Blockholder Disclosure Thresholds and Hedge Fund Activism *

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Abstract

Hedge fund activists discipline corporate management in exchange for trading profits obtained by secretly acquiring shares in target companies prior to intervention. We show how blockholder disclosure thresholds regulate market transparency and hence the extent of activism. We characterize how disclosure thresholds structure the complex interactions between (a) initial investors in a firm—who value the value-enhancing disciplining effects of activism on management, but incur costs trading with activists who know their own value-enhancing potential; (b) activists—who value higher thresholds when establishing equity stakes, but incur costs if high thresholds reduce real investment or discourage managerial misbehavior; and (c) firm managers—who weigh private benefits of value-reducing actions against potential punishment if activists intervene. When managerial behavior is sufficiently unresponsive to threats of activism, initial investors and society value tighter disclosure thresholds than activists whenever the costs of activism tend to be low, making the probability of activism insensitive to the level of activist trading profits. In contrast, activists value tighter thresholds when managerial behavior is responsive to potential activism.

Keywords: Hedge fund activism, blockholder disclosure thresholds, informed trading, investor activism.

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1 Introduction

Hedge fund activism mitigates agency problems that affect governance in publicly-traded companies with dispersed owners. An extensive empirical literature establishes that activist funds generate gains to their targets in terms of performance and stock prices (Brav et al. 2008; Clifford 2008; Klein and Zur 2009; Boyson and Mooradian 2011; Brav et al. 2015; Bebchuk et al. 2015). However, their financially-driven incentives (Brav et al. 2010; Burkart and Dasgupta 2015; Back et al. 2017) and the relative short-termism of their strategies (Brav et al. 2010) often generate controversy. In particular, activist hedge funds are, by nature, informed traders that profit from trading on their information advantages at the expense of uninformed shareholders. As a result, activists can impair real investment, destroying value (Leland 1992; Bernhardt et al. 1995).

Our paper models the inter-linkages between real investment, hedge fund activism and managerial behavior, showing that hedge fund activism creates value when sufficiently limited, but that it can harm both uninformed investors and society otherwise. Our analysis contributes to the regulatory debate about the levels of optimal blockholder disclosure thresholds, when these thresholds limit trading profits of activist funds and hence their incentives to engage in costly, value-enhancing interventions. We determine how disclosure thresholds structure complex interactions between (a) initial investors in a firm—who value the direct and indirect value-enhancing disciplining effects of activism on management, but may incur costs trading with activists who are privately-informed of their value-enhancing potential; (b) activists—who value higher thresholds when establishing equity stakes, but incur costs if high thresholds deter real investment or discourage managerial misbehavior that is the source of their profits; and (c) firm managers—who weigh private benefits of malfeasance against potential punishment if activists intervene. We characterize how the optimal disclosure thresholds vary with economic primitives from the perspectives of uninformed investors, activists and a welfare-maximizing regulator. When managerial behavior is sufficiently unresponsive to threats of activism, initial investors and society value tighter disclosure thresholds than activists when the costs of activism tend to be low, so that the probability of activism is relatively insensitive to the level of activist trading profits. In contrast, when managerial behavior is responsive to potential activism, activists value tighter thresholds.

In 2011, senior partners at Wachtell, Lipton, Rosen & Katz (WLRK), a prominent law firm specializing in corporate and securities law and corporate governance, submitted a rule-making petition—henceforth the WLRK (2011) Petition—to the Securities and Exchange Commission (SEC) advocating that rules governing the disclosure of blocks of stock in publicly traded companies be tightened.[1] WLRK argued that the US disclosure threshold of 5% allows activist investors to secretly accumulate enough stock to control target companies. Empirical evidence shows that while activist funds create fundamental changes in targeted companies (Brav et al. 2008; Klein and Zur 2009), they typically own only about 6% of shares and only hold positions for short periods of time (Brav et al. 2010). This, WLRK argued, undermines the original purpose of Section 13(d) and damages market transparency and investor confidence. Academics responded, questioning the desirability of the proposed measures (Bebchuk and Jackson 2012; Bebchuk et al. 2013). They argued that a crucial incentive for activist funds is the ability to purchase stock at prices that do not yet reflect the value of their actions, and that tighter disclosure rules would discourage hedge fund activism. In turn, they argued that discouraging such activism would harm small investors, who would then not glean the value-enhancing benefits of hedge fund activism on corporate behavior.

Despite the importance of blockholder disclosure thresholds and the heated debate,[2] there has not yet been a comprehensive analysis to provide a rationale for this rule or guidance for potential adjustments. Why a threshold of 5%? When and how do interests of uninformed investors and activist hedge funds conflict? Can activists benefit from disclosure thresholds? Our paper sheds light on these issues. It presents a model of hedge fund activism and shows how disclosure thresholds affect (i) incentives of activist funds to engage in costly managerial disciplining; (ii) real investment of small uninformed investors; (iii) choices by managers of whether to pursue potentially value-destroying activities.

Activist funds profit from secretly acquiring undervalued stock and selling it at higher prices after they intervene. Share prices typically rise sharply when an activist's presence is revealed because the market anticipates subsequent intervention, and Bebchuk et al. (2015) provide evidence that these post-disclosure spikes in share prices reflect the long-term value of intervention. Accordingly, the main source of rents for activist funds is the price change caused by their own interventions, and the value of the shares acquired prior to revealing themselves is key to their profitability (WLRK 2011 Petition, Bebchuk and Jackson 2012).

[1] The WLRK (2011) Petition asks the SEC to update Schedule 13D reporting requirements to reduce a 10-day window between crossing the 5% threshold and the initial filing deadline, and to broaden definitions of beneficial ownership. External link to the WLRK (2011) Petition *here*.

[2] The debate is built around interventions by leading academics and important figures in the industry. Examples of law experts promoting reductions in disclosure thresholds include the following interventions in the *Harvard Law School Forum on Corporate Governance and Financial Regulation*: "Section 13(d) Reporting Requirements Need Updating" and "13(d) Reporting Inadequacies in an Era of Speed and Innovation" by David A. Katz of WLRK in 2012 and 2015 respectively; "Activist Abuses Require SEC Action on Section 13(d) Reporting" and "Proposed Revisions to 13(d) Beneficial Ownership Reporting Rules" by Theodore N. Mirvis of WLRK in 2014 and 2016 respectively. Letters of both the Managed Funds Association and the Alternative Investment Management Association in (2013) to the Canadian Securities Administrators contain arguments by hedge funds against such proposals (external link *here*). Academic work against the WLRK Petition includes Bebchuk and Jackson (2012) and Bebchuk et al. (2013).

A disclosure threshold limits the equity position that can be secretly acquired, reducing incentives to intervene. Importantly, the expected levels of activism affect the expected profitability of real investment by uninformed investors. In turn, this real investment affects the value of activist interventions, creating a feedback effect on the incentives of activists to participate. The optimal disclosure threshold policy for each party reflects the tensions faced with regard to the preferred level of market transparency.

Consider the tradeoffs faced by uninformed investors. Higher transparency (a lower disclosure threshold) reduces their trading losses, but it also reduces the willingness of hedge fund activists to intervene. In turn, this encourages management to pursue its own interests at the expense of shareholders. Uninformed investors value binding disclosure thresholds when the expected trading losses saved outweigh the disciplining benefits. They gain from the reduced shares that activists acquire when those shares are not needed to induce activism, but they are harmed when the share limit discourages activism. Their optimal disclosure threshold, when interior, trades these considerations off. In particular, uninformed investors value binding disclosure thresholds whenever the profit elasticity of activism is sufficiently small.

Despite the long-term value of hedge fund activism (Brav et al. 2015; Bebchuk et al. 2015), researchers have found that activist funds tend to have short investment horizons,[3] and that they acquire stock after targeting a firm.[4] We model this by considering a large informed (potential) activist fund that is external to the firm, and whose incentives to incur the cost of intervention are provided by the increase in the value of the stock that he acquires. That is, the activist's sole source of rents is the increase in stock value due to intervention relative to the acquisition price, making activism directly related to block size.[5]

The activist endogenously determines how many shares to acquire. We develop a static dealership model (see e.g., Kyle 1985) in which the activist trades along with a random, uniformly-distributed measure of shareholders (initial investors) who receive liquidity shocks that force them to sell their shares. A competitive market maker sets price given the net order flow from the activist and initial shareholders. The activist's order trades off between the benefits of a larger block size and the costs of the information revealed. This formulation is related in spirit to that in Edmans (2009), who introduces exponentially-distributed liquidity trade. This allows Edmans to solve for informed trade and expected profits in closed

[3]Brav et al. (2010) finds that the median duration of investment from when the Schedule 13D is filed until divestment is about nine months. Brav et al. (2008) and Boyson and Mooradian (2011) provide more details on the duration of activist hedge funds investment in target companies.

[4]Bebchuk et al. (2013) find that much of an activist's position is built on the day they cross the 5% disclosure threshold.

[5]Shleifer and Vishny (1986) are the first to recognize the positive relation between monitoring incentives and block size, showing that large minority shareholders can alleviate free-riding in the disciplining of corporate management. Edmans and Holderness (2016) review the large literature that follows.

form. Here, uniformly-distributed liquidity trade serves the same purpose, delivering simple closed-form solutions. What matters for our analysis and findings are how an activist's ex-ante expected trading profits are affected by disclosure thresholds at the moment the activist decides to intervene. In that sense, our qualitative insights extend naturally to a dynamic setting along the lines of Back et al. (2017), who focus on the dynamics of the stock acquisition process and the endogenous relation between block size and incentives for costly intervention.

The second key tension in our model is that the activist's trading profits depend on the value of intervention, which is directly related to real investment—value-enhancing actions in larger companies have bigger impacts. When the expected losses of initial shareholders to the activist are too high relative to the benefits of disciplining management, the ability to secretly acquire too many shares reduces real investment, reducing the profits that an activist can extract. The activist does not internalize the investment feedback effect in his trading because he participates only after initial investment has been sunk. A disclosure threshold can serve as a commitment device for an activist to limit his trade, and thereby raise real investment. Surprisingly, we establish the activist never wants a binding disclosure threshold just because it boosts real investment. That is, as long as managerial malfeasance is sufficiently insensitive to the threat of investor activism, we prove that this tension is always resolved against the investment feedback effect—the activist never wants to face a binding disclosure threshold.

The negative effect of market opacity on real investment captures the original concerns of the Williams Act (1968), which was designed to "alert investors in securities markets to potential changes in corporate control and to provide them with an opportunity to evaluate the effect of these potential changes".[6] Trading is a zero-sum game in which the activist's expected trading profits represent expected trading losses to uninformed investors. When trading losses outweigh the benefits of monitoring, i.e., when the profit elasticity of activism is small, hedge fund activism harms uninformed investors, causing them to reduce investment. The opposite happens when the profit elasticity of activism is high. By regulating these trading transfers, disclosure thresholds affect real investment. This link between market efficiency and economic efficiency was first made in Bernhardt et al. (1995). Here, we identify twin real effects of informed trade by hedge fund activists: (i) it encourages activists to create value by intervening in underperforming companies, and (ii) it affects real investment.

The third strategic agent is the firm's management. The manager can take a value-destroying action to obtain private benefits, but she incurs a reputation cost if disciplined by the activist. Improvements in the performance and governance achieved by activists often

[6]Quote of the case resolution Wellman v. Dickinson, 682 F.2d 355, 365-66 (2d. Cir. 1982), citing GAF Corp. v. Milstein, 453 F.2d 709, 717 (2d Cir. 1971), cert. denied, 406 U.S. 910 (1972). (External link *here*). Used in "Section 13(d) Reporting Requirements Need Updating" by David A. Katz of WLRK in *Harvard Law School Forum on Corporate Governance and Financial Regulation*, 2012.

come at the expense of managers and directors who see sharp reductions in compensation and a higher likelihood of being replaced (Brav et al. 2010; Fos and Tsoutsoura 2014). Keusch (2017) finds evidence that following activist campaigns, companies dismiss underperforming CEOs. As a consequence, the threat of being disciplined by an activist improves managerial performance (Gantchev et al. 2017). We capture this mechanism, recognizing the ex-ante disciplining role of hedge fund activists in discouraging managerial malfeasance. Since higher trading transfers make an activist more willing to act *if* management misbehaves, they also induce better behavior by management. We call this the managerial feedback effect.

The managerial feedback benefits uninformed investors, but, paradoxically, by reducing the likelihood that a manager pursues actions that benefit himself at the expense of shareholders, it reduces an activist's opportunities to extract profit from its business of disciplining management. When managers are sensitive to the threat of activism, initial shareholders are happy to increase the block disclosure threshold, as their trading losses are only realized when the activist intervenes, so they are conditional on managers' malfeasance. Raising the disclosure threshold both increases activists' intervention rates (ex-post disciplining) and discourages malfeasance (ex-ante disciplining). The same mechanism represents a tension for an activist fund, which trades off higher conditional trading profits against a lower probability of profiting. When the activism elasticity of malfeasance is sufficiently large, i.e., when managerial feedback is strong, activist hedge funds benefit from tighter disclosure thresholds. Indeed, we establish that whenever activists value a binding disclosure threshold, it is always lower than that preferred by uninformed investors. In effect, the willingness of an activist hedge fund discourages excessively—from its perspective, but not shareholders—the desire of management to pursue its own interests at the expense of shareholders. Shareholders gain from the activist's willingness to engage without having to pay in terms of trading costs.

We also characterize the socially-optimal disclosure threshold and show that it rarely coincides with the preferred policies of uninformed investors or activists. Society (a regulator) does not internalize the transfer of trading profits from uninformed investors to the hedge fund, caring only about the expected value of the firm net of the cost of capital and the cost of activism. Intuitively, society is not directly concerned about trading in financial markets, but only the indirect real effects of such trading. We show that the socially-optimal disclosure threshold is always weakly between the thresholds preferred by shareholders and the activist hedge fund.

We next relate the paper to the literature. Section 2 studies a simple model of hedge fund activism in which managerial behavior is exogenous. Section 3 introduces blockholder disclosure thresholds and derives the optimal policies for the different parties. Section 4 endogenizes managerial behavior. Section 5 concludes. An Appendix contains all proofs.

1.1 Related Literature

This paper contributes to a rapidly growing body of research on hedge fund activism. The seminal work of Shleifer and Vishny (1986) introduced the role of blockholders as monitors of corporate management. More recently, research has focused on the relation between financial markets and the monitoring incentives of blockholders (see Edmans and Holderness 2016 for a review).[7] The literature on hedge fund activism, including our paper, reflects that disciplining management often *is* the business of blockholders. The key role of financial markets follows from the strategies of blockholders, which consist of acquiring stock in target companies before the price reflects the value of their actions.

We motivate our main modelling assumptions using findings from the vast empirical literature on hedge fund activism. Collin-Dufresne and Fos (2015) and Gantchev and Jotikasthira (2017) provide evidence that hedge fund activists exploit liquidity sales to purchase stock in target companies. A host of papers document that activist funds enhance the value of these companies by disciplining management (Brav et al., 2008;Clifford, 2008; Klein and Zur, 2009; Boyson and Mooradian, 2011; Brav et al., 2015; Bebchuk et al., 2015) through costly interventions (Gantchev, 2013). Brav et al. (2010), Fos and Tsoutsoura (2014) and Keusch (2017) provide empirical foundations for our assumption that managers in target companies are penalized when disciplined by activist funds. Our paper endogenizes firm value by assuming that investors react to the expected value of the company, which is determined by corporate governance. While this relation has not been established in the literature on hedge fund activism, La Porta et al. (2006) and Djankov et al. (2008) find evidence of higher investment in markets with more legal investor protection.

Some of our predictions have empirical support, while others remain to be tested. The model predicts that the stock price reaction that follows disclosure of an activist fund captures the value of their actions (Bebchuk et al., 2015), and that disclosure thresholds constrain their acquisitions (Bebchuk et al., 2013). Gantchev et al. (2017) provides evidence of the ex-ante disciplining effect of hedge fund activism.

Few papers have formally studied hedge fund activism. Most notably, our paper recognizes the role of financial markets on the incentives of activists to take positions in a target company and intervene. This property is shared with Back et al. (2017), who characterize the dynamic trading of an activist investor. As in our paper, they follow Kyle (1985) by introducing exogenous market uncertainty (liquidity trading) that provides camouflage for a blockholder's trades. Back et al. (2017) revisit the classic question of the relationship be-

[7]Broadly, this can be classified as "exit" (Admati and Pfleiderer, 2009; Edmans, 2009; Edmans and Manso, 2011); "voice" literature in shareholder interventions; and the interaction between the two (Levit, 2017; Back et al., 2017).

tween liquidity and economic efficiency, and show how the intervention cost function affects outcomes. Our paper simplifies the trading process (static) and the cost of intervention (fixed) in order to endogenize investment and study the role of market transparency, i.e., of blockholder disclosure thresholds. In this way, the two papers complement each other.

Market liquidity also plays a key role in our model. The activist fund is initially external to the target company, so liquidity camouflages its purchases of shares and diminishes adverse price impacts, making intervention more profitable. This positive relationship was first formalized by Maug (1998) and Kahn and Winton (1998) in the context of general blockholder interventions, and Kyle and Vila (1991) in the context of takeovers.[8]

Other analyses of hedge fund activism share with our paper the essential trade-off between the financial benefit of increasing a target company's value (and hence share price) and the cost of intervention. Burkart and Lee (2015) compare hedge fund activism with hostile takeovers in a complete information setting, and show that they can be regarded as polar approaches to the free-riding problem of Grossman and Hart (1980). Burkart and Dasgupta (2015) model hedge fund activism as a dual-layered agency model between investors, activists and managers. Activist funds compete for investor flows, and this affects their governance as blockholders. In their paper, funds inflate short-term performance by increasing payouts financed by leverage, which discourages value-creating interventions in economic downturns due to debt overhang. Brav et al. (2016) recognize the complementarity of costly interventions by distinct funds in the same target and model the resulting coordination problem.

Our paper is also related to the insider trading literature. In our model, the hedge fund activist is an informed trader that profits from trading with uninformed investors. This reduces the profitability of uninformed investors, who then reduce their investments. Leland (1992) and Bernhardt et al. (1995) first model this mechanism to study the welfare effects of insider trading. This literature focuses on the informational role of prices for investment and anticipation of future trading by uninformed agents with informed traders; our current paper combines this anticipation of future trading with how such informed trading provides incentives for managerial disciplining. A more direct link to the insider trading literature concerns the impact of mandatory disclosure rules for insiders (see Huddart et al. 2001).

Our paper is motivated by a regulatory debate that has been largely overlooked by the finance literature. Many calls for revisions of blockholder disclosure rules have been made by prominent lawyers, hedge funds and academics.[9] Bebchuk and Jackson (2012) provide a

[8] In contrast, Coffee (1991) and Bhide (1993) argue that liquidity facilitates exit when management underperforms, and therefore discourages intervention. In the dynamic analysis of Back et al. (2017), the relationship between liquidity and intervention depends on the structure of the cost function.

[9] *Harvard Law School Forum on Corporate Governance and Financial Regulation* contains a discussion of interventions by different parties.

comprehensive analysis in corporate law of the law and economics of blockholder disclosure thresholds, and Bebchuk et al. (2013) empirically analyse pre-disclosure accumulations of hedge fund activists. In line with their findings, our paper shows that lower disclosure can increase investor value. This is against a widely-held view that higher transparency *must* provide more investor protection,[10] a view that ignores investor protection from activists.

2 Hedge Fund Activism

In this section we model hedge fund activism and characterize the inter-linkage with real investment. We consider a firm that raises capital for a project whose value depends on the initial investment by uninformed *investors* and a business plan that may be either good or bad. The *manager* can deliberately adopt the bad business plan in order to obtain private rents at the expense of shareholders. The bad plan reduces value for shareholders unless an outside *activist* hedge fund intervenes to discipline management and implement the good plan. All agents are risk neutral. There are four dates, $t = 0, 1, 2, 3$. There is no discounting.

At $t = 0$ a continuous of dispersed investors invest capital k in a project, which is expected to pay off

$$V = f(k)\left[1 - \delta \cdot 1_{\{m=0\}}\right] \tag{1}$$

at $t = 3$. Here, f is a standard production technology with $f'(\cdot) > 0$, $f''(\cdot) < 0$, $f'(0) \to \infty$. The indicator function accounts for the business plan $m \in \{0, 1\}$ implemented by the manager at $t = 1$. The good plan ($m = 1$) yields cash flows $f(k)$ to investors. The bad plan ($m = 0$) yields nothing with probability $\delta \in [0, 1]$. Equivalently, the bad plan destroys a proportion δ of the project's value. Investors are uninformed, unable to distinguish between the good and bad business plans. We initially assume that the manager adopts the bad business plan ($m = 0$) with exogenous probability z. Section 4 endogenizes managerial malfeasance. The marginal cost of capital is $r > 0$. Initial investors become shareholders that receive claims to terminal project payoffs that they may trade at date 2. We normalize the measure of shares outstanding to one.

At $t = 2$, some initial investors receive liquidity shocks and must sell their shares in a competitive dealership market. These investors sell l shares, where l is uniformly distributed on $[0, b]$. We let $x(l)$ denote the associated density, and observe that $b \in [0, 1]$ is a measure of market liquidity. Also possibly present in the market is an activist, who is an outsider to the firm. The activist identifies managerial malfeasance when it occurs with probability λ. The

[10] See Schouten and Siems (2010) and references therein for the corporate law literature; and see La Porta et al. (2006) and Djankov et al. (2008) for papers in the economics literature that use ownership disclosure rules in an index of investor protection.

activist can discipline management by incurring a fixed cost c, forcing the firm to shift from the bad business plan to the good one. The activist privately observes this cost c. Other market agents share a common prior that c is distributed on $[0, C]$ according to a strictly positive and weakly decreasing density g and associated cumulative function G. The activist chooses how many shares $\alpha \in [0, 1]$ to acquire, which we term his *position*. A competitive *market maker* observes the net order flow $\omega = \alpha - l$ from the activist and initial investors, but not its components, and sets a price that equals expected project payoffs given ω, i.e., the market maker breaks even in expectation as in Kyle (1985).

To ease presentation, we assume that (i) the activist cannot act as a mere inside trader, only intervening when $m = 0$; and (ii) the activist disciplines management whenever he takes a position in the firm; i.e., he does not "cut-and-run" by selling his shares before engaging with management. We show in Appendix B that neither of these assumptions qualitatively affects the results.[11]

At $t = 3$, the project delivers cash flows $f(k)$ if the manager implemented the good plan or if the activist disciplines the manager. Otherwise, expected cash flows are $(1 - \delta) f(k)$. Figure 1 summarizes the sequence of events.

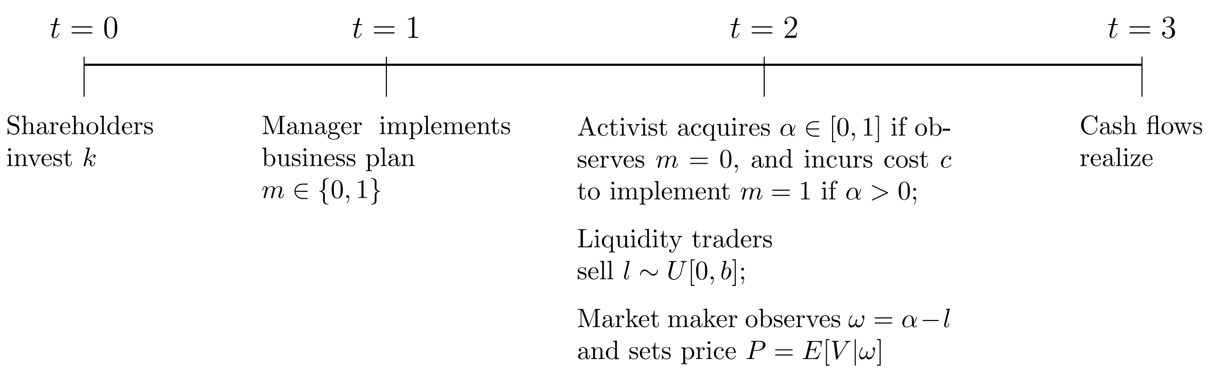

Figure 1: Time line

The parameters δ and z capture the severity of the agency problem between management and ownership. If $\delta = 0$, both business plans yield cash flows $f(k)$, so there are no frictions between investors and the manager, and thus no room for managerial disciplining; and if

[11] Appendix B.1 allows the activist to acquire stock when the business plan is good ($m = 1$) and there is no need for him to intervene. This *increases* his information rents without affecting the net value of the project. This hurts uninformed investors reducing their investment. Appendix B.2 introduces a new liquidity shock to allow the activist to sell shares after the price increase that follows disclosure, and shows that an equilibrium with "cut and run" does not exist unless binding disclosure thresholds are very low. In reality, while activists may "cut-and-run", empirical evidence shows that hedge fund activism increases the value of target companies via costly disciplining (see Gantchev (2013) for the costs of activism, and Bebchuk et al. (2015) for evidence on the value of hedge fund activism). Cutting and running becomes even less attractive when it impairs the reputation of activist funds, which Johnson and Swem (2017) find to be important for their profitability.

$z = 0$ the manager always implements the good business plan. In contrast, $\delta > 0$ and $z > 0$ imply that the manager may destroy shareholder value to obtain private benefits, creating a potential role for hedge fund activism. In Section 4 we endogenize the probability z that the manager implements the bad business plan to study the effects of a strategic manager.

We assume that the activist correctly identifies the good business plan and can discipline management at cost c,[12] and that the activist buys shares in the target company at a single time where shareholders (investors) face liquidity shocks. In practice, these processes are dynamic,[13] with uncertain costs and outcomes.[14] We abstract from these mechanics to study the incentives provided by financial markets. What matters for our analysis are the *expectations* that the activist forms about these costs and outcomes at $t = 2$ when deciding *whether* to attempt to discipline management. The decision is based on the balance between *expected* financial benefits and engagement costs, and the likely dynamic price impacts of trading—and not the particular paths that can be realized given a decision to move forward.

The static trading setting preserves the fundamental property that there is an adverse price effect via trading that reveals information to the market (see, e.g., Bebchuk and Jackson, 2012). The continuum of random liquidity sales l allows us to endogenize the activist's position α; and the uniform distribution yields a simple closed-form solution for this position. These properties facilitate our analysis of blockholder disclosure thresholds. The continuum of liquidity shocks differentiates our model from most corporate finance models that feature simple discrete (typically binary) levels of liquidity trade. Our trading environment is similar in spirit to Edmans (2009), who assumes exponentially distributed liquidity purchases to characterize the sales of an informed blockholder.

2.1 Market Equilibrium

We solve recursively for the perfect Bayesian Nash equilibrium of this model. At $t = 2$ real investment has been sunk by uninformed investors and is observable to all parties, the manager adopted the bad business plan with probability z, and the activist observes malfeasance with probability λ. Uninformed investors receive liquidity shocks and trade simultaneously

[12]In practice, the intervention cost c depends on factors such as an activist's ability to coordinate with other shareholders and managerial entrenchment. See Back et al. (2017) for how different functional forms for intervention costs affect the incentives to intervene in a dynamic setting.

[13]The dynamics of stock acquisition have been studied in the insider trading literature (see Collin-Dufresne and Fos 2016 and references therein). With regard to hedge fund activism, Collin-Dufresne and Fos (2015) find evidence that activist funds select times of higher liquidity when they trade, while Back et al. (2017) analyse the incentives of "exit" versus "voice" during the trading process.

[14]For an analysis of the engagement process see Gantchev (2013), who builds a sequential decision model to estimate the costs of proxy fights and other stages of shareholder activism. See Becker et al. (2013) for details on the costs of launching a proxy fight.

with the activist in the dealership market with pricing by the risk neutral market maker. At $t = 0$ investors anticipate the subsequent events and invest capital.

2.1.1 Trading

Proposition 1 summarizes the Bayesian Nash equilibrium in the subgame at date 2. The activist participation and trade is optimal given the market maker's pricing function, and the market maker's pricing function earns it zero expected profits given the activist's decisions.

Proposition 1 *At $t = 2$ real investment k is sunk and observable to all parties. If the activist observes managerial malfeasance ($m = 0$), and the cost of activism is sufficiently small, $c \leq c_t^*$ where*

$$c_t^* = z\left[1 - \lambda G\left(c_t^*\right)\right] \frac{b}{4} \delta f(k); \tag{2}$$

he takes a position

$$\alpha^* = \frac{b}{2} \tag{3}$$

and engages in managerial disciplining. Otherwise the activist does not participate.

The market maker, upon observing net order flow ω, sets the following prices

$$\begin{array}{lll} P(\omega) = P_l \equiv \left[\frac{(1-z)+z(1-\lambda G(c_t^*))(1-\delta)}{1-z\lambda G(c_t^*)}\right] f\left(k\right) & if & \omega < b + \alpha^* \\ P(\omega) = P_m \equiv \left[1 - z(1-\lambda G(c_t^*))\delta\right] f\left(k\right) & if & \omega \in [b + \alpha^*, 0] \\ P(\omega) = P_h \equiv f\left(k\right) & if & \omega > 0. \end{array} \tag{4}$$

A full proof is in the Appendix; here we provide the key intuition. After observing the net order flow, the market maker updates beliefs according to Bayes rule and sets prices in (4). Letting a_1 denote activism and a_0 denote the absence of activism, the market maker's pricing rule satisfies

$$\begin{aligned} P &= E\left[V|\omega\right] \qquad (5) \\ &= \Big[\Pr\left[a_1|\omega\right]\Pr\left[V = f\left(k\right)|a_1\right] + \Pr\left[a_0|\omega\right]\Pr\left[V = f\left(k\right)|a_0\right]\Big] f\left(k\right). \end{aligned}$$

When the net order flow is sufficiently negative, the market maker knows with certainty that the activist did not buy shares, i.e., $\Pr\left[a_1|\omega < -b + \alpha^*\right] = 0$. The market maker infers that either (a) there was no malfeasance (which happens with unconditional probability $1 - z$), in which case the project pays $f(k)$; or (b) there was malfeasance, and either the malfeasance was not discovered, or the cost of intervention was too high (which collectively happen with unconditional probability $z[1 - \lambda G(c_t^*)]$), in which case expected project payoffs are $(1-\delta)f(k)$. Similarly, a positive net order flow reveals that the activist took a position with certainty, in which case the project is sure to pay off $f(k)$: $\Pr[a_1|\omega > 0] = 1$ and $\Pr[V = f(k)|a_1] = 1$. In contrast, intermediate net order flows $\omega \in [-b+\alpha^*, 0]$ are consistent with both the presence and the absence of activism, and allow the activist to extract information rents from uninformed investors. Given a net order flow of $\omega \in [-b+\alpha^*, 0]$, the market maker knows that either liquidity trade was $l = -\omega$, or that liquidity trade was $l = -\omega + \alpha^*$. With the uniform distribution, these densities cancel out of the numerator and denominator of the conditional probability of activism, causing the market maker to set price equal to the *unconditional* expected project payoff regardless of the level of net order flow $\omega \in [-b+\alpha^*, 0]$. It is this feature of the uniform distribution that simplifies analysis.

When the activist participates and liquidity shocks outweigh the number of shares that he buys, i.e., $l \geq \alpha^*$, the activist acquires the stock below its true value at $P_m < f(k)$. If, instead, $l < \alpha^*$, then the activist pays P_h for each share and makes no profit. The probability that the activist camouflages his share purchase with liquidity sales is $\int_\alpha^b \frac{1}{b} dl = \frac{b-\alpha}{b}$. It follows that his expected gross profits conditional on buying α shares are

$$E[\Pi_A|a_1] = \left(\frac{b-\alpha}{b}\right)\alpha\left[f(k) - P_m\right]. \tag{6}$$

Inspection of (6) reveals that the activist faces a trade-off between the number of undervalued shares that he may acquire α and the expected cost of information revelation $\frac{b-\alpha}{b}$. This captures adverse price effects by which the expected stock price paid by the activist rises as he buys more shares. The activist's expected trading profits in (6) are maximized by a share purchase of $\alpha^* = b/2$. Greater liquidity b makes it easier for the activist to camouflage his trade, encouraging him to acquire a larger position.[15]

If the activist observes managerial malfeasance, he disciplines management when doing so is expected to be profitable, i.e., when $E[\Pi_A|a_1] \geq c$. This relation pins down the activist's cost participation cut-off in equilibrium:

$$c_t = z\left[1 - \lambda G(c_t)\right]\left(\frac{b-\alpha}{b}\right)\alpha\delta f(k), \tag{7}$$

which takes the form in (2) when evaluated at the optimal position of $\alpha^* = b/2$, i.e., $c_t^* \equiv c_t(\alpha^*)$.[16] The cut-off c_t is unique and maximized for $\alpha = \alpha^*$. In equilibrium, the activist employs a threshold strategy such that, conditional on observing malfeasance, he

[15] The positive relation between informed trading and market liquidity has long been studied in the literature. See Bond et al. (2012)'s review of the role of liquidity in the real effects of financial markets, and the review by Edmans and Holderness (2016) of the effect of liquidity in the context of blockholder interventions.

[16] To obtain (7) set $c_t = E[\Pi_A|a_1]$ using the expression in (6) substituting for the price P_m using (4).

buys α^* shares and disciplines management if and only if $c \leq c_t^*$.[17]

The endogenous cut-off c_t^* captures two key equilibrium features. First, it represents the activist participation threshold, and thus the extent of managerial disciplining. The probability that the activist intervenes to discipline the manager after observing the manager taking an action that reduces shareholder value is $G(c_t^*)$. Thus, a higher c_t^* implies superior governance. Second, c_t^* captures the activist's expected conditional trading profits. In equilibrium, the activist's expected trading profits *equal* the expected trading losses of uninformed investors because trading is a zero-sum game in which the market maker expects to break even. Thus, c_t^* represents the expected transfer of trading profits from uninformed investors to the activist conditional on the activist intervening.

These conditional trading transfers c_t^* increase with investment k. The greater is real investment, the greater is the project value, and hence (i) the more valuable is managerial disciplining, and (ii) the more profitable it is for the activist to intervene. Two assumptions drive this result. First, the cost of activism is independent of the company's value, so the incentives for disciplining are positively related to stock ownership (Shleifer and Vishny 1986).[18] Second, because the value enhanced by the intervention is multiplicative, rather than additive, the relevant measure of incentives is the activist's *dollar* ownership, not its *share* ownership (Edmans and Holderness 2016).[19]

Conditional trading transfers c_t^* also rise with market liquidity b. High liquidity increases activist trading profits and thus the probability $G(c_t^*)$ that the activist finds it profitable to discipline management. In line with Kahn and Winton (1998) and Maug (1998), higher liquidity allows the activist to increase his position with a reduced risk of discovery, thereby encouraging intervention. Back et al. (2017) model the dynamics of position building by activist funds and show the potentially positive effects of liquidity. Consistent with this, Collin-Dufresne and Fos (2015) and Gantchev and Jotikasthira (2017) provide evidence that activist funds camouflage their purchases with liquidity trades by other parties.

2.1.2 Investment

At $t = 0$ uninformed investors anticipate trading outcomes and activism levels, and invest capital so as to maximize expected profits. In addition to the investment decision, Proposition 2 characterizes the expected project payoffs and how they are split among market

[17] To verify uniqueness note that the left-hand side of (7) increases in c_t and the right-hand side decreases.

[18] Brav et al. (2016) argue that it can be harder for activists to intervene in larger companies due to credit constraints. Our model can be modified to provide a similar prediction in the presence of financial constraints.

[19] In the related context of CEO incentives, Baker and Hall (2004) and Edmans et al. (2009) show theoretically that a CEO's dollar ownership and not percentage ownership is relevant when the CEO has a multiplicative effect on firm value.

participants in expectation at $t = 0$. This sets the ground for the analysis of the main interacting forces in the model and the introduction of blockholder disclosure thresholds.

Proposition 2 *The expected value at $t = 0$ of the project given investment k is*

$$E\left[V\right] = \left[1 - z(1 - \lambda G(c_t^*))\delta\right] f(k) \equiv \pi_V f(k). \tag{8}$$

The expected gross profits of the activist are:

$$E[\Pi_A] = z\lambda G(c_t^*) \frac{c_t^*}{f(k)} f(k) \equiv \pi_A f(k). \tag{9}$$

The expected gross profits of uninformed investors are:

$$E[\Pi_I] = (\pi_V - \pi_A) f(k) \equiv \pi_I f(k). \tag{10}$$

The investment k by uninformed investors solves

$$\pi_I f'(k) - r = 0. \tag{11}$$

Total expected cash flows are the product of $f(k)$ and the probability that the project succeeds $\pi_V \in [0, 1]$. Proposition 2 reveals that expected total rents are split between the activist and uninformed investors in proportions π_A/π_V and π_I/π_V respectively. This follows because the market maker earns zero expected profits, which means that activist trading profits are extracted one-for-one from uninformed investors. More formally, the expected gross profits of the activist are captured by the product of the unconditional probability that he participates $z\lambda G(c_t^*)$ and the expected trading profits from participating c_t^*. Uninformed investors obtain, in expectation, the rest of the "pie", $(\pi_V - \pi_A) f(k)$. Real investment, characterized by (11), maximizes expected profits of uninformed investors at date 0.

Proposition 2 shows that activism has an impact on real investment via its effect on the expected profits of uninformed investors. Investors face a tension as to their preferred extent of activism, where the extent of activism is captured by $G(c_t^*)$. Higher transfers of trading profits c_t^* increase the proportion of cash flows taken by the activist in expectation π_A, reducing the investors' portion π_I. However, higher trading transfers also incentivize activist participation, and the increased managerial discipline raises total expected cash flows $\pi_V f(k)$. As a result, greater trading transfers c_t^* to activists need not hurt uninformed investors. In particular, activism fosters real investment when investor gains from managerial disciplining outweigh the associated trading losses, and it discourages real investment otherwise.

This mechanism underscores the *investment feedback effect* faced by the activist. The value of activism is directly related to the size of the project—the profitability of the activist grows with real investment, i.e., c_t^* grows with k. But, expected levels of activism affect investment. Therefore, expected activism affects real investment, which, in turn, affects the extent of activism. Crucially, the activist does not internalize this investment feedback in his trading decision because this is taken at $t = 2$, when real investment has already been sunk. Thus, when the activist participates, he takes a position α^* to maximize *conditional* expected profits (6), i.e., for a given k, rather than *unconditional* expected profits (9).

Our analysis identifies novel strategic interactions between uninformed investors and activist funds. The linkage between investment and trading profit transfers is similar to that found in papers studying the real effects of informed trading (Leland 1992; Bernhardt et al. 1995). We incorporate a new element: the informed trader is an activist fund who can increase investment value by alleviating agency problems between owners and managers (Brav et al. 2008; Klein and Zur 2009, Brav et al. 2015; Bebchuk et al. 2015). The effect of hedge fund activism on real investment is thus twofold: Informed trading reduces the profitability of uninformed investors who respond with lower investment; but it also encourages the intervention of activist funds that discipline management, thereby incentivizing investment.

3 Blockholder Disclosure Thresholds

Blockholder disclosure thresholds are rules that require a shareholder to disclose stock holdings when they reach a certain fraction of the overall voting rights in a publicly traded firm. In recent years, hedge fund activism has led some market participants and commentators to call for an expansion of these rules, and policy makers are now contemplating how to respond. We next briefly describe the institutional framework. We then contribute to the regulatory debate by deriving the optimal threshold policies for investors, hedge fund activists and society.

3.1 Institutional Framework and Regulatory Debate

A key concern for financial regulators is the protection of minority shareholders against dominant shareholders. Ownership disclosure rules are considered to be one such protection mechanism. The OECD's Principles of Corporate Governance of 2004 advocate that "one of the basic rights of investors is to be informed about the ownership structure of the enterprise" (OECD, 2004). In the US, the disclosure of "beneficial ownership" is regulated by the Williams Act of 1968, passed in response to a wave of hostile takeover attempts, mostly through tender offers.[20] In Europe, the EU Transparency Directive of 2004 claims that the

[20] See Nagel et al. (2011) for a more extensive analysis and more detailed arguments.

disclosure of major holdings in listed companies should enable investors to acquire or dispose of shares in full knowledge of changes in the voting structure (EC, 2004). Along with other corporate transparency rules, blockholder disclosure thresholds are set to prevent the expropriation of rents by large shareholders that gain influence or control of their companies at the expense of uninformed investors.[21]

Investor protection is key to increasing confidence and encouraging real investment. For instance, the EU Transparency Directive belongs to a range of measures that aim, among other things, to enable issuers to raise capital on competitive terms across Europe (Schouten 2010). La Porta et al. (2006) and Djankov et al. (2008) provide evidence that greater legal protection of investors is associated with more developed financial markets. Both studies construct protection indices that include ownership disclosure rules. Our paper captures the link between investor protection and investment, but it challenges the extended view on the relationship between corporate transparency and protection. Our earlier analysis shows that the ability to secretly acquire stock encourages activist funds to discipline management, alleviating agency problems between uninformed investors and managers, consistent with the empirical evidence that hedge fund activists enhance the value of their target companies.

Blockholder disclosure thresholds differ across financial systems. For example, investors that intend to introduce corporate changes in US publicly-listed companies must fill a 13(d) file when their holdings reach 5% of voting rights. In Canada, equivalent disclosure of ownership is not required until a 10% stake is acquired. In the EU, Germany recently reduced the threshold to 3%, which is also the cutoff in the UK, while the threshold in France remains at 5%. Regulation across jurisdictions also differs in such elements as the time window to report acquisitions, the information that must be disclosed, and the types of securities subject to disclosure.[22] Schouten and Siems (2010) identify a historical trend and convergence towards greater ownership disclosure, i.e., towards lower thresholds. Yet, despite the vast potential impacts of small differences in these rules, it remains unclear what brings regulatory bodies to set a disclosure threshold of, for instance, 5% rather than 2% or 10%; and Edmans and Holderness (2016) ask why regulators (and researchers) tend to focus on measures of percentage ownership and neglect those of absolute ownership.

The increasing importance of hedge fund activism has altered the regulatory debate. Broadly, ownership disclosure rules were set to inform investors about stock acquisitions that can result in takeovers or proxy fights. The WLRK (2011) Petition argued that these rules no longer serve their purpose because activist funds can gain control of target compa-

[21] See Edmans and Holderness (2016) for a review of the literature on the costs imposed by blockholders that pursue their own private benefits.

[22] "Stakebuilding, mandatory offers and squeeze-out comparative table" by Practical Law, of Thomson Reuters provides a synthesis of ownership disclosure rules in financial systems. External link to the table *here*.

nies with small positions. Several academics opposed the petition arguing that hedge fund activism increases the value of target companies and hence has positive externalities for other investors. According to Bebchuk and Jackson (2012) this was at the heart of the Williams Act, which considered that outside investors who acquire large blocks of stock "should not be discouraged, since they often serve a useful purpose by providing a check on entrenched but inefficient management." The debate is not confined to the US. For instance, in Canada, a recent proposal to reduce the disclosure threshold from 10% to 5% was opposed by two major associations of investment funds that argued "the lower threshold will make share acquisitions by engaged investors more expensive and, in many circumstances, too costly to justify the resources, time and effort for such activity. This, in turn, will chill the market for engaged investing, and erode the benefits of the value creation that results from having shareholder engagement" (MFA and AIMA 2013).

3.2 Optimal Policies

We now extend our model to show how blockholder disclosure thresholds can regulate the level of hedge fund activism, deriving the optimal policies for investors, activist and society.

Ownership disclosure rules may limit the number of undervalued shares that the activist can acquire, reducing his incentives to participate. If a legal disclosure threshold $\overline{\alpha}$ is implemented, an activist must publicly announce his position when it crosses the threshold. Then the activist has no incentive to establish a larger position because doing so would reveal his presence causing the stock price to rise to $P_h = f(k)$, which would eliminate his information rents, rendering intervention unprofitable.[23] Corollary 3 follows immediately:

Corollary 3 *A disclosure threshold $\overline{\alpha}$ is binding if and only if $\overline{\alpha} < \alpha^*$. In equilibrium, when a disclosure threshold binds the activist sets $\alpha = \overline{\alpha}$.*

The activist's conditional trading profits $c_t(\alpha)$ in (7) increase with his position for $\alpha < \alpha^*$. Thus, when the activist participates, he acquires a position $\alpha = \min\{\overline{\alpha}, \alpha^*\}$. The mechanism implies that for a given firm characterized by $f(k)$, a binding threshold necessarily reduces both the profits and extent of hedge fund activism. To see this, let $\overline{c}_t$ represent the trading profits, and hence participation cut-off, associated with a position determined by a binding threshold $\overline{\alpha} < \alpha^*$. Because trading profits increase in α, activism is now less profitable, i.e., $\overline{c}_t < c_t^*$, making the activist less likely to participate, i.e., $G(\overline{c}_t) < G(c_t^*)$.[24] A direct consequence is that managerial malfeasance is more likely to destroy value. This mechanism

[23]This price reaction is consistent with evidence by Bebchuk et al. (2015) that the stock-price spike that follows disclosure reflects the long-term value of the intervention.

[24]It follows from the analysis in Section 2 that $\overline{c}_t = z\left[1 - \lambda G(\overline{c}_t)\right]\left(\frac{b-\overline{\alpha}}{b}\right)\overline{\alpha}\delta f(k) < c_t^*$.

is consistent with arguments against expanding ownership disclosure rules (see Section 3.1). However, our paper shows that they only comprise part of the overall effect.

The argument is incomplete because it neglects the effects of a disclosure threshold on real investment. Changes in expected levels of activism at $t = 2$ also alter real investment at $t = 0$, which, in turn, affects the activist's incentives to participate. A binding disclosure threshold reduces the conditional transfer of trading profits from investors to the activist, which may incentivize real investment, creating a positive investment feedback that can increase activism.

Proposition 4 derives the consequences of blockholder disclosure thresholds by characterizing the ordering of the optimal disclosure threshold policies for investors, the activist and a welfare-maximizing regulator representing society. We denote these policies $\overline{\alpha}_I$, $\overline{\alpha}_A$ and $\overline{\alpha}_R$ respectively. We present our results as a function of the *profit elasticity of activism*,

$$\varepsilon_a(c_t) = \frac{\partial G\left(c_t\right)}{\partial c_t}\frac{c_t}{G(c_t)}.$$

Here, ε_a captures the responsiveness of activism to informed trading: the higher is ε_a, the bigger is the increment in the probability that the activist intervenes $G(c_t)$ in response to a marginal increase in expected trading profits c_t. Absent a binding disclosure threshold, when the activist participates he buys α^* shares, earns expected gross profits c_t^*, and the profit elasticity of activism is $\varepsilon_a\left(c_t^*\right) \equiv \varepsilon_a^*$.

Proposition 4 *There exists cutoffs* $\varepsilon_a^{*R} \equiv -\left(\frac{c_t^*}{\delta f(k)-c_t^*}\right)\left[\frac{\frac{df(k)/d\alpha}{f(k)}}{\frac{dc_t^*/d\alpha}{c_t^*}}\right]$ *and* $\varepsilon_a^{*I} \equiv \left(\frac{c_t^*}{\delta f(k)-c_t^*}\right)$, *on the profit elasticity of activism where* $\varepsilon_a^{*R} < \varepsilon_a^{*I}$ *such that*

1. *No one benefits from a binding disclosure threshold if the profit elasticity of activism is sufficiently high:* $\varepsilon_a^* \geq \varepsilon_a^{*I} \Rightarrow \alpha^* \leq \{\overline{\alpha}_I, \overline{\alpha}_A, \overline{\alpha}_R\}$.

2. *Only investors benefit from a binding disclosure threshold if the profit elasticity of activism is intermediate:* $\varepsilon_a^{*R} \leq \varepsilon_a^* < \varepsilon_a^{*I} \Rightarrow 0 < \overline{\alpha}_I < \alpha^* \leq \{\overline{\alpha}_A, \overline{\alpha}_R\}$.

3. *Both investors and society gain from a binding disclosure threshold if the profit elasticity of activism is low, with investors gaining more:* $\varepsilon_a^* < \varepsilon_a^{*R} \Rightarrow 0 < \overline{\alpha}_I < \overline{\alpha}_R < \alpha^* \leq \overline{\alpha}_A$.

Figure 2 illustrates the results; a full proof is in Appendix A. Optimal disclosure threshold policies are characterized by the first order conditions (FOCs) of net profit functions with respect to the activist position α. Corollary 3 implies that when the optimal position is less than α^*, it can be achieved in equilibrium by a binding disclosure threshold.

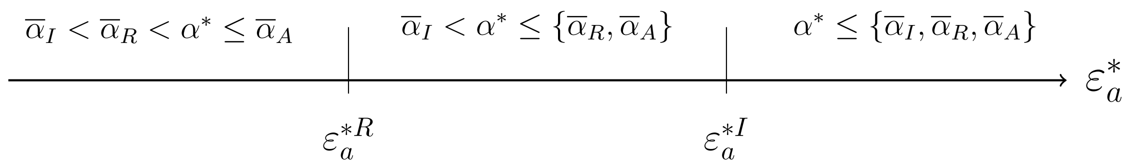

Figure 2: Optimal Disclosure Thresholds

Uninformed investors maximize $\pi_I f(k) - rk$. The associated FOC reveals that they benefit from a binding disclosure threshold if and only if

$$g(c_t^*)\left[\delta f(k) - c_t^*\right] < G(c_t^*), \tag{12}$$

which can be rearranged to $\varepsilon_a^* < \varepsilon_a^{*I}$. The left-hand side (LHS) represents the marginal benefits to uninformed investors of increasing the transfer of trading profits to the activist when $\alpha = \alpha^*$, i.e., for c_t^*. Higher transfers cause the probability that the activist participates conditional on observing managerial malfeasance to rise by $g\left(c_t^*\right)$. The associated benefit for investors is the difference between the total value enhanced by the activist $\delta f(k)$ and their trading losses c_t^*. The right-hand side (RHS) captures the conditional loss from marginally higher transfers: with probability $G(c_t^*)$ the activist would have participated anyway, even if expected trading profits had not increased.

A binding disclosure threshold $\overline{\alpha}$ reduces transfers of trading profits, $c_t(\overline{\alpha}) \equiv \overline{c}_t < c_t^*$. (12) shows that this raises the marginal benefits to investors of activism (LHS) and reduces the associated losses (RHS), increasing marginal profitability. Equivalently, a binding threshold increases the profit elasticity of activism ε_a, and it requires less trading transfers from investors to encourage higher activism. Transfers of trading profits are the cost that investors incur in exchange for managerial discipline, and this cost rises with the extent of activism.

The optimal extent of activism for investors solves this FOC: $\overline{\alpha}_I$ solves $\varepsilon_a = c_t / \left[\delta f(k) - c_t\right]$ when $\varepsilon_a^* < \varepsilon_a^{*I}$. Full disclosure is never optimal. If the activist cannot acquire stock secretly, trading profits and hence transfers vanish, i.e., if $\alpha \to 0$ then $c_t \to 0$. But then the activist never participates. Then, the marginal benefits of discipline for investors outweigh the corresponding trading losses, i.e., $g(c_t)\left[\delta f(k) - c_t\right] > G(c_t)$. Thus, uninformed investors always benefit from some degree of market opacity, i.e., $\overline{\alpha}_I > 0$: the marginal profitability to uninformed investors of activism is always positive whenever $\overline{\alpha}_I$ is sufficiently small.

The optimal extent of activism can be achieved by a disclosure threshold when the corresponding trading transfers are lower than those in the unconstrained equilibrium, i.e., when (12) holds, but not otherwise. The mechanism highlights the asymmetric role of disclosure rules, which can only limit, but not foster, informed trading. If, absent regulation, the marginal profitability of activism for investors is positive, i.e., if (12) is not satisfied, the desired extent of activism cannot be achieved and the optimal policy is non-binding, i.e., $\overline{\alpha}_I \geq \alpha^*$. We discuss below the role of market liquidity, which determines α^* and thus whether a particular disclosure threshold is binding.

Our argument builds on the result that transfers of trading profits increase with the activist's position, i.e., $\frac{dc_t}{d\alpha} > 0$ for $\alpha < \alpha^*$. It follows that restricting α reduces c_t. *This is not immediate.* We earlier established that the activist faces an investment feedback effect that he does not internalize. In particular, the activist's position at $t = 2$ influences initial investment k, and this determines the trading profits from a given position α. A binding disclosure threshold regulates the number of shares that the activist buys in equilibrium. We have

$$\frac{dc_t}{d\alpha} = \underbrace{\frac{\partial c_t}{\partial \alpha}}_{\textit{mg. net trading transfer}} + \underbrace{\frac{\partial c_t}{\partial k}\frac{\partial k}{\partial \alpha}}_{\textit{investment feedback}}. \tag{13}$$

Net trading transfers capture the effect of the activist's position on transfers at $t = 2$ for a given investment k. (7) revealed that $\frac{\partial c_t}{\partial \alpha} > 0 \Leftrightarrow \alpha < \alpha^*$, leading the activist to take a position α^* in the absence of a disclosure threshold (Proposition 1). The investment feedback effect captures the impact of the activist's position on real investment $\frac{\partial k}{\partial \alpha}$, and the effect that it has, in turn, on trading transfers $\frac{\partial c_t}{\partial k}$. Real investment always raises trading transfers, and thus the extent of activism, i.e., $\frac{\partial c_t}{\partial k} > 0$. However, the activist position α might be large enough to hurt investors, who respond by reducing investment. That is, if $\alpha > \overline{\alpha}_I$ then $\frac{\partial k}{\partial \alpha} < 0$, and the effect of a larger position on trading transfers is determined by the balance of two opposing forces: positive net transfers and a negative investment feedback. We show that, surprisingly, the tension is always resolved against the investment feedback effect, so $\frac{dc_t}{d\alpha} > 0$ for $\alpha < \alpha^*$.

This result reflects the subordinated nature of investment feedback with respect to the direct impact of trading transfers. Intuitively, these transfers lead the activist to take a position α^*, which, in turn, affects investment. If the reduction of investment from increasing α was strong enough to reduce the activist's trading profits, i.e., if $\frac{dc_t}{d\alpha} < 0$, it would also increase investor profits because $g(c_t)\,[\delta f(k) - c_t] < G(c_t)$ when $\frac{\partial k}{\partial \alpha} < 0$. But then investors would *increase* investment, not reduce it, benefitting activists. Since trading transfers are the activist's sole source of income, this mechanism explains why he never benefits from a binding disclosure threshold:

Corollary 5 *Negative investment feedback reduces the positive impact of increasing the activist position on trading profits c_t and thus on the extent of activism $G(c_t)$. However, it does not alter the sign of the impact, i.e., $\frac{dc_t}{d\alpha} > 0$ for $\alpha < \alpha^*$: the activist never benefits from a blockholder disclosure threshold just because it boosts investment.*

Thus, when investors seek a binding disclosure threshold $\overline{\alpha}_I < \alpha^*$, a conflict of interest arises between them and the activist. An activist position that exceeds $\overline{\alpha}_I$ harms investors, reducing real investment. This, in turn, reduces the profitability of activism and the levels of managerial discipline (negative investment feedback). Nonetheless, the investment response is never strong enough to outweigh the net positive effect of additional shares on activist profits. Therefore, the activist never wants a binding disclosure threshold to increase investment.

Society maximizes total expected value net of the costs of capital rk and the expected costs of activism $z\lambda G(c_t) E[c|c \leq c_t]$. Society gains from a binding disclosure threshold if

$$z\lambda g(c_t^*) [\delta f(k) - c_t^*] \frac{dc_t^*}{d\alpha} + \pi_A f'(k) \frac{\partial k}{\partial \alpha} < 0, \tag{14}$$

which can be rearranged to $\varepsilon_a^* < \varepsilon_a^{*R}$.[25] The condition reveals that society cares about both the value-enhancing effects of activism and real investment. The first term in (14) captures the impact of the activist's equity position on project value via managerial discipline. This is positive for all $\alpha < \alpha^*$. In particular, Corollary 5 shows that the extent of activism is directly related to the activist's position regardless of the investment feedback, i.e., $\frac{dc_t}{d\alpha} > 0$. Moreover, greater managerial discipline always creates value. Here, $g(c_t)\,\delta f(k)$ is the conditional increase in gross value, and $g(c_t)\,c_t$ is the corresponding increase in expected cost of activism. The second term in (14) represents investment feedback that is not internalized by investors. More specifically, real investment solves $\pi_I f'(k) - r = 0$, but the optimal investment for society sets $(\pi_I + \pi_A) f'(k) - r = 0$,

Society only benefits from a disclosure threshold if investors also do so, but the converse is not true. For $\varepsilon_a^* < \varepsilon_a^{*R}$ to hold, the investment feedback must be negative, i.e., $\frac{\partial k}{\partial \alpha} < 0$, implying that $\varepsilon_a^* < \varepsilon_a^{*I}$. Intuitively, society only cares about the real economy, and not about secondary markets (trading transfers). The only social cost of increasing managerial disciplining is the potential reduction in investment. If this is sufficiently strong, then (14) holds and the regulator wants to set a binding disclosure threshold. Still, this threshold always exceeds the optimal threshold from the perspective of investors who do care about trading transfers.

That society's preferred disclosure threshold lies (weakly) between those preferred by investors and activists also arises in models of insider trading where real investment is endogenous (Leland 1992; Bernhardt et al. 1995). The social cost of increasing activism is a potential reduction of real investment due to lower market transparency. Thus, a regulator only considers implementing a disclosure threshold when this also benefits investors. Yet, while investors incur trading losses society does not, so the socially optimal level of market transparency is lower. Therefore, when the regulator seeks a binding threshold, it always exceeds the pre-

[25] See Appendix A. Rearrangement of (14) to obtain $\varepsilon_a^* < \varepsilon_a^{*R}$ uses $\frac{df(k)}{d\alpha} = f'(k)\frac{\partial k}{\partial \alpha}$.

ferred threshold of investors, and sometimes they disagree on the need for a binding policy.

3.2.1 The role of liquidity and the cost of activism

Results in Proposition 4 are influenced by the interaction of two opposing forces: (i) market liquidity and (ii) the cost of activism. We discuss and interpret their role.

Corollary 6 *Let a cost distribution function g be such that no one benefits from a binding disclosure threshold, i.e., $\varepsilon_a^* \geq \varepsilon_a^{*I}$. Reduce the cost of activism with a transfer of probability mass $\min\{g(c), \tau\}$ from each realization $c \in (0, C]$ to $c = 0$. There exist cutoffs $\tau^I(b) < \tau^R(b)$ such that*

1. *Investors gain from a binding disclosure threshold if and only if $\tau > \tau^I(b)$.*
2. *Society gains from a binding disclosure threshold if and only if $\tau > \tau^R(b)$.*

Both cutoffs decrease with market liquidity, i.e., $\tau^{I\prime}(b) < 0$ and $\tau^{R\prime}(b) < 0$.

Corollary 6 considers the effect of a reduction in the cost of activism consisting of an even decrease in the probability of any positive cost. Transformation $\tau > 0$ scales down density g, reducing both the expected cost and profit elasticity of activism ε_a. As a result, the marginal profitability of trading transfers for investors is less at any given c_t, and they benefit from a binding disclosure threshold when the cost reduction is large enough. In particular, $\varepsilon_a^* = \varepsilon_a^{*I}$ when $\tau = \tau^I(b)$, and a larger τ tightens the optimal threshold. Analogous intuition holds for society. At the limit, as τ grows arbitrarily large, activism becomes almost costless, and investors do not need to incentivize activist participation with higher trading profits. Then, the optimal policy for both investors and society approaches full transparency, i.e., $\{\overline{\alpha}_I, \overline{\alpha}_R\} \to 0$.

Both cutoffs $\tau^I(b)$ and $\tau^R(b)$ decrease with the extent of market liquidity b because this makes activism more profitable: α^* and c_t^* both rise. All else equal, this reduces the profit elasticity of activism, and may make a binding disclosure beneficial for investors. In (12), the LHS decreases and the RHS increases. It follows that the cost reduction that leads investors to gain from a binding policy falls as market liquidity rises.

These results are intuitive. The activist requires market liquidity to establish an equity stake and profit from intervention (Maug 1998; Kahn and Winton 1998). Disclosure thresholds operate against liquidity by increasing market transparency and limiting the activist's position (Bebchuk et al. 2013). Greater liquidity reduces the marginal profitability of activism for investors, making a disclosure threshold more desirable. The cost of activism operates in the opposite direction. When the cost of managerial discipline is likely to be high, investors want to concede further trading transfers to incentivize activism, and they do not benefit from a disclosure threshold. In particular, with high costs, i.e., big g, the profit elasticity of activism is large for relatively opaque markets, and investors do not want to limit the potential trading profits of activists.

The cost of activism is often related to managerial entrenchment. Staggered boards make it harder to gain control of a company in a proxy contest, discouraging activism. Our model is consistent with Gompers et al. (2003) and Bebchuk and Cohen (2005), who find evidence of a negative correlation between firm value and management-favouring provisions. In such instances, relaxing disclosure thresholds can benefit investors by alleviating the negative effect of these provisions at the expense of market opacity and investor trading losses.

4 Managerial Feedback

We next endogenize the probability of managerial malfeasance to characterize the complete inter-linkage between investment, hedge fund activism and corporate management, and the consequences for optimal blockholder disclosure threshold policies.

We extend our model by assuming that if the manager implements the good business plan ($m = 1$) at $t = 1$, she receives a payoff that is normalized to zero at $t = 3$. If, instead, the manager adopts the bad plan ($m = 0$), her payoff depends on whether she is disciplined by the activist. When the activist does not intervene, adopting the bad business plan gives the manager a fixed benefit φ. If the activist disciplines the manager, she does not receive the private benefit and incurs a privately-observed reputation cost $\rho > 0$. Other market agents share a common prior that ρ is distributed on $[0, R]$ according to a strictly positive density h and associated cumulative function H. We assume that private benefits from malfeasance are not too high: $\varphi \leq 4R$.[26]

Both private benefits from malfeasance φ and the reputation costs of being disciplined by an activist ρ allow for multiple interpretations.[27] For instance, managerial benefits from acting against shareholders might be related to increasing executive compensation or empire-building mergers and acquisitions that managers value but harm firm value. The costs of being disciplined by an activist may reflect career prospects. For example, Fos and Tsoutsoura (2014) report that facing a direct threat of removal is associated with \$1.3-\$2.9 million in foregone income until retirement for the median incumbent director in their sample; and Keusch (2017) finds that in the year after activists intervene, internal CEO turnover rises 7.4%.

[26] We use this upper bound on the private benefits from malfeasance φ to ease establishing that second-order conditions hold in the derivation of optimal blockholder disclosure threshold policies.

[27] Because the firm's manager only cares about the *net* benefit of malfeasance, one could alternatively assume that the benefits of malfeasance are random, and that the reputation cost is fixed.

4.1 Market Equilibrium

The manager employs a threshold strategy, implementing the bad business plan if and only if $\rho \leq \rho_t$. At the cut-off, the expected private benefits from malfeasance equal the expected loss due to punishment, $(1 - \lambda G(c_t))\varphi = \lambda G(c_t)\rho_t$, which we solve for:

$$\rho_t = \varphi \left[\frac{1 - \lambda G(c_t)}{\lambda G(c_t)} \right]. \tag{15}$$

The probability of managerial malfeasance is $H(\rho_t)$. The equilibrium analysis is analogous to Section 2.1, where both Propositions 1 and 2 extend by directly setting $z \equiv H(\rho_t)$.

The solution for ρ_t reveals that malfeasance declines with the *conditional* probability of activism $G(c_t)$: the more likely the activist is to participate after observing malfeasance, the less likely is the manager to misbehave. We call the managers' response to the threat of activism, the *managerial feedback* effect. This effect is negative, reflecting that the threat of activism deters managers from destroying shareholder value. Activism disciplines management through two complementary channels: (i) ex post, the activist intervenes to change the business plan when it is bad; (ii) ex ante, it discourages the adoption of the bad plan.

The mechanism is consistent with anecdotes suggesting that executives of firms that are yet-to-be-targeted by activist funds feel threatened and proactively work with advisors and lawyers to evaluate firm policies that minimize the vulnerability to attacks by activist funds.[28] More formally, Gantchev et al. (2017) find evidence that non-target firms, observing that their peers are being targeted by activists, perceive a higher risk of becoming a future target, and change their policies to mitigate this risk.

4.2 Optimal Policies

We study optimal blockholder disclosure threshold policies when the probability of managerial malfeasance is endogenous. Managerial feedback raises new policy questions. For example, additional trading profits increase the conditional profitability of activism (Proposition 4) and reduce activists' opportunity to profit (managerial feedback). Do investors still benefit from a disclosure threshold? What are the implications for real investment, and thus for society? How does managerial feedback affect the reluctance of hedge fund activists to support ownership disclosure rules? Could activist funds seek lower thresholds than investors?

Proposition 7 answers these questions, characterizing the ordering of optimal disclosure

[28]See, for instance, "Key Issues for Directors in 2014" by Martin Lipton of Wachtell, Lipton, Rosen and Katz, The Harvard Law School Forum on Corporate Governance and Financial Regulation, December 16, 2013; "Boardrooms Rethink Tactics to Defang Activist Investors", The New York Times, November 11, 2013.

policies for market participants. We define an elasticity measure that allows us to present results intuitively: the *activism elasticity of management,*

$$\varepsilon_m = \frac{\partial H(\rho_t)}{\partial G(c_t)} \frac{G(c_t)}{H(\rho_t)}.$$

Here, $\varepsilon_m < 0$ captures a manager's reaction to the threat of activism. The bigger is ε_m (in absolute value), the larger is the reduction in the probability of managerial malfeasance $H(\rho_t)$ in response to a marginal increase in the conditional probability of activism $G(c_t)$. In the absence of a binding disclosure, when the activist participates he buys α^* shares and has expected gross profits c_t^*. Moreover, the manager adopts the bad business plan if and only if $\rho \leq \rho_t(c_t^*) \equiv \rho_t^*$ and the activism elasticity of management is $\varepsilon_m(c_t^*, \rho_t^*) \equiv \varepsilon_m^*$. In the proposition below, we assume that second-order conditions are well-behaved for investors and activists; the Appendix shows that this will be so when the costs of intervention for the activist and the reputation costs of management have uniform distributions.

Proposition 7 *Suppose that the net expected profits of investors and activists are quasiconcave in α for $\alpha \leq \alpha^*$. Then there exist cutoffs on the activism elasticity of management,* $\varepsilon_m^{*A} \equiv -\frac{1}{\varepsilon_a^*}\left(\frac{c_t^*}{c_t^* - E[c|c \leq c_t^*]}\right)$, $\varepsilon_m^{*I} \equiv -\left(\frac{\partial \pi_A / \partial H(\rho_t^*)}{\partial \pi_I / \partial H(\rho_t^*)}\right)\left[\frac{\delta f(k) - c_t^*}{c_t^*} - \frac{1}{\varepsilon_a^*}\right]$ *and* $\varepsilon_m^{*R} \equiv \left[\frac{\delta f(k) - c_t^*}{c_t^*} + \frac{1}{\varepsilon_a^*}\left(\frac{\frac{df(k)/d\alpha}{f(k)}}{\frac{dc_t^*/d\alpha}{c_t^*}}\right)\right]\left[-\frac{\partial \pi_I / \partial H(\rho_t^*)}{\partial \pi_A / \partial H(\rho_t^*)} - \frac{c_t^* - E[c|c \leq c_t^*]}{c_t^*}\right]^{-1}$*, where* $\varepsilon_m^{*A} < \varepsilon_m^{*I} < \varepsilon_m^{*R}$ *such that*

1. *If the activism elasticity of management is sufficiently high, then only the activist benefits from a binding disclosure threshold:* $\varepsilon_m^* < \varepsilon_m^{*A} \Rightarrow 0 < \overline{\alpha}_A < \alpha^* \leq \{\overline{\alpha}_I, \overline{\alpha}_R\}$.

2. *If the activism elasticity of management is moderately high, then no one benefits from a binding disclosure threshold:* $\varepsilon_m^{*A} \leq \varepsilon_m^* \leq \varepsilon_m^{*I} \Rightarrow 0 < \alpha^* \leq \{\overline{\alpha}_I, \overline{\alpha}_A, \overline{\alpha}_R\}$.

3. *If the activism elasticity of management is moderately low, then only investors benefit from a binding disclosure threshold:* $\varepsilon_m^{*I} < \varepsilon_m^* \leq \varepsilon_m^{*R} \Rightarrow 0 < \overline{\alpha}_I < \alpha^* \leq \{\overline{\alpha}_A, \overline{\alpha}_R\}$.

4. *If the activism elasticity of management is low enough, then investors and society gain from a binding disclosure threshold, but activists do not:* $\varepsilon_m^{*R} < \varepsilon_m^* \Rightarrow 0 < \overline{\alpha}_I < \overline{\alpha}_R < \alpha^* \leq \overline{\alpha}_A$.

Figure 3 illustrates the results. When the activism elasticity of managerial malfeasance is high, both the regulator and investors want more activism because they gain from deterring malfeasance—neither wants a binding disclosure threshold: $\varepsilon_m^* < \varepsilon_m^{*I}$. In contrast, the activist is harmed by reduced malfeasance and can gain from a threshold that limits his capacity to intervene if management is sensitive enough to the profitability of intervention, i.e., if $\varepsilon_m^* < \varepsilon_m^{*A}$. When, instead, this elasticity is low enough, the ordering of optimal policies is reversed, and the considerations of Proposition 4 dominate for the three parties. Then, investors gain more from a tighter threshold than the regulator ($\varepsilon_m^* > \varepsilon_m^{*I}$) because they incur the trading losses that society does not internalize; the regulator wants a tighter threshold than the activist ($\varepsilon_m^* > \varepsilon_m^{*R}$) because the negative investment feedback harms society; and while lower investment hurts the activist, it does not modify his optimal position (Corollary 5). Investors, activist funds and society can only agree on disclosure thresholds for intermediate activism elasticity levels ϵ_m, where everyone believes that disclosure thresholds should not bind.

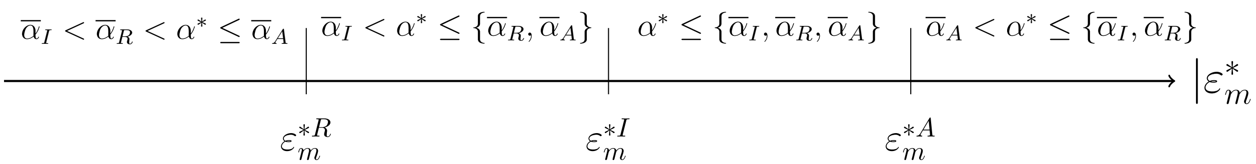

Figure 3: Optimal Disclosure Thresholds with Managerial Feedback

The full proof is in the Appendix. Here, we develop the main intuition. Setting $\left\{\varepsilon_m^{*A}, \varepsilon_m^{*I}, \varepsilon_m^{*R}\right\} = 0$ and rearranging terms with respect to ε_a^* yields the cutoffs in Proposition 4. Proposition 7 then reveals how those findings are altered when management's behavior is sensitive to the possibility of hedge fund activism.

The activist benefits from a binding disclosure threshold when

$$\begin{aligned} H(\rho_t)\lambda G\left(c_t^*\right) + M_A &< 0 \qquad (16) \\ \textit{where} \quad M_A \equiv \frac{dH\left(\rho_t^*\right)}{dc_t}\lambda G\left(c_t^*\right)\left[c_t^* - E\left[c|c \leq c_t^*\right]\right] &< 0. \end{aligned}$$

The condition can be rearranged to $\varepsilon_m^* < \varepsilon_m^{*A}$. Here, M_A represents the managerial feedback effect, which hurts the activist—well-behaving management destroys the raison dêtre of activists. Higher trading profits c_t^* increase the *conditional* profitability of activism, and the extent of activism upon managerial malfeasance $G\left(c_t^*\right)$—Proposition 4. However, it also deters management from acting against uninformed investors, reducing the activist's opportunity to profit. As a result, increasing a binding disclosure threshold, $\bar{\alpha}$, and hence increasing *trading* profits, need not increase the activist's *unconditional* expected profits.

$\frac{dH(\rho_t^*)}{dc_t} = h(\rho_t^*)\frac{d\rho_t^*}{dc_t}$ captures the responsiveness of management to the threat of activism. A large h implies a high activism elasticity of management ε_m, and a large reduction in malfeasance in response to a marginal increase in the conditional profitability of activism. Then, the activist benefits from a disclosure threshold that serves to commit the activist to reducing intervention rates, thereby encouraging managerial malfeasance. In contrast, when

h is very small,[29] activism does not meaningfully deter managerial malfeasance, and the activism elasticity of management goes to zero. With minimal managerial feedback, $M_A \to 0$, so (16) never holds and predictions reduce to those in Proposition 4: the activist is hurt by a binding disclosure threshold.

The cut-off ε_m^{*A} increases with ε_a^*—the higher is the profit elasticity of activism, the more the activist values a disclosure threshold. When higher trading profits greatly increase the extent of activism, they may also strongly deter managerial malfeasance. Then, the responsiveness ε_a^* of the activist to its potential trading profits harms it—so that the activist gains from a binding disclosure threshold that restrains its responsiveness. In those circumstances, neither investors nor the regulator want a binding disclosure threshold. This reflects that the activist's gains from a binding disclosure threshold are due to the increased managerial malfeasance that it causes, malfeasance that destroys surplus directly when the activist does not intervene and indirectly when the activist incurs costs of intervention. But then, investors and the regulator value the extensive discouragement effect of potential activism on managerial malfeasance. In particular, when the marginal value to the activist of tightening the disclosure threshold is positive, it is negative for investors and the regulator; and vice versa.

Proposition 7 shows that there exists a range of values $\varepsilon_m^* \in \left[\varepsilon_m^{*A}, \varepsilon_m^{*I}\right]$ such that no market participant gains from a binding disclosure threshold. If $\varepsilon_m^* \geq \varepsilon_m^{*A}$, managerial feedback is small enough from the activist's perspective not to outweigh the benefits of higher conditional profits from participating. Moreover, if $\varepsilon_m^* \leq \varepsilon_m^{*I}$ then the benefits to uninformed investors from deterring managerial malfeasance exceed the associated trading losses of activism, which they incur only if management misbehaves. Thus, investors, too, do not want to limit an activist's trading profits, even though those profits come at their expense. In particular, investors gain from a binding disclosure threshold if

$$\frac{H(\rho_t^*)\lambda}{f(k)}\left[g\left(c_t^*\right)\left(\delta f\left(k\right) - c_t^*\right) - G\left(c_t^*\right)\right] + M_I \quad < \quad 0 \tag{17}$$

$$\textit{where} \quad M_I \equiv \frac{dH(\rho_t^*)}{dc_t}\frac{\partial \pi_I}{\partial H(\rho_t^*)} \quad > \quad 0,$$

which can be rearranged to $\varepsilon_m^* > \varepsilon_m^{*I}$.

Comparing equations (12) and (17) reveals the effect of managerial feedback for investors, M_I. Equation (12) in Section 3 shows that, absent managerial feedback, investors' preference over disclosure thresholds only reflects the direct marginal costs and benefits of activism encapsulated in the first term. When management responds to the threat of activism, the

[29]When the second-order conditions hold, local statements about h hold globally for all c_t associated with binding disclosure thresholds.

positive effects of activism to investors become twofold: it increases managerial discipline, ex post, *and* it deters managerial malfeasance, ex ante. Thus, managerial feedback reduces the desirability of disclosure thresholds to investors. When $h(\rho)$ is tiny for ρ associated with $c_t \leq c_t^*$, feedback vanishes, so $M_I \to 0$, and (17) reduces to (12). When h is higher, management's actions become more sensitive to the extent of activism. As a result, investors may find a binding disclosure threshold undesirable even if the conditional marginal profitability of activism is negative, i.e., even if $g(c_t^*)(\delta f(k) - c_t^*) < G(c_t^*)$. It follows that if investors find a binding disclosure threshold desirable with managerial feedback, then they also do so in the absence of managerial feedback: $\varepsilon_a^* < \varepsilon_a^{*I}$ is necessary for $\varepsilon_m^{*I} < 0$, and hence for (17) to hold.

Society does not internalize management's private gains from malfeasance, but is affected by the destruction of project value. A regulator wants a binding disclosure threshold when

$$\begin{aligned} \Big[H(\rho_t^*)\lambda g(c_t^*)(\delta f(k) - c_t^*) + M_R\Big]\frac{dc_t^*}{d\alpha} + \pi_A f'(k)\frac{\partial k}{\partial \alpha} &< 0 \\ \textit{where} \quad M_R = M_I f(k) + M_A &> 0, \end{aligned} \tag{18}$$

which can be rearranged to $\varepsilon_m^* > \varepsilon_m^{*R}$. M_R captures the social impact of managerial feedback. Society does not care about transfers of profits between investors and the activist caused by managerial feedback, but only about the aggregate effect, $M_R = M_I f(k) + M_A$. Further expanding M_R reveals that the social benefits of managerial feedback consist of the sum of two elements, weighted by the response of management $\frac{dH(\rho_t)}{dc_t}$ to the threat of activism.[30] The regulator wants greater *potential* activism and hence weaker ownership disclosure rules when managers respond by more to the threat of discipline. The first element in the expansion is the value enhanced by deterring malfeasance: $\delta f(k)[1 - \lambda G(c_t)]$. Here, $\delta f(k)$ is the difference in firm value under good and bad business plans; and $1 - \lambda G(c_t)$ is the probability that the activist does stop a bad plan when it is implemented. The second element is the expected cost incurred by the activist when it disciplines management, $\lambda G(c_t)E[c|c \leq c_t]$. Deterring malfeasance means that those costs are not incurred.

The sole social cost of activism is a potential reduction in investment. Thus, the regulator must gain from a nonbinding disclosure threshold if it benefits investors: we can only have $\varepsilon_m^{*R} < \varepsilon_m^*$ if investment is reduced by the transfer of trading profits from investors to the activist, i.e., if $\frac{df(k)}{d\alpha} = f'(k)\frac{\partial k}{\partial \alpha} < 0$.[31] The profit elasticity of activism ε_a^* reduces the harmful effects of negative investment feedback, raising the optimal disclosure threshold.

[30] In particular, $M_R = -\frac{dH(\rho_t)}{dc_t}\Big[\delta f(k)[1 - \lambda G(c_t)] + \lambda G(c_t)E[c|c \leq c_t]\Big]$.

[31] To satisfy $\varepsilon_m^{*R} < \varepsilon_m^*$, the cutoff ε_m^{*R} must be negative. The denominator is positive because $-\frac{\partial \pi_I/\partial H(\varphi_t^*)}{\partial \pi_A/\partial H(\varphi_t^*)} > 1$ whereas $\frac{c_t^* - E[c|c \leq c_t^*]}{c_t^*} < 1$. Thus, $\varepsilon_m^{*R} < 0$ if and only if $\frac{\delta f(k) - c_t^*}{c_t^*} + \frac{1}{\varepsilon_a^*}\left(\frac{\frac{df(k)/d\alpha}{f(k)}}{\frac{dc_t^*/d\alpha}{c_t^*}}\right) < 0$.

5 Concluding Remarks

Hedge fund activism has generated a regulatory debate about the desirability of revising blockholder disclosure thresholds. These rules were set to protect small investors from abusive tactics of blockholders. We identify the tradeoffs. Disclosure thresholds may discourage activist funds from intervening to protect small investors from corporate managers that can take actions that benefit themselves at the expense of firm value; but activist funds are also informed traders who profit from trading on their information advantage about their value-enhancing actions at the expense of uninformed investors. While managerial discipline creates value and incentivizes real investment, the associated trading rents extracted from uninformed investors reduce their profitability and impair investment, destroying value.

We show that the preferences for binding disclosure thresholds of investors, activist funds and society are never aligned. Whenever activists gain from a binding threshold—which commits them to intervening less frequently, encouraging managerial misbehavior—investors and society are harmed. Managerial discipline increases investment value without the need for investors to incur further trading losses, and the increased investment benefit society. When, instead, investors gain from a binding threshold, they benefit more than regulators, and activists are necessarily harmed even when the excessive trading losses cause investors to reduce their investments. We only find scope for agreement when all market participants gain from non-binding disclosure thresholds. This requires that the willingness of activists to intervene be sufficiently sensitive to the degree of market opacity, but, in turn, that firm management not be too sensitive to the threat of activism in its choices of whether to take actions that benefit itself at the expense of shareholders.

6 Appendix A: Proofs

6.1 Proof Proposition 1

Market maker. Let $\widehat{\alpha}$ be the market maker's conjecture about the activist trade. Denote $\widehat{c}_t \equiv c_t(\widehat{\alpha})$ the corresponding conjecture about his cost participation threshold.

The market maker observes net order flow ω. This is either due to (i) the activist did not take a position and $l = -\omega$; (ii) the activist participates and $l = -\omega + \widehat{\alpha}$. The activist does not participate when the business plan is good, and when the business plan is bad and either he does not observe it and/or the cost to discipline management is too high. The unconditional probability is $[1 - z\lambda G(\widehat{c}_t)]x(-\omega)$. The activist participates if he observes the bad business plan and the cost to discipline management is sufficiently small, which has unconditional probability $z\lambda G(\widehat{c}_t)\, x(-\omega + \widehat{\alpha})$. Thus, the expected value of the project is

$$\begin{aligned} E[V] &= \left[\frac{x(-\omega)(1-z) + x(-\omega+\widehat{\alpha})z\lambda G(\widehat{c}_t)}{x(-\omega)(1-z) + x(-\omega+\widehat{\alpha})z\lambda G(\widehat{c}_t) + x(-\omega)z[1-\lambda G(\widehat{c}_t)]}\right] f(k) \\ &\quad + \left[\frac{x(-\omega)z[1-\lambda G(\widehat{c}_t)]}{x(-\omega)(1-z) + x(-\omega+\widehat{\alpha})z\lambda G(\widehat{c}_t) + x(-\omega)z[1-\lambda G(\widehat{c}_t)]}\right](1-\delta) f(k) \end{aligned} \tag{19}$$

Suppose the market maker observes $\omega < -b + \widehat{\alpha}$. Then $x(-\omega + \widehat{\alpha}) = 0$, implying that the activist does not participate and $P(\omega) = P_l$. Similarly, suppose that $\omega > 0$. Then $x(-\omega) = 0$, and the activist participates with certainty so $P(\omega) = P_h$. Finally, suppose that some $\omega \in [-b + \widehat{\alpha}, 0]$ is observed. Then, the market maker does not know whether the activist participates, and $x(-\omega + \widehat{\alpha}) = x(-\omega) = 1/b$, cancelling out of the numerator and denominator. The denominator becomes one and the conditional expected value of the project simplifies to $P(\omega) = P_m$.

Activist. The activist position $\alpha^* = b/2$ is derived in the main text, and the market maker's conjecture is correct in equilibrium, i.e., $\widehat{\alpha} = \alpha^*$. Uniqueness of c_t follows from the fact that the left-hand side of (7) increases with c_t, whereas the right-hand side decreases with c_t. To study c_t as a function of α and k, define $F \triangleq c_t - z[1 - \lambda G(c_t)]\left(\frac{b-\alpha}{b}\right)\alpha\delta f(k)$. From the Implicit Function Theorem, $\frac{\partial c_t}{\partial q} = -\frac{\partial F/\partial q}{\partial F/\partial c_t}$. Thus, we have

$$\begin{aligned} \frac{\partial c_t}{\partial \alpha} &= \frac{z\delta[1-\lambda G(c_t)](b-2\alpha) f(k)}{b + \lambda g(c_t) z\delta(b-\alpha)\alpha f(k)}; \\ \frac{\partial c_t}{\partial k} &= \frac{z\delta[1-\lambda G(c_t)](b-\alpha)\alpha f'(k)}{b + \lambda g(c_t) z\delta(b-\alpha)\alpha f(k)}. \end{aligned} \tag{20}$$

So $\frac{\partial c_t}{\partial \alpha} > 0 \leftrightarrow \alpha < \alpha^* = \frac{b}{2}$ and $\frac{\partial c_t}{\partial k} > 0$.

6.2 Proof of Proposition 2

Gross expected profits. For a full characterization of the gross profit functions at $t = 0$ consider an arbitrary position α. The unconditional project value $E[V]$ in Proposition 2 weighs cash flows $f(k)$ with the probabilities that (i) the manager implements the good business plan, $1 - z$; (ii) the manager implements the bad plan but is disciplined by the activist, $z\lambda G(c_t)$; (iii) the manager implements the bad plan and is not disciplined by the activist but the project succeeds anyway, $z[1 - \lambda G(c_t)](1 - \delta)$.

The activist's gross profits are obtained by weighting his conditional profits $E[\Pi_A|a_1]$ with the probability of participation $z\lambda G(c_t)$;

$$\begin{aligned} E[\Pi_A] &= \pi_A f(k) \\ \textit{with } \pi_A &= z\lambda G(c_t) z[1 - \lambda G(c_t)] \left(\frac{b-\alpha}{b}\right) \alpha\delta. \end{aligned} \tag{21}$$

By construction, expected investors' profits are the residual $E[\Pi_I] = [\pi_V - \pi_A] f(k)$,

$$\begin{aligned} E[\Pi_I] &= \pi_I f(k) \\ \textit{with } \pi_I &= (1 - z) + z\lambda G(c_t) \left[1 - z[1 - \lambda G(c_t)] \left(\frac{b-\alpha}{b}\right) \alpha\delta\right] \\ &\quad + z[1 - \lambda G(c_t)](1 - \delta). \end{aligned} \tag{22}$$

Proposition 2 provides expressions for expected profits in equilibrium, incorporating $\alpha = \alpha^* = b/2$. We rearrange π_A as a function of c_t to show that α affects expected profits only through trading transfers c_t and capital, i.e., $E[\Pi_A](c_t(\alpha), k(\alpha))$ and $E[\Pi_I](c_t(\alpha), k(\alpha))$.

Real Investment. The first-order condition for investors' *net* profits $\pi_I f(k) - rk$ characterizes real investment. Note that while π_I is function of both activism and investment, small investors are price takers and do not internalize the effects of their own investment.

6.3 Proof of Proposition 4

Investors. We derive the optimal disclosure threshold for investors. Their net expected profits are $\pi_I f(k) - rk$. We differentiate with respect to α to characterize how their marginal profits vary with the activist's position:

$$\frac{d}{d\alpha}\{\pi_I f(k) - rk\} = \left[\frac{\partial \pi_I}{\partial c_t}\frac{dc_t}{d\alpha} + \frac{\partial \pi_I}{\partial k}\frac{\partial k}{\partial \alpha}\right] f(k) + [\pi_I f'(k) - r]\frac{\partial k}{\partial \alpha} \tag{23}$$

We show that (23) is strictly positive at $\alpha = 0$, implying that investors always benefit from some degree of market opacity, i.e., $\overline{\alpha}_I > 0$. We then prove that (23) decreases in α for $\alpha < \alpha^*$. Therefore, if (23) is negative at $\alpha = \alpha^*$, then the optimal disclosure threshold $\overline{\alpha}_I$ solves (23) $= 0$ and $\overline{\alpha}_I < \alpha^*$. If, instead, (23) is positive at $\alpha = \alpha^*$, then the optimal threshold is non-binding, i.e., $\overline{\alpha}_I \geq \alpha^*$.

Analysis of (23) simplifies because of two properties. First, Proposition 2 shows that in equilibrium $\pi_I f'(k) - r = 0$, so the last term of (23) vanishes. Second, any interior maximum of $\pi_I f(k) - rk$ satisfies $\frac{\partial k}{\partial \alpha} = 0$ because the activist position that maximizes investor profits, also maximizes investment.[32] Using these two features and the expansion $\frac{dc_t}{d\alpha} = \frac{\partial c_t}{\partial \alpha} + \frac{\partial c_t}{\partial k}\frac{\partial k}{\partial \alpha}$, it follows from (23) that any interior solution $\overline{\alpha}_I < \alpha^*$ solves $\frac{\partial \pi_I}{\partial c_t}\frac{\partial c_t}{\partial \alpha} f(k) = 0$.

The proof of Proposition 1 shows that $\frac{\partial c_t}{\partial \alpha} > 0 \leftrightarrow \alpha < \alpha^* = b/2$ with $\frac{\partial c_t}{\partial \alpha} = 0$ for $\alpha < \alpha^*$. Therefore, if there is an interior solution $\overline{\alpha}_I < \alpha^*$, it must be characterized by $\frac{\partial \pi_I}{\partial c_t} = 0$, where

$$\frac{\partial \pi_I}{\partial c_t} = \frac{z\lambda}{f(k)}\left[g(c_t)(\delta f(k) - c_t) - G(c_t)\right]. \tag{24}$$

Because $g(c)$ is decreasing in c, (24) decreases with c_t.

At $\alpha = 0$ activist trading profits are zero, i.e., $c_t = 0$. It follows that if $\alpha = 0$ then (24) > 0, and thus (23) > 0. Therefore, investors always benefit from some degree of market opacity, i.e., from $\overline{\alpha}_I > 0$. We prove below that trading transfers increase with the activist's position $\alpha < \alpha^*$ despite investment feedback, i.e., that $\frac{dc_t}{d\alpha} > 0$ for $\alpha < \alpha^*$—see the *activist* section of the proof. Hence, (24) decreases with α for $\alpha < \alpha^*$, and the same is true for (23). A binding optimal threshold exists if and only if (23) < 0 for $\alpha = \alpha^*$. Moreover, it satisfies (23) $= 0$. The condition (23) < 0 can be rearranged as $\varepsilon_a^{*I} < \varepsilon_a^*$.

Activist. We derive the activist's optimal disclosure threshold. His net expected profits are

$$\pi_A f(k) - z\lambda G(c_t) E[c|c \leq c_t] = z\lambda G(c_t)\left[c_t - E[c|c \leq c_t]\right], \tag{25}$$

where the right-hand side uses the expression for π_A in Proposition 2. Here, $z\lambda G(c_t)$ is the probability that the activist participates, i.e., the probability that (i) the manager adopts the bad business plan, (ii) the activist observes it, and (iii) his cost of intervention is sufficiently small. Conditional on intervention being optimal, his expected profits are the difference between trading profits c_t and the cost of disciplining management, which is expected to be $E[c|c \leq c_t] = \left[\int_0^{c_t} cg(c)\,dc\right]/G(c_t)$.

[32]From the Implicit Function Theorem, $\frac{\partial k}{\partial \alpha} = -\frac{\frac{\partial \pi_I}{\partial c_t}\frac{\partial c_t}{\partial \alpha} f'(k)}{\pi_I f''(k)}$, where the denominator is negative. The proof of Proposition 4 continues by showing that the numerator in this expression characterizes the sign of (23). Therefore, $\frac{\partial k}{\partial \alpha} > 0$ if and only if $\frac{d}{d\alpha}\{\pi_I f(k) - rk\} > 0$.

Differentiating with respect to α yields the marginal profitability to the activist of increasing his position:

$$\frac{d}{d\alpha}\left\{z\lambda G\left(c_t\right)\left[c_t - E\left[c|c \leq c_t\right]\right]\right\} = z\lambda G\left(c_t\right)\frac{dc_t}{d\alpha} \tag{26}$$

The result follows because

$$\begin{aligned}
\frac{dE\left[c|c \leq c_t\right]}{d\alpha} &= \frac{\partial E\left[c|c \leq c_t\right]}{\partial c_t}\frac{dc_t}{d\alpha} \\
&= \frac{g\left(c_t\right)}{G\left(c_t\right)}\left[\frac{\frac{\partial}{\partial c_t}\left\{\int_0^{c_t} cg\left(c\right)dc\right\}}{g\left(c_t\right)} - E\left[c|c \leq c_t\right]\right]\frac{dc_t}{d\alpha} \\
&= \frac{g\left(c_t\right)}{G\left(c_t\right)}\left[c_t - E\left[c|c \leq c_t\right]\right]\frac{dc_t}{d\alpha}
\end{aligned} \tag{27}$$

where the last line uses $\frac{\partial}{\partial c_t}\left\{\int_0^{c_t} cg\left(c\right)dc\right\} = g\left(c_t\right)c_t$.

The sign of (26) is determined by $\frac{dc_t}{d\alpha} = \frac{\partial c_t}{\partial \alpha} + \frac{\partial c_t}{\partial k}\frac{\partial k}{\partial \alpha}$. The Proof of Proposition 1 shows $\frac{\partial c_t}{\partial \alpha} > 0 \leftrightarrow \alpha < \alpha^* = \frac{b}{2}$ and also that $\frac{\partial c_t}{\partial k} > 0$. Hence, for the activist to gain from a binding disclosure threshold it must be that $\frac{\partial k}{\partial \alpha} < -\frac{\partial c_t/\partial \alpha}{\partial c_t/\partial k}$ for $\alpha < \alpha^*$, i.e., that the negative investment response to activism by investors is strong enough to outweigh the positive marginal net trading transfers. We prove that this cannot be so by contradiction.

If $\frac{\partial k}{\partial \alpha} < 0$, a marginal increase in the activist's position must hurt investors, implying that $\frac{\partial \pi_I}{\partial c_t} < 0$. Suppose that the investment feedback satisfies $\frac{\partial k}{\partial \alpha} < -\frac{\partial c_t/\partial \alpha}{\partial c_t/\partial k}$ and thus that $\frac{dc_t}{d\alpha} < 0$. By assumption increasing α reduces c_t, so it must increase *investor* profits because $\frac{\partial \pi_I}{\partial c_t} < 0$. But this higher profitability leads investors to increase capital when the activist increases his position $\frac{\partial k}{\partial \alpha} > 0$, a contradiction. It follows that $\frac{dc_t}{d\alpha} > 0$ for $\alpha < \alpha^*$.

This argument establishes that $\overline{\alpha}_A \geq \alpha^*$ in the absence of managerial feedback and yields Corollary 5. This result was also used in the derivation of the optimal disclosure threshold for investors, above.

Regulator. We derive the optimal disclosure threshold for society. The regulator maximizes the project value net of both cost of capital and expected cost of activism, maximizing

$$\pi_V f(k) - rk - z\lambda G\left(c_t\right)E\left[c|c \leq c_t\right], \tag{28}$$

where π_V is described in Proposition 2. Differentiating (28) with respect to α yields the marginal benefit to the regulator of increasing the activist's position:

$$
\begin{aligned}
& \frac{d}{d\alpha}\left\{\pi_V f(k) - rk - z\lambda G\left(c_t\right) E\left[c|c \leq c_t\right]\right\} & (29)\\
= \; & \frac{\partial \pi_V}{\partial c_t}\frac{dc_t}{d\alpha} f(k) + \pi_V f'\left(k\right)\frac{\partial k}{\partial \alpha} - r\frac{\partial k}{\partial \alpha} - z\lambda\left[g\left(c_t\right) E\left[c|c \leq c_t\right] + G\left(c_t\right)\frac{dE\left[c|c \leq c_t\right]}{dc_t}\right]\frac{dc_t}{d\alpha} & \\
= \; & \frac{\partial \pi_V}{\partial c_t}\frac{dc_t}{d\alpha} f(k) + \left[\pi_V f'\left(k\right) - r\right]\frac{\partial k}{\partial \alpha} - z\lambda g\left(c_t\right) c_t \frac{dc_t}{d\alpha} & (30)\\
= \; & \left[\frac{\partial \pi_V}{\partial c_t} f(k) - z\lambda g\left(c_t\right) c_t\right]\frac{dc_t}{d\alpha} + \pi_A f'\left(k\right)\frac{\partial k}{\partial \alpha} \; . & (31)
\end{aligned}
$$

where the second equality (30) uses (27); the third equality (31) rearranges (30) using both equilibrium relationships $\pi_I f'\left(k\right) - r = 0$ (optimal investment by the investors) and $\pi_V = \pi_I + \pi_A$ from Proposition 2. Next, in (31) substitute for $\frac{\partial \pi_V}{\partial c_t} = z\delta\lambda g\left(c_t\right)$ obtained by differentiating the expression for π_V in Proposition 2, and use $\pi_A = z\lambda G\left(c_t\right)\frac{c_t}{f(k)}$ to obtain

$$
\begin{aligned}
(29) \quad = \quad & z\lambda g\left(c_t\right)\left[\delta f(k) - c_t\right]\frac{dc_t}{d\alpha} + z\lambda G\left(c_t\right)\frac{c_t}{f\left(k\right)} f'\left(k\right)\frac{\partial k}{\partial \alpha} & (32)\\
\underset{sign}{=} \quad & g\left(c_t\right)\left[\delta f(k) - c_t\right]\frac{dc_t}{d\alpha} + G\left(c_t\right) c_t \frac{f'\left(k\right)}{f\left(k\right)}\frac{\partial k}{\partial \alpha}. &
\end{aligned}
$$

The first line of (32) corresponds to the condition in (14). The second line of (32) can be rearranged to obtain the expression for ε_a^{*R} in Proposition 4 by noting that $\frac{df(k)}{d\alpha} = f'\left(k\right)\frac{\partial k}{\partial \alpha}$.

It has been shown that $\frac{dc_t}{d\alpha} > 0$ for $\alpha < \alpha^*$; from (7) it follows that $\delta f(k) - c_t > 0$. Thus, $\frac{\partial k}{\partial \alpha} < 0$ is a necessary condition for a binding disclosure threshold to be optimal for the regulator, and $\varepsilon_a^{*R} < \varepsilon_a^{*I}$.

6.4 Proof of Corollary 6

We prove Corollary 6 in three steps.

1. A transfer $\tau > 0$ always reduces $g(c_t)$ and increases $G(c_t)$. A transfer $\tau > 0$ creates both a direct and an indirect effect on $g(c_t)$. The *direct* effect reduces $g(c_t)$ and increases $G(c_t)$ for any given $c_t \in (0, C]$. The *indirect* effect reduces c_t. In particular, from both (7) and the Implicit Function Theorem, c_t decreases in G. Thus, the increase in G caused by the direct effect diminishes c_t. The two effects have opposite effects on $g(c_t)$, but the direct effect always outweighs the indirect effect, so the transfer unambiguously reduces $g(c_t)$ and increases $G(c_t)$. To see this, suppose that a transfer $\tau > 0$ leads to a bigger $g(c_t)$, so the decrease in c_t outweighs the reduction of g. It follows that $G(c_t)$ is smaller, and therefore c_t is larger, a contradiction.

2. There exist cutoffs τ^I and τ^R such that $\varepsilon_a^* < \varepsilon_a^{*I}$ if and only if $\tau^I > \tau$, and $\varepsilon_a^* < \varepsilon_a^{*R}$ if and only if $\tau^R > \tau$. Moreover, $\tau^I < \tau^R$. We showed that any transfer $\tau > 0$ reduces both c_t and $g(c_t)$, and increases $G(c_t)$. From the characterizations provided in Proposition 4, it follows that ε_a^*, ε_a^{*I} and ε_a^{*R} decrease with a transfer $\tau > 0$. Consider now the biggest possible transfer $\tau = \sup\{g\}$, so that all probability mass accumulates at $c = 0$. Then, for any $c_t > 0$, we have $g(c_t) = 0$ and $G(c_t) = 1$. From the characterizations of cutoffs ε_a^*, ε_a^{*I} and ε_a^{*R} in Proposition 4, it follows that a transfer $\tau = \sup\{g\}$ yields $\varepsilon_a^* = 0$, and $\varepsilon_a^{*I} > \varepsilon_a^{*R} > 0$. By continuity, there exist cutoffs $\{\tau^I, \tau^R\} \in (0, \sup\{g\}]$. Since $\varepsilon_a^{*R} < \varepsilon_a^{*I}$, these thresholds satisfy $\tau^I < \tau^R$.

3. Both cutoffs τ^I and τ^R decrease with market liquidity b. Everything else equal, higher liquidity b increases c_t, and decreases the marginal profits of investors $g(c_t)[\delta f(k) - c_t] - G(c_t)$. Thus, a smaller transfer τ^I is required for $\varepsilon_a^{*I} < \varepsilon_a^*$. When $g(c_t)[\delta f(k) - c_t] < G(c_t)$, an increase in trading transfers c_t makes investors' marginal profits more negative, and increases the negative investment feedback $\frac{\partial k}{\partial \alpha} < 0$. From (32) it follows that eventually marginal profits for society become negative.

6.5 Proof of Proposition 7

We derive the critical cutoffs $\{\varepsilon_m^I, \varepsilon_m^A, \varepsilon_m^R\}$ in an analysis that mirrors that in the proof of Proposition 4 incorporating $z \equiv H\left(\varphi\left[\frac{1-\lambda G(c_t)}{\lambda G(c_t)}\right]\right)$. The proof continues to compare the cutoffs and derive the implications for the optimal disclosure thresholds of market participants. Finally it shows that second order conditions hold for uniformly distributed cost of activism and reputation cost.

As a preliminary step, we verify that the partial effects of α and k on the trading transfers c_t preserve the same sign. From the Implicit Function Theorem,

$$\begin{aligned} \frac{\partial c_t}{\partial \alpha} &= \frac{H(\rho_t)[1 - \lambda G(c_t)](b - 2\alpha)\delta f(k)}{b + \left[H(\rho_t)\lambda g(c_t) - h(\rho_t)\frac{d\rho_t}{dc_t}[1 - \lambda G(c_t)]\right](b - \alpha)\alpha\delta f(k)} \\ \frac{\partial c_t}{\partial k} &= \frac{H(\rho_t)\delta[1 - \lambda G(c_t)](b - \alpha)\alpha f'(k)}{b + \left[H(\rho_t)\lambda g(c_t) - h(\rho_t)\frac{d\rho_t}{dc_t}[1 - \lambda G(c_t)]\right](b - \alpha)\alpha\delta f(k)} \end{aligned} \tag{33}$$

where $\frac{d\rho_t}{dc_t} = -\frac{\varphi}{\lambda}\frac{g(c_t)}{G(c_t)^2}$. Therefore, $\frac{\partial c_t}{\partial \alpha} > 0 \leftrightarrow \alpha < \alpha^* = \frac{b}{2}$ and $\frac{\partial c_t}{\partial k} > 0$.

Investors. The derivative of investors' net profits with respect to α is given by (23). If no interior solution exists, then investors do not benefit from a disclosure threshold, i.e., $\overline{\alpha}_I \geq \alpha^*$.

In equilibrium, $\pi_I f'(k) - r = 0$ and $\frac{\partial k}{\partial \alpha} = 0$ at an interior maximum, $\overline{\alpha}_I < \alpha^*$. Use $\frac{dc_t}{d\alpha} = \frac{\partial c_t}{\partial \alpha} + \frac{\partial c_t}{\partial k}\frac{\partial k}{\partial \alpha}$ to simplify (23) to $\frac{\partial \pi_I}{\partial c_t}\frac{\partial c_t}{\partial \alpha} f(k)$. We have $\frac{\partial c_t}{\partial \alpha} > 0 \leftrightarrow \alpha < \alpha^* = b/2$ and

$\frac{\partial c_t}{\partial k} > 0$. Hence, an interior maximum $\overline{\alpha}_I < \alpha^*$ is characterized by $\frac{\partial \pi_I}{\partial c_t} = 0$, where

$$\frac{\partial \pi_I}{\partial c_t} = \frac{H(\rho_t)\lambda}{f(k)}\left[g(c_t)(\delta f(k) - c_t) - G(c_t)\right] + \underbrace{\frac{dH(\rho_t)}{dc_t}\frac{\partial \pi_I}{\partial H(\rho_t)}}_{M_I} \tag{34}$$

Here, $\frac{dH(\rho_t)}{dc_t} = h(\rho_t)\frac{d\rho_t}{dc_t} = g(c_t)\frac{\partial H(\rho_t)}{\partial G(c_t)}$ and $\frac{\partial \pi_I}{\partial H(\rho_t)} = -\left[\delta(1 - \lambda G(c_t)) + \lambda G(c_t)\frac{c_t}{f(k)}\right]$. Because $M_I > 0$, managerial feedback raises the marginal profitability of a higher cutoff to investors.

At $\alpha = 0$, activist trading profits are zero, so $c_t = 0$, and hence (34) > 0 and thus (23) > 0: investors always benefit from some degree of market opacity, i.e., $\overline{\alpha}_I > 0$. To characterize ε^I_m, rearrange (34) $= 0$ as:

$$0 = \frac{H(\rho_t)\lambda}{f(k)}\left[g(c_t)(\delta f(k) - c_t) - G(c_t)\right] + g(c_t)\frac{\partial H(\rho_t)}{\partial G(c_t)}\frac{\partial \pi_I}{\partial H(\rho_t)}. \tag{35}$$

Substituting $\varepsilon_a = \frac{g(c_t)}{G(c_t)}c_t$ and $\varepsilon_m = \frac{\partial H(\rho_t)}{\partial G(c_t)}\frac{G(c_t)}{H(\rho_t)}$ into (35), we next divide by $H(\rho_t)$ and successively rearrange to obtain:

$$\begin{aligned}
0 &= \frac{\lambda}{f(k)}\left[\varepsilon_a\left(\frac{\delta f(k) - c_t}{c_t}\right) - 1\right] + \varepsilon_m \frac{g(c_t)}{G(c_t)^2}\frac{\partial \pi_I}{\partial H(\rho_t)}; \qquad (36)\\
&= \frac{\lambda}{f(k)}\left[\varepsilon_a\left(\frac{\delta f(k) - c_t}{c_t}\right) - 1\right] + \varepsilon_m \varepsilon_a \frac{1}{G(c_t)c_t}\frac{\partial \pi_I}{\partial H(\rho_t)};\\
\Rightarrow &\; -\left(\frac{\lambda G(c_t)\frac{c_t}{f(k)}}{\partial \pi_I / \partial H(\rho_t)}\right)\left[\frac{\delta f(k) - c_t}{c_t} - \frac{1}{\varepsilon_a}\right] = \varepsilon_m.
\end{aligned}$$

The expression for ε^I_m then follows directly from $\lambda G(c_t)\frac{c_t}{f(k)} = \frac{\partial \pi_A}{\partial H(\rho_t)}$. When investors value a binding disclosure threshold, i.e., when $\overline{\alpha}_I < \alpha^*$, it satisfies $\varepsilon_m = \varepsilon^I_m$.

Activist. The activist's expected net profits are given by (25). Differentiating with respect to α yields

$$\begin{aligned}
&\frac{d}{d\alpha}\left\{H(\rho_t)\lambda G(c_t)\left[c_t - E[c|c \le c_t]\right]\right\} \qquad (37)\\
=&\left[H(\rho_t)\lambda G(c_t) + \underbrace{\frac{dH(\rho_t)}{dc_t}\lambda G(c_t)\left[c_t - E[c|c \le c_t]\right]}_{M_A}\right]\frac{dc_t}{d\alpha}.
\end{aligned}$$

where $\frac{dc_t}{d\alpha} = \frac{\partial c_t}{\partial \alpha} + \frac{\partial c_t}{\partial k}\frac{\partial k}{\partial \alpha}$ was derived in the proof of Proposition 4. Because $M_A < 0$, managerial feedback reduces the marginal profits from increasing α to the activist.

Since (37) > 0 at $\alpha = 0$, the activist always benefits from some degree of market opacity, i.e., $\overline{\alpha}_A > 0$. If no interior solution exists, then the activist does not benefit from a disclosure threshold, i.e., $\overline{\alpha}_A \geq \alpha^*$. Set (37) $= 0$ to derive ε_m^A, and recall that $\frac{dc_t}{d\alpha} > 0$ for $\alpha < \alpha^*$. Thus, (37) $= 0$ implies

$$H(\rho_t) + \frac{dH(\rho_t)}{dc_t}\left[c_t - E\left[c|c \leq c_t\right]\right] = 0. \tag{38}$$

Substitute $\frac{dH(\rho_t)}{dc_t} = g\left(c_t\right)\frac{\partial H(\rho_t)}{\partial G(c_t)}$ and the expressions for elasticities $\varepsilon_a = \frac{g(c_t)}{G(c_t)}c_t$ and $\varepsilon_m = \frac{\partial H(\rho_t)}{\partial G(c_t)}\frac{G(c_t)}{H(\rho_t)}$ into (38) and divide by $H(\rho_t)$ to obtain:

$$\begin{aligned} 0 &= 1 + g(c_t)\frac{\partial H\left(\rho_t\right)}{\partial G(c_t)}\frac{1}{H(\rho_t)}\left[c_t - E\left[c|c \leq c_t\right]\right] \\ &= 1 + \frac{g\left(c_t\right)}{G\left(c_t\right)}\frac{\partial H\left(\rho_t\right)}{\partial G(c_t)}\frac{G\left(c_t\right)}{H(\rho_t)}\left[c_t - E\left[c|c \leq c_t\right]\right] \\ &= 1 + \varepsilon_m\varepsilon_a\left[\frac{c_t - E\left[c|c \leq c_t\right]}{c_t}\right]. \end{aligned} \tag{39}$$

The characterization of ε_m^A follows directly.

Regulator. The regulator's net expected payoff is given by (28). Differentiating with respect to α yields the marginal payoff to the regulator of increasing the activist's position:

$$\begin{aligned} &\frac{d\pi_V}{dc_t}\frac{dc_t}{d\alpha}f(k) + \pi_V f'\left(k\right)\frac{\partial k}{\partial\alpha} - r\frac{\partial k}{\partial\alpha} - \frac{dH(\rho_t)}{dc_t}\lambda G\left(c_t\right)E\left[c|c \leq c_t\right]\frac{dc_t}{d\alpha} \\ &-H(\rho_t)\lambda g\left(c_t\right)E\left[c|c \leq c_t\right]\frac{dc_t}{d\alpha} - H\left(\rho_t\right)\lambda G\left(c_t\right)\frac{g\left(c_t\right)}{G\left(c_t\right)}\left[c_t - E\left[c|c \leq c_t\right]\right]\frac{dc_t}{d\alpha}. \end{aligned} \tag{40}$$

Substitute the equilibrium relationship $\pi_I f'\left(k\right) - r = 0$ and $\pi_V = \pi_I + \pi_A$ to rearrange the regulator's marginal payoff from increasing α as:

$$\begin{aligned} (40) &= \frac{d\pi_V}{dc_t}\frac{dc_t}{d\alpha}f(k) + \pi_A f'\left(k\right)\frac{\partial k}{\partial\alpha} \\ &\quad -\frac{dH(\rho_t)}{dc_t}\lambda G\left(c_t\right)E\left[c|c \leq c_t\right]\frac{dc_t}{d\alpha} - H\left(\rho_t\right)\lambda g\left(c_t\right)c_t\frac{dc_t}{d\alpha} \\ &= -\frac{dH(\rho_t)}{dc_t}\Big[\delta f(k)\left[1 - \lambda G\left(c_t\right)\right] + \lambda G\left(c_t\right)E\left[c|c \leq c_t\right]\Big]\frac{dc_t}{d\alpha} \\ &\quad +H\left(\rho_t\right)\lambda g\left(c_t\right)\left[\delta f(k) - c_t\right]\frac{dc_t}{d\alpha} + \pi_A f'\left(k\right)\frac{\partial k}{\partial\alpha} \end{aligned} \tag{41}$$

where the second equality follows from $\frac{d\pi_V}{dc_t} = H\left(\rho_t\right)\delta\lambda g\left(c_t\right) - \frac{dH(\rho_t)}{dc_t}\delta\left[1 - \lambda G\left(c_t\right)\right]$. Rearranging yet again yields:

$$\begin{aligned}
(40) &= \Big[H(\rho_t)\lambda g(c_t)[\delta f(k) - c_t] + M_R\Big]\frac{dc_t}{d\alpha} + \pi_A f'(k)\frac{\partial k}{\partial \alpha}, \qquad (42)\\
\text{where } M_R &\equiv -\frac{dH(\rho_t)}{dc_t}\Big[\delta f(k)[1-\lambda G(c_t)] + \lambda G(c_t)E[c|c\le c_t]\Big].
\end{aligned}$$

This equation corresponds to the characterization in (18). Since $M_R > 0$, managerial feedback increases the marginal profitability to the regulator of increasing the activist's position.

To ease exposition, we define $\Psi \equiv -\frac{\partial \pi_V}{\partial H(\rho_t)} f(k) + \lambda G(c_t) E[c|c \le c_t]$ so that $M_R = -\frac{dH(\rho_t)}{dc_t}\Psi$. Moreover, recall that $\frac{dH(\rho_t)}{dc_t} = g(c_t)\frac{\partial H(\rho_t)}{\partial G(c_t)}$. Substituting, rewrite (42) as:

$$\begin{aligned}
0 &= \left[-\frac{\partial H(\rho_t)}{\partial G(c_t)} g(c_t)\Psi + H(\rho_t)\lambda g(c_t)(\delta f(k) - c_t)\right]\frac{dc_t}{d\alpha} + \pi_A\frac{df(k)}{d\alpha} \qquad (43)\\
&= g(c_t)(\delta f(k) - c_t) - \frac{g(c_t)}{G(c_t)}\frac{\partial H(\rho_t)}{\partial G(c_t)}\frac{G(c_t)}{H(\rho_t)}\frac{\Psi}{\lambda} + \frac{\pi_A}{H(\rho_t)\lambda}\frac{df(k)/d\alpha}{dc_t/d\alpha}\\
&= \varepsilon_a\left(\frac{\delta f(k) - c_t}{c_t}\right)G(c_t) - \varepsilon_m\varepsilon_a\frac{\Psi}{\lambda c_t} + \frac{\pi_A}{H(\rho_t)\lambda}\frac{df(k)/d\alpha}{dc_t/d\alpha}\\
&= \varepsilon_a\left(\frac{\delta f(k) - c_t}{c_t}\right) - \varepsilon_m\varepsilon_a\frac{\Psi}{\lambda G(c_t)c_t} + \frac{\frac{df(k)/d\alpha}{f(k)}}{\frac{dc_t/d\alpha}{c_t}}\\
&= -\varepsilon_m + \frac{\lambda G(c_t)c_t}{\Psi}\left[\frac{\delta f(k) - c_t}{c_t} + \frac{1}{\varepsilon_a}\left(\frac{\frac{df(k)/d\alpha}{f(k)}}{\frac{dc_t/d\alpha}{c_t}}\right)\right],
\end{aligned}$$

where the third line uses $\varepsilon_a = \frac{g(c_t)}{G(c_t)}c_t$ and $\varepsilon_m = \frac{\partial H(\rho_t)}{\partial G(c_t)}\frac{G(c_t)}{H(\rho_t)}$. To derive ε_m^R note in the last line of (43) that using $\pi_V = \pi_I + \pi_A$ we obtain

$$\begin{aligned}
\frac{\lambda G(c_t)c_t}{\Psi} &= \left[-\frac{\frac{\partial \pi_I}{\partial H(\rho_t)}f(k)}{\lambda G(c_t)c_t} - \frac{\frac{\partial \pi_A}{\partial H(\rho_t)}f(k)}{\lambda G(c_t)c_t} + \frac{E[c|c\le c_t]}{c_t}\right]^{-1} \qquad (44)\\
&= \left[-\frac{\partial \pi_I/\partial H(\rho_t)}{\partial \pi_A/\partial H(\rho_t)} - \frac{c_t - E[c|c\le c_t]}{c_t}\right]^{-1}.
\end{aligned}$$

Cutoff relation. The analysis above rearranges the marginal payoffs to market participants of increasing α. When second order conditions hold, (i) activist marginal profits are decreasing at α^* when $\varepsilon_m^* < \varepsilon_m^{*A}$; (ii) investors' marginal profits are decreasing at α^* if $\varepsilon_m^{*I} < \varepsilon_m^*$; (iii) the regulator's marginal payoff is decreasing at α^* when $\varepsilon_m^{*R} < \varepsilon_m^*$.

Next we show that $\varepsilon_m^A < \varepsilon_m^I < \varepsilon_m^R$. Since marginal profits of all market agents are positive at $\alpha = 0$, $\varepsilon_m \in (\varepsilon_m^A, \varepsilon_m^I)$ when $\alpha = 0$. It follows that if second order conditions hold, when investors want a binding disclosure threshold, activists do not and vice versa. Moreover, and no party wants a binding disclosure threshold if $\varepsilon_m^* \in [\varepsilon_m^{A*}, \varepsilon_m^{I*}]$.

To see that $\varepsilon_m^A < \varepsilon_m^I$, note that the relation is equivalent to

$$\frac{1}{\varepsilon_a}\left(-\frac{\partial \pi_A/\partial H\left(\rho_t\right)}{\partial \pi_I/\partial H\left(\rho_t\right)} - \frac{c_t}{c_t - E\left[c|c \le c_t\right]}\right) < -\left(\frac{\partial \pi_A/\partial H\left(\rho_t\right)}{\partial \pi_I/\partial H\left(\rho_t\right)}\right)\left[\frac{\delta f\left(k\right) - c_t}{c_t}\right]. \tag{45}$$

The left-hand side of (45) is negative because

$$-\frac{\partial \pi_A/\partial H\left(\rho_t\right)}{\partial \pi_I/\partial H\left(\rho_t\right)} = -\frac{\lambda G\left(c_t\right)\frac{c_t}{f(k)}}{-\left[\left[1-\lambda G\left(c_t\right)\right]\delta + \lambda G\left(c_t\right)\frac{c_t}{f(k)}\right]} \in (0,1)$$

whereas $\frac{c_t}{c_t - E[c|c\le c_t]} > 1$. The right-hand side of (45) is positive because $\partial \pi_A/\partial H\left(\rho_t\right) > 0$ whereas $\partial \pi_I/\partial H\left(\rho_t\right) < 0$, so we have $\varepsilon_m^A < \varepsilon_m^I$.

To see that $\varepsilon_m^I < \varepsilon_m^R$, note that a necessary condition for $\varepsilon_m^R < 0$ is that investment decrease with α, i.e., $\frac{df(k)}{d\alpha} = f'(k)\frac{\partial k}{\partial \alpha} < 0$, which implies that activist marginal profits decrease and thus $\varepsilon_m^I < \varepsilon_m$. Hence, if $\varepsilon_m^R = 0$, then $\varepsilon_m^I < \varepsilon_m < 0$. That is, the sole cost to society of increasing trading transfers is a reduction in real investment, while the benefits exceed those for investors. Thus, for $\varepsilon_m^R < \varepsilon_m$, it is necessary, but not sufficient, that $\varepsilon_m^I < \varepsilon_m$, which implies $\varepsilon_m^R < \varepsilon_m^I$.

6.5.1 The uniform-uniform case

We show that when both c and ρ are uniformly distributed, second-order conditions hold.

Investors. We rewrite the first-order condition for investors in (35), first substituting in the uniform distribution of the manager's cost of reputation, and then the uniform distribution of the activist's cost of intervention. Substituting $H(\rho_t) = \frac{\rho_t}{R}$ and $h(\rho_t) = \frac{1}{R}$, (35) becomes:

$$\begin{aligned} 0 \;\; = \;\; & \underbrace{\frac{\varphi}{R}\left[\frac{1-\lambda G(c_t)}{\lambda G(c_t)}\right]}_{H(\rho_t)}\frac{\lambda}{f(k)}\left[g(c_t)(\delta f(k) - c_t) - G(c_t)\right] \\ & + \underbrace{\frac{\varphi}{R}\left[\frac{g(c_t)}{\lambda G(c_t)^2}\right]}_{-\partial H(\rho_t)/\partial c_t}\underbrace{\left[\delta(1-\lambda G(c_t)) + \lambda G(c_t)\frac{c_t}{f(k)}\right]}_{-\partial \pi_I/\partial H(\rho_t)}. \end{aligned} \tag{46}$$

Multiplying (46) by $\frac{R}{\varphi}\left[\frac{\lambda G(c_t)}{1-\lambda G(c_t)}\right]\frac{f(k)}{\lambda}$ yields an equivalent condition

$$0 = g(c_t)(\delta f(k) - c_t) - G(c_t) + \left[\frac{g(c_t)}{\lambda G(c_t)}\right]\left[\delta f(k) + \frac{\lambda G(c_t)}{1-\lambda G(c_t)}c_t\right], \tag{47}$$

which we multiply yet again by $\frac{1}{g(c_t)}$ and rearrange to obtain

$$0 = \delta f(k) \left[\frac{1+\lambda G(c_t)}{\lambda G(c_t)} \right] + c_t \left[\frac{\lambda G(c_t)}{1-\lambda G(c_t)} \right] - \frac{G(c_t)}{g(c_t)}. \tag{48}$$

Substituting $G(c_t) = \frac{c_t}{C}$ and $g(c_t) = \frac{1}{C}$, the first-order condition (48) for investors becomes

$$0 = \delta f(k) \left[\frac{C+\lambda c_t}{\lambda c_t} \right] + c_t \left[\frac{\lambda c_t}{C-\lambda c_t} \right] - c_t \tag{49}$$

We prove that there is a unique solution to the first-order condition for investors by showing that the right-hand side (RHS) of (49) decreases in c_t. Differentiating yields

$$\frac{d}{dc_t} RHS(49) = \left(\frac{C}{C-\lambda c_t} \right)^2 - \frac{\delta f(k) C}{\lambda c_t^2} - 2, \tag{50}$$

which is negative for $c_t \to 0$ and increasing in c_t. We derive an upper bound for c_t and show that $\frac{d}{dc_t} RHS(49) < 0$ for such trading transfers, establishing that the solution to the first-order condition is unique. Trading profits c_t are maximized by the optimal conditional trade $\alpha^* = b/2$ with the highest liquidity shock $b = 1$. Substituting into the expression for c_t yields an implicit upper bound on c_t:

$$\begin{aligned} c_t &\leq H(\rho_t)[1-\lambda G(c_t)] \frac{\delta f(k)}{4} \\ &= \frac{\varphi}{R} \left[\frac{C-\lambda c_t}{\lambda c_t} \right] \left[\frac{C-\lambda c_t}{C} \right] \frac{\delta f(k)}{4}, \end{aligned} \tag{51}$$

or equivalently,

$$\left(\frac{C}{C-\lambda c_t} \right)^2 = \frac{\varphi}{R} \frac{C}{\lambda c_t^2} \frac{\delta f(k)}{4}.$$

Plugging the last expression in (50) reveals that $\frac{d}{dc_t} RHS(49) < 0$ for $\varphi < 4R$.

Activist. Substitute $H(\rho_t) = \frac{\rho_t}{R}$ and $h(\rho_t) = \frac{1}{R}$ to rewrite the activist's first-order condition (38) as:

$$0 = \underbrace{\frac{\varphi}{R} \left[\frac{1-\lambda G(c_t)}{\lambda G(c_t)} \right]}_{H(\rho_t)} + \underbrace{\left(-\frac{\varphi}{R} \frac{g(c_t)}{\lambda G(c_t)^2} \right)}_{\partial H(\rho_t)/\partial c_t} [c_t - E[c|c \leq c_t]] \tag{52}$$

Multiplying (52) by $\frac{R}{\varphi} \left[\frac{\lambda G(c_t)}{1-\lambda G(c_t)} \right]$ yields a simpler, equivalent condition

$$0 = 1 - \left[\frac{g(c_t)}{G(c_t)} \right] \left(\frac{c_t - E[c|c \leq c_t]}{1-\lambda G(c_t)} \right). \tag{53}$$

Substitute $G(c_t) = \frac{c_t}{C}$ and $g(c_t) = \frac{1}{C}$ and note that $c_t - E\left[c|c \leq c_t\right] = \frac{c_t}{2}$. It follows that the activist's first-order condition satisfies

$$0 = 1 - \frac{1}{2}\left(\frac{C}{C - \lambda c_t}\right). \tag{54}$$

The right-hand side decreases in c_t, implying a unique solution.

7 Appendix B: Robustness

7.1 Allowing for pure informed trading

We relax the assumption that the activist can only take a position when the manager implements the bad business plan and show that it does not alter our results qualitatively. We reproduce the analysis of the market in Section 2.1 assuming that at $t = 2$, if the activist observes the company, which occurs with probability λ, he can take a position, regardless of the business plan implemented by the manager at $t = 1$.

Proposition 8 *At $t = 2$, if the activist either (a) observes managerial malfeasance ($m = 0$) and the cost of activism is sufficiently small, $c \leq c_t^*$ where*

$$c_t^* = z\left[1 - \lambda G\left(c_t^*\right)\right] \frac{b}{4} \delta f(k); \tag{55}$$

or (b) observes that the manager behaves ($m = 1$); he takes a position

$$\alpha^* = \frac{b}{2} \tag{56}$$

and engages in managerial disciplining in situation (a).
The market maker, upon observing the net order flow, sets prices

$$\begin{array}{lll} P(\omega) = P_l \equiv \left[\frac{(1-z)(1-\lambda)+z[1-\lambda G(c_t^*)](1-\delta)}{(1-\lambda)+\lambda z(1-G(c_t^*))}\right] f(k) & \text{if } \omega < -b + \alpha^* \\ P(\omega) = P_m \equiv \left[1 - z(1 - \lambda G(c_t^*))\delta\right] f(k) & \text{if } \omega \in [-b + \alpha^*, 0] \\ P(\omega) = P_h \equiv f(k) & \text{if } \omega > 0 \end{array} . \tag{57}$$

We provide the full proof at the end of this section; here we discuss the differences with the model in the main text. Case (a) is equivalent to the setting studied in Section 2.1 and results are equal. The activist intervenes to discipline management if the conditional trading profits of doing so (weakly) outweigh the cost of intervention, i.e., if $c \leq c_t^*$. Trading profits equal those of the benchmark setting, and the corresponding cost cutoff (55) is the same. The position that maximizes trading profits is not altered by the new assumption $\alpha^* = b/2$.

Case (b) captures the difference with respect to the original model, and highlights that the activist can acquire stock when the manager behaves ($m = 1$). It reveals an intuitive result:

Lemma 9 *Pure informed trading occurs if and only if the activist observes that the manager implemented the good business plan. Therefore, it has unconditional probability $(1 - z)\lambda$.*

When the activist observes the good plan, he can profit from his information advantage (trading profits) without the need of incurring any cost. Thus, he always takes a position.

Moreover, the activist would never act as a mere informed trader after observing the bad plan. This would imply acquiring overvalued stock, and has negative expected profits.

Notably, when the activist acts as a mere informed trader, he takes the same position $\alpha^* = b/2$. Whether he intends to discipline management or not, a position of $b/2$ maximizes trading profits. If management misbehaves, the activist only participates if these trading profits outweigh the cost of intervention. If management behaves, he always participates (upon observing management's action).

A positive net order flow $\omega > 0$ reveals the activist, and activist participation is associated to certain cash flows $f(k)$ —as in the benchmark model. This is because additional participation only occurs if the business plan is good —case (b). An intermediate order flow $\omega \in [-b + \alpha^*, 0]$ does not provide any information about activist participation, and the conditional value of the project equals the unconditional value. For a given k, the new assumption does not change the value of the project, so the expression for P_m is unchanged from Proposition 1. Price P_l is lower than in the benchmark model. This is because when the absence of the activist is revealed, i.e., if $\omega < -b + \alpha^*$, it is more likely that the bad business plan was implemented. This is because if the activist had observed a good plan, he would have taken a position.

Proposition 10 *The expected value at $t = 0$ of the project given investment k is*

$$E[V] = [1 - z(1 - \lambda G(c_t^*))\delta]f(k) \equiv \pi_V f(k). \tag{58}$$

Expected gross profits of the activist are:

$$E[\Pi_A] = [(1 - z)\lambda + z\lambda G(c_t^*)] \frac{c_t^*}{f(k)} f(k) \equiv \pi_A f(k). \tag{59}$$

Expected gross profits of uninformed investors are:

$$E[\Pi_I] = (\pi_V - \pi_A)f(k) \equiv \pi_I f(k). \tag{60}$$

Investment by uninformed investors k solves

$$\pi_I f'(k) - r = 0. \tag{61}$$

The proof follows directly from that of Proposition 2 in the main text and the following discussion. Given initial investment, the project has the same value $E[V]$ than in the benchmark setting - Proposition 2. The new assumption alters the distribution of revenues between investors and the activist. Equation (59) reveals that the activist obtains the same trading profits c_t^* but with higher probability. In particular, trading transfers are realized if either (a) the activist disciplines management, which occurs with probability $z\lambda G(c_t^*)$; (b) the activist acts as a mere informed trader, which has probability $(1-z)\lambda$. It follows that π_I is smaller than in Proposition 2 and therefore investment levels captured by (61) are lower too.

7.1.1 Proof of Proposition 9

Market maker. The market maker's conjecture about activist position is $\widehat{\alpha}$, and $\widehat{c}_t \equiv c_t\left(\widehat{\alpha}\right)$ the corresponding conjecture about the trading transfers.

The net order flow ω either (i) equals liquidity trade because the activist did not take a position, i.e., $l = -\omega$; or (ii) is the difference between liquidity sales and the activist position, i.e., $l = -\omega + \widehat{\alpha}$. The activist does not participate when either he does not observe the company, or he observes that the bad business plan is implemented but it is too costly to intervene. The unconditional probability is $\left[(1-\lambda) + z\lambda(1-G\left(\widehat{c}_t\right))\right] x(-\omega)$. The activist participates when he observes the company and either the manager implemented the good business plan, or she implemented the bad business plan but the cost of intervention is sufficiently small. The unconditional probability of taking a position is $\left[(1-z)\lambda + z\lambda G\left(\widehat{c}_t\right)\right] x(-\omega+\widehat{\alpha})$. It follows that the expected value of the project is

$$
\begin{aligned}
E[V] \;=\;& \left[\frac{x(-\omega)(1-z)(1-\lambda) + x(-\omega+\widehat{\alpha})(1-z)\lambda + x(-\omega+\widehat{\alpha})z\lambda G\left(\widehat{c}_t\right)}{\left[\begin{array}{c} x(-\omega)(1-z)(1-\lambda) + x(-\omega+\widehat{\alpha})(1-z)\lambda + x(-\omega+\widehat{\alpha})z\lambda G\left(\widehat{c}_t\right) \\ +x(-\omega)z(1-\lambda) + x(-\omega)z\lambda(1-G\left(\widehat{c}_t\right)) \end{array}\right]}\right] f(k) \\
&+ \left[\frac{x(-\omega)z(1-\lambda) + x(-\omega)z\lambda(1-G\left(\widehat{c}_t\right))}{\left[\begin{array}{c} x(-\omega)(1-z)(1-\lambda) + x(-\omega+\widehat{\alpha})(1-z)\lambda + x(-\omega+\widehat{\alpha})z\lambda G\left(\widehat{c}_t\right) \\ +x(-\omega)z(1-\lambda) + x(-\omega)z\lambda(1-G\left(\widehat{c}_t\right)) \end{array}\right]}\right] (1-\delta)f(k)
\end{aligned} \tag{62}
$$

Consider the case where the market maker observes $\omega < -b + \widehat{\alpha}$. Then $x(-\omega+\widehat{\alpha}) = 0$ and $x(-\omega) = 1/b$, implying that the activist does not participate and $P(\omega) = P_l$ if $\widehat{\alpha} = \alpha^*$. Similarly, suppose that $\omega > 0$. Then $x(-\omega) = 0$ and $x(-\omega+\widehat{\alpha}) = 1/b$, and the activist participates with certainty so $P(\omega) = P_h$. Finally, consider the case where $\omega \in [-b+\widehat{\alpha}, 0]$. Then $x(-\omega) = x(-\omega+\widehat{\alpha}) = 1/b$ and the market maker does not know whether the activist participates. The conditional expected value of the project is $P(\omega) = P_m$.

Activist position. When the activist takes a position α, with probability $\int_{-b+\alpha}^{0} \frac{1}{b} dl = \frac{b-\alpha}{b}$ the net order flow satisfies $\omega \in [-b+\alpha, 0]$ and he obtains gross profit $f(k) - P_m > 0$ for each share he ordered. With the remaining probability $\frac{\alpha}{b}$, the net order flow is $\omega > 0$ and he pays $P_h = f(k)$, thereby making zero profits. His gross expected profit conditional on participating reads

$$E\left[\Pi_A | a_{11}\right] = E\left[\Pi_A | a_{10}\right] = \left(\frac{b-\alpha}{b}\right)\alpha\left[f(k) - P_m\right] \tag{63}$$

and it is maximized for a position $\alpha^* = b/2$.

Consider now an arbitrary $\alpha \leq \alpha^*$. Upon observing $m = 0$, the activist participates if and only if $c \leq E\left[\Pi_A | a_1\right]$, implying that the *intervention* cut-off satisfies $c_t = E\left[\Pi_A | a_1\right]$. Plugging P_m into $E\left[\Pi_A | a_1\right]$ yields

$$c_t = z\left[1 - \lambda G\left(c_t\right)\right]\left(\frac{b-\alpha}{b}\right)\alpha\delta f(k). \tag{64}$$

If, instead, the activist observes $m = 1$, he acts as an informed trader and does not incur any cost. Therefore, he takes a position $\alpha = \alpha^*$ regardless of the realization of c.

7.2 Allowing for cut-and-run

We relax the assumption that the activist must incur the cost to discipline management whenever he takes a position in the company and show that it does not affect our results qualitatively. After acquiring stock, the activist discloses his position and this leads to a price increase that makes his intervention profitable. We introduce a new liquidity shock that allows the activist to abandon his position by selling stock without incurring the cost of intervention, i.e., to cut-and-run. We assume that cut-and-run has a fixed cost of reputation and this is privately known to the activist.

We enrich the original setting so that $t = 2$ has four subperiods, from $t = 2.1$ to $t = 2.4$. At $t = 2.1$, the activist observes the business plan that the manager implemented with probability λ. Upon observing the business plan, the activist can take a position $\alpha \in [0, 1]$, regardless of whether the plan is good or bad (i.e., we allow for pure informed trading) in a dealership market where there is also liquidity trade of $l_1 \sim U[-b, b]$. At $t = 2.2$, the activist can disclose his position if it was not previously disclosed by his stock purchase. At $t = 2.3$, if the activist has a position in the company, he can exit by selling shares $\mu \leq [0, \alpha]$ in a dealership market that also has liquidity trade of $l_3 \sim U[-b, b]$. At $t = 2.4$, the activist decides whether to discipline management and incur the cost c, which is privately observed. Unwinding a position without trying to discipline management after disclosure, i.e., cutting and running, has a privately known reputation cost ς. Other agents have the prior that ς

is distributed on $[0, \Sigma]$ according to a strictly positive density s and associated cumulative function S. We assume that s is weakly decreasing and satisfies the monotone hazard ratio property. Figure 4 details the sequence of events.

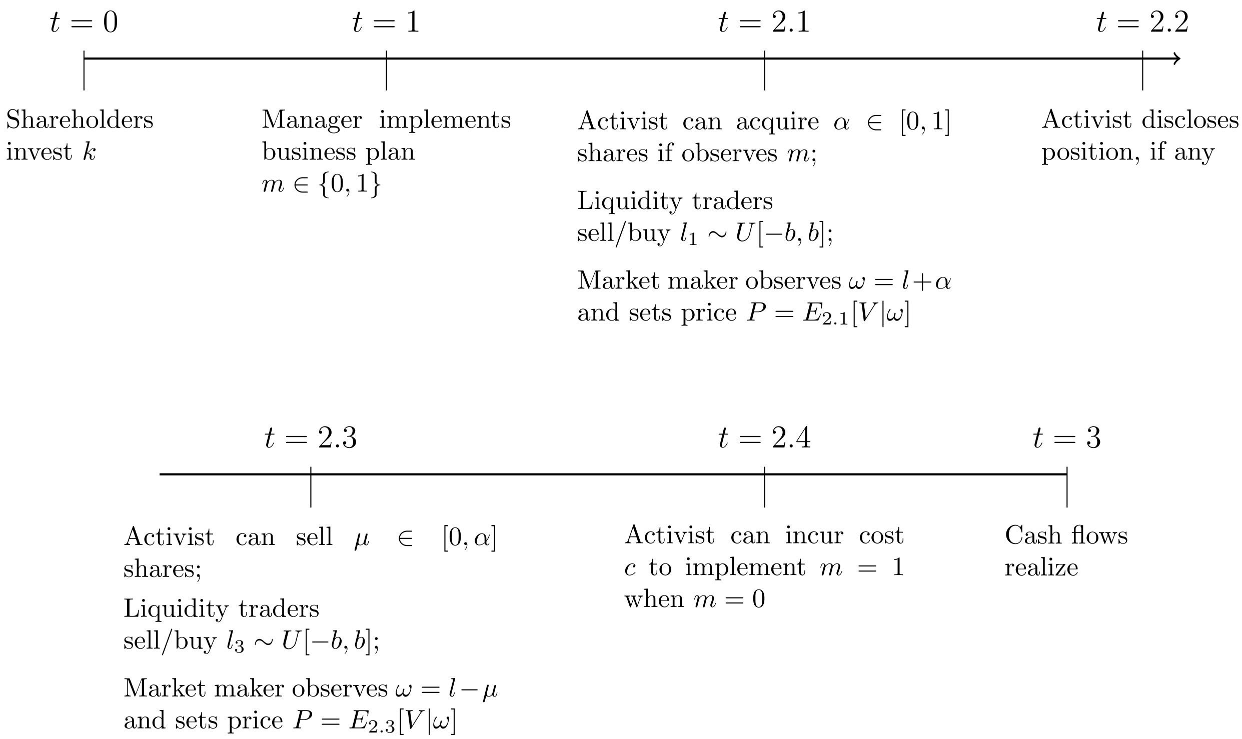

Figure 4: Time line with cut-and-run

We allow liquidity shocks to be positive or negative to provide the activist an opportunity to camouflage stock sales after revealing his position, preserving the key role of liquidity for informed trading. For simplicity we assume that the distributions of liquidity trade at $t = 2.1$ and $t = 2.3$ to be the same. In reality, the activist likely has a better opportunity to conceal his trade when he takes a position ($t = 2.1$) than when he abandons his position after disclosure ($t = 2.3$). This is because other market participants may pay closer attention when they know that the activist has a position, making cutting-and-running less profitable. Our setting can be viewed as providing an upper bound on the profits of a cut-and-run strategy.[33] Despite this, we show that a cut-and-run strategy is never profitable in our benchmark setting.

The assumption that cutting-and-running damages reputations is consistent both with anecdotes and with more systematic evidence by Johnson and Swem (2017). Intuitively, cutting-and-running harms an activist's credibility in subsequent interventions. If the market believes that a fund is unable to discipline management, it will be harder for it to convince

[33] If at $t = 2.3$, liquidity trade was $l_3 \sim U[-yb, yb]$ with $y < 1$ then the information rents from selling stock would be reduced, making cutting-and-running less profitable.

shareholders in a proxy fight, increasing the cost of actual discipline. Formally, the reputation cost provides an additional degree of market uncertainty that allows us to overcome a discontinuity in the profitability of cut-and-run when blockholder disclosure thresholds bind.

We consider pure strategy Bayesian Nash Equilibrium and obtain the following result:

Proposition 11 *In equilibrium, if the disclosure threshold does not bind, the activist does not cut-and-run.*

A formal proof is provided at the end of this section; here we develop the intuition. The activist is time consistent, so our analysis compares the expected profits of each strategy at $t = 2.1$. We denote $E[\Pi_A^I]$ the gross expected profits of intervention at $t = 2.1$ and $E[\Pi_A^R]$ the gross expected profits of cut-and-run at the same period. To establish Proposition 12, we show that $E[\Pi_A^I] \geq 0 \geq E[\Pi_A^R]$. Thus, the activist takes a position and disciplines management if and only if $c \leq E[\Pi_A^I]$, and he never cuts-and-runs.

To ease exposition and analysis, we set $\delta = 1$ so that the bad business plan destroys *all* value, and normalize firm size to one, i.e. $f(k) = 1$. Neither assumption affects the result. Moreover, the reputation cost is irrelevant for Proposition 12 because $0 \geq E[\Pi_A^R]$ implies that it also holds when cutting-and-running has no reputation costs. For simplicity, we temporarily set $\Sigma = 0$. Next, we argue that when prices are consistent with $E[\Pi_A^I] \geq 0 \geq E[\Pi_A^R]$, the activist has no incentives to deviate, so it is an equilibrium. This equilibrium rules out the other equilibrium candidate, $E[\Pi_A^I] \geq E[\Pi_A^R] > 0$, and therefore it is unique.[34]

Consider $E[\Pi_A^I] \geq 0 \geq E[\Pi_A^R]$ to be an equilibrium candidate. At $t = 2.1$, if the activist takes a position, then $\alpha^* = b$ (recall now that $l_1 \sim U[-b, b]$, not $U[0, b]$). The position is optimal given the tension between positive share value and the cost of information revelation, and therefore it is independent of the subsequent strategy, i.e., (i) act as a mere informed trader, (ii) discipline management, (iii) deviate to cut-and-run. The activist trade is such that with probability 0.5 he conceals and pays $P_{m1} = 1 - z[1 - \lambda G(c_t)]$ for each share. With equal probability the activist is observed and he pays $P_{h1} = 1$ because the market maker believes that either he is acting as a mere informed trader or he will discipline management.

At $t = 2.2$ the activist always reveals his position if it was not involuntarily disclosed at $t = 2.1$. If the activist intends to intervene, then disclosure is inherent in his strategy.[35] If, in-

[34] Deviating to cutting-and-running when prices are consistent with $E[\Pi_A^I] \geq 0 \geq E[\Pi_A^R]$ is more profitable than cutting and running when prices are consistent with $E[\Pi_A^I] \geq E[\Pi_A^R] > 0$. Thus, the two equilibrium candidates are mutually exclusive.

[35] If disclosure was not necessary for intervention, it would still be weakly dominant. In particular, conditional on intervention, the activist is indifferent about disclosing his position. See, e.g., Gantchev (2013), Jiang et al. (2016) or Levit (2017), for work on hedge fund activism that considers activist pressure "behind doors ".

stead, the activist were to deviate and cut-and-run, he must disclose his position to generate the price increase that can make selling the stock prior to intervention potentially profitable.

At $t = 2.3$ the activist may deviate from the equilibrium path and cut-and-run, i.e., to sell stock and not discipline management at $t = 2.4$. The rents from cut-and-run are maximized by selling all stock, i.e., $\mu^* = \alpha^*$, reflecting that l_1 and l_3 have the same distributions. With probability 0.5 the activist conceals and obtains $P_{h3} = 1$ per share. This follows because the market maker believes that the activist kept his position, indicating that either the business plan is good or that he will intervene to discipline management. With equal probability, the market maker observes the activist's sale and then sets a price $P_{l3} = 0$: the market maker now knows with certainty that the business plan is bad and the activist will not discipline management, making the firm worthless.

It follows that the net expected profit per share from deviating to cutting-and-running is $\frac{1}{2}\left[P_{h3} + P_{l3} - P_{h1} - P_{l1}\right] < 0$, and therefore it is not a profitable deviation. That $E[\Pi_A^I] \geq 0 \geq E[\Pi_A^R]$ reflects the asymmetry in the activist's cost of revealing information when taking a position and when abandoning the position. While the absence of the activist *does not* imply that the project delivers zero cash flows, cutting-and-running *does*. More specifically, the revenues from secretly selling stock equal the cost of being revealed when acquiring it, i.e., $P_{h3} = P_{h1}$. However, the price paid when acquiring stock secretly outweighs the revenues when cut-and-run is revealed, i.e., $P_{m1} > P_{l3}$ ($P_{l3} = 0$ is only used in this weak way).

The activist's profitability of both intervening $E[\Pi_A^I]$ and cutting-and-running $E[\Pi_A^R]$ is crucially determined by the opportunity to camouflage trade during liquidity shocks. Binding blockholder disclosure thresholds limit the activist position (Corollary 3) and thus increase the likelihood of camouflaging trade. We study the effect of disclosure thresholds when the activist can cut-and-run and obtain the following result:

Proposition 12 *There exists a binding disclosure threshold cutoff $\overline{\alpha}_r < \alpha^*$ such that, in equilibrium,*

- *if a disclosure threshold is weakly higher, i.e., $\overline{\alpha} \geq \overline{\alpha}_r$, the activist does not cut-and-run;*

- *if a disclosure threshold is lower, i.e., $\overline{\alpha} < \overline{\alpha}_r$, the activist cuts-and-runs when the associated reputation cost ς is sufficiently small.*

A binding disclosure threshold reduces the activist's position and thus the probability that his presence is revealed to the market maker. While the threshold yields lower trading profits (Corollary 5), it also reduces information revelation costs and makes cutting-and-running relatively more profitable. In line with the discussion of Proposition 12, a binding threshold increases the probability of both acquiring stock at a low price P_{m1} and selling it at a high price P_{h3}. The cutoff $\overline{\alpha}_r$ satisfies $E[\Pi_A^R] = 0$, with $E[\Pi_A^I] \geq 0 \geq E[\Pi_A^R]$ as a unique equilibrium for $\overline{\alpha} > \overline{\alpha}_r$ and $E[\Pi_A^I] \geq E[\Pi_A^R] > 0$ as a unique equilibrium for $\overline{\alpha} < \overline{\alpha}_r$.

The activist's privately-observed reputation cost ς smoothes out best responses. The activist cuts-and-runs when the associated net profits are both positive, i.e., $E[\Pi_A^R] > \varsigma$, and higher than the net profits of intervening to discipline management, i.e., $E[\Pi_A^R] - \varsigma > E[\Pi_A^I] - c$. Without ς, an inherent discontinuity in activist behavior arises, with resulting consequences for prices, leaving an interval of binding disclosure thresholds for which there is no market equilibrium. This reflects that if the market maker does not believe the activist will cut and run, then absent net order flow below $-b$, the market maker will set a price of 1; but this can make cutting and running profitable. If the market maker, instead believes that cutting-and-running may occur (then absent ς), the price set when cutting-and-running is concealed will not make it worthwhile.

Beyond the paradox that tight disclosure thresholds can induce the activist to 'miss-behave' by cutting-and-running, the results in Proposition 13 do not affect qualitatively the conclusions drawn from the analysis in the main text. The possibility to cut-and-run hurts investors, but benefits the activist for sufficiently tight disclosure thresholds, i.e., $\overline{\alpha} < \overline{\alpha}_r$. If cutting-and-running is profitable, the activist's incentives to discipline management are reduced, and investors must concede further trading transfers to encourage intervention. Thus, the optimal disclosure threshold policy for investors is higher, and investment is reduced. In contrast the activist can gain more from tighter disclosure thresholds.

7.2.1 Proof of Proposition 12

Assume that there is no reputation cost for cut-and-run—if the result holds when $\Sigma = 0$, it must hold for any $\Sigma > 0$. We consider $E[\Pi_A^I] \geq 0 \geq E[\Pi_A^R]$ an equilibrium candidate, and show that the activist has no incentives to deviate. This rules the other equilibrium candidate. In particular, if $E[\Pi_A^I] \geq 0 \geq E[\Pi_A^R]$ is an equilibrium, then $E[\Pi_A^I] > E[\Pi_A^R] > 0$ cannot be an equilibrium because the corresponding market prices make the activist strictly worse off. Moreover $E[\Pi_A^R] \geq E[\Pi_A^I]$ can never be an equilibrium because expected prices from cutting-and-running at $t = 2.3$ must be strictly lower than the secure cash flows from discipline, which have been normalized to one. We solve recursively.

Intervention $(t = 2.4)$. Liquidity shocks at $t = 2.1$ and $t = 2.3$ have the same distribution so we conjecture and later verify that if the activist cuts-and-runs he sells all stock, i.e., $\mu \in \{\alpha^*, 0\}$. If the activist has α^* shares and the business plan is bad $(m = 0)$, he intervenes to discipline management if and only if $\alpha^* - c \geq 0$.

Exit $(t = 2.3)$. If the activist has a position and the business plan is good, he does not sell stock —he acts as a standard informed trader. If the business plan is bad, he cuts-and-runs if and only if $c > c_{t(2.3)}$, where $c_{t(2.3)}$ is derived below. Given the equilibrium candidate $E[\Pi_A^I] > 0 > E[\Pi_A^R]$, the market maker conjectures $\widehat{\mu} = 0$ and his pricing rule is

$$\begin{array}{ll} P(\omega) = P_{l3} \equiv 0 & \text{if } \omega < -b \\ P(\omega) = P_{h3} \equiv 1 & \text{if } \omega > -b \end{array}. \tag{65}$$

Here, P_{h3} captures the equilibrium path given the activists presence, which is either due to the good business plan, or because the plan is bad and he plans to discipline management. P_{l3} accounts for a potential deviation where the activist cuts-and-runs. A net order flow $\omega < -b$ would reveal activist sales and indicate with certainty that the project yields zero cash flows—the plan is bad and that the activist will not intervene.

If the activist deviates to cut-and-run, then with probability $\int_{-b+\mu}^{b} \frac{1}{2b} dl = \frac{2b-\mu}{2b}$ he camouflages his sales μ and obtains P_{h3} for each share. Thus, cut-and-run has expected payoff $\left(\frac{2b-\mu}{2b}\right)\mu$, which is maximized for $\mu = b$. Therefore, $\mu^* = \min\{b, \alpha^*\}$. We conjecture and verify that $\alpha^* = b$. If the conjecture is correct, then cut-and-run is such that $\mu^* = b$, the activist conceals stock sales with probability 0.5, and obtaining expected revenues $b/2$.

It follows that when the business plan is bad, the activist decides whether intervene in the next period and obtain $\alpha - c$ or deviate cut-and-run, which has expected payoff $b/2$. The activist deviates to cut-and-run if and only if $c > c_{t(2.3)}$, where $c_{t(2.3)} = \alpha - \frac{b}{2} = \frac{b}{2}$.

Disclosure $(t = 2.2)$. The activist always discloses his position. It is necessary in the case of intervention. If, instead, he plans to cut-and-run, disclosure yields the increase in price that can make this strategy profitable.

Entry $(t = 2.1)$. The market maker's conjecture about activist position is $\widehat{\alpha}$. The net order flow ω either (i) equals liquidity trade because the activist does not acquire shares, i.e., $\omega = l$; or (ii) it is the combination of liquidity trade and the activist position, i.e. $\omega = l + \widehat{\alpha}$. The activist acquires shares when either he observes the good business plan, or he observes the bad business plan and intervention profitable, i.e. $c \leq c_t$ where c_t is derived below. The expected value of the project is

$$E_{2.1}[V] = \frac{x(\omega)(1-z)(1-\lambda) + x(\omega-\widehat{\alpha})(1-z)\lambda + x(\omega-\widehat{\alpha})z\lambda G(c_t)}{\left[\begin{array}{c} x(\omega)(1-z)(1-\lambda) + x(\omega-\widehat{\alpha})(1-z)\lambda + x(\omega-\widehat{\alpha})z\lambda G(c_t) \\ +x(\omega)z(1-\lambda) + x(\omega)z\lambda(1-G(c_t)) \end{array}\right]}$$

If the market maker observes $\omega < -b + \widehat{\alpha}$, then $x(\omega - \widehat{\alpha}) = 0$ and $x(\omega) = 1/2b$. If $\omega > b$, then $x(\omega - \widehat{\alpha}) = 1/2b$ and $x(\omega) = 0$. If $\omega \in [-b + \widehat{\alpha}, b]$, then $x(\omega - \widehat{\alpha}) = x(\omega) = 1/2b$. The market maker's pricing rule satisfies

$$\begin{array}{ll} P(\omega) = P_{l1} \equiv \frac{(1-z)(1-\lambda)}{(1-\lambda)+z\lambda(1-G(c_t))} & \text{if } \omega < -b + \widehat{\alpha} \\ P(\omega) = P_{m1} \equiv 1 - z(1-\lambda G(c_t)) & \text{if } \omega \in [-b+\widehat{\alpha}, b] \\ P(\omega) = P_{h1} \equiv 1 & \text{if } \omega > b \end{array} . \tag{66}$$

With probability $\int_{-b}^{b-\alpha} \frac{1}{2b} dl = \frac{2b-\alpha}{2b}$ the activist camouflages his position α. The gross expected profits from intervention read $\left(\frac{2b-\alpha}{2b}\right) \alpha[1-P_{m1}]$ and are maximized for $\alpha^* = b$. This verifies our two previous conjectures: $\alpha^* = \mu^* = b$. It follows that with probability 0.5 the activist camouflages his stock purchase, and the expected gross payoff from taking a position and intervene if the business plan is bad reads $E[\Pi_A^I] = z[1-\lambda G(c_t)]\frac{b}{2}$.

The activist takes a position after observing the bad business plan if and only if $c \leq c_t$, where $c_t = z[1-\lambda G(c_t)]\frac{b}{2}$. The relation $c_t < c_{t(2.3)}$ confirms that the activist is time consistent. Put differently, if the activist takes a position at $t = 2.1$ with the intention to discipline, he does not cut-and-run at $t = 2.3$.

Last, the discussion of Proposition 12 shows that cut-and-run is unprofitable at $t = 2.1$.

7.2.2 Proof of Proposition 13

We introduce binding disclosure thresholds $\overline{\alpha} < \alpha^* = b$ and show that there exists $\overline{\alpha}_r$ such that (i) cut-and-run is never profitable for $\overline{\alpha} \geq \overline{\alpha}_r$; (ii) cut-and-run can be profitable for $\overline{\alpha} < \overline{\alpha}_r$. The analysis for periods $t = 2.2$ and $t = 2.4$ mirrors that in the proof of Proposition 12, so we focus on equilibrium outcomes at $t = 2.1$ and $t = 2.3$, i.e., the trading periods.

i) There exists $\overline{\alpha}_r$ such that cut-and-run is not profitable for $\overline{\alpha} \geq \overline{\alpha}_r$. We show that $E[\Pi_A^R] \leq 0 \longleftrightarrow \overline{\alpha} \geq \overline{\alpha}_r$, so suppose there is no reputation cost, i.e. $\Sigma = 0$. In line with the proof of Proposition 12, we consider $E[\Pi_A^I] > 0 \geq E[\Pi_A^R]$ as an equilibrium candidate and show that there are no incentives to deviate. From that proof, we also know that a disclosure threshold $\overline{\alpha}$ binds if and only if $\overline{\alpha} < b$, and that the most profitable deviation involves selling all stock at $t = 2.3$. Thus, deviating when a disclosure threshold binds implies $\mu = \alpha = \overline{\alpha} < b$.

Exit $(t = 2.3)$. The market maker sets prices in (65). If the activist deviates to cut-and-run he sells $\overline{\alpha}$ shares and camouflages with probability $\int_{-b+\overline{\alpha}}^{b} \frac{1}{2b} dl = \frac{2b-\overline{\alpha}}{2b}$. Thus, the expected payoff of deviating to cut-and-run is $\left(\frac{2b-\overline{\alpha}}{2b}\right)\overline{\alpha}$. The payoff of intervention at $t = 2.3$ is $\overline{\alpha} - c$, so the activist cuts-and-runs if and only if $c > c_{t(2.3)}$ where $c_{t(2.3)} = \frac{\overline{\alpha}^2}{2b}$.

Entry $(t = 2.1)$. The market maker sets prices in (66). With probability $\int_{-b}^{b-\overline{\alpha}} \frac{1}{2b} dl = \frac{2b-\overline{\alpha}}{2b}$ the activist camouflages his position $\overline{\alpha}$. The expected gross profits from intervention are

$E[\Pi_A^I] = \overline{\alpha}\left(\frac{2b-\overline{\alpha}}{2b}\right)[1-P_{m1}]$. The characterization of P_{m1} in (66) and the relation $E[\Pi_A^I] = c_t$ pin down the intervention cost cutoff $c_t = z[1-\lambda G(c_t)]\left(\frac{2b-\overline{\alpha}}{2b}\right)\overline{\alpha}$.

The expected gross profits from cut-and-run are

$$E[\Pi_A^R] = \overline{\alpha}\left(\frac{2b-\overline{\alpha}}{2b}\right)P_{h3} - \overline{\alpha}\left(\frac{2b-\overline{\alpha}}{2b}\right)P_{m1} - \overline{\alpha}\left(\frac{\overline{\alpha}}{2b}\right)P_{h1}, \tag{67}$$

where prices are given by both (65) and (66). Using $P_{h3} = P_{h1}$, algebra confirms that $E[\Pi_A^R] \leq 0$ if and only if $\overline{\alpha} \geq \overline{\alpha}_{r(i)}$, where

$$\overline{\alpha}_{r(i)} = \frac{2b(P_{h3}-P_{m1})}{2P_{h3}-P_{m1}}. \tag{68}$$

Note that $c_{t(2.3)} \geq c_t$ if $\overline{\alpha} \geq \overline{\alpha}_{r(i)}$, which verifies time consistency.

ii) Cut-and-run might be profitable for $\overline{\alpha} < \overline{\alpha}_r$. We now show that $E[\Pi_A^I] > E[\Pi_A^R] > 0$ is the unique equilibrium for disclosure thresholds such that $\overline{\alpha} < \overline{\alpha}_{r(ii)}$, where $\overline{\alpha}_{r(ii)} = \overline{\alpha}_{r(i)}$ when $E[\Pi_A^R] = 0$ and $\overline{\alpha}_{r(ii)} < \overline{\alpha}_{r(i)}$ for $E[\Pi_A^R] > 0$. The reputation cost is now relevant for the activist's strategy, so we consider $\Sigma > 0$.

To ease exposition, we define the following probabilities:

$$\begin{aligned}
\Pr^I &\equiv \Pr\left[E[\Pi_A^I] - c \geq E[\Pi_A^R] - \varsigma \middle| E[\Pi_A^I] - c \geq 0\right] \times \Pr\left[E[\Pi_A^I] - c \geq 0\right] \\
\Pr^R &\equiv \Pr\left[E[\Pi_A^R] - \varsigma > E[\Pi_A^I] - c \middle| E[\Pi_A^R] - \varsigma > 0\right] \times \Pr\left[E[\Pi_A^R] - \varsigma > 0\right]
\end{aligned}$$

Here, P^I is the probability that the activist intervenes to discipline management after observing the bad business plan ($m = 0$), i.e., when intervention is both profitable and more profitable than cut-and-run. Analogously, after observing the bad business plan, cut-and-run is optimal with probability P^R. The probability that the activist does not take a position after observing the bad business plan is $1 - P^I - P^R$.

Exit $(t = 2.3)$. Suppose the activist has a position in the company. Let $\widehat{\mu}$ be the market maker's conjecture about the activist's sales if he cuts-and-runs. The net order flow ω either equals liquidity trade because the activist does not cut-and-run, i.e., $\omega = l_3$; or it is the sum of liquidity trade and activist sales, i.e. $\omega = l_3 - \mu$. The expected value of the project is

$$E_{2.3}[V] = \frac{x(\omega)(1-z) + x(\omega)z\Pr^I}{x(\omega)(1-z) + x(\omega)z\Pr^I + x(\omega+\widehat{\mu})z\Pr^R}.$$

If the market maker observes $\omega < -b$, then $x(\omega+\widehat{\mu}) = 1/2b$ and $x(\omega) = 0$. If $\omega > b-\widehat{\mu}$, then $x(\omega+\widehat{\mu}) = 0$ and $x(\omega) = 1/2b$. If $\omega \in [-b, b-\widehat{\mu}]$, then $x(\omega+\widehat{\mu}) = x(\omega) = 1/2b$.

Accordingly, pricing is given by

$$\begin{aligned} P(\omega) &= P_{l3} \equiv 0 & &\text{if } \omega < -b \\ P(\omega) &= P_{m3} \equiv \tfrac{(1-z)+z\Pr^I}{(1-z)+z\left[\Pr^I+\Pr^R\right]} & &\text{if } \omega \in [-b, b-\widehat{\mu}] \ . \\ P(\omega) &= P_{h3} \equiv 1 & &\text{if } \omega > b-\widehat{\mu} \end{aligned} \tag{69}$$

From the proof of Proposition 12, the profits from cut-and-run are maximized by selling all shares—and hence, given the binding disclosure threshold, $\mu = \alpha = \overline{\alpha}$. The activist camouflages his sales with probability $\int_{-b+\overline{\alpha}}^{b} \frac{1}{2b} dl = \frac{2b-\overline{\alpha}}{2b}$, so the expected gross payoff from cut-and-run is $\left(\frac{2b-\overline{\alpha}}{2b}\right)\overline{\alpha} P_{m3}$ where P_{m3} is given by (69).

Entry $(t = 2.1)$. The market maker's conjecture about the activist's trade is $\widehat{\alpha}$. The net order flow ω either equals liquidity trade $l_1 = \omega$; or it is the sum of liquidity trade and the activist's purchases, $\omega = l_1 + \widehat{\alpha}$. The activist acquires shares when either he observes the good business plan, or he observes the bad business plan and wants to intervene or cut-and-run. Thus,

$$E_{2.1}[V] = \frac{x(\omega)(1-z)(1-\lambda) + x(\omega-\widehat{\alpha})(1-z)\lambda + x(\omega-\widehat{\alpha})z\lambda \Pr^I}{\left[\begin{array}{c} x(\omega)(1-z)(1-\lambda) + x(\omega-\widehat{\alpha})(1-z)\lambda + x(\omega-\widehat{\alpha})z\lambda \Pr^I \\ +x(\omega-\widehat{\alpha})z\lambda \Pr^R + x(\omega)z\lambda\left[1-\Pr^I-\Pr^R\right] + x(\omega)z(1-\lambda) \end{array}\right]}.$$

If the market maker observes $\omega < -b+\widehat{\alpha}$, then $x(\omega-\widehat{\alpha}) = 0$ and $x(\omega) = 1/2b$. If $\omega > b$, then $x(\omega-\widehat{\alpha}) = 1/2b$ and $x(\omega) = 0$. If $\omega \in [-b+\widehat{\alpha}, b]$, then $x(\omega-\widehat{\alpha}) = x(\omega) = 1/2b$. Thus

$$\begin{aligned} P(\omega) &= P_{l1} \equiv \tfrac{(1-z)(1-\lambda)}{(1-z)(1-\lambda)+z(1-\lambda)+z\lambda\left[1-\Pr^I-\Pr^R\right]} & &\text{if } \omega < -b+\widehat{\alpha} \\ P(\omega) &= P_{m1} \equiv (1-z) + z\lambda \Pr^I & &\text{if } \omega \in [-b+\widehat{\alpha}, b] \ , \\ P(\omega) &= P_{h1} \equiv \tfrac{(1-z)+z\Pr^I}{(1-z)+z\left[\Pr^I+\Pr^R\right]} & &\text{if } \omega > b \end{aligned} \tag{70}$$

where $P_{m1} < P_{h1}$.

With probability $\int_{-b}^{b-\overline{\alpha}} \frac{1}{2b} dl = \frac{2b-\overline{\alpha}}{2b}$ the market maker camouflages his position and pays P_{m1} for each share. Thus, the gross payoff from cut-and-run is

$$E[\Pi_A^R] = \overline{\alpha}\left(\frac{2b-\overline{\alpha}}{2b}\right) P_{m3} - \overline{\alpha}\left(\frac{2b-\overline{\alpha}}{2b}\right) P_{m1} - \overline{\alpha}\left(\frac{\overline{\alpha}}{2b}\right) P_{h1}. \tag{71}$$

Algebra manipulation when $P_{m3} = P_{h1}$ reveals that $E[\Pi_A^R] > 0$ if and only if $\overline{\alpha} < \overline{\alpha}_{r(ii)}$, where

$$\overline{\alpha}_{r(ii)} = \frac{2b(P_{m3} - P_{m1})}{2P_{m3} - P_{m1}},$$

where the prices are given in (69) and (70).

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