Activist Directors and Information Leakage

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ABSTRACT

Using the first systematic dataset on settlements between activist investors and target firms resulting in the appointment of activist representatives to the target's board, we show that activist access to the boardroom is followed by a short-term increase in information leakage into stock prices. Our evidence is consistent with the possibility that activists' presence in the corporate boardroom is associated with increased trading on nonpublic information. The data are consistent with the predictions of the dynamic model of criminal behavior in McCrary (2010).

We explore heterogeneity in the data and find that leakage occurs only when hedge funds, rather than other types of investors, lead the activist campaign. We also show that our leakage results are driven by activist appointees who are employees of hedge funds—finance professionals—rather than industry experts.

Finally, we show that settlements leading to the appointment of activist directors are associated with wider bid-ask spreads in company stock prices. These wider spreads reflect a cost of activist settlements that has not previously been considered in the literature.

1. INTRODUCTION

Activist investors—and the implications of their work for public-company shareholders—are the subject of significant debate among lawmakers, practitioners, and scholars. Some contend that activist interventions on average enhance shareholder value, reducing agency costs and managerial slack (e.g., Brav et al., 2008, 2010, 2015; Bebchuk et al., 2015). Others dispute the empirical premise that activists' work is meaningfully associated with value increases (Cremers et al., 2015) or worry that activists, alone or in conjunction with other shareholders, can induce corporate management to sacrifice long-term value creation to satisfy short-term investor demands (Lipton et al., 2013; Coffee & Palia, 2015). Policymakers, meanwhile, are now considering significant changes to the law governing activists' activities, including the rules that require shareholders to disclose significant stakes in public companies (Wachtell, Lipton, Rosen & Katz, 2011; Bebchuk & Jackson, 2012). Importantly, the "vast majority of activist situations [today] result in a negotiated settlement between the activist and the target company," usually involving an agreement to appoint activist representatives to the target's board (Liekefett & Elbaum, 2016; State Street, 2016). Yet little is known about the effects of these agreements on public companies and their investors.

Using a novel database of more than 500 such agreements between activists and target companies over a fifteen-year period, in this Article we provide the first systematic study of activist settlements and the directors appointed pursuant to those agreements. Our study offers four principal findings regarding the effects these directors have on public-company investors. First, we show that the appointment of these directors causes material information regarding the firm and its operations to become more "leaky": that is, more of that information makes its way into the company's stock price prior to the disclosure of that information than in two groups of

control firms we study. Second, the increased leakiness is associated with the appointment of directors who are also employees of the activist investor—that is, finance professionals—as opposed to the industry experts sometimes appointed to the target's board pursuant to an activist settlement. Third, the pattern of this leakage follows dynamic behavioral models of criminal wrongdoing (McCrary & Lee, 2009; McCrary, 2010): the magnitude of our leakage finding decreases over time, as the probability of detecting trading on leaked information increases. Finally, we show that bid-ask spreads grow significantly as a result of the appointment of activist directors, providing evidence of a cost of these settlements that should be weighed against the benefits of activist interventions.[1]

Our study offers several novel contributions to the literature on hedge fund activism. First, although activist hedge funds and their implications for corporate governance have been the subject of important previous work (Kahan & Rock, 2007), their use of settlement agreements to appoint directors to corporate boards has not. We link previous work on activists to study of corporate settlements in another context: settlements between directors and shareholder plaintiffs' attorneys (Romano, 1991). We provide the first descriptive detail on the nature of these agreements and the directors appointed to the board in connection with these settlements.

Second, we introduce a model describing the incentives of those directors regarding their access to material nonpublic information. We begin with prior work modeling the relative benefits of activism and other forms of shareholder influence (Bukart & Lee, 2015) and show how activist directors' access to material nonpublic information might influence both the incidence and quality of shareholder activism. Then, drawing from McCrary's (2010) work on the relationship between wrongdoing and the dynamic probability of detection, we estimate the

[1] For a review of the literature describing previous empirical work documenting these benefits, see Bebchuk & Jackson (2012).

circumstances under which activist directors can have private incentives to facilitate profitable trading on that information. Finally, we link our model to recent work on the social costs of informed trading (Glosten & Putnins, 2015) to consider the welfare implications of such trading.

Third, we provide evidence consistent with the predictions of our model. In particular, we provide causal evidence of an economically and statistically significant relationship between the appointment of a director pursuant to an activist settlement and increased leakage prior to disclosure of material corporate events. Our evidence also demonstrates the heterogeneity of this result, which is associated with the appointment of a director who is also an employee of the hedge fund. We also show that the relationship between the presence of an activist director and information leakage diminishes over time in the fashion predicted by our application of McCrary's (2010) behavioral model of wrongdoing. Finally, we provide causal evidence of the relationship between the presence of an activist director and the expansion of bid-ask spreads predicted in Glosten & Putnins (2015).

To be sure, we are not the first to examine the implications of activist shareholders' access to material nonpublic information. Collin-Dufresne & Fos (2013) use an extensive dataset of trades in the target company's stock before the activist's presence is disclosed to consider whether standard measures of adverse selection reflect such trading.[2] In that setting, however, the activist's *presence itself* was the relevant material nonpublic information. Here, we examine the effects of activist directors on how fundamental information about a material corporate event

[2] Federal law requires activists to disclose their stakes to the public within ten days of acquiring greater than 5% ownership of the target company's stock. As one of us has shown in previous work, activists often use a substantial amount of this ten-day window before disclosing their stake (Bebchuk et al., 2013).

makes its way into stock prices after the activist's intervention, and presence on the board, is publicly known.[3]

Because the Article may raise concerns about trading on the basis of material nonpublic information, we wish to add two cautionary notes regarding the interpretation of our findings. First, we emphasize that we present no direct evidence of any such trading; instead, our we show only that the presence of directors appointed pursuant to an activist settlement causes the leakage of information from the corporate boardroom, and into the company's stock price, to rise. That is: although we provide evidence of increased leakage in these cases, we do not identify the trading mechanism through which this leakage occurs.[4] Second, even if there were direct evidence of that mechanism, this would in no way establish the existence of illegal conduct, as the law of insider trading requires a series of showings—including those regarding the trader's state of mind—that are well beyond the scope of our evidence. Nevertheless, we think our theory and evidence reflect meaningful contributions to the debate on the implications of shareholder activism. In particular, we show that such activism may come with a previously unappreciated cost for investors: significantly more leakage of material information about the firm and its future outside the corporate boardroom, and the consequent expansion of bid-ask spreads.

The remainder of the Article proceeds as follows. Part 2 provides background on previous study of hedge fund activism, describes settlements between such activists and corporate boards, and describes our theoretical framework for examining the implications of

[3] We note that, in the setting in Collin-Dufresne & Fos (2013), the activist *creates* the information—that is, the activist's own intervention. By contrast, in our setting, the material corporate event occurs exogenously, giving the activist and associated traders less opportunity to select the circumstances under which they trade.

[4] Identifying that mechanism, it should be said, will be difficult because of the limited disclosure relating to trading by investors holding less than 5% of public-company stocks. In particular, because federal law requires only quarterly disclosure of investors' holdings on a particular day, and because rules governing disclosure of insider trading applies only to directors, officers, and 10% or greater holders of public-company stocks, observing trading of the kind that would generate the leakage we identify may be exceptionally difficult.

such settlements for public-company investors. Part 3 describes our data on activist settlements and the directors appointed pursuant to those agreements. Part 4 describes our research design and findings. Part 5 briefly concludes.

2. INSTITUTIONAL BACKGROUND AND THEORY

A. Hedge Fund Activism and Settlements

The effects of activist hedge funds on corporate governance have been the subject of a series of seminal articles. Early work (Kahan and Rock (2007)) established that hedge funds' incentives and business models produce interventions different from those associated with other types of shareholders. In particular, hedge-fund activists are known for acquiring significant stakes in target companies and agitating for—and often achieving—significant changes in corporate strategy or management.[5] These characteristics, early theoretical work argued, could produce beneficial changes in corporate governance—reductions in managerial slack and enhanced performance—that would be difficult for more passive investors to achieve.[6]

Later empirical work provided support for the notion that hedge-fund activism is often associated with improved performance. Brav et al. (2008) famously documented that the announcement of an activist's position and plans are associated with meaningful positive abnormal returns, and Brav et al. (2015) provide evidence, on the basis of a broader sample of activist interventions, of enhanced productivity at firms that are the targets of activism. Bebchuk

[5] Gordon and Gilson (2013) later pointed out that activist campaigns offer the added benefit of promoting interventions by other types of investors that are traditionally more passive.

[6] Importantly, however, Kahan and Rock (2007) cautioned about a "potential conflict between hedge funds and other investors: hedge funds and managers making a side deal . . . in which the firm pays the hedge fund to go away. The absence of [any evidence of such payments] is interesting in its own right." Our theory and evidence suggest that the conflict identified in Kahan and Rock (2007) might manifest itself in the form of activist directors' access to material nonpublic information about the firm.

et al. (2015) examine the performance of approximately 2,000 activist targets over the five years following the intervention and find no evidence that increases in stock prices or improvements in target performance following the announcement of an activist's involvement are short-lived.[7]

Activists have long employed a wide range of tactics[8] to induce management to follow the activist's preferred strategy—from public approbation of management's performance to a proxy contest seeking to unseat incumbent board members. More recently, however, these interventions have commonly concluded by way of a settlement agreement between the activist and the company. Under these agreements, incumbent directors often agree to appoint to the board a new director or directors of the activist's choice. In 2016, for example, one significant institutional investor issued a report on these settlements documenting this trend:

> [W]e are concerned with the recent rise of settlement agreements entered into rapidly between boards and activist investors. Over the past three years, companies have conceded a steadily increasing number of board seats to activists through settlement agreements. . . . When reviewed in the context of total new director appointments companies with similar market capitalizations, board seats conceded to activists account for approximately 13% of the 816 new board appointments so far in 2016. . . .
>
> . . . . [W]hile we recognize that negotiated settlements between companies and activists might benefit boards and management by reducing time, expense, and reputation risk, we are concerned that in some cases these settlements are being reached too quickly and without any input from shareholders. (State Street, 2016.)

As suggested by this report, for those who are convinced that activist interventions are generally value-enhancing, the benefits of these settlements are obvious. By agreeing to give the

[7] Cremers et al. (2015) contend that the findings in Bebchuk et al. (2015) are largely the product of selection bias, and argue (consistent with Lipton (2013) and Strine (2010)) that activist interventions, and the short-term pressures that accompany them, can lead managers to sacrifice long-term performance.

[8] As documented in Brav et al. (2008), among the sample of hedge fund activist interventions studied there, in 48.3% of cases the activist announced an intention to communicate with the board regarding ways to enhance shareholder value, in 32.0% the activist offered formal shareholder proposals for change at the firm, in 11.6% the activist sought board representation without a formal proxy contest, in 7.6% the activist threatened to wage a proxy fight or sue the company, in 7.6% the activist launched a proxy fight to replace the board, in 5.4% the activist sued the company or its directors, and in 4.2% of cases the activist actually sought to take control of the company, for example by way of a takeover bid.

activist voice—but not control—in the corporate boardroom, incumbents can avoid the expense and distraction of a contested election, while activists can influence the company's strategy and, by enhancing the firm's value, generate profit on their investments. Those less sanguine about activists, however, worry that such settlements give these investors influence disproportionate to their economic stake in the company and reduce or eliminate activists' incentives to publicly air their concerns about the company for consideration by other shareholders—who, it should be said, usually lack access to the boardroom (State Street, 2016).

Although activist settlements have received scant academic attention, these concerns echo the literature on the settlement of shareholder lawsuits. As Coffee (1985) pointed out, when plaintiffs' attorneys bring suit against corporate defendants, the attorneys' and the board's incentives diverge from those of shareholders, producing settlements contrary to shareholder interests.[9] Activist settlements, too, raise the possibility that activists and target firms will reach an agreement that is privately beneficial for the investor and the incumbent board but costly for shareholders. In this Article, we introduce one such cost: the possibility that the activist, by placing a representative on the company's board, will gain access to material nonpublic information about the firm, leading to increased trading on such information. In the section that follows, we explain why this might occur, what the indicia of such trading might be, and why that trading, though privately beneficial for the activist, can be expected to impose costs on the company's shareholders that will not be fully internalized by the activist.

[9] Indeed, scholars and the Delaware courts have recently grown so skeptical of settlement incentives that certain types of settlements are now regularly rejected by Delaware judges as conveying a sufficient benefit to shareholders to justify an award of attorneys' fees (e.g., Fisch et al. (2015)). For reasons to be skeptical of a categorical rule against approving such settlements, see Dari-Mattiacci & Talley (2016).

B. Theoretical Framework

In this section, we explain why, strictly as a theoretical matter, activist investors and target boards might pursue settlement agreements that facilitate access to, and trading upon, material nonpublic information. We show that expected profits from insider trading induce lower-quality activists to engage in intervention campaigns than otherwise would, and that the social costs of such informed trading implies a divergence between the private and socially optimal level of activist quality.[10]

We begin with the framework in Bukart and Lee (2015), which considers the payoffs to activism.[11] In their model, the activist's campaign succeeds with probability $q(e_a) \propto s_a \theta_a e_a$, where $s_a \in (0,1]$ is the proportion of shares the activist holds at the conclusion of the campaign, $\theta_a \geq 0$ denotes the activist's ability, $e_a \geq 0$ denotes her effort.[12] Firm value after a successful activist campaign is given by $V(e_a) = q(e_a)p_m$, i.e., increasing in the probability of success. The activist incurs an effort cost given by:

$$K(e_a) = \frac{k}{2} e_a^2 + \underline{k}$$

Although for concision we omit the technical assumptions set out in Bukart and Lee (2015), we briefly restate the sequence of the game they consider. The activist begins with a "toehold" investment in the company, $t_a \in (0,1]$ fraction of shares. At $t = -3$, the activist purchases r_a shares at the open-market price p_a. At $t = -2$, the activist chooses whether to engage in an intervention, and if so, what effort level e_a to expend. At $t = -1$, upon the

[10] Although this section includes only a summary of our model, its technical derivations are presented in detail in the Appendix.

[11] Following Bukart and Lee (2015), we adopt the simplifying assumption that the activist seeks to intervene in order to sell the firm to a third-party bidder.

[12] Unlike Bukart and Lee (2015), we do not explicitly parameterize voting rights and implicitly embrace a rule of one-share-one-vote.

successful sale of the firm, the activist receives $s_a V(e_a)$, i.e., her share of the value of the firm, which is a function of the effort exerted at $t = -2$.

Like Bukart and Lee (2015), we require that $p_a \geq V(e_a)$, *i.e.*, the activist is unable to acquire shares on the open market at a price lower than the ex-post expected value, which is essentially the free-rider problem identified in Grossman and Hart (1980).[13] We also impose the incentive constraint that $s_a V'(e_a) = K'(e_a)$, *i.e.*, the activist will optimally expend effort until marginal cost is equal to marginal gains.

Next, we augment Bukart and Lee (2015) by assuming that the activist also receives a payoff equal to the expected value of engaging in illegal insider trading on the basis of information obtained through access to the corporate boardroom after a settlement agreement. We adopt the notation used in McCrary (2010), which implies that the activist's problem is given by:

$$\max s_a V(e_a) - K(e_a) - r_a p_a + E_t[V(B_{t+1})]$$

subject to:

$$p_a \geq V(e_a)$$

$$s_a V'(e_a) = K'(e_a)$$

$$s_a = t_a + r_a$$

The term $E_t[V(B_{t+1})]$ refers to the expected value of the future benefit of insider trading from boardroom access in the dynamic recursive model of McCrary (2010).[14] For present purposes, we consider the simple case where the expected utility from engaging in insider

[13] One motivation for this constraint is that, as noted above, federal law mandates disclosure when blockholders, including activist shareholders, exceed 5% ownership.

[14] We further unpack the term $E_t[V(B_{t+1})]$, or the expected value of future gains from insider trading as estimated by application of McCrary (2010), in the Appendix.

trading is independent of the number of shares acquired. In that case, the solution to the optimization problem is unaffected and the result in Bukart and Lee (2015) applies: $r_a^* = \frac{t_a}{2}$. And, as in their model, there exists a unique $\underline{\theta_a}$ such that the activist will engage in the intervention if and only if her $\theta_a \geq \underline{\theta_a}$. But we expect $\underline{\theta_a}$ to decrease with $E_t[V(B_{t+1})]$: that is, that as insider-trading profits rise, the activist ability necessary to justify an intervention falls.[15]

Now let's consider more carefully the term $E_t[V(B_{t+1})]$, or the expected value of future gains from insider trading, following McCrary (2010). In that model, the activist is presented each period with a (random) benefit of insider trading, denoted by B_{t+1}, which has c.d.f. $F(\cdot)$. Apprehension occurs with probability π_{t+1}. For now, we adopt the simplifying assumption that the penalty for insider trading is a single-period punishment c, which is deterministic and constant over time. In each period, the activist is presented with the opportunity B_{t+1}. If she chooses to commit the crime and is not apprehended, she receives the expected payoff $\delta\ _t[V(B_{t+2})] + B_{t+1}$, where δ is the discount factor. If apprehended, she receives the expected payoff $\delta\ _t[V(B_{t+2})] - c$. If she does not engage in crime, she receives the flow utility $\delta\ _t[V(B_{t+2})]$. The director's problem is to maximize the recursive value function:

$$V(B_{t+1}) = \max\{\delta\ _t[V(B_{t+2})], \pi_t(\delta\ _t[V(B_{t+2})] - c) + (1 - \pi_t)(\delta\ _t[V(B_{t+2})] + B_{t+1})\}.$$

The solution is obtained via a "reservation benefit" b_{t+1}^* such that for any $B_{t+1} > b_{t+1}^*$, the director facilitates insider trading, and otherwise does not.[16] Straightforward substitution yields

[15] The optimal effort is easily calculated (see Bukart and Lee, 2015)) as $e_a^* = \frac{\theta_a}{k}\frac{9}{4}\ t_a^2 p_m$, implying that the activist's expected profit is given by: $t_a V\left(\frac{\theta_a}{k}\frac{9}{4}\ t_a^2 p_m\right) - K\left(\frac{\theta_a}{k}\frac{9}{4}\ t_a^2 p_m\right) + E_t[V(B_{t+1})] = \theta_a^2 \frac{2}{3\ k} t_a^4 p_m^2 - \underline{k} + E_t[V(B_{t+1})]$. For this expression to be positive, a larger $E_t[V(B_{t+1})]$ admits a smaller value of θ_a.

[16] See McCrary (2010) for a straightforward derivation of this recursive expected value. We normalize the flow utility to zero, assuming that the activist's profit is given entirely by the benefit B_{t+1}.

$$E_t[V(B_{t+1})] = \delta E_t[V(B_{t+2})] + \big(1 - F(b^*_{t+1})\big)(1 - \pi_{t+1})E_t[B_{t+1} - b^*_{t+1} | B_{t+1} - b^*_{t+1} > 0],$$

and the reservation benefit is given by $b^*_{t+1} = \frac{\pi_{t+1}}{1-\pi_{t+1}} c$, which is very similar to the result found in the static Becker (1974) model.

In the Appendix, we derive an optimal "stopping time" beyond which the director will no longer facilitate trading on material nonpublic information. For reasons explained there, it will be optimal for the director to facilitate such trading only for a short period of time. Moreover, $E_t[V(B_{t+1})]$ at $t = 0$ will be positive only if the stopping time is chosen correctly. Assuming that the director can facilitate profitable insider trading, then, yields a smaller value of θ_a in the Bukart and Lee (2015) model—that is, permits lower-quality activists to intervene in public-company governance than otherwise would.

It might be tempting to conclude that such conduct, whether or not legally sanctioned, is likely to be social-welfare enhancing. Indeed, in the Bukurt and Lee (2015) model, social welfare would seems strictly enhanced by greater activist participation regardless of activist ability, because firm value, $V(e_a) = s_a \theta_a e_a p_m$, is strictly increasing in θ_a. On this view, the director's access to insider trading opportunities essentially serve as a subsidy for more value-enhancing activism (or, if one prefers, compensation for the activist's socially valuable work). But it does not necessarily follow that the private optimum is identical to the social optimum because of an externality of the insider trading: wider bid-ask spreads.

Glosten & Putnins (2015) argue that informed trading generates welfare losses by leading to wider bid/ask spreads. One way to formalize this idea is to suppose that the social cost of informed trading can be represented as a function of τ, the number of periods that the activist director facilitates insider trading. In Glosten & Putnins (2015), wider bid/ask spreads impose a social cost by preventing some mutually beneficial transactions from taking place—a cost

society incurs in each period in which the insider trades. To see the divergence between the private and social optimum, recall that the expected value of an activist intervention, which we denote as $E[\Pi(\theta_a, \tau)]$, is given as follows, substituting the recursive payoff from insider trading as of time $t = 0$:

$$E[\Pi(\theta_a, \tau)] = \theta_a^2 \frac{27}{32k} t_a^4 p_m^2 - \underline{k} + \sum_{t=0}^{\tau-1} \delta E_t[V(B_{t+2})] + \frac{\frac{1}{2} - ce^{\sqrt{t+1}}}{1 + e^{\sqrt{t+1}}}$$

$$E[\Pi(\theta_a, \tau)] = \theta_a^2 \frac{27}{32k} t_a^4 p_m^2 - \underline{k} + \sum_{t=0}^{\tau-1} \delta^t \left(\frac{\frac{1}{2} - ce^{\sqrt{t+1}}}{1 + e^{\sqrt{t+1}}} \right)$$

As noted previously, there generally exists a τ^* that maximizes the last term at a positive value (unless the punishment c for insider trading is so great that an activist will not engage in it at all). And as a result, the minimum quality level $\underline{\theta_a}$ such that for any $\theta_a > \underline{\theta_a}$, $E[\Pi(\theta_a, \tau)] \geq 0$, is lower than in the absence of insider trading opportunities.

Letting λ denote the average, per-activist social cost imposed by insider trading through the stopping time τ, the social planner's objective function is given by:

$$E[\Pi_S \quad (\theta_a, \tau)] = \theta_a^2 \frac{27}{32k} t_a^4 p_m^2 - \underline{k} + \sum_{t=0}^{\tau-1} \left[\delta^t \left(\frac{\frac{1}{2} - ce^{\sqrt{t+1}}}{1 + e^{\sqrt{t+1}}} \right) \right] - \lambda$$

And by applying the same approximation as in the prior Subsection, the first-order condition with respect to τ is given by:

$$\frac{1}{2} - ce^{\sqrt{\tau_S^*}} - \lambda = 0$$

$$\tau_S^* = \ln \left[\frac{1}{2c} - \lambda \right]^2$$

It is straightforward to see that τ^*_{S} $< \tau^*$ for all $c > 0$. As the expected value of insider trading increases with τ, there exists a range of values of θ_a for which it is privately but not socially optimal to engage in activism, i.e., $E[\Pi(\theta_a, \tau)] > 0$ but $E[\Pi_S$ $(\theta_a, \tau)] < 0$. In Figure 1, we plot $E[\Pi(\theta_a, \tau)]$ and $E[\Pi_S$ $(\theta_a, \tau)]$ as a function of θ_a at the optimal stopping times τ^* and τ^*_{S}, respectively, and show the divergence between the socially and privately optimal levels of activist quality:[17]

[Insert Figure 1 Here.]

In sum, we theorize that the payoffs to shareholder activism can include profits related to directors' facilitation of trading on material nonpublic information, and that directors can recursively determine the optimal amount of such activity in light of the probability of detection. Those profits, in turn, decrease the level of activist quality necessary to justify the marginally viable activist intervention. And, while such profits might reflect compensation for socially productive activism in the style of Manne (1965), since the trading that produces those profits can result in widened bid-ask spreads, and since the costs related to widening spreads are not internalized by the activist,[18] there is the potential for a divergence in the socially and privately optimal level of activist quality. In the sections that follow, we test several predictions from this model using empirical evidence on activist settlements.

[17] In Figure 1, for simplicity parameter values are set at $c = 0.1$, $t_a = 0.1$, $p_m = 1$, $\underline{k} = 3$, $k = 1$, and $\lambda = 4$. The example in the Figure is solely for illustrative purposes; the actual divergence, if any, between the social and private optimum depends on the range of these parameters.

[18] Of course, to the extent that the activist seeks to liquidate their position, the bid-ask spread might be relevant to the activist's private costs. (Though we note in this respect that, unlike many shareholders, activists often prefer control to liquidity (compare Coffee (1991) with Kahan & Rock (2007)). More importantly for present purposes, however, even these privately internalized costs to the activist are unlikely to be equal to the costs to the investing public imposed by widened bid-ask spreads. Our claim is not that the activist internalizes *zero* costs of the trading activity—only that the activist does not internalize *all* the costs of that activity.

3. DATA

A. Activist Settlements and Director Appointments

We begin by constructing a hand-drawn dataset on activist settlements. First, we pull all activist events between January 1, 2000 through December 31, 2015 from SharkRepellent. Next, based on SharkRepellent's data, we divide the engagements into those that resulted in the activist receiving board representation and those that did not. [19] We then examine the securities filings of firms in the former group to identify the nature of the settlement agreement, if any, that led to the appointment of the activist's representative to the board. [20] Figure 2 provides a representative agreement drawn from our dataset.

[Insert Figure 2 Here.]

We then code the set of activist settlements along several dimensions.[21] First, we identify the date on which the activist's representative gains access to the boardroom.[22] We then identify

[19] We focus on activist directors appointed through the settlement process because the contracting and compensation dynamic we refer to in Part 2 above is more reflective of settlement agreements than the uncertain products of the proxy-fight process—a process that introduces additional costs and benefits that complicate our analysis. We intend to study activist directors elected through the proxy machinery in future work.

[20] We note that our dataset includes cases both where a formal settlement agreement is disclosed and where the target company simply notes in a later securities filing that the board and the activist have reached an agreement to appoint the activist's representative to the board. Both situations reflect an agreement to give the activist representation on the board, and in both cases the activist's representative can be expected to have access to material nonpublic information.

[21] We exclude from the dataset any events where the target company lacks data in the Center for Research on Securities Prices (CSRP) database, where an activist has previously gained representation on the target company's board, or where an incumbent director participates in the activist campaign itself.

[22] Ordinarily this is simply the exact date on which the new director joins the board—either by way of board appointment or election from the management slate at the annual meeting. We note, however, that in approximately 8% of the settlements in our dataset the activist instead settles for board "observer" rights, in which the new director gains access to the boardroom before her formal appointment to the board. In these cases, we record the date on which the observer rights become effective. For an example, see Axcels Technologies, Inc., Settlement Agreement By and Among Axcelis Technologies and Vertex Capital, available at https://www.sec.gov/Archives/edgar/data/1113232/000110465915017346/a15-1574_3ex99d2.htm (permitting "each of the [activist's chosen directors to be] appointed as an observer to the Board until the 2015 Annual Meeting . . . [and will] receive copies of all notices and written information furnished to the full Board, reasonably in advance of each meeting to the extent practicable, and [will be] permitted to be present at all meetings of the full Board").

the name of each new director and whether the director is an employee of the activist or is an industry expert.[23] We also draw from SharkRepellent information on whether the activist is a hedge fund, individual, investment advisor, corporation, mutual fund, named stockholder group, pension fund, or other institution or stakeholder. Finally, we examine the settlement agreements themselves, coding for whether the agreements prohibit the activist's initiation of or participation in a formal proxy fight or provide for the reimbursement of the activist's expenses. Table 1 below provides summary statistics on the characteristics of the 514 settlement agreements in our dataset:

[Insert Table 1 Here.]

As Table 1 shows, on average each activist engagement results in the appointment of just fewer than two activist representatives to the target company's board, and in nearly 70% of the agreements at least one of these representatives is an employee of the activist itself.

B. Leakage Sample and Control Group Construction

Next, we construct a dataset that enables us to evaluate the incorporation of information into public-company stock prices. In general, federal law requires such information to be disclosed on Form 8-K, or "'current' reports when specific extraordinary corporate events occur" (SEC, 2002). We begin with 672,158 form 8-Ks filed by 7,852 publicly traded companies over the period January 1, 2000 to September 30, 2016. A representative Form 8-K from our sample is described in Figure 3.

[Insert Figure 3 Here.]

[23] We rely on SEC filings, company websites and Bloomberg profiles to identify each director's background and relationship to the activist.

For each Form 8-K filing, we seek to examine the pace at which the information in the filing makes its way into the company's stock price. To do this, we derive a ``leakage" measure for firm i filing a form 8-K on date t, which we denote $le\ \ k_{i,t}$, as follows:[24]

$$le\ \ k_{i,t} = \frac{r^i_{t-5,t-1}}{r^i_{t-5,t_0}}$$

where t_0 denotes the date of the Form 8-K filing and $r^i_{t_1,t_2}$ denotes the log return for firm i from time t_1 to t_2. For example, r^i_{t-5,t_0} denotes the log difference in the closing price of firm i's publicly traded stock on the date of the event to the closing price of firm i's publicly traded stock five dates before the event. On average, then, higher levels of leakage indicate that information reflected in the Form 8-K made its way into stock prices in the day before the actual disclosure of that information on Form 8-K.[25]

We remove filings by firms with insufficient trading volume to render this ratio undefined, i.e., where $r^i_{t-5,t_0} = 0$. We also remove filings with "negative" leakage (i.e., where the return changed sign from day $t-1$ to day t_0), as the ratio is not meaningful in that case. To reduce noise, we also remove filings with leakage greater than 1 (i.e., overreaction prior to the filing date t_0). The results are qualitatively consistent but noisier when these are included. Finally, we limit the sample to Form 8-Ks filed within a window of three years before and after the date of each activist intervention to ensure that the results are not driven by spurious filings in the remote future. These sample selection criteria yield a total of 164,752 form 8-K filings by 6,781 publicly traded companies over the sample period.

[24] For a corresponding ratio measuring the rate at which information is incorporated into stock prices, see Jackson, Jiang & Mitts (2016).

[25] We note that information disclosed on Form 8-K is occasionally previously disclosed to the public in the form of press releases or other public announcements. To address that possibility, as explained below we search the text of each Form 8-K for phrases related to the issuance of a press release and control for the presence of that phrase in our leakage analysis.

We code as "treatment" filings Form 8-Ks filed by firms that entered into activist settlement agreements, and code as "post" Form 8-K filings that occur after the date that the new director gained access to material nonpublic information, either by joining the board or obtaining observer rights to its deliberations.[26] To reiterate: as a result of this design, we have essentially 514 different treatments occurring at different points in time. This gives us comfort that, from the perspective of causal identification, the effect we measure cannot be driven by an unobservable trend over a single period of time.

It is, of course, conceptually challenging to construct an ideal control group along both the cross-sectional and time-series dimensions. For our primary analysis, we prefer comparability along the time-series axis, and thus assign Form 8-K filings by public companies without an activist intervention to the "control" group. Then, to construct the control group used in our analysis, we randomly dates drawn from the treatment files with replacement. This yields a distribution of "access to material nonpublic information dates" for the control group that is indistinguishable from those dates in the treatment group, as shown in Figure 4 below.

[Insert Figure 4 Here.]

Although this control group gives us comfort that an unobservable time trend is not driving our results, it does not address the concern that firms that are targets of activist interventions but do not agree to appoint activist directors by way of settlement agreements might systematically differ from those that do. Thus, we construct an alternative control group consisting of all firms that have been the targets of activism as identified by the SharkRepellent database. For this alternative control group, we use the date SharkRepellent identifies as the

[26] As described below, however, in our estimations we limit the sample window to a specified period before and after the new director gains access to material nonpublic information to reduce the likelihood that the results are driven by differences in leakage far away in time from the date on which the director first gains access to the boardroom.

beginning of the activist campaign as the relevant date.[27] As noted below, our results are consistent regardless of our choice of control group.

In addition to constructing these two control groups, we derive several covariates for each firm: its market capitalization, Amihud (2002) illiquidity measure, and the idiosyncratic volatility of the firm's stock, each calculated over daily returns in the month preceding the Form 8-K filing. We also calculate the firm's book-to-market ratio, using its most recent Compustat annual report. We also compute the length of the Form 8-K filing, its linguistic complexity (as measured by the Fog index described in Gunning (1968) as modified by Bogert (1985)), as well as whether it refers to a "press release," which might indicate that the filing does not necessarily contain new, public information. Finally, we extract the item numbers—that is, legally specified categories of information—from each Form 8-K filing.[28] We merge the leakage data with these covariates, along with the "treatment characteristics" coding from the activist settlement data, to arrive at the final dataset used in the analysis described below. Table 3 presents summary statistics from this dataset.

[Insert Table 3 Here.]

[27] We acknowledge, of course, that the problem with this approach is that the "time trends" in our difference-in-difference specification will necessarily span different periods of calendar time—even though they are similar with respect to the amount of time following the activist intervention. Suppose, for example, that a settlement agreement was signed with a particular activist target in February, and one of the control group event dates is in May. For the treatment firm, a window of "+30" days will span February to March, but for the control group that window will run from May through June. These are different calendar times, of course, but both reflect a window thirty days after the activist event. By comparison, in our primary control sample, which reflects a more standard difference-in-difference approach, the "+ 30" window reflects the same calendar time for both the treatment and control firms—although, as noted above, as to that sample one might be concerned that this period of time is meaningless for a randomly selected public company. In this way, our two control samples reflect the tradeoffs between time-series and cross-sectional comparability for treatment and control firms.

[28] Public companies today are required to file a Form 8-K for a wide range of corporate events; in securities-law parlance, the various events that are subject to disclosure on Form 8-K are referred to as "items." For example, Item 1.03 on Form 8-K requires disclosure of whether the company has entered into bankruptcy or receivership, Item 2.01 requires disclosure of the completion of the acquisition or sale of corporate assets, and so on.

4. RESEARCH DESIGN AND RESULTS

We use a difference-in-difference design to consider whether the change in leakage before and after the activist intervention differs between our treatment and control groups. We restrict our sample to "time windows" of a certain number of days on either side of the intervention date, employing two primary windows 45 days before and after the intervention and 1,095 days before and after the intervention. In both specifications, we exclude the immediate week on either side of the intervention date to ensure that our results are not driven by leakage related to information regarding the activist intervention itself (in contrast, as explained above, with Collin-Dufresne & Fos (2013)).

The key identifying assumption of this design is the treatment and control groups follow parallel trends—that is, in the absence of the activist settlement, changes in leakage over time would remain similar between the two groups. Qualitatively, there is no reason to suspect that activist funds choose targets that are more likely to experience greater information leakage in the months following the intervention. While we acknowledge, of course, that activist investors select targets on the basis of characteristics such as relative historical performance (as demonstrated by Cremers et al., 2015), we see little basis to worry that those characteristics are correlated with time trends in information leakage.[29]

We empirically verify this identification assumption in two ways. First, in Figure 5, we plot pre- and post-time trends on the leakage outcome for the treatment and control groups. In this figure, the x-axis is the number of days between the intervention date and the Form 8-K

[29] To give an illustration of why a selection critique of this kind is unlikely to be a problem in this design, suppose that hedge funds select targets on the basis of poor governance, and suppose, in turn, poor governance is correlated with insider trading activity. But in a difference-in-differences design, the results can only be biased by *time-varying* omitted variables. Thus, for this objection to be problematic, it must be the case that hedge funds select targets for activist intervention on the basis of unobserved *trends* in increasing leakage. It is hard to imagine what such a trend might be, especially because, with 514 different activist directors gaining boardroom access at different points in time, this kind of time trend cannot merely be a spurious coincidence at a particular moment in calendar time—it must be a consistent trend throughout time.

filing. This normalization by the "time difference" allows for plotting leakage for Form 8-K filings from different points in time on the same figure. We average the leakage by treatment and control group for each "time difference" and apply nonparametric smoothing piecewise to the pre- and post- periods for each group, using a Gaussian kernel with a bandwidth of 30 days.

[Insert Figure 5 Here.]

As Figure 5 shows, trends in leakage over time for our treatment and control groups are parallel prior to the date of the activist intervention. We observe a shift in those trends only after the day of the activist intervention.

As a second way to verify our identification assumption empirically, we perform a "balance test," examining whether leakage as well as the filing covariates are subject to a differential linear pre-trend between the treatment and control groups. We estimate the following specification on the sample with $p = 0$:

$$y_{i,t} = \gamma_0 + \gamma_1 d_i + \gamma_2 \Delta\tau_{i,t} + \gamma_3 (d_i \times \Delta\tau_{i,t}) + \epsilon_{i,t}$$

where $y_{i,t}$ is one of a series of covariates;[30] d_i is an indicator variable equal to 1 if a filing is in the treatment group; $\Delta\tau_{i,t}$ is the number of days between the intervention date and the Form 8-K filing date; and $\epsilon_{i,t}$ is a random error term. We also examine item numbers filed on Form 8-K to verify that these are balanced as well. The coefficient of interest is γ_3, which reflects the difference in the daily time trend between the treatment group and control group. We report the results in Table 3.

[Insert Table 3 Here.]

[30] As described in Table 3, these include (1) leakage, (2) the firm's market-value decline, (3) Amihud (2002) liquidity, (4) idiosyncratic volatility, (5) book-to-market ratio, (6) $r^i_{t-5,t-1}$, (7) r^i_{t-5,t_0}, (8) a dummy variable indicating whether the Form 8-K contains the phrase "press release," (9) the log of the length of the filing (in characters), or (10) the Fog index, as a proxy for the linguistic complexity of the filing.

As Table 3 shows, the coefficient γ_3 on $d_i \times \Delta\tau_{i,t}$ is not significantly different from zero in four of the five specifications. In the idiosyncratic volatility specification, the coefficient is statistically significant but its economic magnitude is too small to be meaningful. This statistical evidence is consistent with the absence of a systematic pre-trend as shown in Figure 5.

Satisfied that our identification assumption is consistent with the evidence, we now turn to measuring the effects of activist settlements, and the directors appointed pursuant to those settlements, on leakage at the firms that enter into those agreements.

A. Information Leakage After Activist Directors Gain Boardroom Access

We first consider whether the change in leakage before and after the date on which the activist settlement gives a new director access to the boardroom differs between our treatment and control firms. To do so, we estimate the following difference-in-differences specification by ordinary least squares, beginning with the short-term window of (-45, +45) :

$$le\ \ k_{i,t} = \beta_0 + \beta_1 d_i + \beta_2\, p\quad t_t + \beta_3(d_i \times p\quad t_t) + \boldsymbol{\gamma' x_{i,t}} + \epsilon_{i,t}$$

where d_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group; $p\quad t_t$ is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates;[31] and $\epsilon_{i,t}$ is a random error term. The coefficient of interest is β_3, which captures the over-time difference in leakage between the two groups. The results are reported in Table 4.

[Insert Table 4 Here.]

[31] As explained in Table 4, these include the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) liquidity measure, and the firm's book-to-market ratio, each as of the month preceding the Form 8-K filing (or the current year, in the case of the book-to-market ratio).

As Table 4 shows, the coefficient β_3 on $d_i \times p \quad t_t$ is positive and statistically significant in all of the specifications. Firms subject to an activist intervention experience, on average, an increase in leakage of 10-12 percentage points, depending on the specification.[32]

As noted in Section 2.B. above, however, theory suggests that any such effect, to the extent produced by illegal conduct, would diminish over time as the probability of detection increases. Thus, we next consider whether the effect we have identified persists over the longer three-year window (-1095, +1095) following the activist intervention. We estimate the same specification described above, and report the results in Table 5, over that longer period.

[Insert Table 5 Here.]

Unlike the results from our short-term sample, as Table 5 shows the coefficient β_3 on $d_i \times p \quad t_t$ is not significantly different over a longer window following the activist intervention.[33] The results in Table 5 suggest that the increase in information leakage identified immediately after such an intervention does not persist over a longer period.[34]

To investigate this time heterogeneity in a non-parametric manner, we estimate this primary specification with differing window lengths, using the full set of control variables as in Tables 4 and 5. Figure 6 presents the difference-in-difference $d_i \times \Delta\tau_{i,t}$ coefficient and 95% confidence intervals for each sample inclusion window.

[Insert Figure 6 Here.]

[32] Moreover, as shown in Table 8, we identify a similar effect when using our alternative control group—that is, a control group consisting of activist targets that did not enter into a settlement agreement. As Table 8 explains, leakage in our treatment firms increases at similar levels of economic and statistical significance in comparison to this control group.

[33] Moreover, as shown in Table 9, we reach the same conclusion when using our alternative control group—that is, a control group consisting of activist targets that did not enter into a settlement agreement. As Table 9 shows, leakage in our treatment firms does not change in meaningful fashion in comparison to this control group.

[34] In unreported analysis, we conducted similar tests over similarly long-run windows of varying length. The results were similar to those described in the text.

As Figure 6 shows, the effect decreases with the window length, and it is consistently not significantly different from zero at a window of 150 days and beyond. This result is consistent with the theoretical discussion in Section 2.B. above: although we find meaningful evidence of an increase in leakage immediately following an activist intervention, that evidence disappears as time passes—and the probability of detecting improper trading rises.

B. Effect Heterogeneity by Investor Type

Next, we consider whether these post-settlement increases in leakage differ depending on the identity of the activist investor. As noted above, our sample includes activist shareholders of varying types, and in light of the important institutional differences among investors (Kahan & Rock, 2007; Gilson & Gordon, 2013), it is important to specify which investor types, if any, are especially associated with the phenomenon identified above.[35]

To examine that question, we repeat the same estimation as in Section 4.A., limiting the sample to the short-term window of (-45, +45). This time, however, we consider two treatment groups: those which are hedge funds and those which are not. We estimate the following difference-in-differences specification by ordinary least squares:

$$le \quad k_{i,t} = \beta_0 + \beta_1 hf_i + \beta_2 oi_i + \beta_3 p \quad t_t + \beta_4 (hf_i \times p \quad t_t) + \beta_5 (o_i \times p \quad t_t) + \boldsymbol{\gamma' x_{i,t}} + \epsilon_{i,t}$$

[35] While we recognize that most literature on shareholder activism restricts its analysis to hedge funds (Brav et al., 2008; Bebchuk et al., 2015), we adopted a conservative approach of including both hedge-fund and other types of activists. As we show in this Section, and consistent with this prior literature, our results are driven by activist hedge funds rather than other investor types.

where hf_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group and the investor is a hedge fund; oi_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group and the investor is not a hedge fund; $p \quad t_t$ is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates;[36] and $\epsilon_{i,t}$ is a random error term. The coefficients of interest are β_4 and β_5, which captures the over-time difference in leakage between each of the treatment groups and the control group. The results are reported in Table 6.

[Insert Table 6 Here.]

As Table 6 shows, the leakage effect we identify is clearly driven by hedge fund investors rather than non-hedge fund investors. This result is consistent with the conjecture that the incentives and business models of hedge-fund activists require compensation for activist interventions that differ meaningfully from those of other investors.

C. Effect Heterogeneity by Director Type

We now consider whether the post-settlement increases in leakage we identify depend on the identity of the director appointed to the target firm's board pursuant to the settlement agreement. As noted above, we code each director's identity on the basis of public searches and classify directors according to whether or not they are employees of the activist investor.[37] Using

[36] As noted in Table 6, these include the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) liquidity measure, and the firm's book-to-market ratio, each as of the month preceding the Form 8-K filing (or current year, in the case of the book-to-market ratio).

[37] The majority of securities filings related to settlement agreements specify the nature of the activist director's relationship, if any, with the activist. In addition, we found that the activist employee appointees are typically senior executives of the activist, making identification of their relationship with the investor straightforward. Directors who are not employees of the activist, by contrast, are typically current or former senior executives in the target company's industry, making identification of their employment and expertise similarly straightforward.

these data, we repeat the same estimation as in Section 4.A. above, again limiting the sample to the short-term window of (-45, +45). This time, however, we consider two treatment groups: those where activist-employees are appointed to the target's board pursuant to the settlement agreement and those where the appointed director are not employees of the activist. We estimate the following difference-in-differences specification by ordinary least squares:

$$le\ \ k_{i,t} = \beta_0 + \beta_1 e_{\ i} + \beta_2 n_{\ \ i} + \beta_3 p_{\ \ t_t} + \beta_4 (e_{\ i} \times p_{\ \ t_t}) + \beta_5 (ne_{\ i} \times p_{\ \ t_t}) + \boldsymbol{\gamma' x_{i,t}} + \epsilon_{i,t}$$

where $e_{\ i}$ is an indicator variable equal to 1 if the 8-K filing is in the treatment group and the activist's employee is a board director; $n_{\ \ i}$ is an indicator variable equal to 1 if the 8-K filing is in the treatment group and the activist's employee is not a board director; $p_{\ \ t_t}$ is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates;[38] and $\epsilon_{i,t}$ is a random error term. The coefficients of interest are β_4 and β_5, which capture the over-time difference in leakage between each of the treatment groups and the control group. We cluster standard errors by firm to account for serial correlation in leakage. The results are reported in Table 9.

[Insert Table 9 Here.]

As Table 9 shows, the leakage effect is clearly driven by activist settlements that lead to the appointment of an activist employee to the target board. Although the reason for this heterogeneity deserves closer consideration, we offer two preliminary possibilities for further study. First, to the extent that the mechanism producing the leakage we observe is trading

[38] As noted in Table 9, these include the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) liquidity measure, and the firm's book-to-market ratio (each as of the month preceding the Form 8-K filing, or, in the case of the book-to-market ratio, the current year).

facilitated by directors, activist employees—that is, finance professionals—are more likely than non-employees to have access to trading capital of the magnitude necessary to produce the leakage we identify here. Second, the reputational sanction associated with improper facilitation of insider trading may be more costly for non-employees—who are typically industry experts, and often current or former officers of large public companies—than for activists' employees.

D. Effect on Bid-Ask Spreads

Finally, we consider whether bid-ask spreads widen following activist settlements that lead to the appointment of directors to the target company's board, consistent with the theoretical predictions described in Section 2.B. To do so, we obtain monthly bid-ask spreads from CRSP for each of the stocks in our treatment and control groups, calculating the "intervention date" for each control group using random sampling with replacement, as discussed above. We then estimate the following difference-in-differences specification:[39]

$$y_{i,t} = \beta_0 + \beta_1 d_i + \beta_2\, p\quad t_t + \beta_3(d_i \times p\quad t_t) + \boldsymbol{\gamma}'\boldsymbol{x_{i,t}} + \epsilon_{i,t}$$

where $y_{i,t}$ is the bid-ask spread divided by the closing price of firm *i*'s stock at month *t*; d_i is a dummy variable equal to 1 if the firm was subject to an activist intervention; $p\quad t_t$ is a dummy variable equal to 1 if month *t* is after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates,[40] and $\epsilon_{i,t}$ is a random error term. The coefficient of interest is β_3, which captures the over-time difference in leakage between the two groups. Table 10 describes the results.

[Insert Table 10 Here.]

[39] Because we use a difference-in-differences design, we again verify the parallel trends assumption, this time as to bid-ask spreads, in Figure 7. As shown in that Figure, trends in bid-ask spreads over time for our treatment and control groups are parallel prior to the date of the activist intervention.

[40] As noted in Table 10, these include the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) illiquidity measure, and the firm's book-to-market ratio, each measured as of the year of month *t*.

As Table 10 shows, consistent with our theoretical model, bid-ask spreads rise by economically and statistically meaningful amounts in our treatment group after the activist director gains access to the boardroom. We note that, although the point estimates for this difference may seem relatively small, as Glosten & Putnins (2015) point out, the social welfare losses associated with an effect like this one can be magnified by the downstream effects of expanded bid-ask spreads in hindering—or making excessively expensive—mutually beneficial transactions. This result is consistent with the possibility that, whatever the private benefits obtained by directors facilitating trading following activist settlements, these benefits come with a corresponding social cost: wider bid-ask spreads that potentially deprive other investors of transactions in the company's stock that would otherwise occur. While we recognize that there is substantial uncertainty regarding the precise magnitude of this social cost, our findings do suggest that the use of activist settlement agreements—and the access to the boardroom that comes with them—carries a cost for public-company investors.

5. CONCLUSION

Although activist investors have long been the subject of extensive debate among scholars and policymakers, little work has been dedicated to an increasingly common outcome following an activist intervention: a settlement agreement leading to the appointment of the activist's representatives to the target company's board. In this Article, we introduce a novel dataset of more than 500 such agreements over a fifteen-year period to examine the implications of activist settlements for public companies and their investors. We show that the appointment of new directors in connection with such settlements causes material information regarding the firm to become more "leaky": more of the information makes its way into the company's stock price before disclosure of that information in securities filings. Moreover, the pattern of this leakage

follows dynamic behavioral models of criminal behavior: the magnitude of our leakage finding decreases over time, as the probability of detecting trading on leaked information increases.

We also document significant heterogeneity in our leakage result, showing that leakage occurs only when hedge funds, rather than other types of investors, lead the activist campaign. And our leakage results are driven by activist appointees who are employees of hedge funds—typically, finance professionals—rather than industry experts. Finally, we show that settlements leading to the appointment of activist directors are associated with wider bid-ask spreads in stock prices. These wider spreads impose a cost, in the form of foregone transactions in the company's stock, that policymakers should weigh against the benefits of the activist's work.

Because activist interventions increasingly result in agreements to appoint directors to the target company's board, activist settlements—and their implications for all investors—deserve closer attention from scholars and lawmakers. We hope that our Article provides a framework for future study of the important questions raised by activist settlements.

Table 1. Summary Statistics: Activist Settlement Agreements. This Table summarizes the characteristics of the 514 settlement agreements that constitute our principal sample.

Settlement Terms	Number of Observations	% of Overall Sample
Average Number of Board Seats Acquired by Activist	1.73	(—)
Activist Directors Granted Observer Rights in Advance of Appointment	40	7.8%
New Director Group Includes Activist Employee	359	69.8%
Agreement Includes Publicly Disclosed Standstill	237	46.1%
Average Standstill Length (In Annual Meetings)	1.37	(—)
Agreement Calls for Reimbursement of Activist Expenses	157	30.5%

Table 2. Summary Statistics: Estimation Dataset. The following table presents summary statistics of the primary dataset used in the analysis described in Section 4 of the Article.

Statistic	N	Mean	St. Dev.	Min	25th Percentile	Median	75th Percentile	Max
r^{i}_{t-5,t_0}	55,393	-0.001	0.096	-2.109	-0.029	-0.001	0.028	2.563
$r^{i}_{t-5,t-1}$	55,393	-0.001	0.027	-0.465	-0.010	0.000	0.009	0.386
Leakage	55,393	0.405	0.295	0.000	0.144	0.362	0.641	1.000
Treatment	55,393	0.119	0.324	0	0	0	0	1
Post	55,393	0.482	0.500	0	0	0	1	1
Hedge Fund Dummy	6,579	0.818	0.386	0	1	1	1	1
Hedge Fund Employee Dummy	6,579	0.699	0.459	0	0	1	1	1
Amihud (2002) Liquidity	48,607	4.216	6.176	0.000	1.183	2.277	4.684	183.556
Idiosyncratic Volatility	48,593	0.028	0.025	0.0003	0.014	0.021	0.033	0.925
Market Capitalization	48,607	5,597,907	22,388,634	623	180,125	700,422	2,724,612	733,747,474
Book to Market Ratio	43,898	396.869	44,929	-182,928	0.002	0.008	0.026	8,897,385
Days Between Activist Intervention and 8-K Filing Date	55,393	-32.649	587.492	-1,064	-528	-31	445	1,064
Length of 8-K Filing (Characters)	27,957	588,849	2,038,096	1,987	31,738	94,405	349,729	107,575,449
Fog Index	27,957	15.668	12.791	3.200	9.600	12.800	18.000	356.800

Table 3. Balance Test on Observable Covariates. The following tables reflect the results of balance tests examining whether leakage or filing covariates are subject to a differential linear pre-trend between the treatment and control groups. We estimate $y_{i,t} = \gamma_0 + \gamma_1 d_i + \gamma_2 \Delta\tau_{i,t} + \gamma_3 (d_i \times \Delta\tau_{i,t}) + \epsilon_{i,t}$, where the coefficient of interest is γ_3, which reflects the difference in the daily time trend between the treatment group and control group. T-statistics are provided below correlation coefficients in parentheses. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Leakage	Log of Market Capitalization	Amihud (2002)	Idiosyncratic Volatility	Book to Market
Treatment	-0.0084	-0.3638**	-0.0170	0.0026**	5598.9769
	(-0.79)	(-2.46)	(-0.55)	(2.16)	(1.01)
Days Since Activist Director Gained Board Access	0.0000	0.0002***	-0.0000***	-0.0000**	-0.0000***
	(0.39)	(4.04)	(-3.08)	(-2.38)	(-3.34)
Treatment x Days Since Activist Director Gained Access	**-0.0000**	**-0.0003****	**0.0000**	**0.0000*****	**0.2961**
	(-0.66)	**(-2.01)**	**(0.09)**	**(2.89)**	**(0.65)**
(Intercept)	0.4058***	13.6139***	0.4061***	0.0264***	0.0221***
	(108.30)	(320.10)	(39.26)	(71.21)	(10.50)
Observations	28,705	25,222	25,222	25,214	23,643
R^2	0.000	0.002	0.001	0.001	0.001

	$\lvert r^i_{t-5,t_0} \rvert$	$\lvert r^i_{t-5,t-1} \rvert$	Contains "Press Release"	Length of Filing (Characters)	Fog Index
Treatment	0.0029	0.0013	0.0210	-0.2035***	-0.9200*
	(0.92)	(1.24)	(1.12)	(-2.66)	(-1.69)
Days Since Activist Director Gained Board Access	-0.0000	-0.0000***	-0.0000	0.0002***	-0.0010**
	(-1.60)	(-2.72)	(-1.05)	(4.71)	(-2.43)
Treatment x Days Since Activist Director Gained Access	**0.0000**	**0.0000**	**0.0000**	**-0.0001**	**0.0003**
	(0.56)	**(0.70)**	**(1.39)**	**(-0.81)**	**(0.40)**
(Intercept)	0.0466***	0.0150***	0.6369***	11.7607***	15.6274***
	(39.60)	(54.22)	(67.43)	(358.89)	(58.98)
Observations	28,705	28,705	14,352	14,352	14,352
R^2	0.000	0.000	0.000	0.003	0.002

Table 3. Balance Test on Observable Covariates (Concluded). This final panel reflects the final set of balance tests examining whether leakage or filing covariates are subject to a differential linear pre-trend between the treatment and control groups. We estimate $y_{i,t} = \gamma_0 + \gamma_1 d_i + \gamma_2 \Delta\tau_{i,t} + \gamma_3 (d_i \times \Delta\tau_{i,t}) + \epsilon_{i,t}$, where the coefficient of interest is γ_3, which reflects the difference in the daily time trend between the treatment group and control group. T-statistics are provided below correlation coefficients in parentheses. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Form 8-K Items Related to Results of Operations	Form 8-K Items Related to Financial Statements	Form 8-K Items Related to Other Events	Form 8-K Items Related to Entry Into a Material Definitive Agreement	Form 8-K Items Related to Regulation FD Disclosure
Treatment	-0.0479***	0.0072	0.0169	0.0232	-0.0007
	(-2.71)	(0.46)	(0.87)	(1.61)	(-0.03)
Days Since Activist Director Gained Board Access	-0.0000	0.0000***	0.0000	0.0000	0.0000
	(-0.48)	(2.91)	(1.62)	(0.65)	(0.31)
Treatment x Days Since Activist Director Gained Access	**-0.0000**	**0.0000**	**0.0000**	**-0.0000**	**0.0000**
	(-1.26)	**(0.39)**	**(0.75)**	**(-0.19)**	**(1.31)**
(Intercept)	0.3520***	0.8062***	0.2500***	0.1389***	0.1998***
	(38.32)	(102.63)	(29.12)	(21.14)	(24.27)
Observations	14,352	14,352	14,352	14,352	14,352
R^2	0.001	0.001	0.000	0.001	0.001

Table 4. Leakage Over the Short Term. In this Table, we provide the results of three ordinary least squares models in which the dependent variable is $lk_{i,t}$, the leakage for a particular Form 8-K filing. The sample is limited to Form 8-K filings within a window of (-45, +45) days around the activist intervention. The model is given by the following linear specification:

$$lk_{i,t} = \beta_0 + \beta_1 d_i + \beta_2 p_t + \beta_3 (d_i \times p_t) + \boldsymbol{\gamma}' \boldsymbol{x_{i,t}} + \epsilon_{i,t}$$

where d_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group; p_t is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates: the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) illiquidity measure, and the firm's book-to-market ratio; each as of the month preceding the Form 8-K filing, or current year in the case of the book-to-market ratio, as well as filing-level covariates: the filing length, Fog index, and fixed effects for item numbers; and $\epsilon_{i,t}$ is a random error term. The coefficient of interest is β_3, which captures the over-time difference in leakage between the two groups. We cluster standard errors by firm to address serial correlation in leakage. T-statistics are provided below correlation coefficients in parentheses. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Leakage	Leakage	Leakage	Leakage	Leakage
Treatment	-0.0568**	-0.0413	-0.0507*	-0.0523	-0.0477
	(-2.30)	(-1.56)	(-1.75)	(-1.63)	(-1.45)
Post	-0.0045	-0.0091	-0.0053	-0.0244	-0.0247
	(-0.33)	(-0.63)	(-0.33)	(-1.05)	(-1.04)
Treatment x Post	**0.1156*** **	**0.0850** **	**0.0966** **	**0.1193** **	**0.1145** **
	(2.94)	**(2.07)**	**(2.18)**	**(2.51)**	**(2.41)**
Market Value of Equity Decile		0.0065***	0.0063*	0.0111**	0.0122**
		(2.78)	(1.78)	(2.41)	(2.57)
Idiosyncratic Volatility			-0.2494	0.6694	0.6626
			(-0.57)	(1.12)	(1.07)
Amihud (2002) Liquidity			0.0019	-0.0005	0.0048
			(0.10)	(-0.02)	(0.16)
Book to Market Value			0.1073*	0.1480**	0.1287*
			(1.80)	(2.58)	(1.83)
Length of 8-K Filing (Characters)				-0.0103*	-0.0069
				(-1.69)	(-0.90)
Fog Index				0.0009	0.0010
				(1.00)	(1.10)
Item FEs	No	No	No	No	Yes
Observations	2,232	1,959	1,610	848	848
R^2	0.005	0.006	0.008	0.022	0.038

Table 5. Leakage Over the Long Term. In this Table, we provide the results of three ordinary least squares models in which the dependent variable is $le\ \ k_{i,t}$, the leakage for a particular Form 8-K filing. The sample is limited to Form 8-K filings within a window of (-1095, +1095) days around the activist intervention. The model is given by the following linear specification:

$$le\ \ k_{i,t} = \beta_0 + \beta_1 d_i + \beta_2\, p\ \ t_t + \beta_3 (d_i \times p\ \ t_t) + \boldsymbol{\gamma' x_{i,t}} + \epsilon_{i,t}$$

where d_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group; $p\ \ t_t$ is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates: the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) illiquidity measure, and the firm's book-to-market ratio; each as of the month preceding the Form 8-k filing, or current year in the case of the book-to-market ratio, as well as filing-level covariates: the filing length, Fog index, and fixed effects for item numbers;; and $\epsilon_{i,t}$ is a random error term. The coefficient of interest is β_3, which captures the over-time difference in leakage between the two groups. We cluster standard errors by firm to address serial correlation in leakage. T-statistics are provided below correlation coefficients in parentheses. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Leakage	Leakage	Leakage	Leakage	Leakage
Treatment	-0.0026	0.0029	0.0010	-0.0037	-0.0042
	(-0.46)	(0.48)	(0.16)	(-0.55)	(-0.63)
Post	0.0016	0.0015	0.0004	0.0006	-0.0003
	(0.60)	(0.54)	(0.13)	(0.12)	(-0.06)
Treatment x Post	**-0.0075**	**-0.0100**	**-0.0039**	**-0.0029**	**-0.0038**
	(-0.95)	**(-1.17)**	**(-0.42)**	**(-0.29)**	**(-0.39)**
Market Value of Equity Decile		0.0047***	0.0042***	0.0043***	0.0040***
		(9.57)	(5.95)	(4.44)	(4.11)
Idiosyncratic Volatility			0.3246***	0.2640***	0.2392**
			(4.51)	(2.73)	(2.43)
Amihud (2002) Liquidity			-0.0126***	-0.0141***	-0.0125***
			(-3.87)	(-3.01)	(-2.69)
Book to Market Value			-0.0000***	-0.0000***	-0.0000***
			(-18.64)	(-17.39)	(-16.41)
Length of Filing (Characters)				-0.0043***	-0.0006
				(-3.19)	(-0.39)
Fog Index				-0.0002	-0.0000
				(-1.01)	(-0.11)
Item FEs	No	No	No	No	Yes
Observations	54,861	48,145	38,201	19,523	19.523
R^2	0.000	0.002	0.003	0.004	0.009

Table 6. Heterogeneity by Investor Type. In this Table, we provide the results of three ordinary least squares models in which the dependent variable is $lk_{i,t}$, the leakage for a particular Form 8-K filing. The sample is limited to Form 8-K filings within a window of (-45, +45) days around the activist intervention. The model is given by the following linear specification:

$$lk_{i,t} = \beta_0 + \beta_1 hf_i + \beta_2 oi_i + \beta_3 p_t + \beta_4 (hf_i \times p_t) + \beta_5 (oi_i \times p_t) + \boldsymbol{\gamma' x_{i,t}} + \epsilon_{i,t}$$

where hf_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group and the investor is a hedge fund; oi_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group and the investor is not a hedge fund; p_t is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates: the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) illiquidity measure, and the firm's book-to-market ratio; each as of the month preceding the Form 8-k filing, or current year in the case of the book-to-market ratio, as well as filing-level covariates: filing length, Fog index, and fixed effects for item numbers; and $\epsilon_{i,t}$ is a random error term. The coefficients of interest are β_4 and β_5, which captures the over-time difference in leakage between each of the treatment groups and the control group. We cluster standard errors by firm to account for serial correlation in leakage. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Leakage	Leakage	Leakage	Leakage	Leakage
Hedge Fund Dummy	-0.0631**	-0.0589**	-0.0679**	-0.0701**	-0.0653*
	(-2.36)	(-2.10)	(-2.23)	(-2.12)	(-1.91)
Not Hedge Fund Dummy	-0.0335	0.0280	0.0176	0.0179	0.0212
	(-0.62)	(0.46)	(0.26)	(0.25)	(0.30)
Post	-0.0045	-0.0091	-0.0053	-0.0245	-0.0248
	(-0.33)	(-0.63)	(-0.33)	(-1.06)	(-1.04)
Hedge Fund Dummy x Post	0.1158***	0.1092**	0.1250***	0.1480***	0.1476***
	(2.83)	(2.54)	(2.72)	(3.04)	(2.97)
Not Hedge Fund Dummy x Post	0.1158	-0.0146	-0.0172	0.0043	-0.0190
	(1.16)	(-0.14)	(-0.15)	(0.04)	(-0.17)
Market Value of Equity Decile		0.0066***	0.0062*	0.0111**	0.0121**
		(2.81)	(1.78)	(2.40)	(2.57)
Idiosyncratic Volatility			-0.2520	0.6619	0.6601
			(-0.58)	(1.11)	(1.07)
Amihud (2002) Liquidity			0.0016	-0.0012	0.0044
			(0.08)	(-0.04)	(0.15)
Book to Market Value			0.1096*	0.1517***	0.1308*
			(1.85)	(2.65)	(1.86)
Filing Length (In Characters)				-0.0104*	-0.0073
				(-1.69)	(-0.94)
Fog Index				0.0010	0.0011
				(1.03)	(1.12)
Item FEs	No	No	No	No	Yes
Observations	2,232	1,959	1,610	848	848
R^2	0.005	0.007	0.009	0.025	0.041

Table 7. Heterogeneity by Activist Employee as Board Director. In this Table, we provide the results of three ordinary least squares models in which the dependent variable is $lea\ k_{i,t}$, the leakage for a particular Form 8-K filing. The sample is limited to Form 8-K filings within a window of (-45, +45) days around the activist intervention. The model is given by the following linear specification:

$$lea\ k_{i,t} = \beta_0 + \beta_1 e_{\ i} + \beta_2 n_{\ \ i} + \beta_3 p_{\ \ t_t} + \beta_4 (e_{\ i} \times p_{\ \ t_t}) + \beta_5 (n_{\ \ i} \times p_{\ \ t_t}) + \boldsymbol{\gamma' x_{i,t}} + \epsilon_{i,t}$$

where $e_{\ i}$ is an indicator variable equal to 1 if the 8-K filing is in the treatment group and the activist's employee is a board director; $n_{\ \ i}$ is an indicator variable equal to 1 if the 8-K filing is in the treatment group and the activist's employee is not a board director; $p_{\ \ t_t}$ is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates: the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) illiquidity measure, and the firm's book-to-market ratio; each as of the month preceding the Form 8-k filing, or current year in the case of the book-to-market ratio, as well as filing-level covariates: the filing length, Fog index, and fixed effects for item numbers;; and $\epsilon_{i,t}$ is a random error term. The coefficients of interest are β_4 and β_5, which capture the over-time difference in leakage between each of the treatment groups and the control group. We cluster standard errors by firm to account for serial correlation in leakage. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Leakage	Leakage	Leakage	Leakage	Leakage
Hedge Fund Employee Director Dummy	-0.0827***	-0.0622**	-0.0784**	-0.0788**	-0.0736**
	(-2.94)	(-1.99)	(-2.33)	(-2.16)	(-1.97)
Not Hedge Fund Employee Director Dummy	0.0036	0.0046	0.0119	0.0072	0.0107
	(0.08)	(0.11)	(0.25)	(0.15)	(0.22)
Post	-0.0045	-0.0091	-0.0053	-0.0245	-0.0248
	(-0.33)	(-0.63)	(-0.33)	(-1.06)	(-1.04)
Employee Director Dummy x Post	**0.1478*** **	**0.1104** **	**0.1255** **	**0.1454*** **	**0.1400** **
	(3.14)	**(2.26)**	**(2.40)**	**(2.65)**	**(2.54)**
Not Employee Director Dummy x Post	**0.0430**	**0.0298**	**0.0315**	**0.0605**	**0.0568**
	(0.66)	**(0.43)**	**(0.43)**	**(0.80)**	**(0.76)**
Market Value of Equity Decile		0.0064***	0.0062*	0.0111**	0.0121**
		(2.75)	(1.78)	(2.43)	(2.58)
Idiosyncratic Volatility			-0.2559	0.6593	0.6548
			(-0.59)	(1.10)	(1.06)
Amihud (2002) Liquidity			0.0022	0.0002	0.0054
			(0.11)	(0.01)	(0.19)
Book to Market Value			0.1091*	0.1497***	0.1307*
			(1.84)	(2.65)	(1.89)
Filing Length (In Characters)				-0.0103*	-0.0071
				(-1.68)	(-0.93)
Fog Index				0.0009	0.0010
				(0.94)	(1.05)
Item FEs	No	No	No	No	Yes
Observations	2,232	1,959	1,610	848	848
R^2	0.006	0.007	0.010	0.025	0.040

Table 8. Leakage Over the Short-Term (Alternative Control Group). In this Table, we utilize the alternative control group consisting of activist interventions that did not result in a board seat. We provide the results of three ordinary least squares models in which the dependent variable is $leakage_{i,t}$, the leakage for a particular Form 8-K filing. The sample is limited to Form 8-K filings within a window of (-45, +45) days around the activist intervention. The model is given by the following linear specification:

$$leakage_{i,t} = \beta_0 + \beta_1 d_i + \beta_2 post_t + \beta_3 (d_i \times post_t) + \boldsymbol{\gamma}' \boldsymbol{x_{i,t}} + \epsilon_{i,t}$$

where d_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group; $post_t$ is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates: the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) illiquidity measure, and the firm's book-to-market ratio; each as of the month preceding the Form 8-k filing, or current year in the case of the book-to-market ratio, as well as filing-level covariates: the filing length, Fog index, and fixed effects for item numbers;; and $\epsilon_{i,t}$ is a random error term. The coefficient of interest is β_3, which captures the over-time difference in leakage between the two groups. We cluster standard errors by firm to account for serial correlation in leakage. T-statistics are provided below correlation coefficients in parentheses. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Leakage	Leakage	Leakage	Leakage	Leakage
Treatment	0.0080	0.0108	-0.0013	-0.0085	-0.0176
	(0.23)	(0.29)	(-0.03)	(-0.16)	(-0.33)
Post	0.0473**	0.0394*	0.0460*	0.0509	0.0358
	(2.29)	(1.80)	(1.72)	(1.33)	(0.88)
Treatment x Post	**0.1066****	**0.1317*****	**0.1340****	**0.1276***	**0.1595****
	(2.23)	**(2.64)**	**(2.41)**	**(1.87)**	**(2.20)**
Market Value of Equity Decile		0.0106***	0.0080	0.0179**	0.0160**
		(3.04)	(1.61)	(2.32)	(2.01)
Idiosyncratic Volatility			0.4442	1.1803*	1.2048*
			(0.95)	(1.84)	(1.72)
Amihud (2002) Liquidity			-0.0269	0.0067	-0.0027
			(-1.47)	(0.11)	(-0.05)
Book to Market Value			0.0483	-0.1489	-0.1419
			(1.28)	(-0.39)	(-0.38)
Filing Length (In Characters)				-0.0094	-0.0084
				(-0.92)	(-0.63)
Fog Index				-0.0020	-0.0029*
				(-1.44)	(-1.90)
Observations	1,037	914	656	329	329
R^2	0.027	0.042	0.050	0.086	0.149

Table 9. Leakage Over the Long-Term (Alternative Control Group). In this Table, we utilize the alternative control group consisting of activist interventions that did not result in a board seat. We provide the results of three ordinary least squares models in which the dependent variable is $leak_{i,t}$, the leakage for a particular Form 8-K filing. The sample is limited to Form 8-K filings within a window of (-1095, +1095) days around the activist intervention. The model is given by the following linear specification:

$$leak_{i,t} = \beta_0 + \beta_1 d_i + \beta_2 post_t + \beta_3 (d_i \times post_t) + \boldsymbol{\gamma}' \boldsymbol{x_{i,t}} + \epsilon_{i,t}$$

where d_i is an indicator variable equal to 1 if the 8-K filing is in the treatment group; $post_t$ is an indicator variable equal to 1 if the 8-K filing occurred after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates: the decile of the firm's market value, idiosyncratic volatility, the Amihud (2002) illiquidity measure, and the firm's book-to-market ratio; each as of the month preceding the Form 8-k filing, or current year in the case of the book-to-market ratio, as well as filing-level covariates: the filing length, Fog index, and fixed effects for item numbers;; and $\epsilon_{i,t}$ is a random error term. The coefficient of interest is β_3, which captures the over-time difference in leakage between the two groups. We cluster standard errors by firm to account for serial correlation in leakage. T-statistics are provided below correlation coefficients in parentheses. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Leakage	Leakage	Leakage	Leakage	Leakage
Treatment	0.0050	0.0082	0.0036	0.0060	0.0039
	(0.83)	(1.32)	(0.56)	(0.74)	(0.48)
Post	-0.0015	0.0017	0.0073	0.0099	0.0085
	(-0.33)	(0.37)	(1.38)	(1.22)	(1.04)
Treatment x Post	**0.0054**	**-0.0000**	**0.0035**	**0.0004**	**0.0016**
	(0.62)	**(-0.00)**	**(0.34)**	**(0.03)**	**(0.13)**
Market Value of Equity Decile		0.0060***	0.0053***	0.0051***	0.0048***
		(8.38)	(5.31)	(3.68)	(3.40)
Idiosyncratic Volatility			0.3807***	0.3167**	0.2911*
			(4.18)	(2.10)	(1.92)
Amihud (2002) Liquidity			-0.0107**	-0.0174***	-0.0161**
			(-2.20)	(-2.70)	(-2.48)
Book to Market Value			-0.0000***	-0.0000***	-0.0000***
			(-17.81)	(-15.14)	(-12.76)
Filing Length (In Characters)				-0.0057***	-0.0009
				(-2.98)	(-0.40)
Fog Index				0.0000	0.0001
				(0.05)	(0.54)
Item FEs	No	No	No	No	Yes
Observations	25,282	22,655	18,434	9,213	9,213
R^2	0.000	0.003	0.004	0.006	0.012

Table 10. Effects of Activist Settlements on Bid-Ask Spreads. This Table reports the results of a difference-in-differences specification:

$$y_{i,t} = \beta_0 + \beta_1 d_i + \beta_2 p \quad t_t + \beta_3 (d_i \times p \quad t_t) + \boldsymbol{\gamma}' \boldsymbol{x_{i,t}} + \epsilon_{i,t}$$

where $y_{i,t}$ is the bid-ask spread divided by the closing price of firm i's stock at month t, d_i is a dummy variable equal to 1 if the firm was subject to an activist intervention; $p \quad t_t$ is a dummy variable equal to 1 if month *t* is after the intervention date; $\boldsymbol{x_{i,t}}$ is a vector of time-varying covariates, and $\epsilon_{i,t}$ is a random error term. The coefficient of interest is β_3, which captures the over-time difference in leakage between the two groups. We cluster standard errors by firm to address serial correlation in spreads. T-statistics are provided below correlation coefficients in parentheses. We use the following indicators of statistical significance: **** indicates $p < 0.001$, ** indicates $p < 0.01$, and * indicates $p < 0.05$.

	Spread	Spread	Spread	Spread	Spread
Treatment	0.0000	0.0002	0.0003	0.0003	-0.0002
	(0.01)	(0.70)	(1.14)	(1.00)	(-0.62)
Post	-0.0007***	-0.0002	0.0000	0.0000	0.0001
	(-6.14)	(-1.48)	(0.21)	(0.35)	(1.20)
Treatment x Post	**0.0021*** **	**0.0013*** **	**0.0009** **	**0.0011** **	**0.0011** **
	(4.14)	**(3.08)**	**(2.17)**	**(2.46)**	**(2.41)**
Amihud (2002) Liquidity		0.0092***	0.0084***	0.0086***	0.0064***
		(21.17)	(20.04)	(17.52)	(11.88)
Idiosyncratic Volatility			0.0982***	0.1040***	0.0724***
			(17.05)	(15.99)	(11.53)
Book to Market Ratio				-0.0000***	-0.0000***
				(-5.37)	(-9.67)
Market Value of Equity Decile					-0.0009***
					(-14.67)
Observations	577,269	532,304	532,238	426,195	426,195
R^2	0.000	0.055	0.064	0.120	0.133

Figure 1. Privately Optimal vs. Socially Optimal Activist Quality Range. This figure shows the range of the activist quality parameter θ_a and the resulting expected value to activism, after choosing the optimal stopping time τ^* as described in Section 2.B.,for the private vs. socially optimal maximization problems. The two expected-value calculations are given by:

$$E[\Pi(\theta_a, \tau)] = \theta_a^2 \frac{27}{32k} t_a^4 p_m^2 - \underline{k} + \sum_{t=0}^{\tau-1} \delta^t \left(\frac{\frac{1}{2} - ce^{\sqrt{t+1}}}{1 + e^{\sqrt{t+1}}} \right)$$

$$E[\Pi_S \quad (\theta_a, \tau)] = \theta_a^2 \frac{27}{32k} t_a^4 p_m^2 - \underline{k} + \sum_{t=0}^{\tau-1} \left[\delta^t \left(\frac{\frac{1}{2} - ce^{\sqrt{t+1}}}{1 + e^{\sqrt{t+1}}} \right) \right] - \lambda$$

Other parameters are set at $c = 0.1$, $t_a = 0.1$, $p_m = 1$, $\underline{k} = 3$, $k = 1$, and $\lambda = 4$. The red shaded region shows the range of activist quality parameter θ_a that yield a positive expected value of activism for the activist but a negative expected value to the social planner.

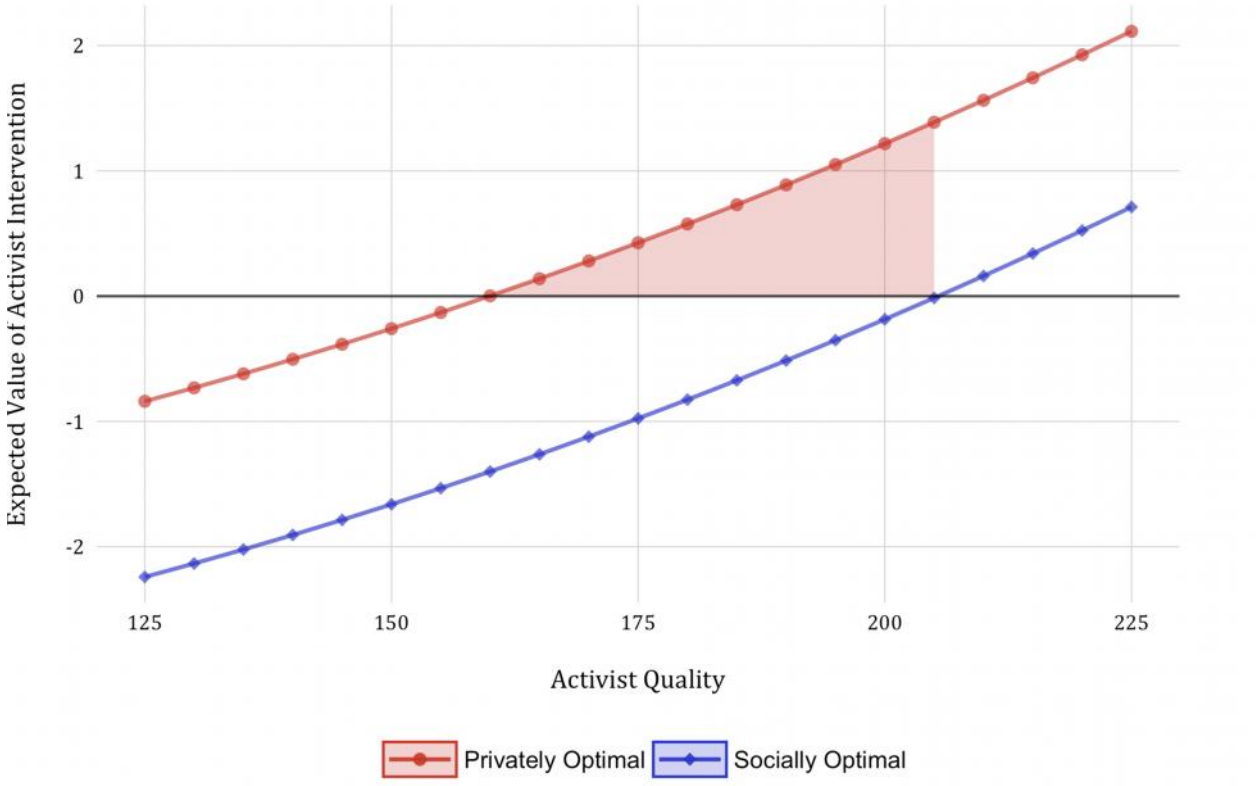


Figure 2. Illustrative Activist Settlement Agreement. The below excerpt from a settlement agreement, this one styled a "Support Agreement" between the Dow Chemical Company and Third Point LLC, a well-known activist investor, is illustrative of the agreements in our principal dataset.

SUPPORT AGREEMENT

This Support Agreement, dated November 20, 2014 (this "Agreement"), is by and among (i) Third Point LLC, Third Point Partners Qualified L.P., Third Point Partners L.P., Third Point Offshore Master Fund L.P., Third Point Ultra Master Fund L.P. and Third Point Reinsurance Co. Ltd. (collectively, "Third Point", and each individually, a "member" of Third Point) and (ii) The Dow Chemical Company (the "Company").

WHEREAS, Third Point and its Affiliates beneficially own 27,500,000 shares of common stock of the Company, par value $2.50 (the "Common Stock") of the Common Stock issued and outstanding on the date hereof; and

WHEREAS, the Company has determined that it is in the best interests of the Company and its stockholders and Third Point has determined that it is in its best interests to come to an agreement with respect to the election of members of the Company's Board of Directors (the "Board") at the Company's 2015 Annual Meeting of Stockholders (the "2015 Annual Meeting") and certain other matters, as provided in this Agreement.

NOW, THEREFORE, in consideration of and reliance upon the mutual covenants and agreements contained herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Board Representation and Board Matters.

(a) The Company and Third Point agree as follows:

(i) the Board shall take all action necessary (A) to increase the size of the Board by three directors to 13 directors, effective as of January 1, 2015, and (B) to appoint each of Robert Steven Miller and Raymond J. Milchovich (collectively, the "Designees") and Mark Loughridge to serve as directors of the Company, effective as of January 1, 2015, until the later of (1) the 2015 Annual Meeting and (2) the date that their successors are duly elected and qualified, subject to the terms of this Agreement;

(ii) the Company's slate of nominees for election as directors of the Company at the Company's 2015 Annual Meeting shall include (A) the Designees, (B) Mark Loughridge, (C) Richard Davis, who will replace a then-current director, other than the Designees and Mark Loughridge, and (D) no more than nine other nominees identified and approved by the Governance Committee and the Board;

(iii) the Company will use its reasonable best efforts to cause the election of each of the Designees to the Company's Board at the 2015 Annual Meeting (including recommending that the Company's stockholders vote in favor of the election of the Designees (along with all other Company nominees) and otherwise supporting each of them for election in a manner no less rigorous and favorable than the manner in which the Company supports its other nominees in the aggregate);

(iv) the Company shall take all action necessary to decrease the size of the Board to 12 directors by the completion of the Company's 2016 Annual Meeting of Shareholders (the "2016 Annual Meeting");

(v) that no later than the date of this Agreement, Third Point will provide to the Company an executed letter in the form attached hereto as Exhibit A, which includes a consent from each Designee to be named as a nominee in the Company's proxy statement for the 2015 Annual Meeting and to serve as a director if so elected (the "Nominee Letter");

(vi) that for so long as the following Designees serve on the Board, such Designee shall be offered the opportunity to become a member of the committees of the Board as follows: (1) Robert Steven Miller,

Governance Committee; and (2) Raymond J. Milchovich, Compensation and Leadership Development Committee; and

(vii) at all times prior to completion of the 2016 Annual Meeting and provided that at least one Designee remains a member of the Board, at least one Designee shall be offered the opportunity to be a member of each committee of the Board which may be created by the Board following execution hereof, and upon election to become such a member the Board shall effect such change in committee composition immediately (and no less than two business days following such election), assuming the absence of conflicts of interest involving such Designee relevant to such committee's activities.

2. Certain Other Matters.

(a) Each Designee shall be entitled to resign from the Board at any time in his discretion. For purposes of this Agreement, the "Standstill Period" shall mean the period from the date of this Agreement until 12:01 a.m. on the forty-fifth (45th) day prior to the advance notice deadline for making director nominations at the Company's 2016 Annual Meeting. If any Designee agrees to be included as a director nominee for election at any Stockholders Meeting other than as a director nominated by the Board for election at such Stockholders Meeting, the irrevocable resignation provision set forth in the Nominee Letter previously provided by such Designee shall become effective.

(b) The Company agrees that for so long as any of the Designees are on the Board, Third Point may request notice from the Company as to whether the Board intends to nominate each Designee for election at the 2016 Annual Meeting and the Company shall notify Third Point in writing of its then-current intentions with respect to the nomination of such Designee for election at the 2016 Annual Meeting (which written notice from the Company shall be delivered to Third Point by the later of forty-five (45) days prior to the advance notice deadline for making director nominations at the Company's 2016 Annual Meeting or ten business days following the Company's receipt of such request from Third Point). In the event that the Company's notifies Third Point pursuant to the immediately preceding sentence of its intent to nominate a Designee for election at the 2016 Annual Meeting, the Company shall so nominate such Designee (including recommending that the Company's stockholders vote in favor of the election of the Designees (along with all other Company nominees) and otherwise supporting each of them for election in a manner no less rigorous and favorable than the manner in which the Company supports its other nominees in the aggregate), unless (i) the Board determines, based on the advice of outside counsel, that it is required as a result of its fiduciary duties not to make such nomination, (ii) such Designee resigns from his position as a director of the Company or (iii) Third Point or any Third Point Affiliate takes any of the actions referenced in Section 2(c)(i), (iv) and, solely as it relates to the action referenced in clause (i) or (iv), clause (iii).

(c) During the Standstill Period, no member of Third Point shall, directly or indirectly (it being understood that any actions taken by Daniel S. Loeb shall be deemed to be actions taken by Third Point), and each member of Third Point shall cause each Third Point Affiliate (as defined below) it controls and Daniel S. Loeb not to, directly or indirectly:

(i) solicit proxies or written consents of stockholders or conduct any other type of referendum (binding or non-binding) with respect to, or from the holders of, the Voting Securities (as defined below), or become a "participant" (as such term is defined in Instruction 3 to Item 4 of Schedule 14A promulgated under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) in or assist any person or entity not a party to this agreement (a "Third Party") in any "solicitation" of any proxy, consent or other authority (as such terms are defined under the Exchange Act) to vote any shares of the Voting Securities (other than such encouragement, advice or influence that is consistent with Company management's recommendation in connection with such matter);

(ii) encourage, advise or influence any other person or assist any Third Party in so encouraging, assisting or influencing any person with respect to the giving or withholding of any proxy, consent or other authority to vote or in conducting any type of referendum (other than such encouragement, advice or influence that is consistent with Company management's recommendation in connection with such matter);

(iii) form or join in a partnership, limited partnership, syndicate or other group, including a "group" as defined under Section 13(d) of the Exchange Act, with respect to the Voting Securities (for the avoidance of doubt, excluding any group composed solely of Third Point and their Affiliates) or otherwise support or participate in any effort by a Third Party with respect to the matters set forth in clauses (i), (vii) or (ix) herein;

(iv) present at any annual meeting or any special meeting of the Company's stockholders any proposal for consideration for action by stockholders or seek the removal of any member of the Board or propose any nominee for election to the Board or seek representation on the Board;

(v) other than in market transactions where the identity of the purchaser is not known and in underwritten widely dispersed public offerings, sell, offer or agree to sell directly or indirectly, through swap or hedging transactions or otherwise, the securities of the Company or any rights decoupled from the underlying securities held by Third Point to any Third Party unless (A) such Third Party is a passive investor that has not filed a Schedule 13D and would not as a result of the purchase of the securities of the Company be required to file a Schedule 13D and (B) such sale, offer, or agreement to sell would not knowingly result in such Third Party, together with its Affiliates, owning, controlling or otherwise having any beneficial or other ownership interest in the aggregate of 9.9% or more of the shares of Common Stock outstanding at such time or would increase the beneficial or other ownership interest of any Third Party who, together with its Affiliates, has a beneficial or other ownership interest in the aggregate of 9.9% or more of the shares of Common Stock outstanding at such time, except in each case in a transaction approved by the Board;

(vi) grant any proxy, consent or other authority to vote with respect to any matters (other than to the named proxies included in the Company's proxy card for any annual meeting or special meeting of stockholders) or deposit any Voting Securities of the Company in a voting trust or subject them to a voting agreement or other arrangement of similar effect with respect to any annual meeting except as provided in Section 2(d) below, special meeting of stockholders or action by written consent (excluding customary brokerage accounts, margin accounts, prime brokerage accounts and the like);

(vii) make any request for stocklist materials or other books and records of the Company under Section 220 of the Delaware General Corporation Law or otherwise;

(viii) make, or cause to be made, any statement or announcement that relates to and constitutes an ad hominem attack on, or relates to and otherwise disparages, the Company or its business, operations or financial performance, its officers or its directors or any person who has served as an officer or director of the Company in the past, or who serves on or following the date of this Agreement as an officer, director or agent of the Company: (A) in any document or report filed with or furnished to the SEC or any other governmental agency, (B) in any press release or other publicly available format, or (C) to any analyst, journalist or member of the media (including without limitation, in a television, radio, internet, newspaper or magazine interview) (and the Company agrees that this Section 2(c)(viii) shall apply mutatis mutandis to the Company and its directors and officers with respect to Third Point);

(ix) institute, solicit or join, as a party, any litigation, arbitration or other proceeding against the Company or any of its current or former directors or officers (including derivative actions), other than (A) litigation by Third Point to enforce the provisions of this Agreement, (B) counterclaims with respect to any proceeding initiated by, or on behalf of, the Company or its Affiliates against Third Point or a Designee and (C) the exercise of statutory appraisal rights; provided that the foregoing shall not prevent any member of Third Point from responding to or complying with a validly issued legal process (and the Company agrees that this Section 2(c)(ix) shall apply mutatis mutandis to the Company and its directors and officers with respect to Third Point);

(x) without the prior written approval of the Board, separately or in conjunction with any other person or entity in which it is or proposes to be either a principal, partner or financing source or is acting or proposes to act as broker or agent for compensation, propose (publicly, privately or to the Company) or effect any tender offer or exchange offer, merger, acquisition, reorganization, restructuring, recapitalization or other business combination involving the Company or a material amount of the assets or businesses of the Company or actively encourage, initiate or support any other Third Party in any such activity;

(xi) purchase or cause to be purchased or otherwise acquire or agree to acquire Beneficial Ownership of any Voting Securities, if in any such case, immediately after the taking of such action, Third Point would, in the aggregate, collectively beneficially own, or have an economic interest in, an amount that would exceed 4.99% of the then outstanding shares of Common Stock;

(xii) enter into any negotiations, agreements, arrangements or understandings with any Third Party with respect to the matters set forth in this Section 2; or

(xiii) request, directly or indirectly, any amendment or waiver of the foregoing in a manner that would be reasonably likely to require public disclosure by Third Point or the Company.

[. . . .]

(d) Until the end of the Standstill Period, Third Point together with all controlled Affiliates of the members of Third Point (such controlled Affiliates, collectively and individually, the "Third Point Affiliates") shall cause all Voting Securities owned by them directly or indirectly, whether owned of record or Beneficially Owned, as of the record date for any annual or special meeting of stockholders or in connection with any solicitation of stockholder action by written consent (each a "Stockholders Meeting") within the Standstill Period, in each case that are entitled to vote at any such Stockholders Meeting, to be present for quorum purposes and to be voted, at all such Stockholders Meetings or at any adjournments or postponements thereof, (i) for all directors nominated by the Board for election at such Stockholders Meeting and (ii) in accordance with the recommendation of the Board on any precatory or non-binding proposals and any non-transaction-related proposals that come before any Stockholder Meeting.

3. Public Announcements. Promptly following the execution of this Agreement, (a) the Company and Third Point shall announce this Agreement by means of a jointly issued press release in the form attached hereto as Exhibit B (the "Joint Press Release") and (b) the Company shall announce the agreement to appoint four new directors to the Board by means of a press release in the form attached hereto as Exhibit C (the "Dow Release"). Neither the Company (and the Company shall cause each of its Affiliates, directors and officers not to) nor Third Point (it being understood that any actions taken by Daniel S. Loeb shall be deemed to be actions taken by Third Point) or any Third Point Affiliate shall make or cause to be made any public announcement or statement with respect to the subject of this Agreement that is contrary to the statements made in the Press Release and the Dow Release, except as required by law or the rules of any stock exchange or with the prior written consent of the other party.

Figure 3. Illustrative Form 8-K: Disclosure of Material Corporate Event. The below excerpt from a Form 8-K filed by Gevity HR, Inc., describing the sudden resignation of its Senior Vice President for National Sales & Field Service Operations, filed approximately one month after a settlement agreement between the company and the activist investor ValueAct, is illustrative of the Form 8-Ks that constitute our sample.

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Date of report (Date of earliest event reported): July 27, 2007 (July 23, 2007)

GEVITY HR, INC.
(Exact name of registrant as specified in charter)

Florida	**0-22701**	**65-0735612**
(State of incorporation)	(Commission File Number)	(IRS Employer Identification No.)

9000 Town Center Parkway
Bradenton, Florida 34202
(Address of principal executive offices / Zip Code)

(941) 741-4300
(Registrant's telephone number, including area code)

Item 5.02. Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

Departure of Certain Officers

Peter Grabowski, Senior Vice President National Sales & Field Service Operations, resigned from Gevity HR, Inc. (the "Company") effective July 23, 2007. In connection with his resignation, Mr. Grabowski and the Company entered into a Separation Agreement and Full and Final Release of Claims, dated July 24, 2007 (the "Agreement"). The Agreement provides that the Company will pay Mr. Grabowski severance totaling $240,000 payable in equal installments of $15,000 through March 13, 2008, together with health and welfare benefits on the same terms and conditions currently in place through that period of time. The Agreement also provides for a full and final release by Mr. Grabowski of any and all claims he may have against the Company. The foregoing description of the Agreement is qualified in its entirety by reference to the full text of the Agreement, which is attached hereto as Exhibit 99.1 and incorporated herein by reference.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

GEVITY HR, INC.
(Registrant)

Dated: July 27, 2007

By: /s/ Edwin E. Hightower, Jr.
Name: Edwin E. Hightower, Jr.

Figure 4. Summary Statistics: Kernel Density Plot of Form 8-K Filings Over Time. The plot below illustrates the density of Form 8-K filings over time in both our treatment and control groups; as shown below, the incidence of Form 8-Ks in each group over time is statistically indistinguishable.

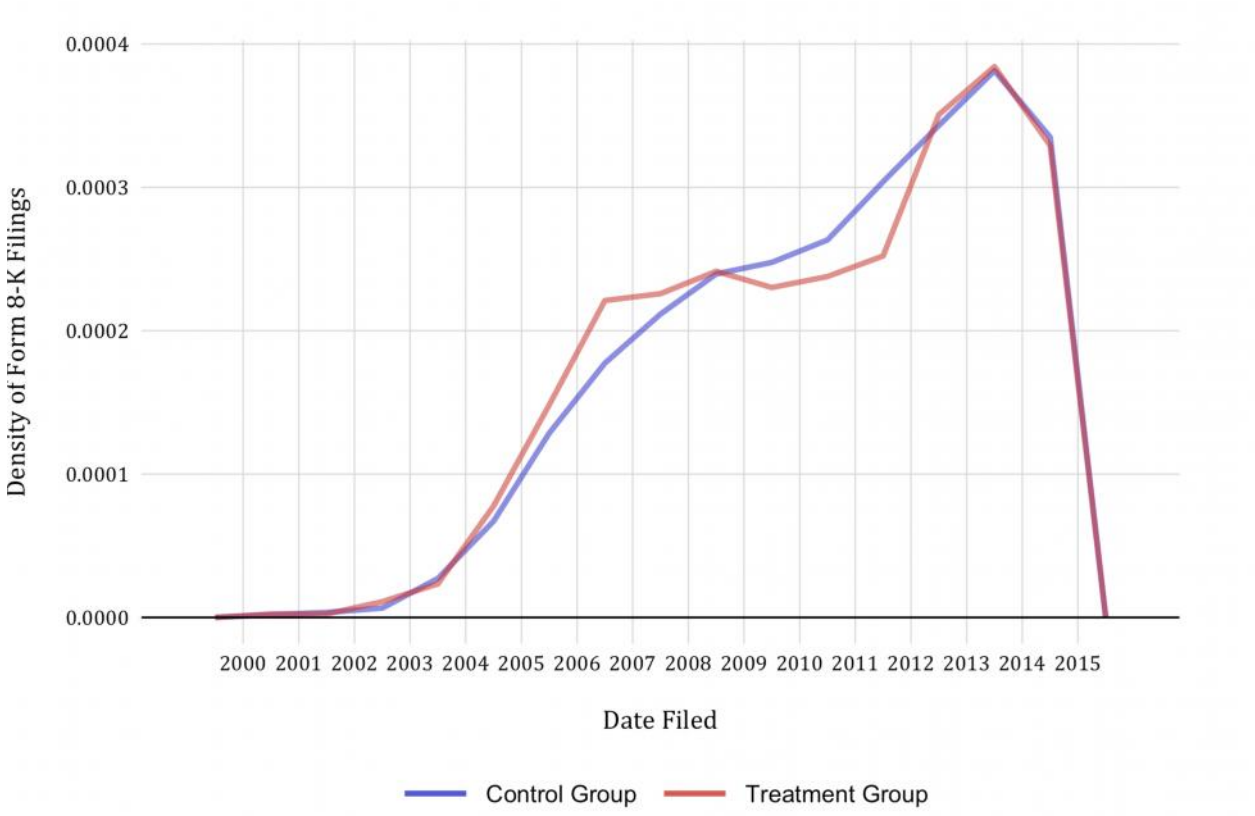


Figure 5. Parallel Trends. This Figure plots pre- and post-time trends on the leakage outcome for the treatment and control groups. The x-axis is the number of days between the intervention date and the Form 8-K filing. This normalization by the "time difference" allows for plotting leakage for Form 8-K filings from different points in time on the same figure. We average the leakage by treatment and control group for each "time difference" and apply nonparametric smoothing piecewise to the pre- and post- periods for each group, using a Gaussian kernel with a bandwidth of 30 days. The treatment group is plotted with a solid line, while the control group is plotted with a dashed line, in the Figure below.

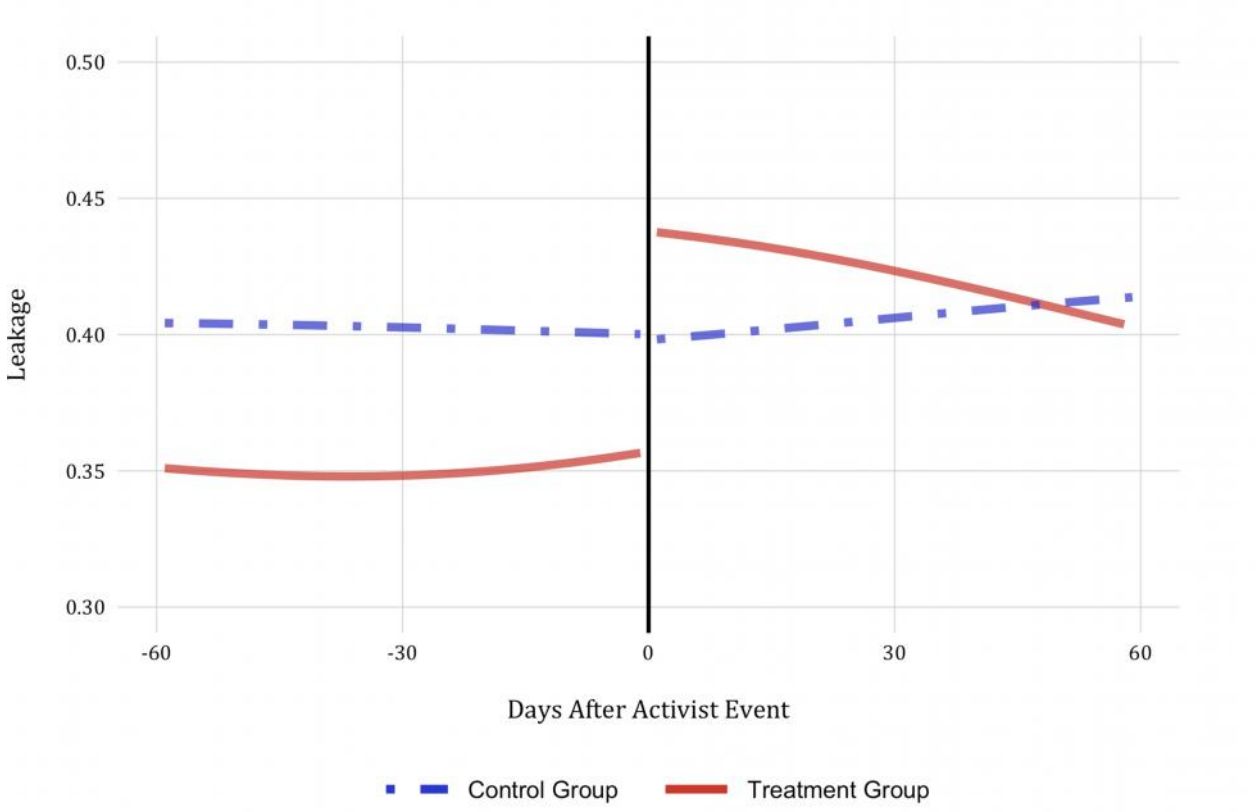


Figure 6. Effect Heterogeneity by Window Length. This Figure presents the difference-in-difference $d_i \times \Delta\tau_{i,t}$ coefficient and 95% confidence intervals for different sample inclusion windows (that is, different windows after the activist director first gains access to the boardroom). As the Figure shows, the effect decreases with the window length, and it is consistently not significantly different from zero at a window of 150 days and beyond.

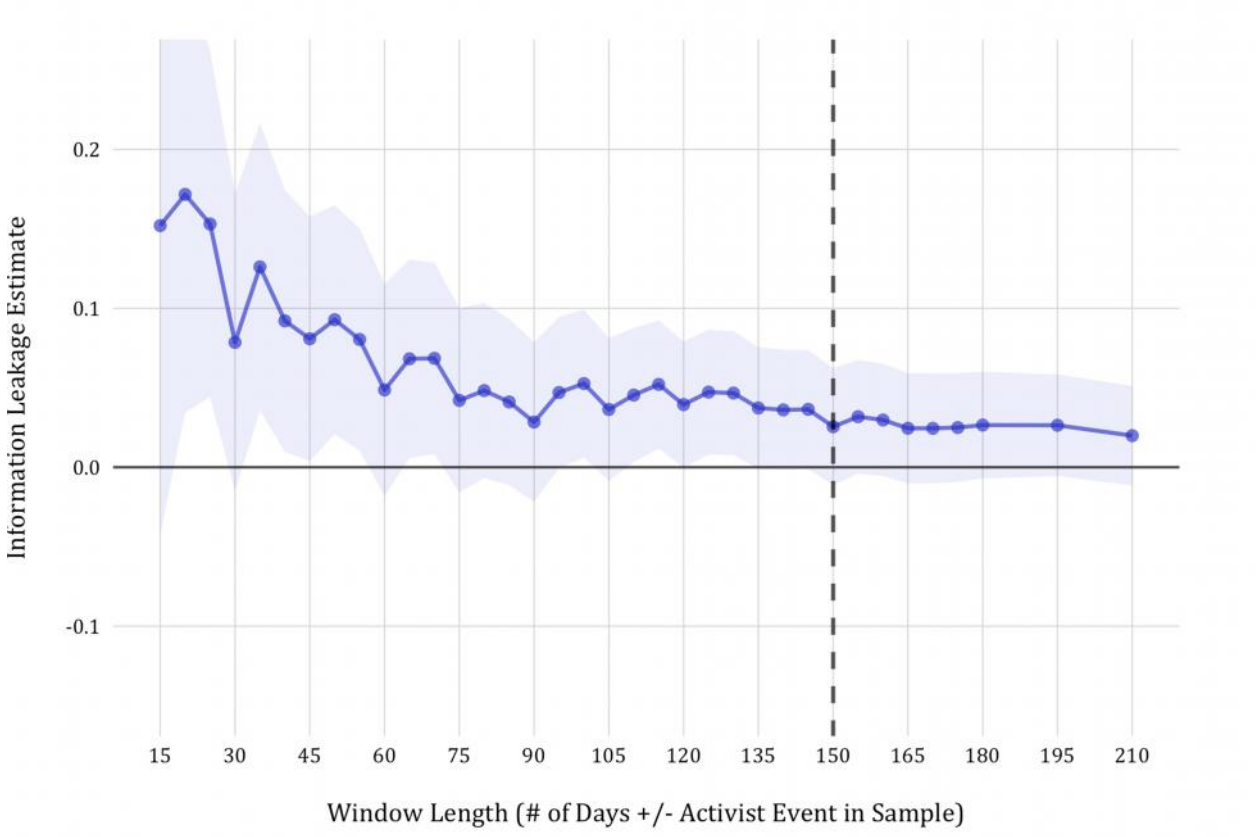
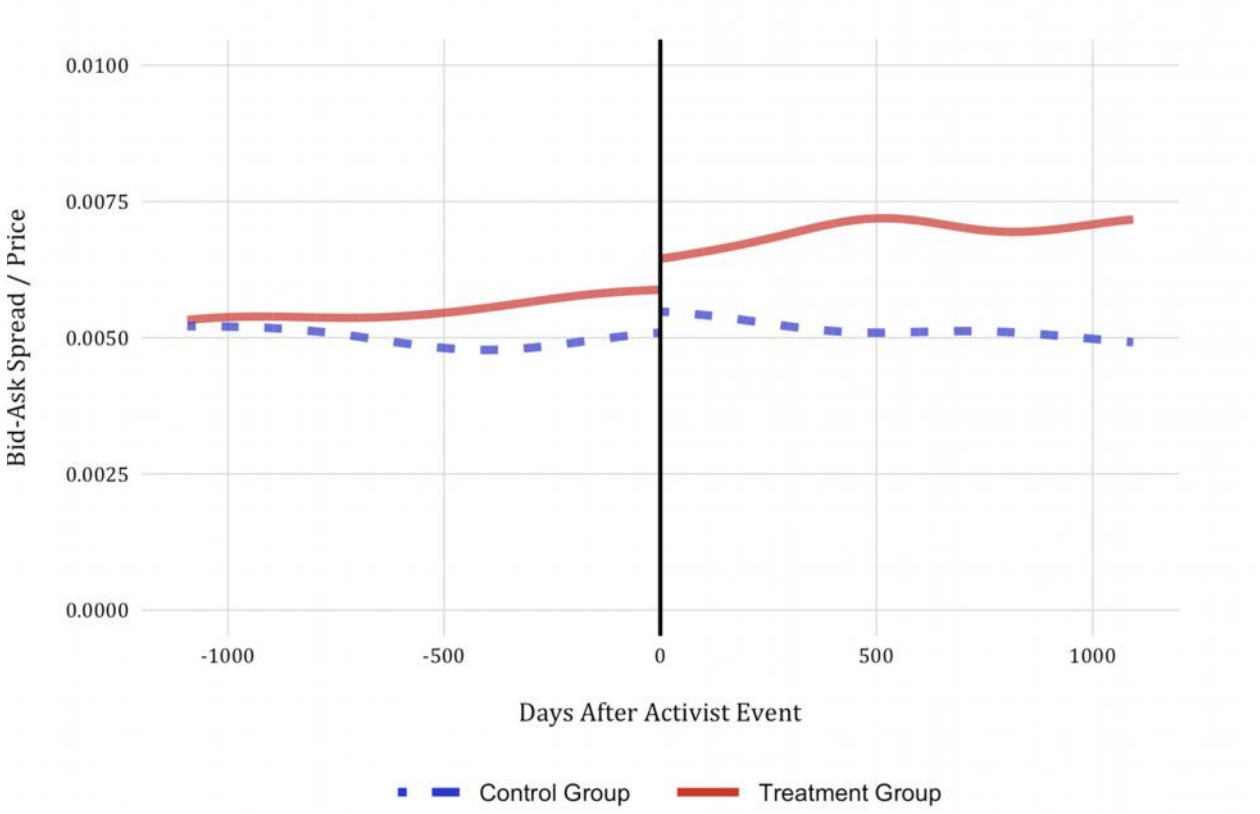


Figure 7. Parallel Trends: Bid-Ask Spreads. The following figure plots the average bid-ask spread divided by the closing price of each firm in the treatment and control groups, prior to and following the activist interventions. As the Figure shows, the trends are approximately parallel prior to the intervention and diverge thereafter.



APPENDIX

In this Appendix, we derive the optimal stopping time for the facilitation of illicit trading in the model described in Section 2.B. Suppose that B_{t+1} is uniformly distributed over the interval $[0,1]$ and the probability of detection is given by a standard logistic function of the square root of time:

$$\pi_t = \frac{1}{1 + \exp(-\sqrt{t})}$$

It is plausible to assume that the probability of detection increases with time because it is easier for prosecutors to detect and establish illegal insider trading as the number of trades and abnormal profit increases. It might seem that the probability of detection does not necessarily increase with time, but rather with the number of trades; however, in this simplified model, it is a reasonable approximation, as the agent either "trades or not" – and the periods of no-trading do not *decrease* the probability of detection. With these assumptions, it is straightforward to substitute:

$$b_t^* = c\frac{\frac{1}{1 + \exp(-\sqrt{t})}}{1 - \frac{1}{1 + \exp(-\sqrt{t})}} = c\exp(\sqrt{t})$$

which allows for a straightforward determination of a maximum stopping time $\bar{\tau}$ such that for any $t > \bar{\tau}$, we have that $\Pr(B_\tau > b_\tau^*) = 0$. Suppose, for example, that the punishment $c = 0.1$. Then $b_\tau^* > 1$ and $\Pr(B_\tau > b_\tau^*) = 0$ at $\bar{\tau} \approx 5.3$.

However, it is generally better for the director to stop before this time $\bar{\tau}$. Substituting $b_t^{\square} = c\exp(\sqrt{t})$ in the value function yields, for any period $t \leq \tau$where $F\left(1 - c\,e^{\sqrt{t}}\right) > 0$ (of course, for any period $t > \tau$ where $F\left(1 - c\,e^{\sqrt{t}}\right) = 0$, we have that $E_t[V(B_{t+1})] = 0$):[41]

$$E_t[V(B_{t+1})] = \delta E_t[V(B_{t+2})] + \left(1 - c\,e^{\sqrt{t+1}}\right)\left(1 - \frac{1}{1 + e^{\sqrt{t+1}}}\right)E_t\left[B_{t+1} - c\,e^{\sqrt{t+1}} \middle| B_{t+1} > c\,e^{\sqrt{t+1}}\right]$$

$$E_t[V(B_{t+1})] = \delta E_t[V(B_{t+2})] + \left(1 - c\,e^{\sqrt{t+1}}\right)\left(1 - \frac{1}{1 + e^{\sqrt{t+1}}}\right)E_t\left[\frac{B_{t+1} - c\,e^{\sqrt{t+1}}}{1 - c\,e^{\sqrt{t+1}}}\right]$$

$$E_t[V(B_{t+1})] = \delta E_t[V(B_{t+2})] + \left(1 - c\,e^{\sqrt{t+1}}\right)\left(1 - \frac{1}{1 + e^{\sqrt{t+1}}}\right)\left(\frac{1}{1 - c\,e^{\sqrt{t+1}}}E_t[B_{t+1}] - 1\right)$$

$$E_t[V(B_{t+1})] = \delta E_t[V(B_{t+2})] + \frac{E_t[B_{t+1}] - 1 - ce^{\sqrt{t+1}}}{1 + e^{\sqrt{t+1}}}$$

Recall that $E_t[B_{t+1}] = \frac{1}{2}$, which leads to:

$$E_t[V(B_{t+1})] = \delta E_t[V(B_{t+2})] + \frac{\frac{1}{2} - ce^{\sqrt{t+1}}}{1 + e^{\sqrt{t+1}}}$$

Note that the second term is approximately the derivative of the cumulative value function with respect to time. For $\delta \approx 1$, the optimal stopping time is simply the first-order condition:

$$\frac{1}{2} - ce^{\sqrt{\tau^{\square}}} = 0$$

$$\tau^{\square} = [\ln 2c]^2$$

[41] Recall that $F(B_{t+1}) = B_{t+1}$ in this simple setting.

In general, it will be the case that $\tau^{\square} < \bar{\tau}$. Consider, again, the example where $c = 0.1$, which yields an optimal stopping time of $\tau^{\square} \approx 2.59$. Letting $\delta = 0.99.$, the cumulative expected value for the upcoming time period is given by:

Time Period	$E_t[V(B_{t+1})]$	π_t
t=1	0.05952391	0.73
t=2	0.07584117	0.80
t=3	0.06689266	0.84
t=4	0.04168107	0.88
t=5	0.005558258	0.90

Appendix Table 1: Expected Payoff By Stopping Time

As the table shows, the activist's expected payoff is indeed maximized by stopping at $t = 2$ rather than $t = 5$. That is: consistent with the empirical findings described in Section 4.A., an activist director may be better off facilitating trading for shorter rather than longer periods of time.

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