

Wolves at the Door: A Closer Look at Hedge Fund Activism

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ABSTRACT

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Some commentators attribute the success of certain hedge fund activism events to “wolf pack” activism, the support offered by other investors, many of whom are thought to accumulate stakes in the target firms before the activists’ campaigns are publicly disclosed. This paper investigates wolf-pack activism by considering the following questions: Is there any evidence of wolf-pack formation? Is the wolf pack formed intentionally (by the lead activist) or does it result from independent activity by other investors? Does the presence of a wolf pack improve the activist’s ability to achieve its stated objectives? First, I find that investors other than the lead activist do in fact accumulate significant share-holdings before public disclosure of activists’ campaigns, a result consistent with wolf-pack formation. Second, these share accumulations are more likely to be mustered by the lead activist rather than occurring spontaneously. Notably, for example, the other investors are more likely to be those who had a prior trading relationship with the lead activist. Third, the presence of a wolf pack is associated with a greater likelihood that the activist will achieve its stated objectives (e.g., will obtain board seats) and higher future stock returns over the duration of the campaign.

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DEDICATION

I dedicate my dissertation work to my family and many friends. A special feeling of gratitude to my loving parents, Alice and Siu Hung Wong, whose words of encouragement and push for tenacity ring in my ears. To my wife, Shirley who has never left my side and has the patience of a saint. Thank you for all your love, support, help, encouragement and dedication.

PREFACE

This dissertation is original, unpublished, independent work by the author, Yu Ting Forester Wong.

1. Introduction

This paper focuses on hedge fund activism, which over the past decade has emerged as a new type of external corporate governance mechanism, attracting the attention of policymakers and researchers (Brav, Jiang, and Kim 2009; Briggs 2007; Gillan and Starks 2007). Specifically, I examine “wolf pack” activism, the accumulation of shares by other non-lead activists who hold smaller stakes (i.e., below 5% of share outstanding threshold) in a target firm and support the activist’s campaign. This phenomenon may explain how hedge fund activists, who typically hold a relatively small stake in target firms (about 6%; see Brav et al. 2009), have been so successful in pressuring target firms to acquiesce to their requests.¹ Briggs (2007) and Coffee and Palia (2015) have suggested that the formation of a wolf pack before the filing of a schedule 13D, a form that activist investors must file upon acquiring 5% or more of the target firm’s stock, effectively increases the percentage of voting shares directed by the activist fund and thus makes the threat of further action, such as a proxy fight, more credible, causing the firm to accede to the activist’s demands.²

Commentators³ usually assume that activist hedge funds orchestrate the formation of wolf packs. According to this line of thinking, the lead activist (13D filer) recruits other investors to join the campaign *before* the 13D filing becomes public, typically leads to a positive stock return. In effect, the activist uses the expected jump in stock price to compensate the other investors for their support. This arrangement may be viewed as a way to circumvent securities

¹ It should be noted that while some pension funds and mutual funds engage in shareholder activism, these institutions usually engage in “governance activism” and not “performance activism” (see Gilson and Gordon 2013). The amount of shareholder support required for “governance activism” is likely to be less than “performance activism”, hence the incentive for these institutions to engage in “wolf pack” activism is also lower.

² The literature on non-binding shareholder proposals shows that management’s propensity to implement the proposals increases with the percentage of votes cast in their favor (Ertimur, Ferri and Stubben 2010; Ertimur, Ferri and Oesch 2013, 2015; Balachandran, Joos and Weber 2012). Hence, the effectiveness of the threat of a proxy fight is likely to depend on the percentage of votes directly or indirectly controlled by the activist.

³ See for, e.g., Briggs (2007) and Coffee and Palia (2015).

regulations and takeover defenses, which are usually triggered by holdings thresholds. The SEC, for example, requires activists to file a Schedule 13D within 10 days of crossing a 5% ownership threshold. In addition, regulatory constraints such as the “short-swing profit rule”⁴ and takeover defenses such as “poison pills”⁵ make it difficult for activists to acquire ownership over a certain holding threshold. By inducing other investors to acquire shares in the target, the lead activist can accumulate a larger percentage of de facto ownership before triggering these regulatory thresholds, thereby increasing the chances of a successful campaign (Coffee and Palia 2015). I label this as the *Coordinated Effort Hypothesis*. However, an alternative hypothesis is that wolf packs arise spontaneously because investors monitor and target the same firms around the same time. Brav, Dasgupta, and Mathews (2015), for example, analytically show that, under certain conditions, a pack can form around an activist without any explicit coordination by the activist. I label this as the *Spontaneous Formation Hypothesis*.

In this paper, I investigate wolf-pack activism by addressing three questions. First, is there any evidence of wolf pack formation? Second, is the wolf pack formed intentionally (by the lead activist) or does it result from independent activity by other investors? Third, does the presence of a wolf pack improve the activist’s ability to achieve its stated objectives? I investigate these questions using 1,922 activist hedge funds’ campaigns—all campaigns in the SharkRepellent database from 1998 through 2014 in which an activist filed Schedule 13D.⁶

⁴ Section 16(b) of the Securities Exchange Act of 1934 entitles shareholders to recover short-swing profits that are based on a purchase and sale or a sale and purchase, within six months, of the stock of a “reporting company.” Once an activist acquires more than 10% of share outstanding, he will be subjected to this rule. The average holding period of the activist is usually longer than six months (see Brav, Jiang and Kim 2009). Yet the activist may not want to lose the option to turn over the position quickly.

⁵ A shareholder rights plan, commonly known as a poison pill, is a tool used by the board of directors to deter activists. Typically, such a plan gives shareholders (other than the activist) rights to buy more shares at a discount if an activist buys a certain percentage or more of the company’s share.

⁶ Under Rule 13d-1(a) and (b) of the 1934 Securities Exchange Act, the US Securities Exchange Commission (SEC) requires investors to file a Schedule 13D with the SEC if (1) the investor acquires more than 5% of any class of security of a publicly traded company, and (2) the investor has an interest in influencing the management of the company. Once both criteria are met, the investor has up to 10 days to file form 13D with the SEC (see Figure 1).

To identify the occurrence of wolf-pack activism, I first examine trading patterns on the day when the 13D filer crosses the 5% threshold (the “trigger date”). This date is not publicly observable until the 13D filing. Similar to prior studies, I document a high level of share turnover on this date, about 325% of the normal trading volume (defined as the average trading volume over the (-120,-60) window before the trigger date). While this could be consistent with wolf-pack formation (e.g., Coffee and Palia 2015), Bebchuk et al. (2013) note that it may simply indicate that the lead activist accumulates most of its holdings on the trigger date. To examine the source of abnormal trading volume, I exploit the fact that activists must report any purchase or sales of the target firm’s equity for at least the 60 days before the filing date, therefore including the trigger date, on Schedule 13D. Using this hand-collected information, I split the share turnover on the trigger date into two separate components: trades by the 13D filer and trades by other investors. I find that, even after removing trades by the 13D filers, the remaining average share turnover is about 250% of normal trading volume. Hence, the bulk of trading volume on the *trigger date* reflects trades by other investors, possibly an indication of the presence of a wolf pack.

Next, I spend the bulk of this paper examining the mechanism of wolf-pack formation. As mentioned above, there are two theories for how wolf packs are formed. The *Coordinated Effort Hypothesis* assumes that the lead activist orchestrated the wolf pack in order to bypass certain regulatory constraints. By contrast, the *Spontaneous Formation Hypothesis* proposes that wolf packs arise spontaneously because investors monitor and target the same firms around the same time. My results find evidence consistent with the *Coordinated Effort Hypothesis*. In particular, my evidence indicates that the abnormally high share turnover is more likely to be mustered by the lead activist than to occur spontaneously, and that lead activists are tipping off institutions

with which they have prior relationships. Using a proprietary dataset from a transaction-cost consulting firm that includes transaction-level trading data by more than 900 institutional investors for the period 1998–2010, I find that an institution is more likely to accumulate shares in an activist’s campaign if the institution has done so in an earlier period. It remains possible that the same activist-institution pairs may be observed multiple times across different targets simply because they employ similar investment strategies. In a separate analysis, I provide further evidence supporting the *Coordinated Effort Hypothesis*. In particular I find that wolf packs are more prominent among reputable activists, indicating that pack members are not only aware of an upcoming campaign, but that they are also aware of the identity of the lead activists.

In addition, by showing substantial trading by other investors on the trigger date, I provide evidence against the *Spontaneous Formation Hypothesis*. While other investors may independently decide to accumulate shares in the target firm, it is not clear why so many of them would do so on the same day—and even less clear why they would do so exactly on the day the 13D filer crosses the 5% threshold (i.e., the trigger date).⁷ Under the *Spontaneous Formation Hypothesis*, the only explanation for this synchronicity would be that they are all responding to the same, sudden change in market conditions (momentum trading, arrival of news, fire-sales, etc.). Using a battery of univariate and multivariate tests, I show that the abnormal trading volume on the trigger date cannot be fully explained by any sudden changes in market conditions.

In the last section of my paper, I examine whether wolf packs improve the lead activist’s chances of success. For this analysis, I create a proxy for the presence of a wolf pack. I classify campaigns with *turnover by non-13D investors* on the trigger date in the top quartile of the

⁷ As shown in Figure 2, although both the 13D filer and other investors start accumulating their position around 40 days before the trigger date, there is a sharp increase in trading on the trigger date. Furthermore, this activity levels off immediately afterwards.

sample distribution as campaigns with wolf packs. Next, using the descriptions provided by the SharkRepellent database, I manually code the activist's stated objective (as reported in the 13D filing) and the outcome of each campaign. After controlling for other factors that prior studies have found to affect these outcomes, my results suggest that the existence of a wolf pack is associated with a statistically significant 6% increase in the success rate of campaigns (the average success rate in the sample is ~74%; a campaign is defined as successful if the activist achieved at least part of his stated objectives). I also examine the subset of 716 campaigns in which the lead activist requested at least one board seat and find that the presence of a wolf pack is associated with a statistically significant 9% increase in the success rate of obtaining a board seat (the average probability of gaining a seat is ~65%). The results are similar when using the raw number of seats won as a proxy for campaign success. In addition, as an alternative measure of success, I also examine stock returns and find that wolf-pack campaigns are associated with a statistically significant 8.3% (6.9%) increase in buy and hold abnormal (raw) return calculated over the duration of the campaign.

Lastly, I show that my results are unlikely to be driven by reverse causality—that is, it is unlikely that the pack members are mere observers who happen to merely join campaigns that are more likely to be successful. If such a story were true, I would expect to observe wolf packs around “easy targets” only. However, I find that wolf packs are more likely to occur in better defended companies, as proxied by *Bullet Proof Rating* (a takeover defense measured by FactSet) and the use of *Poison Pill* (an indicator variable which takes the value of 1 if a poison pill was either in effect or adopted in response to the 13D filer's campaign). These findings are also more consistent with the *Coordinated Effort Hypothesis*, in which the lead activist only creates a wolf pack when he foresees the need to do so because, for example, the company is

better defended. Further, it does not appear that pack members merely join campaigns with higher expected benefits; the expected benefits (as proxied by 13D announcement date returns) for wolf pack campaigns are not any higher than non-wolf pack campaigns.

This study makes four contributions to the literature on hedge fund activism. First, it provides empirical evidence on the existence of wolf packs and identifies when their share accumulation occurs. Second, it documents an association between the presence of wolf packs and an activist's success. In doing so, it helps explain the effectiveness of hedge fund activists in spite of their relatively small stakes in target firms. Third, my findings shed light on the reasons for the high share turnover on the trigger date, by showing that only around 25% of the trading volume is driven by the activist's trades and around 75% by other investors. Fourth, my evidence is inconsistent with a spontaneous formation story and more consistent with the presence of explicit coordination, in which the lead activist likely tips off allies about an upcoming 13D filing, in order to strengthen his negotiating position with the target firm.⁸ These findings may be of interest to the SEC, which has recently expressed concern as to whether this behavior meets the definition of a "group" for the purpose of securities laws.

More broadly, my evidence also contributes to a limited body of research on investors' ability to coordinate. This literature has largely focused on formal coordination between institutional investors and yields mixed findings. For example, Song and Szewczyk (2003) investigate the impact of an effort by the Council of Institutional Investors to induce collective action and find little evidence that coordinated shareholder activism is effective. By contrast, in a different setting, Doidge et al. (2015) find that the Coalition of Canadian Institutional Investors has been effective in improving corporate governance in target firms. My result appears to

⁸ An important caveat is that, at the moment, I cannot rule out that my findings reflect unintentional leakage of information about the activist's trade on the trigger date.

confirm Doidge et al. (2015) and shows that institutions are able to coordinate with each other even without any formal coordination.

My paper also contributes to the recent policy debate over the 10-day filing window for 13Ds. The Dodd-Frank Act included a provision authorizing the SEC to shorten the filing window, but the SEC has yet to act. In a 2011 letter to the SEC, the law firm Wachtell, Lipton, Rosen & Katz recommended cutting the 10-day period to one day, arguing that the 10-day lag facilitates “market manipulation and abusive tactics.” My findings suggest that such concerns may be overstated. Trading around 13D filings is substantial and appears to be driven by private information ahead of public disclosures, but most of the trading by other investors occurs on the trigger date. Shortening the 10-day window is unlikely to ward off wolf packs.

One concurrent study examines a special case of wolf packs: Becht, Franks, Grant, and Wagner (2015) investigate campaigns in which multiple schedule 13Ds are sequentially filed for the same company and finds that campaigns with multiple 13D filers (a form of *disclosed* wolf packs) are more successful than campaigns with a single 13D filer (78% probability of success for multiple 13D filers vs. 46% for single 13D filers).⁹ My study focuses instead on *undisclosed* wolf packs in campaigns with a single 13D filer. The two types of campaigns are qualitatively different. Those with multiple, sequential 13D filings tend to last longer (747 days vs. 404 days for campaigns with a single 13D filer) and likely capture cases where a second 13D filer joins a struggling campaign to increase the probability of success. By contrast, my study examines the role of *undisclosed* wolf packs around the *first* activist event, which has been the subject of debate among commentators and policy makers but has not been examined empirically. Also,

⁹ Becht et al (2015) classify a campaign as successful if any of the following outcomes are achieved: board changes (replacement of the CEO, chairman or non-executive directors), changes to payout policy (share buybacks or increased/special dividends), restructuring (divestitures and spin-offs of noncore assets, and blocking diversifying acquisitions) and takeovers (i.e., the target firm is acquired by a strategic buyer or private equity fund).

cases of multiple 13D filings are relatively infrequent (22% of the campaigns in Becht et al (2015) and 16% in my sample). By contrast, after removing campaigns with multiple 13D filings, more than 50%¹⁰ of the campaigns in my sample are accompanied by some form of undisclosed wolf pack.

¹⁰ This is based on the number of campaigns with positive abnormal trading volume after removing the 13D filer's trade on the trigger date.

2. Sample selection and descriptive statistics

I use data from SEC Schedule 13Ds and SharkRepellent.net to construct a comprehensive sample of activist campaigns between 1998 and 2014. As shown in Table 1, I start with 3,744 unique activism events. Since I focus on trading by other investors before public disclosure of the campaigns, I remove 304 campaigns in which the trigger date and the 13D filing date are the same. For each remaining event, I manually download all 13D filings from SEC.gov and collect the following information: the filing and trigger dates; the identity and Central Index Key (CIK) of the hedge fund; the name, CIK, CUSIP, and SIC code of the target firm; and the percentage of shares owned by the activist at the time of 13D filing. For each stock traded in the dataset, I collect returns, share price, trading volume, and shares outstanding from CRSP and book value of equity from Compustat. I remove 151 campaigns in which a 13D cannot be located, 201 campaigns with missing variables from CRSP/Compustat, and 528 campaigns in which the trigger date was not reported. After excluding Real Estate Investment Trusts (REITs, SIC 6798), blank check entities (SIC 6770), trusts (6792), American Depositary Receipts (ADRs), I am left with 2,293 distinct campaigns. I also exclude 366 campaigns that overlap with another campaign in my sample, in the sense that another 13D is filed (by another activist) between the 13D filing date and end date of a previous campaign. These 366 campaigns are the type of campaigns that Becht et al. (2015) classify as (disclosed) wolf-pack events.¹¹ Finally, I exclude five campaigns for which daily trades by the 13D filer are not available.

The remaining 1,922 campaigns are *initial campaigns without any subsequent 13Ds* and constitute my final sample. These campaigns comprise 340 individual activists and 1,753 unique firms, with the 20 most prominent activists representing around 50% of all campaigns.

¹¹ Out of these 366 campaigns, 196 are *subsequent campaigns*, which relate to 170 initial campaigns. For the 170 initial campaigns in which at least one 13D is filed subsequently, the average length between the initial and subsequent 13D is 501.3 days. The length of these initial campaigns is 746.7 days, significantly longer than the rest of the sample at 403.5 days.

The target companies in my sample are comparable to those in other studies of activism (Brav et al. 2008; Klein and Zur 2009). As shown in Table 2 Panel A, for the target firms at the time of the 13D filing, the average (median) market value is \$933.9 (\$209.4) million, the average institutional holding is 44%, and the average number of analysts following the firms is three. Also, at the time of the 13D filing, on average 13D filers own 8.8% of the shares outstanding, with about 60% of this amount (5.4%) being purchased in the 60 days before filing date (Table 2 Panel B). The median activist holding at the time of 13D filing is 6.5%, with more than 85% of the activists holding less than 10% of shares outstanding in my sample. This is consistent with the argument that poison pills and the short-swing profit rule constrain the amount of shares that can be accumulated by a lead activist (see Section 4.1). Most filers take advantage of the 10-day filing delay allowed under schedule 13D, with the average delay being 7.61 days and over 50% of the sample filing more than nine days after the trigger date. (These figures are higher than documented previously because I remove all campaigns where the filing date and the trigger date are the same).

3. How common are wolf packs? Evidence on the accumulation of shares by other investors

3.1. Abnormal turnover prior to 13D filings

Similar to Coffee and Palia (2015) and Brav et al. (2015), I refer to a “wolf pack” as a loose network of investors who *accumulate shares* in the target firm before the 13D filing.

As a first step in identifying the accumulation of shares by other investors, I examine trading volume around the trigger date. In Figure 2, I plot the trading volume for the full sample of 1,922 CRSP-SharkRepellent campaigns. The variable on the y-axis, $Turnover_{all} = \frac{Vol_{i,t}}{Avg(Vol_{i,t-120} \dots Vol_{i,t-60})}$, is calculated for each campaign and is presented as a percentage of normal trading volume. Hence, if $Turnover_{all}=1$, it means there is no abnormal turnover.¹² Normal trading volume is estimated as the rolling average of trading volume between day -120 and -60. Figure 2 shows a significant spike in turnover on the trigger date: the average turnover is around 325% of normal volume.

[Insert Figure 2]

3.2. Who trades on the trigger date?

Since the trigger date is not publicly observable until the 13D is filed, the high level of turnover cannot be a public reaction to the activist’s campaign. Two prior studies have also documented significant abnormal share turnover on the trigger date before a 13D filing, but they differ in their interpretations. Coffee and Palia (2015) see this high level of turnover as evidence of wolf-pack formation. In contrast, Bebchuk et al. (2013) interpret it as evidence of activist hedge funds accumulating most of their holdings on the trigger date.

¹² Prior studies (see for e.g., Beaver 1986, DeFond, Hung and Trezevant 2006) used abnormal trading volume to assess the information content of earnings announcements. In this paper, information content is less relevant, since the activist’s campaign is supposed to be a privately known event prior to public disclosure.

To distinguish between these explanations, I separate total daily volume into two components: 1) trades by the 13D filer and 2) trades by other investors. If 13D filers solely drive the high turnover, then, after removing their trades, the remaining trading should resemble the target firm's normal volume. If, on the other hand, other investors drive at least part of the abnormal share turnover, then I expect to see a significant level of abnormal turnover even after removing the 13D filer's trades.

I identify trades by 13D filers by hand-collecting the relevant information from Schedule 13Ds, which include trading information for at least 60 days before the filing date. In the vast majority of cases, transaction data are reported on a daily basis. When transaction data are reported at higher-than-daily frequencies, I aggregate to the daily level. I manually collect the following data: date of each transaction, transaction type (purchase or sell), transaction size, transaction price, class of the transaction (common stock, options, warranty, etc.), whether the transaction happened in an open market or a private transaction, and the entity making the trade. Appendix A presents the trading schedule of a typical Schedule 13D filing.

Figure 3 presents the daily trading volume by other investors (total volume less trading by 13D filer). The variable on the y-axis, $Turnover_Other_t$ is the turnover driven by other investors, presented as a percentage of normal trading volume. As before, normal trading volume is estimated as the rolling average of trading volume between day -120 and -60 . Consistent with the existence of wolf packs, Figure 3 shows that, even after removing trades by the 13D filers, the average trading volume on the trigger date is still about 250% of normal trading volume, implying that only around 25% of the total trading volume on the trigger date is driven by the 13D filer's trades.

[Insert Figure 3]

Figure 4 shows how 13D filers and other investors accumulate their shares. As mentioned earlier, the shares accumulated by 13D filers are obtained directly from the schedule 13D. Shares accumulated by other investors are estimated as the remaining share volume after removing (1) trades by 13D filer and (2) normal trading volume (estimated using the rolling average volume from trading days -120 to -60 inclusive). In the 60 trading days before the trigger date, the 13D filer (other investors) accumulate an average of about 5% (8%) of total shares outstanding in the target firm. Consistent with wolf-pack formation, the timing of share accumulation between the 13D filer and other investors appears to be highly synchronous. Share accumulation begins around 40 days before the trigger date, peaks on the trigger date, and then levels off.

[Insert Figure 4]

4. Mechanism of pack formation

Next, I examine the two potential mechanisms of wolf-pack formation. The *Coordinated Effort Hypothesis* assumes that the lead activist orchestrated the wolf pack as a way to bypass certain regulatory constraints. By contrast, the *Spontaneous Formation Hypothesis* proposes that wolf packs arise spontaneously because investors monitor and target the same firms at around the same time.

4.1 Coordinated Effort Hypothesis

Market observers often allege that lead activists muster wolf packs. Under this story, the activist recruits several other investors to join the campaign before filing the 13D, which typically leads to a positive stock return. The arrangement can be done either explicitly, as alleged by media accounts (see for example, Pulliam et al. 2014 and Hoffman and Benoit 2015) or implicitly via gossip and other forms of indirect signaling. However, it is important for the arrangement to take place informally, to avoid forming a “group” under Section 13(d)(3) of the Securities Exchange Act of 1934.¹³

At first sight, it may appear that constituting a wolf pack would not be in the best interest of the lead activist, since she bears all the costs of engagement but only reaps a small percentage of benefits, a typical free-rider problem (e.g., Admati, Pfleiderer and Zechner 1994). However,

¹³ Section 13(d)(3) of the Securities Exchange Act of 1934 states that “[w]hen two or more persons act as a ... group for the purpose of acquiring, holding, or disposing of securities of an issuer, such syndicate or group shall be deemed a ‘person’ for the purposes of this subsection.” Thus, if three investors each acquire 2% of the stock in a target company and their relationship makes them a group, their shares must be aggregated and, under Section 13(d), the SEC will treat them singly and require that they file a Schedule 13D within 10 days of the formation of the group. The statutory definition of ‘group’ has only been slightly clarified by case law. At the time of writing, there is no bright-line test determining what is and what is not group activity. Courts have said that the issue of group activity is a question of fact. The following are factors that various courts have found may suggest group activity: (1) communications among the alleged group members relating to the company; (2) copies of correspondence with the corporation being sent to other alleged group members; (3) one alleged group member’s shares being held in the name of another group member; (4) statements by the alleged group members that they had the power to influence management; (5) any pattern of parallel actions by shareholders over a relatively short and essentially concurrent period; (6) alleged group members providing each other with funds and/or advice; (7) prior business interactions with alleged group members. (For a more detailed explanation, see Howard and William 2006.)

there are a number of reasons why this form of informal coordination is attractive to the lead activist.

First, the pack leader may be financially constrained and unable to acquire sufficient shares to implement changes in the target company. Second, even if not financially constrained, regulatory barriers such as the “short-swing profit rule”¹⁴ and takeover defenses such as “poison pill”¹⁵ make it difficult for activists to acquire ownership over a certain holding threshold. For example, once an activist acquires more than 10% of a target’s shares, he is subjected to the “short-swing profit rule”, which may force the activist to surrender any short-swing profits to the target company. By arranging a wolf pack, the lead activist can increase the percentage of voting shares under its effective control without incurring these problems (Coffee and Palia 2015).

As for the pack members, learning about the impending 13D filing without being treated as a formal 13D group member creates an opportunity for profitable trading. As mentioned earlier, the market usually reacts positively to a 13D filing. Furthermore, being an informal member allows the members to trade profitably without incurring the risk of future lawsuits because the target company will usually not know of their existence (Coffee and Palia 2015).

4.2 Spontaneous Formation Hypothesis

Economic theories provide an explanation for why wolf packs might emerge, even absent any coordination. Different investors might independently target a similar set of firms around the same time. The most applicable model is provided by Brav et al. (2015). In their model, there are two types of players—a large activist and many small activists—and the large activist’s

¹⁴ Section 16(b) of the Securities Exchange Act of 1934 entitles shareholders to recover short-swing profits that are based on a purchase and sale or a sale and purchase, within six months, of the stock of a “reporting company.” The average holding period of the activist is usually longer than six months (see Brav, Jiang and Kim 2009). Yet the activist may not want to lose the option to turn over the position quickly. The definition of “group” is the same under Section 13(d) and Section 16(b). Group activity in both cases is governed by Section 13(d)(3) of the Exchange Act.

¹⁵ A shareholder rights plan, commonly known as poison pill, is a tool used by board of directors to deter activists. Typically, such a plan gives shareholders (other than the activist) rights to buy more shares at a discount if an activist buys a certain percentage or more of the company’s share. Third Point LLC vs. Ruprecht 2014 held that the lowest statutory limit for a poison pill is 10% of shares outstanding. If every other shareholder can buy more shares at a discount, this dilutes the activist’s interest.

campaign will succeed if the number of shares owned by all activists is larger than the shares held or controlled by management. A pack can then form around the lead activist without any explicit communication or intentional coordination by the lead activist.

The intuition is as follows. For a given target, each activist will form an expectation on the probability of a successful campaign (denoted as P_i). An activist will participate in a campaign only if P_i is high enough that her expected benefit exceeds her opportunity cost. When a large activist intervenes, P_i is increased for all small activists. Some small activists who would prefer to not participate in the absence of the large activist will now strictly prefer to participate and effectively form a wolf pack (see Appendix B for a summary of the model).

In this model, the entry by a large activist is synonymous with the filing of Schedule 13D. The timing of entrance by small activists will depend on when the small activists predict that the large activist will file a Schedule 13D (i.e., the increase in P_i) since small and large activists often monitor the same companies and determine their targets using similar criteria. When an event triggers a lead activist's engagement, smaller activists may be following the same event. As a result, P_i for the small activist increases, and the small activist will now want to participate in the campaign.

4.3 Empirical analysis

In this section, I offer some evidence suggesting that the hypothesis of a spontaneous formation of wolf packs (without intentional coordination) is unlikely to be significant.

As mentioned above, *Spontaneous Formation Hypothesis* would be hard to reconcile with the earlier evidence of substantial trading by other investors on the trigger date. In Figure 4, for example, although both activists and other investors start accumulating shares from day -40, the rate of accumulation increases dramatically on the trigger date and it levels off afterward. A

similar spike in trading on the trigger date is evident in Figures 2 and 3. While it is plausible that other investors independently decide to accumulate shares in the same firms targeted by the 13D filers, it seems less likely that many investors would decide to do so at the same time, *and* to do it exactly on the trigger date (which is not a publicly observable event). With spontaneous formation, the only explanation for this pattern would be that both trades by the 13D filer and those by other investors are driven by some sudden change in market conditions. An example would be Kyle-type traders reacting to the lead activist's trade or the arrival of public news. Within the Brav et al. (2015) framework, this is equivalent to a sudden change in market conditions on or right before the trigger date, which results in an increase in P_i (probability of a successful campaign) for both the large and small activists. As a result, both 13D filers and independent investors accumulate shares in the target company simultaneously on the trigger date. I investigate this possibility in the next section.

4.3.1 Reaction by Kyle-type traders?

On the trigger date, the 13D filer's trades account for 25% of the total trading volume on average. Under the *Spontaneous Formation Hypothesis*, a Kyle-type small activist (see Kyle 1985) may interpret the large order flow by the 13D filer as suggesting an upcoming campaign and thus buy shares in the target firm. To examine this possibility, I exploit the fact that not all 13D filers trade on the trigger date. This is because the mandatory 13D filing is triggered, not only by a change in ownership (crossing the 5% threshold), but also by a change in intent, from "passive" to "active." Both triggers must be satisfied before an investor must file a 13D. That is, there is a subset of 351 campaigns with 13D filers ("13G switchers") who already owned more than 5% of the target firm before the trigger date but decided to switch their investment objective

from passive to active on the trigger date.¹⁶ Thus, it is the change in objective that triggered the 13D filing, not a change in holdings.¹⁷ If the documented abnormal turnover was entirely or mostly due to Kyle-type traders, there should be little or no abnormal turnover on the trigger date for this subset of campaigns. However, as shown in Figure 5, abnormal turnover by other investors for this subsample (the 13G switchers) is about 250% relative to normal trading volume, similar in magnitude to the full sample (Figure 3). Hence, it does not appear that the abnormal turnover by other investors is driven by Kyle-type traders.

[Insert Figure 5]

4.3.2 Reaction to the arrival of news?

Another type of sudden change in market conditions—the arrival of news on or right before the trigger date—might also support the *Spontaneous Formation Hypothesis*. In this case, both the 13D filer and the independent investors would accumulate shares in the target company simultaneously on the trigger date because they have the same reaction to news related to the target firm.

To examine this explanation, I identify a subset of 759 campaigns in which there is no public news regarding the target firm during the 10-day period before the trigger date based on a Factiva news search. If the documented share turnover was mostly due to public news arrival, there should be little or no abnormal trading on the trigger date for this subset of campaigns. However, as shown in Figure 6, abnormal turnover by other investors for this “no news” subsample is about 240% relative to normal trading volume, similar in magnitude to the full

¹⁶ These investors have filed a 13G in the past. Investors without an active intent must file a 13G once they have acquired a more than 5% holding. From the moment that these investors switch their intent, they have up to 10 days to change their filings from 13G to 13D; see Rule 13d-1(e), Exchange Act.

¹⁷ The average announcement return for this subset of campaigns is around 1.4% (3 days abnormal return centered on the filing date).

sample (Figure 3). Hence, it does not appear that the arrival of news drives the abnormal turnover by other investors.

[Insert Figure 6]

I also examine a subsample of 273 campaigns in which the four-factor abnormal stock returns (proxy for news) are close to zero (between -0.1% and 0.1%) on both the trigger date and one day before. Similarly, as shown in Figure 7, abnormal turnover by other investors for this alternative “no news” subsample is about 230% relative to normal trading volume, again similar in magnitude to the full sample (Figure 3).

[Insert Figure 7]

4.3.3 Reaction to Fire-Sales?

Another type of sudden change in market condition—fire-sales by non-active institutions—might support the *Spontaneous Formation Hypothesis*. Gantchev and Jotikasthir (2015) shows that fire-sales by non-active institutional raise the probability of a firm becoming an activist target. There are two ways in which fire-sales may trigger simultaneous reaction by both the 13D filer and other independent activists. First, fire-sales by non-active institutional investor may serve as a public signal indicating that the underlying firm needs an intervention. Second, the underlying firm might have already been a pre-determined target of both the 13D filer and the independent activists. When a non-active institution sells on the trigger date, the additional liquidity allows the activists to hide their trades, triggering both the 13D filer and the independent investors to trades.

To examine this explanation, similar to Gantchev and Jotikasthir (2015), I identify non-fire-sales campaigns using three fire-sales proxies. The proxies are calculated for each stock owned by each of the 13F institutions. First, I calculate *Share_Sold* as the percentage of share

outstanding sold. Second, I calculate $Sell_Fraction_N$ as the number of stocks (not shares) sold divided by the number of individual stocks bought or sold. Third, I calculate $Sell_Fraction_D$ as the dollar principal of all stocks sold divided by the dollar principal of all stocks bought and sold.

I identify a sub-sample of 1,175 fire-sales campaigns in which the underlying stock owners either (1) sell more than 1% of share outstanding ($Share_Sold > 1\%$)¹⁸, (2) sell more number of stocks than purchase ($Sell_Fraction_N > 50\%$) or (3) sell more dollar value of shares than purchase ($Sell_Fraction_D > 50\%$). I classify the remaining (1,922-1,175=747) 747 campaigns as non-fire-sales campaigns and examine the share turnovers for this sub-sample of campaigns.

If the share turnovers are mostly due to fire-sales, there should be little or no abnormal trading on the trigger date for this subset of campaigns. However, as shown in Figure 8, the average turnover by other investors for this “non-fire-sales” subsample is about 250% relative to normal trading volume, similar in magnitude to the full sample (Figure 3). Hence, it does not appear that fire-sales drive the abnormal turnover by other investors on the trigger date.

[Insert Figure 8]

4.3.4 Multivariate analysis of daily trading volume

Under the *Spontaneous Formation Hypothesis*, there are several market conditions that may not be captured by my proxy for normal trading volume (which is only based on past trading volume). To control for these factors, I estimate the following pooled campaign-day regression with a total of 115,320 observations. Each observation represents a trading date within the 60 days before the 13D filing (1,922 activist events x 60 days = 115,320 observations), and standard errors are clustered by activist and firm:

¹⁸ The median level of $Share_Sold$ in my sample is around 1% of shares outstanding.

$$Turnover_Other_t = Intercept + Trigger_Date + Controls + FE. \quad (1)$$

The dependent variable, $Turnover_Other_t$, measures the turnover driven by other investors, (i.e. other than the 13D filer) scaled by normal trading volume (as in Figure 3). Hence, if no abnormal turnover is detected, $Turnover_Other_t$ will be one. I include year-fixed effects to control for time trends, industry-fixed effects (Fama-French 12 industries) to control for time-invariant industry characteristics and weekday-fixed effects to control for changes in trading across weekdays.

My main variable of interest is the $Trigger_Date$, an indicator variable that takes the value of 1 if that particular date is the trigger date and 0 otherwise. This variable captures the difference in abnormal turnover between the trigger date and every other date in the 60-day window after controlling for other determinants of trading volume. I divide these determinants into the following categories: 1) momentum, 2) liquidity, 3) arrival of news, and 4) other firm-specific characteristics. As mentioned in Section 4.3.1, order flow and stock returns convey information about the future stock price of the underlying firms and therefore may explain trading by other investors. I include the following momentum proxies as controls: (1) Vol_{t-1} , calculated as percentage of shares outstanding traded on day $t-1$, and (2) Abn_ret_t and Abn_ret_{t-1} , calculated as the excess return from a four-factor model on date t and date $t-1$.

Gantchev and Jotikasthir (2015) shows that an increase in liquidity (institutional selling) raises the probability of a firm becoming an activist target. If such an increase simultaneously raises the probability of a firm's shares being purchased by other investors, then share turnover may be higher on the trigger date. I therefore include the following proxies to control for liquidity: 1) *Institutional Sales* calculated as the percentage of share outstanding sold by

institutional investors on day t (see Gantchew and Jotikasthir 2015); 2) $Amihud_t$, calculated as ratio of stock return to trading volume on day t ; and 3) $Log(MV)$, calculated as the natural logarithm of the firm market value at the beginning of the calendar year.

As mentioned in Section 4.3.2, the arrival of news on or right before the trigger date may induce both the 13D filer and the independent investors to accumulate shares in the target company simultaneously. I include the following news proxies as controls: (1) $10K$, $8K$, and $10Q$ are indicator variables for Forms 10-K, 8-K, and 10Q that are filed on day t ; (2) $I/B/E/S\ forecast$ is an indicator variable for the issuance of I/B/E/S analysts forecast on day t ; (3) $Management Guidance$ is an indicator variable for the issuance management guidance on day t .

I also include a number of others firm characteristics that may be correlated with share turnover: 1) $Bid\ Ask\ Spread_t$, calculated as the absolute difference between the bid (low) and ask (high) of the trading date t ; 2) $13D\ Filer\ Holdings$, calculated as the holdings by the 13D filer on the filing date; 3) $Institutional\ Holding$, calculated as the percentage of shares outstanding held by institutional investors in the most recent quarter (source: Thomson Reuters 13F Filings); and 4) $Analyst\ Following$, calculated as the number of analysts following the firm.

The results indicate that the abnormal turnover by other investors cannot be fully driven by the arrival of news, changes in liquidity, momentum, and other firm-specific characteristics. As shown in Table 3 Panel A, Column (1), even after controlling for these factors, the coefficient of $Trigger_Date$ is approximately 1.23, implying that on the trigger date share turnover is 123% higher than other days in the 60-day window, on average. This means that the turnover driven by other investors on the trigger date is around 228% of normal trading volume (sum of intercept 1.05 and coefficient on $Trigger_Date$ of 1.23). This confirms, in a multivariate setting, the evidence from Figure 3.

I further divide my sample into 13G switchers (similar to Figure 5) and non-switchers. In Column 2, the indicator variable *Trigger date & 13G switcher (non-switcher)* takes the value of 1 if the filer is a 13G switcher (non-switcher) and that particular date is a trigger date and 0 otherwise. The coefficient on *Trigger date & 13G switcher* at 1.21 is significant and positive and is insignificantly different from the coefficient on non-switcher (*Trigger date & non switcher*) at 1.28. This implies that the abnormal turnover is unlikely to be driven by Kyle-type investors following trades by 13D filers.

Next, I divide my sample into campaigns with and without news (based on my Factiva search) in the 10 days before the trigger date, similar to Figure 6. In Column (3) the indicator variable *Trigger date & no news* takes the value of 1 if the campaign have no news and that particular date is a trigger date and 0 otherwise. The coefficient on *Trigger date & no news* is significant at 1.18, implying that, even for campaigns without any news, on the trigger date, share turnover is 118% higher than other days in the 60-day window, on average.

Similar to Figure 7, as an alternative proxy for arrival of news, I divide my sample into campaigns that have high absolute returns and low absolute returns (the later defined as abnormal returns between -0.1% and 0.1%). In Column (4), the indicator variable *Trigger date & low return* takes the value of 1 if the campaign has a low return and that particular date is a trigger date and 0 otherwise. The coefficient on *Trigger date & low return* is significant at 1.20, implying that, on the trigger date, share turnover is 120% higher than other days in the 60-day window, on average.

Lastly, similar to Figure 8, I divide my sample into fire-sales and non-fire-sales campaigns. In Column (5), the indicator variable *Trigger date & non-fire-sales* takes the value of 1 if the campaign is a non-fire-sales campaign and that particular date is a trigger date and 0 otherwise.

The coefficient on *Trigger date & non-fire-sales* is significant at 1.26, implying that, on the trigger date, share turnover is 126% higher than other days in the 60-day window, on average.

As shown in Panel B, in Column (3) and (4), the magnitude of the coefficient of the variable of interest (respectively, *Trigger date & no news* and *Trigger date & low returns*) is statistically lower than the coefficient on the corresponding indicators (respectively, *Trigger date & have news* and *Trigger date & high returns*). However, the economic difference is small, suggesting that a significant portion of the abnormal trading around the trigger date (when there are no news) remains unexplained. This implies that the arrival of news does not explain the observed abnormal trading volume, except in small part.

[Insert Table 3]

4.3.5 Prior relationships

The collective evidence above suggests that my findings are not consistent with spontaneous formation and thus suggests that many wolf packs likely result from coordinated efforts by lead activists. It is more difficult to directly test the *Coordinated Effort Hypothesis* because one cannot observe private communications among investors. Nonetheless, I devise a test that may more directly speak to this hypothesis, examining the past relationship between the investor buying shares (the presumed pack member) and the lead activist. To identify each buyer, I must first obtain the identity of the investor executing each trade, which is not publicly available. To overcome this data limitation, I obtain from a consulting firm a proprietary dataset that includes transaction-level trading data by more than 900 institutional investors (Gantchev and Jotikasthir (2015), Green (2006), and Klein and Tao (2015) use a similar proprietary dataset. For stocks covered by both my dataset and CRSP, my dataset accounts for roughly 10-15% of the total CRSP trading volume.

The dataset spans January 1, 1998, to December 31, 2010. It includes the complete transaction history for all of its institutional clients. There are two ways an institution can enter the database. It can invest on behalf of a plan sponsor that subscribes, or it can subscribe directly. Each observation corresponds to an executed trade. For each trade, the database reports the date of the trade, the execution price of the trade, the stock traded, the number of shares traded, whether the trade was a buy or a sell, and a unique client identity code for the institution making the trade. The client identifier corresponds to the plan sponsor or money manager who is a client of the consulting firm. The client identifier is a permanent numeric code, which allows me to track a given client both in the cross-section and through time. The identity of the clients is not provided.

Using this dataset, I create an empirical proxy for past relationship. For each activist-institution pair, I calculate the number of times that a particular institution has participated in a prior campaign leaded by that particular activist within the last year (denoted as *Past Relationship*). I classify an institution as a participant if that institution purchased shares on the trigger date of the previous campaign. Since estimating *Past Relationship* requires at least one lag year of data I restrict my sample to 1999-2010 (my sample begins in 1998) and examine if an institution is more likely to participate in an activist's campaign if the institution has done so in the last year. Specifically, I estimate the following regression for 1,233 campaigns in which at least one of the institutions traded on the trigger date (i.e. there are 1,922-1,233=689 campaigns in which I was unable to locate any trades in my dataset or took place prior to 1999):

$$Buying = Past Relationship + Controls, \quad (2)$$

where *Buying* is an indicator variable which equals to 1 if the trading institution accumulated a positive number of shares in the target on the trigger date and zero otherwise.

Table 4 Column (1) estimates Eq. (2) as a probit regression and find an average marginal effect is ~8%. This implies that one standard deviation increase in *Past Relationship* leads to a 8% increase in the probability of the institution buying shares of the firms targeted by the same activist (i.e., an institution is more likely to participate in an activist's campaign if the institution has done so in the past; the average probability that an institution will buy a target stock given that they traded on the trigger date is ~40%).

Similarly, Column (2) estimates Eq. (2) as a standard OLS regression. The coefficient on *Past Relationship* is positive, significant, and similar in magnitude as the probit specifications above. This is consistent with the notion that lead activists are more likely to tip off investors with whom they had a prior relationship. Although unlikely (given my results in section 4.3.1 to 4.3.4), it remains possible that the same activist-institution pairs are observed multiple times across different target firms simply because these pairs employ similar investment strategies.

[Insert Table 4]

4.3.6 Reputation of the activists

Next, I examine if reputation of the lead activists have an impact on wolf pack formation. Under the *Coordinated Effort Hypothesis*, wolf-pack members are more likely to participate in a campaign if the lead activist is reputable. First, this may be because other potential pack members perceive reputable activists to have better due-diligence, select less risky campaigns and have better support from other shareholders. Second, reputable activists may have better relationships with other potential wolf-pack members.

I use the number of times an activist has led a campaign as an empirical proxy for the reputation of the activist. *Reputable Activist* is an indicator variable equals to 1 if the activist is 1

of the 20 most prominent activists in my sample and zero otherwise.¹⁹ In particular I estimate the following regression for 1,922 campaigns:

$$\textit{Wolf Pack} = \textit{Reputable Activist} + \textit{Controls} \quad (3)$$

As a proxy for the likely presence of a wolf pack, I use the indicator *Wolf Pack*, set equal to 1 if *Turnover_Other* on the trigger date (the dependent variable in regression 1) is in the top quartile and 0 otherwise.

Table 4 Column (3) estimates Eq. (3) as a probit regression and finds an average marginal effect is ~3%. This implies that a campaign led by a reputable activist has a 3% higher probability of being associated with wolf pack formation. Similarly, Column (4) estimates Eq. (3) as a standard OLS regression. The coefficient on *Reputable Activist* is positive, significant, and similar in magnitude as the probit specifications above. This is consistent with the notion that pack-members are not only aware of an upcoming campaign, but also the identity of the lead activist. Although unlikely (given my results in section 4.3.1 to 4.3.5), it remains possible that reputable activists participate in campaigns that are more predictable.

Overall, my findings suggest that spontaneous formation is unlikely to play a significant role. A large portion of abnormal turnover documented in Figure 3 remains unexplained even after controlling for arrival of news, momentum trading, changes in liquidity and other firm specific factors. Rather, wolf packs appear to be intentionally created by lead activists since investors who accumulate shares prior to the 13D filing (i.e., the public announcement) are more likely to be those who have a prior relationship with the lead activist. Further, it appears that investors are not only aware of an upcoming campaign, but they are also aware of the identity of the lead activists.

¹⁹ The number of campaigns led by the 20 most prominent activists range from 21 to 195 campaigns.

5. Does forming a pack improve the activist campaign's outcome?

Next, I move to my last research question—the impact of coordination among packs members. The collective action literature has long predicted that institutional investors might benefit from coordinating (e.g., Olson 1971; Zwiebel 1995; Corum 2015). But it remains unclear, empirically, whether institutional investors do coordinate and whether this coordination is effective. The literature generally focuses on the formal organization of institutional investors aiming to implement collective action in target firms, with mixed findings. Song and Szewczyk (2003) examine the Council of Institutional Investors' Focus List as an example of formal coordination between institutional investors but find no evidence of effective coordination.²⁰ Doidge et al. (2015), in contrast, find that formal coordination between investors in Canada (through the Canadian Coalition for Good Governance) can improve corporate governance of target firms.

A wolf pack may be viewed as a form of informal coordination. An effective pack should increase the chances of a successful campaign, but it is not obvious that the coordination would always work. For example, if members have already accumulated shares in the target company on the trigger date and if most of the expected value from the campaign is incorporated into stock prices at the 13D filing date (the average announcement return ranges between 3% and 10%; see Brav et al. 2008, Klein et al. 2009), there may be little incentive for the members to hold on to shares in the target and support the leader during the campaign. But the lead activist may overcome this problem by providing private benefits to members, conditional on campaign outcome (this is an assumption of the Brav et al. (2015) model). These private benefits may take various forms. For example, the pack members may receive preferred treatment if the lead

²⁰ Relative to a sample of control firms, the authors found no evidence that targeted firms have better analyst forecasts, more frequent mergers and stock repurchases.

activist is appointed to the board of the target. A successful campaign may also help the pack members to deepen their relationship with the lead activist. Such a relationship may provide small activists with information and connections to other activists in future campaigns.²¹ Hence, the wolf-pack members may have an incentive to hold on to their shares throughout the entire campaign and enhance the lead activist’s bargaining power, thereby making the campaign more likely to succeed.

5.1 Empirical analysis

In this section, I employ the following linear regression to estimate the relationship between the existence of a wolf pack and the activist’s level of success:

$$Outcome = WolfPack + Controls. \quad (4)$$

As a proxy for the likely presence of a wolf pack, I use the indicator *Wolf Pack*, set equal to 1 if *Turnover_Other* on the trigger date (the dependent variable in regression 1) is in the top quartile and 0 otherwise. This indicator captures the incremental successes for the wolf-pack campaign after controlling for other determinants of campaign outcome. I divide these determinants into the following categories: 1) proxy advisors, 2) campaign characteristics, 3) arrival of news, 4) liquidity, 5) momentum, and 6) other firm-specific characteristics.

Prior literature finds that proxy advisors can influence shareholder votes (e.g., Ertimur, Ferri, and Oesch 2013). I therefore include recommendations by Institutional Shareholder Services (ISS) and Glass Lewis & Co. (GL) as a control. The indicator variable *ISS Recommendation (Glass Lewis Recommendation)* takes on the value of 1 when if ISS (GL) makes a recommendation for the lead filer and 0 otherwise.

²¹ Information and connections are likely to be important. Pulliam, Chung, Benoit, and Barry (2014), for example, report that “many high profile investors who know each other don’t want either to get blindsided by another’s investing—or to blindside others.”

I also include the following campaign-specific characteristics which have been shown to affect the campaign's outcome (see Shivdasani 1993; Ahmed and Duellman 2007; Anderson, Mansi and Reeb 2004): 1) *Hostile Offer*, *Lawsuit*, and *Unsolicited Offer* are indicator variables that take the value of 1 if the lead activist makes a hostile offer, files a lawsuit, or makes an unsolicited offer respectively and 0 otherwise; 2) *Classified Board* is an indicator variable that takes on the value of 1 if the target firm has a classified board; 3) *Poison Pill* is an indicator variable that takes on the value of 1 if a poison pill was either in effect or adopted in response to the 13D filer's campaign and 0 otherwise.

My main variable of interest, *Wolf Pack*, is based on the turnover on the trigger date. Part of this turnover may be driven by changes in market conditions which are unrelated to wolf-pack formation but is somehow correlated with campaign outcomes. Therefore, I include the same control variables from Eq. (1) to control for correlated omitted variable biases. As discussed in Section 4.3.4, these variables relate to the arrival of news, changes in liquidity, momentum, and other firm-specific characteristics.

To measure the outcome of the activist campaign, I rely on the description of the campaign's objective and outcome provided in the "Comment" section of the SharkRepellent database. I manually classify each campaign into one of the following six categories: success, partial success, settled, withdrawn, failed, ongoing, and not enough information. Examples of each are provided in Appendix C. After removing campaigns coded as ongoing and not enough information, my final subsample consists of 1,484 campaigns.

In Table 5, Columns (1) and (2), the dependent variable is *Outcome*, which is set to 1 if the campaign is coded as a success, partial success, settled, or withdrawn and 0 if the campaign is coded as failed. Column (1) estimates Eq. (4) as a probit regression and shows that the average

marginal effect of the variable *Wolf Pack* is positive and significant at 6.2%. In untabulated tests, I re-run the same regression after removing campaigns that are coded as settled or withdrawn, with similar results. As a robustness test, I also estimate Eq. (4) using a standard OLS regression, which allows me to cluster standard errors by activists and firm.²² Consistent with the prior results, Column (2) shows that the probability of achieving at least part of the activist's objective is about 7.3% higher for campaigns accompanied by wolf packs (the average success rate in the sample is ~74%).

As shown in Table 2 Panel F, the most frequently sought after objective by the hedge fund activists is board representation. Thus I also examine whether the activists were granted board seats (a more objective approach to identifying campaign outcome). Using the description provided by SharkRepellent, I identify a subset of 716 campaigns in which the activist requested at least one board seat.

In Columns (3) and (4), the dependent variable is *Won_Seat*, which is set to 1 if the activists gain at least one board seat and 0 otherwise. The key independent variable is the indicator variable *WolfPack*, defined above. Column (3), estimated as a probit regression, shows that the average marginal effect of *Wolf Pack* is positive and significant at 8.7%. As a robustness test, I re-estimated Eq. (4) as a standard OLS regression and cluster standard errors by activist and firm. Consistent with prior results, in Column (4) the probability of winning a board seat is about 8.9% higher for a campaign accompanied by a wolf pack (the average probability of gaining a seat is ~65 %).

I also examine whether wolf packs are associated with winning more seats. I do so by replacing the dependent variable with *# Seats Won*, which is the number of seats gained by the

²² Since each activist and firm may appear more than once in my regression, the error within each activist/firm group may be correlated, leading to biased standard errors. Re-estimating Eq. (4) using standard OLS allows me to address this issue by clustering standard errors two ways (by firms and activists).

lead activist (as reported in SharkRepellent). The coefficient on *Wolf Pack* is positive and significant; indicating that campaigns accompanied by a wolf pack gain an average 0.22 seats more (the average number of seats won by an activist is 1.45.).

[Insert Table 5]

5.2 Alternative measures of success

One of the ultimate objectives for hedge fund activists is to earn a positive return on their stock holdings. Therefore as an alternative measure of success, I examine the long window buy and hold stock abnormal return (BHAR) for the duration of the campaign. I use the 13D filing date as the first day of the activism campaign and the end date reported by SharkRepellent as the last day of the campaign.²³

Table 6 presents the difference in BHAR between wolf pack and non-wolf pack campaigns. The average BHAR for a wolf-pack campaign is 8.3% higher than a non-wolf-pack campaign, as indicated by the positive and statistically significant coefficient on *Wolf Pack* in Column (1). In addition, I also examine whether buy and hold excess (raw return less market return) and raw return is higher for wolf-pack campaigns. Similarly, as indicated in Columns (2) and (3), the excess return is 5.5% and raw return is 6.9% higher for wolf-pack campaigns. It does not appear that such differences in returns are anticipated by the market at the time of campaign announcement; in the next section (*reverse causality*) I examine the announcement date return in Table 8 and find no significant difference between wolf pack and non-wolf pack campaigns.

[Insert Table 6]

²³ The end date as reported by SharkRepellent is the date that signals the end of a campaign. For campaigns that are associated with a proxy fight, this date is usually the date that the proxy fight went to a vote or ended if it did not go the distance. For non-proxy fight campaigns, this is the most logical date that signals the end of the campaign. For example, if the activist requested the company to seek a buyer, the end date would be the date that the company agreed to be acquired. For campaigns that are missing end date in SharkRepellent, I use the filing date of the last schedule 13D/A as the end date of the campaign. The SEC requires 13D filers to report any material changes in holdings (1% or more) under the schedule 13D/A, the last schedule 13D/A is usually filed because the activist is unwinding his/her position.

To summarize, my findings suggest that campaigns accompanied by wolf packs are more likely to be successful. My evidence is also consistent with the idea that given the right conditions, institutional investors can effectively coordinate with each other even in the absence of any formal agreement. Note that the tests above are a joint test of the validity of my empirical proxy and the effect of wolf packs on the outcome of the campaign. Under the assumption that wolf packs necessarily improve the rate of success of the campaign (because of the higher percentage of votes de facto controlled by the activist), then the documented positive association may be viewed as an indirect validation of my empirical proxy for wolf packs.

5.3 Reverse Causality

A positive association between the presences of wolf pack and campaign outcome does not necessarily imply that institutional investors are coordinating effectively (i.e. members are supporting the lead activists); instead the pack members merely join campaigns that are more likely to be successful and do not support the lead activist during the campaign because of coordinated efforts. If such a story was true, I would expect to observe wolf packs formation around “easy targets” (targets that are less well-defended for example) only. It should also be noted that reverse causality is more consistent under the *Spontaneous Formation Hypothesis*, since wolf-pack formation is a result of rational anticipation by members, and the lead activists cannot choose to create or deter a wolf pack.

In contrast, the effective coordination story is more consistent with the *Coordinated Effort Hypothesis*, and I expect to observe wolf packs formation around “more difficult targets” only. This is because it is costly for a lead activist to recruit other members: first, other members will start accumulating shares together with the lead activist, pushing prices upwards and making it more costly for the lead activist to achieve his target stake; second, by arranging a wolf pack the

lead activist may incur additional litigation risk (although it remains unclear whether such arrangement breaches any securities regulations). Therefore, a lead activist will only recruit other members for “more difficult targets.” Furthermore, if pack members are only “free riding” and do not generate any benefit for the lead activist, in equilibrium I do not expect to observe any wolf-pack formation.

I employ the following linear regression to estimate the relationship between the existence of a wolf pack and the level of defense employed by the underlying target:

$$\textit{Wolf Pack} = \textit{Defense} + \textit{Controls} \quad (5)$$

I use the *Bullet Proof Rating* from FactSet as an empirical proxy for a company’s relative defense against activism campaigns. The rating is a proprietary index which takes into account significant components that impact takeover defenses. It includes only proactive defenses undertaken by the target.²⁴ The rating scale is from 0 to 10, with a 10 representing the most formidable defenses. The regression results for regression 4 are presented in table 7. Inconsistent with reverse causality, the coefficients on *Bullet Proof Rating* (Columns 1 and 2) are positive and significant at the 10% level, suggesting that lead activists are more likely to employ the wolf-pack tactics in better defended companies.

As mentioned previously in section 4.1, one of the major benefits of the wolf-pack arrangement is that it allows the lead activist to “control” a higher level of share outstanding without triggering the “poison pills”. Therefore, I replaced *Bullet Proof Rating* and used *Poison Pill* as an alternative proxy for a company’s relative defense against activism campaigns. Again, inconsistent with reverse causality, the coefficients on *Poison Pill* (Columns 3 and 4) are positive and significant, suggesting that lead activists are more likely to employ the wolf-pack tactic in

²⁴ The rating does not take into consideration ownership and voting rights, the takeover laws which govern the state in which a company is incorporated, nor whether a company has opted out of coverage of applicable state takeover laws.

companies that are more likely to adopt a poison pill. In Columns (5) and (6), I separated *Poison Pill* into two separate components, targets that responded to the campaign by adopting a pill (*Pill in Response to Campaign*) and targets that already had a pill in place (*Pill in Force Prior to Campaign*). Interestingly, only the coefficient on *Pill in Response to Campaign* is statistically significant, suggesting that lead activists can anticipate future pill adoption by management.

[Insert Table 7]

Instead of selecting “easy targets”, pack members may select campaigns that have high expected benefits. Therefore, I use the announcement date return as an ex-ante measure for the campaign’s expected payoff and examine such reverse causality. In table 8, I replaced *Bullet Proof Rating* in Eq. (5) with varies short window announcement date return. If my results are driven by reverse causality, I expect to observe wolf-pack formation around campaigns with a high level of expected payoffs. However, consistently none of the coefficients on the returns measures were statistically significant at conventional levels. This further confirms that my results are unlikely to be driven by reverse causality.

[Insert Table 8]

6. Conclusion

I find evidence consistent with the existence of wolf packs by documenting share accumulation by other investors before public disclosure of 13D filings. These accumulations tend to concentrate on the trigger date. Further analyses suggest that it is unlikely that they are solely driven by investors spontaneously responding to changes in market conditions. Instead, those who accumulate shares before a 13D filing are more likely to be investors who have a relationship with the lead activist, which is consistent with coordination by a pack leader. I also show that this sort of trading is positively associated with future campaign success in terms of whether the activist achieves his stated objectives.

Researchers' understanding of wolf packs could be further strengthened by examining the economic determinants of pack formation. Future researchers might, for example, consider the role of information asymmetry in pack formation. On one hand, timely and reliable information about a target would allow pack members to efficiently decide whether to join the campaign. On the other, the benefit of effective monitors, such as hedge fund activists, is most important in settings characterized by high information asymmetry (as articulated by Bushman et al. 2004). Furthermore, concentrated ownership allows a wolf pack to more effectively influence management and secure private benefits from other non-equity stakeholders. To the extent that timely and reliable disclosures constrain the ability of block holders to secure private benefits, one would expect a positive relationship between wolf-pack formation and information asymmetry.

It is beyond the reach of this paper to investigate whether hedge funds are breaching the group disclosure requirement of schedule 13D. But the evidence here does suggest that wolf packs are a frequently used tactic. Whether this behavior should be encouraged might be a topic

for policymakers to consider. If wolf packs are encouraged, is their value sufficient to overcome the potentially unfair advantage given to hedge fund activists? Conversely, would discouraging wolf packs undermine the monitoring role that activists serve? These are important policy questions that future researchers can consider.

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Appendix A: Typical Schedule 13D Trading Schedule

(c) During the sixty (60) days preceding the date of this report, the Reporting Persons purchased the following shares of Common Stock in the open market.

| Reporting Person ----- | Trade Date ----- | Shares ----- | Price/Share ----- |
|---------------------------|---------------------|-----------------|----------------------|
| ValueAct Master Fund | 07-27-05 | 296,100 | 21.37 |
| | 07-28-05 | 246,750 | 21.25 |
| | 07-29-05 | 222,075 | 20.97 |
| | 08-01-05 | 197,800 | 21.19 |
| | 08-01-05 | 6,824 | 21.18 |
| | 08-02-05 | 92,076 | 21.25 |
| | 08-02-05 | 98,900 | 21.15 |
| | 08-03-05 | 197,800 | 21.01 |
| | 08-04-05 | 98,900 | 20.96 |
| | 08-04-05 | 98,900 | 20.95 |
| | 08-04-05 | 148,350 | 20.99 |
| | 08-05-05 | 98,900 | 20.97 |
| | 08-05-05 | 98,900 | 21.00 |
| | 08-08-05 | 197,800 | 20.99 |
| | 08-08-05 | 148,350 | 21.00 |
| | 08-09-05 | 148,449 | 21.13 |
| | 08-10-05 | 107,801 | 21.16 |
| | 08-12-05 | 247,250 | 20.90 |
| | 08-15-05 | 247,250 | 20.85 |
| | 08-15-05 | 494,500 | 20.86 |
| | 08-15-05 | 247,250 | 20.84 |
| | 08-16-05 | 148,350 | 20.78 |
| | 08-16-05 | 49,450 | 20.77 |
| 08-16-05 | 49,450 | 20.80 | |
| 08-17-05 | 146,372 | 20.84 | |
| 08-17-05 | 150,328 | 20.72 | |
| 08-18-05 | 247,250 | 20.93 | |

Appendix B: Summary of Brav et al. (2015)

In the coordination games developed by Brav, Dasgupta, and Mathews (2015), there are two types of players: a large activist investor, synonymous with the 13D filers studied in my tests, and small activist investors, who are under no obligation to disclose in my setting (if their holdings remain below 5%) and therefore remain invisible. There exists a firm in which a certain percentage of shares are owned by entrenched shareholders. The remaining percentage of shares is owned by other passive investors who are willing to sell their shares at fair value and will update their value as new information emerges. All investors receive a noisy signal about the degree of entrenchment in the firm. The players face two decisions: 1) whether to acquire shares in the target and, if they do, 2) whether to engage the target. The outcome depends on whether the total shares owned by the engaging activist are sufficient to overcome the entrenchment.

The game can be divided into four periods. During the first, the small activists decide whether to buy shares from the passive investors (without knowing the lead activist's plans). In the second period, the lead activist will decide whether to acquire shares in the target, and his action is publicly observable. This is synonymous with the activist filing a schedule 13D. In the third period, the small activists who did not acquire shares in the first period can acquire shares again, now knowing the large activist's position. Finally, in the fourth period, all the activists, large and small, will decide simultaneously whether to engage the target. If they do, each will face a private engagement cost. If the engagement succeeds, each activist will earn a private benefit. Since the passive investors are rational, they will price their stock accordingly, and the only gains for the activists will be the private benefit less their engagement and opportunity costs. For the lead activist, these private benefits may include positive publicity, which may lead to more fund inflows from other investors. For the small activists, these private benefits may take

the form of preferred treatment from the lead activist, who joins the target's board, as well as other soft information and connections to other activist investors.

Imagine a scenario in which a large activist does not participate, and there exists a small activist who is indifferent between acquiring a share and not doing so (his opportunity cost is exactly the same as his expected benefit from acquiring a share.). By monotonicity, only activists with opportunity costs below this threshold activist will acquire shares. However, imagine now that the large activist does participate. The existence of a large activist would increase the expected probability of successful engagement, and thus the threshold activist is no longer indifferent between acquiring shares or not: he strictly prefers to acquire. In fact, some small activists who strictly prefer not to participate, absent the large activist, will now strictly prefer to participate. The implication is that the presence of a large activist—or even the anticipation of that presence—spurs entry by the small activist, increasing the wolf-pack ownership level.

During the first period, the small activists and other passive investors are uncertain about the large activist's plans. Although the small activists can only acquire shares once, if they do not acquire shares during this period, they will still be able to do so at a later stage. Each small activist faces an exogenously determined opportunity cost of acquiring a share in the firm. Under this set of assumptions, it is clear that, if these small activists can somehow predict entrance by the lead activists (better than other passive investors), they will prefer to acquire shares in this period, rather than later, when the large activist's participation is publicly disclosed (since there is a trading profit to be gained).

There are two situations in which the small activists will trade ahead of a large activist's entrance. The first is when the lead activists leak information about their plans to the small activists (intentional coordination). The second, given the same piece of news, is when the small

activists can better predict future entrance (*spontaneous formation*) by lead activist than other passive investors (who will sell shares to the small activists).

Appendix C: Examples from SharkRepellent database

| Total | Board | Payout | Restructuring | Takeover |
|-------|------------|------------|---------------|------------|
| 1922 | 716 37% | 462 24% | 482 25% | 443 23% |

| Classifications | Comments |
|--------------------------|---|
| Successful | <p>Example 1: Campaign to maximize shareholder value included letter to management proposing that company engage in a share repurchase program. Shortly after campaign initiation, board announced cost reduction measures and a 500,000 share repurchase program.</p> <p>Example 2: Dissident campaign included notice that it may speak to management regarding Board representation and business plans. Dissident group later suggested 1 dissident representative to replace Board member who resigned, and this representative was elected.</p> <p>Example 3: Dissident conducted discussions with Co. regarding operational & structural changes, including a spin-off. Co. announced plans to spin-off its Financial Services business and later expanded its Board to appoint 5 Dissident recommended individuals.</p> |
| Partly successful | <p>Example 1: Dissident won 3 of 4 seats up for election to 13 person Board, ISP never launched tender offer after company refused to exempt the tender offer from company's "poison pill" and Delaware freeze out provision.</p> <p>Example 2: Annual meeting proxy fight to replace 4 of 10 directors settled for 3 seats on 11-seat board. Previously, Starboard had started a written consent solicitation, and Co. adopted pill with 15% trigger after Starboard accumulated 14.8% stake.</p> <p>Example 3: Roumell has nominated 2 candidates to 6-seat board for 2014 annual meeting. Co. agreed to add 1 nominee (Previously, Roumell urged Co. to repurchase shares. After 3rd party made unsolicited offer, Roumell urged for sale process.).</p> |
| Settled | <p>Example 1: Proxy fight to elect 2 dissident nominees settled. As part of settlement agreement, the company agreed to repurchase 111,000 common shares from the dissident for \$20.25 per share (a premium of 11.75% over the preceding 30 day average market price).</p> <p>Example 2: Proxy fight settled. As part of settlement agreement, Board size increased from 10 to 13, and 3 dissidents elected to Board.</p> <p>Example 3: Longview, 9% holder, urged PETM to review strategic alternatives and explore sale of the Co. Co. reviewed strategic alternatives and then agreed to be acquired by a private group led by BC Partners.</p> <p>Example 4: Maguire, 5.3% holder, requested one board seat and urged Co. to replace CEO, implement cost restructuring plan, and review strategic alternatives, including a sale. Parties entered into settlement agreement providing for mutually</p> |

agreeable director.

Withdrawn

Example 1: Proxy fight for three seats on eight-seat board was voluntarily withdrawn after Progress announced plan to divest assets and buy back shares, as Starboard had requested.

Example 2: Proxy fight for 2 seats on the 7 person board at the 2009 annual meeting was withdrawn; dissident decided not to nominate its candidates at the annual meeting.

Example 3: Dissident campaign urged company to seek a sale of its subsidiary banks otherwise threatened to seek board representation. Dissident withdrew campaign after the company announced it agreed to be acquired by First Financial Corporation.

Fail

Example 1: Lenox's one director nominee was defeated at the 2010 annual meeting. Although its proposal requesting board declassification received more votes cast for its approval than against it, the proposal was defeated after counting abstentions as votes against.

Example 2: Campaign urged Board to enhance shareholder value and specifically liquidate company's investment in Ready Mix, Inc. Despite dissident's opposition, management nominees were elected at annual meeting and the shareholder proposal defeated.

Example 3: Dissident 2-person slate not elected, as no nominee received required majority of votes present at meeting; incumbent directors thus continued to serve. Western's non-binding declassification proposal passed.

Example 4: Proxy fight for one board seat was unsuccessful. Co. had adopted 10% trigger poison pill in response to Biglari's 9.3% stake.

Not Enough Information

Example 1: 13D Filer - No Publicly Disclosed Activism

Ongoing

Example 1: Basswood Capital, 9.03% holder, disclosed it may engage in discussions with the Company's board, management, other shareholders, industry observers, and potential acquirers regarding the Co.'s future plans to increase shareholder value.

Example 2: Dissident campaign included a letter to the board advising it to seek a director candidate from its larger shareholders. Dissident also advised the company to have at least one conference call each year in which all shareholders can participate.

Example 3: Atlantic, 5.1% holder, disclosed that it engaged and would continue to engage in discussions with Oil States' management and board regarding the Co.'s business, corporate governance, and board composition for the purpose of increasing shareholder value.

Appendix D: Variables definitions

Control Variables

| | |
|-----------------------------------|---|
| <i>Log(MV)</i> | Nature Log of market value of the target firm |
| <i>Institution Holding</i> | This is the % of share outstanding owned by all 13F institutions in the most recent quarter |
| <i>Analyst Following</i> | The number of I/B/E/S analyst that issued an earning forecast for the target firm during the past quarter |
| <i>Amihud t</i> | This is the Amihud illiquidity ratio, estimate on date t |
| <i>10K t</i> | Indicator variable which takes the value of 1 if a Form 10-K was filed on day t |
| <i>8K t</i> | Indicator variable which takes the value of 1 if a Form 8-K was filed on day t |
| <i>10Q t</i> | Indicator variable which takes the value of 1 if a Form 10-Q was filed on day t |
| <i>Earnings Announcement t</i> | Indicator variable which takes the value of 1 if day t is the date of quarterly earnings announcement |
| <i>I/B/E/S forecast t</i> | Indicator variable which takes the value of 1 if an analyst in I/B/E/S issues an earnings forecast on day t |
| <i>Management Guidance t</i> | Indicator variable which takes the value of 1 if management issues guidance on day t |
| <i># News t-30 to t</i> | The number of news reported between the date t-30 and date t about the target firm in the 13D filing. Obtained from Factiva searches. |
| <i># News t</i> | The number of news reported on the date t about the target firm in the 13D filing. Obtained from Factiva searches. |
| <i># News t-1</i> | The number of news reported on the date t-1 about the target firm in the 13D filing. Obtained from Factiva searches. |
| <i># News t-2</i> | The number of news reported on the date t-2 about the target firm in the 13D filing. Obtained from Factiva searches. |
| <i>13D Filer Trade t</i> | The % of share outstanding traded by the 13D filer on date t |
| <i>Abn_Ret t</i> | The abnormal return estimated using the 4 factor model (SML, HML, Market, Momentum), on the event date |
| <i>Abn_Ret t-1</i> | The abnormal return estimated using the 4 factor model (SML, HML, Market, Momentum), one trading date prior to the event date |
| <i>Vol t</i> | Normal trading volume estimated as the average of volume between trading days -120 to days -60 |
| <i>Bid Ask Spread</i> | The absolute difference between the bid and ask on date t |
| <i>Institutional Sales t</i> | The percentage of shares outstanding sold by institutional investors on day t, see Gantchev and Jotikasthira (2015) |
| <i>Glass Lewis Recommendation</i> | Indicator variable obtained from SharkRepellent: take the value of 1 if glass lewis make a recommendation for the 13D filer; 0 otherwise (SharkRepellent only reports publically disclosed Glass Lewis vote recommendation) |
| <i>ISS</i> | Indicator variable obtained from SharkRepellent : take the value of 1 if ISS make a |

| | |
|------------------------------|--|
| <i>Recommendation</i> | recommendation for the 13D filer; 0 otherwise (SharkRepellent only reports publically disclosed ISS vote recommendation) |
| <i>Classified Board</i> | Indicator variable obtained from SharkRepellent : takes the value of 1 if board is classified; 0 otherwise |
| <i>Unsolicited Offer</i> | Indicator variable obtained from SharkRepellent : takes the value of 1 if an unsolicited offer is made; 0 otherwise |
| <i>Hostile Offer</i> | Indicator variable obtained from SharkRepellent : takes the value of 1 if an hostile offer is made; 0 otherwise |
| <i>Lawsuit</i> | Indicator variable obtained from SharkRepellent : takes the value of 1 if a lawsuit is filed; 0 otherwise |
| <i>Letter to Shareholder</i> | Indicator variable obtained from SharkRepellent : takes the value of 1 if a letter to shareholder was made; 0 otherwise |
| <i>Poison Pill</i> | Indicator variable obtained from SharkRepellent : takes the value of 1 a poison pill was either in effect or adopted in respond to the 13D filer's campaign; 0 otherwise |

Other Variables

| | |
|--|--|
| <i>13D Filer Shares - 60 to filing date</i> | This is the % of common share accumulated by the 13D filer from 60 days prior to filing date till filing date |
| <i>13D Filer Shares - 60 to trigger date</i> | This is the % of common share accumulated by the 13D filer from 60 days prior to filing date till trigger date |
| <i>13D Filer Hold</i> | The % of share outstanding held by the 13D filer at filing date |

Fire-Sales Proxies

| | |
|------------------------|--|
| <i>Share_Sold</i> | The percentage of shares outstanding sold by a particular 13F institution within a particular quarter |
| <i>Sell_Fraction_N</i> | The number of stocks (not shares) sold divided by the number of individual stocks bought or sold by that particular 13F institution |
| <i>Sell_Fraction_D</i> | The dollar principal of all stocks sold divided by the dollar principal of all stocks bought and sold by that particular 13F institution |

Outcome Proxies

| | |
|-------------------------|---|
| <i># Board Seat Won</i> | This is the number of board seat won by the lead activist as reported in SharkRepellent |
| <i>Won Seat</i> | Indicator variable: takes the value of 1 if activist won at least one seat, 0 otherwise |
| <i>Outcome</i> | Indicator variable: takes the value of 1 if activist achieved at least a part of their demand, settled the campaign or withdrawn the campaign, 0 if the campaign failed |
| <i>Outcome Index</i> | An index variable: takes the value of 1 if activist fully achieved his demand; 0 if activist achieved part of his demand, settled or withdrawn from the campaign; -1 if the activist failed |

Wolf Pack proxies

| | |
|-----------------------|---|
| <i>Turnover_Other</i> | (Total Trading Volume-13D Filer Trade)/(Normal Trading Volume) |
| <i>Wolf Pack</i> | Indicator variable: takes the value of 1 if "wolf pack proxy continous" is in the upper quantile; 0 otherwise |

Figure 1 - Timeline for 13D Filing

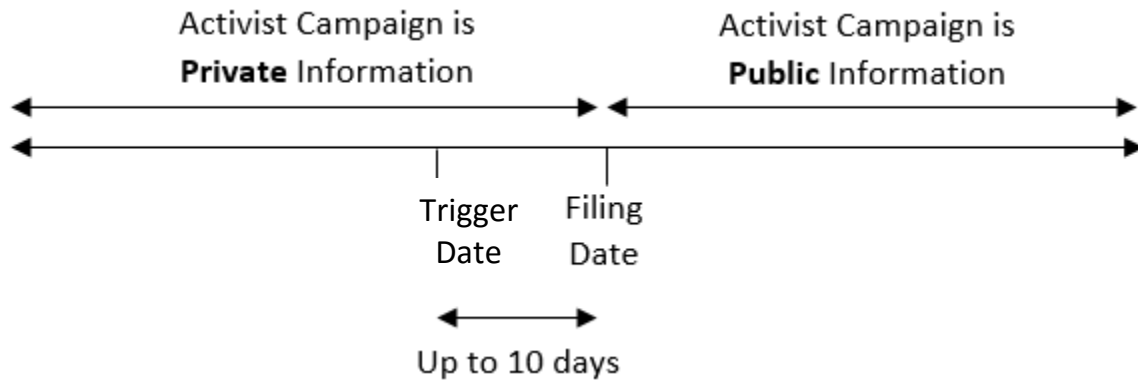


Figure 1 is a timeline for a typical 13D filing. The filing date is the date in which the 13D is submitted to the SEC and made publicly available. The trigger date is the date in which the 13D filer triggered the filing requirement. There are two triggers for 13D filings: (1) the investor acquires more than 5% of any class of security of a publicly traded company; and (2) the investor has an interest in influencing the management of the company. Once both triggering events are satisfied, the investor has up to 10 days to file form 13D with the SEC.

Figure 2- Total turnover around the Trigger Date

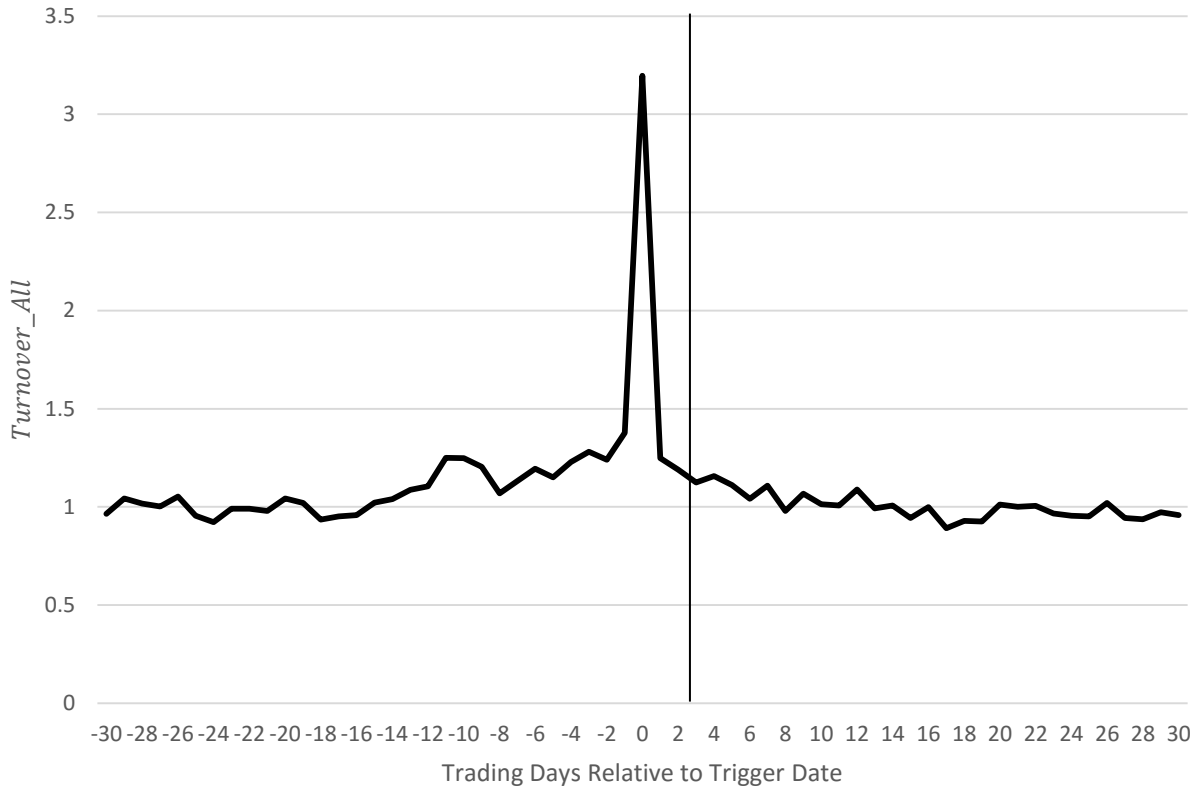


Figure 2 shows the average daily share turnover ($Turnover_All$) over the 60-day period around the trigger date (the day in which the activist triggers the 13D filing requirement). $Turnover_All = \frac{Vol_{i,t}}{Avg(Vol_{i,t-120} \dots Vol_{i,t-60})}$ is the total daily trading volume deflated by the normal trading volume for the firm. Normal trading volume $Avg(Vol_{i,t-120} \dots Vol_{i,t-60})$ is calculated as the rolling average of -120 to -60 days trading volume. $Turnover_All = 1$ implies that there is no abnormal trading on that particular day. The figure includes 1,922 activist events between 1998 and 2014 (see Table 1). All variables are winsorized at the 1% and 99% level.

Figure 3 - Turnover by Other Investors around the Trigger Date: Full Sample

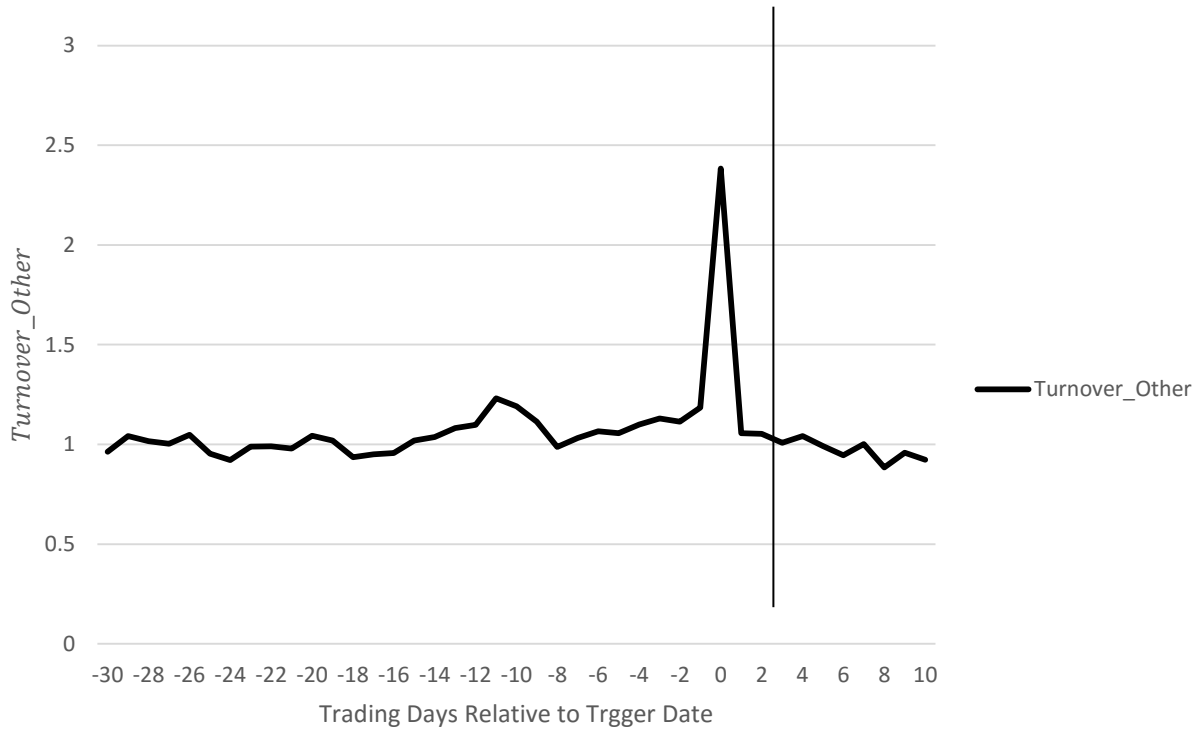


Figure 3 shows the average daily share turnover by other investors ($Turnover_Other_t$) around the trigger date (the day in which the activist triggers the 13D filing requirement). $Turnover_Other_t = \frac{Other_Vol_{i,t}}{Avg(Vol_{i,t-120} \dots Vol_{i,t-60})}$ is the total daily trading volume (net of the volume traded by the 13D filer) deflated by the normal trading volume for the firm. In particular, $Other_Vol$ is calculated as the total trading daily volume less the daily volume traded by the activist (manually collected from the schedule 13D). Normal trading volume $Avg(Vol_{i,t-120} \dots Vol_{i,t-60})$ is calculated as the rolling average of -120 to -60 days trading volume. $Turnover_Other = 1$ implies that there is no unexplained abnormal trading on that particular day. The figure includes 1,922 activist events between 1998 and 2014 (see Table 1). All variables are winsorized at the 1% and 99% level. Note: because 13D filers are only required to disclose their trading up until the filing date, whenever a filer files prior to the 10 days cutoff, for the purpose of this Figure, I assume that the 13D filer makes no trade between the filing date and day +10 from the trigger date trading date.

Figure 4- Share Accumulation around Trigger Date

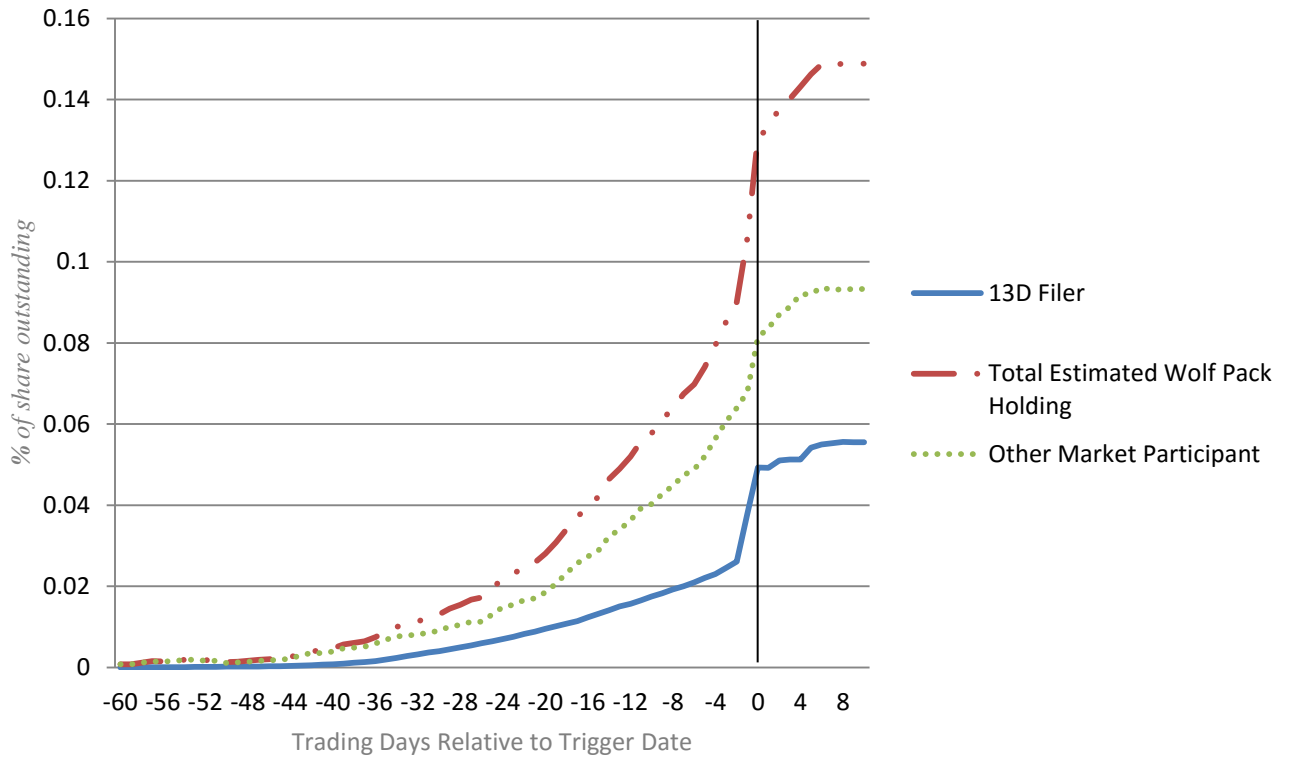


Figure 4 shows the percentage of shares accumulated by 13D filers and other investors. The trigger date is the day in which the 13D filer triggers the 13D filing requirement. The shares accumulated by the 13D filers are obtained directly from the schedule 13D. The shares accumulated by other investors are estimated as the remaining share volume after removing (1) trades by 13D filer and (2) normal trading volume. Normal trading volume is estimated using the rolling average volume from trading days -120 to -60 inclusive. The figure includes 1,922 activist events between 1998 and 2014 (see Table 1). All variables are winsorized at the 1% and 99% level. Note: because 13D filers are only required to disclose their trading up until the filing date, whenever a filer files prior to the 10 days cutoff, for the purpose of this Figure, I assume that the 13D filer makes no trade between the filing date and day +10 from the trigger date.

Figure 5 - Turnover by Other Investors around the Trigger Date: Subset of campaigns with no trades by the 13D filer on the trigger date (13G switchers)

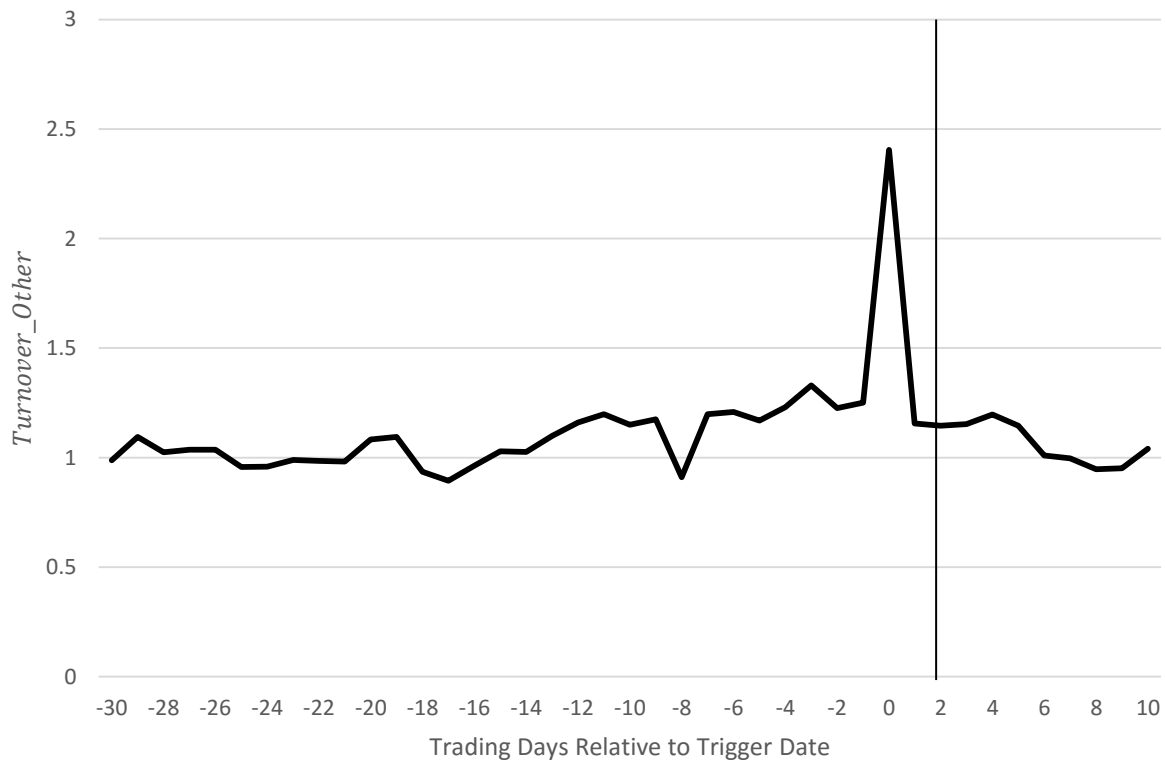


Figure 5 shows the average daily share turnover by other investors ($Turnover_{Other}_t$, defined in Figure 3) around the trigger date (the day in which the activist triggers the 13D filing requirement) for the subset of 351 campaigns without any trading by the 13D filer on the trigger date (these are cases where the activist already owns 5% of the shares but triggers the filing requirement because it changes its intent from ‘passive’ to ‘active’). Note: because 13D filers are only required to disclose their trading up until the filing date, whenever a filer files prior to the 10 days cutoff, for the purpose of this Figure, I assume that the 13D filer makes no trade between the filing date and day +10 from the trigger date.

Figure 6 - Turnover by Other Investors around the Trigger Date: Subset of campaigns with no news

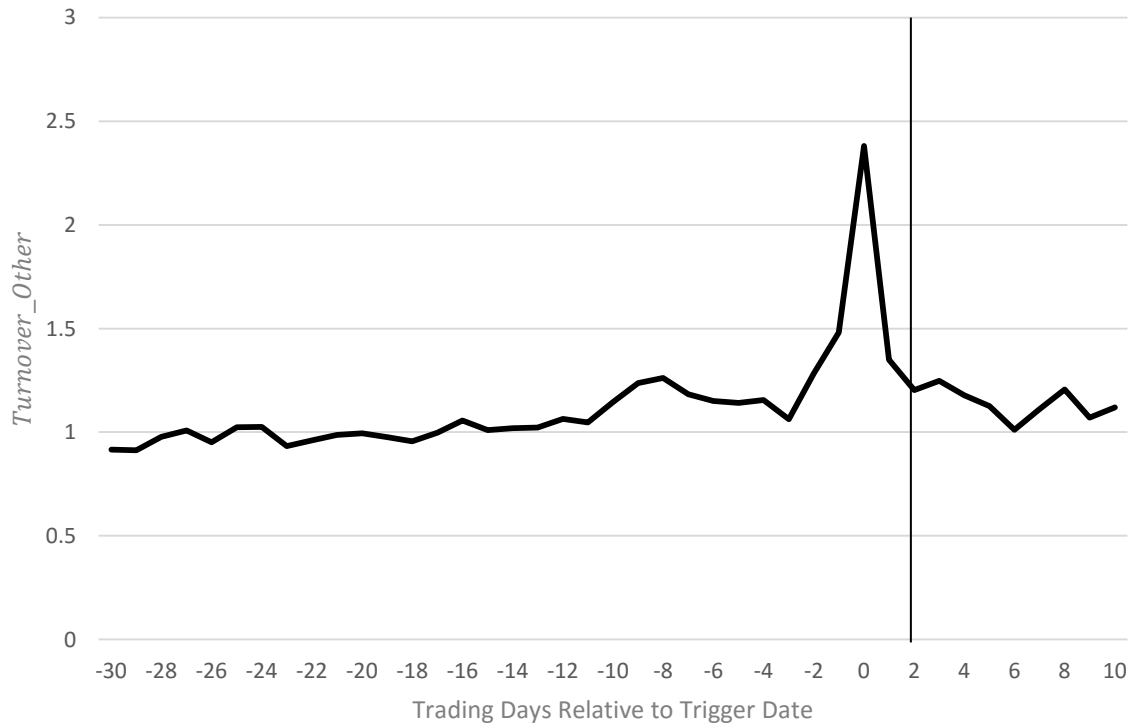


Figure 6 shows the average daily share turnover by other investors ($Turnover_Other_t$, defined in Figure 3) around the trigger date (the day in which the activist triggers the 13D filing requirement) for the subset of 759 campaigns with no news in the 10 days prior to the trigger date. Note: because 13D filers are only required to disclose their trading up until the filing date, whenever a filer files prior to the 10 days cutoff, for the purpose of this Figure, I assume that the 13D filer makes no trade between the filing date and day +10 from the trigger date.

Figure 7 - Turnover by Other Investors around the Trigger Date: Subset of campaigns with small abnormal return (-0.1% to 0.1%)

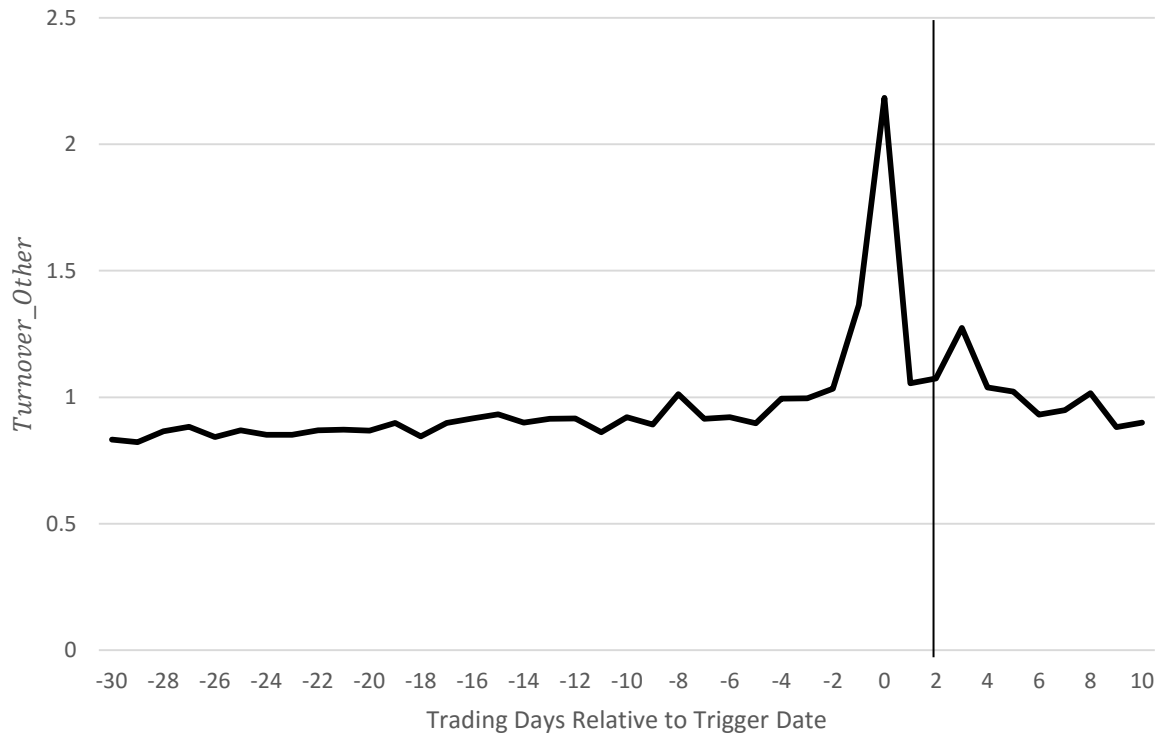


Figure 7 shows the average daily share turnover by other investors ($Turnover_Other_t$, defined in Figure 3) around the trigger date (the day in which the activist triggers the 13D filing requirement) for the subset of 293 campaigns with small abnormal return (-0.1% to 0.1%) on the trigger days and one day before. Note: because 13D filers are only required to disclose their trading up until the filing date, whenever a filer files prior to the 10 days cutoff, for the purpose of this Figure, I assume that the 13D filer makes no trade between the filing date and day +10 from the trigger date.

Figure 8 - Turnover by Other Investors around the Trigger Date: Subset of campaigns with no fire-sales

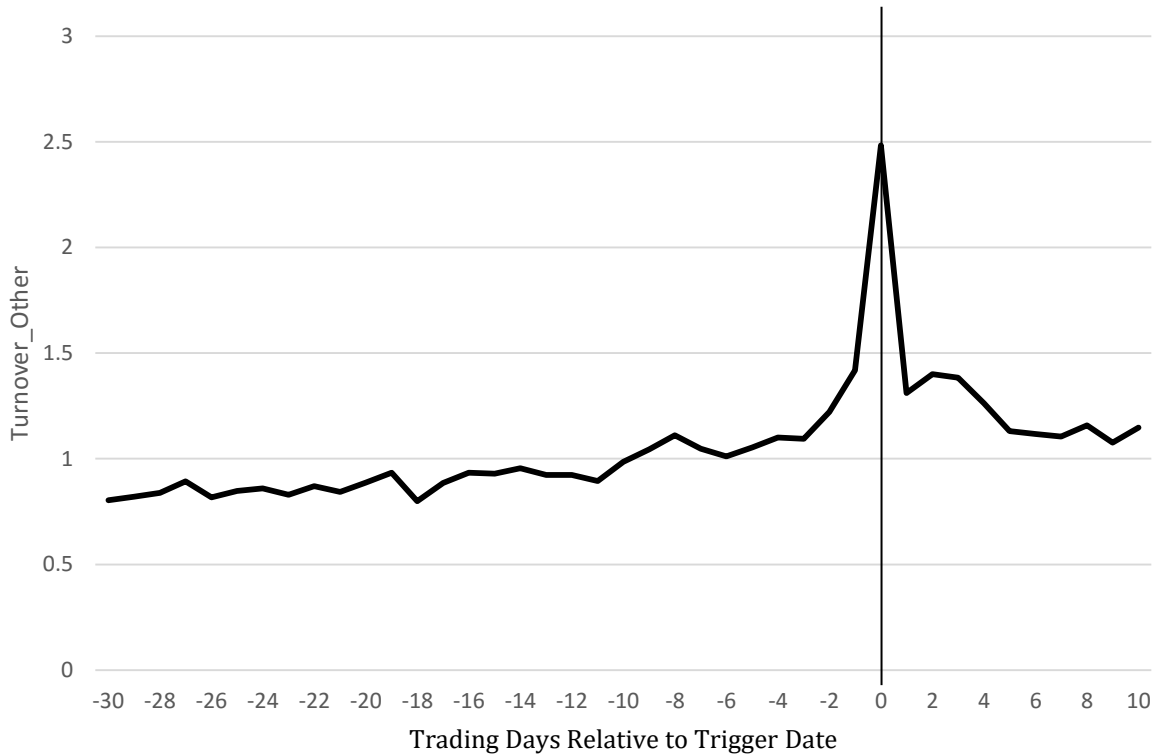


Figure 8 shows the average daily share turnover by other investors ($Turnover_Other_t$, defined in Figure 3) around the trigger date (the day in which the activist triggers the 13D filing requirement) for the subset of 747 campaigns with no fire-sales. I classify a campaign as a non-fire-sales campaign if the underlying stock owners (1) sell less than 1% of share outstanding ($Share_Sold < 1\%$), (2) sell less number of stocks than purchase ($Sell_Fraction_N < 50\%$) and (3) sell less dollar value of shares than purchase ($Sell_Fraction_D < 50\%$). Note: because 13D filers are only required to disclose their trading up until the filing date, whenever a filer files prior to the 10 days cutoff, for the purpose of this Figure, I assume that the 13D filer makes no trade between the filing date and day +10 from the trigger date.

Table 1- Sample Selection

| Selection procedure | Campaigns Removed | Total |
|--|--------------------------|--------------|
| SharkRepellent .net Campaigns between 1998 to 2014 | | 3744 |
| Campaigns where trigger date = filing date | 304 | 3440 |
| Campaigns where no 13D is found | 151 | 3289 |
| Missing variables from CRSP/Compustat | 201 | 3088 |
| Missing trigger date | 528 | 2560 |
| Remove SIC 6798, 6770, 6792, ADRs | 267 | 2293 |
| Subsequent campaigns | 196 | 2097 |
| Initial Campaigns with subsequent campaigns | 170 | 1927 |
| 13D transaction table is at lower-than-daily frequency | 5 | 1922 |

Table 2- Descriptive Statistic

| | N | Mean | Median | Std. |
|--|----------|-------------|---------------|-------------|
| Panel A Control Variables | | | | |
| Log(MV) | 1,922 | 6.839 | 5.344 | 7.883 |
| Institution Holding | 1,922 | 0.440 | 0.444 | 0.361 |
| Analyst Following | 1,922 | 3.271 | 2.000 | 5.090 |
| Amihud trigger date | 1,922 | 0.468 | 0.191 | 0.739 |
| 10K trigger date | 1,922 | 0.003 | 0.000 | 0.063 |
| 8K trigger date | 1,922 | 0.006 | 0.000 | 0.081 |
| 10Q trigger date | 1,922 | 0.014 | 0.000 | 0.118 |
| Earnings Announcement trigger date | 1,922 | 0.008 | 0.000 | 0.089 |
| I/B/E/S forecast trigger date | 1,922 | 0.028 | 0.000 | 0.165 |
| Management Guidance trigger date | 1,922 | 0.003 | 0.000 | 0.056 |
| # News trigger date-30 to trigger date | 1,922 | 9.651 | 2.000 | 18.608 |
| # News trigger date | 1,922 | 2.212 | 0.000 | 13.859 |
| 13D Filer Trade trigger date | 1,922 | 0.007 | 0.001 | 0.015 |
| Abn_Ret trigger date | 1,922 | 0.007 | 0.001 | 0.083 |
| Vol trigger date | 1,922 | 0.013 | 0.006 | 0.029 |
| Bid Ask Spread trigger date | 1,922 | 0.064 | 0.022 | 0.098 |
| Institutional Sales trigger date % | 1,922 | 0.006 | 0.000 | 0.259 |
| Glass Lewis Recommendation | 1,922 | 0.020 | 0.000 | 0.098 |
| ISS Recommendation | 1,922 | 0.042 | 0.000 | 0.154 |
| Classified Board | 1,922 | 0.469 | 0.000 | 0.499 |
| Unsolicited Offer | 1,922 | 0.041 | 0.000 | 0.199 |
| Hostile Offer | 1,922 | 0.014 | 0.000 | 0.116 |
| Lawsuit | 1,922 | 0.039 | 0.000 | 0.194 |
| Letter to Shareholder | 1,922 | 0.077 | 0.000 | 0.266 |
| Poison Pill | 1,922 | 0.301 | 0.000 | 0.459 |
| Panel B Other Variables | | | | |
| 13D Filer Shares -60 to filing date | 1,922 | 0.054 | 0.040 | 0.068 |
| 13D Filer Shares -60 to trigger date | 1,922 | 0.046 | 0.040 | 0.059 |
| 13D Filer Holdings filing date | 1,922 | 0.088 | 0.063 | 0.067 |
| Panel C Fire-Sales Proxies | | | | |
| Share_Sold | 1,922 | 0.019 | 0.010 | 0.027 |
| Sell_Fraction_N | 1,922 | 0.643 | 0.558 | 0.232 |
| Sell_Fraction_D | 1,922 | 0.690 | 0.553 | 0.372 |
| Panel D Outcome Proxies | | | | |
| # Board Seat Won | 716 | 1.455 | 1.000 | 1.348 |
| Won Seat | 716 | 0.655 | 1.000 | 0.476 |
| Outcome | 1,484 | 0.744 | 1.000 | 0.437 |
| Outcome Index | 1,484 | 0.076 | 0.000 | 0.677 |

Panel E Wolf Pack proxies

| | | | | |
|-----------------------------|-------|-------|-------|-------|
| Turnover Other trigger date | 1,922 | 2.450 | 0.080 | 5.204 |
| Wolf Pack | 1,922 | 0.250 | 0.000 | 0.433 |

Panel F Activist Demands

| Total | Board | Payout | Restructuring | Takeover |
|--------------|--------------|---------------|----------------------|-----------------|
| 1922 | 716 | 462 | 482 | 443 |
| | 37% | 24% | 25% | 23% |

Table 3- Mechanism of Wolf-Pack Formation: Changes in Market Conditions

| | Panel A: Regression on <i>Turnover_Other_t</i> | | | | |
|---|--|------------------------|------------------------|------------------------|------------------------|
| | (1) All | (2) 13G Switchers | (3) No News | (4) Low Ret | (5) Fire-sales |
| <i>Intercept</i> | 1.046 *** [13.532] | 1.044 *** [13.589] | 1.038 *** [13.463] | 1.048 *** [13.56] | 1.038 *** [13.158] |
| Main Variable | | | | | |
| <i>Trigger date</i> | 1.231 *** [7.932] | | | | |
| <i>Trigger date & (13G switcher)(no news)(low return)(non-fire-sales)</i> | | 1.209 *** [3.484] | 1.181 *** [4.739] | 1.195 *** [3.406] | 1.259 *** [7.901] |
| <i>Trigger date & (non-switcher)(have news)(high return)(fire-sales)</i> | | 1.284 *** [5.961] | 1.393 *** [7.36] | 1.361 *** [7.794] | 1.182 *** [5.678] |
| Momentum | | | | | |
| <i>Abn_Ret_t</i> | 5.070 *** [3.074] | 5.087 *** [3.088] | 5.053 *** [3.067] | 5.068 *** [3.074] | 5.067 *** [3.079] |
| <i>Abn_Ret_{t-1}</i> | -0.763 *** [3.036] | -0.760 *** [3.033] | -0.769 *** [3.059] | -0.765 *** [3.041] | -0.764 *** [3.01] |
| <i>Vol_{t-1}</i> | 0.004 *** [6.614] | 0.004 *** [6.586] | 0.004 *** [6.657] | 0.004 *** [6.613] | 0.004 *** [6.62] |
| Liquidity | | | | | |
| <i>Institutional Sales</i> | 0.783 *** [5.197] | 0.785 *** [5.207] | 0.785 *** [5.214] | 0.783 *** [5.196] | 0.787 *** [5.191] |
| <i>Log (MV)</i> | -0.064 *** [15.459] | -0.064 *** [15.421] | -0.064 *** [15.437] | -0.064 *** [15.457] | -0.064 *** [15.455] |
| <i>Amihud_t</i> | 0.004 [0.544] | 0.004 [0.603] | 0.004 [0.553] | 0.003 [0.529] | 0.004 [0.615] |
| Arrival of News | | | | | |
| <i>10K</i> | 0.212 ** [2.094] | 0.214 ** [2.105] | 0.215 ** [2.119] | 0.211 ** [2.089] | 0.207 ** [2.059] |
| <i>8K</i> | 0.601 *** [5.236] | 0.605 *** [5.23] | 0.601 *** [5.236] | 0.600 *** [5.226] | 0.440 *** [2.845] |
| <i>10Q</i> | 0.171 *** [3.732] | 0.172 *** [3.744] | 0.172 *** [3.771] | 0.170 *** [3.709] | 0.163 *** [3.556] |
| <i>Earnings Announcement</i> | 0.275 ** [2.079] | 0.293 ** [2.123] | 0.278 ** [2.179] | 0.268 ** [2.098] | 0.253 [1.423] |
| <i>I/B/E/S forecast</i> | 0.418 *** [4.1] | 0.414 *** [4.046] | 0.416 *** [4.061] | 0.419 *** [4.097] | 0.380 *** [3.719] |
| <i>Management Guidance</i> | 0.326 ** [2.408] | 0.323 ** [2.393] | 0.324 ** [2.4] | 0.325 ** [2.403] | 0.347 ** 2.512 |
| <i># News_t</i> | 0.021 ** [2.01] | 0.021 ** [2.009] | 0.021 ** [2.009] | 0.021 ** [2.01] | 0.021 ** 2.009 |
| <i># News_{t-1}</i> | -0.014 *** [3.003] | -0.014 *** [3.008] | -0.014 *** [3.005] | -0.014 *** [3.002] | -0.014 *** -3.001 |
| <i># News_{t-2}</i> | -0.004 [1.112] | -0.004 [1.093] | -0.004 [1.106] | -0.004 [1.112] | -0.004 [1.119] |

| Other firm characteristics | | | | | |
|---|-----------------------|-----------------------|-------------------------|-----------------------|-----------------------|
| <i>Bid Ask Spread</i> _t | -0.163 *** [2.679] | -0.164 *** [2.696] | -0.163 *** [2.695] | -0.163 *** [2.682] | -0.163 *** [2.672] |
| <i>13D Filer Holdings</i> | 0.002 * [1.671] | 0.002 [1.476] | 0.002 * [1.678] | 0.002 * [1.67] | 0.002 * [1.662] |
| <i>Institution Holding</i> | -0.115 *** [3.447] | -0.115 *** [3.431] | -0.113 *** [3.384] | -0.115 *** [3.443] | -0.114 *** [3.419] |
| <i>Analyst Following</i> | -0.005 ** [2.526] | -0.006 *** [2.568] | -0.005 ** [2.52] | -0.005 ** [2.528] | -0.005 ** [2.515] |
| Adj. R ² | 0.114 | 0.110 | 0.111 | 0.114 | 0.115 |
| Adj. R ² without FE | 0.110 | 0.108 | 0.101 | 0.113 | 0.113 |
| No. (13G switcher)(no news)(low return)(non-fire-sales) | N/A | 351 | 759 | 273 | 747 |
| No. (non-switcher)(have news)(high return)(fire-sales) | N/A | 1,571 | 1,163 | 1,649 | 1,175 |
| No. Total Campaigns | | | 1,922 | | |
| No. Observations | | | 115,320 | | |
| Fixed Effects | | | Year, Industry, Weekday | | |
| Std. Error Cluster | | | Activist Firm | | |

Panel B: F-Test between co-efficient

| | All | 13G vs. Non Switchers | No vs. Have News | Low vs. High Return | Non Fire-Sales vs. Fire-Sales |
|---|-----|-----------------------|----------------------|----------------------|-------------------------------|
| Difference between Coefficients [F Value] | N/A | 0.075 [0.010] | 0.212 *** [7.160] | 0.166 *** [7.560] | -0.077 [1.43] |

Panel A presents a pool campaign-day regression with 115,320 observations, each observation represents one trading date within the 60 days prior to the 13D filing, and a total of 1,922 unique campaigns are represented. The campaigns are obtained from SharkRepellent database; I removed campaigns with the same trigger date and filing date, and campaigns with multiple 13Ds. The estimation period is from Jan 1998 to Dec 2014. All variables are winsorized at the extreme at the 1% and 99% level. Columns (1) – (4) are estimated using standard O.L.S. regression standard errors are cluster by activist and firm. The dependent variable $Turnover_Other_t$ is $(\frac{Total\ Trading\ Volume - 13D\ Filer\ Trade}{Normal\ Trading\ Volume})$ calculated on the date t, if there is no abnormal turnover this variable would equal one. In Column (1), the main variable of interest *Trigger_date* is an indicator variable equal to the value of 1 if that date is a trigger date (the date which trigger the filing obligation for 13D filers) and 0 otherwise. In Columns (2) – (4), the main variable of interest *Trigger_date & (13G switcher) (no news) (low return)(non-fire-sales)* is an indicator variable equal to the value of 1 if the 13D campaign is either a 13G switcher (have no news) (low return)(non-fire-sales) and that date is a trigger date and 0 otherwise. Panel B presents the corresponding F Test between the coefficients *Trigger_date & (13G switcher) (no news) (low return)(non-fire-sales)* and *Trigger_date & (non-switcher) (have news) (high return)(fire-sales)*. For a description of the control variables, please refer to Appendix D. Note: 13D filers are only required to disclose their trading for 60 calendar days prior to the filing date, therefore not all filers provided their trading information between “day –60 from trigger date” and “day–60 from filing date”, for the purpose of the regressions in Table 3, I assume that the 13D filers make no trade within this period.

Table 4- Mechanism of Formation: Prior Relationship and Activists' Reputation

| Main Variable | (1) Probit [dydx]/ <i>Buying</i> | (2) OLS/ <i>Buying</i> | (3) Probit.[dydx]/ <i>Wolf Pack</i> | (4) O.L.S./ <i>Wolf Pack</i> |
|-----------------------------------|-------------------------------------|---------------------------|--|---------------------------------|
| <i>Past Relationship</i> | 0.079 ** [2.38] | 0.081 *** [2.58] | | |
| <i>Reputable Activist</i> | | | 0.032 * [1.69] | 0.033 * [1.545] |
| Momentum | | | | |
| <i>Abn_Ret t</i> | -0.363 [1.53] | -0.237 [1.58] | 0.036 [0.2] | 0.232 [1.32] |
| <i>Abn_Ret t-1</i> | -0.508 ** [2.5] | 0.707 ** [1.97] | -0.662 [1.98] | -0.347 [1.067] |
| <i>Vol t-1</i> | -0.005 * [1.73] | 0.000 [0.54] | 0.002 *** [4.38] | 0.002 *** [2.778] |
| Liquidity | | | | |
| <i>Institutional Sales</i> | -0.140 ** [1.86] | -0.301 *** [2.7] | 0.053 ** [3.77] | 0.054 ** [2.481] |
| <i>Log (MV)</i> | 0.102 * [1.67] | 0.014 * [1.19] | -0.011 *** [2.97] | -0.031 *** [2.959] |
| <i>Amihud_t</i> | 0.145 [0.95] | 0.136 [0.89] | -0.069 *** [3.88] | -0.037 *** [3.664] |
| Arrival of News | | | | |
| <i>10K</i> | -0.038 [0.353] | 0.117 [0.62] | 0.088 [0.44] | 0.108 [0.537] |
| <i>8K</i> | -0.074 [0.672] | -0.074 [1.101] | 0.064 [0.33] | 0.029 [0.147] |
| <i>10Q</i> | 0.049 * [1.95] | 0.251 ** [2.03] | 0.349 *** [3.2] | 0.145 * [1.679] |
| <i>Earnings Announcement</i> | 0.021 [0.212] | 0.045 [0.341] | -0.122 [0.423] | -0.081 [0.542] |
| <i>I/B/E/S forecast</i> | 0.057 [1.299] | -0.150 * [1.77] | 0.093 [1.04] | 0.091 [1.034] |
| <i>Management Guidance</i> | 0.027 [0.412] | 0.043 [0.34] | 0.65 *** [6.313] | 0.650 *** [6.313] |
| <i># News t</i> | 0.003 [0.14] | -0.002 [1.28] | 0.01 *** [4.17] | 0.011 *** [4.773] |
| <i># News t-1</i> | -0.008 [0.27] | 0.001 [0.59] | -0.007 ** [2.39] | -0.004 [1.192] |
| <i># News t-2</i> | -0.026 [1.25] | -0.005 [1.52] | 0.003 [0.45] | -0.003 [0.938] |
| Other firm characteristics | | | | |
| <i>Bid Ask Spread t</i> | -0.192 [0.73] | -0.178 [0.82] | 0.052 [0.49] | 0.133 [1.382] |
| <i>13D Filer Holdings</i> | 0.062 [0.85] | 0.064 [0.07] | 0.003 [1.42] | 0.000 [0.236] |
| <i>Institution Holding</i> | -0.032 [1.17] | -0.048 [1.21] | -0.024 [0.45] | -0.070 [1.183] |

| | | | | |
|------------------------------|------------------|--------------------|-----------------|--------------------|
| <i>Analyst Following</i> | -0.003 [1.32] | 0.003 [1.15] | 0.005 [1.58] | 0.001 [0.36] |
| Pseudo [Adj.] R ² | [0.030] | 0.021 | [0.106] | 0.116 |
| Fixed Effects | | FF 12 Industries | | |
| Std. Cluster | None | Campaign, Activist | None | Campaign, Activist |
| No. Total Campaigns | | 1,233 | | 1,922 |
| No. Observations | | 3,553 | | 1,922 |

Columns (1) and (2) above are based on 1,233 campaigns between 1999 and 2010, inclusive. Trading data and the identity of the institutional investors executing each trade are obtained from a consulting firm. The main variable *Past Relationship* is the number of times that a particular institution has participated in a prior campaign led by that particular activist within the last year, an institution is treated as a participant if that institution purchased shares on the trigger date of the previous campaign. The dependent variable *Buying* is an indicator variable which takes the value of 1 if the institution purchased shares in the target firm on the trigger date and 0 otherwise. Columns (3) and (4) are based on 1,922 campaigns as describe in Figure 2. The main variable of interest is *Reputable Activist*, an indicator variable which takes the value of 1 if an activist is 1 of the 20 most prominent activists my sample period (Jan 1998 to Dec 2014). The dependent variable *Wolf Pack* is an indicator variable which takes the value of 1 when *Turnover_Other_{trigger_date}* is in the top quartile and zero otherwise.

Table 5- Effectiveness of Wolf Packs (Campaign Outcome)

| Main Variable | (1) Probit /Outcome [dydx] | (2) O.L.S. / Outcome | (3) Probit / won seats [dydx] | (4) O.L.S. / won seats | (5) O.L.S. /#seat |
|---|-------------------------------|-------------------------|----------------------------------|---------------------------|----------------------|
| <i>Wolf Pack</i> | 0.062 ** [2.144] | 0.073 ** [2.413] | 0.087 *** [3.184] | 0.089 *** [3.276] | 0.216 ** [1.656] |
| Proxy Advisors | | | | | |
| <i>ISS Recommendation</i> | 0.078 [1.856] | 0.071 [1.121] | 0.157 *** [4.04] | 0.176 *** [3.465] | 0.720 *** [3.387] |
| <i>Glass Lewis Recommendation</i> | 0.144 ** [3.138] | 0.152 *** [2.603] | -0.085 * [2.022] | -0.082 ** [1.694] | 0.334 [1.362] |
| Activist Tactics | | | | | |
| <i>Hostile Offer</i> | -0.073 [0.914] | -0.110 [1.105] | -0.136 [1.7] | -0.153 * [1.451] | 0.263 [0.337] |
| <i>Lawsuit</i> | 0.013 [0.266] | 0.000 [0.001] | 0.119 *** [3.081] | 0.161 *** [2.672] | 0.248 [1.042] |
| <i>Classified Board</i> | -0.036 [1.517] | -0.037 [1.542] | -0.025 [1.415] | -0.025 [1.419] | -0.245 ** [1.991] |
| <i>Poison Pill</i> | -0.026 [1.092] | -0.025 [0.980] | 0.041 * [2.239] | 0.038 ** [1.741] | 0.019 [0.155] |
| <i>Unsolicited Offer</i> | -0.163 *** [3.342] | -0.199 *** [2.848] | 0.039 [0.882] | 0.044 [0.694] | -0.195 [0.786] |
| Momentum | | | | | |
| <i>Abn_Ret trigger date</i> | -0.124 [0.541] | -0.143 [0.819] | -0.183 [1.343] | -0.127 [1.494] | -1.512 [1.232] |
| <i>Abn_Ret trigger date -1</i> | 0.147 [0.442] | 0.171 [0.552] | 0.097 [0.416] | 0.050 [0.184] | 2.071 [1.562] |
| <i>Vol trigger date -1</i> | -0.001 [1.324] | -0.001 [1.376] | -0.001 [1.52] | 0.000 [1.421] | 0.008 [1.926] |
| Liquidity | | | | | |
| <i>Institutional Sales trigger date</i> | 6.880 * [1.255] | 1.646 [3.689] | 1.272 * [1.322] | 1.611 [1.686] | 6.856 ** [2.518] |
| <i>Log (MV)</i> | 0.007 [0.598] | 0.005 [0.378] | -0.032 *** [3.935] | -0.028 *** [3.291] | -0.013 [0.188] |
| <i>Amihud_ trigger date</i> | -0.026 ** [1.939] | -0.038 * [2.022] | -0.013 [1.078] | -0.015 [1.352] | 0.034 [0.325] |
| Arrival of News | | | | | |
| <i>10K</i> | 0.186 *** [2.5162] | 0.166 *** [2.916] | 0.044 [0.350] | 0.037 [0.252] | 0.409 * [1.661] |
| <i>8K</i> | -0.216 [1.485] | -0.262 [1.187] | -0.111 [0.858] | -0.104 [1.009] | 1.539 ** [2.336] |
| <i>10Q</i> | -0.022 [0.266] | -0.023 [0.21] | 0.145 ** [2.453] | 0.178 ** [2.117] | -0.215 [0.755] |
| <i>Earnings Announcement</i> | 0.117 [0.616] | 0.122 [0.663] | 0.246 [1.322] | 0.254 [1.234] | 0.342 [1.345] |
| <i>I/B/E/S forecast</i> | -0.014 [0.293] | -0.003 [0.039] | 0.013 [0.236] | 0.008 [0.106] | -0.348 [1.354] |
| <i>Management Guidance</i> | 0.097 [1.812] | 0.097 * [1.498] | -0.084 [0.577] | -0.089 [0.45] | -0.251 [0.813] |

| | | | | | |
|------------------------------------|-------------------|-------------------|----------------------|----------------------|----------------------|
| <i># News trigger date</i> | -0.001 [0.562] | -0.001 [0.355] | -0.002 [0.989] | -0.001 [0.539] | -0.016 ** [2.065] |
| <i># News trigger date-1</i> | 0.004 [0.924] | 0.003 [0.977] | -0.001 [0.253] | -0.001 [0.882] | 0.013 [0.557] |
| <i># News trigger date-2</i> | -0.005 [0.975] | -0.005 [1.07] | 0.001 [0.698] | 0.001 [1.138] | 0.062 [1.554] |
| Other firm characteristics | | | | | |
| <i>Bid Ask Spread trigger date</i> | -0.140 [1.445] | -0.140 [1.143] | -0.026 [0.322] | -0.056 [0.65] | -0.769 [1.199] |
| <i>13D Filer Holdings</i> | 0.001 [0.485] | 0.001 [0.385] | 0.007 *** [5.023] | 0.011 *** [4.208] | 0.020 [1.555] |
| <i>Institution Holding</i> | 0.054 [0.935] | 0.062 [1.165] | 0.033 [0.825] | 0.028 [0.65] | 0.453 [1.468] |
| <i>Analyst Following</i> | 0.004 [1.215] | 0.003 [1.026] | 0.013 *** [6.387] | 0.013 *** [4.769] | 0.003 [0.139] |
| Pseudo [Adj.] R ² | 0.084 | [0.073] | 0.117 | [0.092] | [0.126] |
| Fixed Effect | | | FF 12 Industries | | |
| No. Observations | 1,484 | 1,484 | 716 | 716 | 716 |
| Std. Error Cluster | None | Activist, Firm | None | Activist, Firm | Activist, Firm |

Columns (1) and (2) above include 1,484 campaigns with sufficient information in SharkRepellent database to determine the campaign outcome. Columns (3) and (4) above include 716 campaigns in which the lead activist requested at least one board seats. The estimation period is from Jan 1998 to Dec 2014. All variables are winsorized at the extreme 1% level. In Columns (1) and (2) the dependent variable *outcome* is an indicator variable which equal to 1 if the activist achieved at least part of what they requested and 0 otherwise. In Columns (3) and (4) the dependent variable *won seats* is an indicator variable which equal one if the activist won at least one board seats and 0 otherwise. In Column (5) the dependent variable *#seats* is the raw number of seat won by the lead activist. The main variable of interest in *Wolf Pack* is an indicator variable which takes the value of 1 when *Turnover_Other_{trigger_date}* is in the top quartile and zero otherwise. For a description of the control variables, please refer to Appendix D.

Table 6- Effectiveness of Wolf Packs (Long Run Return)

| Main Variable | (1) O.L.S. /B.H.A.R. | (2) O.L.S. / Excess_Ret | (3) O.L.S. / Raw_Ret |
|---|-------------------------|----------------------------|-------------------------|
| <i>Wolf Pack</i> | 0.083 *** [2.022] | 0.055 ** [1.669] | 0.069 ** [1.829] |
| Proxy Advisors | | | |
| <i>ISS Recommendation</i> | -0.067 [1.391] | -0.035 [0.721] | -0.032 [0.518] |
| <i>Glass Lewis Recommendation</i> | 0.084 [1.624] | 0.074 [1.374] | 0.066 [0.965] |
| Activist Tactics | | | |
| <i>Hostile Offer</i> | 0.085 [0.617] | 0.133 [1.114] | 0.106 [0.849] |
| <i>Lawsuit</i> | -0.001 [0.018] | -0.007 [0.145] | 0.004 [0.072] |
| <i>Classified Board</i> | -0.017 [0.651] | -0.003 [0.106] | 0.016 [0.561] |
| <i>Poison Pill</i> | 0.060 ** [1.885] | 0.036 [1.152] | 0.047 [1.407] |
| <i>Unsolicited Offer</i> | 0.064 [0.811] | 0.056 [0.79] | 0.093 [1.242] |
| Momentum | | | |
| <i>Abn_Ret trigger date</i> | 0.295 [1.041] | 0.351 [1.113] | 0.264 [0.785] |
| <i>Abn_Ret trigger date -1</i> | 0.576 [1.615] | 0.700 * [1.905] | 0.795 ** [1.963] |
| <i>Vol trigger date -1</i> | -0.001 [1.013] | -0.001 [0.784] | -0.001 [0.791] |
| Liquidity | | | |
| <i>Institutional Sales trigger date</i> | -0.034 *** [4.47] | -0.021 ** [2.342] | -0.027 *** [2.802] |
| <i>Log (MV)</i> | -0.003 [0.25] | -0.006 [0.441] | -0.008 [0.534] |
| <i>Amihud_ trigger date</i> | 0.005 [0.225] | -0.019 [1.102] | -0.006 [0.303] |
| Arrival of News | | | |
| <i>10K</i> | 0.163 [0.701] | 0.147 [0.836] | 0.306 [1.08] |
| <i>8K</i> | -0.028 [0.23] | -0.119 [1.207] | -0.073 [0.563] |
| <i>10Q</i> | 0.227 [0.818] | 0.205 [0.858] | 0.211 [0.751] |
| <i>Earnings Announcement</i> | -0.156 [1.475] | -0.145 [1.553] | -0.203 * [-1.932] |
| <i>I/B/E/S forecast</i> | -0.012 [0.167] | 0.035 [0.392] | 0.046 [0.442] |
| <i>Management Guidance</i> | -0.104 [0.523] | -0.141 [0.774] | -0.151 [0.689] |
| <i># News trigger date</i> | -0.004 * [1.685] | -0.002 [0.968] | -0.002 [0.966] |

| | | | |
|------------------------------------|--|----------------------|--------------------|
| <i># News trigger date-1</i> | 0.001 [0.227] | 0.001 [0.208] | -0.001 [0.193] |
| <i># News trigger date-2</i> | 0.020 [1.63] | 0.016 * [1.662] | 0.019 [1.483] |
| Other firm characteristics | | | |
| <i>Bid Ask Spread trigger date</i> | 0.111 [0.929] | -0.007 [0.07] | 0.112 [0.939] |
| <i>13D Filer Holdings</i> | -0.002 [0.799] | -0.003 [1.321] | -0.003 [1.024] |
| <i>Institution Holding</i> | 0.142 *** [2.596] | 0.162 *** [2.948] | 0.160 ** [2.51] |
| <i>Analyst Following</i> | 0.003 [0.682] | -0.001 [0.163] | 0.000 [0.068] |
| Adj. R ² | 0.057 | 0.069 | 0.090 |
| Fixed Effect | | FF 12 Industries | |
| No. Observations | 1,484 | 1,484 | 1,484 |
| Std. Error Cluster | Activist, Firm Activist, Firm Activist, Firm | | |

Columns (1) – (3) include 1,484 campaigns with sufficient information to calculate long run stock returns. All variables are winsorized at the extreme 1% level. In Columns (1) the dependent variable *BHAR* is the four factors (momentum, size, book to market and market factors) abnormal return of the underlying target cumulated from the 13D filing date till the end date of the campaign as reported in SharkRepellent. The four abnormal returns are estimated using the standard two-step method; the estimation window is 255 days, ending 46 days before the return date. In Columns (2) the dependent variable *Excess_Ret* is the raw return of the underlying target minus market return cumulated from the 13D filing date till the end date of the campaign as reported in SharkRepellent. In Column (3) the dependent variable *Raw_Ret* is the raw return of the underlying target cumulated from the 13D filing date till the end date of the campaign as reported in SharkRepellent. The main variable of interest in *Wolf Pack* is an indicator variable which takes the value of 1 when *Turnover_Other_trigger_date* is in the top quartile. For a description of the control variables, please refer to Appendix D.

Table 7 Reverse Causality (Corporate Defenses)

| Main Variable | (1) Probit/ Wolf Pack | (2) O.L.S./ Wolf Pack | (3) Probit/ Wolf Pack | (4) O.L.S./ Wolf Pack | (5) Probit / Wolf Pack | (6) O.L.S./ Wolf Pack |
|--|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|--------------------------|
| <i>Bullet Proof Ratings</i> | 0.015* [1.694] | 0.015* [1.289] | | | | |
| <i>Poison Pill</i> | | | 0.045** [2.261] | 0.069** [2.376] | | |
| <i>Pill in Response to Campaign</i> | | | | | 0.106** [2.172] | 0.102** [1.971] |
| <i>Pill in Force Prior to Campaign</i> | | | | | 0.019 [0.812] | 0.022 [1.375] |
| Momentum | | | | | | |
| <i>Abn_Ret_t</i> | -0.209 [1.122] | -0.318 [1.272] | -0.205 [1.120] | -0.330 [0.871] | -0.227 [1.222] | -0.330 [1.321] |
| <i>Abn_Ret_{t-1}</i> | -0.156 [0.634] | -0.096 [0.306] | -0.136 [0.552] | -0.200 [0.47] | -0.145 [0.581] | -0.085 [0.27] |
| <i>Vol_{t-1}</i> | 0.002*** [3.960] | 0.002*** [3.701] | 0.002*** [3.783] | 0.002*** [2.892] | 0.002*** [3.751] | 0.002*** [3.567] |
| Liquidity | | | | | | |
| <i>Institutional Sales</i> | 0.111*** [3.521] | 0.075** [2.515] | 0.109*** [3.454] | 0.084** [2.201] | 0.113*** [3.592] | 0.074** [2.301] |
| <i>Log (MV)</i> | -0.018** [2.112] | -0.019** [2.099] | -0.018** [2.075] | -0.005 [0.419] | -0.018** [2.093] | -0.018** [2.093] |
| <i>Amihud_t</i> | -0.061*** [3.223] | -0.046*** [4.915] | -0.061*** [3.21] | -0.043*** [2.847] | -0.060*** [3.164] | -0.045*** [4.812] |
| Arrival of News | | | | | | |
| <i>10K</i> | 0.301* [1.879] | 0.346 [1.545] | 0.307* [1.891] | 0.260 [0.881] | 0.311* [1.934] | 0.356 [1.599] |
| <i>8K</i> | -0.178 [1.120] | -0.252 [1.33] | -0.166 [1.022] | -0.237 [1.124] | -0.163 [1.015] | -0.246 [1.306] |
| <i>10Q</i> | 0.177** [2.088] | 0.169 [1.633] | 0.177 [2.073] | 0.160 [1.307] | 0.173** [2.016] | 0.163 [1.599] |
| <i>Earnings Announcement</i> | -0.088 [0.231] | -0.088 [0.357] | -0.082 [0.245] | -0.079 [0.313] | -0.102 [0.3423] | -0.118 [0.452] |
| <i>I/B/E/S forecast</i> | 0.013 [0.222] | 0.060 [0.589] | 0.010 [0.164] | 0.116 [0.926] | 0.017 [0.273] | 0.065 [0.632] |
| <i>Management Guidance</i> | 0.544*** [3.712] | 0.561*** [3.932] | 0.601 [3.8714] | 0.605*** [4.005] | 0.532*** [3.881] | 0.562*** [3.997] |
| <i># News_t</i> | 0.015*** [7.031] | 0.014*** [4.397] | 0.014*** [6.968] | 0.015*** [5.505] | 0.014*** [6.822] | 0.014*** [4.252] |
| <i># News_{t-1}</i> | -0.003 [0.923] | -0.004 [0.6] | -0.003 [0.899] | -0.010* [1.891] | -0.002 [0.862] | -0.004 [0.598] |
| <i># News_{t-2}</i> | 0.001 [0.063] | 0.001 [0.089] | 0.002 [0.083] | -0.002 [0.332] | 0.001 [0.031] | 0.001 [0.083] |
| Other firm characteristics | | | | | | |
| <i>Bid Ask Spread_t</i> | 0.131 [1.453] | 0.166* [1.683] | 0.136 [1.511] | 0.201 [0.95] | 0.132 [1.461] | 0.167* [1.714] |
| <i>13D Filer Holdings</i> | -0.001 [0.844] | -0.001 [0.648] | -0.001 [0.851] | 0.000 [0.032] | -0.002 [1.152] | -0.001 [1.101] |

| | | | | | | |
|--|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|
| <i>Institution Holding</i> | -0.056 [1.414] | -0.049 [1.195] | -0.052 [1.32] | -0.082* [1.755] | -0.050 [1.272] | -0.044 [1.105] |
| <i>Analyst Following</i> | -0.004 [1.113] | -0.003 [1.121] | -0.004 [1.182] | -0.007* [1.892] | -0.004 [1.222] | -0.003 [1.237] |
| Adj. R ² [Pseudo R ²] | [0.105] | 0.109 | [0.123] | 0.115 | [0.125] | 0.112 |
| Fixed Effects | | | FF 12 Industries | | | |
| No. Observations | 863 | 863 | 1,484 | 1,484 | 1,484 | 1,484 |
| Std. Error Cluster | None | Activist, Firm | None | Activist, Firm | None | Activist, Firm |

Columns (1) and (2) include 863 campaigns with bullet proof index provided by FactSet. All variables are winsorized at the extreme 1% level. Columns (3) – (6) include the same sample of campaigns as in table 5 above. The dependent variable *Wolf Pack* is an indicator variable which takes the value of 1 when *Turnover_Other_{trigger_date}* is in the top quartile. In Columns (1) and (2) the main variable of interest is *Bullet Proof Rating*, a proprietary rating by FactSet that measures how well a company is defended, a high bullet proof index suggests that the company is well defended. In Columns (3) and (4) the main variable of interest is *Poison Pill*, an indicator variable which takes the value of 1 if either the target adopted a poison pill in respond to the campaign or a poison pill was already in place. In Columns (5) and (6) the main variables of interest are *Pill in Response to Campaign*, an indicator variable which takes the value of 1 if the target adopted a poison pill in respond to the campaign and *Pill in Force Prior to Campaign* an indicator variable which takes the value of 1 if a poison pill was already in place prior to the campaign. For a description of the control variables, please refer to Appendix D.

Table 8 Reverse Causality (Filing Date Return)

| Main Variable | (1) Probit/ Wolf Pack | (2) O.L.S./ Wolf Pack | (3) Probit/ Wolf Pack | (4) O.L.S./ Wolf Pack | (5) Probit/ Wolf Pack | (6) Probit/ Wolf Pack |
|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <i>BHAR (3 days)</i> | 0.089 [0.6] | 0.075 [0.348] | | | | |
| <i>BHAR (5 days)</i> | | | -0.025 [0.875] | -0.049 [0.233] | | |
| <i>Raw Ret (3 days)</i> | | | | | 0.109 [0.518] | |
| <i>Raw Ret (5 days)</i> | | | | | | 0.040 [0.796] |
| Momentum | | | | | | |
| <i>Abn_Ret_t</i> | -0.024 [0.11] | -0.109 [0.352] | -0.037 [0.17] | -0.123 [0.4] | -0.063 [0.29] | -0.070 [0.32] |
| <i>Abn_Ret_{t-1}</i> | -0.573 [1.64] | -0.451 [1.147] | -0.577 [1.65] | -0.439 [1.116] | -0.514 [1.46] | -0.517 [1.47] |
| <i>Vol_{t-1}</i> | 0.003 *** [3.64] | 0.002 *** [4.055] | 0.003 *** [3.7] | 0.002 *** [4.14] | 0.003 *** [3.63] | 0.003 *** [3.67] |
| Liquidity | | | | | | |
| <i>Institutional Sales</i> | 0.126 *** [3.78] | 0.368 ** [2.275] | 0.126 *** [3.78] | 0.376 ** [2.351] | 0.123 *** [3.71] | 0.123 *** [3.7] |
| <i>Log (MV)</i> | -0.015 [1.22] | -0.018 [1.363] | -0.016 [1.25] | -0.018 [1.414] | -0.017 [1.33] | -0.017 [1.34] |
| <i>Amihud_t</i> | -0.043 ** [2.16] | -0.036 *** [3.025] | -0.042 ** [2.14] | -0.036 *** [2.979] | -0.044 ** [2.21] | -0.044 ** [2.2] |
| Arrival of News | | | | | | |
| <i>10K</i> | 0.101 [0.49] | 0.063 [0.202] | 0.100 [0.48] | 0.061 [0.198] | 0.100 [0.48] | 0.100 [0.48] |
| <i>8K</i> | -0.281 [1.49] | -0.343 * [1.71] | -0.283 [1.5] | -0.342 * [1.71] | -0.296 [1.58] | -0.295 [1.57] |
| <i>10Q</i> | 0.229 *** [2.64] | 0.227 ** [2.166] | 0.230 *** [2.65] | 0.228 ** [2.168] | 0.228 *** [2.62] | 0.228 *** [2.62] |
| <i>Earnings Announcement</i> | -0.173 [0.74] | -0.174 [0.62] | -0.144 [0.48] | -0.154 [0.68] | -0.208 [0.345] | -0.189 [0.332] |
| <i>I/B/E/S forecast</i> | 0.016 [0.22] | 0.084 [0.743] | 0.016 [0.22] | 0.083 [0.735] | 0.040 [0.53] | 0.038 [0.5] |
| <i>Management Guidance</i> | 0.521 *** [3.454] | 0.543 *** [3.622] | 0.520 *** [3.453] | 0.542 *** [3.607] | 0.519 *** [3.449] | 0.518 *** [3.465] |
| <i># News_t</i> | 0.014 *** [6.46] | 0.013 *** [3.689] | 0.014 *** [6.45] | 0.013 *** [3.656] | 0.014 *** [6.34] | 0.014 *** [6.33] |
| <i># News_{t-1}</i> | -0.003 [0.94] | -0.004 [0.573] | -0.003 [0.9] | -0.004 [0.565] | -0.003 [0.9] | -0.003 [0.87] |
| <i># News_{t-2}</i> | 0.001 [0.11] | 0.000 [0.011] | 0.001 [0.14] | 0.000 [0.073] | 0.000 [0.06] | 0.001 [0.09] |
| Other firm characteristics | | | | | | |
| <i>Bid Ask Spread_t</i> | 0.134 [1.22] | 0.189 [1.561] | 0.138 [1.26] | 0.193 [1.603] | 0.134 [1.22] | 0.137 [1.25] |

| | | | | | | |
|--------------------------|--------|----------------|------------------|----------------|--------|--------|
| <i>13D Filer</i> | -0.002 | -0.001 | -0.002 | -0.001 | -0.002 | -0.002 |
| <i>Holdings</i> | [1.01] | [0.757] | [0.97] | [0.674] | [0.85] | [0.83] |
| <i>Institution</i> | -0.046 | -0.029 | -0.045 | -0.029 | -0.046 | -0.045 |
| <i>Holding</i> | [0.75] | [0.402] | [0.73] | [0.393] | [0.74] | [0.73] |
| <i>Analyst Following</i> | -0.003 | -0.003 | -0.003 | -0.002 | -0.003 | -0.003 |
| | [0.8] | [0.721] | [0.73] | [0.65] | [0.8] | [0.75] |
| Adj. R ² | 0.121 | 0.092 | 0.123 | 0.094 | 0.122 | 0.122 |
| Fixed Effects | | | FF 12 Industries | | | |
| No. Observations | 1,484 | 1,484 | 1,484 | 1,484 | 1,484 | 1,484 |
| Std. Error Cluster | None | Activist, Firm | None | Activist, Firm | None | None |

Columns (1) – (6) include the same sample of campaigns as in table 5 above. The dependent variable *Wolf Pack* is an indicator variable which takes the value of 1 when *Turnover_Other_{trigger_date}* is in the top quartile. In Columns (1) and (2) the main variable of interest *BHAR (3 days)* is the four factors cumulative abnormal return 1 day around the filing date of the schedule 13D (filing day-1 to filing day+1). In Columns (3) and (4) the main variable of interest *BHAR (5 days)* is the four factors abnormal return 2 days around the filing date of the schedule 13D (filing day-2 to filing day+2). In Column (5) the main variable of interest *raw return (3 days)* is the cumulative raw returns 1 day around the filing date of the schedule 13D (filing day-1 to filing day+1). In Column (6) the main variable of interest *raw return (5 days)* is the cumulative raw returns 2 days around the filing date of the schedule 13D (filing day-2 to filing day+2). For a description of the control variables, please refer to Appendix D.