european corporate governance institute

The Wall Street Stampede: Exit as Governance with Interacting Blockholders

Finance Working Paper N°632/2019

February 2022

Dragana Cvijanović
Cornell University

Amil Dasgupta
London School of Economics and Political Science and ECGI

Konstantinos Zachariadis
Queen Mary University of London

ECGI Working Paper Series in Finance

The Wall Street Stampede: Exit as Governance with Interacting Blockholders

Working Paper N° 632/2019
February 2022

Dragana Cvijanović
Amil Dasgupta
Konstantinos Zachariadis

We thank Adrian Corum, Alex Edmans, Naveen Khanna, Peter Kondor, Doron Levit, Richmond Mathews, Giorgia Piacentino, Fenghua Song, Toni Whited (the Editor), and an extremely helpful anonymous referee for feedback. We are also grateful to audiences at AFA 2020, Bristol, Cambridge, Durham, FIRS 2019, LSE, QMUL, Rotterdam, SFI Lugano, University of Cyprus, Warwick Business School, and Westminster. We thank Alon Brav for sharing his activism data and Maddalena Ronchi and Moritz Wiedemann for excellent research assistance. Dasgupta and Zachariadis acknowledge financial support from the ESRC via Research Grant ES/S016686/1.

Abstract

The growth of the asset management industry has made it commonplace for firms to have multiple institutional blockholders. In such firms, the strength of governance via exit depends on how blockholders react to each other's exit. We present a model to show that open-ended institutional investors such as mutual funds react strongly to an informed blockholder's exit, leading to correlated exits that enhance corporate governance. Our analysis points to a new role for mutual funds in corporate governance. We examine the trades of mutual funds around exits by activist hedge funds to present empirical evidence consistent with our model.

Keywords: institutional investors, competition for flow, exit governance, correlated trading

JEL Classifications: G23, G34

Dragana Cvijanović*
Associate Professor of Applied Economics and Policy
Cornell University, School of Hotel Administration, Cornell SC Johnson College of Business
565A Statler Hall
14853 Ithaca, NY, United States
e-mail: dc998@cornell.edu

Amil Dasgupta
Professor of Finance
London School of Economics and Political Science, Department of Finance
Houghton Street
London, WC2A 2AE, United Kingdom
phone: +44 207 955 7458
e-mail: a.dasgupta@lse.ac.uk

Konstantinos Zachariadis
Associate Professor
Queen Mary University of London, School of Economics and Finance
Mile End Road, Mile End Campus
London E1 4NS, United Kingdom
phone: +44 207 882 8698
e-mail: k.e.zachariadis@qmul.ac.uk

*Corresponding Author

The Wall Street Stampede: Exit as Governance with Interacting Blockholders *

Dragana Cvijanović[§] Amil Dasgupta[¶] Konstantinos Zachariadis[‖]

This version: January 2022

Abstract

The growth of the asset management industry has made it commonplace for firms to have multiple institutional blockholders. In such firms, the strength of governance via exit depends on how blockholders react to each other's exit. We present a model to show that open-ended institutional investors such as mutual funds react strongly to an informed blockholder's exit, leading to correlated exits that enhance corporate governance. Our analysis points to a new role for mutual funds in corporate governance. We examine the trades of mutual funds around exits by activist hedge funds to present empirical evidence consistent with our model.

Keywords: institutional investors, competition for flow, exit governance, correlated trading

JEL classification: G23, G34

*We thank Adrian Corum, Alex Edmans, Naveen Khanna, Peter Kondor, Doron Levit, Richmond Mathews, Giorgia Piacentino, Fenghua Song, Toni Whited (the Editor), and an extremely helpful anonymous referee for feedback. We are also grateful to audiences at AFA 2020, Bristol, Cambridge, Durham, FIRS 2019, LSE, QMUL, Rotterdam, SFI Lugano, University of Cyprus, Warwick Business School, and Westminster. We thank Alon Brav for sharing his activism data and Maddalena Ronchi and Moritz Wiedemann for excellent research assistance. Dasgupta and Zachariadis acknowledge financial support from the ESRC via Research Grant ES/S016686/1.

[§]Cornell University. *email*: dc998@cornell.edu

[¶]London School of Economics and ECGI. *email*: a.dasgupta@lse.ac.uk

[‖]Queen Mary University of London. *email*: k.e.zachariadis@qmul.ac.uk

1 Introduction

In March 2007, Chapman Capital, an activist hedge fund, acquired a 6.5% stake in FSI International, a Minnesota-based producer of semiconductor inputs. Chapman filed a 13D[1] intending to replace management and merge FSI with a larger company complaining that its CEO was paying himself generously while the company made repeated losses. FSI countered that they were a cyclical business in an industry downturn and were already making several operational changes. They claimed that Chapman did not represent other shareholders' preferences and was taking a "...typical activist hedge-fund approach, to try to come in and discredit management."[2] The debate raged for months. Eventually, however, Chapman gave up on fostering change at FSI and sold its full stake in the open market in the first quarter of 2008 at a significant loss. FSI remained independent with its management in place until 2012, at which time it merged with a larger company, as originally suggested by Chapman.

In January 2008, there were seven institutional investors (other than Chapman) who each held roughly a million (or more) shares.[3] During the first quarter of 2008, as Chapman exited, two of these blockholders—both mutual funds—significantly reduced their holdings: TCW sold 318,713 shares (∼30% of their holdings) while Heartland Advisors sold 176,584 (∼10% of theirs). In contrast, the Wisconsin Investment Board, a public pension fund, held its position constant, while Renaissance Technologies, a hedge fund, increased its holdings by 94,000 shares (∼10% of their stake).[4]

Chapman's exit from FSI in 2008 can be viewed as an example of the "Wall Street Walk:" when a blockholder concludes that managers will not make value-maximizing choices, she may sell out to avoid (further) longer-term losses.[5] Such informed sales will, however, lower the share price of the company, punishing managers, raising the cost of bad choices ex ante, a

[1]Section 13(d) of the US Securities Exchange Act of 1934 requires investors to file with the SEC upon acquiring 5% of a public company if they have an interest in influencing its management or operations.

[2]Benno Sand, FSI's executive vice president for business development and investor relations, quoted in the Star Tribune, 21 June 2007.

[3]All other institutional blocks were approximately half the size of the smallest of these seven.

[4]Of the remaining three, two mutual funds, Dimensional and Perritt, also reduced their holdings, while Needham, with both mutual and hedge funds, held its position constant.

[5]While Chapman sold at a loss, by selling when it did it avoided much larger further losses. The FSI stock price declined by approximately 87% in the year following Chapman's exit, and took around two years to return to March 2008 price levels.

mechanism known as governance via exit (Admati and Pfleiderer (2009), Edmans (2009)). The McCahery, Sautner, and Starks (2016) survey of institutional investors suggests that they commonly use exit to govern.

The FSI-Chapman anecdote reminds us that blockholders do not exist in isolation: when one exits, others may (or may not) join. The degree to which blockholder exits are correlated is clearly relevant to governance via exit. If exits are correlated, the share price impact is likely to be higher, strengthening the ex ante threat of exit. Institutional investors are aware of this: McCahery, Sautner, and Starks (2016) find that the most important consideration in institutional exit decisions (72% of respondents) is the decision by *others* to exit.

More intriguingly, the FSI-Chapman anecdote illustrates that those blockholders who exited with Chapman were very different from those who didn't. Mutual funds were the biggest sellers in the quarter in which Chapman exited. As a result of their open-ended structure, these investors are subject to investor redemptions. In contrast, a large public pension fund (whose investors cannot easily leave) and a hedge fund (whose investors are sophisticated and may have agreed to lock-up provisions) retained or increased their holdings.

The co-existence of multiple institutional blockholders with differing organizational and incentive structures is widespread. Using data from 1999 to 2017, Dasgupta, Fos, and Sautner (2021) report that the average US firm had over 11 institutional blockholders with 1% or more of shares. They also document significant heterogenenity in blockholdings. Focussing on mutual funds (as regulated, retail orientated, open-ended institutions) and hedge funds (as unregulated institutions with sophisticated, sometimes locked-in, investors), they find that the average firm had 2.5 mutual fund blockholders and 2.6 hedge fund blockholders at the 1% or higher level. Thus, potential interactions across several, heterogeneous, institutional blockholders is of key relevance to corporate governance. We study such interactions in this paper. How do institutional incentives affect the manner in which different blockholders react to each others' exit and, in turn, the strength of the exit governance mechanism? What characteristics of institutional investors strengthen or weaken the threat of exit in a multi-blockholder setting?

We take a two-pronged approach to address these questions. First, we develop a model of how governance via exit operates in the presence of multiple institutional blockholders with differing incentives. While institutional incentives are multi-faceted, inspired by the FSI-Chapman anecdote, we focus on one pervasive source of heterogeneity: Some institutional investors (e.g., mutual funds) are (relatively more) open-ended and thus more exposed to short-term investor redemption than others (e.g., hedge funds, endowments, pensions funds). Exposure to redemption risk has been widely demonstrated to have undesirable consequences in asset pricing following the seminal work of Shleifer and Vishny (1997) on the limits of arbitrage. In contrast, we show that in corporate governance such exposure can be a *positive* force. The key insight is to recognize that institutional blockholders who are exposed to short-term redemptions do not wish to disappoint their clients. As a result, when such blockholders perceive that an informed blockholder has sold out, they worry that unless they follow suit they will be revealed to be poorly informed and suffer outflows. This increases their incentives to exit when the engaged blockholder exits, ramping up the quantity sold, and enhancing the ex ante power of the engaged blockholder in the eyes of corporate managers, improving governance. We then present empirical evidence to illustrate the mechanism in our model. In particular, we show that when activist hedge funds exited target firms between 1994 and 2011, open-ended mutual funds sold out significantly more than other institutions.

Our model takes the Admati and Pfleiderer (2009) framework as a starting point and enriches it in three ways. First, since we are interested in how blockholders react to each other's exit, we allow for multiple blockholders who move sequentially. Second, since we focus on the incentives of heterogeneous institutional investors, in our setting some blockholders are exposed to redemption risk while others are not. Finally, since the *amount* of selling support provided by other blockholders to an engaged, informed blockholder is central to our story, we create an explicit role for the *quantity* of selling by introducing a (microfounded) downward-sloping demand curve.

In our model, a corporate manager chooses between a good action (that generates high eventual cash flows) and a bad one (that generates low cash flows) that endows him with private benefits. An informed blockholder observes the manager's choices and decides whether to retain or exit. As in Admati and Pfleiderer (2009), the possibility of liquidity shocks creates noise in the secondary market, and thus when this blockholder observes that the manager chooses the bad action, it is in her best interest to exit. A second blockholder observes the informed blockholder's choice (or infers it from price movements) and decides how to react. This blockholder is imperfectly informed, and the quality of her information depends on her own (unknown) type. Further, this second blockholder's incentives can differ. She may either be motivated purely by portfolio value maximization—i.e., she does not worry about short-term redemptions—in which case we call her "value motivated." Or she may be subject to the possibility of investor redemptions—in which case, she wants to ensure that she is not revealed to have received incorrect information because that risks outflows—and we refer to her as "flow motivated."

In equilibrium, value motivated blockholders do not react to the exit of the informed blockholder. If the value motivated blockholder is well informed, she exits if and only if her own information indicates that the manager has chosen the bad action. If the value motivated blockholder is poorly informed she *never* exits, because she does not wish to pay the roll down the downward-sloping demand curve implied by her sales. In sharp contrast, as long as the informed blockholder is not subject to frequent liquidity shocks, flow motivated blockholders react maximally to the exit of the informed blockholder: *regardless* of their own private information, such blockholders exit whenever the informed blockholder exits. In other words, flow motivated blockholders herd behind the informed blockholder.

The governance implications of such behavior are nuanced. On the one hand, the fact that flow motivated blockholders herd behind the informed blockholder enhances the price drop associated with the informed blockholder's exit, increasing punishments for suboptimal choices. On the other, the fact that such blockholders ignore their own information when making exit decisions introduces *endogenous* noise, sometimes punishing the manager severely even when he has made *optimal* choices. We can nevertheless parsimoniously characterize how governance ranks across equilibria with value motivated vs flow motivated blockholders. We show that the only instance in which governance works better *without* flow motivated blockholders is if value motivated blockholders are very well informed. Otherwise, governance is unambiguously better with flow motivated blockholders. Further, we show that if information acquisition is a choice, it is unlikely that value motivated blockholders will choose to become well informed in the presence of a large informed blockholder. Thus, our analysis suggests that flow motivated blockholders are beneficial for governance via exit in conjunction with an informed blockholder.

Our conclusion stands in contrast to that of Dasgupta and Piacentino (2015). In their single-blockholder model, flow motivations weaken the threat of exit. In our multiple-blockholder model, the interaction of flow motivated blockholders with engaged blockholders strengthens governance via exit. The two papers model funds' ability differently: Dasgupta and Piacentino (2015) focus on stock selection while we focus on monitoring. To compare and contrast the economics of these two approaches, in Section 5.3 we develop a simple unified model of exit by blockholders who care about *both* selection reputation and monitoring reputation. Using this, we show that attempting to appear skilled at selection tempts funds to exit too little whereas attempting to appear skilled at monitoring—in the event of negative information generated by, e.g., the exit of an informed blockholder—tempts funds to exit too much. While the former is unambiguously bad for governance via exit, the latter can be beneficial when the secondary market for the firm's shares is illiquid. Our model also suggests that the beneficial effects of flow motivations on governance via exit are likely to dominate when bad managerial choices translate relatively quickly into lowered cash flows.

We now turn to the empirical component of our analysis. Our baseline model delivers two interconnected sets of results: (i) how blockholders react to each other's exits; and (ii) the implications of such interactions for governance. The second set of predictions are not readily amenable to empirical examination as they rely on unobservables such as the information quality of value motivated blockholders. In contrast, trading choices and the identity of blockholders can be inferred from holdings data. In our empirical analysis, we therefore focus on the first set of predictions, thus examining whether the *underlying foundations* for our governance results are evident in the data. In particular, we examine trading by institutional investors in the aftermath of exits by activist hedge funds. Given the immersive involvement of activist funds in their target firms, we treat such funds as informed blockholders. We identify how and when such informed blockholders exit and trace the reactions of other institutional investors via quarterly 13F filings.

We treat open-ended *mutual funds* (identified by their presence in the Morningstar Open End Mutual Funds database) as our proxy for flow motivated blockholders. In contracting with their clients, such retail funds are subject to significant restrictions imposed by the Investment Companies Act of 1970, leading over 97% of them to use assets under management contracts as their exclusive form of compensation (Elton, Gruber, and Blake (2003)). This creates clear incentives for them to act in ways that maximize investor capital inflow.

Other asset managers, such as pension funds, hedge funds, banks and insurance companies, typically have compensation structures with varying degrees of sophistication that enable relatively better alignment of the interests of investors and their funds, thus potentially inducing funds to act more as portfolio value maximizers. While there is clearly heterogeneity amongst non-mutual funds, *on average*, such institutions will be less flow motivated than mutual funds.

Our empirical analysis is based on a set of 399 firms, each of which experienced an activist campaign that terminated via exit between 1994 and 2011. The results of our empirical analysis suggest that the mechanism identified in our theoretical framework is at play in the real world. Controlling for unobserved firm-level heterogeneity and general economic conditions, we find that following exits by activist funds, flow motivated mutual funds sell out of the target firm significantly more than other institutional investors. Such differences in trading behavior are exacerbated when (i) the activist exited at a loss, (ii) when we exclude campaigns that concluded in visible success, and (iii) when the market's immediate reaction suggested that the activist exit was unlikely to be due to liquidity needs. We argue in Section 6 that all these findings are in line with our model's predictions.

1.1 Related literature

Our paper builds on the literature on blockholder monitoring (surveyed by Edmans and Holderness (2017)) and the role of institutional investors in particular (surveyed by Dasgupta, Fos, and Sautner (2021)). We classify our discussion of more specific links to the literature into three components.

Exit models. Edmans and Manso (2011) consider multiple blockholders who govern via exit. In their model, competition in trading by multiple blockhoders leads to improved information aggregation (as in Kyle models with multiple insiders), improving governance. Their focus is different from ours. Edmans and Manso (2011) are interested in whether multi-blockholder structures per se can be beneficial. Accordingly, their blockholders are homogeneous and there is no role for incentives and heterogeneity, which are key ingredients in our analysis. Further, their analysis is static and does not permit blockholders to react to each other's exit. Dasgupta and Piacentino (2015) were the first to focus on how flow motivations affect exit, and the connection to that paper has been discussed above. Like us, Song (2017) considers the role of flow motivations in a multiple blockholder setting, but unlike us he focuses on how such motivations influence the use of voice by non-flow motivated blockholders.

Herding models. In our paper flow motivated investors bolster the exit governance mechanism by herding out of firms when engaged blockholders exit. Herding arises in our model because these investors care about their ex post reputation with their clients. Reputational herding was first analyzed by Scharfstein and Stein (1990). In contrast to that paper, prices are endogenously determined in ours, incorporating the effect of herding. Further, these endogenously determined prices enter into the manager's payoff function, thus affecting managerial choices and firm value, which in turn feeds back into prices. The existence of this feedback loop—missing from the traditional herding literature—implies that herding can be beneficial despite the induced loss in information aggregation. Khanna and Sonti (2004) also combine herding with a (different form of) price feedback loop. In their paper, herding can push prices higher and induce a positive change in the firm's investment, through feedback from prices into corporate investment. As a result herding can be beneficial. In formalizing the benefits of herding, our paper is closely connected in spirit to Khanna and Mathews (2011). They consider whether herding can improve investment decisions in settings in which (i) early movers choose the precision of their information and (ii) subsequently rely on the information revealed by all decisions in order to make decisions. They show that as long as such future decisions are sufficiently important, early movers will acquire more precise information when they know that late movers will herd and reveal no information. In a different context not involving governance considerations, Altı, Kaniel, and Yoeli (2012) tell a distinct story of trend chasing not involving reputational concerns. In their model, funds are uncertain about the quality of their information, and wait for public news to confirm their information before trading in that direction.

Governance role of active mutual funds. Our paper is thematically linked to empirical papers seeking to examine the role of mutual funds in corporate governance. Iliev and Lowry (2015) document that mutual funds may exert influence via voice by showing that a substantial fraction of mutual funds are active voters, not purely reliant on proxy voting advice. Our results demonstrate that mutual funds may also contribute to governance via correlated exit strategies. Further, some recent papers provide evidence that active mutual funds provide support in governance via voice to activist hedge funds include Kedia, Starks, and Wang (2021) and Brav, Jiang, Li, and Pinnington (2021).[6] Finally, our work complements Giannetti and Yu (2020), who empirically examine the governance benefits of short-horizon investors. Identifying short-horizon investors as those empirically classified to be "transient" by Bushee (2001), they find that firms with more such investors respond better than peers to reductions in import tariffs (an exogenous shock), and argue that this is due to the disciplining effect of the fear of aggressive sales by short-term investors. By establishing the ex ante governance benefits of herd sales, we provide a conceptual foundation for their findings. Further, our micro foundation via flow sensitivity provides guidance on *why* some investors may sell aggressively in response to bad news. Finally, while they focus empirically on firm-level outcomes, we focus instead on the actual trades of different institutional owners.

2 A Conceptual Framework

Consider an economy with four dates $t = 0, 1, 2$ and 3. There is a single firm, with a continuum of outstanding shares, normalized to measure 1. The firm generates a single cash flow, $v \in \{\underline{v}, \overline{v}\}$, at $t = 3$ where the realized value of v depends on managerial actions. Denote the (endogenously determined) share price of the firm at $t = 1, 2, 3$ by P_t. All information is

[6]A growing parallel strand of the literature features an active debate about the role of passive, i.e., *index*, mutual funds in corporate governance (see Dasgupta, Fos, and Sautner (2021, sec. 5.4.4) for a discussion of these papers). This strand is less related to our work as index funds can play no role in governance via exit.

public at $t = 3$ and thus $P_3 = v$.

The actors in the model are a corporate manager, an informed blockholder who makes choices at $t = 1$, a second blockholder who makes choices at $t = 2$, and a continuum of myopic risk averse traders who operate at $t = 1$ and 2. There is no discounting.

At $t = 0$ the manager (M) chooses an action $a_M \in \{\underline{v}, \overline{v}\}$ where $\overline{v} > \underline{v} > 0$. M derives a stochastic private benefit β from choosing $\underline{v}$, where β is distributed on $[0, \infty)$ with CDF F. The realized value of β is privately observed by M. M's action uniquely determines the cash flows produced by the firm, i.e., $v = a_M$. As is standard in exit models, M is incentivized by a linear combination of short-term prices and final cash flows. In particular, M's payoff is given by $\omega_1 P_1 + \omega_2 P_2 + \omega_3 v + I\left(a_M = \underline{v}\right)\beta$, where $I\left(\cdot\right)$ is the indicator function and $\omega_{1,2,3} > 0$. We define $\Delta v \equiv \overline{v} - \underline{v}$.

At $t = 1$ an informed blockholder (IB), who enters the model owning $\alpha_1 \in (0, 1)$ fraction of equity, observes the manager's action. IB then chooses whether to retain $a_1 = r$ or exit $a_1 = e$. IB's ex post payoff is given by

$$\pi_1 = \begin{cases} \alpha_1 v, & if\, a_1 = r, \\ \alpha_1 P_1, & if\, a_1 = e. \end{cases}$$

Further, with probability $\delta_1 \in (0, 1)$ IB is subject to a privately observed liquidity shock and must choose $a_1 = e$.

At $t = 2$ there is a second blockholder (2B), who enters the model owning $\alpha_2 \in (0, 1 - \alpha_1)$, observes a_1,[7] as well as a private signal about M's action, $s_2 \in \{\underline{v}, \overline{v}\}$. 2B then chooses whether to retain $a_2 = r$ or exit $a_2 = e$. 2B's signal is imperfect and depends on her skill. In particular, 2B can be of two types $\tau \in \{g, b\}$, where $\gamma_2 = Pr(\tau = g)$; the precision of the signal is given by:

$$\sigma_{2,\tau^*} = \mathbb{P}\left[s_i = v^* \mid v = v^*, \tau = \tau^*\right],$$

where $\tau^* \in \{g, b\}$ with $1 \geq \sigma_{2,g} > \sigma_{2,b} \geq \frac{1}{2}$. We denote the average precision of 2B's information by $\sigma_2 \equiv \gamma_2 \sigma_{2,g} + (1 - \gamma_2)\sigma_{2,b}$. Like IB, 2B is subject to liquidity shocks: with

[7]The model is qualitatively unchanged if—instead of observing a_1—2B observed P_1, since IB is the only trader at $t = 1$.

probability $\delta_2 \in (0,1)$ 2B is subject to a privately observed liquidity shock and must choose $a_2 = e$.

We think of 2B as being an institutional investor who manages the capital of clients. In turn, we think of institutional investors as being of two broad classes.

One class of institutional investor consists of asset managers whose interests are perfectly aligned with their (risk neutral) clients. They maximize portfolio value (as their clients would, had they been in control), and we refer to such institutional investors as being *value motivated* (VM). If 2B is VM, then her ex post payoff is given by:

$$\pi_2 = \begin{cases} \alpha_2 v, & if\, a_2 = r, \\ \alpha_2 P_2, & if\, a_2 = e, \end{cases}$$

VM institutions can be thought to be asset managers whose clients are sophisticated and set investment mandates—including, e.g., incentive payments, self-investment requirements, and lock-up provisions—to align incentives. A natural example of such investors are sophisticated and (relatively) unregulated hedge funds.

The other class of institutional investor is made up of asset managers whose interests are not perfectly aligned with their principals due to their organizational structure and limitations on incentive contracting. As a result of such limitations, these institutions are subject to investor redemption pressure, and act in ways that maximize their chances of having their investment mandates renewed, i.e., to retain or attract investor flow in order to earn fees. We refer to such investors as being *flow motivated* (FM). If 2B is FM, imagine that she earns fee $w > 0$ if rehired by clients at the end of the game. In making their rehiring decisions, clients compare the institution to the available alternative, which is a new fund with a probability $\gamma_3 \sim U[0,1]$ of being the good type. γ_3 is realized at $t = 3$. In other words, 2B's expected future earnings are

$$\mathbb{P}\left[\mathbb{P}\left(\tau = g \mid v, a_2\right) > \gamma_3\right] w = \mathbb{P}\left(\tau = g \mid v, a_2\right) w.$$

Thus, the FM 2B maximizes

$$\mathbb{P}\left(\tau = g \mid v, a_2\right).$$

A natural example of such investors are retail mutual funds. The contracts between retail mutual funds and their investors are restricted by provisions in the Investment Companies Act of 1970 leading over 97% of them to use assets under management contracts as their exclusive form of compensation (Elton, Gruber, and Blake (2003)). This creates clear incentives for them to act in ways that maximize investor capital inflow, and indeed, there is extensive empirical evidence (Brown, Harlow, and Starks (1996), Chevalier and Ellison (1997)) that mutual funds *do* compete for investor flow.

We assume, that the signal s_2 is independent of s_1 conditional on v, and these signals, the private benefit, β, and the type, τ, are mutually independent.

At $t = 1, 2$ there is a continuum of myopic risk-averse traders with mean-variance preferences. Each trader has endowment W, observes the history of trades up to and including date t (denoted by h_t) making rational inferences, and can either invest in the stock or in the risk-free asset (with zero rate of return). By holding $x_{i,t}$ units of the stock at price p_t trader i with "risk aversion" λ_i obtains utility

$$x_{i,t}\mathbb{E}(v|h_t) - \frac{1}{2}\lambda_i x_{i,t}^2 \mathrm{Var}(v|h_t) + W - p_t x_{i,t}.$$

2.1 Preliminaries

2.1.1 Strategies and Notation

Strategies are designated as follows: IB's strategy is $\Sigma_1 : a_M \to \{e, r\}$; 2B's strategy is $\Sigma_2 : a_1, s_2 \to \{e, r\}$; and M's strategy is designated $\Sigma_M : \beta \to \{\underline{v}, \overline{v}\}$. Let $\alpha_t \equiv \alpha\left(h_t\right)$ denote the total (cumulative) quantity sold conditional on history h_t. Let $q_t \equiv q\left(h_t\right) = \mathbb{P}\left(v = \overline{v}|h_t\right)$ denote the conditional probability that M chose action $\overline{v}$ given history h_t.

2.1.2 Characterizing prices

Consider the short-lived traders. The first order condition of trader i at any date t implies:

$$x_{i,t} = \frac{\mathbb{E}(v|h_t) - P_t}{\lambda_i \text{Var}(v|h_t)}$$

so, market clearing at each t: $\int_i x_{i,t} di = \alpha_t$, gives

$$P_t = \mathbb{E}(v|h_t) - \lambda \alpha_t \text{Var}(v|h_t),$$

where $\lambda \equiv 1/\int_i \frac{1}{\lambda_i} di$. Throughout the remainder of our analysis we impose the following assumption:

Assumption 1. $\lambda < 1/\Delta v$.

This assumption ensures that prices are well behaved in the model. Lemma 1 below shows that under Assumption 1 prices (i) do not fall below $\underline{v}$, (ii) are increasing in the conditional probability of $v = \overline{v}$; and (iii) are higher when managers make better choices.

Lemma 1. *If* $\lambda < 1/\Delta v$,

(i) $P_t > \underline{v}$ *for all* t, h_t.

(ii) P_t *is increasing in* q_t.

(iii) If there exists $\hat{\beta}$ *such that* $\Sigma_M = \left\{ \underline{v} \text{ if and only if } \beta > \hat{\beta} \right\}$ *and* q_t *is increasing in* $\hat{\beta}$, *then* P_t *is increasing in* $\hat{\beta}$.

The proof of this result—as well as that of all subsequent results—is in Section A of the Appendix. In our model, the price is the expected asset cash flows given the observed history, $\mathbb{E}(v|h_t)$, less a risk premium $\lambda \alpha_t \text{Var}(v|h_t)$. The risk premium is higher if the asset is (conditionally) more risky (i.e., if $\text{Var}(v|h_t)$ is higher), if more of it must be held by risk averse traders (i.e., if α_t is higher), and if aggregate risk aversion (λ) is higher. For high levels of λ, the market clearing price could fall below the lowest possible cash flow $\underline{v}$. Part (i) of Lemma 1 establishes an upper bound on λ sufficient to rule out this possibility. Further, while expected cash flows $\mathbb{E}(v|h_t) = \Delta v q_t + \underline{v}$ is linear in the conditional probability that M chooses $\overline{v}$ q_t, the conditional variance of cash flows $\text{Var}(v|h_t) = \Delta v^2 q_t(1-q_t)$ is non-monotone.

For high levels of λ, the price could be non-monotone in q_t. However, part (ii) of Lemma 1 shows that under the same condition as in part (i), the price is always increasing in q_t. Part (iii) of Lemma 1 is useful for subsequent analysis. It establishes that if M chooses $\overline{v}$ if and only if his private benefit is smaller than some threshold $\hat{\beta}$ then—under the same condition as in parts (i) and (ii)—the price is increasing in $\hat{\beta}$.

2.1.3 Governance Benchmarks

Before moving on to our main analysis we state two governance benchmarks.

No governance. Suppose there is no governance via exit—because, for whatever reason, shareholders cannot respond to managerial actions—and thus the prices at $t = 1, 2$ are unaffected by the manager's action. Denote these prices P_1^B and P_2^B. In that case, the choice facing the manager is as follows. If he chooses $a_M = \overline{v}$ then his payoff will be $\omega_1 P_1^B + \omega_2 P_2^B + \omega_3 \overline{v}$ whereas if he chooses $a_M = \underline{v}$ his payoff will be $\omega_1 P_1^B + \omega_2 P_2^B + \omega_3 \underline{v} + \beta$. Thus the manager will choose $a_M = \underline{v}$ if and only if $\beta \geq \underline{\beta} \equiv \omega_3 \Delta v > 0$.

Perfect governance. Suppose there is perfect governance in that prices perfectly reflect the informational content of managerial choices, i.e., $P_1 = P_2 = a_M$, where $a_M \in \{\underline{v}, \overline{v}\}$. Then, the manager chooses the low action if and only if $(\omega_1 + \omega_2 + \omega_3)\overline{v}$ is lower than $(\omega_1 + \omega_2 + \omega_3)\underline{v} + \beta$ or, equivalently, $\beta \geq \overline{\beta} \equiv (\omega_1 + \omega_2 + \omega_3)\Delta v \in (\underline{\beta}, \infty)$.

3 Trading in equilibrium

3.1 The value motivated case

We first solve for the equilibrium for the case in which 2B is VM.

Proposition 1. *There exist* $\frac{1}{2} < \underline{\sigma} < \overline{\sigma} < 1$ *and* $\beta_{VM}^u, \beta_{VM}^{\sigma_2} \in (\underline{\beta}, \overline{\beta})$ *such that:*

1. *IB chooses* $a_1 = e$ *if and only if* $a_M = \underline{v}$.

2. *For* $\sigma_2 > \overline{\sigma}$

(a) *If* $a_1 = e$, *2B chooses* $a_2 = e$ *if and only if* $s_2 = \underline{v}$*;*

(b) *If* $a_1 = r$, *2B chooses* $a_2 = r$ *for all* s_2*.*

(c) *M chooses* $\underline{v}$ *if and only if* $\beta > \beta^{\sigma_2}_{VM}$*.*

3. *For* $\sigma_2 < \underline{\sigma}$

(a) *If* $a_1 = e$, *2B chooses* $a_2 = r$ *for all* s_2*;*

(b) *If* $a_1 = r$, *2B chooses* $a_2 = r$ *for all* s_2*.*

(c) *M chooses* $\underline{v}$ *if and only if* $\beta > \beta^{u}_{VM}$*.*

IB observes M's choices and by Lemma 1, part (i), prices at $t = 1$ are always strictly above $\underline{v}$. Thus it is clearly in IB's best interest to exit if and only if M has chosen the low action. If $a_1 = r$, then—since IB is perfectly informed (and retention rules out liquidity shocks)—this immediately reveals that $a_M = \overline{v}$. Thus all uncertainty is resolved and $P_t = \overline{v}$ for $t = 1, 2, 3$, rendering 2B's choices inconsequential for managerial incentives. In turn, 2B is indifferent across all trades and it is (weakly) a best response to set $a_2 = r$.

If $a_1 = e$, however, there is residual uncertainty, because IB may have exited for informational or liquidity reasons. Now, 2B's private information becomes relevant. 2B has valuable information about M's actions, but her information is imperfect. She faces a tradeoff. When she observes $s_2 = \underline{v}$, she would ideally sell (because her information is correct on average) but then she lowers prices, i.e., she faces a "roll down the demand curve" due to the risk premium component of exit prices. If her information is of sufficiently high quality ($\sigma_2 > \overline{\sigma}$), it is worth paying the roll down the demand curve, and she chooses to exit if and only if her information indicates that M chooses the low action. If her information is sufficiently imprecise ($\sigma_2 < \underline{\sigma}$), then it is too costly to pay the roll down the demand curve and 2B simply retains. Thus, from M's perspective, the expected punishment for choosing $a_M = \underline{v}$ depends on the quality of 2B's information. Accordingly, M follows a conditional strategy, choosing $a_M = \underline{v}$ for $\beta > \beta^{u}_{VM}$ when 2B is poorly informed and for $\beta > \beta^{\sigma_2}_{VM}$ when 2B is well informed. The former threshold does not depend on the precise quality of 2B's information (since 2B follows an information-uncontingent strategy when poorly informed) but the latter does.

3.2 The flow motivated case

We now solve for the equilibrium for the case in which 2B is FM. In our analysis, we fix off-equilibrium beliefs as follows: off-equilibrium retention is assumed to arise from having observed $s_2 = \overline{v}$. These beliefs are robust in the sense that they would be the *on*-equilibrium beliefs if with a small probability 2B was "naive" and always acted according to her signal. Defining $\overline{F} \equiv 1 - F$, we have:

Proposition 2. *As long as* $\delta_1 < \underline{\delta}_1 \equiv \overline{F}\left(\overline{\beta}\right)/F\left(\overline{\beta}\right)$*, there exists* $\beta_{FM}^{\delta_1} \in \left(\underline{\beta}, \overline{\beta}\right)$ *such that:*

1. *IB chooses* $a_1 = e$ *if and only if* $a_M = \underline{v}$.
2. *If* $a_1 = e$*, 2B chooses* $a_2 = e$ *for all* s_2.
3. *If* $a_1 = r$*, 2B chooses* $a_2 = r$ *for all* s_2.
4. *M chooses* $\underline{v}$ *if and only if* $\beta > \beta_{FM}^{\delta_1}$.

IB's behavior is identical to the previous case. As before, when $a_1 = r$, it is revealed that $v = \overline{v}$, but when $a_1 = e$ residual uncertainty remains. 2B has valuable information about M's actions, but her information is imperfect. Imagine that 2B has observed signals $s_2 = \overline{v}$. When IB exits, 2B knows that this could be either because IB was subject to a liquidity shock in which case IB's action is uninformative about the future firm cash flow v. However, if IB was not subject to a liquidity shock, then exit is informative: the future cash flow will be $\underline{v}$. A flow motivated 2B is interested in maximizing her clients' ex post inferences about her. She has two choices. If she follows the equilibrium strategy and exits (even though she has received signal $s_2 = \overline{v}$), her clients can make no inferences about her, since equilibrium trading is uninformative. If she deviates and retains, she will be revealed to be correctly informed if both (i) IB was subject to a liquidity shock and (ii) her own signal is correct. In this case, she will improve her standing in the eyes of her clients. But, if either (i) or (ii) fails, then she will be revealed to be incorrectly informed, and her standing in the eyes of her clients will decline. Intuitively, when δ_1 is small, IB's exit convinces 2B that it is sufficiently likely that the realized outcome will be $\underline{v}$, which also simultaneously makes her doubt the quality of her own information thus making a negation of (ii) more likely. Thus, it is better for 2B to "jam" her private signal by acting in a manner that hides it from her clients.

By a similar argument, if δ_1 is large, then the likelihood of (i) above becomes high, and thus observing a signal that disagrees with IB's actions makes it less likely that (ii) will fail. For such parameters, it is better not to "jam" private signals, but rather to follow them:

Proposition 3. *As long as* $\delta_1 > \overline{\delta}_1 \equiv \overline{F}\left(\underline{\beta}\right)/F\left(\underline{\beta}\right)$*, there exists* $\beta_{FM}^{\delta_1} \in \left(\underline{\beta}, \overline{\beta}\right)$ *such that:*

1. *IB chooses* $a_1 = e$ *if and only if* $a_M = \underline{v}$*.*

2. *If* $a_1 = e$*, 2B chooses* $a_2 = e$ *if and only if* $s_2 = \underline{v}$*;*

3. *If* $a_1 = r$*, 2B chooses* $a_2 = r$ *for all* s_2*.*

4. *M chooses* $\underline{v}$ *if and only if* $\beta > \beta_{FM}^{\delta_1}$*.*

Note that since $\overline{\beta} > \underline{\beta}$ and $\overline{F}/F$ is a decreasing function, we have that $\overline{\delta}_1 > \underline{\delta}_1$.

4 Governance in equilibrium

We now compare governance with VM vs FM blockholders. To ensure that our comparison is driven by (endogenous) incentives instead of (exogenous) variations in information quality, we hold the precision of information for 2B constant across VM and FM blockholders.

Proposition 4. *There exists* $\delta_1^* \in \left(\overline{\delta}_1, 1\right)$ *and* $\sigma^* \in [\overline{\sigma}, 1)$*, such that for* $\delta_1 \in (0, \underline{\delta}_1) \cup (\delta_1^*, 1)$ *and* $\sigma_2 \in \left(\frac{1}{2}, \underline{\sigma}\right) \cup (\sigma^*, 1)$*, we have:*

$$\beta_{VM}^{u} < \beta_{FM}^{\delta_1} \leq \beta_{VM}^{\sigma_2},$$

where $\underline{\sigma}$ *and* $\overline{\sigma}$ *are defined in Proposition 1 while* $\underline{\delta}_1$ *and* $\overline{\delta}_1$ *are defined in Propositions 2 and 3, respectively.*

The comparison between governance across equilibria of our model is subtle because it involves a feedback loop: 2B's trading affects prices (and thus the rewards and punishments that M faces for his choices), which in turn affects M's decisions, which then feeds back into prices.

Adding further complexity, VM and FM blockholders' trades respond differentially to model parameters. For VM blockholders the key parameter is the quality of private information σ_2 (see Proposition 1): for a given trade by the IB, VM blockholders care only about the degree to which they are informed over and above information already priced in. In contrast, FM blockholders care only indirectly about profits, being instead incentivized by whether they are perceived (ex post) to be well informed. Thus, for them, it is key that IB's trade will turn out to be ex post "correct." Hence, the key parameter driving the trade of FM blockholders is δ_1, the likelihood that the IB experienced a liquidity shock and thus traded in an uninformative manner (see Propositions 2 and 3).

Nevertheless, we can provide a parsimonious comparison of governance. Good governance is achieved by lowering the probability that M chooses $a_M = \underline{v}$, i.e., by raising the threshold level of private benefits β above which the undesirable action is chosen. Proposition 4 demonstrates that governance *can* be better in the VM case *but only if* 2B is highly informed; In case 2B is not well informed, governance is *unambiguously* better with FM blockholders.

Intuitively, the comparison across the FM and VM cases may be thought of as follows. M behaves best when he is punished (via blockholder exit) whenever he chooses $a_M = \underline{v}$ and is rewarded (via blockholder retention) otherwise.

For small δ_1, the FM 2B exits whenever IB exits. This means that M is strongly penalized—because 2B's exit lowers prices further following IB's exit—when he chooses $a_M = \underline{v}$. This is good for governance. But, a downside is that M is also punished just as much when he has chosen $a_M = \overline{v}$ if IB is forced to sell due to a liquidity shock: since 2B does not use her signal in equilibrium, valuable information is lost. This information loss is averted if 2B is VM and very well informed. In that case, when M chooses $a_M = \underline{v}$, he is punished for sure by IB's exit and likely also punished by 2B's exit; whereas when he chooses $a_M = \overline{v}$ and IB is forced to exit due to a liquidity shock, unless 2B also faces a liquidity shock, M's accidental punishment will likely be ameliorated by 2B's retention. Thus, in the case of a sufficiently well informed 2B, governance will be better than in the case in which 2B is FM. If, however, 2B is poorly informed, then the VM 2B will not sell at all. Thus, when it comes to punishing M for $a_M = \underline{v}$, it is as if IB acts alone. This reduction of punishment for poor choices weakens governance, which is superior in the FM case than in the VM case for $\sigma_2 < \underline{\sigma}$.

For large δ_1, with well-informed 2B, trading choices and thus governance are identical across the VM and FM cases. In contrast, a poorly informed VM 2B never punishes M for choosing $a_M = \underline{v}$, while a poorly informed FM 2B follows an informative trading strategy for large δ_1. Hence, again, governance is superior in the FM case.

5 Extensions

5.1 Endogenous information acquisition

Proposition 4 suggests that governance can be better in the VM case but only if 2B is highly informed; in case 2B is poorly informed, governance is better with FM blockholders. Since the quality of information is to some extent a choice made by blockholders, the applied implication of this result relies on whether VM 2B in firms with an IB are likely to be well informed or not. We now model the information acquisition choice of 2B in the VM case. Since the behavior of 2B in the FM case is independent of the quality of her information, it is sufficient to model information acquisition only for the VM case.

We start with a poorly informed VM 2B, with $\sigma_2 < \underline{\sigma}$, keeping the rest of the model unchanged. 2B now has a choice at the beginning of the game: Suppose that, by expending some cost, she can become perfectly informed, i.e., have $\sigma_2 = 1$. Her information acquisition choice is observed by all. We show that:

Proposition 5. *The willingness of a VM 2B to pay to acquire information is monotonically decreasing in the size of IB's stake, α_1.*

2B's ex ante decision to pay to become informed relies on potential gains from being informed at the point of trade. There are two potential trading histories after which 2B must trade: $a_1 = r$ or $a_1 = e$. Since IB observes a_M, conditional on observing $a_1 = r$, it will be common knowledge that $v = \overline{v}$, and the quality of 2B's information is irrelevant. Thus, the benefits of information derives entirely from how it benefits 2B's trade conditional on $a_1 = e$. If 2B is uninformed, by Proposition 1 she will choose $a_2 = r$ and thus receive continuation payoff $E(v|a_1 = e)$. If 2B has paid to acquire information, so that $\sigma_2 = 1 > \overline{\sigma}$, by Proposition 1 she will sell when her information indicates that $a_M = \underline{v}$. In this case, she gains because she liquidates at some market clearing price $P_2 > \underline{v}$ (by Lemma 1) instead of holding on to her position for a payoff of $\underline{v}$. Thus, her incremental payoff from paying for information is positive. But this incremental payoff diminishes in the size of IB's sold stake α_1, because the market clearing price decreases towards $\underline{v}$ as the traded quantity becomes larger. Effectively, the larger is α_1, the bigger the roll down the demand curve when 2B has an opportunity to trade. Thus, 2B's willingness to pay for information will decrease.

Our results to date have implications for the potential preferences of informed blockholders such as activist hedge funds with regard to their fellow blockholders in target firms. In particular, consider an activist who is contemplating establishing a position in a firm in which other blockholders are value maximizers. This activist faces a trade-off: to gain direct influence over target management (via "voice") the activist would like to increase α_1, but higher α_1 worsens (indirectly) governance via exit, by making it less likely that her fellow blockholders will choose to become informed and thus provide (implicit) support for the activist's governance via the threat of exit. This trade-off does not exist in firms in which fellow blockholders are flow motivated institutional investors.

5.2 Discussion of modeling choices

In constructing our model we have made a number of choices. In the Online Appendix (OA.1), we provide a discussion of some of these. We discuss the assumed exogeneity of the order of trading in the model and show that it does not matter. We also show that our results hold even if 2B blockholders are simultaneously value- and flow-motivated. Finally, we discuss the myopia of our risk averse traders.

5.3 Selection vs monitoring: Flow motivations and governance via exit

Dasgupta and Piacentino (2015) (DP, henceforth) argue that flow motivations hurt governance via exit while we argue that they may help. We now examine the economic forces behind these opposing results. In brief, there is a *fundamental strategic similarity* across the two models but a *key applied difference* in how such strategic behavior impacts governance. The similarity arises because in both models flow motivations lead to the suppression of private information that funds deems harmful to their reputation. The difference arises because information suppression is bad for exit in DP, whereas it can be beneficial in our model.

It is helpful to understand the difference between DP and our paper in the context of the temptation to deviate from the *standard exit equilibrium* in which the fund exits if and only if her private information indicates that the manager has chosen the value destroying action. In DP, there is only (ex ante) stock selection ability (better types of funds are more likely to choose firms where managers will avoid the value destroying action) but *no* monitoring ability (*all* types of funds observe managerial actions perfectly). Funds are evaluated at the interim date on the basis of their reaction to the manager's choices, but not on the basis of final cash flows.[8] In contrast, in our paper, there is only monitoring ability (better types of funds have an advantage in observing the manager's actions) but *no* selection ability. Funds are evaluated on the basis of final cash flows. Since monitoring ability cannot be assessed without final cash flows, interim date evaluation is irrelevant in our current model.

In reality, both selection and monitoring abilities matter, and investors will likely evaluate and reward both. To examine how funds respond to such dual incentives, we develop a simple model. This is presented in the Online Appendix (OA.2) and intuitively discussed here.

In our dual-reputation model, funds have both selection and monitoring skills. Selection skill stems from information they observe about the firm before deciding whether to invest: better funds receive more precise information. Monitoring skill is relevant if they invest: as shareholders, funds obtain further information about the firm; the precision of such information is again type dependent. Selection and monitoring signals are independent conditional on fund type and firm quality, i.e., though good funds are better at both selection and monitoring, the two skills are distinct. Following portfolio selection but ahead of monitoring, negative (type-independent) information may be revealed about the firm to the fund (e.g., the exit of a well-informed activist). Investors observe the fund's exit actions and form an immediate update (on their selection skill) and then update again following final

[8] The lack of final date evaluation is without loss of generality in the absence of monitoring ability differences, see DP section V.A.2 for a discussion.

cash flows (now on monitoring ability). Funds care about a weighted sum of their selection and monitoring reputation.

We show that the fund is subject to two temptations: both temptations push the fund to deviate from the *standard exit equilibrium*, but in different directions. The desire to boost selection reputation pushes towards too little exit because exit suggests that the fund selected the wrong firm. This is a simplified version of the mechanism in DP. Yet, the desire to boost monitoring reputation can push towards too much exit. This arises if the fund observes additional information (e.g., the exit of a well-informed activist) that suggests the manager has settled on the value destroying action. Then, even if the fund's private signal suggests otherwise, she is tempted to exit anyway (i.e., exit "too much") so as to appear to be a more successful monitor. This is a simplified version of the mechanism in our model.

The key difference between these two temptations to deviate from a *standard exit equilibrium* is that the first can *never* be good for exit while the second *may* be good *if* uninformed exit has a price impact. This arises in our model due to a downward sloping demand curve, because—as noted in the introduction—then the *quantity* sold affects prices.[9]

Our model provides guidance on how the fund trades off selection and monitoring reputation. The fund cares about a *weighted* sum of their selection (short-term) and monitoring (long-term) reputation. These weights can be interpreted to represent the temporal gap between short-term and long-term evaluation, i.e., how far off the final revelation of cash flows is when the fund makes its exit decision. If the gap is long, the fund will not wish to hurt its selection reputation by exiting because it can maintain a good reputation (thus retaining client capital) for a long time by faking selection skill before final cash flows are revealed. In these cases, flow motivations weaken exit as governance. On the other hand, if the fund believes that the revelation of final cash flows is imminent, then she will be tempted to principally maximize her monitoring reputation, sacrificing selection reputation. In these cases, flow motivations can lead to excessive exit and aid governance via exit as long as uninformed sales deliver price impact. Overall, flow motivations are likely to aid governance via exit

[9] If the residual demand curve is perfectly elastic—a simplifying characteristic of many models in the tradition of Glosten and Milgrom (1985) and Kyle (1985)—then the uninformed sales of our Proposition 2 will have no effect on prices, and thus no impact on governance.

when:

1. The revelation of the consequences of the manager's perverse actions is imminent, and
2. When the demand curve for the firm's shares is downward sloping, so the quantity sold matters for price impact.

6 An Empirical Investigation

Our model delivers two interconnected sets of results. First, in Propositions 1, 2, and 3, we characterize how VM and FM blockholders trade in response to an informed blockholder's exit. Second, in Proposition 4, we delineate how such trading choices affect managerial incentives and thus the quality of governance. While our governance result—that the flow motivations of blockholders may aid governance via exit—is of key economic interest, it is not readily amenable to empirical examination. Apart from the usual difficulties of empirically examining governance via the *threat* of exit as discussed by Bharath, Jayaraman, and Nagar (2013), the characterization in Proposition 4 relies on unobservables such as the information quality of VM blockholders. In contrast, trading choices and the identity of the blockholders are observable. Thus, in this section, we empirically examine the trades of FM and VM blockholders, in order to examine whether the *underlying foundations* for our governance effects are evident in the data.

To identify exits by informed blockholders, we use data from Brav, Jiang, Partnoy, and Thomas (2008) (BJPT) and Brav, Jiang, and Kim (2010) (BJK). BJPT and BJK combine regulatory filings by activist hedge funds with news searches to build up a rich dataset on activist campaigns, documenting when and how activist funds exited. Given the intensity of activist funds' involvement in target firms, they are likely to be well informed. Quarterly 13F filings allow us to trace the behavior of other institutional blockholders. We identify open-ended mutual funds (via their presence in the Morningstar Open End Mutual Funds database, as described below) as our proxy for FM blockholders. As noted in Section 2, the majority of mutual funds are purely flow-motivated. This renders them (by definition) more flow motivated than the *average* non-mutual fund institutional investor, including those that impose explicit lock-up provisions, e.g., hedge funds, or those that benefit from implicit lockups, e.g., state pension funds whose investors need to switch jobs to change providers.

Table 1: Summary from Propositions 1, 2, and 3, on how FM (Top row) and VM (Bottom row) blockholders respond to the observed exit of the IB.

		Left	Right
		$\delta_1 < \underline{\delta}_1$	$\delta_1 > \overline{\delta}_1$
Top	FM	Always sell	Sell if and only if $s_2 = \underline{v}$
Bottom	VM	If $\sigma_2 > \overline{\sigma}$, sell if and only if $s_2 = \underline{v}$. If $\sigma_2 < \underline{\sigma}$ never sell.	If $\sigma_2 > \overline{\sigma}$, sell if and only if $s_2 = \underline{v}$. If $\sigma_2 < \underline{\sigma}$ never sell.

Table 1 summarizes the conclusions of Propositions 1, 2, and 3 regarding how FM and VM blockholders respond to the observed exit of the IB. When $\delta_1 > \overline{\delta}_1$, the exit choices of FM and VM blockholders are identical when VM blockholders are well informed; but when VM blockholders are poorly informed, they never sell, so that FM blockholders overall sell more often when $\delta_1 > \overline{\delta}_1$. Such differences are exacerbated when $\delta_1 < \underline{\delta}_1$, because FM blockholders *always* sell. Thus, unconditionally on δ_1, i.e., comparing the Top row with the Bottom row across the Left and Right columns, combined with our identifying assumption that mutual funds are relatively flow motivated, delivers our first empirical prediction:

EP1. *Conditional on the exit of an activist fund, mutual funds sell more relative to other institutional investors.*

As the discussion above suggests, if we were to condition on $\delta_1 < \underline{\delta}_1$, i.e., compare across the Top and Bottom rows for *only* the Left column, the differences in selling between FM and VM blockholders are exacerbated. While δ_1 is not directly observable, a natural empirical proxy for δ_1 is the immediate price reaction to an informed blockholder's exit. If the market believes that δ_1 is small, the immediate price impact of an informed blockholder's exit should be larger. Using the price reaction to an informed blockholder's exit as a proxy for δ_1 delivers our second empirical prediction:

EP2. *The difference between mutual funds and other institutional investors' reaction to the exit of an activist fund is higher when the immediate price impact of the activist blockholder's exit is larger.*

Are activist engagements good empirical counterparts for the model?

The richness of the BJK data make activist campaigns attractive for us, but the discerning reader may worry that the publicity inherent in activist campaigns limits their fit to exit models. In exit models, the informed blockholder has private information about the manager's choice of action. In an activist campaign, activists declare their preferred action ($\overline{v}$) in the 13D filing. At the outset of campaigns it is also often publicly known (e.g., Chapman Capital vs FSI) that target management do not wish to undertake that action. To what extent does the activist have private information about the manager's actions at the point of exit?

Activist campaigns typically take time and involve a degree of persuasion (via the use of voice—both public and behind the scenes) of target management. In campaigns such as Chapman vs FSI, the activist may continue to try to persuade or pressurize management even if they are initially unwilling, in the hope that they may change their mind. If such persuasion works, the campaign succeeds (and typically ends with a public announcement, e.g., Becht et al. (2017)). If persuasion fails, there will be a point when the activist realizes that target managers will simply *not* choose their preferred action and concludes that the campaign will fail. Further—in contrast to the case where persuasion succeeds—the activist has no incentive to make his conclusion public. Hence, the activist's private information is effectively the conclusion that the manager simply cannot be persuaded to choose $\overline{v}$, and thus—by implication—chooses $\underline{v}$. Interpreted in the context of activist campaigns, our model abstracts from the full dynamics of the interaction (voice) between activists and management, and effectively starts at the point when the activist reaches some conclusion as to whether the manager will choose $\overline{v}$, which we label $t = 0$. Theoretical analysis of the interaction between voice and exit by an activist shareholder is provided by Levit (2019).

It is noteworthy that we do not claim that activist hedge funds principally govern via the threat of exit. In our view—implicit in the discussion in the previous paragraph—they use *voice* to persuade management. But simultaneously management will be aware that once an activist realizes that his campaign will fail, he may exit to prevent further losses, an implicit threat that supports voice (Hirschman (1970)). Our analysis suggests that such exits may induce flow-motivated blockholders to also sell, bolstering the implicit threat of exit.

6.1 Data

We merge activist hedge fund campaign data with information on institutional holdings in target companies from the Thomson Reuters 13F database as well as with the Morningstar Open-end Mutual Fund portfolio holdings dataset.

6.1.1 Activist Campaign Data

We use data on activist campaigns based on an updated sample (1994–2011) provided by Alon Brav using the same data collection procedure and estimation methods as in BJPT and BJK. The activist campaign dataset is primarily based on Schedule 13D filings. Under Section 13(d) of the 1934 Exchange Act, investors must file with the SEC within 10 days of acquiring more than 5% of any class of securities of a publicly traded company if they have an interest in influencing the management or the operations of the company. Schedule 13D filings provide information about the filing date, ownership and its changes, cost of purchase, and the stated purpose of the filer. BJK then combine the 13D filings data with data obtained through news searches using Factiva, gathering additional information such as the target management's response and the development and resolution of events.

The resulting sample consists of 2,739 distinct campaigns involving 2,016 targets and 175 hedge fund families. As shown in Table 2 (Panel A), 38.88% of hedge fund campaigns involved a specific engagement objective by the informed blockholder in targeting the company, 52.54% were run without a specific objective,[10] and 8.58% had an unspecified/missing classfication in the data.

[Insert Table 2 here]

In Panel B we classify campaigns with a specific goal by their outcomes and find that there is significant heterogeneity. In 43.47% of campaigns, hedge funds reported that the outcome of their engagement was successful, and in 20.47% they settled with the target company. Activists reported a failed campaign in 14.55% of campaigns while they withdrew in 8.54%

[10] BJK denote campaigns as non-specific if the 13D filings and news searches on campaign objective provide generic statements such as "improving the company or improving shareholder value". For more information see Appendix B.

of campaigns. Around 1% of campaigns were still ongoing at the time of data collection and around 11% of campaigns had insufficient information about the outcome.

The data contain information on how and when campaigns were terminated. We define the *termination date* to be the date when the activist fund: either a) reduces its stake in the target company below 5% (the filing date of the last 13D/A that indicates ownership fell below 5%), or if a) is not available, then b) divests (this can also include the date when the target was acquired by another company or liquidated); or if neither a) nor b) are available, then c) the date on which the campaign reaches a resolution (e.g. the target firm is sold, the company agrees to comply with the activist's demands, or the activist quits, etc.).

Panel C provides information on the manner of campaign termination. The most common form of termination, in 39.21% of cases, is via sale in the open market, i.e., via "exit" in the sense of the model in Section 2. At the time of data extraction, 30.08% of activists still held on to their stakes in target companies, 8% of campaigns ended in the target being merged with another company, and 4.67% ended with the target company being sold to a third party. Other types of termination (liquidation, selling back to the target, or target being taken by another hedge fund) are less frequent. In almost 15% of campaigns, the manner of termination was not known at the time of data extraction.

In Panel B we provide detail regarding outcomes in campaigns that terminated via exits. 72.53% of campaigns in which the activist withdrew and 37.42% of campaigns that the activist considered as failure ended in exits. Among campaigns that concluded as success (settlement), in 24.19% (33.03% respectively) of cases the activist exited. Hence, there is also significant heterogeneity in outcomes within campaigns that terminated in exits.

For our analysis, we retain only the first campaign in which a firm was targeted, generating a one-to-one correspondence between campaigns and firms. Further, we restrict attention to sales in the open market, i.e., exits, in order to match our theoretical setup. This results in the inclusion of 911 unique firms in which activist campaigns ended via exit.

6.1.2 Institutional Holdings Data

We trace the trading behavior of other blockholders via quarterly 13F filings. In the U.S. any institutional investor who manages $100 million or more must disclose their stock holdings by filing Form 13F to the SEC. We use the S34 dataset (13F filings) compiled by Thomson Reuters and combine it with the Morningstar Open End Mutual Funds database. We identify as *mutual funds* all funds that appear in the Morningstar Open End Mutual Funds database over the 1994–2013 time period. We note that our data on Open End Mutual Funds extends beyond the activist campaign data, to allow us to trace mutual fund trades *following* activist exits. For each mutual fund, the Morningstar database contains information about the fund's total assets under management (AUM), its individual stock holdings, and type (e.g., index, fund of funds, socially responsible, etc.). Since our empirical analysis is conducted at the (mutual) fund-family level, we aggregate the Morningstar data at that level. Finally, we name-match and merge the Morningstar fund-family data with the 13F ownership data. This procedure is described in detail in Section C of the Appendix. We eliminate all fund families that are principally indexers as they cannot exit, using a procedure described in Section D of the Appendix. Finally, fund-families present in the 13F data, but not in Morningstar are then conversely classified as *non-mutual funds*.

[Insert Table 3 here]

We merge the pre-matched 13F-Morningstar data with the activist campaign data, add firm level characteristics available from Compustat, and limit our sample to companies with non-missing total assets. The resulting dataset consists of an unbalanced panel of 16,889 firm-quarter observations on 399 unique firms whose campaigns terminated via exit. As shown in Table 3 Panel A, the average number of shares outstanding in our sample is 47 million, and the corresponding average market capitalization stands at $967 million. Institutional holdings represent on average 51.73% of the firm's stock ownership. Mutual funds hold on average 17.71% of a firm's stock, while non-mutual funds hold 21.31%. As for the company characteristics, the average firm size in terms of total assets in our sample is $1.4 billion, with an average leverage ratio of 22%, and average market-to-book ratio of 1.97. While the average firm size is smaller than the full investment universe, the distributions of the institutional, mututal fund and non-mutual fund holdings variables are broadly in line with the existing studies on institutional ownership (e.g., Gantchev, Gredil, and Jotikasthira (2019)).

In Panel B of Table 3, we list the top three largest mutual fund managers in our sample in terms of the average holdings size, Fidelity comes up top; similarly, we list the top three largest *non-mutual fund* managers, where Barclays Bank Plc is top. We also include their classification as an indexer (1) or not (0). Out of these top institutions only Vanguard Group is classified as an indexer and so is excluded from our ensuing analysis.

6.2 Empirical Methodology and Results

To test EP1, we first examine whether mutual funds sell more than other institutions across our full sample of exits using the following differences-in-differences (DiD) specification:

$$\begin{aligned}\frac{Holdings_{i,t}}{SharesOut_{i,t}} &= \alpha + \beta_1 PostActivism_{i,t} \times MutualFund_{i,t} + \beta_2 PostActivism_{i,t} \\ &+ \beta_3 MutualFund_{i,t} + \gamma_i + \delta_t + \varepsilon_{i,t}. \end{aligned} \tag{1}$$

The variable $Holdings_{i,t}$ represents the holdings of institutions in firm i at quarter t. We normalize such holdings by the total number of shares outstanding in firm i at quarter t, $SharesOut_{i,t}$. $Holdings_{i,t}$ refers to mutual fund holdings if $MutualFund_{i,t} = 1$ and to non-mutual fund holdings if $MutualFund_{i,t} = 0$. The variable $PostActivism_{i,t}$ is equal to 1 if the *termination date* in firm i is in quarter t or earlier, and zero otherwise. We conduct our analysis in windows of six and four quarters around the termination date. This is to (i) have similar amounts of data across all campaigns and (ii) capture the short-term trading behavior of funds in the spirit of our model. The coefficient of interest is β_1, which should be negative according to EP1. This and all estimations below include firm and quarter fixed effects and heteroscedasticity-adjusted standard errors.

Our results are shown in Table 4.[11] Column 1 shows results of estimating specification (1)

[11] When we run our regressions we split each firm-quarter observation into two: one for MF and the other for non-MF holdings. The two observations are identical but for the *MutualFund* dummy (1 in the former, 0 in the latter) and corresponding *Holdings* variables. For some firm-quarters we do not have holdings for one category of institution, resulting to 32,957 (16,068 firm-quarters for which we have both, i.e., $2\times16{,}068 =$

in ± 6 quarters, while column 2 restricts attention to ± 4 quarters; and columns 3–4 are the respective specifications with controls $Controls_{i,t}$. Consistent with EP1, our baseline results show that the estimated β_1 is negative and significant across all columns, suggesting that following an activist's exit, mutual funds sell more relative to non-mutual funds.

[Insert Table 4 here]

Our baseline analysis included all exits. However, our model speaks specifically to exits which have governance impact by affecting prices, i.e., before all information becomes public. Such exits occur either when the manager chooses the value destroying action or when the fund experiences a liquidity event. In reality, funds may also sell in the open market (i.e., "exit" in an empirical sense) to take profits after the public success of an activist campaign. Such exits have no governance role and—following such exits—there is no reason for mutual funds (or anyone else) to be influenced by the activist's sale. To examine whether the findings in Table 4 are driven by the phenomena we model, we empirically identify exits relevant to our model in two different ways.

First, using a market-based approach, we re-estimate specification (1) while splitting our sample into (a) exits *at a loss*, i.e., if the end-of-month stock price was lower at termination than at entry ($EaL_i = 1$) and (b) all other exits ($EaL_i = 0$). An exit at a loss is unlikely to be the result of profit-taking after a successful campaign. As per Panel C of Table 3, exits at a loss represent nearly 29% of all exits. The results of this analysis are shown in Table 5. We find that the estimated value of β_1 is negative and significant—and much larger than those in Table 4—only in the case of exits at a loss (columns 1-4), but insignificant for exits *not* at a loss (columns 5-8).

[Insert Table 5 here]

Second, using the empirical classification provided by BJK (discussed above) we re-estimate specification (1) while splitting our sample into exits that they classify as *visible* successes and all other exits. The complement of the set of visibly successful exits likely represents exits in which the outcome is not publicly known when the activist sells. For convenience,

32,136 plus 821 firm-quarters for which we have only one).

we refer to this complement as the set of "unsuccessful" exits, though clearly the label is not literal and thus we put it within quotes. We construct a dummy variable called UnS ("unsuccessful"), which is equal to 0 if—according to the BJK dataset—(i) the outcome of the campaign was a success, (ii) the campaign had declared specific goals, and (iii) the date of the outcome announcement is before the termination date. As per Panel C of Table 3, "unsuccessful" exits represent nearly 92% of all exits. The results of this analysis are reported in Table 6. The estimated value of β_1 is negative and significant only for the subsample with $UnS = 1$ (columns 1-4), whereas when $UnS = 0$ (columns 5-8) it is insignificant.

[Insert Table 6 here]

Clearly, neither the market-based nor the empirical BJK classification are perfect methods for identifying the exits relevant to our theoretical framework. However, the fact that both classifications deliver results that are qualitatively consistent with each other offers reassurance that the forces in our model are indeed at play in the data.

We now examine EP2 by estimating the following difference-in-difference-in-difference (DiDiD) specification:

$$\begin{aligned}\frac{Holdings_{i,j,t}}{SharesOut_{i,t}} &= \alpha + \beta_1 PostActivism_{i,t} \times MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+T} + \\ &+ \beta_2 PostActivism_{i,t} \times PriceImpact_{i,t_i,t_i+T} + \beta_3 MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+T} \\ &+ \beta_4 PostActivism_{i,t} \times MutualFund_{i,t} + \beta_5 PostActivism_{i,t} + \beta_6 MutualFund_{i,t} \\ &+ \beta_7 PriceImpact_{i,t_i,t_i+T} + \gamma_i + \delta_t + \varepsilon_{i,t}, \qquad (2)\end{aligned}$$

where

$$PriceImpact_{i,t_i,t_i+T} \equiv 1 - \frac{\text{Price}(t_i + T)}{\text{Price}(t_i)},$$

and t_i is the termination date in firm i and $T > 0$ in days. $PriceImpact_{i,t_i,t_i+T}$ captures the magnitude of the price reaction to the exit of the activist as measured by the net return between the termination date t_i and T days afterwards (i.e., an event window analysis).

The coefficient of interest is β_1, which should be negative according to EP2. Table 7 reports the results for estimating (2), where in Panel A and B we consider $T = 1$ and $T = 3$, respectively. All specifications include the same set of control variables, fixed effects structure, and standard errors treatment as before.[12] The estimated coefficient β_1 is negative and significant across all columns, suggesting that a larger share price drop following an activist's exit exacerbates the degree to which mutual funds sell relative to non-mutual funds.

[Insert Table 7 here]

Not surprisingly, we find that the results from estimating specification 2 over exits at a loss or "unsuccessful" exits are stronger. These results are in the Online Appendix, Table OA.1.

7 Conclusion

Most public corporations today have multiple small blockholders. In such firms governance via exit is affected by how blockholders react to each others' exit. Institutional investors, who hold the majority of such equity blocks, are heterogeneous in their incentives. In this paper, we examine how such incentives affect the manner in which institutional blockholders react to each others' exit and thus, in turn, the effectiveness of the governance via exit. Our model shows that flow motivated institutional investors (e.g., mutual funds) will be sensitive to an informed blockholder's exit, giving rise to correlated exits and strengthening governance.

Our empirical analysis of activist hedge fund campaigns supports the model's predictions on how blockholders react to each others' exits: following activist exits, mutual funds sell more aggressively than other institutional investors. Our model delivers further results that may be amenable to empirical examination. First, our analysis in Section 4 generates firm-level governance rankings which rely on the information quality of value motivated blockholders. Second, our findings in Section 5.1 suggest that the composition of blockholders affects the preferences of activist hedge funds in building stakes and engaging target firms: when value motivated blockholders predominate, the activist faces a trade-off between exit and voice which is absent with flow motivated blockholders. Finally, our analysis in Section 5.3 suggests that flow motivated blockholders are a net positive for governance via exit in settings

[12] We do not have an estimate for β_7 because $PriceImpact_{i,t_i,t_i+T}$ is collinear with the firm fixed effects γ_i.

where the adverse consequences of poor managerial choices are revealed quickly and where the secondary market for the firm's shares is relatively illiquid. These further predictions represent new areas for future empirical work.

References

Admati, A. R., and P. Pfleiderer, 2009, "The "Wall Street Walk" and Shareholder Activism: Exit as a Form of Voice," *Review of Financial Studies*, 22, 2645–2685.

Altı, A., R. Kaniel, and U. Yoeli, 2012, "Why Do Institutional Investors Chase Return Trends?," *Journal of Financial Intermediation*, 21, 694–721.

Becht, M., et al., 2017, "Returns to Hedge Fund Activism: An International Study," *Review of Financial Studies*, 30, 2933–2971.

Bharath, S. T., S. Jayaraman, and V. Nagar, 2013, "Exit as Governance: An Empirical Analysis," *Journal of Finance*, 68, 2515–2547.

Brav, A., W. Jiang, and H. Kim, 2010, "Hedge Fund Activism: A Review," *Foundations and Trends in Finance*, 4, 185–246.

Brav, A., W. Jiang, T. Li, and J. Pinnington, 2021, "Picking Friends Before Picking (Proxy) Fights: How Mutual Fund Voting Shapes Proxy Contests," *Columbia Business School Research Paper*.

Brav, A., W. Jiang, F. Partnoy, and R. Thomas, 2008, "Hedge Fund Activism, Corporate Governance, and Firm Performance," *Journal of Finance*, 63, 1729–1775.

Brown, K. C., W. V. Harlow, and L. T. Starks, 1996, "Of Tournaments and Temptations: An Analysis of Managerial Incentives in the Mutual Fund Industry," *Journal of Finance*, 51, 85–110.

Bushee, B. J., 2001, "Do Institutional Investors Prefer Near-Term Earnings Over Long-Run Value?," *Contemporary Accounting Research*, 18, 207–246.

Bushee, B. J., and C. F. Noe, 2000, "Corporate Disclosure Practices, Institutional Investors, and Stock Return Volatility," *Journal of Accounting Research*, 38, 171–202.

Chevalier, J., and G. Ellison, 1997, "Risk Taking by Mutual Funds as a Response to Incentives," *Journal of Political Economy*, 105, 1167–1200.

Dasgupta, A., V. Fos, and Z. Sautner, 2021, "Institutional Investors and Corporate Governance," *Foundations and Trends in Finance*, 12:4.

Dasgupta, A., and G. Piacentino, 2015, "The Wall Street Walk When Blockholders Compete for Flows," *Journal of Finance*, 70, 2853–2896.

Edmans, A., 2009, "Blockholder Trading, Market Efficiency, and Managerial Myopia," *Journal of Finance*, 64, 2481–2513.

Edmans, A., and C. G. Holderness, 2017, "Blockholders: A Survey of Theory and Evidence," *Handbook of the Economics of Corporate Governance*, 1, 541–636.

Edmans, A., and G. Manso, 2011, "Governance Through Trading and Intervention: A Theory of Multiple Blockholders," *Review of Financial Studies*, 24, 2395–2428.

Elton, E. J., M. J. Gruber, and C. R. Blake, 2003, "Incentive Fees and Mutual Funds," *Journal of Finance*, 58, 779–804.

Gantchev, N., O. Gredil, and C. Jotikasthira, 2019, "Governance Under the Gun: Spillover Effects of Hedge Fund Activism," *Review of Finance*, 23, 1031–1068.

Giannetti, M., and X. Yu, 2020, "Adapting to Radical Change: The Benefits of Short-Horizon Investors," *forthcoming at Management Science*.

Hirschman, A. O., 1970, *Exit, Voice, and Loyalty*, Harvard University Press.

Iliev, P., and M. Lowry, 2015, "Are Mutual Funds Active Voters?," *The Review of Financial Studies*, 28, 446–485.

Kedia, S., L. T. Starks, and X. Wang, 2021, "Institutional Investors and Hedge Fund Activism," *Review of Corporate Finance Studies*, 10, 1–43.

Khanna, N., and R. D. Mathews, 2011, "Can Herding Improve Investment Decisions?," *RAND Journal of Economics*, 42, 150–174.

Khanna, N., and R. Sonti, 2004, "Value Creating Stock Manipulation: Feedback Effect of Stock Prices on Firm Value," *Journal of Financial Markets*, 7, 237–270.

Khorana, A., H. Servaes, and L. Wedge, 2007, "Portfolio Manager Ownership and Fund Performance," *Journal of Financial Economics*, 85, 179–204.

Levit, D., 2019, "Soft Shareholder Activism," *Review of Financial Studies*, 32, 2775–2808.

Lim, J., B. A. Sensoy, and M. S. Weisbach, 2016, "Indirect Incentives of Hedge Fund Managers," *Journal of Finance*, 71, 871–918.

McCahery, J. A., Z. Sautner, and L. T. Starks, 2016, "Behind the Scenes: The Corporate Governance Preferences of Institutional Investors," *Journal of Finance*, 71, 2905–2932.

Scharfstein, D. S., and J. C. Stein, 1990, "Herd Behavior and Investment," *American Economic Review*, 80, 465–479.

Shleifer, A., and R. W. Vishny, 1997, "The Limits of Arbitrage," *Journal of Finance*, 52, 35–55.

Song, F., 2017, "Blockholder Short-Term Incentives, Structures, and Governance," *European Corporate Governance Institute (ECGI) – Finance Working Paper No. 513/2017. Available at SSRN:* https://ssrn.com/abstract=2516643.

Appendix

A. Proofs

Proof of Lemma 1: We observe that:

$$\begin{aligned} P_t &\equiv \mathbb{E}\left[v \mid h_t\right] - \lambda\alpha_t \mathrm{Var}\left[v \mid h_t\right] \\ &= \Delta v q_t - \lambda\alpha_t \Delta v^2 q_t(1-q_t) + \underline{v}. \end{aligned}$$

i) We have

$$P_t \geq \underline{v} \iff \Delta v q_t - \lambda\alpha_t \Delta v^2 q_t(1-q_t) \geq 0,$$

First note that the existence of liquidity shocks guarantees that $q_t > 0$ for all h_t. If $\alpha_t = 0$ the inequality above holds immediately. If $\alpha_t > 0$ but $q_t = 1$, again the inequality holds immediately. For $\alpha_t > 0$ and $q_t \in (0,1)$, $P_t \geq \underline{v}$ is equivalent to

$$\lambda < \frac{1}{\alpha_t}\frac{1}{\Delta v}\frac{1}{1-q_t}. \tag{3}$$

Since $\alpha_t \leq \alpha_1 + \alpha_2 < 1$ and $q_t \in (0,1)$, the above inequality is guaranteed by $\lambda < \frac{1}{\Delta v}$.

ii) To see this take the q_t derivative of P_t:

$$\frac{\partial P_t}{\partial q_t} = \Delta v \left(1 - \lambda\alpha_t \Delta v(1-2q_t)\right).$$

For $q_t \geq \frac{1}{2}$ it is immediate that $\frac{\partial P_t}{\partial q_t} > 0$. For $q_t \in \left(0, \frac{1}{2}\right)$, $\frac{\partial P_t}{\partial q_t} > 0$ is equivalent to

$$\lambda < \frac{1}{\alpha_t}\frac{1}{\Delta v}\frac{1}{1-2q_t}.$$

Again, since $\alpha_t \leq \alpha_1 + \alpha_2 < 1$ and $2q_t \in (0,1)$, the above inequality is guaranteed by $\lambda < \frac{1}{\Delta v}$.

iii) Since

$$\frac{\partial P_t}{\partial \hat{\beta}} = \frac{\partial q_t}{\partial \hat{\beta}} \Delta v \left(1 - \lambda\alpha_t \Delta v(1-2q_t)\right),$$

$\frac{\partial P_t}{\partial \hat{\beta}} > 0$ follows from the observations in the proof of statement (ii) above and the fact that, by hypothesis, $\frac{\partial q_t}{\partial \hat{\beta}} > 0$. ■

Proof of Proposition 1:

Prices at $t = 1$: There are two possible histories r and e. If $a_1 = r$, then since IB observes a_M the $t = 1$ price will be $P_1(r) = \overline{v}$. If $a_1 = e$, inferences are imperfect due the existence of the liquidity shock. Denote $M's$ strategy by the threshold $\hat{\beta} \in \left\{\beta^u_{VM}, \beta^{\sigma_2}_{VM}\right\}$. Further, making the dependence of q_t on the manager's strategy explicit, and defining $\overline{F} \equiv 1 - F$, if $a_1 = e$ we have:

$$q_1(e;\hat{\beta}) = \frac{\delta_1 F(\hat{\beta})}{\delta_1 F(\hat{\beta}) + \overline{F}(\hat{\beta})}.$$

Thus, if $a_1 = e$, the price in $t = 1$ is

$$P_1(e;\hat{\beta}) \quad \equiv \quad \Delta v q_1(e;\hat{\beta}) + \underline{v} - \lambda\alpha_1\Delta v^2 q_1(e;\hat{\beta})(1 - q_1(e;\hat{\beta})). \tag{4}$$

Claim 1. $P_1(e;\hat{\beta})$ is increasing in $\hat{\beta}$.

Proof of Claim 1: Since F is increasing and $\overline{F}$ is decreasing, $q_1(\hat{\beta})$ is increasing in $\hat{\beta}$. The claim now follows from Lemma 1, part (iii). ■

IB's strategy: If IB observes $s_1 = \overline{v}$, retaining pays $\alpha_1\overline{v}$, whereas selling pays $\alpha_1 P_1(a_1 = e) < \alpha_1\overline{v}$. Thus, she holds. If IB observes $s_1 = \underline{v}$ then retaining pays $\alpha_1\underline{v}$, while selling pays $\alpha_1 P_1(a_1 = e) > \alpha_1\underline{v}$ (by Lemma 1, part i). Thus, she sells.

Prices at $t = 2$ for $\sigma_2 > \overline{\sigma}$: There are four possible histories: $(r, r), (r, e), (e, r), (e, e)$. Since IB observes a_M, we have $P_2\left(r, r; \beta^{\sigma_2}_{VM}\right) = P_2\left(r, e; \beta^{\sigma_2}_{VM}\right) = \overline{v}$. For the history (e, r), reusing the same notation as above:

$$q_2(e, r; \beta^{\sigma_2}_{VM}) \equiv \mathbb{P}[a_M = \overline{v} \mid a_1 = e, a_2 = r] = \frac{\delta_1\widehat{\delta}_{2,h}F(\beta^{\sigma_2}_{VM})}{\delta_1\widehat{\delta}_{2,h}F(\beta^{\sigma_2}_{VM}) + \widehat{\delta}_{2,l}\overline{F}(\beta^{\sigma_2}_{VM})},$$

where $\widehat{\delta}_{2,h} \equiv \mathbb{P}[a_2 = r | a_M = \overline{v}] = (1 - \delta_2)\sigma_2$ and $\widehat{\delta}_{2,l} \equiv \mathbb{P}[a_2 = r | a_M = \underline{v}] = (1 - \delta_2)(1 - \sigma_2)$. So

$$P_2(e, r; \beta^{\sigma_2}_{VM}) \quad \equiv \quad \Delta v q_2(e, e; \beta^{\sigma_2}_{VM}) + \underline{v} - \lambda\alpha_1\Delta v^2 q_2(e, e; \beta^{\sigma_2}_{VM})(1 - q_2(e, e; \beta^{\sigma_2}_{VM})). \tag{5}$$

For the history of (e, e), reusing the same notation as above:

$$q_2(e,e;\beta^{\sigma_2}_{VM}) \equiv \mathbb{P}[a_M = \overline{v} \mid a_1 = e, a_2 = e] = \frac{\delta_1\delta_{2,h}F(\beta^{\sigma_2}_{VM})}{\delta_1\delta_{2,h}F(\beta^{\sigma_2}_{VM}) + \delta_{2,l}\overline{F}(\beta^{\sigma_2}_{VM})},$$

where $\delta_{2,h} \equiv \mathbb{P}[a_2 = e|a_M = \overline{v}] = \delta_2\sigma_2 + (1-\sigma_2)$ and $\delta_{2,l} \equiv \mathbb{P}[a_2 = e|a_M = \underline{v}] = \delta_2(1-\sigma_2)+\sigma_2$. So

$$P_2(e,e;\beta^{\sigma_2}_{VM}) \equiv \Delta v q_2(e,e;\beta^{\sigma_2}_{VM}) + \underline{v} - \lambda(\alpha_1+\alpha_2)\Delta v^2 q_2(e,e;\beta^{\sigma_2}_{VM})(1-q_2(e,e;\beta^{\sigma_2}_{VM})). \tag{6}$$

Claim 2. $P_2(e,r;\beta^{\sigma_2}_{VM})$ and $P_2(e,e;\beta^{\sigma_2}_{VM})$ are increasing in $\beta^{\sigma_2}_{VM}$.

Proof of Claim 2: Again, this follows immediately from the fact that $q_2(e,r;\beta^{\sigma_2}_{VM})$ and $q_2(e,e;\beta^{\sigma_2}_{VM})$ are increasing in $\beta^{\sigma_2}_{VM}$ and Lemma 1, part (iii). ■

Prices at $t = 2$ for $\sigma_2 < \underline{\sigma}$: There are four possible histories: $(r,r),(r,e),(e,r),(e,e)$. As before $P_2(r,r;\beta^u_{VM}) = P_1(r,e;\beta^u_{VM}) = \overline{v}$. Since 2B retains regardless of s_2, retention is uninformative so that $P_2(e,r;\beta^u_{VM}) = P_1(e;\beta^u_{VM})$, any exit by 2B must be due to a liquidity shock and hence also uninformative, and thus:

$$P_2(e,e;\beta^u_{VM}) = \Delta v q_1(e;\beta^u_{VM}) + \underline{v} - \lambda(\alpha_1+\alpha_2)\Delta v^2 q_1(e;\beta^u_{VM})(1-q_1(e;\beta^u_{VM})). \tag{7}$$

By Claim 1, $P_1(e;\beta^u_{VM}), P_2(e,r;\beta^u_{VM}), P_2(e,e;\beta^u_{VM})$ are increasing in β^u_{VM}.

2B's strategy: Suppose that 2B faces prices:

$$P_2\left(r,r;\beta^{\sigma_2}_{VM}\right), P_2\left(r,e;\beta^{\sigma_2}_{VM}\right), P_2(e,r;\beta^{\sigma_2}_{VM}), P_2(e,e;\beta^{\sigma_2}_{VM}).$$

If $a_1 = r$, 2B knows that $v = \overline{v}$ and $P_2\left(r,r;\beta^{\sigma_2}_{VM}\right) = P_2\left(r,e;\beta^{\sigma_2}_{VM}\right) = \overline{v}$, and thus will be indifferent between retaining and exiting. Consider now what happens if $a_1 = e$. First, consider 2B with $s_2 = \overline{v}$. The payoff from retaining is $\mathbb{E}[v \mid a_1 = e, s_2 = \overline{v}]$, while the payoff from exiting is $P_2(e,e;\beta^{\sigma_2}_{VM})$. We have that

$$P_2(e,e;\beta^{\sigma_2}_{VM}) < \mathbb{E}[v \mid a_1 = e, a_2 = e] \le \mathbb{E}[v \mid a_1 = e, s_2 = \overline{v}].$$

The first inequality follows from the existence of the risk premium term for $\lambda > 0$, while the second from the fact that a high signal s_2 weakly increases the expectation relative to the information inferred from the fund exiting. Hence, 2B will choose r if $s_2 = \overline{v}$.

Second, consider 2B with $s_2 = \underline{v}$. The payoff from retaining is $\mathbb{E}[v \,|\, a_1 = e, s_2 = \underline{v}]$, while the payoff from exiting is $P_2(e, e; \beta_{VM}^{\sigma_2})$. By Lemma 1, part (i) $P_2(e, e; \beta_{VM}^{\sigma_2}) > \underline{v}$ whereas for $\sigma_2 \to 1$ we have $\mathbb{E}[v \,|\, a_1 = e, s_2 = \underline{v}] \to \underline{v}$. Hence, there exists $\sigma_h < 1$ such that for all $\sigma_2 > \sigma_h$ the payoff from exiting is higher than that from retaining.

Suppose that 2B faces prices:

$$P_2\left(r, r; \beta_{VM}^{u}\right), P_2\left(r, e; \beta_{VM}^{u}\right), P_2(e, r; \beta_{VM}^{u}), P_2(e, e; \beta_{VM}^{u}).$$

If $a_1 = r$, 2B knows that $v = \overline{v}$ and $P_2\left(r, r; \beta_{VM}^{u}\right) = P_2\left(r, e; \beta_{VM}^{u}\right) = \overline{v}$, and thus will be indifferent between retaining and exiting. Consider now what happens if $a_1 = e$. First, consider 2B with $s_2 = \overline{v}$. The payoff from retaining is $\mathbb{E}[v \,|\, a_1 = e, s_2 = \overline{v}]$, while the payoff from exiting is: $P_2(e, e; \beta_{VM}^{u})$. Since

$$P_2(e, e; \beta_{VM}^{u}) < \mathbb{E}[v \,|\, a_1 = e, a_2 = e] \leq \mathbb{E}[v \,|\, a_1 = e, s_2 = \overline{v}],$$

2B will choose r.

Second, consider 2B with $s_2 = \underline{v}$. The payoff from retaining is $\mathbb{E}[v \,|\, a_1 = e, s_2 = \underline{v}]$, while the payoff from exiting is $P_2(e, e; \beta_{VM}^{u})$. Note that for $\sigma_2 \to 1/2$ we have that $\mathbb{E}[v \,|\, a_1 = e, s_2 = \underline{v}] \to \mathbb{E}[v \,|\, a_1 = e] > P_2(e, e; \beta_{VM}^{u})$. The limit follows from the fact that for $\sigma_2 = 1/2$ 2B's signal is uninformative, while the inequality follows from existence of the risk premium term for $\lambda > 0$. Hence, there exists $\underline{\sigma} > 1/2$ such that for all $\sigma_2 < \underline{\sigma}$ the payoff from retaining is higher than that from exiting.

M's strategy: Suppose that IB chooses $a_1 = e$ if and only if $a_M = \underline{v}$ while 2B chooses $a_2 = e$ if and only if $s_2 = \underline{v}$. We guess and verify that M chooses $a_M = \overline{v}$ if and only if $\beta \leq \beta^*$, for some $\beta^* \in \left(\underline{\beta}, \overline{\beta}\right)$. Then, $P_1\left(e; \beta^*\right)$ is given by (4) replacing $\hat{\beta}$ by β^*, $P_2(e, r; \beta^*)$ is given by (5) replacing $\beta_{VM}^{\sigma_2}$by β^*, and $P_2(e, e; \beta^*)$ is given by (6) replacing $\beta_{VM}^{\sigma_2}$ by β^*, while $P_1\left(r; \beta^*\right) = P_2\left(r, r; \beta^*\right) = P_2\left(r, e; \beta^*\right) = \overline{v}$. It also follows that, by Claims 1 and 2,

$P_1(e;\beta^*)$, $P_2(e,r;\beta^*)$ and $P_2(e,r;\beta^*)$ are increasing in β^*.

Suppose M chooses $a_M = \overline{v}$. M's payoff is then

$$\begin{aligned} & (1-\delta_1)\,(\omega_1+\omega_2)\overline{v} + \delta_1\omega_1 P_1(e;\beta^*) \\ + \quad & \delta_1\omega_2\left((1-\delta_2)\sigma_2 P_2(e,r;\beta^*) + (1-\delta_2)\,(1-\sigma_2)\,P_2(e,e;\beta^*) + \delta_2 P_2(e,e;\beta^*)\right)) + \omega_3\overline{v}. \end{aligned}$$

If instead that M chooses $a_M = \underline{v}$, the payoff is

$$\omega_1 P_1(e;\beta^*) + \omega_2\left((1-\delta_2)\sigma_2 P_2(e,e;\beta^*) + (1-\delta_2)\,(1-\sigma_2)\,P_2(e,r;\beta^*) + \delta_2 P_2(e,e;\beta^*)\right) + \omega_3\underline{v} + \beta.$$

Thus, M will choose $a_M = \underline{v}$ if and only if

$$\begin{aligned} \beta \geq RHS^{\sigma_2}_{VM}(\beta^*) \quad & \equiv \quad \omega_3\Delta v + (1-\delta_1)\,(\omega_1+\omega_2)\overline{v} - (1-\delta_1)\,\omega_1 P_1(e;\beta^*) \\ & + \quad P_2(e,r;\beta^*)\omega_2\left(\delta_1(1-\delta_2)\sigma_2 - (1-\delta_2)\,(1-\sigma_2)\right) \\ & + \quad P_2(e,e;\beta^*)\omega_2\left(\delta_1\left((1-\delta_2)\,(1-\sigma_2)+\delta_2\right) - (1-\delta_2)\sigma_2 - \delta_2\right). \quad (8) \end{aligned}$$

M's policy β^* is defined via the fixed point equation $\beta^* = RHS^{\sigma_2}_{VM}(\beta^*)$. At $\beta^* = 0$ all prices are $\underline{v}$ so that:

$$RHS^{\sigma_2}_{VM}(0) = \left[(\omega_1+\omega_2)(1-\delta_1)+\omega_3\right]\Delta v > 0,$$

while as $\beta^* \to \infty$ all prices converge to $\overline{v}$, so that

$$RHS^{\sigma_2}_{VM}(+\infty) = \omega_3\Delta v < \infty.$$

Hence, a fixed point exists. Since the left hand side of the fixed point equation is increasing, to show uniqueness suffices to show that $RHS^{\sigma_2}_{VM}(\beta^*)$ is decreasing. In order to do this, we make the following observations.

1. $P_1(e;\beta^*), P_2(e,r;\beta^*), P_2(e,e;\beta^*)$ are each increasing in β^*.

2. In the expression for $RHS^{\sigma_2}_{VM}(\beta^*)$ (see 8), the coefficient on $P_1(e;\beta^*)$ is clearly negative.

3. Note that:

$$\frac{\partial P_2(e,r;\beta^*)}{\partial \beta^*} = \Delta v \frac{\partial q_2(e,r;\beta^*)}{\partial \beta^*} \left[1 - \alpha_1 \lambda \Delta v \left(1 - 2q_2(e,r;\beta^{\sigma_2}_{VM})\right)\right],$$

where

$$\frac{\partial q_2(e,r;\beta^*)}{\partial \beta^*} = \frac{\partial}{\partial \beta^*} \frac{1}{1+\frac{1}{\delta_1}\frac{1-\sigma_2}{\sigma_2}\frac{\overline{F}(\beta^*)}{F(\beta^*)}} = -\frac{\frac{1}{\delta_1}\frac{1-\sigma_2}{\sigma_2}\frac{\partial}{\partial \beta^*}\frac{\overline{F}(\beta^*)}{F(\beta^*)}}{\left[1+\frac{1}{\delta_1}\frac{1-\sigma_2}{\sigma_2}\frac{\overline{F}(\beta^*)}{F(\beta^*)}\right]^2}.$$

Since $\lim_{\sigma_2 \to 1} \frac{\partial q_2(e,r;\beta^*)}{\partial \beta^*} = 0$, we have that $\lim_{\sigma_2 \to 1} \frac{\partial P_2(e,r;\beta^*)}{\partial \beta^*} = 0$.

4. It is easy to check that $\lim_{\sigma_2 \to 1} \frac{\partial P_2(e,e;\beta^*)}{\partial \beta^*} > 0$.

5. As $\sigma_2 \to 1$, (i) the coefficient on $P_2(e,e;\beta^*)$ converges to

$$\delta_1(1-\delta_2) + \delta_1\delta_2 - (1-\delta_2) - \delta_2 = \delta_1\delta_2 - 1 < 0.$$

Observations (1)-(5) imply that there exists a $\sigma^* < 1$ such that for $\sigma > \sigma^*$, $RHS(\beta^*)$ is decreasing. Now, set $\overline{\sigma} \equiv \max(\sigma_h, \sigma^*)$ and label the unique fixed point as $\beta^{\sigma_2}_{VM}$.[13]

Suppose that IB chooses $a_1 = e$ if and only if $a_M = \underline{v}$ while 2B chooses $a_2 = r$ for all s_2. We again guess and verify that M chooses $a_M = \overline{v}$ if and only if $\beta \leq \beta^*$, for some $\beta^* \in (\underline{\beta}, \overline{\beta})$. Then, $P_1(e;\beta^*)$ is given by (4) replacing $\hat{\beta}$ by β^*, $P_2(e,r;\beta^*) = P_1(e;\beta^*)$, $P_2(e,e;\beta^*)$ is given by (7) replacing β^u_{VM} by β^*, while $P_1(r;\beta^*) = P_2(r,r;\beta^*) = \overline{v}$. It also follows that, by Claims 1 and 2, $P_1(e;\beta^*), P_2(e,r;\beta^*), P_2(e,e;\beta^*)$ are increasing in β^*.

Suppose M chooses $a_M = \overline{v}$. This gives payoff

$$\omega_1\left((1-\delta_1)\overline{v} + \delta_1 P_1(e;\beta^*)\right) + \omega_2\left((1-\delta_1)\overline{v}\right.$$
$$+ \quad \left.\delta_1\left((1-\delta_2)P_2(e,r;\beta^*) + \delta_2 P_2(e,e;\beta^*)\right)\right) + \omega_3\overline{v}.$$

[13]Recall that σ_h is the minimum σ_2 for which 2B's payoff from exiting is higher than that from retaining.

Suppose instead that M chooses $a_M = \underline{v}$. This gives payoff

$$\omega_1 P_1(a_1 = e) + \omega_2 \left((1-\delta_2)P_2(e,r;\beta^*) + \delta_2 P_2(e,r;\beta^*)\right) + \omega_3 \underline{v} + \beta.$$

Thus, M will choose $a_M = \underline{v}$ if and only if

$$\begin{aligned} \beta \geq RHS^u_{VM}(\beta^*) &\equiv \omega_3 \Delta v + \omega_1 (1-\delta_1)(\overline{v} - P_1(e;\beta^*)) \\ &+ \omega_2 (1-\delta_1)(\overline{v} - ((1-\delta_2)P_2(e,r;\beta^*) + \delta_2 P_2(e,e;\beta^*))) \,. \end{aligned} \tag{9}$$

M's policy β^* is defined via the fixed point equation $\beta^* = RHS^u_{VM}(\beta^*)$. Moreover:

$$RHS^u_{VM}(0) = [(\omega_1+\omega_2)(1-\delta_1)+\omega_3]\,\Delta v > 0 \text{ and } RHS^u_{VM}(+\infty) = \omega_3 \Delta v < \infty,$$

so a fixed point exists. In addition, the left hand side of this equation is clearly increasing, while $RHS^u_{VM}(\beta^*)$ is decreasing because prices $P_1(e;\beta^*)$, $P_2(e,r;\beta^*), P_2(e,e;\beta^*)$ are increasing in β^*. Hence, there exists unique β^* solving the above fixed point equation, which we label β^u_{VM}. ■

Proof of Proposition 2:

Prices at $t=1$ and IB's strategy: These steps of the proof are identical to the case of Proposition 1.

Prices at $t=2$: There are three possible histories: $(r,r),(r,e),(e,e)$. Since IB observes a_M, we have $P_2\left(r,r;\beta^{\delta_1}_{FM}\right) = P_2\left(r,e;\beta^{\delta_1}_{FM}\right) = \overline{v}$. For the history of (e,e), since 2B's choice is uninformative, reusing the same notation as above we have:

$$q_2(e,e;\beta^{\delta_1}_{FM}) = q_1\left(e;\beta^{\delta_1}_{FM}\right) = \frac{\delta_1 F(\beta^{\delta_1}_{FM})}{\delta_1 F(\beta^{\delta_1}_{FM}) + \overline{F}(\beta^{\delta_1}_{FM})}.$$

So

$$P_2(e,e;\beta^{\delta_1}_{FM}) \equiv \Delta v q_1\left(e;\beta^{\delta_1}_{FM}\right) + \underline{v} - \lambda(\alpha_1+\alpha_2)\Delta v^2 q_1\left(e;\beta^{\delta_1}_{FM}\right)(1 - q_1\left(e;\beta^{\delta_1}_{FM}\right)). \tag{10}$$

Clearly, therefore, $P_2(e, e; \beta_{FM}^{\delta_1})$ is increasing in $\beta_{FM}^{\delta_1}$.

2B's strategy: There are two cases.

Case 1: IB exits. If 2B observes $a_1 = e$ and $s_2 = \overline{v}$, the expected payoff from exiting is γ_2, where the average reputational payoff from exiting derives from the fact that the blockholder follows a signal uncontingent strategy in equilibrium, leading to no updating. If 2B retains, this off-equilibrium action conveys that she received signal $s_2 = \overline{v}$ and the expected payoff will be

$$\begin{aligned}\mathbb{E}\left[\mathbb{P}\left[\tau = g \mid v, a_2 = r\right] \mid a_1 = e, s_2 = \overline{v}\right] &= \mathbb{P}\left[\tau = g \mid v = \underline{v}, s_2 = \overline{v}\right] \mathbb{P}\left[v = \underline{v} \mid a_1 = e, s_2 = \overline{v}\right] \\ &\quad + \mathbb{P}\left[\tau = g \mid v = \overline{v}, s_2 = \overline{v}\right] \mathbb{P}\left[v = \overline{v} \mid a_1 = e, s_2 = \overline{v}\right],\end{aligned}$$

where

$$\begin{aligned}\mathbb{P}\left[\tau = g \mid v = \underline{v}, s_2 = \overline{v}\right] &= \frac{\mathbb{P}\left[s_2 = \overline{v} \mid v = \underline{v}, \tau = g\right] \mathbb{P}[\tau = g]}{\mathbb{P}\left[s_2 = \overline{v} \mid v = \underline{v}, \tau = g\right] \mathbb{P}[\tau = g] + \mathbb{P}\left[s_2 = \overline{v} \mid v = \underline{v}, \tau = b\right] \mathbb{P}[\tau = b]}, \\ &= \frac{(1-\sigma_{2,g})\gamma_2}{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)}, \text{ and similarly} \\ \mathbb{P}\left[\tau = g \mid v = \overline{v}, s_2 = \overline{v}\right] &= \frac{\sigma_{2,g}\gamma_2}{\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)}.\end{aligned}$$

Substituting back to the expectation this yields:

$$\begin{aligned}&\mathbb{E}\left[\mathbb{P}\left[\tau = g \mid v, a_2 = r\right] \mid a_1 = e, s_2 = \overline{v}\right] \\ &= \frac{(1-\sigma_{2,g})\gamma_2}{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)} \frac{\left[(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)\right] \overline{F}(\beta)}{\left[(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)\right] \overline{F}(\beta) + \delta_1 \left[\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)\right] F(\beta)} \\ &+ \frac{\sigma_{2,g}\gamma_2}{\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)} \frac{\delta_1 \left[\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)\right] F(\beta)}{\left[(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)\right] \overline{F}(\beta) + \delta_1 \left[\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)\right] F(\beta)} \\ &= \frac{(1-\sigma_{2,g})\gamma_2 \overline{F}(\beta) + \sigma_{2,g}\gamma_2\delta_1 F(\beta)}{\left[(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)\right] \overline{F}(\beta) + \left[\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)\right] \delta_1 F(\beta)}. \qquad (*)\end{aligned}$$

Hence, for exit to be optimal it is necessary that the expression above is lower than the gain under retention, that is

$$
\begin{aligned}
& (*) < \gamma_2 \\
\iff & (1-\sigma_{2,g}\overline{F}(\beta)(1-\gamma_2) + \sigma_{2,g}\delta_1 F(\beta)(1-\gamma_2) < (1-\sigma_{2,b})(1-\gamma_2)\overline{F}(\beta) + \sigma_{2,b}\delta_1 F(\beta)(1-\gamma_2) \\
\iff & \delta_1 F(\beta)(\sigma_{2,g}-\sigma_{2,b}) < \overline{F}(\beta)(\sigma_{2,g}-\sigma_{2,b}) \\
\iff & \delta_1 < \frac{\overline{F}(\beta)}{F(\beta)}.
\end{aligned}
$$

So, we need the liquidity shock δ_1 to be low enough. Given, that $\overline{F}/F$ is decreasing and $\beta < \overline{\beta}$ a sufficient condition to satisfy the above is that $\delta_1 < \overline{F}\left(\overline{\beta}\right)/F\left(\overline{\beta}\right)$. Hence, for δ_1 small enough, when 2B observes $a_1 = e$ and $s_2 = \overline{v}$, she chooses to exit. It is easy to check that if it observes $a_1 = e$ and $s_2 = \underline{v}$ 2B will have an even greater incentive to exit.

Case 2: IB retains. If 2B fund observes $a_1 = r$ then her expected payoff from following the equilibrium strategy is γ_2, which derives from the fact that the fund follows a signal-uncontingent strategy in equilibrium. If 2B instead deviates to exit, her exit is attributed to a liquidity shock, and thus again her payoff is γ_2. Thus, 2B is indifferent, and it is a best response to retain.

M's strategy: Suppose that IB chooses $a_1 = e$ if and only if $a_M = \underline{v}$ while 2B chooses $a_2 = e$ if and only if $a_1 = e$. We guess and verify that M chooses $a_M = \overline{v}$ if and only if $\beta \leq \beta^*$, for some $\beta^* \in \left(\underline{\beta}, \overline{\beta}\right)$. Then, $P_1\left(e;\beta^*\right)$ is given by (4) replacing $\hat{\beta}$ by β^*, $P_2(e,e;\beta^*)$ is given by (10) replacing $\beta^{\delta_1}_{FM}$ by β^*, while $P_1\left(r;\beta^*\right) = P_2\left(r,r;\beta^*\right) = P_2\left(r,e;\beta^*\right) = \overline{v}$. As noted above, $P_1\left(e;\beta^*\right)$ and $P_2(e,e;\beta^*)$ are increasing in β^*.

Suppose M chooses $a_M = \overline{v}$. This gives payoff

$$\omega_1\left(\left(1-\delta_1\right)\overline{v} + \delta_1 P_1(e;\beta^*)\right) + \omega_2\left(\left(1-\delta_1\right)\overline{v} + \delta_1 P_2(e,e;\beta^*)\right) + \omega_3\overline{v}.$$

Suppose instead M chooses $a_M = \underline{v}$. This gives payoff

$$\omega_1 P_1(e;\beta^*) + \omega_2 P_2(e,e;\beta^*) + \omega_3\underline{v} + \beta.$$

Thus, M chooses $a_M = \underline{v}$ if and only if

$$\beta \geq RHS_{FM}(\beta^*) \equiv \omega_3 \Delta v + \omega_1 (1-\delta_1)(\overline{v} - P_1(e;\beta^*)) + \omega_2 (1-\delta_1)(\overline{v} - P_2(e,e;\beta^*)). \quad (11)$$

Thus, M's policy β^* is defined via the fixed point equation $\beta^* = RHS_{FM}(\beta^*)$. Note that

$$RHS_{FM}(0) = [(\omega_1 + \omega_2)(1-\delta_1) + \omega_3] \Delta v > 0 \text{ and } RHS_{FM}(+\infty) = \omega_3 \Delta v < \infty,$$

so a fixed point exists. In addition, the left hand side of this equation is clearly increasing, while $RHS_{FM}(\beta^*)$ is decreasing because prices $P_1(e;\beta^*)$ and $P_2(e,e;\beta^*)$ are increasing in β^*. Hence, there exists unique β^* solving the above fixed point equation, which we label $\beta^{\delta_1}_{FM}$. ■

Proof of Proposition 3. Prices at $t=1$ and IB's strategy: These steps of the proof are identical to the case of Proposition 1.

Prices at $t=2$: These are identical to the case for Proposition 1 with $\sigma_2 > \overline{\sigma}$, so we do not repeat them here.

2B's strategy: There are two cases.

Case 1: IB exits. Consider 2B who observes $s_2 = \overline{v}$. Equilibrium requires that 2B prefers retention to exit. Utilizing prior calculations from the proof of Proposition 2 we can compute the payoffs as follows. If 2B retains, her expected payoff will be

$$\mathbb{E}[\mathbb{P}[\tau = g \mid v, a_2 = r] \mid a_1 = e, s_2 = \overline{v}] = \mathbb{P}[\tau = g \mid v = \underline{v}, s_2 = \overline{v}]\,\mathbb{P}[v = \underline{v} \mid a_1 = e, s_2 = \overline{v}] + \mathbb{P}[\tau = g \mid v = \overline{v}, s_2 = \overline{v}]\,\mathbb{P}[v = \overline{v} \mid a_1 = e, s_2 = \overline{v}],$$

where

$$\mathbb{P}[\tau = g \mid v = \underline{v}, s_2 = \overline{v}] = \frac{\mathbb{P}[s_2 = \overline{v} \mid v = \underline{v}, \tau = g]\,\mathbb{P}[\tau = g]}{\mathbb{P}[s_2 = \overline{v} \mid v = \underline{v}, \tau = g]\,\mathbb{P}[\tau = g] + \mathbb{P}[s_2 = \overline{v} \mid v = \underline{v}, \tau = b]\,\mathbb{P}[\tau = b]},$$
$$= \frac{(1-\sigma_{2,g})\gamma_2}{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)}, \text{ and similarly}$$
$$\mathbb{P}[\tau = g \mid v = \overline{v}, s_2 = \overline{v}] = \frac{\sigma_{2,g}\gamma_2}{\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)}.$$

If 2B exits, her expected payoff will be

$$\mathbb{E}\left[\mathbb{P}\left[\tau = g \mid v, a_2 = e\right] \mid a_1 = e, s_2 = \overline{v}\right] = \mathbb{P}\left[\tau = g \mid v = \underline{v}, s_2 = \underline{v}\right] \mathbb{P}\left[v = \underline{v} \mid a_1 = e, s_2 = \overline{v}\right] + \mathbb{P}\left[\tau = g \mid v = \overline{v}, s_2 = \underline{v}\right] \mathbb{P}\left[v = \overline{v} \mid a_1 = e, s_2 = \overline{v}\right],$$

where

$$\mathbb{P}\left[\tau = g \mid v = \overline{v}, s_2 = \underline{v}\right] = \frac{(1-\sigma_{2,g})\gamma_2}{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)},$$

$$\mathbb{P}\left[\tau = g \mid v = \underline{v}, s_2 = \underline{v}\right] = \frac{\sigma_{2,g}\gamma_2}{\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)}.$$

Thus equilibrium requires that:

$$\begin{aligned}
& \mathbb{P}\left[v = \overline{v} \mid a_1 = e, s_2 = \overline{v}\right] \frac{\sigma_{2,g}\gamma_2}{\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)} \\
+ \quad & \mathbb{P}\left[v = \underline{v} \mid a_1 = e, s_2 = \overline{v}\right] \frac{(1-\sigma_{2,g})\gamma_2}{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)} \\
\geq \quad & \mathbb{P}\left[v = \overline{v} \mid a_1 = e, s_2 = \overline{v}\right] \frac{(1-\sigma_{2,g})\gamma_2}{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)} \\
+ \quad & \mathbb{P}\left[v = \underline{v} \mid a_1 = e, s_2 = \overline{v}\right] \frac{\sigma_{2,g}\gamma_2}{\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)}
\end{aligned}$$

which is equivalent to

$$\begin{aligned}
& \left(\frac{\sigma_{2,g}\gamma_2}{\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)} - \frac{(1-\sigma_{2,g})\gamma_2}{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)}\right) \times \\
\times \quad & \left(\mathbb{P}\left[v = \overline{v} \mid a_1 = e, s_2 = \overline{v}\right] - \mathbb{P}\left[v = \underline{v} \mid a_1 = e, s_2 = \overline{v}\right]\right) \geq 0.
\end{aligned}$$

Since the first term in the product is positive, equilibrium requires that:

$$\mathbb{P}\left[v = \overline{v} \mid a_1 = e, s_2 = \overline{v}\right] \geq \mathbb{P}\left[v = \underline{v} \mid a_1 = e, s_2 = \overline{v}\right],$$

i.e., that:

$$\delta_1 \geq \frac{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)}{\sigma_{2,g}\gamma_2 + \sigma_{2,b}(1-\gamma_2)} \frac{\overline{F}(\beta)}{F(\beta)},$$

for which, given that the first fraction is less than unity and the monotonicity of $\overline{F}(\beta)/F(\beta)$, is guaranteed by $\delta_1 \geq \overline{F}\left(\underline{\beta}\right)/F\left(\underline{\beta}\right)$. The case for 2B with the low signal follows by symmetry. Case 2: IB retains. If 2B fund observes $a_1 = r$ then she knows, regardless of what signal she receives, that $v = \overline{v}$. Her expected payoff from retention is γ_2, whereas the reputational payoff from exiting is

$$\frac{(1-\sigma_{2,g})\gamma_2}{(1-\sigma_{2,g})\gamma_2 + (1-\sigma_{2,b})(1-\gamma_2)} < \gamma_2.$$

M's strategy: The steps here are identical to the case for Proposition 1 with $\sigma_2 > \overline{\sigma}$, so we do not repeat them here. ■

Proof of Proposition 4: First consider the case in which $\delta_1 \in (0, \underline{\delta}_1)$. For such δ_1, we first consider $\sigma_2 > \overline{\sigma}$ and thus compare $\beta_{VM}^{\sigma_2}$ and $\beta_{FM}^{\delta_1}$. Recall from the proof of Proposition 1 that there is a unique fixed point $\beta_{VM}^{\sigma_2}$ satisfying (8) for all $\sigma_2 > \overline{\sigma}$. Consider $\sigma_2 > \overline{\sigma}$. Observe also that as $\sigma_2 \to 1$,

$$RHS_{VM}^{\sigma_2}\left(\beta^*\right) \to RHS_{VM}^{1}\left(\beta^*\right) \equiv \omega_3 \Delta v + \omega_1\left(1-\delta_1\right)\left(\overline{v} - P_1(e;\beta^*)\right) + \omega_2\left(1-\delta_1\delta_2\right)\left(\overline{v} - P_2(e,e;\beta^*)\right)$$

Now, it follows from (11) that for any given threshold β^*

$$RHS_{VM}^{1}\left(\beta^*\right) > RHS_{FM}\left(\beta^*\right).$$

This is substantiated by two observations. First, for all $0 < \delta_1 < 1$ and $0 < \delta_2 < 1$ we have $1 - \delta_1\delta_2 > 1 - \delta_1 > 0$. Second, since there is no information in an exit by 2B in the FM case, while there is some negative information in exit by 2B in the VM case for $\sigma_2 > \overline{\sigma}$, we have that[14]

$$P_2^{VM,\sigma_2}(e,e;\beta^*) < P_2^{FM}(e,e;\beta^*) \Rightarrow \overline{v} - P_2^{VM,\sigma_2}(e,e;\beta^*) > \overline{v} - P_2^{FM}(e,e;\beta^*)$$

[14] Throughout this proof we will use a superscript on P_2 to denote the corresponding case we consider, either $\{VM, \sigma_2\}$, $\{VM, u\}$ or FM; while the arguments as before are the actions of IB and 2B, conditional on M's threshold. For example $P_2^{VM,\sigma_2}(e,e;\beta^*)$ is the $t = 2$ price when 2B is a VM with $\sigma_2 > \overline{\sigma}$, and both IB and 2B exit, given M's threshold β^*.

Thus, continuity of $RHS^{\sigma_2}_{VM}(\beta^*)$ in σ_2 implies that there exists $\sigma^* \in [\overline{\sigma}, 1)$ such that for all $\sigma_2 > \sigma^*$ we have

$$RHS^{\sigma_2}_{VM}(\beta^*) > RHS_{FM}(\beta^*),$$

where $RHS^{\sigma_2}_{VM}(\beta^*)$, $RHS_{FM}(\beta^*)$ are defined in (8), (11), respectively. Hence, since both RHSs are decreasing for all β^* and are ranked as specified above we have that for $\sigma_2 > \sigma^*$, the solutions to the fixed point equations are also ranked $\beta^{\delta_1}_{FM} < \beta^{\sigma_2}_{VM}$.

For $\delta_1 \in (0, \underline{\delta}_1)$, we next consider $\sigma_2 < \underline{\sigma}$ and thus compare β^u_{VM} and $\beta^{\delta_1}_{FM}$. Inspection of (9) and (11) implies that for any β^*

$$RHS^u_{VM}(\beta^*) < RHS_{FM}(\beta^*),$$

where $RHS^u_{VM}(\beta^*)$ is defined in (9). This is substantiated by two observations. First, $P_2^{FM}(e, e; \beta^*) = P_2^{VM,u}(e, e; \beta^*)$ because given their equilibrium behavior there is no information in the exit of 2B either in the FM case or in the VM case with $\sigma_2 < \underline{\sigma}$. Second, $P_2^{FM}(e, e; \beta^*) < P_2^{VM,u}(e, r; \beta^*)$ because although there is no information in 2B's action in either case, the risk premium lowers the price in the FM case purely due to 2B's exit. Taken, together we have

$$P_2^{FM}(e, e; \beta^*) < (1 - \delta_2)P_2^{VM,u}(e, r; \beta^*) + \delta_2 P_2^{VM,u}(e, e; \beta^*) \quad \Rightarrow$$
$$\overline{v} - P_2^{FM}(e, e; \beta^*) > \overline{v} - \Big((1 - \delta_2)P_2^{VM,u}(e, r; \beta^*) + \delta_2 P_2^{VM,u}(e, e; \beta^*)\Big).$$

Hence, since both RHSs are decreasing for all β^* and are ranked as specified above we have that the solutions to the fixed point equations are also ranked as $\beta^{\delta_1}_{FM} > \beta^u_{VM}$.

Next consider the case in which $\delta_1 \in \left(\overline{\delta}_1, 1\right)$. For such δ_1, we again first consider the case in which $\sigma_2 > \overline{\sigma}$ and thus compare $\beta^{\sigma_2}_{VM}$ and $\beta^{\delta_1}_{FM}$. When $\sigma_2 > \overline{\sigma}$, equilibrium behavior is identical across Propositions 1 and 3, and thus prices are also identical. Hence for all $\sigma_2 > \overline{\sigma}$, we have $\beta^{\sigma_2}_{VM} = \beta^{\delta_1}_{FM}$, which is then true also for $\sigma_2 > \sigma^*$ for $\sigma^* \in [\overline{\sigma}, 1)$.

Finally, for $\delta_1 \in \left(\overline{\delta}_1, 1\right)$, consider the case in which $\sigma_2 < \underline{\sigma}$ and compare $\beta^{\delta_1}_{FM}$ and β^u_{VM}. Since the FM 2B's trading strategy for $\delta_1 > \overline{\delta}_1$ is identical to that of a VM 2B's trading strategy for $\sigma_2 > \sigma^*$, $\beta_{FM}^{\delta_1}$ is given by the solution to

$$\begin{aligned}\beta^* = RHS_{VM}^{\sigma_2}(\beta^*) &\equiv \omega_3 \Delta v + (1-\delta_1)(\omega_1+\omega_2)\overline{v} - (1-\delta_1)\,\omega_1 P_1(e;\beta^*) \\ &+ P_2^{VM,\sigma_2}(e,r;\beta^*)\omega_2\left(\delta_1(1-\delta_2)\sigma_2 - (1-\delta_2)(1-\sigma_2)\right) \\ &+ P_2^{VM,\sigma_2}(e,e;\beta^*)\omega_2\left(\delta_1\left((1-\delta_2)(1-\sigma_2)+\delta_2\right) - (1-\delta_2)\sigma_2 - \delta_2\right).\end{aligned}$$

where $P_1(e;\beta^*)$ is given by (4), $P_2^{VM,\sigma_2}(e,r;\beta^*)$ is given by (5), and $P_2^{VM,\sigma_2}(e,e;\beta^*)$ is given by (6), all with the obvious modifications. In turn, β_{VM}^{u} is defined by the solution to

$$\begin{aligned}\beta^* = RHS_{VM}^{u}(\beta^*) &\equiv \omega_3 \Delta v + \omega_1(1-\delta_1)\left(\overline{v} - P_1(e;\beta^*)\right) \\ &+ \omega_2(1-\delta_1)\left(\overline{v} - \left((1-\delta_2)P_2^{VM,u}(e,r;\beta^*) + \delta_2 P_2^{VM,u}(e,e;\beta^*)\right)\right),\end{aligned}$$

where $P_2^{VM,u}(e,r;\beta^*) = P_1(e;\beta^*)$ and $P_2^{VM,u}(e,e;\beta^*)$ is given by (7), with obvious modifications. Now, it follows upon some rearrangement that

$$\begin{aligned}\frac{1}{\omega_2}\left[RHS_{VM}^{\sigma_2}(\beta^*) - RHS_{VM}^{u}(\beta^*)\right] = &\quad P_2^{VM,\sigma_2}(e,r;\beta^*)(1-\delta_2)\left((1+\delta_1)\sigma_2 - 1\right) \\ &- P_2^{VM.\sigma_2}(e,e;\beta^*)\left((1-\delta_2)\left((1+\delta_1)\sigma_2 - \delta_1\right) + \delta_2(1-\delta_1)\right) \\ &+ (1-\delta_1)\left((1-\delta_2)P_2^{VM,u}(e,r;\beta^*) + \delta_2 P_2^{VM,u}(e,e;\beta^*)\right).\end{aligned}$$

The third term is strictly positive; moreover, $P_2^{VM,\sigma_2}(e,r;\beta^*) > P_2^{VM,\sigma_2}(e,e;\beta^*)$ for all δ_1. Now, as $\delta_1 \to 1$, the coefficients on $P_2^{VM,\sigma_2}(e,r;\beta^*)$ and $P_2^{VM,\sigma_2}(e,e;\beta^*)$ both converge to $(1-\delta_2)(2\sigma_2 - 1) > 0$ since $\sigma_2 > 1/2$. Thus, $\lim_{\delta_1 \to 1}\left[RHS_{VM}^{\sigma_2}(\beta^*) - RHS_{VM}^{u}(\beta^*)\right] > 0$, so there exists $\delta_1^* \in \left(\overline{\delta}_1, 1\right)$ such that $\beta_{VM}^{u} < \beta_{FM}^{\delta_1}$ for all $\delta_1 \in (\delta_1^*, 1)$. ■

Proof of Proposition 5: First we note that 2B's information choice makes no difference to the strategies of IB. When 2B chooses her action at $t = 2$, there can be two relevant histories: $a_1 = r$ or $a_1 = e$. Given the history $a_1 = r$, it becomes common knowledge that $v = \overline{v}$, and thus 2B's information is irrelevant. Thus, whether 2B decides, ex ante, to pay to acquire information depends on her payoffs, conditional on her (prior) information decision, following history $a_1 = e$.

Given $a_1 = e$:

If 2B has not paid for information, she is still uninformed and her continuation equilibrium behavior is given by Proposition 1 for $\sigma_2 < \underline{\sigma}$. Since she always chooses $a_2 = r$, her equilibrium payoff is given by $\mathbb{E}[v \,|\, a_1 = e]$.

Suppose instead that she has paid to become perfectly informed. Now she acts according to the equilibrium in Proposition 1 for $\sigma_2 > \overline{\sigma}$. So her expected payoff from becoming informed is:

$$\mathbb{P}(v = \overline{v} \,|\, a_1 = e) \underbrace{\overline{v}}_{\text{if } a_m = \overline{v} \text{ 2B chooses } a_2 = r} + \mathbb{P}(v = \underline{v} \,|\, a_1 = e) \underbrace{P_2(e, e; \beta_{VM}^{\sigma_2=1})}_{\text{if } a_m = \underline{v} \text{ 2B chooses } a_2 = e}$$

By adding and subtracting $\underline{v}$ in the second term we have that 2B's continuation payoff given information acquisition is:

$$\begin{aligned}
& \mathbb{P}(v = \overline{v} \,|\, a_1 = e)\overline{v} + \mathbb{P}(v = \underline{v} \,|\, a_1 = e) \left(\underline{v} + P_2(e, e; \beta_{VM}^{\sigma_2=1}) - \underline{v}\right) \\
= \; & \mathbb{P}(v = \overline{v} \,|\, a_1 = e)\overline{v} + \mathbb{P}(v = \underline{v} \,|\, a_1 = e)\underline{v} + \mathbb{P}(v = \underline{v} \,|\, a_1 = e) \left(P_2(e, e; \beta_{VM}^{\sigma_2=1}) - \underline{v}\right) \\
= \; & \underbrace{\mathbb{E}(v | \, a_1 = e)}_{\text{payoff without information}} + \underbrace{\mathbb{P}(v = \underline{v} \,|\, a_1 = e) \left(P_2(e, e; \beta_{VM}^{\sigma_2=1}) - \underline{v}\right)}_{\text{incremental payoff to paying } c_I}.
\end{aligned}$$

Given $\lambda < 1/\Delta v$, from Assumption 1, we have that $P_2(e, e; \beta_{VM}^{\sigma_2=1}) > \underline{v}$, from Lemma 1 part (i), so the incremental payoff is positive. However, $P_2(e, e; \beta_{VM}^{\sigma_2=1})$ decreases in α_1, and thus 2B's incremental payoff—and thus 2B's willingness to pay for information—is monotonically decreasing in α_1. ■

B. Campaign objectives in BJK

According to BJK, a campaign's objective is *specific* if the informed activist acquired a stake in the target company with a view to influence: a) the management's capital structure decisions (i.e. excess cash, under-leverage, debt restructuring, recapitalization, share repurchase, dividend policy, equity issuance); or b) the company's ownership structure (i.e. through sale of the company or its main assets to a third party, by taking majority control of the company, buy-out of the company, by taking the company private); or c) the company's business strategy (i.e. by addressing the lack of business focus, by conducting business restructuring including spinning off of business segments, with a view to block a pending M&A deal involving the company or wanting to change the terms); or d) the company's corporate governance (i.e. through targeting company's takeover defenses, seeking CEO/chairman replacement, increasing board independence or fair representation, encouraging information disclosure, tackling fraud and executive compensation

C. Matching Morningstar with Thomson Reuters data

In this section we provide a brief overview of how we match the Morningstar fund level data with 13F fund-family data from Thomson Reuters. Morningstar data is available at the fund level for a collection of mutual funds over 1993–2013 time period at monthly frequency. It contains detailed information on individual stock holdings by each fund, as well as their type: index, fund-of-funds or SRI (Socially Responsible Investor). We aggregate monthly fund level data at the annual fund-family level in order to be able to match it to 13F fund-family holdings available from Thomson Reuters.

Since Morningstar data does not provide fund-family identifiers, we employ a manual name matching procedure to match the top 200 fund families from Morningstar (in terms of their average AUM over the sample period) with 13F data. We manually search online each Morningstar fund family name to identify the closest neighbour in 13F fillings. This procedure has a few hurdles, in that fund families' names can change over time (thus, we might have one version of the name in Morningstar and another version of the name in 13F). Based on the information found online we select within the group of potential 13F manager names that could be matched to a fund family in Morningstar, a final match. To identify the final match we take into consideration: (i) whether the value of variable *inv_long* in Morningstar *stat_family* is similar to the market value reported in 13F for the candidate *mgrname*; (ii) the *mgrtype* in 13F (we give priority to matches with *mgrtype=IIA/INV*). Finally, we denote as *mutual funds* all Fund-families from Morningstar that were matched to 13F data and those unmatched are then denoted as *non-mutual funds*.

D. Indexers

The presence of indexers presents a challenge. In contrast to (flow-motivated) mutual funds, and (value-motivated) non-mutual funds, indexers are passive entities designed to track the performance of a broad stock market index, e.g., the S&P 500. Their mechanical trading rules preclude participation in the exit governance mechanism and thus we need to exclude them from our analysis. We classify mutual fund families as *Indexers* if, according to Morningstar, more than 50% of the fund-families' AUM is held by index funds, or if more than 50% of funds within a fund family are classified as indexers. To identify index funds among non-mutual funds in our sample, we use the 13F data and follow Bushee (2001) and Bushee and Noe (2000). We classify a non-mutual fund as an *Indexer* if their index classification (in the two aforementioned papers) is Dedicated, and as a *Non-Indexer* if their classification is Quasi-Indexer or Transient.

E. Main Tables and Figures

Table 2: **Summary Statistics – Activist Campaigns**

This table shows the summary statistics for the hedge fund activist campaigns obtained from BJPT and BJK. The activist sample consists of 2,739 distinct campaigns involving 2,016 unique targets and 175 hedge fund families between 1994 and 2011. Panel A describes the percentage of campaigns that had a specific engagement goal. Panel B shows the respective frequencies of campaign outcomes in cases when the campaign was declared to have specific goals, and in Panel C we report relative frequencies of various exit mechanisms.

Panel A

Campaign goals	#N	%
Without a goal	1,439	52.54%
With a goal	1,065	38.88%
Unspecified/Missing	235	8.58%
Total	2,739	100.00%

Panel B

Campaign outcome	#N	%	Sale in the open market (exit)	% per outcome
Success	463	43.47%	112	31.11%
Fail	155	14.55%	58	16.11%
Settle	218	20.47%	72	20.00%
Ongoing	11	1.03%	1	0.28%
Withdraw	91	8.54%	66	18.33%
No sufficient information	118	11.08%	49	13.61%
Not applicable	2	0.19%	1	0.28%
Unspecified/Missing	7	0.66%	1	0.28%
Total	1,065	100.00%	360	100.00%

Panel C

Type of campaign termination	#N	%
Still holding	824	30.08%
Sale in the open market (exit)	1,074	39.21%
Sold to a third party	128	4.67%
Target taken by a private HF	15	0.55%
Merger with another company	220	8.03%
Liquidated	31	1.13%
Sell back to the target	38	1.39%
Unspecified/Missing	409	14.93%
Total	2739	100.00%

Table 3: **Summary Statistics – Institutional Holdings and Firm Characteristics**

In this table we show the summary characteristics for the final merged firm-quarter sample of all firms which were targets of activist campaigns that terminated with a sale in the open market, i.e., an exit. Panel A shows summary statistics on institutional ownership and firm characteristics. Panel B shows the top-3 mutual funds and top-3 non-mutual funds based on their average market value over 1994–2013, as well as, whether they are categorized as an index fund (1) or not (0). Panel C presents the frequencies of exits and sub-types of exits in the firm-quarter sample. Within the set of exits, Exit at a loss (EaL) is 1 when the activist sold at a loss, meaning that there was a price drop, measured on an end-of-month basis, between the activist's entry and exit dates, and 0 otherwise. Again, within the set of exits, Unsuccessful exit (UnS) is 0 if the outcome of the campaign was a success, a campaign had declared specific goals, and the outcome announcement date is before the exit date, and 1 otherwise.

Panel A

	Mean	Median	Std. dev.	Min	Max	#N
Shares outstanding in MM	46.65	23.00	86.01	1.00	1,103	16,889
Market Capitalisation (MM$)	967.77	240.80	2,447.96	0.14	35,261	16,889
Institutional Shares (%) per Firm	51.73	53.47	28.98	0.00	100	16,889
Non-MF holdings (%) per Firm	21.31	21.12	14.32	0.00	71	16,889
MF holdings (%) per Firm	17.71	16.13	13.33	0.00	67	16,889
Total Assets	1,402.64	326.05	4,036.06	0.34	48,039	16,889
Total Debt/Total Assets	0.22	0.14	0.40	0.00	18	16,889
M/B	1.97	1.38	4.02	0.36	174	16,889
Operating income after depreciation	94.25	15.64	301.77	0.00	5,456	16,889
Cash	78.76	20.32	199.90	0.00	3,991	16,889

Panel B

Mutual Funds			
Rank	Manager	Index Fund	Avg Market Value ($billion)
1	FIDELITY MANAGEMENT & RESEARCH	0	403
2	VANGUARD GROUP	1	331
3	STATE STR CORP	0	328

Non-Mutual Funds			
Rank	Manager	Index Fund	Avg Market Value ($billion)
1	BARCLAYS BANK PLC	0	316
2	CAPITAL WORLD INVESTORS	0	259
3	CAPITAL RESEARCH GBL INVESTORS	0	216

Panel C

Exit at a loss		
$EaL =$	Frequency	Percent
1	4,821	28.55%
0	12,068	71.45%
Total	16,889	100.00%
Unsuccessful exit		
$UnS =$	Frequency	Percent
1	15,538	92.00%
0	1,351	8.00%
Total	16,889	100.00%

Table 4: **DiD of Institutional Holdings: All Exits**

This table shows results of estimating specification (1) and its extension with controls and event-windows as described in Section 6.2. The dependent variable is $Holdings_{i,t}/SharesOutstanding_{i,t}$, which measures the (amount of) holdings of stock i, at time t, held by institutional investors, normalized by the total number of shares outstanding of firm i at time t. The main independent variable is $PostActivism_{i,t} \times MutualFund_{i,t}$, which measures the difference in holdings pre and post the activist's exit for mutual funds vs non-mutual funds. Specifications in columns 1–4 differ in the length of the pre and post period we consider, and whether we include firm×quarter controls, as indicated. All specifications include firm and quarter fixed effects. Standard errors are adjusted for heteroskedasticity, and t-statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	$Holdings_{i,t}/SharesOutstanding_{i,t}$			
	(1)	(2)	(3)	(4)
Window	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters
Firm×Quarter Controls	N	N	Y	Y
$PostActivism_{i,t} \times MutualFund_{i,t}$	-0.907***	-0.696*	-0.937***	-0.733*
	[-2.603]	[-1.761]	[-2.745]	[-1.879]
$PostActivism_{i,t}$	1.179***	0.721	1.299***	0.752*
	[3.050]	[1.617]	[3.392]	[1.694]
$MutualFund_{i,t}$	-2.908***	-3.002***	-2.914***	-2.999***
	[-11.893]	[-10.444]	[-12.191]	[-10.583]
$Leverage_{i,t}$			-12.045***	-11.958***
			[-7.914]	[-6.183]
$M/B_{i,t}$			0.795***	0.622***
			[7.698]	[4.704]
$\log(TotalAssets)_{i,t}$			5.980***	5.536***
			[15.960]	[11.750]
Firm fixed effects	Y	Y	Y	Y
Quarter fixed effects	Y	Y	Y	Y
Observations	8,854	6,335	8,854	6,335
R-squared	0.642	0.673	0.656	0.682

Table 5: **DiD of Institutional Holdings: Exits at a Loss vs Not**

This table shows results of estimating specification (1) conditioning further in the subsample of firm/campaigns i for which $EaL_i = 1$ in columns 1–4 and the subsample $EaL_i = 0$ in columns 5–8. The dependent variable is $Holdings_{i,t}/SharesOutstanding_{i,t}$, which measures the (amount of) holdings of stock i, at time t, held by institutional investors, normalized by the total number of shares outstanding of firm i at time t. The main independent variable is $PostActivism_{i,t} \times MutualFund_{i,t}$, which measures the difference in holdings pre and post the activist's exit for mutual funds vs non-mutual funds. Specifications in columns 1–8 differ in the exits we condition on, the length of the pre and post period we consider, and whether we include firm×quarter controls, as indicated. EaL_i is 1 when the activist sold at a loss, meaning that there was a price drop, measured on an end-of-month basis, between the activist's entry and exit dates, and 0 otherwise. All specifications include firm and quarter fixed effects. Standard errors are adjusted for heteroskedasticity, and t-statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	$Holdings_{i,t}/SharesOutstanding_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	$EAL_i = 1$	$EAL_i = 1$	$EAL_i = 1$	$EAL_i = 1$	$EAL_i = 0$	$EAL_i = 0$	$EAL_i = 0$	$EAL_i = 0$
Window	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters
Firm×Quarter Controls	N	N	Y	Y	N	N	Y	Y
$PostActivism_{i,t} \times MutualFund_{i,t}$	-1.929**	-1.833**	-1.953**	-1.853**	-0.674	-0.432	-0.705	-0.474
	[-2.419]	[-2.003]	[-2.479]	[-2.039]	[-1.011]	[-0.719]	[-1.061]	[-0.790]
$PostActivism_{i,t}$	0.914	0.197	1.090	0.359	1.194**	0.750	1.310***	0.766
	[0.952]	[0.174]	[1.152]	[0.322]	[2.405]	[1.544]	[2.632]	[1.551]
$MutualFund_{i,t}$	-3.127***	-3.313***	-3.126***	-3.309***	-2.859***	-2.937***	-2.868***	-2.933***
	[-5.745]	[-5.047]	[-5.801]	[-5.068]	[-4.395]	[-4.397]	[-4.410]	[-4.392]
$Leverage_{i,t}$			-20.570***	-20.443***			-11.205***	-11.016***
			[-5.237]	[-3.908]			[-4.373]	[-3.605]
$M/B_{i,t}$			1.565***	1.033**			0.703***	0.598***
			[4.291]	[2.176]			[4.755]	[3.492]
$\log(TotalAssets)_{i,t}$			6.370***	4.981***			5.974***	5.647***
			[5.178]	[3.202]			[8.121]	[6.710]
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Quarter fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,695	1,206	1,695	1,206	7,159	5,129	7,159	5,129
R-squared	0.650	0.671	0.659	0.676	0.643	0.676	0.658	0.686

Table 6: **DiD of Institutional Holdings: "Unsuccessful" Exits vs Not**

This table shows results of estimating specification (1) conditioning further in the subsample of firm/campaigns i for which $UnS_i = 1$ in columns 1–4 and the subsample $UnS_i = 0$ in columns 5–8. The dependent variable is $Holdings_{i,t}/SharesOutstanding_{i,t}$, which measures the (amount of) holdings of stock i, at time t, held by institutional investors, normalized by the total number of shares outstanding of firm i at time t. $UnS_i = 0$ if the outcome of the campaign was a success, a campaign had declared specific goals, and date of outcome announcement < date of exit, otherwise $UnS = 1$. The main independent variable is $PostActivism_{i,t} \times MutualFund_{i,t}$, which measures the difference in holdings pre and post the activist's exit for mutual funds vs non-mutual funds. Specifications in columns 1–8 differ in the exits we condition on, the length of the pre and post period we consider, and whether we include firm×quarter controls, as indicated. Recall that UnS_i is 0 if the outcome of the campaign was a success, a campaign had declared specific goals, and the outcome announcement date is before the exit date, and 1 otherwise. All specifications include firm and quarter fixed effects. Standard errors are adjusted for heteroskedasticity, and t-statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

	$Holdings_{i,t}/SharesOutstanding_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	$UnS_i = 1$	$UnS_i = 1$	$UnS_i = 1$	$UnS_i = 1$	$UnS_i = 0$	$UnS_i = 0$	$UnS_i = 0$	$UnS_i = 0$
Window	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters
Firm×Quarter Controls	N	N	Y	Y	N	N	Y	Y
$PostActivism_{i,t} \times MutualFund_{i,t}$	-0.940***	-0.728*	-0.970***	-0.767*	-0.640	-0.254	-0.652	-0.233
	[-2.629]	[-1.801]	[-2.770]	[-1.926]	[-0.450]	[-0.148]	[-0.462]	[-0.136]
$PostActivism_{i,t}$	1.134***	0.712	1.241***	0.722	2.046	0.325	2.137	0.600
	[2.856]	[1.560]	[3.154]	[1.590]	[1.210]	[0.148]	[1.275]	[0.271]
$MutualFund_{i,t}$	-2.622***	-2.729***	-2.630***	-2.726***	-6.099***	-6.188***	-6.096***	-6.213***
	[-10.570]	[-9.390]	[-10.855]	[-9.525]	[-5.585]	[-4.584]	[-5.620]	[-4.594]
$Leverage_{i,t}$			-11.754***	-12.468***			-10.810	-2.769
			[-7.744]	[-6.185]			[-1.646]	[-0.356]
$M/B_{i,t}$			0.805***	0.618***			0.365	0.468
			[7.706]	[4.626]			[0.552]	[0.400]
$\log(TotalAssets)_{i,t}$			5.899***	5.404***			5.080**	5.577*
			[15.452]	[11.236]			[2.330]	[1.664]
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Quarter fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	8,141	5,826	8,141	5,826	713	509	713	509
R-squared	0.649	0.682	0.663	0.691	0.605	0.604	0.609	0.606

Table 7: **DiDiD of Institutional Holdings: All Exits**

This table shows results of estimating specification (2) with controls and event-windows as described in Section 6.2. The dependent variable is $Holdings_{i,t}/SharesOutstanding_{i,t}$, which measures the (amount of) holdings of stock i, at time t, held by institutional investors, normalized by the total number of shares outstanding of firm i at time t. The main independent variable is $PostActivism_{i,t} \times MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+T}$, which measures the effect of the price reaction to the exit of the activist blockholder comparing across both pre vs post the event quarter and mutual vs non-mutual funds. Specifications in columns 1–4 differ in the length of the pre and post period we consider, and whether we include firm×quarter controls, as indicated. $PriceImpact_{i,t_i,t_i+T}$ captures the magnitude of the price reaction to the exit of the activist as measured by the net return between the termination date t_i and T days afterwards. Panel A considers $T = 1$ and Panel B considers $T = 3$. All specifications include firm and quarter fixed effects. Standard errors are adjusted for heteroskedasticity, and t-statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Panel A: $T = 1$

	$Holdings_{i,t}/SharesOutstanding_{i,t}$			
	(1)	(2)	(3)	(4)
Window	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters
Firm×Quarter Controls	N	N	Y	Y
$PostActivism_{i,t} \times MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+1}$	-0.216**	-0.250***	-0.224***	-0.261***
	[-2.446]	[-2.635]	[-2.591]	[-2.763]
$PostActivism_{i,t} \times PriceImpact_{i,t_i,t_i+1}$	0.041	0.067	0.094	0.101
	[0.606]	[0.921]	[1.404]	[1.406]
$MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+1}$	0.070	0.100	0.069	0.102
	[1.103]	[1.479]	[1.121]	[1.511]
$PostActivism_{i,t} \times MutualFund_{i,t}$	-1.228***	-0.893**	-1.253***	-0.926**
	[-3.183]	[-2.054]	[-3.317]	[-2.161]
$PostActivism_{i,t}$	1.398***	0.879*	1.569***	0.944*
	[3.271]	[1.797]	[3.721]	[1.944]
$MutualFund_{i,t}$	-2.872***	-3.037***	-2.877***	-3.032***
	[-10.613]	[-9.516]	[-10.879]	[-9.654]
$Leverage_{i,t}$			-10.694***	-9.990***
			[-5.793]	[-4.073]
$M/B_{i,t}$			0.890***	0.656***
			[7.412]	[4.467]
$\log(TotalAssets)_{i,t}$			6.150***	5.630***
			[14.449]	[10.578]
Firm fixed effects	Y	Y	Y	Y
Quarter fixed effects	Y	Y	Y	Y
Observations	7,246	5,196	7,246	5,196
R-squared	0.647	0.682	0.661	0.690

Panel B: $T = 3$

	$Holdings_{i,t}/SharesOutstanding_{i,t}$			
	(1)	(2)	(3)	(4)
Window	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters
Firm×Quarter Controls	N	N	Y	Y
$PostActivism_{i,t} \times MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+3}$	-0.255***	-0.223***	-0.253***	-0.224***
	[-4.301]	[-3.504]	[-4.336]	[-3.500]
$PostActivism_{i,t} \times PriceImpact_{i,t_i,t_i+3}$	0.141***	0.127**	0.159***	0.144***
	[2.941]	[2.437]	[3.278]	[2.742]
$MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+3}$	0.282***	0.272***	0.281***	0.272***
	[6.631]	[5.658]	[6.712]	[5.652]
$PostActivism_{i,t} \times MutualFund_{i,t}$	-1.320***	-0.944**	-1.340***	-0.971**
	[-3.454]	[-2.187]	[-3.579]	[-2.281]
$PostActivism_{i,t}$	1.473***	0.933*	1.633***	0.996**
	[3.460]	[1.915]	[3.887]	[2.056]
$MutualFund_{i,t}$	-2.689***	-2.886***	-2.694***	-2.882***
	[-10.022]	[-9.124]	[-10.266]	[-9.245]
$Leverage_{i,t}$			-10.716***	-10.065***
			[-5.798]	[-4.120]
$M/B_{i,t}$			0.903***	0.670***
			[7.703]	[4.658]
$\log(TotalAssets)_{i,t}$			6.150***	5.633***
			[14.545]	[10.706]
Firm fixed effects	Y	Y	Y	Y
Quarter fixed effects	Y	Y	Y	Y
Observations	7,246	5,196	7,246	5,196
R-squared	0.649	0.683	0.662	0.691

Online Appendix

OA.1 Discussion of modeling choices

OA.1.1 IB better informed than 2B and moves early

In our model, we specify that IB (i) is better informed than 2B and (ii) makes trading decisions before 2B. We believe this is a reasonable set of modeling choices and that the two features go hand in hand. We have in mind an engaged IB, who is likely to have more precise and more timely information about the manager's choices than other blockholders. Further, when any blockholder has information about the (irreversible) bad choices of firm managers, it is in her private interest to act on it *before* others know—this is the essence of what makes the threat of exit credible.

While we believe that our modeling choice is natural, we should note that our qualitative results are unlikely to change if the precise timings of when IB and 2B acted were relaxed, as long as the quality of IB's information is superior to that of 2B. Imagine a scenario in which the 2B may receive information ahead of IB. Since it is infeasible to prevent 2B from trading *after* IB, we can now consider the possibility that 2B can trade before or after IB. First, as our analysis already indicates, a VM 2B doesn't really care about what the IB does, so the precise timing of her choices relative to IB is not qualitatively relevant. Imagine now a FM 2B, who received positive information about the manager's actions and then chose to hold on to her position. Now, subsequent to this decision, 2B observes (or infers from prices) that the IB has exited. This 2B now is in an identical position to that of the 2B in our model. As long as she attributes sufficient probability that the IB's sale was informationally motivated (i.e., if δ_1 is not large) she will still be inclined to maximize flows by reversing her earlier decision and selling out after IB, despite her own information.

OA.1.2 2B is both VM and FM

In our model, we consider two potential versions of 2B: either fully VM or fully FM. Reality is less black and white. For example, a minority of mutual funds do insist on their managers investing personal wealth in the fund (Khorana, Servaes, and Wedge (2007)) and even highly sophisticated hedge funds do also care about future flows (Lim, Sensoy, and Weisbach (2016)). It may, thus, be desirable to consider mixed motivations for 2B, for example, endow her with an utility function of the form

$$\kappa\pi_2 + (1-\kappa)\,\mathbb{P}\left(\tau = g \mid v, a_2\right),$$

where $\kappa \in [0,1]$. Our analysis is qualitatively unchanged (though algebraically more tedious) by this generalization. For example, there exist $\widehat{\delta}_1$ and $\widehat{\kappa}$ such that for all $\delta_1 < \widehat{\delta}_1$ and $\kappa < \widehat{\kappa}$, 2B will behave exactly as in Proposition 2.

OA.1.3 Myopic Traders

The risk averse traders who generate the residual demand curve in our model are myopic in the sense that they offer pricing at $t = 1$ on the basis of the quantity sold up to that point, even in equilibria (e.g., Proposition 2) where the sale at $t = 1$ perfectly predicts further quantities sold at $t = 2$. The prices at $t = 1$ and $t = 2$ are different because—even though no further information is revealed by the $t = 2$ sale in Proposition 2—the quantity directly affects the price. The qualitative implications would be unaffected if the price immediately jumped down to the $t = 2$ price in Proposition 2, as flow motivations would still lead to correlated exits and enhanced punishment for managers, with concomitant governance implications.

OA.2 Model with selection and monitoring skills

Consider the following simple model of blockholder exit decisions where the blockholder is interpreted to be a mutual fund who is interested in maximizing her reputation with investors.

Since our interest is in illustrating the temptations for the fund to exit "too little" (as in DP) or "too much" (as in our paper), we abstract from managerial actions and market prices. Instead, we work directly with firm cash flows. The implications of blockholder exit decisions on managerial choices are implicit and can be inferred from the models of DP and this paper.

There is a single firm whose cash flows are given by a random variable $v \in \{\underline{v}, \overline{v}\}$ where the public ex ante prior distribution is given by $\pi_0 = Pr(v = \overline{v}) = \frac{1}{2}$. The realized value of v is unknown to all agents until the terminal date $t = 2$ when it is publicly revealed.

There is a fund that initially considers whether to hold a block in the firm. The fund undertakes research on the firm at $t = 0$, obtaining a signal $s_0 \in \{\underline{v}, \overline{v}\}$ about v and then decides whether to invest ($a_0 = I$) i.e., buy a block in the firm, or not to invest ($a_0 = NI$). Since this initial signal is used for investment decisions, we refer to s_1 as the "selection signal." Conditional on non-investment, the game ends. Conditional on investment, the fund then monitors the firm as a blockholder at date $t = 1$, obtaining a second signal $s_1 \in \{\underline{v}, \overline{v}\}$, which we refer to as a "monitoring signal." The fund can then decide to sell its block, i.e., exit ($a_1 = E$) or not exit ($a_1 = NE$) at $t = 1$.

The fund can be of two types $\tau \in \{g, b\}$, where $\gamma = Pr(\tau = g)$. The type of the fund determines the precision of both its selection signal and its monitoring signal as follows:

$$\sigma_\tau = \mathbb{P}\left[s_0 = v^* \mid v = v^*, \tau = \tau^*\right] = \mathbb{P}\left[s_1 = v^* \mid v = v^*, \tau = \tau^*\right],$$

where $\tau^* \in \{g, b\}$ with $1 > \sigma_g > \sigma_b \geq \frac{1}{2}$. We assume that v and τ are independent (i.e., the fund's type is independent of the firm's value) and the signals s_0 and s_1 are independent conditional on v and τ, i.e., prediction and monitoring errors are independent of each other for a given fund for a given firm. In other words, despite the fact that good type of funds are simultaneously better selectors and better monitors, selection and monitoring represent distinct skills in the model.

Finally, at a date $t = \frac{1}{2}$, an unanticipated (i.e., ex ante, zero probability) "information event" may occur.[15] If it does, then the fund—regardless of type—observes additional negative information about the firm (e.g., by observing the exit of an informed activist hedge fund blockholder) generating an updated prior, $\pi_1 \in \left[0, \frac{1}{2}\right]$. We assume that mutual fund investors are unaware of information events. This assumption simplifies our analysis.[16] Finally, since we are interested in when flow motivations are a net positive for governance via exit, it is without loss to focus on *negative* information events: good news always disincentivizes exit.

The fund's investors observe a_0 at $t = 0$, a_1 at $t = 1$ and v at $t = 2$. They make inferences about the firm at two dates. First, at $t = 1$ they form an updated posterior $\gamma_1 = Pr(\tau = g|a_0, a_1)$. Then, at $t = 2$, they form an updated posterior $\gamma_2 = Pr(\tau = g|a_0, a_1, v)$. The fund's payoff is given by $\omega_1\gamma_1 + \omega_2\gamma_2$ where $\omega_1 \geq 0$ and $\omega_2 \geq 0$. We choose this representation in order to be able to nest as special cases the form of evaluation in DP ($\omega_2 = 0$) or in this paper ($\omega_1 = 0$). The fraction $\frac{\omega_1}{\omega_2}$ captures the value of the initial $t = 1$ reputation relative to the final $t = 2$ reputation. This can be thought to be a short-hand for the length of time over which the fund is able to benefit (or suffer) from γ_1 before γ_2 is formed. For example, if the distance between $t = 1$ and $t = 2$ is sort, i.e., the revelation of public information is imminent, then $\frac{\omega_1}{\omega_2}$ is small.

Since $\sigma_g > \sigma_b \geq \frac{1}{2}$, the fund's signals generated by its research are fundamentally valuable. As a result, we consider whether it is possible to derive an equilibrium in which $a_0 = I$ if and only if $s_0 = \overline{v}$ and $a_1 = E$ if and only if $s_1 = \underline{v}$. The latter is simply the definitional characteristic of the *standard exit equilibrium* in which the blockholder exits if they have private information suggesting that the firm's eventual cash flows are likely to be low. The former is essential for the meaningful evaluation of stock selection: If the fund chose to invest regardless of its signal, then selection skills would be irrelevant. We can now state:

Proposition OA.1. *Consider a potential equilibrium in which $a_0 = I$ if and only if $s_0 = \overline{v}$*

[15] The unanticipated nature of the information event is for simplicity. Generating a well defined prior over such event can only affect $t = 0$, i.e., investment choices. However, our interest is in choices made at $t = 1$.

[16] Allowing mutual fund investors to observe information events would preserve most of the qualitative features of the analysis below. However, it would open up the possibility that—under sufficiently extreme information events—deviations due to selection may also lead to too much exit.

and $a_1 = E$ if and only if $s_1 = \underline{v}$. Consider a fund which has chosen $a_0 = I$.

1. *If $\omega_2 = 0$ then if fund observes $s_1 = \underline{v}$ it will deviate to choose $a_1 = NE$, i.e., exit too little.*

2. *If $\omega_1 = 0$ then there exists a $\bar{\pi}_1 \in \left(0, \frac{1}{2}\right)$ such that if $\pi_1 \in [0, \bar{\pi}_1)$, the fund with $s_1 = \overline{v}$ will deviate to choose $a_1 = E$, i.e., exit excessively.*

3. *When $\omega_1 > 0$ and $\omega_2 > 0$, for* each $\pi_1 \in [0, \bar{\pi}_1)$, there exists a $\Omega(\pi_1) \in (0, 1)$ such that for $\frac{\omega_1}{\omega_2} < \Omega(\pi_1)$ *the fund with $s_1 = \overline{v}$ will deviate to choose $a_1 = E$, i.e., exit excessively. Further,* $\Omega(\pi_1)$ is decreasing in π_1.

Proof. Part (1). With $\omega_2 = 0$ the fund cares only about γ_1. We evaluate $\gamma_1(I, E)$ and $\gamma_1(I, NE)$ and compare them. In equilibrium, $\gamma_1(I, E) = Pr(\tau = g | s_0 = \overline{v}, s_1 = \underline{v})$ and $\gamma_1(I, NE) = Pr(\tau = g | s_0 = \overline{v}, s_1 = \overline{v})$. Computing $\gamma_1(I, NE)$ first we have:

$$Pr(\tau = g | s_0 = \overline{v}, s_1 = \overline{v}) = \frac{Pr(\tau = g, s_0 = \overline{v}, s_1 = \overline{v})}{Pr(s = \overline{v}, s_1 = \overline{v})}$$

$$Pr(\tau = g, s_0 = \overline{v}, s_1 = \overline{v}) = Pr(\tau = g, s_0 = \overline{v}, s_1 = \overline{v}, v = \overline{v}) + Pr(\tau = g, s_0 = \overline{v}, s_1 = \overline{v}, v = \underline{v})$$

$$= Pr(v = \overline{v}) Pr(\tau = g) Pr(s_0 = \overline{v} | \tau = g, v = \overline{v}) Pr(s_1 = \overline{v} | \tau = g, v = \overline{v})$$

$$+ Pr(v = \underline{v}) Pr(\tau = g) Pr(s_0 = \overline{v} | \tau = g, v = \underline{v}) Pr(s_1 = \overline{v} | \tau = g, v = \underline{v})$$

$$= \pi_1 \gamma \sigma_g^2 + (1 - \pi_1) \gamma (1 - \sigma_g)^2$$

Thus, analogous calculations imply that:

$$Pr(\tau = g | s_0 = \overline{v}, s_1 = \overline{v}) = \frac{\pi_1 \gamma \sigma_g^2 + (1 - \pi_1) \gamma (1 - \sigma_g)^2}{\pi_1 \gamma \sigma_g^2 + (1 - \pi_1) \gamma (1 - \sigma_g)^2 + \pi_1 (1 - \gamma) \sigma_b^2 + (1 - \pi_1)(1 - \gamma)(1 - \sigma_b)^2}$$

Turning now to $\gamma_1(I, E)$, we have

$$Pr(\tau = g | s_0 = \overline{v}, s_1 = \underline{v}) = \frac{Pr(\tau = g, s_0 = \overline{v}, s_1 = \underline{v})}{Pr(s = \overline{v}, s_1 = \overline{v})}$$

$$Pr(\tau = g, s_0 = \overline{v}, s_1 = \underline{v}) = Pr(\tau = g, s_0 = \overline{v}, s_1 = \underline{v}, v = \overline{v}) + Pr(\tau = g, s_0 = \overline{v}, s_1 = \underline{v}, v = \underline{v})$$

$$= Pr(v = \overline{v})Pr(\tau = g)Pr(s_0 = \overline{v}|\tau = g, v = \overline{v})Pr(s_1 = \underline{v}|\tau = g, v = \overline{v})$$

$$+Pr(v = \underline{v})Pr(\tau = g)Pr(s_0 = \overline{v}|\tau = g, v = \underline{v})Pr(s_1 = \underline{v}|\tau = g, v = \underline{v})$$

$$= \pi_1 \gamma \sigma_g (1 - \sigma_g) + (1 - \pi_1) \gamma (1 - \sigma_g) \sigma_g = \gamma \sigma_g (1 - \sigma_g).$$

Thus, analogous calculations imply that:

$$Pr(\tau = g|s_0 = \overline{v}, s_1 = \underline{v}) = \frac{\gamma \sigma_g (1 - \sigma_g)}{\gamma \sigma_g (1 - \sigma_g) + (1 - \gamma) \sigma_b (1 - \sigma_b)}.$$

It is thus clear that $\gamma_1(I, NE) > \gamma_1(I, E)$ if and only if

$$\frac{\pi_1 \sigma_b^2 + (1 - \pi_1)(1 - \sigma_b)^2}{\pi_1 \sigma_g^2 + (1 - \pi_1)(1 - \sigma_g)^2} \text{¡} \frac{\sigma_b (1 - \sigma_b)}{\sigma_g (1 - \sigma_g)}, \tag{OA.1}$$

Now, since mutual fund investors do not observe information events, we have $\pi_1 = \frac{1}{2}$ and (OA.1) reduces to:

$$\frac{\sigma_b^2 + (1 - \sigma_b)^2}{\sigma_g^2 + (1 - \sigma_g)^2} \text{¡} \frac{\sigma_b (1 - \sigma_b)}{\sigma_g (1 - \sigma_g)},$$

which further simplifies to

$$\frac{\sigma_b}{1 - \sigma_b} + \frac{1 - \sigma_b}{\sigma_b} < \frac{\sigma_g}{1 - \sigma_g} + \frac{1 - \sigma_g}{\sigma_g},$$

which is true as the function $\frac{x}{1-x} + \frac{1-x}{x}$ is increasing for $x \in \left[\frac{1}{2}, 1\right)$. Thus, $\gamma_1(I, NE) > \gamma_1(I, E)$ and regardless of the signal, the fund will prefer not to exit.

Part 2. With $\omega_1 = 0$ the fund only cares about γ_2. Unlike for γ_1, the fund does not know γ_2 (since it relies on the realized value of v) but has to take expectations over it. To demonstrate the required result, we thus need to show that for π_1 low enough we have $E\left[Pr(\tau = g|s_0 = \overline{v}, s_1 = \underline{v}, v)|s_1 = \overline{v}\right] > E\left[Pr(\tau = g|s_0 = \overline{v}, s_1 = \overline{v}, v)|s_1 = \overline{v}\right]$. Clearly, as $\pi_1 \to 0$, $E\left[Pr(\tau = g|s_0, s_1, v)|s_1 = \overline{v}\right] \to Pr(\tau = g|s_0, s_1, v = \underline{v})$. Computing the relevant cases for $Pr\left(\tau = g|s_0, s_1, v = \underline{v}\right)$ we have:

$$Pr\left(\tau = g|s_0 = \overline{v}, s_1 = \overline{v}, v = \underline{v}\right) = \frac{\gamma\left(1-\sigma_g\right)^2}{\gamma\left(1-\sigma_g\right)^2 + \left(1-\gamma\right)\gamma\left(1-\sigma_b\right)^2}$$

and

$$Pr\left(\tau = g|s_0 = \overline{v}, s_1 = \underline{v}, v = \underline{v}\right) = \frac{\gamma\left(1-\sigma_g\right)\sigma_g}{\gamma\left(1-\sigma_g\right)\sigma_g + \left(1-\gamma\right)\left(1-\sigma_b\right)\sigma_b}.$$

Since

$$\frac{\left(1-\sigma_b\right)^2}{\left(1-\sigma_g\right)^2} > \frac{\left(1-\sigma_b\right)\sigma_b}{\left(1-\sigma_g\right)\sigma_g}$$

we have that, in the limit as $\pi_1 \to 0$,

$$E\left[Pr\left(\tau = g|s_0 = \overline{v}, s_1 = \underline{v}, v\right)|s_1 = \overline{v}\right] > E\left[Pr\left(\tau = g|s_0 = \overline{v}, s_1 = \overline{v}, v\right)|s_1 = \overline{v}\right]$$

Thus, by continuity, there exists a $\bar{\pi}_1 \in \left(0, \frac{1}{2}\right)$ such that if $\pi_1 \in [0, \bar{\pi}_1)$,

$$E\left[Pr\left(\tau = g|s_0 = \overline{v}, s_1 = \underline{v}, v\right)|s_1 = \overline{v}\right] > E\left[Pr\left(\tau = g|s_0 = \overline{v}, s_1 = \overline{v}, v\right)|s_1 = \overline{v}\right].$$

Part 3. As shown above, the fund's desire to maximize γ_1 induces the fund with $s_1 = \underline{v}$ to deviate to $a_1 = NE$. Since the fund with $s_1 = \overline{v}$ has identical incentives, she also would not exit (though in her case this would not represent a deviation from equilibrium). In other words, funds are disincentivized to exit. But, for $\pi_1 \in [0, \bar{\pi}_1)$, the fund's desire to maximize γ_2 induces the fund with $s_1 = \overline{v}$ to deviate to $a_1 = E$ (which of course implies that the fund with $s_1 = \underline{v}$ will also exit, though in her case this will not be a deviation from equilibrium). In other words, funds are incentivized to exit unconditionally, i.e., excessively.

Overall, the incentives to maximize γ_1 vs γ_2 push the fund in opposite directions. Which one dominates will depend on the relative value of ω_1 and ω_2. Thus, for each $\pi_1 \in [0, \bar{\pi}_1)$, there exists a $\Omega\left(\pi_1\right) \in (0, 1)$ such that for $\frac{\omega_1}{\omega_2} < \Omega\left(\pi_1\right)$ the incentive to exit excessively will dominate. Also, since $\gamma_1(I, E)$ and $\gamma_1(I, NE)$ are unaffected by π_1 but $E\left[Pr\left(\tau = g|s_0, s_1, v\right)|s_1\right]$

is decreasing in π_1, it is clear that $\Omega(\pi_1)$ is decreasing in π_1.■

OA.3 DiDiD of Institutional Holdings: Exits at a Loss and Unsuccessful Exits

Table OA.1: **DiDiD of Institutional Holdings: Exits at a Loss and Unsuccessful Exits**

This table shows results of estimating specification (2) conditioning further in the subsample of firm/campaigns i for which $EaL_i = 1$ in columns (1)–(4) and the subsample $UnS_i = 1$ in columns (5)–(8). The dependent variable is $Holdings_{i,t}/SharesOutstanding_{i,t}$, which measures the (amount of) holdings of stock i, at time t, held by institutional investors, normalized by the total number of shares outstanding of firm i at time t. The main independent variable is $PostActivism_{i,t} \times MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+T}$, which measures the effect of the price reaction to the exit of the activist blockholder comparing across both pre vs post the event quarter and mutual vs non-mutual funds. Specifications in columns 1–4 (correspondingly 5–8) differ in the length of the pre and post period we consider, and whether we include firm×quarter controls, as indicated. Panel A considers $T = 1$ and Panel B considers $T = 3$. Recall that: EaL_i is 1 when the activist sold at a loss, meaning that there was a price drop, measured on an end-of-month basis, between the activist's entry and exit dates, and 0 otherwise; UnS_i is 0 if the outcome of the campaign was a success, a campaign had declared specific goals, and the outcome announcement date is before the exit date, and 1 otherwise; and $PriceImpact_{i,t_i,t_i+T}$ captures the magnitude of the price reaction to the exit of the activist as measured by the net return between the termination date t_i and T days afterwards. All specifications include firm and quarter fixed effects. Standard errors are adjusted for heteroskedasticity, and t-statistics are reported below the coefficients in parentheses. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Panel A: $T = 1$

	$Holdings_{i,t}/SharesOutstanding_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	$EaL_i = 1$	$EaL_i = 1$	$EaL_i = 1$	$EaL_i = 1$	$UnS_i = 1$	$UnS_i = 1$	$UnS_i = 1$	$UnS_i = 1$
Window	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters
Firm×Quarter Controls	N	N	Y	Y	N	N	Y	Y
$PostActivism_{i,t} \times MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+1}$	-0.656**	-1.053***	-0.640**	-1.042***	-0.248***	-0.272***	-0.256***	-0.284***
	[-2.272]	[-3.364]	[-2.307]	[-3.386]	[-2.756]	[-2.816]	[-2.901]	[-2.937]
$PostActivism_{i,t} \times PriceImpact_{i,t_i,t_i+1}$	0.212	0.463*	0.313	0.531**	0.060	0.080	0.121*	0.118
	[0.894]	[1.738]	[1.372]	[2.024]	[0.875]	[1.069]	[1.772]	[1.597]
$MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+1}$	0.778***	0.931***	0.771***	0.924***	0.077	0.104	0.076	0.106
	[4.046]	[4.111]	[4.216]	[4.176]	[1.208]	[1.519]	[1.225]	[1.549]
$PostActivism_{i,t} \times MutualFund_{i,t}$	-3.279***	-2.815***	-3.303***	-2.830***	-1.247***	-0.900**	-1.276***	-0.934**
	[-3.561]	[-2.672]	[-3.624]	[-2.694]	[-3.159]	[-2.034]	[-3.301]	[-2.144]
$PostActivism_{i,t}$	1.619	0.361	1.909*	0.539	1.416***	0.951*	1.572***	1.007**
	[1.458]	[0.280]	[1.762]	[0.425]	[3.255]	[1.926]	[3.660]	[2.053]
$MutualFund_{i,t}$	-2.602***	-2.902***	-2.605***	-2.902***	-2.754***	-2.913***	-2.759***	-2.907***
	[-4.040]	[-3.761]	[-4.066]	[-3.762]	[-9.983]	[-8.989]	[-10.242]	[-9.123]
$Leverage_{i,t}$			-16.895**	-12.639			-10.841***	-10.254***
			[-2.524]	[-1.528]			[-5.585]	[-3.961]
$M/B_{i,t}$			2.282***	1.376*			0.889***	0.651***
			[3.732]	[1.896]			[7.291]	[4.393]
$\log(TotalAssets)_{i,t}$			10.275***	7.085**			6.039***	5.454***
			[4.880]	[2.538]			[13.827]	[10.021]
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Quarter fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,356	969	1,356	969	6,759	4,850	6,759	4,850
R-squared	0.626	0.651	0.636	0.654	0.653	0.691	0.667	0.699

Panel B: $T = 3$

	$Holdings_{i,t}/SharesOutstanding_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	$EaL_i = 1$	$EaL_i = 1$	$EaL_i = 1$	$EaL_i = 1$	$UnS_i = 1$	$UnS_i = 1$	$UnS_i = 1$	$UnS_i = 1$
Window	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters	± 6 quarters	± 4 quarters
Firm×Quarter Controls	N	N	Y	Y	N	N	Y	Y
$PostActivism_{i,t} \times MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+3}$	-0.421**	-0.469**	-0.418**	-0.467**	-0.295***	-0.260***	-0.293***	-0.261***
	[-2.270]	[-2.315]	[-2.279]	[-2.310]	[-4.815]	[-3.956]	[-4.862]	[-3.951]
$PostActivism_{i,t} \times PriceImpact_{i,t_i,t_i+3}$	0.161	0.204	0.126	0.192	0.158***	0.146***	0.185***	0.170***
	[1.051]	[1.219]	[0.832]	[1.153]	[3.202]	[2.733]	[3.697]	[3.128]
$MutualFund_{i,t} \times PriceImpact_{i,t_i,t_i+3}$	0.527***	0.504***	0.525***	0.503***	0.291***	0.285***	0.291***	0.285***
	[4.344]	[3.455]	[4.363]	[3.455]	[6.668]	[5.782]	[6.749]	[5.777]
$PostActivism_{i,t} \times MutualFund_{i,t}$	-3.445***	-3.101***	-3.472***	-3.116***	-1.336***	-0.950**	-1.358***	-0.978**
	[-3.767]	[-2.949]	[-3.840]	[-2.973]	[-3.419]	[-2.167]	[-3.549]	[-2.262]
$PostActivism_{i,t}$	1.675	0.488	2.011*	0.693	1.489***	1.008**	1.633***	1.061**
	[1.518]	[0.382]	[1.866]	[0.550]	[3.436]	[2.049]	[3.815]	[2.169]
$MutualFund_{i,t}$	-2.395***	-2.662***	-2.393***	-2.660***	-2.575***	-2.763***	-2.580***	-2.758***
	[-3.775]	[-3.465]	[-3.792]	[-3.464]	[-9.410]	[-8.612]	[-9.646]	[-8.728]
$Leverage_{i,t}$			-16.654**	-12.489			-10.863***	-10.340***
			[-2.484]	[-1.508]			[-5.589]	[-4.012]
$M/B_{i,t}$			2.259***	1.351*			0.903***	0.665***
			[3.686]	[1.846]			[7.586]	[4.588]
$\log(TotalAssets)_{i,t}$			10.466***	7.184**			6.041***	5.466***
			[4.973]	[2.568]			[13.940]	[10.159]
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Quarter fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,356	969	1,356	969	6,759	4,850	6,759	4,850
R-squared	0.626	0.649	0.636	0.653	0.655	0.693	0.668	0.701

about ECGI

The European Corporate Governance Institute has been established to improve *corporate governance through fostering independent scientific research and related activities.*

The ECGI will produce and disseminate high quality research while remaining close to the concerns and interests of corporate, financial and public policy makers. It will draw on the expertise of scholars from numerous countries and bring together a critical mass of expertise and interest to bear on this important subject.

The views expressed in this working paper are those of the authors, not those of the ECGI or its members.

Electronic Access to the Working Paper Series

The full set of ECGI working papers can be accessed through the Institute's Web-site (www.ecgi.global/content/working-papers) or SSRN:

Finance Paper Series	http://www.ssrn.com/link/ECGI-Fin.html
Law Paper Series	http://www.ssrn.com/link/ECGI-Law.html