S)Voice\_mgt$ and $(S)Voice\_shr$ separates proposals as management sponsored and shareholder sponsored. $(S)Voice\_class$ further separates proposals to be management sponsored compensation related (C1), management sponsored governance related (C2), management sponsored miscellaneous and other items (C3), management sponsored capital structure and strategy related (C4), shareholder sponsored compensation related (C5), shareholder sponsored governance related (C6), and shareholder sponsored other proposals (C7). A detailed classification can be found in subsection 2.6.1. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Voice – recent disagreement with management								
VARIABLES	Target			Control			Comparison	
	Mean	SD	Median	Mean	SD	Median	Difference	t-statistics
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)
Voice_all	0.333	0.307	0.235	0.331	0.308	0.215	-0.002	-0.20
Voice_mgt	0.301	0.289	0.195	0.293	0.291	0.169	-0.009	-0.88
Voice_shr	0.533	0.324	0.564	0.529	0.318	0.553	-0.004	-0.14
Voice_c1	0.267	0.288	0.142	0.222	0.270	0.096	-0.046***	-4.41
Voice_c2	0.199	0.229	0.089	0.201	0.243	0.082	0.003	0.31
Voice_c3	0.044	0.168	0	0.050	0.178	0	0.005	0.79
Voice_c4	0.178	0.247	0.060	0.189	0.259	0.084	0.011	0.61
Voice_c5	0.330	0.226	0.452	0.405	0.243	0.474	0.075*	2.19
Voice_c6	0.706	0.275	0.798	0.641	0.292	0.704	-0.065*	-2.03
Voice_c7	0.268	0.214	0.290	0.232	0.197	0.224	-0.036	-1.49
Panel B: Strict voice – recent disagreement with management & ISS								
	Mean	SD	Median	Mean	SD	Median	Difference	t-statistics
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)
SVoice_all	0.139	0.146	0.092	0.122	0.129	0.083	-0.017***	-3.83
SVoice_mgt	0.137	0.146	0.090	0.120	0.128	0.080	-0.018***	-4.08
SVoice_shr	0.026	0.063	0	0.030	0.066	0	0.004	0.71
SVoice_c1	0.123	0.168	0.048	0.091	0.132	0.034	-0.032***	-6.31
SVoice_c2	0.098	0.118	0.051	0.087	0.109	0.046	-0.011**	-2.86
SVoice_c3	0.007	0.036	0	0.008	0.037	0	0.000	0.35
SVoice_c4	0.105	0.166	0.024	0.092	0.131	0.029	-0.012	-1.38
SVoice_c5	0.039	0.073	0	0.027	0.063	0	-0.012	-1.39
SVoice_c6	0.021	0.068	0	0.022	0.062	0	0.001	0.12
SVoice_c7	0.035	0.065	0	0.038	0.064	0.008	0.003	0.36

Intuitively, when comparing the disagreement with management or the disagreement with management&ISS between the target and control group we find that both the closest past and all past disagreement are higher among target group before targeting than the control group, and the difference when we use disagreement with management&ISS is statistically significant. For example, about 12.2% voting funds disagree with the management&ISS recommendations in our control sample while that is 13.9% in the target sample. The difference also is largely from management sponsored issues which are mainly routine proposals. It seems that shareholders' discontent with regular issues rather than other shareholder proposals are more likely to induce activism. This is consistent with some of the responses given by McCahery, Sautner and Starks (2016) that shareholders rarely pass on proposals to actual voting either due to early settlement or due to avoiding confrontation, which makes shareholder proposals rare and may not capture the discontent from all shareholders. For regular votes, we further discover that the control sample and target sample statistically differ in discontent in compensation and governance related issues. 12.3% (9.8%) funds vote out of their discretion against management recommendations for proposals related to executive compensation (governance) before campaigns in the target company while only 9.1% (8.7%) vote against management in the control sample. We also find the strict measure of the disagreement with management&ISS has more statistical power to distinguish the target and control sample.

2.6.3 Regression results for different voices

Are activists more likely to target companies with more disagreement with management expressed through voting?

To investigate whether activists selectively target companies with more disagreement expressed during annual meetings, based on the summary statistics, we run the following regression:

$$\text{Target}_{i,t+1} = \alpha + \beta \times \text{disagree with mgt\&ISS}_{i,t} + \gamma \times Z_{i,t} + \theta_t + \delta_i + \varepsilon_{i,t} \quad (2.20)$$

$\text{Target}_{i,t+1} = 1$ if company i is targeted during the quarter end at $t+1$. $Z_{i,t}$ is a set of firm controls discussed in the previous subsections. δ_i is industry fixed effect (results with firm fixed effect are untabulated and discussed below) and we also include quarter fixed effect θ_t. We also separate for different type of proposal and the results are presented in Table 2.9. Panel A (B) shows the results without (with) E-index. Clustered standard errors are reported in parentheses.

Table 2.9: An analysis of institutional voice and target selection
This table applies a linear probability model to examine how dissatisfaction through voting in annual meetings predicts the activist target selection. Panel A reports the full sample results and Panel B reports the sub sample with E-index available. All independent variables are as defined in Table 2.1 and 2.8. In each column we report coefficients and their clustered standard errors. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: full sample										
VARIABLES	(1a) target	(2a) target	(3a) target	(4a) target	(5a) target	(6a) target	(7a) target	(8a) target	(9a) target	(10a) target
SVoice_all	0.005**									
	(0.002)									
SVoice_mgt		0.005**								
		(0.002)								
sSVoice_shr			0.002							
			(0.007)							
SVoice_c1				0.007**						
				(0.003)						
SVoice_c2					0.005*					
					(0.003)					
SVoice_c3						-0.000				
						(0.007)				
SVoice_c4							0.002			
							(0.004)			
SVoice_c5								0.016		
								(0.016)		
SVoice_c6									0.005	
									(0.008)	
SVoice_c7										-0.008
										(0.012)
LogMV	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.003***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
BM	0.004***	0.004***	0.001	0.004***	0.004***	0.004***	0.003***	0.006**	0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.002)
Dividend	-0.119**	-0.119**	-0.042	-0.128**	-0.121**	-0.109**	-0.132	-0.199	-0.013	-0.197
yield	(0.047)	(0.047)	(0.116)	(0.055)	(0.047)	(0.049)	(0.083)	(0.166)	(0.116)	(0.171)
Past return	-0.005***	-0.005***	-0.009**	-0.005***	-0.005***	-0.005***	-0.007***	-0.003	-0.005	-0.012**
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.007)	(0.004)	(0.005)
Illiquidity	-0.001	-0.001	-0.002	-0.002	-0.001	0.001	-0.001	0.005	0.000	-0.013
	(0.001)	(0.001)	(0.005)	(0.002)	(0.001)	(0.002)	(0.002)	(0.030)	(0.004)	(0.026)
O_total	0.012***	0.012***	0.010***	0.011***	0.013***	0.011***	0.010***	0.012**	0.009***	0.008*
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.002)	(0.005)	(0.003)	(0.004)
Constant	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	116,412	116,412	23,938	93,761	116,229	103,443	36,036	9,289	17,537	13,103
R-squared	0.007	0.007	0.013	0.008	0.007	0.007	0.008	0.021	0.012	0.019
Ind FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

	Panel B: sub sample with E-index available									
VARIABLES	(1b) target	(2b) target	(3b) target	(4b) target	(5b) target	(6b) target	(7b) target	(8b) target	(9b) target	(10b) target
SVoice_all	0.006*									
	(0.003)									
SVoice_mgt		0.005								
		(0.003)								
SVoice_shr			0.002							
			(0.007)							
SVoice_c1				0.012***						
				(0.004)						
SVoice_c2					0.009**					
					(0.004)					
SVoice_c3						0.010				
						(0.013)				
SVoice_c4							-0.003			
							(0.005)			
SVoice_c5								0.020		
								(0.015)		
SVoice_c6									0.005	
									(0.008)	
SVoice_c7										-0.004
										(0.012)
LogMV	-0.002***	-0.002***	-0.003***	-0.002***	-0.002***	-0.002***	-0.002***	-0.003***	-0.003***	-0.002***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
BM	0.006***	0.006***	0.002	0.005***	0.006***	0.005***	0.003**	0.007*	0.002	0.003
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
Dividend	-0.111	-0.111	0.013	-0.110	-0.112*	-0.075	-0.163*	-0.241	0.027	-0.268*
yield	(0.068)	(0.068)	(0.125)	(0.070)	(0.068)	(0.070)	(0.085)	(0.185)	(0.145)	(0.137)
Past return	-0.004	-0.004	-0.008*	-0.004	-0.004	-0.004*	-0.007*	-0.001	-0.007	-0.006
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.004)	(0.007)	(0.005)	(0.006)
Illiquidity	-0.005	-0.005	-0.013	-0.009***	-0.006	-0.005	-0.006	0.098**	-0.013	0.006
	(0.003)	(0.003)	(0.021)	(0.003)	(0.004)	(0.004)	(0.007)	(0.045)	(0.020)	(0.052)
O_total	0.010***	0.010***	0.010***	0.008***	0.010***	0.010***	0.013***	0.010	0.008*	0.006
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.003)	(0.006)	(0.004)	(0.005)
E_index	0.000	0.000	0.000	0.000	0.001*	0.001	-0.000	-0.001	-0.001	0.000
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Constant	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	59,101	59,101	20,151	51,934	59,064	53,910	20,063	8,479	14,964	11,775
R-squared	0.008	0.008	0.012	0.009	0.008	0.008	0.012	0.018	0.013	0.016
Ind FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

Consistent with the summary statistics, the positive and statistically significant coefficient of discontent expressed through voting against management&ISS indicates that the more discontent of the voters, the higher the probability of activism targeting. When decomposing into different proposal types, we find that management sponsored proposal and especially compensation and governance related proposal have more predicting power on targeting than the rest. Management sponsored compensation has the highest power and economic magnitude. 1 standard deviation of disagreement with management&ISS measured at the closest voting date before the quarter start increases the probability of targeting during the quarter by 16.8%. In untabulated analysis, we use all past voting records to measure disagreement and find the result is stronger for measures taken at the closest voting date. This means activists weighs more on the more "recent" discontent than further in the past. The results remain unchanged when we include E-index, which means the discontent measure is different from traditional internal governance measures.

When we control for firm fixed effects, the coefficient on voting becomes

statistically insignificant. This is potentially because voice measure is less frequent and measured on an annual basis. We also reduce the frequency to annual basis and the result (untabulated) remains the same.

2.7 How the three measures affect target selection simultaneously?

In this section, we add all the three measures – holding, exiting as well as voice – to investigate which signals the activists pick up while targeting, and the results are presented in Table 2.10. As the disagreement in management sponsored compensation proposals has the most power and economic magnitude, we use it as the proxy for voice. We run the following panel regression:

$$\text{Target}_{i,t+1} = \alpha + \beta_1 \times \text{dissatisfied owners}_{i,t} + \beta_2 \times \text{dissatisfied sellers}_{i,t} + \beta_3 \times \text{voice}_{i,t} + \gamma \times Z_{i,t} + \theta_t + \delta_i + \varepsilon_{i,t} \tag{2.21}$$

We measure dissatisfied owners and sellers both in ownership percentage as well as fractions of numbers. We also restrict both variable specification to large dissatisfied owners and sellers to capture the institutions that have more than average stakes and thus may matter more in activists' target selections. We also include the rest of the ownership after separating out dissatisfied ownership from total ownership. Table 2.10 panel A measures holding and exiting as fraction of shares while panel B uses the proportion of certain institutions out of all institutional investors. In column (1) of each panel, we use all dissatisfied owners or sellers and in column (2) we restrict to large owners or sellers whose ownership exceeds the average. In each specification, we also include E-index as governance quality measure, and the sample size is reduced substantially due to data availability. We include firm (industry) fixed effect and time fixed effects. Clustered robust standard errors are reported in parentheses.

Table 2.10: An analysis of institutional dissatisfaction and target selection
This table applies a linear probability model to examine how dissatisfaction measured as holding, exiting and voice predicts the activist target selection. Panel A measures holding and exiting as fractions of shares while panel B uses the proportion of certain institutions out of all institutional investors. In column (1) of each panel, we use all dissatisfied owners or sellers and in column (2) we restrict to large owners or sellers whose ownership exceeds the average. In each specification, we also include E-index as governance quality measure. *O_rest* is the difference between total institutional ownership and certain ownership decomposition. For example, in column (1a) *O_rest* is the difference between total institutional ownership and *O_neg*. All other independent variables are as defined in Table 2.1, 2.2, 2.5, and 2.8. In each column we report coefficients and their clustered standard error. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Panel A: aggregated dissatisfied ownership and exited ownership							
VARIABLES	(1a) target	(1b) target	(1c) target	(1d) target	(2a) target	(2b) target	(2c) target	(2d) target
O_neg	0.014***	0.013***	0.008***	0.012**				
	(0.002)	(0.004)	(0.003)	(0.006)				
S_neg	0.048***	0.037**	0.059**	0.052**				
	(0.014)	(0.015)	(0.023)	(0.025)				
O_neg_large					0.015***	0.014***	0.009***	0.013**
					(0.002)	(0.004)	(0.003)	(0.006)
S_neg_large					0.036**	0.024	0.053**	0.045*
					(0.015)	(0.016)	(0.025)	(0.026)
SVoice_c1	0.011***	0.007	0.016***	0.014	0.011***	0.007	0.016***	0.014
	(0.003)	(0.006)	(0.005)	(0.008)	(0.003)	(0.006)	(0.005)	(0.008)
LogMV	-0.002***	-0.003***	-0.001***	-0.003**	-0.002***	-0.003***	-0.001***	-0.003**
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
BM	0.003***	0.003*	0.004***	0.003	0.003***	0.003*	0.005***	0.003
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Dividend yield	-0.140**	-0.156*	-0.113	-0.151	-0.140**	-0.153*	-0.115	-0.149
	(0.055)	(0.089)	(0.071)	(0.103)	(0.055)	(0.089)	(0.071)	(0.103)
Past return	-0.003	-0.002	-0.002	-0.000	-0.003	-0.002	-0.002	-0.000
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Illiquidity	-0.001	-0.010***	-0.007**	-0.016	-0.002	-0.010***	-0.007**	-0.016
	(0.002)	(0.003)	(0.003)	(0.012)	(0.002)	(0.003)	(0.003)	(0.012)
O_rest	0.008***	0.006	0.006**	0.007	0.009***	0.006	0.006**	0.006
	(0.002)	(0.004)	(0.003)	(0.006)	(0.002)	(0.004)	(0.003)	(0.006)
E-index			0.000	0.001*			0.000	0.001*
			(0.000)	(0.001)			(0.000)	(0.001)
Constant	Y	Y	Y	Y	Y	Y	Y	Y
Observations	93,761	93,761	51,934	51,934	93,761	93,761	51,934	51,934
R-squared	0.009	0.067	0.009	0.071	0.008	0.067	0.009	0.070
Firm FE		Y		Y		Y		Y
Ind FE	Y		Y		Y		Y	
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

Panel B: proportions of dissatisfied owners and sellers								
VARIABLES	(1a) target	(1b) target	(1c) target	(1d) target	(2a) target	(2b) target	(2c) target	(2d) target
PO_neg	0.002	0.004**	0.001	0.003				
	(0.001)	(0.002)	(0.002)	(0.002)				
PS_neg	0.005***	0.006***	0.005**	0.005**				
	(0.002)	(0.002)	(0.002)	(0.002)				
PO_neg_large					0.019***	0.023***	0.011	0.023***
					(0.005)	(0.006)	(0.008)	(0.008)
PS_neg_large					0.018***	0.013**	0.034***	0.030**
					(0.006)	(0.006)	(0.013)	(0.014)
SVoice_c1	0.011***	0.008	0.017***	0.014*	0.011***	0.007	0.016***	0.014
	(0.003)	(0.006)	(0.005)	(0.008)	(0.003)	(0.006)	(0.005)	(0.008)
LogMV	-0.002***	-0.003***	-0.001***	-0.004***	-0.002***	-0.003***	-0.001***	-0.003**
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
BM	0.003***	0.002*	0.005***	0.003	0.003***	0.003*	0.005***	0.003
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Dividend yield	-0.149***	-0.170*	-0.132*	-0.170*	-0.137**	-0.154*	-0.118*	-0.154
	(0.055)	(0.089)	(0.071)	(0.103)	(0.055)	(0.089)	(0.070)	(0.103)
Past return	-0.004*	-0.002	-0.003	-0.001	-0.003	-0.001	-0.002	-0.000
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
Illiquidity	-0.002	-0.011***	-0.009**	-0.018	-0.003	-0.011***	-0.008**	-0.017
	(0.002)	(0.003)	(0.003)	(0.013)	(0.002)	(0.003)	(0.003)	(0.013)
O_total	0.011***	0.008**	0.007***	0.007	0.011***	0.009**	0.008***	0.008
	(0.001)	(0.004)	(0.002)	(0.006)	(0.001)	(0.004)	(0.002)	(0.006)
E-index			0.000	0.001*			0.000	0.001*
			(0.000)	(0.001)			(0.000)	(0.001)
Constant	Y	Y	Y	Y	Y	Y	Y	Y
Observations	93,761	93,761	51,934	51,934	93,761	93,761	51,934	51,934
R-squared	0.009	0.067	0.009	0.071	0.008	0.067	0.009	0.071
Firm FE		Y		Y		Y		Y
Ind FE	Y		Y		Y		Y	
Qtr FE	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

We find that all the three measures – the dissatisfied owners, dissatisfied sellers and voice – are associated with subsequent targeting controlling for industry and quarter fixed effects. Voice becomes insignificant but economically unchanged after controlling for firm fixed effect (columns (1b) and (1d)). Interestingly, after including dissatisfied owners and sellers and firm fixed effect (in columns (1d) and (2d)), the rest of the ownership becomes economically small and insignificant at 10%, which indicates that the dissatisfaction of existing owners and sellers is more important than simple total institutional ownership for activists' target selection. The magnitude of our variables of interest is also economically meaningful. Take column (1a) in panel A Table 2.10 for example, 1 percentage point increase in the dissatisfied ownership (sold) is associated with 0.014 (0.048) percentage point increase in the probability of targeting. A 1 percentage point increase in disagreement with management & ISS in the closest past annual voting is associated with a 0.011 percent point increase in the probability of targeting. The magnitude remains similar to that when we analyse each proxy individually. When we further restrict to large dissatisfied owners and large dissatisfied sellers, the results remains similar. The magnitude of large dissatisfied owners become slightly bigger. This is plausible in that the activists need to rely on existing large shareholders to push changes in companies and their dissatisfaction with stock performance may indicate a higher chance or less effort for activists to gain support. The magnitude of large dissatisfied sellers becomes smaller and its statistical power is slightly reduced. This indicates

that it is the small dissatisfied sellers' consensus move that signals the prospect of the company which may attract activists' attention. In panel B Table 2.10, we also present the results with the alternative measure of the ratio of the number of dissatisfied owners to that of total owners as well as the ratio of the number of dissatisfied sellers to that of total sellers. We include total ownership as the control variable for the baseline specification for ownership structure. The results remain largely unchanged.

Controlling for other factors, the combination of selling which dips share price, as well as continued holding from existing dissatisfied owners which can provide potential support for the activists, increases the likelihood of a stock becoming the target of a campaign. We present in the next section some suggestive evidence on how the remaining dissatisfied owners affect activists' tactics and success.

2.8 How dissatisfied owners affect campaigns cross-sectionally?

2.8.1 Activists' tactics

After recognizing the importance of institutional shareholder base for target selection, we also investigate how different institutional characteristics of target firms affect activists' tactics and its initial impact measured by the announcement returns. Activists' tactics are obtained from their item 4 disclosure in schedule 13D as well as extensive news search on Factiva. The filer is required to state their "purpose of transaction" in Item 4 and we use the sample classification as in Brav, Jiang, Partnoy, and Thomas (2008). The activist may also submit shareholder proposals, engage in proxy fights, and seek a board seat. We also code $threat = 1$ if the activist threatens to sue the management or submit shareholder proposals regardless its actual subsequent actions. Usually an activist will use a variety of tactics, thus the above ones are not mutually exclusive.

We summarize the usage of all tactics in our sample in Table 2.1. There are 11.2% cases where activists threaten to sue management and the frequencies for takeover bid, submitting proposals and seeking board representation is 3.4%, 14.1% and 20.9% respectively.

We investigate how the remaining displeased owners affect the activists' tactics by running the following probit regression on activists' target sample only:

$$\text{Tactics}_{i,t} = \alpha + \beta \times \text{dissatisfied owners}_{i,t} + \gamma \times Z_{i,t} + \varepsilon_{i,t} \tag{2.22}$$

The result is presented in Table 2.11 with panel A investigating the tactics of threat, panel B of proposals, panel C of takeover bids and panel D of board representation. Both the coefficient estimates and associated marginal probabilities are reported. Clustered standard errors are in parentheses.

Table 2.11: An analysis of institutional dissatisfied owners and activist's tactics
This table applies a probit model to examine how the existence of dissatisfied institutions affects activists' tactics. Threats, shareholder proposals, takeover bids and seeking board representations are investigated in each panel. *O_rest* is the difference between total institutional ownership and certain ownership decomposition. For example, in column (1a) *O_rest* is the difference between total institutional ownership and *O_neg*. All other independent variables are as defined in Table 2.1 and 2.2. In each column we report probit coefficients, their heteroscedasticity-robust standard errors, and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Panel A: threat								Panel B: proposal							
	(1a)		(2a)		(3a)		(4a)		(1b)		(2b)		(3b)		(4b)	
VARIABLES	Threat	Mfx	Threat	Mfx	Threat	Mfx	Threat	Mfx	Pro	Mfx	Pro	Mfx	Pro	Mfx	Pro	Mfx
O_neg			0.620***	0.115***							-0.095	-0.021				
			(0.226)	(0.042)							(0.209)	(0.046)				
O_neg_large	0.719***	0.134***							-0.096	-0.021						
	(0.256)	(0.047)							(0.239)	(0.053)						
PO_neg					0.402**	0.075**							-0.018	-0.004		
					(0.201)	(0.037)							(0.185)	(0.041)		
PO_neg_large							1.555**	0.291**							-0.056	-0.012
							(0.747)	(0.139)							(0.716)	(0.159)
LogMV	0.035	0.006	0.036	0.007	0.028	0.005	0.043	0.008	-0.042	-0.009	-0.042	-0.009	-0.038	-0.008	-0.038	-0.009
	(0.051)	(0.009)	(0.051)	(0.009)	(0.051)	(0.010)	(0.053)	(0.010)	(0.050)	(0.011)	(0.050)	(0.011)	(0.050)	(0.011)	(0.051)	(0.011)
BM	0.047	0.009	0.049	0.009	0.064	0.012	0.078	0.015	0.083	0.018	0.084	0.019	0.080	0.018	0.079	0.018
	(0.088)	(0.016)	(0.088)	(0.016)	(0.086)	(0.016)	(0.086)	(0.016)	(0.085)	(0.019)	(0.085)	(0.019)	(0.085)	(0.019)	(0.085)	(0.019)
Dividend	-7.729	-1.436	-7.909	-1.470	-8.670	-1.624	-9.401	-1.760	18.406	4.091	18.382	4.085	18.589	4.132	18.637	4.143
yield	(14.463)	(2.687)	(14.458)	(2.687)	(14.472)	(2.710)	(14.410)	(2.699)	(12.863)	(2.861)	(12.859)	(2.860)	(12.870)	(2.863)	(12.916)	(2.873)
Past return	0.374	0.069	0.379	0.070	0.385	0.072	0.321	0.060	0.191	0.042	0.185	0.041	0.216	0.048	0.221	0.049
	(0.303)	(0.056)	(0.305)	(0.057)	(0.319)	(0.060)	(0.305)	(0.057)	(0.265)	(0.059)	(0.266)	(0.059)	(0.278)	(0.062)	(0.269)	(0.060)
Illiquidity	-0.447	-0.083	-0.436	-0.081	-0.479	-0.090	-0.508	-0.095	0.093	0.021	0.091	0.020	0.096	0.021	0.097	0.022
	(0.320)	(0.059)	(0.319)	(0.059)	(0.325)	(0.061)	(0.329)	(0.061)	(0.240)	(0.053)	(0.239)	(0.053)	(0.241)	(0.054)	(0.244)	(0.054)
O_rest	-0.518	-0.096	-0.516	-0.096	-0.175	-0.033	-0.193	-0.036	0.381	0.085	0.388	0.086	0.331	0.074	0.332	0.074
	(0.329)	(0.061)	(0.330)	(0.061)	(0.295)	(0.055)	(0.296)	(0.055)	(0.320)	(0.071)	(0.321)	(0.071)	(0.289)	(0.064)	(0.293)	(0.065)
Constant	Y		Y		Y		Y		Y		Y		Y		Y	
Observations	892	892	892	892	892	892	892	892	892	892	892	892	892	892	892	892
	Panel C: takeover bid								Panel D: seeking board representation							
	(1c)		(2c)		(3c)		(4c)		(1d)		(2d)		(3d)		(4d)	
VARIABLES	Takeover	Mfx	Takeover	Mfx	Takeover	Mfx	Takeover	Mfx	Boardrep	Mfx	Boardrep	Mfx	Boardrep	Mfx	Boardrep	Mfx
O_neg	0.279	0.020							0.120	0.034						
	(0.388)	(0.028)							(0.218)	(0.062)						
O_neg_large			0.264	0.019							0.112	0.032				
			(0.347)	(0.025)							(0.191)	(0.055)				
PO_neg					0.237	0.017							0.136	0.039		
					(0.311)	(0.022)							(0.171)	(0.049)		
PO_neg_large							0.593	0.043							-0.090	-0.026
							(1.053)	(0.076)							(0.638)	(0.183)
LogMV	0.074	0.005	0.076	0.005	0.076	0.005	0.077	0.006	0.059	0.017	0.060	0.017	0.061	0.018	0.053	0.015
	(0.071)	(0.005)	(0.071)	(0.005)	(0.071)	(0.005)	(0.074)	(0.005)	(0.045)	(0.013)	(0.046)	(0.013)	(0.045)	(0.013)	(0.047)	(0.013)
BM	0.058	0.004	0.057	0.004	0.057	0.004	0.064	0.005	0.113	0.032	0.113	0.032	0.113	0.032	0.118	0.034
	(0.146)	(0.010)	(0.146)	(0.010)	(0.145)	(0.010)	(0.142)	(0.010)	(0.080)	(0.023)	(0.080)	(0.023)	(0.081)	(0.023)	(0.079)	(0.023)
Dividend	-34.091	-2.441	-34.072	-2.438	-33.846	-2.422	-34.458	-2.475	-10.046	-2.873	-10.042	-2.872	-9.983	-2.854	-10.233	-2.927
yield	(27.841)	(1.959)	(27.815)	(1.955)	(27.691)	(1.944)	(27.738)	(1.953)	(13.864)	(3.964)	(13.860)	(3.963)	(13.850)	(3.959)	(13.892)	(3.973)
Past return	0.221	0.016	0.234	0.017	0.288	0.021	0.203	0.015	-0.194	-0.056	-0.189	-0.054	-0.144	-0.041	-0.255	-0.073
	(0.389)	(0.028)	(0.392)	(0.028)	(0.421)	(0.030)	(0.387)	(0.028)	(0.255)	(0.073)	(0.256)	(0.073)	(0.270)	(0.077)	(0.260)	(0.074)
Illiquidity	0.396	0.028	0.400	0.029	0.379	0.027	0.375	0.027	0.151	0.043	0.153	0.044	0.142	0.041	0.155	0.044
	(0.295)	(0.021)	(0.296)	(0.021)	(0.295)	(0.021)	(0.296)	(0.021)	(0.230)	(0.066)	(0.231)	(0.066)	(0.231)	(0.066)	(0.231)	(0.066)
O_rest	-0.094	-0.007	-0.105	-0.008	0.025	0.002	0.016	0.001	-0.010	-0.003	-0.016	-0.004	0.036	0.010	0.061	0.018
	(0.542)	(0.039)	(0.545)	(0.039)	(0.465)	(0.033)	(0.468)	(0.034)	(0.294)	(0.084)	(0.295)	(0.084)	(0.268)	(0.077)	(0.268)	(0.077)
Constant	Y		Y		Y		Y		Y		Y		Y		Y	
Observations	892	892	892	892	892	892	892	892	892	892	892	892	892	892	892	892

We find weak evidence that the more dissatisfied owners are before a campaign, the more likely the activist will make a takeover bid and seek board representation, although the results are not statistically significant. This may be due to the fact that activists' tactics are selected to maximize their opportunities to achieve their goals and thus are more company specific. Interestingly, we find that the higher the dissatisfied ownership (or the number of dissatisfied owners), the higher the probability the activist threat to sue the management or take other hostile actions. This is plausible as activists can pressure managers more especially when the existing shareholders are dissatisfied with poor company performance.

2.8.2 Cross-sectional returns

Often the announcement returns are seen as the perceived success of activists (Brav, Jiang, Partnoy, and Thomas, 2008). We conjecture that the existence of dissatisfied owners are more likely to support the activists and thus for campaigns with more potential supporters, the activists may have a higher chance of success. In this subsection, we present evidence to support this conjecture.

We first measure the cumulative abnormal announcement return for the window [-5,5] and [-10,10] trading days around the announcement day. To see if there is any reversal, we also measure the cumulative abnormal quarterly return around the announcement using the [-2,60] trading days window. For long term return and long term success, our measure of dissatisfied ownership (before-target quarter) is beyond its scope thus we do not investigate it here. The summary statistics for the short term and long term returns is presented in Table 2.1. Similar to the prior literature, our sample experiences a statistically significant return during the 10 (20) day window around the announcement and is 4.1% (4.3%) on average. The quarterly return after the announcement is 2.7% on average.

We regress announcement returns as well as subsequent quarterly returns on the existence of displeased owners for the activism sample:

$$\text{Return}_{i,t} = \alpha + \beta \times \text{dissatisfied owners}_{i,t} + \gamma \times Z_{i,t} + \varepsilon_{i,t} \tag{2.23}$$

We report the results for different return specifications in columns (1), (2), and (3) in Table 2.12 respectively. In each specification, we use the same four different measures of dissatisfied owners as before. Heteroscedasticity-robust standard errors are in parentheses.

Table 2.12: An analysis of institutional dissatisfied owners and target firm stock returns

This table applies an ordinary least square model to examine how the existence of dissatisfied institutions affects activists' campaign announcement returns. Column (1) and (2) investigates short term market reaction while column (3) use the quarterly return as a long term measure. All other independent variables are as defined in Table 2.1 and 2.2. In each column we report coefficients and their heteroscedasticity-robust standard errors. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	(1a)	(1b)	(1c)	(1d)	(2a)	(2b)	(2c)	(2d)	(3a)	(3b)	(3c)	(3d)
	Returns	Returns	Returns	Returns	Returns	Returns	Returns	Returns	Returns	Returns	Returns	Returns
VARIABLES	[-5,+5]	[-5,+5]	[-5,+5]	[-5,+5]	[-10,+10]	[-10,+10]	[-10,+10]	[-10,+10]	[-2,+60]	[-2,+60]	[-2,+60]	[-2,+60]
O_neg		0.026*				0.036*				0.059**		
		(0.014)				(0.019)				(0.025)		
O_neg_large	0.029*				0.041*				0.069**			
	(0.016)				(0.021)				(0.029)			
PO_neg			0.021*				0.017					0.035
			(0.013)				(0.018)					(0.024)
PO_neg_large				0.086*				0.078			0.230**	
				(0.046)				(0.068)			(0.092)	
LogMV	0.002	0.003	0.003	0.004	-0.001	-0.001	-0.001	-0.000	0.018***	0.018***	0.022***	0.019***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)	(0.007)	(0.007)	(0.007)
BM	0.013	0.013	0.014*	0.014*	0.010	0.010	0.011	0.011	0.006	0.006	0.008	0.008
	(0.008)	(0.008)	(0.008)	(0.008)	(0.012)	(0.012)	(0.012)	(0.012)	(0.016)	(0.016)	(0.016)	(0.016)
Dividend yield	-0.646	-0.648	-0.733	-0.766	-0.026	-0.031	-0.179	-0.204	-2.034	-2.046	-2.310	-2.277
	(0.848)	(0.848)	(0.847)	(0.856)	(1.327)	(1.327)	(1.329)	(1.341)	(1.690)	(1.691)	(1.687)	(1.693)
Past return	0.019	0.019	0.022	0.020	0.044	0.044	0.040	0.039	-0.025	-0.024	-0.019	-0.027
	(0.023)	(0.023)	(0.025)	(0.024)	(0.034)	(0.034)	(0.036)	(0.035)	(0.047)	(0.047)	(0.048)	(0.051)
Illiquidity	-0.007	-0.007	-0.011	-0.013	0.026	0.026	0.021	0.019	0.123**	0.123**	0.108*	0.114*
	(0.020)	(0.020)	(0.020)	(0.020)	(0.032)	(0.032)	(0.031)	(0.031)	(0.060)	(0.060)	(0.060)	(0.061)
Constant	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	892	892	892	892	892	892	892	892	892	892	892	892
R-squared	0.011	0.011	0.010	0.011	0.011	0.011	0.008	0.009	0.024	0.023	0.024	0.020

We find that all our proxies for dissatisfied owners are significantly and positively associated with the perceived success of activists upon announcement. A 1 percentage increase in the dissatisfied ownership is associated with 2.6 (3.6) basis point increase in the 10 (20) days return around announcement and the result is not reversed but slightly increases for the following quarter. The magnitudes of coefficient for large owners are slightly bigger. This provides some suggestive evidence that the presence of such a discontented shareholder base may well be more pro-activist and lead to their success of pushing changes in these companies.

2.9 Evidence on support to activists from dissatisfied owners

This section attempts to provide direct evidence for our conjecture that dissatisfied institutions can be the potential allies of activists and thus we test how they vote during annual meetings under the influence of the campaigns as well as after the campaigns. As is shown in Brav, Jiang, Partnoy, and Thomas (2008), the median campaign length is 369 days, for each target company with voting records after a campaign announcement, we take the annual meeting that takes place during one calendar year after campaign announcement as the campaign year annual meeting. Voting against management can be seen as pro-activist (Kedia, Starks and Wang, 2016) and we investigate whether institutions classified as *dissatisfied* before a campaign announcement are more likely to vote against management in the subsequent

annual meetings of the target firms. We also check whether dissatisfied institutions vote differently from others during the annual meetings after campaign years to rule out the different voting preferences between them unrelated to dissatisfaction of the target stock. As management sponsored proposals are routine proposals that do not suffer from selection problems, we mainly focus on these proposal types. One of the common activism agendas is to target companies with excessive executive compensation and we also analyse management sponsored compensation related proposals.

We use the same definition of dissatisfied owners as in section 2.4. Dissatisfied owners are defined at the quarter end immediately before the campaign announcement. We manually match the 13F institution name with ISS voting analytics N-PX institution ID and there are in total 193 institutions, 799 firm-year annual meetings in the campaign year and 1,838 firm-year annual meetings afterwards. On average, institutions vote against management proposals 10.1% of the time, while the ISS recommends against management 7.8% of the time. For each voting institution (fund family), we follow the literature and define % *against* as the proportion of its total funds voting against management. As the measure also captures disagreement within fund family, we also defined the dummy variable $against = 1$ if there is at least one fund within the fund family vote against management.

We present the results in Table 2.13. Panel A presents all management sponsored compensation related proposals while panel B includes all management sponsored proposals. Column (a) presents the ordinary least square results with percentage funds within a fund family against management as dependent variable while column (b) presents the result of the linear probability model using dummy variable $against = 1$ as the dependent variable. Column (1) includes annual meetings during one year after the campaign announcement and column (2) investigates all annual meetings afterwards.We include a set of firm level control variables measured at the fiscal year end before annual meetings. ROA is defined as earnings before interest, tax, depreciation and amortization (EBITDA) scaled by lagged assets. $Leverage$ is the book leverage ratio defined as debt/(debt + book value of equity). $ISSAgainst$ is a dummy variable that equals 1 if the ISS recommend to vote against management. All other independent variables are as defined in Table 2.1.We include institution, proposal type and year fixed effect and clustered standard errors are reported in parentheses.

Table 2.13: An analysis of institutional dissatisfied owners' voting
This table examines how the dissatisfied institutions vote during annual meetings of target companies. Panel (A) presents all management sponsored compensation related proposals while panel B includes all management sponsored proposals. Column (1) includes annual meetings during one year after the campaign announcement and column (2) investigates all annual meetings afterwards. Column (a) uses the percentage of funds voting against management within an institution as the dependent variable and an ordinary least square model. Columns (b) apply the probit model to the dummy variable $Against = 1$ if at least one fund within the family votes against management. $Dissatisfied$ is equal to 1 if the institution is classified as dissatisfied in equation 2.2 at the quarter end before campaign announcement and 0 otherwise. $ISS\ Against$ equals to 1 if ISS recommends to vote against management and 0 otherwise. The rest of the variables are measured at the fiscal year end before the annual meetings. ROA is defined as earnings before interest, tax, depreciation and amortization (EBITDA) scaled by lagged assets. $Leverage$ is the book leverage ratio defined as debt/(debt + book value of equity). All other independent variables are as defined in Table 2.1. In each column we report coefficients and their clustered standard errors. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Panel A: management compensation proposals				Panel B: all management sponsored proposals			
	Campaign year		Years after campaigns		Campaign year		Years after campaigns	
	(1a)	(1b)	(2a)	(2b)	(1a)	(1b)	(2a)	(2b)
VARIABLES	% against	Against	% against	Against	% against	Against	% against	Against
Dissatisfied	0.019**	0.025***	-0.000	0.000	0.009*	0.011*	0.003	0.004
	(0.008)	(0.008)	(0.003)	(0.004)	(0.005)	(0.006)	(0.004)	(0.004)
ISS Against	0.572***	0.591***	0.576***	0.601***	0.554***	0.570***	0.545***	0.573***
	(0.039)	(0.038)	(0.039)	(0.038)	(0.040)	(0.039)	(0.041)	(0.041)
LogMV	0.000	0.008*	-0.003	0.005	-0.007***	-0.002	-0.005**	-0.001
	(0.004)	(0.005)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)
BM	-0.019***	-0.015**	-0.006	-0.006	-0.002	-0.004	0.002	0.002
	(0.007)	(0.007)	(0.006)	(0.006)	(0.003)	(0.004)	(0.003)	(0.003)
ROA	-0.127***	-0.145***	-0.076***	-0.075***	-0.008	-0.020	-0.015	-0.014
	(0.036)	(0.035)	(0.024)	(0.024)	(0.019)	(0.022)	(0.015)	(0.015)
Past return	-0.000	0.001	0.004	0.004*	0.005*	0.004	0.005***	0.005***
	(0.006)	(0.006)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)
Leverage	-0.025*	-0.022	-0.004	-0.011	-0.000	0.005	-0.002	-0.005
	(0.013)	(0.013)	(0.008)	(0.009)	(0.007)	(0.009)	(0.006)	(0.007)
Dividend yield	0.023	0.012	-0.075	-0.071	-0.096	-0.094	-0.101*	-0.115*
	(0.113)	(0.120)	(0.060)	(0.066)	(0.093)	(0.101)	(0.057)	(0.061)
Illiquidity	0.068	0.086	0.000	0.022	-0.001	0.012	-0.014	-0.010
	(0.074)	(0.081)	(0.041)	(0.043)	(0.038)	(0.040)	(0.029)	(0.033)
O_total	-0.018	-0.007	-0.001	0.007	-0.003	0.006	0.004	0.013
	(0.018)	(0.018)	(0.009)	(0.010)	(0.014)	(0.017)	(0.008)	(0.008)
Constant	Y	Y	Y	Y	Y	Y	Y	Y
Observations	13,641	13,641	65,412	65,412	151,712	151,712	684,691	684,691
R-squared	0.438	0.423	0.409	0.387	0.439	0.401	0.412	0.377
Institution FE	Y	Y	Y	Y	Y	Y	Y	Y
Proposal type FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Cluster	Institution	Institution	Institution	Institution	Institution	Institution	Institution	Institution

We find that institutions that had experienced negative holding period returns before a campaign announcement (the remaining dissatisfied owners) are more likely to vote against management in routine votes and especially in management sponsored compensation proposals. In untabulated results, the unconditional mean of vote against management in compensation related proposals is 15.2%. Dissatisfaction increases the likelihood by 2.5 percentage points. Consistent with the literature,

we find institutions are more likely to vote against management in compensation related proposals if the ISS votes against management and if the firm performs poorly in operation. The latter do not affect institutional voting in all management sponsored proposals. Interestingly, in the annual meetings after the campaign year, there is no difference in term of voting patterns between these originally dissatisfied institutions and other institutions. This gives us direct evidence that dissatisfied owners turn out to be more pro-activist and support our conjecture that a concentration of dissatisfied institutional owners will make the firm an easier target for the hedge fund activist.

2.10 Summary

In summary, this chapter investigates the institutional investor environment of the target firms and relates it to the selection of target companies. It documents that firms with a higher concentration of institutional investors expressing dissatisfaction through voting, holding and exiting, are more likely to be the activism targets. The revealed governance preference from institutional investors can signal the quality of the firm and the activists are more likely to gain support from these dissatisfied shareholders. Supporting evidence shows that activists are more likely to use threats to sue management or submit shareholder proposals if there are more dissatisfied owners holding the target companies. Indirect evidence shows that the more dissatisfied owners there are, the higher the campaign announcement return is. Direct evidence from subsequent annual meeting shows that the remaining dissatisfied institutions are more likely to be pro-activist in routine votes and especially compensation related votes. The chapter contributes to the understanding of activism target selection.

Chapter 3

Social networks and information sharing in hedge fund activism

3.1 Introduction

On March 26, 2007, GAMCO Investors, Inc., a prominent activist hedge fund, disclosed in a Schedule 13D filing a 5.4% stake in Intermec, Inc., a workflow performance company. In the Schedule 13D, GAMCO and its affiliates stated that they "may suggest or take a position with respect to potential changes in the operations, management or capital structure" as a means of "enhancing shareholder values." Intermec's stock price jumped 8.2% during the [-2, +2] event window surrounding the announcement.

Transamerica Asset Management, an investment company, began to purchase Intermec's shares aggressively around GAMCO's announcement. During the 60 calendar days prior to the 13D filing, Transamerica accumulated 0.6% of Intermec's outstanding stock, and the fund acquired 198,660 shares on March 2 alone. Given Intermec's average daily volume was 640,973 shares during the 60-day period (excluding GAMCO's purchases), Transamerica was clearly a standout.

Interestingly, Transamerica and GAMCO were linked with each other through their key personnel. For example, Patricia L. Sawyer, a director of Transamerica since 1993, served as Vice President at the American Express Company (NYSE ticker: AXP) from 1987 to 1989. During the same period, John C. Ferrara was director for financial planning and analysis, a senior role at AXP. Mr. Ferrara held various senior positions at GAMCO from 1999 to the end of 2007. The social connection Ms. Sawyer and Mr. Ferrara established while working at AXP might have facilitated information flows between the two funds, which could have influenced Transamerica's decision to purchase the Intermec stock around GAMCO's disclosure of its large stake in the company.

The Transamerica/GAMCO case does not appear to be an exception.[1] Activist hedge funds, which push for broad changes at (underperforming) firms, often

[1] According to a 2014 Wall Street Journal article (Pulliam, Chung, Benoit, and Barry, 2014), Jana Partners LLC informed Elliott Management Corp. of its stake in Juniper Networks, Inc. before the media reported on the stake on January 23, 2014. The article provided several other

communicate with other investors about their campaigns, permissible under the SEC rules.[2] In doing so, these sophisticated investors can build alliances for their planned campaigns at the target firms. As minority shareholders, activists need the support of other institutional investors in order to accomplish their goals (Brav, Jiang, Partnoy, and Thomas, 2008; Jiang, Li, and Mei, 2016). The head of activist strategy at Clinton Group, Inc., another activist fund, once commented "I'm happy to give people my thoughts on things I own and I'm happy to learn about how other people think." (Pulliam, Chung, Benoit, and Barry, 2014.)

Institutional investors that receive information on the activist's campaign, either before or after the activist's disclosure, can potentially profit from this information. Communication prior to the disclosure enables the activist to use "the pop in the stock price to help pay these people [institutions]," according to corporate law firm Cadwalader, Wickersham & Taft LLP. Further communication after the 13D filing would clarify the activist's goals and plans, and help build a solid alliance, which could increase the odds of winning the coming battle against the target company.

Despite the importance of this issue, however, the academic literature has not formally analyzed the characteristics of social interactions between the activist and other institutions around activism events, or more importantly, how such information flows would help the activist to attract allies for its campaign. In this paper, we study information dissemination during activist campaigns using a social network framework (see Jackson (2011) for an overview of social networks applications). The activist, on the one hand, possesses valuable private information — its insights of the target company, its stake, and its planned actions against the firm. As a minority stockholder, the activist has a strong incentive to gain attention and support from other important players such as large institutional investors. Institutional investors, on the other hand, have a strong incentive to access this private information to trade profitably. An institution and the activist are more likely to interact if they are socially connected. A convenient feature for identification is that the connection itself typically has been formed prior to the activism event, and its formation is usually independent of the information to be transmitted.

Our study builds on a comprehensive sample covering 1,422 activist campaigns involving 287 unique activists from 2005 to 2014. We use the BoardEx database to identify social ties between managers of the lead activist and those at other institutions, of which the main social relationships are school ties (36% of all ties) and past employment ties (55% of all connections), as well as connections from club membership and charity work (9% of all ties). To test whether information is spread via the social network between the lead activist and institutional investors, we first compare the trades of institutions whose mangers are socially connected to the activist with trades of funds whose managers have no ties with

similar cases.

[2]Generally, investors are free to communicate with one another in any manner they prefer, subject to restrictions that apply if they are held to be engaging in a solicitation of proxies, avoiding disclosure obligations, or if they have access to material, confidential information about the company whose stock they hold, or are trading.

the activist. To the extent socially connected fund managers have a comparative advantage in collecting information regarding the activist's campaign, we should observe that they purchase more aggressively around the activist disclosure, and earn higher risk-adjusted returns on their trades. The increase of overall stakes by connected institutions can potentially benefit the lead activist, resulting in a higher rate of campaign success.

Our analyses reveal that actively managed institutions whose managers are socially connected to those at the lead activist tend to increase their stakes in the target firm around the activist disclosure. More specifically, a connected institution is 2.9 percentage points more likely to increase its portfolio weight in the target firm, compared to funds that are not socially connected to the activist. We find similar effects of social ties on institutional trading prior to the activist disclosure, using 13F institutional ownership data and an alternative transaction database. Interestingly, using a difference-in-differences specification, we find that there is a stronger association between social connections and the propensity for trading when the activist has a better track record, as measured by its past success rate. This suggests that support from connected funds is not unconditional – activists of higher quality tend to garner more support.

In addition, we explore heterogeneity in social connections. Relationships established at public firms are associated with a lower likelihood of ownership increasing around the activist disclosure, compared to connections created at private firms and social functions such as clubs and charity work. This is potentially attributed to a lower chance of knowing someone well in public companies, which are typically larger than private firms and functions.

Connected funds also perform significantly better on their investments than non-connected institutions, generating a risk-adjusted long-short portfolio return of 1.8% per month. Furthermore, we find that connected institutions as a whole increase their ownership in the target by 1.3 percentage points of the outstanding stock around the campaign disclosure, relative to non-connected institutions. There is also a wide spread in the differential changes in holdings in the target stock, suggesting that activists in certain targets could enjoy disproportionally more support from connected funds. Further evidence suggests that such disproportional acquisition of stocks by connected funds around the disclosure benefits the activists by increasing the campaign success rate, including gaining board seats, as these shareholders can be the activist core allies in its endeavors in making changes at the target firm (see Brav, Dasgupta, and Mathews (2016) for a theoretical discussion). As our study focuses on the interaction between the activist and actively managed funds, it complements Appel, Gormley, and Keim (2016), who found that large ownership stakes of passive institutional investors tend to increase the likelihood of success by activists.

Our results are robust to alternative specifications, such as the linear probability model with fund and time fixed effects. We obtain similar results by using school ties only, which are deemed more exogenous than other types of social connections (Cohen, Frazzini, and Malloy, 2008). Another potential concern is that a social tie with the lead activist may capture a higher ability of the fund manager,

rather than a comparative advantage in information. To address this, we control for elite school ties as a proxy for fund managers' ability, as suggested by Butler and Gurun (2012). Our result shows that, after controlling for elite school ties, non-elite school ties still significantly predict institutional trading. Furthermore, if social ties capture similarities in fund characteristics or investment styles between the activist and connected institutions, we would expect that connected funds also trade more aggressively non-target stocks in the activist's portfolio during the campaign quarter. A placebo test using 13F institutional holdings data finds no such effect.

Our study relates a growing literature on hedge fund activism to the literature on the role of social networks in economics and finance.[3] Recent work on hedge fund activism has examined the characteristics of hedge fund activism events, and whether such actions create value for target shareholders (Brav, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009; Becht, Franks, Grant, and Wagner, 2015). A strand of this literature analyzes the effects of activism on two important groups of stakeholders: creditors (Klein and Zur, 2011) and employees (Brav, Jiang, and Kim, 2015; Fos and Jiang, 2015). Gantchev and Jotikasthira (2016) also document that institutional selling tends to raise a firm's probability of becoming an activist target. However, little is known about whether and how activists influence other investors' decisions to trade the target stock, and whether such influence would support the activist's agenda in achieving its stated goals.

Brav, Dasgupta, and Mathews (2016) have developed a theoretical model to study so-called "wolf pack" activism, in which coordination is established between the lead activist and other institutions as they anticipate each other's actions in making their trading decisions. Our paper, by uncovering a potential information channel through which activists can influence other institutions' trading decisions, complements the implicit coordination channel they model. Information exchange between the lead activist and institutional investors could facilitate effective coordination. Our work is related to, but distinct from, a recent study by Wong (2016), which examines the formation of wolf packs during activism events, and finds that investors other than the lead activist accumulate some shares before the activist disclosure. Our paper takes a different approach by explicitly mapping out investors' social connections such as school ties and past employment relationships, which enables us to study information dissemination and alliance building around activism events.[4]

Our paper is also related to the literature on how social networks may affect investors' investment decisions and portfolio performance. Recent theoretical work shows that information sharing among investors generally improves market efficiency (Colla and Mele, 2010; Ozsoylev and Walden, 2011; Han and Yang, 2013).

[3]See Jackson (2014) for an introduction to economics of social networks, and Allen and Babus (2008) for a survey of networks in finance.

[4]Unlike Wong (2016), we do not focus on potential information leakage prior to activists' disclosures. The SEC is currently investigating whether certain activist hedge funds have coordinated their trades without filing appropriate disclosures (Schedule 13D filings). Rather, we argue investors who receive information from the activists, either before or after the activists' disclosures, can potentially profit from this information.

Empirically, Hong, Kubik, and Stein (2005) have shown a correlation in trades by mutual fund managers who work in the same city, while Cohen, Frazzini, and Malloy (2008) found that fund managers enjoy higher abnormal returns by investing in firms to which they are connected through school ties. The literature also includes Hochberg, Ljungqvist, and Lu (2007), Ivković and Weisbenner (2007), Pool, Stoffman, and Yonker (2015), Gao and Huang (2015), Ahern (2016), and Gompers, Mukharlyamov, and Xuan (2016). Our study is different in that there is potentially a higher incentive for information exchange between the lead activist and connected institutions as the latter appear to stand ready to support the activist's endeavor in implementing its agenda. Our unique setting also enables an estimation of mutual benefits to the lead activist and its connected institutions.

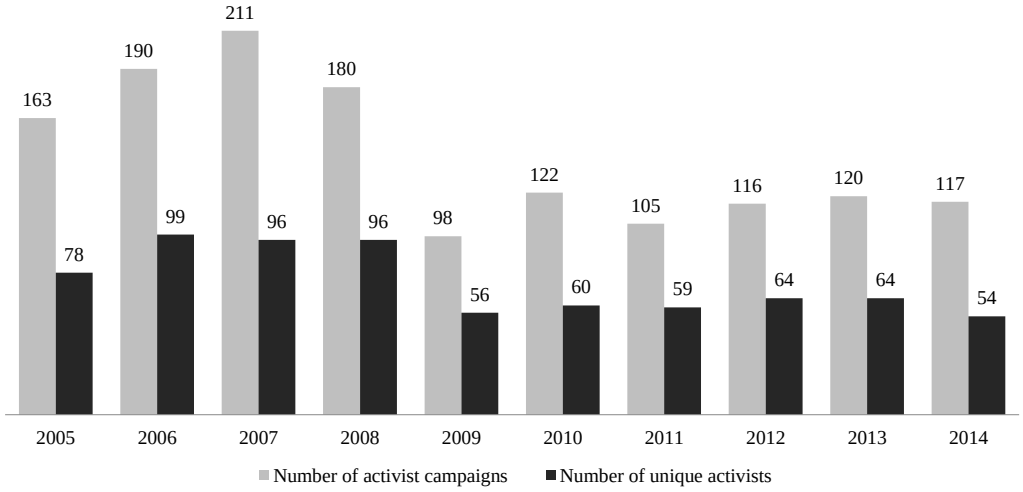
3.2 Data sources and sample overview

3.2.1 Sample of activist campaigns

Similar to Brav, Jiang, Partnoy, and Thomas (2008) and Gantchev (2013), we use data from Schedule 13D filings and SharkRepellent — a data provider specializing in corporate governance — to construct a comprehensive list of campaigns launched by activist hedge funds from 2005 to 2014. Our sample starts in 2005 for two reasons. First, social network data on fund managers are sparse before 2005. Second, and more importantly, mutual funds, a major type of institution studied in this paper, have been required by the SEC to report their quarterly holdings of US stocks since May 2004. The activist hedge funds are referred to as lead activists. Our main source is Schedule 13D, which an investor is required to file with the SEC if they acquire 5% or more of a publicly traded firm with the intention to influence its operation, strategy or management. SharkRepellent further identifies activism events in which the campaigns are launched through press releases, rather than 13D filings.

We manually collect the following information: the lead activist's filing date or press release date, the activist's identity and its ownership in the target company at disclosure, the campaign outcome (what the activist achieves from its intervention), and the name and CUSIP of the target firm. Our campaign sample starts with 2,016 unique activism events. The sample is reduced to 1,422 unique campaigns after it is merged with CRSP, Compustat, BoardEx, and the Thomson Reuters institutional ownership database. These events involve 1,050 distinct target firms and 287 lead activists. Figure 3.1 plots the annual frequency of activist campaigns and the number of unique lead activists over our sample period. Activism activity reached its peak in 2007, before dropping significantly during the financial crisis and then increasing in more recent years.

Figure 3.1: Hedge fund campaigns from 2005 to 2014
The grey bars plot the annual number of campaigns launched by lead activist hedge funds. The dark bars plot the correspondent numbers of unique lead activist funds engaged in these events.



3.2.2 Sample of social networks

To identify social ties between a lead activist and other institutional investors, we restrict our sample of institutions to two types of actively managed funds: non-activist institutions and non-campaign activist funds. Non-activist institutions include non-activist hedge funds and growth-oriented mutual funds.[5] Growth-oriented mutual funds seek maximum capital gains and have comparatively high risks, thus share some features of hedge funds (Klein and Li, 2015). We exclude other types of mutual funds because these investment firms are well diversified, and their investment in a target company is less likely to be affected by activism events. To ensure tractability for manual collection of social ties between the lead activist and institutional investors, we restrict non-activist hedge funds to those with an average portfolio value above $5 billion over the past five years prior to the campaign quarter. Further, in order to study institutions' quarterly changes in ownership in the target

[5]Using the Thomson Reuters database, we obtain 13F filings for all investment firms that are categorized as 4 or 5 in the Thomson Reuters database. These investmeampaign activist funds, the former consisting of non-activint firms primarily are hedge funds or similar types of investing firms. We label this group of investors "non-activist hedge funds." Using the Thomson Reuters database, we obtain S12 filings for mutual funds with investment objective codes equal to 2, 3 and 4, the database's indicators for Aggressive Growth, Growth and Growth & Income funds, respectively. We make sure that non-activist hedge funds and growth-oriented mutual funds are mutually exclusive. We then aggregate individual funds' holdings at the fund manager level.

stock before the activist disclosure, for each campaign we drop the institutions that report holdings in the Thomson Reuters database for less than two consecutive quarters before the campaign quarter.

Our sample of institutions consists of 454 unique non-activist institutions and 282 unique non-campaign activist funds. The average number of all institutions for one campaign is 467, with an average of 276 non-activist funds, and 191 non-campaign activist funds.

Procedure for identifying social connections

Our primary data source to identify social connections between each institution and the lead activist is BoardEx. BoardEx collects biographical and relationship data for directors and senior executives in public and private companies across the globe. We locate funds – lead activists and other institutions – in BoardEx by manually searching variations of their names.[6] For all funds identified in BoardEx, the top four positions are Managing Director, Vice President, Director, and Portfolio Manager. A lead activist and an institution are defined to be socially connected if any top official from the activist has a social relationship with a top official from the institution. From our original sample, we drop 101 activists and 125 institutions that have never had any recorded officials in BoardEx.

The two main social relationships identified by BoardEx are school ties (when two people attended the same university at the same time), and employment ties (when two people worked in the same organization at the same time, such as sitting on the Board of Directors of a company). Other ties include club membership and charity work.

To mitigate endogeneity concerns, we include only "past ties" that have been established well before the activist launches its campaign. Reverse causality would be a concern if we were to include ties created during or after the campaign year, because the activist often gains board seats during the campaign, which may create new ties with certain institutions via serving on the board. Past ties between the activist and other institutions, however, are relatively exogenous to the initiation of an activist campaign, thus facilitating causal interpretation.

Our independent variable of interest, *connection to lead activist*, takes a value of 1 if at least one relationship established in the past between two funds' key personnel is still active during the campaign quarter. Otherwise, this dummy variable equals 0. During our sample period a fund may experience turnover of its key personnel. We thus deem a relationship with another fund to be severed if a key connected person leaves before the campaign year and there is no other active relationship between existing personnel pair of the two funds.

A simple example illustrates social connections between two funds. Ronald H. McGlynn and Mario J. Gabelli both graduated from Columbia Business School in 1967. In 1973, Ronald H. McGlynn co-founded Cramer Rosenthal McGlynn, LLC ("CRM"), a $7 billion hedge fund. In 1977, Mario J. Gabelli founded Gabelli

[6]For individual funds that do not exist in BoardEx, we use information of directors and senior executives at their fund families.

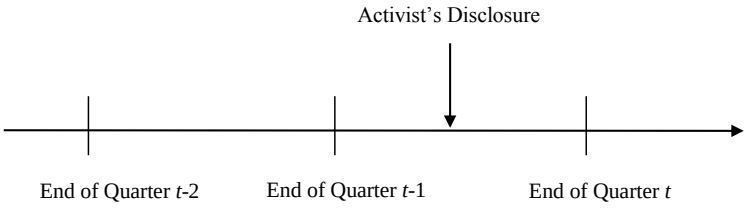
Asset Management Company Investors ("GAMCO Investors"), a prominent activist hedge fund. The "start time" for the tie between CRM and GAMCO Investors is thus 1977. Both were still working at the two funds as of May 2016. Therefore, for the 2007 activism event launched by GAMCO Investors in Aquila, Inc., an electricity and natural gas distribution firm, CRM was a connected fund. For CRM, the dummy variable, *connection to lead activist*, equals 1 for this event. A more rigorous algorithm is shown in Appendix A.

It is worth noting that our method of defining the variable *connection to lead activist* is conservative. We do not sum all the personal ties between any two funds. Large institutions typically have more key employees, thus the summation may simply capture the "size effect." Another potentially more important reason is that BoardEx may not cover all personnel working at all institutions during our sample period. Adding up all the personal ties between two funds thus could further introduce bias. Nevertheless, using the summation of all the personal ties between two funds yields similar results to our main findings.

3.2.3 Institutional ownership and trading data

To examine how socially connected institutions trade around activist campaigns and the potential benefits of such trades, relative to non-connected funds, we mainly rely on Thomson Reuters 13F institutional ownership information.[7] As illustrated in Figure 3.2, for each institution in our sample, we obtain its quarterly holdings in each target firm immediately before and after the activist disclosure date (13D or press release date). We then use two metrics for this institution's holdings in the target firm: (1) weight of the target stock in the institution's portfolio, (2) percent ownership of the target's outstanding stock. As funds' portfolio allocations are constrained by their total capital available, we mainly use the first measure to investigate whether social connections affect funds' trading in the target firm.

Figure 3.2: An illustration of the event timeline
This timeline illustrates the timing of an activist event. The activist disclosure takes place during quarter t (from the end of quarter $t-1$ to the end of quarter t).



[7]Under the Securities and Exchange Act of 1934, investment firms with over $100 million of US equities are required to report their US equity holdings in a Form 13F within 45 days of calendar quarter ending March 31, June 30, September 30 and December 31.

By using 13F institutional ownership data in our main analysis, we do not know when exactly in a quarter an institution's trades are executed and, therefore, we cannot make inferences on whether the investor traded prior to or after the activist disclosure. We attempt to separately study the effect of social connections on institutional trading *before* the activist disclosure as trading activity could be most sensitive to information during this period. To this end, we rely on a transaction database which includes only a subset of the institutions that file Schedule 13Fs as well as smaller funds that are not required to file 13Fs. We are able to match 638 distinct activist events, which involve 537 unique target firms and 190 lead activists. As we do not observe the complete portfolios for funds in this transaction database, our main specification relates changes in funds' ownership in target firms to their social connections with the lead activist.

3.2.4 Sample overview

Firm characteristics

Table 3.1 compares characteristics of the target firms to those of a set of industry, size (market capitalization), and book-to-market ("B/M") matched firms. Matched companies for each target are assigned from the same year, same industry based on three-digit SIC, and same 10×10 size and B/M sorted portfolios. Column (1) presents the means, medians, and standard deviations of characteristics for the target companies. Column (2) reports differences in attributes between the average target firm and the average matched company. When we report the difference in size, the size matching criterion is abandoned, and when we describe the difference in B/M, the B/M matching is dropped.

Table 3.1: Descriptive Statistics of firm fundamentals
This table reports the characteristics of firms targeted by lead activist hedge funds. Column (1) presents the averages, medians, and standard deviations of characteristics for the target companies. Column (2) reports differences between the target firms and the industry, size (market capitalization), and book-to-market matched firms. Our sample includes all 1,422 firms targeted by activists from 2005 to 2014. B/M is book value of equity divided by market value of equity. *Growth* is the growth rate of sales over the previous year. *Return on assets* is defined as earnings before interest, tax, depreciation and amortization (EBITDA) scaled by lagged assets. *Cash* is (cash + cash equivalents)/assets, and *Dividend yield* is (common dividend + preferred dividend)/(market value of common stock + book value of preferred stock). $Prior-year\ stock\ return$ is the buy-and-hold stock return during the 12 months. *Amihud illiquidity* is the yearly average (using daily data ending quarter t-1 from CRSP) of $1000\sqrt{|ret|/dollartradingvolume}$. Finally, *Institutional ownership* is the proportion of shares held by institutional investors, as reported by the Thomson Reuters Ownership Database. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

VARIABLES	Summary statistics			Difference with matched firms	
	Average	Median	Std. Dev.	Diff. in Avg.	*t*-stat. of Diff.
	(1a)	(1b)	(1c)	(2a)	(2b)
Market value ($ billion)	1.255	0.206	3.751	-2.107***	-6.21
B/M	0.771	0.533	0.594	0.064***	3.51
Growth	0.104	0.052	0.397	-0.061***	-3.98
Return on assets (ROA)	0.055	0.083	0.186	0.078***	13.97
Cash	0.202	0.120	0.212	-0.027***	-4.05
Dividend yield	0.010	0.000	0.059	-0.002***	-5.40
Prior-year stock return	0.008	0.011	0.484	-0.014	-1.24
Amihud illiquidity	0.355	0.115	0.661	-0.237***	-10.45
Institutional ownership	0.592	0.631	0.301	0.201***	27.01

Table 3.1 shows that target companies are significantly smaller than matched firms (at the 1% level), with an average market value of $1.3 billion. However, target stocks are more liquid, measured by Amihud Illiquidity (Amihud, 2002). Targets have higher B/M ratios, implying activist hedge funds are value investors (Brav, Jiang, Partnoy, and Thomas, 2008). Relative to their matched peers, target companies have slower sales growth. However, they have higher profitability, as measured by return on assets (ROA), which is consistent with Gantchev (2013). In terms of capital structure, targets have a lower cash-to-assets ratio and dividend yield. Interestingly, target firms appear to experience lower buy-and-hold returns during the 12 months prior to the activist announcement, indicating the lead activists are more likely to target underperforming firms.[8] Lead activists also tend to target firms with significantly higher institutional ownership, consistent with a key finding of Jiang, Li and Mei (2016), who analyze activists' endeavors in opposing announced merger deals. Consistent with Brav, Jiang, Partnoy, and Thomas (2008), Klein and Zur

[8]In our sample, prior-year stock returns for target firms are lower than those in Brav, Jiang, Partnoy, and Thomas (2008), and Gantchev (2013). This is likely to be due to the fact that our sample period includes the 2008-2009 financial crisis, during which many target companies had negative returns.

(2009), and Gantchev (2013), our overall evidence suggests activists tend to target small and underperforming companies with no significant operational issues.

Network characteristics

Table 3.2 shows characteristics of the networks between lead activists and other institutions for 2005-2014. For example, the 2010 sample consists of 60 unique lead activists, 281 non-activist institutions, and 207 non-campaign activist funds. There is a total of 53,563 relationship pairs between the lead activists and other institutions for the 122 campaigns launched in 2010, 6.1% of which are connected relationships (defined as "network density"). The most frequent relationships are school ties (2.14% of all relationship pairs) and employment ties (3.12% of all relationship pairs). Other ties, such as club membership and charity work, make up the remaining 1.89% of connections. Although there is some fluctuation in the number of lead activists across years, the number of institutional investors and the network density remains relatively stable. This is consistent with findings in the social network literature (Jackson, 2011).

Table 3.2: Descriptive Statistics of network characteristics
This table reports the network characteristics. Column (1a)-(1c) show the annual numbers of lead activists and other institutions, respectively. Column (1d) reports the numbers of all relationship pairs between the lead activists and institutional investors, while column (1e) lists the numbers of all socially connected pairs between the lead activists and institutional investors. Column (2) reports network densities for all connections, school ties, employment ties, and other ties, respectively. For each type of connection, network density is defined as the number of connected pairs divided by the number of total pairs.

		Institutional investors				Network density			
Year	# Lead activists	# Non-campaign activist funds	# Non-activist institutions	# Relationship pairs b/t lead activists and institutions	# Connected pairs b/t lead activists and institutions	All connections	School ties	Employment ties	Other ties
	(1a)	(1b)	(1c)	(1d)	(1e)	(2a)	(2b)	(2c)	(2d)
2005	78	164	290	67,822	2,458	3.55%	1.52%	1.17%	0.88%
2006	99	178	258	81,746	5,035	6.16%	1.78%	2.76%	2.28%
2007	96	202	290	95,763	5,282	5.52%	1.92%	2.27%	1.97%
2008	96	215	259	83,710	4,342	5.19%	1.48%	2.06%	2.31%
2009	56	220	281	44,929	2,563	5.70%	1.60%	2.82%	1.96%
2010	60	207	281	53,563	3,276	6.12%	2.14%	3.12%	1.89%
2011	59	187	253	45,572	2,640	5.79%	1.88%	2.76%	2.20%
2012	64	212	365	63,634	4,303	6.72%	2.78%	3.94%	0.89%
2013	64	209	365	63,800	5,141	8.06%	3.21%	5.33%	1.08%
2014	54	202	352	60,465	4,955	8.19%	2.96%	5.15%	1.32%

3.3 Social Networks and institutional trading

If connected institutions are better informed about the lead activist's stake in the target firm and its plan of attack, we should observe larger trades by them around the activist disclosure (Brav, Dasgupta, and Mathews, 2016). For each type of institution, we mainly report quarterly changes in ownership around the disclosure. In subsections 3.3.5 and 3.3.6, we further investigate whether connected institutions trade more aggressively prior to the disclosure, during which information presumably is more valuable.

3.3.1 Univariate analysis of quarterly ownership

To start with, Table 3.3 reports connected institutions' portfolio values and their investments in target stocks, compared to non-connected institutions. On average, a connected institution has a portfolio value of $25.9 billion, significantly larger than that of a non-connected one (t-statistic = 70.6). Connected institutions also invest more capital in the target stock before the activist disclosure. In terms of the weight of the target stock in the institution's portfolio, however, the difference between connected and non-connected institutions is not statistically significant at the 10% level.

Table 3.3: Univariate analysis of quarterly ownership
This table compares the overall portfolio value and investment in the target firm between connected institutions and non-connected institutions. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Connected institutions			Difference with non-connected institutions	
	Average (1a)	Median (1b)	Std. Dev. (1c)	Diff. in Avg. (2a)	t-stat. of Diff. (2b)
Total portfolio value ($ billion)	25.870	5.244	86.293	15.945***	70.58
Capital invested in target stock before lead activist's disclosure ($ million)	2.751	0.000	32.351	1.984***	23.46
Weight of target stock in a fund's portfolio before lead activist's disclosure (%)	0.014	0.000	0.209	0.000	0.01
Increase in capital in target stock ($ million)	0.189	0.000	14.374	0.219***	4.92
Percentage point increase in the weight of target stock in a fund's portfolio around lead activist's disclosure (%)	0.005	0.000	0.298	0.007***	5.78

Importantly, around the disclosure, connected institutions on average increase their capital investment in the target, while non-connected ones actually reduce their holdings. This difference is statistically significant at the 1% level. This univariate analysis provides initial evidence that socially connected institutions trade more aggressively around activist disclosures, presumably because they are more informed about their positions and plans.

3.3.2 Changes in institutions' quarterly ownership

Having shown that an institution's social connection to the lead activist is associated with more purchases around the disclosure, we now turn to multivariate tests of whether this trading decision is systematically related to the institution's relationship to the activist, controlling for the institution's capital constraint and other target firm-level attributes. We estimate a probit model in which the dependent variable equals 1 if an institution increases the weight of the target firm in its portfolio around the disclosure date (from quarter end *t-1* to t), 0 otherwise. The results are presented in Table 3.4. Each column displays the coefficients and the associated marginal probability representing the marginal effect of each regressor on the likelihood of an institution's increase in ownership in the target. The set of regressors is

the same as that in Table 3.1.

Table 3.4: Social connections and institutional trading
This table applies a probit model to examine whether connection to the lead activist predicts a change in an institution's ownership in the target firm around the activist's disclosure. Connection to lead activist is a dummy variable equal to 1 if the institution is connected to the activist as of year $t-1$ (year t is when the activist discloses it position in the target firm). We report the main results for the full sample, the sample of activist funds, and the sample of non-activist institutions in column (1), (2), and (3) respectively. All other independent variables are as defined in Table 3.1. In each column we report probit coefficients, their heteroscedasticity-robust t-statistics, and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variable: dummy for an increase in the weight of the target stock in a fund's portfolio around the activist's disclosure								
	Full sample			Non-activist institutions			Non-campaign activist funds		
	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
Connection to lead activist	0.347***	34.25	2.91%	0.365***	31.23	3.80%	0.185***	8.35	0.83%
Log (MV)	0.165***	65.43	1.04%	0.181***	60.80	1.43%	0.129***	25.42	0.48%
Return on assets (ROA)	0.080***	3.28	0.50%	0.147***	4.98	1.15%	-0.107**	-2.38	-0.40%
Prior-year stock return	0.031***	4.05	0.19%	0.016*	1.75	0.13%	0.062**	4.26	0.24%
B/M	0.048***	7.97	0.30%	0.057***	7.95	0.45%	0.025**	2.12	0.09%
Growth	-0.072***	-7.01	-0.44%	-0.089***	-7.21	-0.70%	-0.032*	-1.73	-0.12%
Cash	0.134***	7.69	0.87%	0.184***	8.52	1.45%	0.042	1.22	0.16%
Dividend yield	0.163***	3.25	1.02%	0.222***	3.91	1.75%	-0.026	-0.12	-0.10%
Amihud illiquidity	-0.034***	-4.08	-0.21%	-0.023***	-2.65	-0.18%	-0.068***	-3.15	-0.26%
Institutional ownership	0.531***	38.29	3.32%	0.560***	34.08	4.40%	0.498***	18.15	1.88%
Observations	611,139			361,279			249,860		
Pseudo R-squared	8.3%			9.3%			6.0%		
% (Dep variable = 1)	3.8%			5.0%			2.0%		

Column (1) shows results for the full sample of all institutions. Most importantly, and consistent with results in Table 3.3, *Connection to lead activist* has a significant (at the 1% level) impact on the likelihood of a fund's increase in the weight of the target firm in its portfolio. A connected institution is 2.9 percentage points more likely to raise its stake in the target around the activist disclosure, compared to those that are not socially connected to the lead activist. Relative to the unconditional probability of 3.8% for an increase in the target stock, the incremental probability is remarkable. Such a relation indicates that even after controlling for institutions' capital constraints, connected funds buy target stock more aggressively, likely due to better access to information via their social connections to the lead activist.

As expected, institutions are more likely to increase their weights in larger and more liquid targets, as measured by the logarithm of market capitalization and Amihud Illiquidity. This is consistent with Falkenstein (1996), Gompers and Metrick (2001), and Bennett, Sias and Starks (2003), who found that institutions prefer the stock of large corporations with a deeper market. Relatedly, funds have a higher propensity to purchase stocks with a higher institutional ownership, which are also larger and have a higher liquidity. Institutions also tend to chase recent outperforming firms as measured by return on assets (ROA) or prior-year stock

return, consistent with Gompers and Metrick (2001), and Ferreira and Matos (2008). Investors on average reduce their investment in growth stocks, as implied by the negative coefficient on *growth* (significant at the 1% level), suggesting they are able to exploit value anomaly. This is also consistent with a positive coefficient on *B/M*. Institutions tend to increase holdings in cash-rich firms, and those that pay large dividends, consistent with findings in Brav, Jiang, Partnoy, and Thomas (2008), and Gantchev (2013).

Next, we examine the effects of social ties for non-activist institutions and non-campaign activist funds, respectively. Column (2) shows that a connected non-activist institution is 3.8 percentage points more likely to increase its portfolio weight in the target around the disclosure, compared to non-activist institutions that are not socially connected to the lead activist. Coefficient estimates for other covariates are similar to those for the full sample.

Column (3) reports results for a subsample of non-campaign activist funds. The coefficient estimate on *connection on lead activist* indicates that a connected non-campaign activist fund is 0.8 percentage point more likely to increase its portfolio weight in the target firm around the lead activist's disclosure. This is consistent with findings for the full sample and the subsample of non-activist institutions. The incremental probability is economically significant relative to the unconditional probability of 2.0% for an increase in the portfolio weight in the target. Similar to the results for the full sample, these activist funds are more likely to increase investment in larger and more liquid firms with higher institutional ownership, as well as value stocks with higher recent returns. However, the funds tend to increase their weights in firms with lower returns on assets, while cash and dividend yield do not seem to affect these investors' weights in the target firm. These suggest that non-campaign activist funds' investment objectives may be different from the rest of the sample – non-activist institutions.

3.3.3 Robustness analyses

Sensitivity to alternative specifications

In the analyses above, we take into account an institution's capital constraint in creating our dependent variable. Although this is our preferred measure, we also carry out an analysis by using an alternative measure — a dummy variable equal to 1 if the fund increases its percent ownership of the target company around the activist disclosure. As shown in Table 3.5, for the full sample, a connected institution is 2.7 percentage points more likely to increase its ownership in the target around the disclosure (significant at the 1% level), relative to those that are not connected to the activist. The magnitude is comparable to our main analysis.

Table 3.5: Social connections and changes in institutional ownership
This table applies a probit model to examine whether connection to the lead activist predicts a change in an institution's ownership in the target firm around the activist's disclosure. Connection to lead activist is a dummy variable equal to 1 if the institution is connected to the activist as of year $t-1$ (year t is when the activist discloses it position in the target firm). All other independent variables are as defined in Table 3.1. In each column we report probit coefficients, their heteroscedasticity-robust t-statistics, and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable:	Dummy for an increase in percent ownership of the target stock around the disclosure		
	Probit model		
	Coefficient	*t*-stat.	Marg. Prob.
Connection to lead activist	0.360***	34.61	2.74%
Log (MV)	0.163***	60.65	0.91%
Return on assets (ROA)	0.065***	2.57	0.36%
Prior-year stock return	0.046***	5.83	0.26%
B/M	0.041***	6.63	0.23%
Growth	-0.042***	-4.10	-0.24%
Cash	0.073***	3.83	0.41%
Dividend yield	0.125**	2.38	0.70%
Amihud illiquidity	-0.061***	-5.05	-0.34%
Institutional ownership	0.525***	35.58	2.92%
Observations	611,139		
Pseudo R-squared	8.5%		
Adj. R-squared			
Fund fixed effects			
Campaign event fixed effects			
% (Dep variable = 1)	3.4%		

To mitigate the potential concern that past employment ties and other types of social ties may not be strictly exogenous to the activist events (i.e., social ties are made due to an "anticipation effect"), we now focus on education ties only, which are usually formed many years in the past, and their formation is typically independent of the information to be transmitted via the network (Cohen, Frazzini, and Malloy, 2008). Two managers are defined to be connected if they attended the same school or department of a university at the same time. The results are presented in table 3.6. Column (1) in table 3.6 shows that for the full sample, a connected institution is 3.2 percentage points more likely to increase its weight in the target firm around the activist disclosure than institutions without connections. The magnitude is consistent with our estimate using all types of social connections.

Table 3.6: Education connections and changes in institutional ownership
This table applies a probit model to examine whether connection to the lead activist predicts a change in an institution's ownership in the target firm around the activist's disclosure. *Connection to lead activist* is a dummy variable equal to 1 if the institution is connected to the activist as of year $t-1$ (year t is when the activist discloses it position in the target firm). Panel (C) focuses on education ties, in which *school tie to lead activist* is a dummy variable equal to 1 if the institution is connected to the activist through education ties as of year $t-1$. *Elite* ($non-elite$) *school tie* to lead activist is an indicator equal to 1 if the connection is through attending the same elite (non-elite) school. The list of elite schools is the intersection of the top-20 ranking lists from US News & World Report (2008), Financial Times (2006), and Business Week (2000). The elite schools are Berkeley, Chicago, Columbia, Dartmouth, Harvard, Michigan, Massachusetts Institute of Technology, Northwestern, New York University, Stanford, University of California, Los Angeles, University of Pennsylvania, and Yale. All other independent variables are as defined in Table 3.1. In each column we report probit coefficients, their heteroscedasticity-robust t-statistics, and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variable: dummy for an increase in the weight of the target stock in a fund's portfolio around the activist's disclosure					
	Coefficient (1a)	*t*-stat. (1b)	Marg. Prob. (1c)	Coefficient (2a)	*t*-stat. (2b)	Marg. Prob. (2c)
School tie to lead activist	0.364***	22.43	3.20%			
Elite school tie to lead activist				0.393***	19.16	3.57%
Non-elite school tie to lead activist				0.318***	12.26	2.70%
Log (MV)	0.167***	66.33	1.06%	0.167***	66.32	1.06%
Return on assets (ROA)	0.074***	3.07	0.47%	0.075***	3.06	0.47%
Prior-year stock return	0.034***	4.48	0.22%	0.034***	4.47	0.22%
B/M	0.049***	8.12	0.31%	0.049***	8.11	0.31%
Growth	-0.072***	-7.05	-0.46%	-0.072***	-7.04	-0.45%
Cash	0.133***	7.42	0.85%	0.134***	7.42	0.85%
Dividend yield	0.169***	3.40	1.07%	0.170***	3.41	1.07%
Amihud illiquidity	-0.037***	-4.31	-0.23%	-0.037***	-4.31	-0.23%
Institutional ownership	0.529***	38.17	3.34%	0.529***	38.15	3.34%
Observations	611,139			611,139		
Pseudo R-squared	8.0%			8.0%		
% (Dep variable = 1)	3.8%			3.8%		

Sensitivity to alternative explanations

Many fund managers graduate from top schools. Fund managers' social connections, especially their school ties to the lead activist, might capture the managers' abilities that affect their trading decisions around the activist disclosure. To address this potential concern, we control for ties established at elite schools as a proxy for fund managers' abilities, as suggested by Butler and Gurun (2012). Following Butler and Gurun (2012), our list of elite schools is the intersection of the top-20 ranking lists from US News & World Report (2008), Financial Times (2006), and Business Week (2000). The elite schools are Berkeley, Chicago, Columbia, Dartmouth, Harvard, Michigan, Massachusetts Institute of Technology, Northwestern, New York University, Stanford, University of California, Los Angeles, University of Pennsylvania, and

Yale. Column (2) Table 3.6 reports that, after controlling for elite school ties, a connected institution through a non-elite school tie is still 2.7 percentage points more likely to increase its portfolio weight in the target stock, relative to non-connected institutions. The estimate is significant at the 1% level.

Furthermore, we address another potential concern that social connections might capture similarities in fund characteristics or investment styles between the lead activist and connected institutions, rather than information advantage for the connected institutions. We use a placebo test to examine whether connected institutions also trade more aggressively the *non-target* stocks in the lead activist's portfolio during the campaign quarter compared with non-connected ones. If social ties truly capture similarities in fund traits or investment styles between the two funds, then for these non-target firms we should observe a pattern similar to that reported in Table 3.7.

Table 3.7: Social ties and changes in institutional ownership: a placebo test
This table applies a probit model to examine whether a connection to the lead activist predicts a change in an institution's ownership in the activist's non-target portfolio firms around the activist's campaign disclosure. *Connection to lead activist* is a dummy variable equal to 1 if the institution is connected to the activist as of year $t-1$ (year t is when the activist discloses it position in the target firm). The analysis is carried out for non-target firms with over 5% ownership by the activists during their campaign quarter. All other independent variables are as defined in Table 3.1. In each column we report probit coefficients, their heteroscedasticity-robust t-statistics, and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variable: dummy for an increase in the weight of non-target stocks in a fund's portfolio around the activist's disclosure		
	Coefficient	*t*-stat.	Marg. Prob.
Connection to lead activist	-0.001	-0.04	-0.01%
Log (MV)	0.216***	62.56	0.22%
Return on assets (ROA)	0.001	0.05	0.01%
Prior-year stock return	0.052***	6.44	0.05%
B/M	0.001***	14.48	0.01%
Growth	-0.068***	-5.85	-0.07%
Cash	-0.102***	-6.02	-0.10%
Dividend yield	-0.307***	-4.68	-0.31%
Amihud illiquidity	-0.168***	-5.45	-0.17%
Institutional ownership	0.025**	2.17	0.03%
Observations	2,292,349		
Pseudo R-squared	7.6%		
% (Dep variable = 1)	2.8%		

We apply the same analysis in subsection 3.3.2 to the 1,221 unique non-target firms with over 5% ownership by 136 activists during their campaign quarters. The activists' ownership in these companies is comparable to that in the campaign

targets. As reported in Table 3.7, in contrast to our main findings, connected institutions are 0.01 percentage points less likely to increase their portfolio weights in non-target firms in the activist's portfolio, although the estimate is statistically insignificant at the 10% level. In untabulated analysis, we include all non-target companies held by the activists in the campaign quarters and obtain similar results. Overall, the evidence lends support to our claim that social ties capture information flows between the activists and other institutions around the activists' disclosures, rather than reflect fund manager abilities, similarities in fund traits or investment styles.

3.3.4 Heterogeneity in social ties and activist quality

The detailed biographical and relationship data in BoardEx affords us the opportunity to explore how different types of social connections affect institutional trading differently. In addition to education ties studied in subsection 3.3.3, in untabulated analysis, we separately examine employment ties and other ties such as club membership and charity work. Regarding relationships established while working at private companies, a connected institution is 4.3 percentage points more likely to increase its weight in the target firm around the activist disclosure than those without connections, other things being equal. The marginal probability of increasing ownership in the target due to relationships established at public companies is estimated to be 2.8 percentage points. This smaller magnitude is potentially due to the fact that the chance of knowing someone well in public firms is slimmer than in private firms, which are typically smaller. For other ties, the incremental probability of increasing ownership in the target is about 5.8 percentage points. This relatively large magnitude again is attributed to the close-knit nature of the functions, such as club membership and charity work.

Table 3.8: The heterogeneity in activist quality
This table applies a probit model to examine whether the heterogeneity in activist quality affects changes in institutions' ownership in the target firm around the activist's disclosure. *Connection to lead activist* is a dummy variable equal to 1 if the institution is connected to the activist as of year $t-1$ (year t is when the activist discloses its position in the target firm). *Past campaign success rate* equals the number of campaigns in which the activist achieved at least one of its stated goals divided by the total number of campaigns launched by the activist. *Firm control* variables are as defined in Table 3.1. In each column we report probit coefficients, their heteroscedasticity-robust t-statistics, and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variable: dummy for an increase in the weight of the target stock in a fund's portfolio around the activist's disclosure		
	Coefficient	*t*-stat.	Marg. Prob.
Connection to lead activist	0.331***	22.11	2.74%
Past success rate of lead activist	0.133***	12.07	0.84%
Connection to lead activist × Past campaign success rate	0.073**	2.14	0.46%
Firm controls	Yes		
Observations	611,139		
Pseudo R-squared	8.3%		
% (Dep variable = 1)	3.8%		

In Table 3.8, we further study whether the quality of the lead activist influences the propensity of institutional trading associated with their social ties to the activist. The lead activist's quality is approximated by its past campaign success rate, which equals to the number of campaigns in which the activist achieved at least one of its stated goals divided by the total number of campaigns launched. The average success rate is 0.66, with a standard deviation of 0.35. The positive coefficient on the interaction term, *connection to lead activist*×*past campaign success rate*, indicates that there is a stronger association between social connections and institutional trading around activist disclosure when the activist has a better track record. This suggests that support from connected institutions is not unconditional – good activists on average enjoy more support from connected ones, as reflected in more purchases of the target stock by them.

3.3.5 Changes in quarterly ownership before the activist disclosure

Using 13F institutional ownership data provides an advantage of wide coverage, however, we do not know when in the quarter institutions' trades are executed and, therefore, our estimates are likely to capture the effects of social ties to the lead activist on institutional trading both before and after the activist's disclosure.

It would be interesting to separately examine the effect of social connections on institutional trading even before the activist's disclosure, during which trading may be most sensitive to information flows. Similar to Klein, Saunders, and Wong (2014), we look at institutional holdings from the end of quarter $t-2$ to $t-1$, of campaigns with quarter $t-1$ ending within 20 or 10 days before the activist disclosure (see Figure 3.2). Such a short window ensures that the institution is likely to execute the bulk of its trades within the past three months prior to the activist disclosure.

Table 3.9: Changes in institutional ownership before the activist disclosure
This table applies a probit model to examine whether connection to the lead activist predicts a change (from quarter $t-2$ to quarter $t-1$) in an institution's ownership in the target firm before the activist's disclosure. *Connection to lead activist* is a dummy variable equal to 1 if the institution is connected to the activist as of year $t-1$ (year t is when the activist discloses it position in the target firm). All other independent variables are as defined in Table 3.1. In each column we report probit coefficients, their heteroscedasticity-robust t-statistics, and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variable: dummy for an increase in the weight of the target stock in a fund's portfolio around the activist's disclosure					
	Quarter *t*-1 ends within 20 days before the disclosure			Quarter *t*-1 ends within 10 days before the disclosure		
	Coefficient (1a)	*t*-stat. (1b)	Marg. Prob. (1c)	Coefficient (2a)	*t*-stat. (2b)	Marg. Prob. (2c)
Connection to lead activist	0.346***	15.21	2.79%	0.306***	8.24	2.20%
Log (MV)	0.162***	27.96	0.98%	0.151***	14.07	0.83%
Return on assets (ROA)	0.042	0.71	0.25%	-0.062	-0.64	-0.34%
Prior-year stock return	0.226***	14.31	1.37%	0.203***	8.78	1.11%
B/M	0.045***	3.90	0.27%	0.066***	3.51	0.37%
Growth	-0.153***	-4.47	-0.92%	0.040	0.65	0.22%
Cash	0.240***	5.76	1.45%	0.078	1.11	0.43%
Dividend yield	-0.294	-1.48	-1.77%	0.628**	2.43	3.46%
Amihud illiquidity	-0.049**	-2.38	-0.13%	0.009	0.58	0.05%
Institutional ownership	0.489***	15.13	2.95%	0.726***	14.14	4.00%
Observations	117,165			51,853		
Pseudo R-squared	9.1%			8.7%		
% (Dep variable = 1)	3.7%			3.4%		

Table 3.9 reports results using the same method as in subsection 3.3.2. Column (1) (column (2)) restricts to a sample where quarter $t-1$ ends 20 (10) days before the activist announcement. The sample is reduced to 258 (114) campaigns involving 128 (77) activists. Column (1) (column (2)) reports that, for an average institution, the marginal probability of increasing ownership in the target due to social ties is estimated to be 2.8 (2.2) percentage points, other things being equal. The magnitude is comparable to our main results reported in column (1), Table 3.4. The estimates for most other covariates are also similar to those reported in Table 3.4. These results suggest that social connections to the lead activist appear to be relevant in institutions' trading decisions even before the public disclosure.

3.3.6 Daily trades before the activist disclosure

In addition to the smaller sample size, one potential concern about the analysis in subsection 3.3.5 is that the direction and timing of the actual trades within the quarter before campaign disclosure are unobserved. Furthermore, some institutions trading far from disclosure could be affected not only by their social connections to the lead activist but also by other events. To mitigate these, we use a transaction database to determine a more precise connection between the activist disclosure and institutional trading activity during 60 or 30 calendar days prior to the disclosure (see Gantchev and Jotikasthira (2016) for a similar setting).[9]

The database, spanning 1998 to 2010, records information for each transaction by covered institutions: the CUSIP of the stock traded, time of the transaction, number of shares traded, execution price, as well as direction of the transaction (a purchase or sale). We repeat the procedure in subsection 3.2.2 to identify social ties between these institutional investors and the lead activist. We drop activism events with no institutional trading during the 60 or 30 calendar days prior to the announcement date. After merging with CRSP, Compustat and the Thomson Reuters database, our final sample consists of 638 campaigns from 2005 to 2010.

Due to space, we do not tabulate network characteristics between the lead activist and other institutions for this sample. For comparison purposes, the 2010 sample consists of 79 campaigns launched by 45 unique lead activists. There is a total of 21,560 relationship pairs between the lead activists and 273 institutions, and the network density is 4.9%. This density is slightly lower than the one when using the 13F database to create the networks, potentially due to incomplete personnel information BoardEx collected for the generally smaller funds (than 13F institutions) in this transaction database. The network density measure remains relatively stable during our sample period.

[9] According to Gantchev and Jotikasthira (2016), this data provider supplies transaction cost analysis to brokers, mutual fund companies, and pension plan sponsors representing almost 14% of total CRSP trading volume for 2000-2007.

Table 3.10: Changes in institutional ownership before the disclosure using trading data

Using institutional trading data, this table applies a probit model to examine whether connection to the lead activist predicts a change in an institution's ownership in the target firm before the activist's disclosure (date 0) measured as the shares held in relative to total shares outstanding of the target companies. *Connection to lead activist* is a dummy variable equal to 1 if the institution is connected to the activist as of year $t-1$ (year t is when the activist discloses it position in the target firm). All other independent variables are as defined in Table 3.1. In each column we report probit coefficients, their heteroscedasticity-robust t-statistics, and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Dependent variable: dummy for an increase in percent ownership of the target before the disclosure					
	During the (-60, 0) period			During the (-30, 0) period		
	Coefficient (1a)	*t*-stat. (1b)	Marg. Prob. (1c)	Coefficient (2a)	*t*-stat. (2b)	Marg. Prob. (2c)
Connected to lead activist	0.235***	6.32	0.68%	0.239***	5.26	0.40%
Log (MV)	0.176***	21.22	0.39%	0.189***	18.24	0.24%
Return on assets (ROA)	0.144**	1.99	0.32%	0.402***	4.57	0.50%
Prior-year stock return	0.053***	3.48	0.12%	0.009	0.35	0.01%
B/M	0.041***	3.56	0.10%	0.036	1.52	0.04%
Growth	-0.033	-1.39	-0.07%	-0.103**	-2.34	-0.13%
Cash	0.215***	4.59	0.47%	0.191***	3.17	0.24%
Dividend yield	0.337***	2.72	0.74%	0.451***	3.13	0.56%
Amihud illiquidity	0.027	0.44	0.06%	0.121	1.38	0.15%
Institutional ownership	0.396***	9.43	0.87%	0.396***	7.07	0.50%
Observations	182,013			182,013		
Pseudo R-squared	6.1%			6.9%		
% (Dep variable = 1)	1.1%			0.6%		

As we do not observe complete portfolios for funds in this transaction database, the dependent variable is thus a dummy variable equal to 1 if the fund increases its percent ownership of the target company during the 60 (30) calendar days prior to the disclosure date. The results, comparable to those using 13F institutional ownership data, are reported in Table 3.10. Column (1) (column (2)) shows that a connected fund is 0.7% (0.4%) percentage points more likely to increase its ownership in the target during the 60 (30) days before the announcement, compared to institutions that do not have a social tie with the lead activist. The effects of most covariates are similar to those reported in Table 3.4.

In summary, we find that, compared to institutions without a connection to the lead activist, a connected institution is significantly more likely to raise its stake in the target both around and before the activist disclosure.

3.4 Returns on "Connected" Investment

The fact that connected institutional investors appear to increase their stakes in the target firm around the campaign disclosure does not necessarily imply these trades are profitable. Taking a similar approach to Cohen, Frazzini, and Malloy (2008) and Klein and Li (2015), we thus compare the performance, for individual institutions, of investment in connected activists' target firms to that in non-connected activists' targets, and test the hypothesis that an institution earns higher returns due to its social connections to the lead activists.

We use a event study method in the spirit of Cohen, Frazzini, and Malloy (2008). For all the target firms a sample institution holds at their corresponding campaign quarter ends, we assign each of them to one of the two portfolios: connected or non-connected. For a target firm, if the institution is (not) socially connected to its lead activist, it is assigned to the (non-) connected portfolio. We compute monthly returns on stocks in the connected and non-connected portfolios over their campaign quarters as a proxy for the returns earned around the activist disclosures. Next, we compute value-weighted portfolio returns (connected and non-connected) by weighting each stock by the fund's dollar investment in it at the end of quarter t, and then averaging across institutions.

As we are aggregating returns from different quarters, in addition to the market-adjusted returns (returns in excess to a value-weighted portfolio of all CRSP firms), we also calculate characteristically adjusted returns ("DGTW-adjusted returns") as in Daniel, Grinblatt, Titman, and Wermers (1997): For each stock's return, we subtract the return on a value-weighted portfolio of all CRSP stocks in the same size (market capitalization), book-to-market and momentum quintile.

Table 3.11: Social connections and institutions' returns
This table reports average market-adjusted returns and DGTW-adjusted returns (Daniel, Grinblatt, Titman, and Wermers, 1997) for connected institutions versus non-connected ones during the campaign quarter. At the beginning of each quarter, for each institution we assign target firms in its portfolio to one of the two portfolios: connected or non-connected. For a target firm, if the institution is socially connected to the lead activist, then the stock is in the connected portfolio. The stock is in the non-connected portfolio if the institution is not socially connected to the activist. We compute monthly returns on connected and non-connected stocks over the campaign quarter as a proxy for the returns earned around the activist disclosure. Market-adjusted returns are defined as raw returns minus the returns on a value-weighted portfolio of all CRSP firms. DGTW characteristic-adjusted returns are defined as raw returns minus the returns on a value-weighted portfolio of all CRSP firms in the same size, industry-adjusted market-to-book, and one-year momentum quintile. We then compute value-weighted portfolios (connected and non-connected) by averaging across institutions, weighting each stock by the fund's dollar investment in it at the end of the quarter. Returns are in monthly percent, and are calculated for the full sample of institutions, non-campaign activist funds, and non-activist institutions, respectively. $t-statistics$ are shown below the estimates, and $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Market-adjusted return			DGTW-adjusted return		
	Connected portfolio	Non-connected portfolio	Difference	Connected portfolio	Non-connected portfolio	Difference
Full sample	3.10%***	1.54%***	1.56%**	2.47%***	0.66%*	1.81%***
	[6.53]	[4.20]	[2.35]	[5.55]	[1.84]	[2.85]
Non-activist institutions	2.75%***	1.21%***	1.54%**	2.17%***	0.34%	1.83%***
	[5.13]	[3.47]	[2.45]	[4.19]	[1.01]	[3.00]
Non-campaign activist funds	4.09%***	2.14%***	1.95%	3.34%***	1.21%	2.13%*
	[4.12]	[2.65]	[1.20]	[3.87]	[1.54]	[1.83]

Table 3.11 reports our findings. For the full sample of institutions, the connected and non-connected portfolios earn 3.10% and 1.54% monthly in market-adjusted returns, respectively. The long-short market-adjusted return between the connected portfolio and the non-connected one is 1.56% monthly, significant at the 5% level. The corresponding DGTW-adjusted long-short portfolio return is 1.81% per month, significant at the 1% level. When we restrict our sample to non-activist institutions, the long-short portfolio yields a monthly market-adjusted return of 1.54% and a DGTW-adjusted return of 1.83%. Restricting the sample to non-campaign activist funds, we also obtain similar estimates for both return measures as for the full sample. However, only the difference in DGTW-adjusted return is significant at the 10% level. It is worth noting that our long-short portfolio returns are somewhat larger than those found in Cohen, Frazzini, and Malloy (2008), potentially due to two reasons. First, ours include "run-up" returns before the disclosure,

as suggested by Brav, Jiang, Partnoy, and Thomas (2008), while Cohen, Frazzini, and Malloy (2008) report abnormal returns within two trading days around news announcements. Second, we pool one-off cross-time returns altogether, while Cohen, Frazzini, and Malloy (2008) study returns around regular news events, such as earnings releases.

Our results support the hypothesis that connected institutions have a comparative advantage in obtaining information on the target stocks from the lead activist. When fund managers and the lead activist are likely to have a higher level of social interactions, they increase their stakes in the stock and earn large positive returns. As a result, the long-short portfolio that consists of connected and non-connected target stocks earns positive abnormal returns around the activist announcement.

3.5 Potential benefits to the lead activist

In this section, we investigate from the lead activist's perspective whether its social ties with institutional investors benefit the activist campaign. Having profited from information on the campaign, connected funds are expected to stand ready to support the activist's agenda. This type of alliance building differentiates our study from the literature on social networks and investment performance (e.g., Cohen, Frazzini, and Malloy, 2008), which focuses on information flows from the insiders to investors.

We first examine the differential changes in aggregate ownership between connected and non-connected funds for the average firm. Relative to non-connected funds, connected institutions as a whole increase their ownership in the target by 1.3 percentage points of the outstanding stock (significant the 5% level). This is also economically significant as the median ownership by the lead activist is 6.8% in our sample. The median target sees a 0.6% increase in holdings by connected institutions, relative to non-connected ones. The 75th and 25th percentile values are 2.5% and -0.9%, respectively, while at the 95th and 5th percentiles, they are 11.4% and -5.6%. This large difference suggests that some target firms potentially enjoy disproportionally more support from connected funds, which could tip the outcome of the activist campaign.

Second, we present evidence that connected funds' ownership in the target stock could benefit the lead activist when it prepares to implement its agenda. The presence of connected funds, presumably the activist's core allies, can be used as leverage when the activist engages target management. Specifically, we relate trades by connected institutions during the campaign quarter to campaign success. Our main independent variable of interest is the percentage-point increase in connected funds' ownership during the campaign quarter. An alternative measure is connected funds' aggregate ownership in the target divided by non-connected funds' at the quarter end immediately after the disclosure. Both variables capture potential support for the lead activist resulting from its social connections. For campaigns that information on the outcomes is available, the dependent variable equals 1 if the lead activist fully or partly achieves its goals, and 0 otherwise. A probit model

is employed to study whether potential support for the activist predicts campaign success, controlling for the same firm covariates in the previous subsection.

Table 3.12: Social connections and activist campaign success
This table examines how the presence of connected institutions affects campaign success of the lead activist in both the market measure and actual measure. In column (1), the dependent variable is a dummy variable equal to 1 if the activist achieves at least one of its stated goals between the disclosure and resolution dates. The dependent variable in column (2) is an indicator equal to 1 if the activist is granted board seats as a result of the campaign. In column (3), the dependent variable is the market-adjusted buy-and-hold abnormal returns of the target companies during the $[-10, +30]$ trading-day window around the campaign disclosure. In panel (A), the independent variable of interest is the aggregated percentage-point increase in connected institutions' ownership in the target stock during the campaign quarter. The independent variable of interest in panel (B) is the shares of target held by all connected institutions divided by shares owned by non-connected institutions at the quarter end immediately after the disclosure. Firm control variables are as defined in Table 3.1 (not tabulated). In columns (1) and (2), we report the coefficients, their heteroscedasticity-robust t-statistics and the marginal probability change induced by a one-unit change in the value of a specific covariate from its sample average. In column (3), we report the coefficients and t-statistics $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable:	Dummy for campaign success			Dummy for campaign success when the activist gains board seats			Abnormal return during [-10, 30] around the activist disclosure	
	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.
Panel A	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)
Percentage-point increase in connected funds' ownership during campaign quarter	0.204**	2.50	3.89%	0.315**	2.11	5.99%	0.018***	4.85
Firm controls	Yes			Yes			Yes	
Observations	521			429			1,235	
Pseudo R-squared	2.2%			2.1%				
Adj. R-squared							1.9%	
% (Dep variable = 1)	66.0%			64.8%				
Panel B								
Connected funds' ownership divided by non-connected funds' ownership	0.440**	2.22	12.15%	0.365*	1.85	10.42%	0.009***	4.25
Firm controls	Yes			Yes			Yes	
Observations	521			429			1,235	
Pseudo R-squared	1.3%			0.9%				
Adj. R-squared							1.8%	
% (Dep variable = 1)	60.2%			60.1%				

As shown in column (1) of Table 3.12, potential support for the activist positively predicts its success. When the increase in connected funds' ownership during the campaign quarter goes up by one percentage point, there is a 3.9 percentage point increase in the likelihood of campaign success. As expected, the target size negatively predicts the activist's success as it is usually more difficult to implement changes in large and complex firms. Also activists are also more likely to succeed in targets with higher institutional ownership, consistent with a key finding in Appel,

Gormley, and Keim (2016).

In column (2), we use an alternative measure for campaign success, which equals 1 if the activist is granted board seats as a result of its intervention, 0 otherwise. Gaining board seats typically is viewed as a major success for activist investors, who can then effect changes via these directors (Brav, Jiang, Partnoy, and Thomas, 2008). A one percentage point increase in connected institutions' ownership is associated with a 6.0 percentage point increase in the likelihood of the activist obtaining board seats.

In addition, we relate the former to short-term stock returns around the disclosure, which is a market measure for campaign success. Column (3) reports that a one percentage point increase in connected funds' ownership is associated with 1.8 percentage point increase in the Fama-French four factor abnormal returns during the [-10,+30] trading-day window around the disclosure. Varying the window for the return measure does not substantially alter our results.

3.6 Summary

In summary, this chapter investigates the implications of social connections in the context of hedge fund activism. By mapping out investors' social connections such as school ties and past employment relationships, we uncover a potential information channel through which lead activists can communicate with other institutions to build an alliance. An institutional investor whose managers are socially connected to those at the lead activist is 2.9 percentage points more likely to increase its portfolio weight in the target firm over the campaign quarter, relative to funds that are not connected to the activist. The effect is stronger when the activists have a better track record. Connected institutions earn significantly more announcement returns. Evidence suggests that the presence of connected funds can benefit the activist by increasing its success rate.

Chapter 4

The benefits of friendship in hedge fund activism

4.1 Introduction

Activist shareholders, hedge funds in particular, have become a major force in corporate decision-making. They have successfully pressured target companies to listen to their demands in about two-thirds of the campaigns launched since 2005. Despite the growth of activist investment in recent years, activists generally hold a small percentage of target company stock, and usually do not play a pivotal role in vote outcomes. According to FactSet, for campaigns launched in 2015, the median percentage ownership of the dissident group was less than 7%, and was less than 3% at firms with a market capitalization of over $20 billion.

In order to succeed in their campaigns, activists rely on the support of institutional investors who have become increasingly dominant players in the stock market. To build alliances for their campaigns, activists often communicate with asset managers about the wisdom of their plans for a target firm, permissible under the SEC rules.[1] Even a renowned investor such as Nelson Peltz needed personally and repeatedly to pitch his ideas for Procter & Gamble to portfolio managers at numerous institutions, including top fund companies such as BlackRock and State Street. Support from some of these institutions is believed to be the single most important factor in winning the hardest-fought proxy contest in 2017 (the winning margin was a mere 0.0016 percent of the shares outstanding).

Despite the importance of this issue, however, the academic literature has not formally analyzed the characteristics of interactions between activists and other institutions in activism events, or more importantly, how such interactions would affect connected institutions' trading and governance practice. In this chapter, we study activists' alliance building during campaigns using a social network framework (see Jackson (2011) for an overview of social networks applications). An activist

[1] Generally, investors are free to communicate with one another in any manner they prefer, subject to restrictions that apply if they are held to be engaging in a solicitation of proxies, avoiding disclosure obligations, or if they have access to material, confidential information about the company whose stock they hold, or are trading.

possesses valuable private information — its insights of problems at the target company and its planned actions against the firm. However, their stake in the target firm is usually less than 5% ownership. Their target firms generally have a higher concentration of other institutional investors such as mutual funds. These institutional investors have a strong incentive to access activists' information and learn about their true intention and quality to decide whether to exercise their governance rights by voting against management. An institution and the activist are more likely to interact if they are socially connected. The head of an institution is also more familiar with the activist if she or he has past social relationships with the activist. A convenient feature for identification is that the connection itself typically has been formed prior to the activism event, and its formation is usually independent of the information to be transmitted.

To test whether information is spread via the social network between an activist and institutional investors, we first compare the trades of institutions whose mangers are socially connected to the activist with trades of funds whose managers have no ties with the activist. To the extent socially connected fund managers have a comparative advantage in collecting information regarding the activist's campaign, we should observe that they purchase more aggressively after the activist disclosure, and earn higher risk-adjusted returns on their trades. The increase in connected institutions' stakes can benefit the activist in voting events, resulting in a higher rate of campaign success.

Our analysis reveals that actively managed institutions whose managers are socially connected to those at an activist hedge fund tend to increase their stakes in the target firm during the activist's campaign. More specifically, a connected institution is 1.1 percentage points more likely to increase its stake in the target firm, compared to funds that are not socially connected to the activist. Given that the unconditional probability for an increase in the target firm is 2.5%, this represents a 44% increase in the incremental probability. Note that we obtain this result after controlling for major similarities between the activist and institutions, as well as event and institution fixed effects that capture time-invariant event and institution level characteristics.

We next examine three types of social connections: school ties, employment ties and other ties. As one of the most exogenously formed social relationship, school ties are found to positively affect connected institutions' propensity to trade the target stock during a campaign (the incremental probability is 36%). Employment or other ties are associated with a higher incremental probability of trading, potentially attributed to ties established in more recent years or the close-knit nature of the connections, such as club membership and charity work.

To address the concern that some omitted variables capturing similarities between activists and institutions, such as stock picking skills, we replace institution fixed effects with institution×activist fixed effects. These fixed effects control for all types of time-invariant similarities between institutions and activists. The economic and statistical significance of the estimated coefficient on the social connection dummy is similar to that in the main analysis in subsection 4.3.1.

Some could argue that certain social ties, such as past employment ties,

may not be strictly exogenous to activism events. As in He and Huang (2017), we use mergers and acquisitions ("M&As") among financial institutions as plausibly exogenous shocks to social connections. Institutions typically merge for reasons unrelated to an official's social tie to a particular activist. By using a subsample that includes all institutions subject to M&As before activism events, we find that a connected institution is 1.7 percentage points more likely to raise stakes in a target firm, which represents an increase of 47% in the incremental probability. This is qualitatively similar to our main analysis in subsection 4.3.1.

Connected institutions also perform significantly better on their investment than non-connected institutions, generating a risk-adjusted long-short portfolio return of 0.42% to 0.51% per month. Hedge funds achieve a slightly higher alpha than mutual fund families, partly attributed to the fact that hedge funds on average trade more aggressively than mutual funds.

We next link institutional trading with alliance building by comparing connected and non-connected institutions' voting in the annual sharehlder meetings of targeted companies. If connected institutions are more ready to challenge management by voting against their proposals, this is strong evidence that activists have built an alliance that can effectively force changes at target firms. We use voting records by mutual fund families from Institutional Shareholder Services' Voting Analytics to test this hypothesis. We find that connected institutions' votes against management proposals (management-sponsored directors) are 0.9 (1.3) percentage points more than those by non-connected funds, representing an increase of 9% (13%) in the disapproval rate. Furthermore, connected institutions that purchase target stocks during a campaign are more likely to challenge management in shareholder meetings, which presumably will benefit them more if campaigns are successful. We also confirm that the effects exist only for meetings during activist campaigns, but not for meetings after outcome dates.

Our results are robust when we restrict our sample to events in which activist announcements take place within 10 trading days after Quarter $t-1$ ends or the Abel Noser transaction database which includes a subset of the institutions that file Schedule 13Fs as well as smaller funds that are not required to file 13Fs. To account for an institution's capital constraint, we also replace the dependent variable with an indicator equal to one if an institution increases the weight of the target stock in its portfolio during a campaign. The results are similar to our main analysis in subsection 4.3.1. Dropping repeat activists, we obtain similar results.

Our study relates a growing literature on hedge fund activism to the literature on the role of social networks in economics and finance.[2] Recent work on hedge fund activism has examined the characteristics of hedge fund activism events and whether such actions create value for target shareholders (Brav, Jiang, Partnoy, and Thomas, 2008; Klein and Zur, 2009; Becht, Franks, Grant, and Wagner, 2015), and the determinants of targeting by activists (Brav, Jiang, and Li, 2017; Gantchev and Jotikasthira, 2016; Kedia, Starks, and Wang, 2017). However, little is known about

[2]See Jackson (2014) for an introduction to economics of social networks, and Allen and Babus (2008) for a survey of networks in finance. More recent papers in this literature includes Xu (2017), Paddrik, Park, and Wang (2017), Fisman, Shi, Wang, and Xu (2017), Cai and Szeidl (2016).

whether and how activists influence other investors' trading and voting decisions, and whether such influence would support the activist's agenda in achieving its stated goals.

This chapter is closely related to the literature on business networks and proxy voting in the asset management industry. Cvijanovic, Dasgupta, and Zachariadis (2016) find that business ties with portfolio firms (based on 401(K) plans) influence mutual funds' proxy voting, confirming the pattern found in the prior literature (Davis and Kim, 2007; Ashraf, Jayaraman, and Ryan, 2012). Ours is the first to examine how connections with shareholder opponents affect mutual fund voting, expanding the literature on the factors that influence investor voting (Iliev and Lowry, 2014; Cai, Garner, and Walkling, 2009; Bolton, Li, Ravina, and Rosenthal, 2018).

Brav, Dasgupta, and Mathews (2017) have developed a theoretical model to study the so-called "wolf pack" activism, in which an lead activist's presence implicitly helps a group of smaller activists to coordinate their efforts and become more aggressive at engaging the target, thus leading to a higher probability of successful activism. In particular, they predict the entry of a number of small activists after the lead activist's disclosure. This chapter, by uncovering a potential information channel through which activists can influence other institutions' trading decisions, complements the implicit coordination channel they model. Information exchange between the lead activist and connected institutions could facilitate effective coordination.

Our work is related to, but distinct from, a recent study by Wong (2016), which finds that some investors other than the lead activist accumulate significant shares *before* the activist disclosure. He attributes this to potential information leakage prior to activists' disclosures. In contrast, we focus on social interactions *after* the activists' disclosures per Brav, Dasgupta, and Mathews (2017), and identify systematic trading and voting patterns by connected institutions. Another difference between our paper and Wong (2016) is that we explicitly map out investors' social connections such as school ties and past employment relationships, while Wong (2016) proxies for social interactions by past co-investment activities. Our study also relates to Appel, Gormley, and Keim (2016), who find aggregate ownership stakes of passive institutional investors are associated with an increase in activists' success probability. Rather, we study individual institutions' trading and voting decisions by exploring their social connections to a lead activist.

Our paper is also related to the literature on how social or business networks may affect investors' investment decisions and portfolio performance. Recent theoretical work shows that information sharing among investors generally improves market efficiency (Colla and Mele, 2010; Ozsoylev and Walden, 2011; Han and Yang, 2013). Notable empirical works include Hong, Kubik, and Stein (2005), Pool, Stoffman, and Yonker (2015), Hochberg, Ljungqvist, and Lu (2007), Ivković and Weisbenner (2007), Gao and Huang (2015), Ahern (2016), Gompers, Mukharlyamov, and Xuan (2016), Maggio, Franzoni, Kermani, and Sommavilla (2016), Kumar, Mullally, Ray, and Tang (2017).

4.2 Data sources and sample overview

4.2.1 Sample of activist campaigns

The sample is the same as in Chapter 3. Figure 3.1 plots the annual frequency of activist campaigns and the number of unique activists over our sample period. Activism activity reached its peak in 2007, before dropping significantly during the financial crisis and then increasing in more recent years.

4.2.2 Sample of social networks

To identify social ties between an activist and institutional investors, we restrict our sample of institutions to two types of actively managed funds: hedge funds and actively-managed mutual funds.[3] We divide hedge funds into three size groups based on their average portfolio value over the past five years prior to the campaign quarter: \$100 million-\$1 billion (3,270 funds), \$1 billion-\$5 billion (838 funds), and above \$5 billion (423 funds).[4] To ensure tractability for manual collection of social ties between an activist and institutional investors, in each of the first two size groups, we randomly pick 100 funds to search in BoardEx. For the third group (above \$5 billion), we search every fund in BoardEx. Using the Thomson Reuters database, we also obtain S12 filings for all actively-managed mutual funds, and aggregate individual funds' holdings to the fund family level.

Our sample of institutions consists of 703 unique hedge funds (including the activist hedge funds) and 362 distinct mutual fund families. The average number of all institutions for one campaign is 660, with an average of 414 hedge funds, and 246 mutual fund families.

Procedure for identifying social connections

The procedure is the same as in Chapter 3. Our independent variable of interest, *Connection to activist*, takes a value of one if at least one relationship established in the past between two institutions' key personnel is still active during the campaign quarter. Otherwise, this dummy variable equals zero. During our sample period an institution may experience turnover of its key personnel. We thus deem a relationship with another fund to be severed if a key connected person leaves before the campaign year and there is no other active relationship between existing personnel in the two funds.

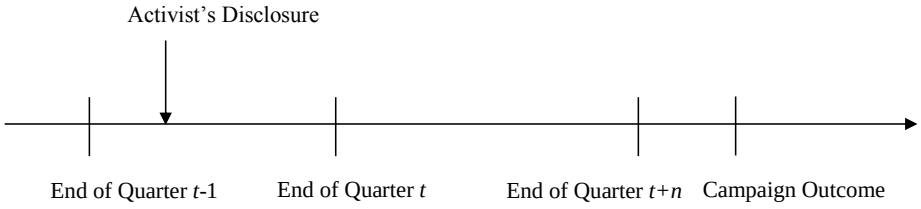
[3] Using the Thomson Reuters database, we first obtain 13F holdings for all investment firms that are categorized as 4 or 5 in the Thomson Reuters database. We then exclude pension funds and endowments. The remaining investment firms are primarily hedge funds or similar types of investing firms. We label this group of investors "hedge funds."

[4] According to Preqin, a leading source of data and intelligence for the alternative assets industry, funds with AUM over \$1 billion are considered as large funds. Funds with AUM over \$5 billion are considered ultra large. As of May 2017, "\$1 Billion Club" managers held 88% of all hedge fund capital (Preqin, 2017). Under the Securities and Exchange Act of 1934, investment firms, including hedge funds, with over \$100 million of US equities are required to report their US equity holdings in a Form 13F within 45 days of the calendar quarters ending March 31, June 30, September 30 and December 31.

4.2.3 Institutional ownership and trading data

To examine how socially connected institutions trade during activist campaigns and the potential benefits of such trades, relative to non-connected funds, we mainly rely on Thomson Reuters 13F institutional ownership information. As illustrated in Figure 4.1, for each institution in our sample, we obtain its quarterly ownership in each target firm immediately after the 13D or press release date (end of Quarter t), as well as its quarterly ownership in each target immediately before the campaign outcome date (end of Quarter $t+n$). Institutional trading is proxied by the change in its holdings in the target firm from the end of Quarter t to the end of Quarter $t+n$. To account for the possibility that institutions' portfolio allocations are constrained by their total capital available, in Appendix D, we also use the change in the weight of the target stock in an institution's portfolio to examine whether social connections affect its trading in the target firm.

Figure 4.1: An illustration of the event timeline
This timeline illustrates the timing of an activist event. The activist disclosure takes place during Quarter t (between the end of Quarter $t-1$ and the end of Quarter t). The end of Quarter t is referred to as the campaign announcement quarter end, and the end of Quarter $t+n$ is referred to as the quarter end before the outcome date.



By using 13F institutional ownership data in our main analysis, we do not know when exactly in the campaign announcement quarter an institution's trades are executed and, therefore, it is possible that our proxy for institutional trades captures only part of the actual trades during an activist campaign, especially when the activist's disclosure takes place toward the beginning of Quarter t. To this end, in robustness analysis, we restrict our sample to events in which activist announcements take place within 10 trading days after Quarter $t-1$ ends. We then proxy institutional trading by ownership change in the target firm from the end of Quarter $t-1$ to the end of Quarter $t+n$.

In addition, we rely on the Abel Noser transaction database which includes a subset of the institutions that file Schedule 13Fs as well as smaller funds that are not required to file 13Fs. Abel Noser is a leading execution cost consulting firm serving over 500 clients globally. According to Gantchev and Jotikasthira (2016), this data provider supplies transaction cost analysis to brokers, mutual fund companies, and pension plan sponsors representing almost 14% of total CRSP trading volume for

2000-2007. Therefore, the data set represents a significant subset of institutional trading.[5] We identify social connections with activists for *all institutions* in the Abel Noser database.

The database, spanning 1998 to 2010, records information for each transaction by covered institutions: the CUSIP of the stock traded, time of the transaction, number of shares traded, execution price, as well as direction of the transaction (a purchase or sale). We repeat the procedure in subsection 4.2.2 to identify social ties between these institutional investors and activists.

4.2.4 Institutional voting data

An important part of this chapter is to examine whether connected institutions are less likely to support management than non-connected institutions in target firms' shareholder meetings during activist campaigns. Starting in 2003 the SEC has required all US mutual funds to disclose their proxy voting records via N-PX filings. Our source of mutual fund voting records is the ISS Voting Analytics database, which contains votes cast by major fund families on all proposals for each Russell 3000 firm from 2005 to 2014.[6] Merging our sample of target companies into Voting Analytics, we end up with 818 unique target firms with 171 fund families that have BoardEx information. For these target firms, 162 fund families voted on 5,329 management-sponsored proposals (including 3,805 director nominees) in 796 meetings between activist announcement and resolution dates. Relatedly, 165 fund families voted on 13,832 management-sponsored proposals (9,857 director nominees) in 1,816 meetings *after* campaign resolution. It is worth noting that we focus on management-sponsored proposals, including director nominations, to mitigate selection issues arising from strategic behavior of shareholder sponsors (Ertimur, Ferri, and Muslu, 2011; Matsusaka, Ozbas, and Yi, 2017).

4.2.5 Proxies for similarities between activists and institutions

Hong, Kubik, and Stein (2005) show that mutual fund managers who work in the same city have correlated trades. To account for such similarities between activists and institutions, we create an indicator variable equal to one if an activist and an institution are located in the same city, and zero otherwise. Head office locations of activists and institutions are obtained from name searches on EDGAR, the US Securities and Exchange Commission's ("SEC") online portal.

As Coval and Moskowitz (1999, 2001) point out, fund managers also exhibit a strong preference for locally headquartered firms. To control for such an investment preference, we create an indicator equal to one if an institution and a target firm's headquarters are located in the same city, and zero otherwise. City names are obtained from fund name searches on EDGAR.

[5]The Abel Noser transaction database has been used by several recent studies to analyze the trading behavior of institutional investors, which include Chemmanur, He, and Hu (2009), Puckett and Yan (2011), and Brown, Wei, and Wermers (2014).

[6]The ISS Voting Analytics database includes fund votes by the top 100 fund families between 2003 and 2006, and from 2007 onward, ISS has collected voting records by the top 300 families.

Following Blocher (2016), we measure the portfolio overlap in stock holdings between funds i and j during quarter t as the dot product between a vector of securities held by fund i (h_{it}) and fund j (h_{jt}), divided by the product of Euclidean norm of each vector. The portfolio overlap is computed at each quarter end.

Lakonishok, Shleifer, and Vishny (1992) find that fund managers with a similar amount of assets under management herd with each other to some extent. At the end of quarter t, we pool all activists and institutions and divide them into size quintiles based on total net assets ("TNA"). We create a dummy variable equal to one if an institution and an activist are in the size quintile, and zero otherwise.

4.2.6 Sample overview

This subsection presents the network characteristics and summary statistics of our sample.

Network characteristics

Table 4.1 shows characteristics of the networks between activists and institutional investors for 2005-2014. For example, the 2010 sample consists of 60 unique activists, 412 hedge funds, and 238 mutual fund families. There is a total of 69,728 relationship pairs between the activists and other institutions for the 122 campaigns launched in 2010, 5.9% of which are connected relationships (defined as "network density"). The most frequent relationships are school ties (2.6% of all relationship pairs) and employment ties (4.0% of all relationship pairs). Other ties, such as club membership and charity work, make up just 0.5% of all connections. Note that school, employment, and other ties are not mutually exclusive. Although there is some fluctuation in the number of activists across years, the number of institutional investors and the network density remain relatively stable. This is consistent with findings in the social network literature (Jackson, 2011).

Table 4.1: Descriptive Statistics of network characteristics
This table reports network characteristics for our sample. Columns (1a)-(1c) show the annual numbers of activists, hedge fund companies, and mutual fund families, respectively. Columns (2a)-(2d) report network densities for all types of social connections, school ties, employment ties, and other ties, respectively. A school tie is a social connection an institution and an activist have through top personnel who attended a school together in the past. An employment tie is a social connection an institution and an activist have through top personnel who worked together in a third institution in the past. Other ties refer to connections created through club membership, charity work and so on. School, employment, and other ties are not mutually exclusive. For each type of connection, network density is defined as the number of connected pairs divided by the number of all relationship pairs between an activist and institutional investors. A detailed procedure to define social ties can be found in Appendix A.

Year	# Activists	Institutional investors		Network density			
		# Hedge fund companies	# Mutual fund families	All connections	School ties	Employment ties	Other ties
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(2d)
2005	78	399	221	2.58%	1.45%	1.46%	0.10%
2006	99	418	225	4.58%	2.05%	3.05%	0.18%
2007	96	426	238	4.05%	2.08%	2.54%	0.20%
2008	96	454	251	4.39%	2.27%	2.60%	0.35%
2009	56	438	245	5.20%	2.25%	3.63%	0.35%
2010	60	412	238	5.85%	2.64%	3.99%	0.48%
2011	59	447	244	5.11%	2.47%	3.24%	0.62%
2012	64	553	267	7.16%	3.54%	4.47%	0.91%
2013	64	548	263	9.10%	4.28%	6.27%	1.05%
2014	54	529	238	8.42%	3.73%	5.49%	1.36%

For the Abel Noser sample, the network characteristics between activists and other institutions are the same as in Chapter 3.

Summary statistics

Table 4.2 reports the averages, medians and standard deviations for variables used in our analysis. We separately report statistics for the main Thomson Reuters 13F sample, and the Abel Noser sample. In 2.5% of the time, an institution increases holdings in a target stock from the campaign announcement quarter end (Quarter t) to the quarter end before the outcome date (Quarter $t + n$). The proportion of funds within the average family that vote against management-sponsored proposals (director nominees) during activist campaigns is 10% (10%). In fact, most funds within a family vote in unison — for 98.5% of the time, the proportion of funds voting against management on a given proposal is either zero or 100%. Activists achieve at least one of their stated goals in 66.7% of the interventions. On average, return on assets improves from 2.8% from the first year after activist disclosure to 4.6% in the third year. This is consistent with Bebchuk, Brav, and Jiang (2015), who find that target firms' profitability improves during a five-year period after activist disclosures. The average (median) buy-and-hold abnormal return is 4.7% (3.5%) over a one-year period after the disclosure, while it is 17.9% (14.8%) over a

three-year period.

Table 4.2: Summary Statistics
This table shows summary statistics of major variables used in the study. For the Thomson Reuters 13F sample, *Increase in ownership during activist campaign* equals 1 if an institution increases ownership in a target stock from the campaign announcement quarter end to the quarter end before the outcome date, and 0 otherwise. $Vote\ against\ management\ proposal$ (*director nominee*) is the percent of "Against" votes among all funds within an institution on management-sponsored proposals (director nominees) at shareholder meetings that take place between campaign announcement and outcome dates. $Vote\ against\ management$ (*director nominee*) *in all meetings* is the percent of "Against" votes among all funds within an institution on management-sponsored proposals (director nominees) at all shareholder meetings that take place after the campaign announcement. *Campaign Success* equals 1 if an activist achieves at least one of its stated goals, and 0 otherwise. Return on assets (ROA) is earnings before interest, tax, depreciation and amortization (EBITDA) scaled by lagged assets. $ROA\ Y1$, $ROA\ Y2$ and $ROA\ Y3$ are calculated during the first, second, and third year after campaign announcement, respectively. $BHAR[0, Y1]$, $BHAR[0, Y2]$ and $BHAR[0, Y3]$ are the buy-and-hold abnormal returns (benchmarked to one of the 25 Fama-French size and book-to-market value-weight portfolios) of a target stock during 1 year, 2 years, and 3 years after campaign announcement, respectively. *Connection to activist* equals 1 if an institution and the activist are socially connected via top personnel, and 0 otherwise. $Same\ city - institution\ and\ firm$ is an indicator equal to 1 if an institution and the target firm's headquarters are located in the same city. Same city – institution and activist equals 1 if an institution and the activist are located in the same city, and 0 otherwise. *Same – size quintile* equals 1 if portfolios of an institution and the activist are in the same size quintile at the quarter end before campaign announcement. $Portfolio\ overlap$ in stock holdings between funds i and j during quarter t as the dot product between a vector of securities held by fund i (h_{it}) and fund j (h_{jt}), divided by the product of Euclidean norm of each vector (Blocher, 2016). The portfolio overlap is computed at each quarter end. For the Abel Noser transaction sample, *Increase in ownership during activist campaign* equals 1 if an institution increases ownership in a target stock from one day after campaign announcement to one day before the outcome date, and 0 otherwise. Other variables are defined as for the Thomson Reuters 13F sample.

	The Thomson Reuters 13F Sample		
Dependent variable	Average	Median	Std. Dev.
Institution level			
Increase in ownership during activist campaign	0.025	0	0.155
Vote against management proposal	0.100	0	0.295
Vote against management proposal in all meetings	0.089	0	0.280
Vote against director nominee	0.100	0	0.294
Vote against director nominee in all meetings	0.089	0	0.280
Firm level			
Campaign success	0.667	1	0.423
ROA Y1	0.028	0.073	0.225
ROA Y2	0.033	0.070	0.377
ROA Y3	0.046	0.076	0.206
BHAR [0, Y1]	0.047	0.035	0.593
BHAR [0, Y2]	0.106	0.103	0.802
BHAR [0, Y3]	0.179	0.148	0.903
Independent variable of interest			
Connection to activist	0.055	0	0.227
Connection to activist (by hedge funds)	0.066	0	0.248
Connection to activist (by mutual funds)	0.049	0	0.216
Connection to activist (school ties)	0.026	0	0.160
Connection to activist (employment ties)	0.035	0	0.185
Connection to activist (other ties)	0.005	0	0.072
Control variable			
Same city – institution and activist	0.116	0	0.320
Same city – institution and target	0.018	0	0.133
Portfolio overlap	0.026	0	0.061
Same-size quintile	0.222	0	0.416
	The Abel Noser sample		
	Average	Median	Std. Dev.
Increase in ownership during activist campaign	0.018	0	0.134
Connection to activist	0.037	0	0.189
Same city – institution and activist	0.080	0	0.272
Same city – institution and target	0.011	0	0.105

In terms of similarities between activists and institutions, 11.6% of the time,

an institution and an activist locate in the same city (New York City, Boston, and Chicago are the top three locations for institutions and activist funds). An institution and a target firm are headquartered in the same city just 1.8% of the time. The average portfolio overlap between an activist and an institution is 2.6%, while more than 22% of activist-institution pairs are in the same size quintile.

Summary statistics for the same variables in the Abel Noser sample are similar to those in the 13F sample. However, we do not construct *Portfolio overlap* and *Same-size quintile* for this sample because institutions in the Abel Noser database do not report their portfolio holdings or TNA.

4.3 Social networks and institutional trading

4.3.1 Baseline results

If connected institutions are better informed about the activist's plan of attack and its chance of success, we should observe larger trades by them from the activist disclosure to the outcome date (Brav, Dasgupta, and Mathews, 2016). We begin our analysis by estimating the linear probability model regression

$$IncreaseInOwnership_{fijt} = \alpha + \beta Connection_{ijt} + \delta Controls_{ijt} + \lambda_{fit} + \mu_j + \epsilon_{fijt} \tag{4.1}$$

in which $IncreaseInOwnership_{fijt}$ is an indicator equal to one if institution j increases ownership in a firm f targeted by activist i in year t from the campaign announcement quarter to the quarter end before the outcome date, and zero otherwise. $Connection_{ijt}$ equals one if an institution and an activist are socially connected through top personnel, and zero otherwise. $Controls_{ijt}$ is a vector of control variables, including location dummies between the institution and activist/target, portfolio overlap between an institution and an activist, and same-size indicators. λ_{fit} represent activism-event fixed effects and μ_j are institution fixed effects. ϵ_{fijt} is the error term.

If social interactions systematically influence institutions' trading in a target stock, then β in equation (1) should be positive. The estimate of β is the incremental probability of an increase in target stock holdings during activist campaigns for connected institutions. The control variables control for major similarities between an institution and an activist that may affect the institution's decision in trading the target stock. The fixed effects control for all time-invariant event and institution characteristics. Standard errors are adjusted for heteroscedasticity and they are clustered along the institution dimension.

Table 4.3: Social connections and changes in institutional ownership
This table applies a linear probability model to examine whether a social connection to the activist predicts an increase in target stock ownership from campaign announcement quarter end to the quarter end before the outcome date. *Connection to activist* is a dummy variable equal to 1 if an institution is connected to the activist as of year $t-1$ (year t is when the activist discloses its position in the target firm). Panel A reports main results for our full sample, the subsample of hedge funds, and the subsample of mutual funds, while Panel B shows additional analysis for the full sample examining different types of social connections. Panel C replicates Panel A except that the analysis includes Institution $\times$ Activist fixed effects. All other independent variables are as defined in table 4.2. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Main analysis

Dependent variable: Increase in ownership during activist campaign	Full sample	Hedge funds	Mutual funds
	(1)	(2)	(3)
Connection to activist	0.011***	0.010***	0.011***
	[5.718]	[4.007]	[4.377]
Same city – institution and target	0.001	0.001	0.001
	[1.277]	[0.700]	[0.884]
Same city – institution and activist	0.003*	0.005**	0.001
	[1.904]	[2.149]	[0.179]
Portfolio overlap	0.021***	0.015**	0.031***
	[4.145]	[2.389]	[3.032]
Same-size quintile	0.011***	0.012***	0.009***
	[12.848]	[11.327]	[6.389]
Observations	884,530	584,206	300,324
Adj. R-squared	0.141	0.141	0.145
Event FEs	Yes	Yes	Yes
Institution FEs	Yes	Yes	Yes
% (Dep variable = 1)	2.45%	2.63%	2.11%

Panel B: Types of social connections

Dependent variable: Increase in ownership during activist campaign	School ties	Employment ties	Other ties
	(1)	(2)	(3)
Connection to activist	0.009***	0.015***	0.016***
	[3.713]	[3.854]	[2.678]
Same city – institution and target	0.001	0.001	0.001
	[1.376]	[1.403]	[1.406]
Same city – institution and activist	0.003*	0.003*	0.003*
	[1.912]	[1.902]	[1.919]
Portfolio overlap	0.022***	0.022***	0.022***
	[4.284]	[4.223]	[4.279]
Same-size quintile	0.011***	0.011***	0.011***
	[12.861]	[12.885]	[12.880]
Observations	884,530	884,530	884,530
Adj. R-squared	0.141	0.141	0.141
Event FEs	Yes	Yes	Yes
Institution FEs	Yes	Yes	Yes
% (Dep variable = 1)	2.45%	2.45%	2.45%

Panel C: Alternative model specification

Dependent variable: Increase in ownership during activist campaign	Full sample	Hedge funds	Mutual funds
	(1)	(2)	(3)
Connection to activist	0.009***	0.006*	0.013***
	[3.136]	[1.728]	[3.303]
Same city – institution and target	0.005**	0.006**	0.002
	[2.317]	[2.353]	[0.646]
Portfolio overlap	-0.005	-0.013	0.011
	[-0.563]	[-1.315]	[0.718]
Same-size quintile	0.002**	0.002	0.002**
	[2.312]	[1.540]	[2.049]
Observations	800,281	532,530	267,751
Adj. R-squared	0.283	0.281	0.293
Event FEs	Yes	Yes	Yes
Institution × Activist FEs	Yes	Yes	Yes
% (Dep variable = 1)	2.62%	2.81%	2.25%

As shown in table 4.3, panel A, for the full sample of all institutions, a connected institution is 1.1 percentage points more likely to raise its stake in the target during an activist campaign, compared to those that are not socially connected to the activist. The coefficient estimate is statistically significant at the 1% level. Given that the unconditional probability for an increase in the target stock is 2.5%, this represents an increase in the incremental probability of 44%. Similarities between institutions and activists appear to capture institutional purchases as well. An institution is 0.3 percentage points more likely to increase its holdings in an target stock if it is located in the same city as the activist (the estimate is significant at the 10% level). This is consistent with the results in Hong, Kubik, and Stein (2005). In addition, a one-standard-deviation increase in portfolio overlap is associated with a 13 basis-point increase in the likelihood of institutional purchase, all else being equal. If an institution and an activist are from the same-size quintile, then the institution is 1.1 percentage points more likely to increase holdings. Both coefficient estimates are significant at the 1% level. Columns (2) and (3) report results for hedge funds and mutual fund families, respectively. The effects of social connections on institutional purchases for these two groups are similar to that for the full sample.

Appendix B replicates the analysis by replacing the event fixed effects with firm characteristics. The coefficient estimates on *Connection* for the full sample and subgroups are almost identical to those from the fixed-effect model.[7]

In panel B of table 4.3, we show results by re-estimating equation (2) for three types of social connections: school ties, employment ties and other types of ties. School ties on average are established earlier than other ties before an activism event starts, and their formation is typically independent of the information to be transmitted via the network. Therefore they are considered as one of the most exogenous social connections (Cohen, Frazzini, and Malloy, 2008; Butler and Gurun,

[7]Firm characteristics also predict institutional trading in target firms. For example, institutions are more likely to raise investments in small stocks and those with poor recent price performance. They also tend to increase holdings in cash-rich firms and those that pay lower dividends, consistent with Brav, Jiang, Partnoy, and Thomas (2008).

2012). An institution connected via school ties is 0.9 percentage point more likely to increase investment in the target during an activist campaign, compared to those that are not socially connected to the activist. This represents an increase in the incremental probability of 36%. Employment ties are associated with an increase of 60% in the incremental probability. The larger magnitude is potentially due to the fact that employment ties are established in more recent years. Other ties are associated with an increase of 64% in the incremental probability. The larger magnitude may be attributed to the close-knit nature of the social functions, such as club membership and charity work.

Controlling for all similarities between institutions and activists

The baseline analysis in subsection 4.3.1 may not control for omitted variables capturing similarities between institutions and activists, such as stock picking abilities or investment styles. To address this, we replace institution fixed effects in equation 4.1 with Institution×Activist fixed effects. Institution×Activist fixed effects control for all types of time-invariant similarities between institutions and activists. However, this makes the model more restrictive by using only events launched by *repeat* activists to estimate the coefficients. As shown in panel C of table 4.3, the economic and statistical significance of the estimated coefficient on *Connection* is similar to that in the main analysis.

4.3.2 Identification using fund company M&As

Although variations of specifications for equation (2) rule out time-invariant factors in institutional investment decisions and similarities between institutions and activists, it remains possible that some social ties (e.g., past employment ties) may not be strictly exogenous to the activist events (i.e., social ties are potentially made due to an "anticipation effect"). To address such endogeneity concerns, we use M&As among institutions as plausibly exogenous shocks to social connections.

As explained in He and Huang (2017), institutions typically merge for reasons unrelated to the fundamentals of their individual stock holdings. Similarly, institutions merge for reasons unrelated to an official's social connection to a particular activist. When two institutions merge, the acquiring entity can become connected to an activist because connected personnel from the target institution move to the new institution. On the other hand, connections can be severed due to senior official turnover associated with a deal. By focusing on a subset of institutions that experience M&As before the launch of activist campaigns, we are able to claim a causal relationship between social connections and institutional trading during activist campaigns.

Our sample of financial institution M&As is obtained from the Securities Data Company ("SDC") database. We apply the following filters in the prior literature (He and Huang, 2017): (1) both the target and acquirer are financial institutions (four-digit SIC from 6000 to 6999), (2) a merger is announced between 2004 and 2013 and is completed within a year. These steps generate 274 unique mergers. For all institution-activist pairs in each year $t-1$ (year t is when the activist discloses

its position in the target firm), we include only institutions that completed M&As during the previous year (year $t-2$). This matching criterion yields 1,082 events involving 195 unique institutions.

Table 4.4: Fund company M&As and social connections
This table applies a linear probability model to examine whether social connections, created or severed by fund company mergers and acquisitions (M&As), predict an increase in target stock ownership from campaign announcement quarter end to the quarter end before the outcome date. For all institution-activist pairs in each year $t-1$ (year t is when the activist discloses its position in the target firm), we select a subsample of institutions that experience M&As during the previous year $t-2$. In column (1), we include all institutions that are subject to M&As, and in column (2), we exclude institutions that are subject to M&As but remain connected with the activist. Connection to activist is a dummy variable equal to 1 if an institution is connected to the activist as of year $t-1$. All other independent variables are as defined in table 4.2. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable: Increase in ownership during activist campaign	All institutions subject to M&As	All institutions subject to M&As, excluding those remain connected
	(1)	(2)
Connection to activist	0.017***	0.015**
	[2.609]	[2.035]
Same city – institution and target	0.002	0.001
	[0.293]	[0.110]
Same city – institution and activist	0.012	0.001
	[0.935]	[0.086]
Portfolio overlap	0.042	0.041
	[1.529]	[1.333]
Same-size quintile	0.018***	0.016***
	[4.529]	[4.358]
Observations	25,774	23,272
Adj. R-squared	0.224	0.214
Event FEs	Yes	Yes
Institution FEs	Yes	Yes
% (Dep variable = 1)	3.61%	3.06%

Table 4.4 reports the results by re-estimating equation (2). In column (1), our sample includes all institutions that are subject to M&As before activism events. A connected institution is 1.7 percentage points more likely to increase investment in the target during an activist campaign, compared to those that are not socially connected to the activist. This represents an increase in the incremental probability of 47%. In column (2), we exclude institutions that remain connected after M&As. The magnitude of the estimate is qualitatively similar to that shown in column (1).

Overall, our results using fund company M&As as plausibly exogenous shocks to social connections are consisent with our main results. The findings suggest that our main results are unlikely to be driven by potentially endogenous social connections.

4.3.3 Returns on "connected" investment

The fact that connected institutional investors appear to increase their stakes in the target firm during an activist campaign does not necessarily imply these trades are profitable. Taking a similar approach to Cohen, Frazzini, and Malloy (2008), and Pool, Stoffman, and Yonker (2015), we thus compare the performance, for individual institutions, of investment in connected activists' target firms to that in non-connected activists' targets, and test the hypothesis that an institution earns higher returns due to its social connections to activists.

We use a calendar-time portfolio method. Following Cao, Goldie, Liang, and Petrasek (2016) and Jiang, Li, and Mei (2017), we construct two calendar-time portfolios on a daily basis, and the portfolios are rebalanced when campaigns are launched, concluded or withdrawn. For each target firm a sample institution holds during its campaign, we assign the target-institution pair to one of the two portfolios: connected or non-connected. For a target firm, if the institution is (not) socially connected to its activist, it is assigned to the (non-) connected portfolio. For each day and each portfolio, we compute value-weighted returns by weighting the institution's dollar investment in the firm at the beginning of quarter t. To obtain abnormal returns earned from connections, we first aggregate daily portfolio returns to the monthly level and run time-series regressions using the market factor, and Fama French five-factors, respectively. The reported abnormal returns are thus in monthly percent, and are calculated for the full sample of institutions, hedge funds, and mutual funds, respectively.[8] Table 4.5 presents calendar time portfolio returns for the full sample, hedge funds, and mutual fund families, respectively.

[8]We also calculate characteristically adjusted returns ("DGTW-adjusted returns") as in Daniel, Grinblatt, Titman, and Wermers (1997), and find that the results are similar to those from the calendar-time portfolio regressions.

Table 4.5: Returns on "Connected" campaigns
This table reports calendar-time portfolio returns. At the beginning of each activist campaign, if the target stock is held by a connected institution, we assign the stock to a "connected" portfolio. Following Cao, Goldie, Liang, and Petrasek (2015) and Jiang, Li, and Mei (2017), the calendar-time portfolio is constructed on a daily basis, and is rebalanced when campaigns are launched, concluded or withdrawn. We compute value-weighted portfolios. To obtain abnormal returns, we aggregate daily portfolio returns to the monthly level and run time-series regressions using the market factor, and Fama French five-factors, respectively. Returns are in monthly percent, and are calculated for the full sample of institutions, hedge funds, and mutual funds, respectively. The t-statistics in the square brackets are calculated using Newey-West (1987) standard errors with seven lags. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Raw return			Abnormal return from CAPM			Abnormal return from the Fama-French five-factor model		
	Connected portfolio (1a)	Non-connected portfolio (1b)	Diff. (1c)	Connected portfolio (2a)	Non-connected portfolio (2b)	Diff. (2c)	Connected portfolio (3a)	Non-connected portfolio (3b)	Diff. (3c)
Full sample	1.56%***	1.06**	0.50%**	0.86%***	0.35	0.51%**	0.95%***	0.53**	0.42%
	[2.75]	[1.20]	[1.85]	[2.62]	[1.41]	[1.85]	[2.78]	[2.06]	[1.47]
Hedge funds	1.61%***	1.05**	0.55%*	0.86%**	0.33	0.53%*	1.00%**	0.48*	0.53%**
	[2.63]	[2.00]	[1.76]	[2.29]	[1.36]	[1.67]	[2.59]	[1.91]	[2.30]
Mutual funds	1.50%***	1.11**	0.39%	0.86%**	0.43%**	0.43%	0.93%**	0.59*	0.34
	[2.64]	[2.46]	[1.04]	[2.26]	[2.31]	[2.17]	[2.35]	[1.71]	[0.86]

For the full sample of institutions, the connected and non-connected portfolios earn 1.56% and 1.06% monthly in raw returns, respectively. A long-short portfolio that purchases stocks in the connected portfolio and shorts non-connected ones earns 0.5% per month, significant at the 5% level. The abnormal return for the long-short portfolio using the CAPM and Fama-French five-factor models are 0.51% and 0.42% per month respectively (t-statistic = 1.85). When we restrict our sample to hedge funds, the long-short portfolio yields a monthly raw return of 0.55% and a Fama-French alpha of 0.53%. For mutual fund families, we obtain slightly smaller estimates for both return measures than those for hedge funds. The fact that hedge funds trade more aggressively than mutual funds may contribute to this difference. On average, hedge funds buy \$7.9 million in connected stocks and \$6.3 million in non-connected stocks, while mutual fund families buy \$3.3 million in connected stocks and \$1.8million in non-connected stocks.

Our results support the hypothesis that connected institutions have a comparative advantage in obtaining information on the target stocks from activists. When fund managers and an activist are likely to have a higher level of social interactions, they increase their stakes in the stock and earn large positive returns. As a result, the long-short portfolio that consists of connected and non-connected target stocks earns positive abnormal returns during the activist campaign.

4.4 Social connections and shareholder voting

In this section, we study how connected institutions' trading contribute to activists' successes. As Edmans and Holderness (2017) point out, institutional investors pri-

marily exercise their shareholder rights through voting for directors and major corporate proposals. Directors receiving a meaningful fraction of negative votes are more likely to step down (Cai, Garner, and Walkling, 2009), and companies often respond to negative voting outcomes on other management-sponsored proposals, such as compensation-related ones (Ferri and Maber, 2013). If connected institutions are more ready than non-connected institutions to vote against management in target companies during activist campaigns, this is strong evidence that the activists have built an alliance that can effectively challenge management and potentially improve firm performance and shareholder value.

We study director elections and other management-sponsored proposals, which include executive compensation plans, Say-on-Pay proposals, governance-related proposals, capitalization proposals, and routine and miscellaneous proposals. Together, they account for over 95% of all proposals (Li, 2016).

For mutual fund s, we define an indicator variable *Vote against management proposal*$_s$ that equals one if the fund votes against a proposal sponsored by management, and zero otherwise. Our main dependent variable below represents the percent of funds within an institution that vote against management:

$$\text{Vote against management proposal} = \sum_{s}^{S} \text{Vote against management proposal}_s \tag{4.2}$$

in which S is the number of funds within the institution. *Vote against director nominee* is defined in a similar fashion.

As ISS recommendations are shown to significantly sway institutional votes (Iliev and Lowry, 2014; Cvijanovic, Dasgupta, and Zachariadis, 2016), we also define *ISS against management*, which equals one if ISS recommends against management, and zero otherwise. On average, ISS recommends against management proposals 7.5% of the time, while it recommends against management's director nominees 7.4% of the time. Both percentages are less than the proportion of votes cast by fund families (10%).

We estimate a linear probability model by regressing *Vote against management proposal* or *Vote against director nominee* on *Connection to activist*, proxies for similarities between instiutitons and activists, and proposal fixed effects and institution fixed effects, which capture time-invariant proposal and institution level characteristics.

Table 4.6: Social connections and shareholder voting during activist campaigns
This table examines how connected institutions vote in target firms' shareholder meetings after activist disclosures. Column (1) include shareholder meetings that take place between campaign announcement and outcome dates, while column (2) includes all post-announcement shareholder meetings by target firms. *Vote against management proposal* (*director nominee*) is the percent of "Against" votes among all funds within an institution on management-sponsored proposals (director nominees). *Connection to activist* is a dummy variable equal to 1 if an institution is connected to the activist as of year $t-1$ (year t is when the activist discloses its position in the target firm). *Meeting during campaign* is an indicator equal to 1 if a shareholder meeting is held between campaign announcement and outcome dates. All other independent variables are as defined in table 4.2. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Meetings during activist campaign		All meetings after activist announcement	
Dependent variable	Vote against management proposal	Vote against director nominee	Vote against management proposal	Vote against director nominee
	(1a)	(1b)	(2a)	(2b)
Connection to activist	0.009*	0.013**	0.003	0.004
	[1.908]	[2.333]	[1.344]	[1.346]
Connection to activist × Meeting during campaign			0.009**	0.012**
			[2.265]	[2.513]
Same city – institution and target	-0.003	0.006	-0.005	-0.005
	[-0.280]	[0.478]	[-0.826]	[-0.857]
Same city – institution and activist	-0.001	-0.004	-0.001	-0.001
	[-0.223]	[-0.587]	[-0.416]	[-0.202]
Portfolio overlap	-0.066	-0.076	-0.015	-0.015
	[-1.460]	[-1.328]	[-0.567]	[-0.427]
Same-size quintile	0.002	0.003	0.000	0.002
	[0.354]	[0.380]	[0.123]	[0.577]
Observations	101,308	72,634	443,606	320,027
Adj. R-squared	0.483	0.512	0.466	0.503
Proposal FEs	Yes	Yes	Yes	Yes
Institution FEs	Yes	Yes	Yes	Yes

In column (1) of table 4.6, we report evidence on whether connected institutions are more likely to challenge management in shareholder meetings during activist campaigns. Column (1a) reports that connected institutions' votes against management proposals are 0.9 percentage point more than those by non-connected institutions. The coefficient estimate is statistically significant at the 10% level. Given that the unconditional disapproval rate of fund families for directors is 10%, this represents an increase in disapproval of 9%.

Column (1b) replicates the analysis in column (1a) for director elections only. Connected institutions' votes against management-sponsored directors are about 1.3 percentage points more than those by non-connected institutions (significant at the 5% level). This represents an incremental increase in disapproval of 13%.

In column (2), we relate disapproval of management proposals and director nominees with *Connection to activist*, interacted with *Meeting during campaign*,

which is an indicator variable equal to one for meetings that take place during activist campaigns. This difference-in-differences ("DiD") specification compares differential votes between connected and non-connected institutions during campaign years with those in years with less activist influence. Note that the regressor *Meeting during campaign* and *ISS recommends against proposal* is dropped due to multicollinearity with proposal fixed effects. [9] The results are similar. The result in column (2b) suggests that during activist campaigns, the difference in "Against" votes for directors between connected and non-connected institutions is about 1.2 percentage points, compared with that in later years with less activist influence. We obtain similar results for all management proposals in columns (2a).

4.4.1 Ownership changes and shareholder voting

Having shown that socially connected shareholders are move likely to challenge management during activism events, we proceed to study the interactive effects of institutional trading and voting. Presumably, connected institutions that purchase target stocks during a campaign are more likely to challenge the management in shareholder meetings because doing so will benefit them more than when they do not increase holdings. Loosely speaking, this is analogous to Cornelli and Li (2002), who explain that a risk arbitrageur "creates" private information after purchasing shares because they are now privately informed about their own voting decisions, which in turn increases the value of the shares by raising the probability of a favourable vote outcome (deal completion). Applying the same framework to an connected institution during an activist campaign, its information advantage lies in the fact it is privately informed about its intention to support the activist (vote against management), which improves the probability of activist success and an increase in stock prices.

[9] Appendix C replicates the analysis by replacing the event fixed effects with firm characteristics.

Table 4.7: Ownership changes and shareholder voting during activist campaigns
This table examines how connected institutions vote in target firms shareholder meetings when their ownerships change. The sample includes shareholder meetings that take place between campaign announcement and outcome dates. *Vote against management proposal* (*director nominee*) is the percent of "Against" votes among all funds within an institution on management-sponsored proposals (director nominees). *Connection to activist* is a dummy variable equal to 1 if an institution is connected to the activist as of year $t-1$ (year t is when the activist discloses its position in the target firm). *Increase in ownership during activist campaign* equals 1 if an institution increases ownership in a target stock from the campaign announcement quarter end to the quarter end before the outcome date, and 0 otherwise. All other independent variables are as defined in table 4.2. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Meetings during activist campaign	
Dependent variable	Vote against management proposal	Vote against director nominee
	(1)	(2)
Connection to activist	0.003	0.007
	[0.548]	[1.025]
Connection to activist × Increase in ownership during activist campaign	0.017**	0.018**
	[2.494]	[2.090]
Increase in ownership during activist campaign	-0.001	0.003
	[-0.075]	[0.447]
Same city – institution and target	-0.003	0.006
	[-0.262]	[0.484]
Same city – institution and activist	-0.001	-0.004
	[-0.234]	[-0.601]
Portfolio overlap	-0.067	-0.076
	[-1.478]	[-1.340]
Same-size quintile	0.002	0.003
	[0.317]	[0.355]
Observations	101,316	72,634
Adj. R-squared	0.455	0.512
Proposal FEs	Yes	Yes
Institution FEs	Yes	Yes

For this study, we focus on all meetings that take place during activist campaigns. Specifically, we regress *Vote against management proposal* or *Vote against director nominee* on *Connection to activist*, interacted with *Increase in ownership*, as well as proxies for similarities between institutions and activists, and proposal fixed effects and institution fixed effects. A positive coefficient on the interaction term, *Connection to activist*×*Increase in ownership*, indicates that there is a stronger association between social connections and voting against management proposals/director nominees when an institution purchases target stocks during the campaign. As shown in column (1) of table 4.7, connected institutions' votes against management-sponsored proposals/directors are 1.7-1.8 percentage points more than those by non-connected institutions when the institutions increase investment in the target firms (significant at the 5% level). This represents an incremental increase in disapproval of 17% to 18%.

4.5 Robustness analysis

4.5.1 Activist disclosure within 10 days after Quarter $t-1$ ends

Using 13F institutional ownership data provides an advantage of wide coverage, however, we do not know when in the quarter institutions' trades are executed and, therefore, it is possible that our proxy for institutional trades captures only part of the actual trades during an activist campaign, especially when the activist's disclosure takes place toward the beginning of Quarter t. To this end, in robustness analysis, we restrict our sample to events in which activist announcements take place within 10 trading days after Quarter $t-1$ ends. We then proxy institutional trading by ownership change in the target firm from the end of *Quarter* $t-1$ to the end of Quarter $t+n$. Such a short window ensures that the change in an institution's ownership captures the bulk of its trades even if it trades heavily shortly after the activist disclosure.

Table 4.8: Robustness analysis
This table applies a linear probability model to examine whether a social connection to an activist predicts an increase in target stock ownership after the activists disclosure. Column (1) uses the Thomson Reuters 13F ownership data, and restricts the sample to campaigns that start within 10 trading days after the end of Quarter t-1 (see Figure 4.1). Column (2) uses the Abel Noser transaction database. The dependent variable equals 1 if an institutions stakes increase from one day after activist announcement to the outcome date. *Connection to activist* is a dummy variable equal to 1 if an institution is connected to the activist as of year $t-1$ (year t is when the activist discloses its position in the target firm). All other independent variables are as defined in table 4.2. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable: Increase in ownership during activist campaign	The 13F sample: Activist disclosure takes place within 10 trading days after Quarter *t*-1 ends	The Abel Noser transaction sample
	(1)	(2)
Connection to activist	0.011***	0.007***
	[2.888]	[2.761]
Same city – institution and target	0.003	0.004
	[0.479]	[1.224]
Same city – institution and activist	0.007***	0.005**
	[2.844]	[2.276]
Portfolio overlap	0.051***	
	[2.667]	
Same-size quintile	0.003**	
	[2.298]	
Observations	76,709	224,061
Adj. R-squared	0.156	0.102
Event FEs	Yes	Yes
Institution FEs	Yes	Yes
% (Dep variable = 1)	2.27%	1.83%

Table 4.8 reports results by re-estimating equation (2). In column (1), we restrict to a sample where quarter $t-1$ ends within 10 days before the activist announcement. The sample is reduced to 124 campaigns involving 81 activists.

Column (1) reports that, for an average institution, the marginal probability of increasing ownership in the target due to social ties is estimated to be 1.1 percentage points, other things being equal. The magnitude is identical to our main results reported in table 4.3. The estimates for most other covariates are also similar to those reported in table 4.3.

4.5.2 The Abel Noser transaction sample

One potential concern about the analysis in subsection 4.5.1 is the small sample size. Alternatively, we use the Abel Noser transaction database to determine a more precise connection between the activist disclosure and institutional trading activity during campaign (see Gantchev and Jotikasthira (2016) for a similar setting).

The dependent variable is a dummy variable equal to one if an institution increases its percent ownership of the target company from one day after activist announcement to the outcome date. The results, comparable to those using 13F institutional ownership data, are reported in column (2) of table 4.8. A connected institution is 0.7% percentage point more likely to increase its ownership in the target during a campaign, compared to institutions that do not have a social tie with the activist. This represents a 38% increase in incremental probability. The effects of most covariates are similar to those reported in table 4.3. (*Portfolio overlap* and *Same-size quintile* are omitted for this sample because funds in the Abel Noser database do not report their portfolio holdings or TNA.)

4.5.3 Sensitivity to alternative specifications

In the analyses above, we do not take into account an institution's capital constraint in creating our dependent variable. Although that is our preferred measure, we also carry out an analysis by using an alternative measure — a dummy variable equal to one if an institution increases the weight of the target stock in its portfolio during a campaign. As shown in Appendix D, for the full sample, a connected institution sees a 32% increase in the incremental probability of increasing its portfolio weight (significant at the 1% level), relative to those that are not connected to the activist. This magnitude is comparable to our main analysis. The results for hedge funds and mutual fund families are also similar.

4.5.4 Excluding events by repeat activists

Activist events can be concentrated with a number of large funds involving in multiple campaigns. For example, for the 122 campaigns launched in 2010, 103 are initiated by activists who launched activism in at least one campaign in the past. To address the concern that our results are potentially driven by a few large funds, such as GAMCO, Pershing Square, and Icahn Capital LP who may also have many social connections with other institutions, we re-estimate equation (2) by excluding repeat activists.

In columns (1) to (3) of Appendix E, we include only events by activists who in the past launched zero events, fewer than two events, and fewer than five events,

respectively. The magnitude of the estimated coefficient on *Connection to activist* is slightly larger than that in the main analysis in table 4.3.

4.6 Summary

This chapter investigates the benefits of social connections in the context of hedge fund activism. An institutional investor whose managers are socially connected to those at the lead activist is 1.1 percentage points more likely to increase its ownership in the target firm during the campaign period, compared to funds that are not socially connected to the activist. The effect is robust when using a subsample that includes all institutions subject to M&As to capture exogenous shocks to social connections. Connected institutions earn significantly more returns on campaigns and they are more likely to vote pro-activist in the annual meetings during campaigns.

Chapter 5

Conclusion

In conclusion, the thesis has investigated the institutional investor environment of target firms and related it to the selection of target companies and the information channel through social connections among activists and other institutions.

We have documented that firms with a higher concentration of institutional investors expressing dissatisfaction through voting, holding and exiting are more likely to be activism targets. The revealed governance preference from institutional investors can signal the quality of the firm, and activists are more likely to gain support from these dissatisfied shareholders. Supporting evidence shows that activists are more likely to use threats to sue management or submit shareholder proposals if there are more dissatisfied owners holding the target companies. Indirect evidence shows that the more dissatisfied owners there are, the higher the campaign announcement return is. Direct evidence from subsequent annual meeting voting records shows that dissatisfied institutions are more likely to be pro-activist in routine votes and especially compensation related votes.

In the analysis of information sharing through social networks, investors' social connections, such as school ties and past employment relationships, have been mapped out. An institutional investor whose managers are socially connected to those at the lead activist is 2.9 percentage points more likely to increase its portfolio weight in the target firm over the campaign quarter, relative to funds that are not connected to the activist. Compared to those established at public companies, social ties created at private firms and social functions such as clubs are associated with a higher likelihood of increasing "connected" ownership, and the likelihood is higher when the activist has a better track record. The monthly returns earned from investing in connected hedge funds' targets is 1.8 percentage points higher than those from non-connected ones. Further evidence suggests that the presence of connected funds can benefit the activist by increasing its success rate, including gaining board seats. The results are robust to alternative specifications, as well as to alternative hypotheses, such as fund manager ability, fund characteristics, or investment styles.

In the same framework of analyzing alliance building among activists and institutional investors during campaign period, a connected institution is found to increase, on average, 1.1 percentage points its ownership in the target firm, compared

to funds that are not socially connected to the activist. To address endogeneity by using mergers and acquisitions among financial institutions as plausibly exogenous shocks to social connections, similar results are obtained: a connected institution is 1.7 percentage point more likely to raise stakes in a target firm (the incremental probability is 47%). Connected institutions also perform significantly better on their investment than non-connected institutions, generating a risk-adjusted long-short portfolio return of 0.42% to 0.51% per month. Furthermore, connected institutions' votes against management proposals (management-sponsored directors) are 0.9 (1.3) percentage points more than those by non-connected funds, representing an increase of 9% (13%) in the disapproval rate. The connected institutions that purchase target stocks during a campaign are even more likely to challenge management in shareholder meetings, which presumably will benefit them more if campaigns are successful. These effects only exist for meetings during activist campaigns, but not for meetings after outcome dates.

The thesis contributes to the literature of hedge fund activism and provides an insightful picture of the working of a campaign. It also relates to corporate governance theories and the applications of social networks in finance research. It is the product of the ever increasing awareness of institutional investors' roles in corporate governance and sheds light on the ever more complex nature of minority shareholder investing and governing.

Appendix A

Defining activist social ties

To determine"effective" social ties between an activist fund and an institutional investor, we list the four scenarios below (all names are hypothetical).

Scenario 1: John worked at an activist fund named Activist Capital ("Activist A") from 2005 to 2014. Mary worked at an investment company called Growth Capital ("Institution B") from 2008 to 2012. Both John and Mary were studying at the same university in 1975. The effective social tie between Activist Capital and Growth Capital based on John and Mary's connection started in 2008 and ended in 2012.

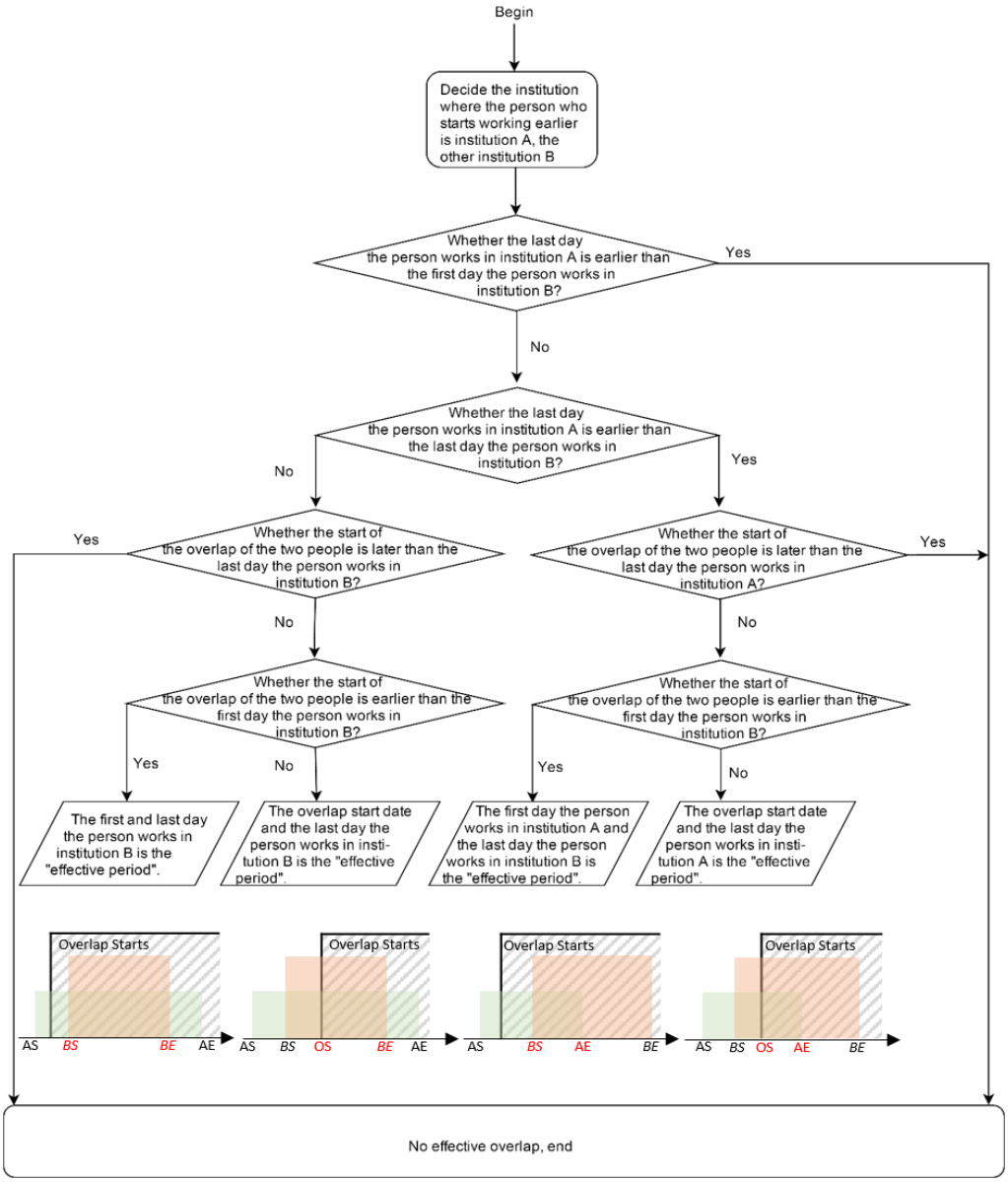
Scenario 2: John worked at an activist fund named Activist Capital ("Activist A") from 2005 to 2014. Mary worked at an investment company called Growth Capital ("Institution B") from 2008 to 2012. Both John and Mary served as directors of a corporation from 2009. The effective social tie between Activist Capital and Growth Capital based on John and Mary's connection started in 2009 and ended in 2012.

Scenario 3: John worked at an activist fund named Activist Capital ("Activist A") from 2005 to 2010. Mary worked at an investment company called Growth Capital ("Institution B") from 2008 to 2012. Both John and Mary were studying at the same university in 1975. The effective social tie between Activist Capital and Growth Capital based on John and Mary's connection started in 2008 and ended in 2010.

Scenario 4: John worked at an activist fund named Activist Capital ("Activist A") from 2005 to 2010. Mary worked at an investment company called Growth Capital ("Institution B") from 2008 to 2012. Both John and Mary served as directors of a corporation from 2009. The effective tie between Activist Capital and Growth Capital based on John and Mary's connection started in 2009 and ended in 2010.

These four scenarios correspond to the four charts in the algorithm detailed in Figure A1 below.

Figure A.1: An illustration of social ties between activist A and institution B AS (BS) is the starting time of a person in institution A (B) and AE (BE) is the last day the person works for institution A (B). The green (orange) box is the duration a person works in institution A (B). OS is the starting time when the two people from institutions A and B become known to each other via a third organization. The shaded area is the time during which the two people are known to each other. The duration between labels highlighted in red is the "effective" period during which institutions A and B are connected by the two people they are still working in their institutions and are known to each other via a third party.



Appendix B

Connected ownership

Table B.1: Social connections and changes in institutional ownership – Extension of Table 4.3, Replacing Event Fixed Effects with Firm Controls
This table replicates Table 4.3 except that event fixed effects are replaced with firm characteristics. All variables are as defined in Tables 3.1 and 4.2. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable: Increase in ownership during activist campaign	Full sample	Hedge funds	Mutual funds
	(1)	(2)	(3)
Connection to activist	0.010***	0.010***	0.011***
	[5.323]	[3.717]	[4.092]
Same city – institution and target	0.001	0.001	0.001
	[1.305]	[0.817]	[0.759]
Same city – institution and activist	0.003*	0.005**	-0.000
	[1.712]	[2.202]	[-0.153]
Portfolio overlap	0.017***	0.012*	0.024**
	[3.258]	[1.805]	[2.519]
Same-size quintile	0.011***	0.012***	0.010***
	[12.779]	[11.290]	[6.344]
Log (MV)	-0.003***	-0.003***	-0.002
	[-3.302]	[-2.936]	[-1.494]
Return on assets (ROA)	-0.001	0.003	-0.008
	[-0.195]	[0.545]	[-1.343]
Prior-year stock return	-0.004***	-0.004***	-0.003***
	[-5.676]	[-4.512]	[-3.395]
B/M	-0.003**	-0.003**	-0.002
	[-2.426]	[-2.128]	[-1.146]
Growth	0.008***	0.009***	0.007***
	[5.455]	[4.528]	[3.093]
Cash	0.012***	0.010*	0.018***
	[3.106]	[1.811]	[3.160]
Dividend yield	-0.106***	-0.138***	-0.046*
	[-5.765]	[-5.541]	[-1.894]
Amihud illiquidity	-0.001	-0.001	-0.001
	[-1.639]	[-1.071]	[-1.241]
Institutional ownership	0.006	0.005	0.006
	[1.596]	[1.166]	[1.040]
Observations	741,351	489,343	252,008
Adj. R-squared	0.139	0.139	0.143
Year FEs	Yes	Yes	Yes
Institution FEs	Yes	Yes	Yes
% (Dep variable = 1)	2.51%	2.69%	2.17%

Appendix C

Connected voting

Table C.1: Social connections and shareholder voting during activist campaigns – Extension of Table 4.3, Replacing Event Fixed Effects with Firm Controls
This table replicates Table 4.3 except that event fixed effects are replaced with firm characteristics. All variables are as defined in Tables 3.1 and 4.2. *ISS recommends against proposal* is a dummy variable equal to 1 if Institutional Shareholder Services issues a recommendation against a proposal, and 0 otherwise. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Meetings during activist campaign		All meetings after activist announcement	
Dependent variable	Vote against management proposal	Vote against director nominee	Vote against management proposal	Vote against director nominee
	(1a)	(1b)	(2a)	(2b)
Connection to activist	0.012**	0.016**	0.003	0.003
	[2.560]	[2.753]	[1.081]	[1.103]
Connection to activist × Meeting during campaign			0.010***	0.013***
			[2.628]	[2.737]
Meeting during campaign			0.006***	0.006**
			[2.663]	[2.149]
Same city – institution and target	-0.004	0.004	-0.004	-0.004
	[-0.594]	[0.565]	[-0.697]	[-0.762]
Same city – institution and activist	-0.003	-0.004	0.002	0.002
	[-0.416]	[-0.616]	[0.532]	[0.362]
Portfolio overlap	-0.062	-0.072	-0.023	-0.026
	[-1.767]	[-1.595]	[-1.419]	[-1.213]
Same-size quintile	0.003	0.005	0.001	0.002
	[0.644]	[0.844]	[0.341]	[0.631]
ISS recommends against proposal	0.561***	0.553***	0.544***	0.537***
	[12.030]	[10.563]	[12.324]	[11.429]
Log (MV)	-0.002	-0.003	-0.003	-0.004*
	[-0.472]	[-0.593]	[-1.550]	[-1.696]
B/M	0.001	0.002	-0.001	-0.002
	[0.251]	[0.519]	[-0.761]	[-0.857]
Return on assets (ROA)	-0.020	-0.013	-0.013*	-0.006
	[-1.499]	[-1.105]	[-1.734]	[-0.727]
Prior-year stock return	-0.003	-0.002	-0.001	-0.001
	[-1.047]	[-0.430]	[-0.549]	[-0.902]
Growth	0.016*	0.016	0.007*	0.009*
	[1.938]	[1.484]	[1.779]	[1.943]
Cash	0.015*	0.017	0.013	0.012
	[2.093]	[1.439]	[1.506]	[1.128]
Dividend yield	-0.100	-0.173	-0.104*	-0.130*
	[-0.765]	[-1.305]	[-1.774]	[-1.861]
Amihud illiquidity	0.020	0.017	0.031	0.042
	[0.339]	[0.199]	[0.867]	[0.826]
Institutional ownership	-0.004	-0.006	0.000	-0.007
	[-0.458]	[-0.396]	[0.098]	[-0.985]
Observations	86,699	62,521	390,510	282,562
Adj. R-squared	0.433	0.466	0.420	0.461
Proposal-type FEs	Yes		Yes	
Year FEs	Yes	Yes	Yes	Yes
Institution FEs	Yes	Yes	Yes	Yes

Appendix D

Connected portfolio allocation

Table D.1: Social connections and changes in institutional portfolio allocation – Extension of Table 4.3, Replacing the Dependent Variable with *Increase in Portfolio Weight*

This table replicates Table 2 except that the dependent variable is replaced with *Increase in portfolio weight during activist campaign*, which is an indicator equal to 1 if an institution increases the weight of the target stock in its portfolio between activist announcement and outcome dates. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable: Increase in portfolio weight during activist campaign	Full sample	Hedge funds	Mutual funds
	(1)	(2)	(3)
Connection to activist	0.008***	0.008***	0.008***
	[4.882]	[3.527]	[3.624]
Same city – institution and target	0.000	0.000	0.000
	[0.532]	[0.374]	[0.074]
Same city – institution and activist	0.002	0.004*	-0.000
	[1.407]	[1.722]	[-0.112]
Portfolio overlap	0.026***	0.022***	0.029***
	[5.336]	[3.914]	[2.959]
Same-size quintile	0.011***	0.012***	0.009***
	[13.401]	[11.715]	[6.804]
Observations	884,530	584,206	300,324
Adj. R-squared	0.141	0.144	0.140
Event FEs	Yes	Yes	Yes
Institution FEs	Yes	Yes	Yes
% (Dep variable = 1)	2.50%	2.70%	2.10%

Appendix E

Social connections and changes in institutional ownership in non-repetitive activists' campaigns

Table E.1: Social connections and changes in institutional ownership in non-repetitive activists' campaigns – Extension of Table 2, Excluding Repeat Activists
This table replicates column (1) of Table 2 except that repeat activists are excluded from the analysis. In column (1), all repeat activists who have launched more than one campaign in the past are excluded. In column (2), activists with fewer than two past campaigns are included. In column (3), activists with fewer than five past campaigns are included. In each column we report coefficient estimates and their heteroscedasticity-robust t-statistics. Standard errors are clustered at the institution level. $*$, $**$ and $***$ indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Dependent variable: Increase in ownership during activist campaign	Activists with zero past campaigns	Activists with fewer than two past campaigns	Activists with fewer than five past campaigns
	(1)	(2)	(3)
Connection to activist	0.010***	0.012***	0.012***
	[3.678]	[4.568]	[5.282]
Same city – institution and target	0.000	0.002	0.001
	[0.288]	[1.574]	[0.958]
Same city – institution and activist	0.001	0.002	0.001
	[0.366]	[0.799]	[0.332]
Portfolio overlap	0.056***	0.073***	0.054***
	[4.993]	[7.696]	[7.227]
Same-size quintile	0.003***	0.005***	0.007***
	[4.160]	[6.638]	[10.169]
Observations	184,605	297,564	483,742
Adj. R-squared	0.133	0.137	0.136
Event FEs	Yes	Yes	Yes
Institution FEs	Yes	Yes	Yes
% (Dep variable = 1)	1.82%	2.03%	2.12%

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