

**The Wall Street Walk when
Blockholders Compete for Flows**

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The Wall Street Walk when Blockholders Compete for Flows*

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Abstract

An important recent theoretical literature argues that the threat of exit can represent an effective form of governance when the blockholder is a principal. However, a significant fraction of equity blocks is held by delegated portfolio managers. How do agency frictions arising from the delegation of portfolio management affect the ability of blockholders to govern via the threat of exit? We show that when blockholders are sufficiently career concerned exit will fail as a disciplining device. Our results have testable implications on the relative degree to which different classes of delegated portfolio managers use exit as a form of governance.

1 Introduction

Publicly traded corporations are affected by a core agency problem: managers pay the full cost of effort in running the corporations but shareholders enjoy most of the benefits. When ownership is dispersed individual shareholders have little incentive to monitor managers and little ability to influence them. Holders of equity blocks (“blockholders”) are a natural solution to this problem. Because they own many shares they have both the incentive to monitor and the ability to influence management. Several well-known papers (e.g. Grossman and Hart (1980), Shleifer and Vishny (1986), Admati, Pfleiderer, and Zechner (1994) and Kahn and Winton (1998)) have shown that blockholders can increase firm value through monitoring and activism. Activism can take the form of bringing forth shareholder proposals, proxy voting against management, informal negotiations with management, jawboning etc. These activities are collectively referred to as the use of “voice” by blockholders.

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An alternative potential way to enhance firm value is through the threat of exit: if management acts suboptimally, blockholders can simply sell their blocks—the so-called “Wall Street Walk”. The exit of a blockholder will typically depress the stock price, punishing management whenever executive compensation is linked to the market price of equity. However, exit also imposes costs on the blockholder—she liquidates blocks at potentially unfavourable prices. A natural question thus arises: Can the threat to exit act as an effective form of governance and enhance shareholders’ value?

A growing theoretical literature starting with Admati and Pfleiderer (2009) and Edmans (2009) answers this question in the affirmative. Admati and Pfleiderer argue that when blockholders observe managers acting suboptimally, it is in their own best interest to exit early before information about the manager’s actions become public. This makes exit a credible threat which then ameliorates managerial misbehaviour and enhances firm value. Edmans argues that informed institutional trading enhances the informational efficiency of the firm’s equity in the secondary market, enabling myopic managers to make better investment decisions and thus enhancing firm value.

This literature treats the blockholder as a profit maximizing principal: she acts as an individual owner of an equity block would. In contrast to this assumption, at least a significant proportion of equity blocks is held by institutional investors who are delegated portfolio managers.¹ In addition, a growing empirical literature (e.g., Chevalier and Ellison (1997, 1999), Brown, Harlow, and Starks (1996), Agarwal, Daniel, and Naik (2009), and Dass, Massa, and Patgiri (2008)) documents that these delegated investors face implicit incentives that make their behaviour deviate from what is in the best interest of purely profit maximizing principals. In particular, the literature shows that, to varying degrees, different classes of portfolio managers face *career concerns*: In addition to compensation explicitly linked to their profits, they also receive uncontingent fees based on the amount of money they manage, which leads them to compete to retain existing clients and win new ones.

In this paper we ask how the contractual incentives of funds interacts with their ability to monitor via the threat of exit. Taking as a baseline the model of Admati and Pfleiderer (2009), we show that the career concerns of delegated blockholders may interfere with their ability to credibly threaten management by exit. In Admati and Pfleiderer, when a blockholder observes perverse behaviour on the part of the management of firms in which she holds a

¹Institutional money managers hold over 70% of publicly traded US equity (see for example Gillan and Starks (2007)), and a significant measure of these holdings is quite concentrated. For example, Hawley and Williams (2007) point out that, in 2005 the hundred largest US institutions owned 52% of publicly held equity. In addition, Gopalan (2008) notes that in 2001 almost 60% of NYSE-listed firms had an institutional blockholder with at least 5% equity ownership. Finally, Davis and Yoo (2003) point out that large mutual fund families, such as Fidelity, own sizeable blocks in a majority of large US corporations.

block, she faces a choice between selling the block early or retaining it until all information becomes public at a later date. As long as there is any noise in the interim-date market, it is always in the interest of the blockholder to sell early rather than late. This, in turn, punishes management, making exit an effective form of governance.

We show that, when the blockholder is a sufficiently career-concerned delegated portfolio manager, exit can no longer act as an effective form of governance. The core intuition, which we flesh out in greater detail below, is that exit may be informative about the ability of the fund to generate value for investors. The signalling role of exit may impair its disciplinary potential. Thus, when blockholders are delegated portfolio managers who compete for investors' flows, they may be less successful in using the threat of exit to govern.

Focusing on the ability of institutional investors to govern via exit is all the more relevant today because there is growing recognition that the degree of traditional stewardship by these investors is limited at best. In the aftermath of the financial crisis, this has led practitioners and regulators to produce recommendations (e.g. Paul Woolley's (2010) "Manifesto for Giant Funds") and codes of conduct (e.g. the UK Financial Reporting Council's (2010) "UK Stewardship Code") aimed at improving the degree of engagement and activism by these blockholders. Thus, our results, which suggest that some classes of institutional blockholders may not be able to effectively use the alternative form of governance—exit—underscore the importance of this regulatory effort to enhance funds' activism.

Our model features a *manager* who runs a firm and a *fund* who holds an equity block in that firm on the behalf of a set of *investors* who employ her to manage their money. There are three dates. At date 0, the manager may take some perverse action that reduces the value of the firm but endows him with private benefits. The amount by which he lowers the value of the firm by taking the perverse action is private information to the manager until date 2, when all information becomes public. The fund can observe the manager's actions and can choose whether to sell the block of shares at date 1 or to hold on to it until date 2.

Funds come in two types. Good funds are better monitors than bad funds. While good funds can, via monitoring, eliminate the managers access to the perverse action, bad funds can do so only with positive probability. As a result, if at the end of the game an investor is matched with a good fund, he attains a higher continuation payoff than if he is matched with a bad one.

The investors' initial match with the fund is random and they do not know the type of their fund at date 0. At both dates 1 and 2 investors observe the fund's portfolio value and can make inferences about her type. Based on such inferences, at each of these dates investors can choose to retain the fund or replace her with a randomly selected fund. If investors choose to retain the fund at both dates 1 and 2, their expected continuation value depends on their

endogenous belief about the type of the fund based on all information received.

The fund cares about investors' perception of her ability. This is because, for each period that she is employed, she receives a fixed wage w . In addition to this, she also receives a fraction α of any liquidating portfolio value (at date 1 or 2, depending on when the portfolio is liquidated), with the investors receiving the rest. The fund's payoff parameters α and w represent, respectively, the fund's compensation sensitivity to earned profits and investor flows. While the first is obvious, the latter deserves further mention. The fund can be retained or fired at date 1. While the profit-contingent component of compensation may either rise or fall as a result of these events, the *uncontingent* component of compensation is certainly higher if the fund is retained instead of fired at date 1. It is in this sense that the size of w captures the fund's concern for flows: it is only by retaining the current investors (i.e., preventing outflows) that the fund can earn w for another period. The relative size of α vs w , in turn, captures the relative importance of explicit (profit-related) vs implicit (flow-related) compensation.

We show two main results:

1. First, we prove an impossibility result. We show that when the fund is sufficiently flow sensitive (i.e., w is large relative to α), and when good funds generate sufficiently higher continuation value for investors than bad ones, it is impossible in equilibrium for *any* type of fund to credibly threaten the manager by exit conditional on the perverse action being taken. Thus, in sharp contrast to Admati and Pfleiderer (2009), exit cannot act as a form of governance when the blockholder is sufficiently career concerned. The intuition is as follows.

For exit to impose discipline, funds must sell in equilibrium if they observe the perverse action being taken. Since good funds can eliminate the perverse action without the need to exit, the only funds that can be seen to exit must be the bad ones. But then exit reveals that the fund is of the bad type, which will induce the investor to fire the fund. When observing the perverse action being taken, the bad fund faces the following choice: She may either hold the block, be retained by the investor and earn w for an extra period, but suffer from an α -share of smaller profits at $t = 2$, or she may sell the block early, be fired by the investor and lose the assets-under-management fee for the second period, but realize larger profits on the actual position. When w is large and α is small, the former option is more attractive.

For this argument to be valid, it is not just necessary for investors to fire the fund conditional on an early block sale, but also to retain the fund in the absence of such a sale. Why would investors choose to pay w for an extra period when the fund cannot take any further productive actions on their behalf during $t = 2$? They would do so

because by retaining the fund, they gather further information about her type. Since investors would rather be matched with a good rather than a bad fund at the end of the game, this additional information is valuable to them. Indeed, it is most valuable—and worth paying w for an extra period—precisely when good and bad funds produce sufficiently different continuation values.

2. To endow our results with empirical content, we then proceed to show what *can* arise in equilibrium. We show that, when good funds generate sufficiently higher continuation value for investors than bad ones: (i) when w is large relative to α , there exists an equilibrium in which no fund chooses to exit conditional on the perverse action being taken by the manager; in contrast (ii) when w is small relative to α , the fund *is* credibly able to use exit as a disciplining device.

Thus, the effectiveness of exit as a governance mechanism will be determined by variations in the contractual incentives of the delegated blockholder. Across the different classes of delegated portfolio managers, there is clear variation in the size of $\frac{\alpha}{w}$. For example, mutual funds typically receive no explicit profit-based compensation. Thus, the vast majority of mutual funds have $\frac{\alpha}{w} = 0$. Other portfolio managers, such as, for example, hedge funds derive a significant fraction of their payoffs from explicit profit-based compensation. For these investment vehicles, $\frac{\alpha}{w} \gg 0$. Thus, our results suggest that mutual funds would be less effective in using exit as a disciplining device than hedge funds. We discuss empirical evidence consistent with our result below.

Our analysis relates most directly to the relatively recent theoretical literature that shows that the threat of exit is, in itself, a governance mechanism. Apart from the papers of Admati and Pfleiderer (2009) and Edmans (2009) that we have already noted above, this literature includes the work of Gopalan (2008) and Edmans and Manso (2011). Gopalan (2008) presents a model in which a privately informed blockholder can impact the probability of takeover through trading and therefore can influence firm governance. Edmans and Manso (2011) consider the trade-off between voice and exit and solve for the number of blockholders which maximizes firm value. In contrast to these papers, which treat the blockholder as a principal, we focus on the delegated nature of blockholding. This new literature on exit, as well as our work, builds on a large theoretical literature on the role of blockholders in corporate governance.² That literature typically focuses on the role and incentives of the blockholder to monitor, rather than focusing on exit itself as a governance mechanism.

²See, for example, Maug (1998), Mello and Repullo (2004), Burkart, Gromb, and Panunzi (1997), Bolton and von Thadden (1998), Faure-Grimaud and Gromb (2004), Tirole (2001), and Noe (2002) in addition to the papers cited earlier in the introduction.

Our paper also has a familial connection to the growing literature on the financial equilibrium implications of the career concerns of funds (see, for example, Dasgupta and Prat (2008), Dasgupta, Prat, and Verardo (2011b), or Guerrieri and Kondor (2011)). These papers establish a link between fund managers' career concerns and the equilibrium prices, returns, and volume of assets they trade. In contrast, we focus on the implications of funds' career concerns and the nature of corporate governance in firms in which they hold equity blocks.

The growing empirical literature on exit as a governance mechanism has not, to date, focussed on delegation per se. This literature nevertheless provides a number of findings that are broadly consistent with our model. Parrino, Sias, and Starks (2003) were the first to empirically investigate the role of exit as a governance mechanism. Amongst other things, they showed that the degree to which institutions use exit may depend on their type. Using the CDA/Spectrum classification of institutions (into Bank Trusts, Insurance Companies, Independent Investment Advisors, Investment Companies and Others) they find that, for the years 1982 to 1993, bank trusts are greater users of exit than investment companies. While the aggregate nature of 13-F filings and the legal nature of the CDA/Spectrum classification warrant a degree of caution in interpreting their findings in the context of our model, it is likely that the average bank trust is less influenced by investor flows than, say, a traditional mutual fund company which would typically appear under investment companies under the CDA/Spectrum classification. Thus, this evidence is broadly consistent with our theoretical result that flow-sensitive institutions would be less effective in using exit. Duan and Jiao (2011) and Helwege, Intintoli, and Zhang (2011) both show that voice is more important than exit for different institutional investors. Duan and Jiao (2011) use CRSP mutual fund holding data and ISS voting data from 2003 to 2006 and find that mutual funds are more likely to oppose management through proxy voting than to exit. When combined with other evidence (see, for example, Kahan and Rock (2007) and Gillan and Starks (2007)) that mutual funds are loath to vote against management in general, this suggests that this category of blockholder rarely uses exit as a form of governance. Helwege, Intintoli, and Zhang (2011) instead use 13-F data from 1982 to 2004 to show that for institutional investors voice is more important than exit in forcing CEO removal. This finding is also broadly consistent with our model. Suppose we interpret the type-dependent monitoring technology in our model as the effective use of voice. Then, since all institutions can use voice, but only relatively flow-insensitive institutions will use exit, our model would also predict that – averaged across types of institutions – exit will be less effective than voice in corporate governance.

Our paper engages with the empirical literature in another, more subtle, way. While our discussion to date has treated exit as an *alternative* to voice, it is sometimes asserted that the threat of exit *supports* shareholders' voice. This idea dates back at least to Hirschman

(1970, p. 82), who writes: “The chances for voice to function effectively...are appreciably strengthened if voice is backed up by the threat of exit, whether it is made openly or whether the possibility of exit is merely well understood to be an element in the situation.” Viewed from this angle, our theoretical finding that mutual funds can less credibly threaten to exit than hedge funds implies differential success across these classes of institutions in the effective use of voice. Knowing that mutual funds’ exit threat is not credible, management will also be less attentive to their voice. As a result, mutual funds may rationally spend less time and effort in using voice. In contrast, hedge funds’ ability to credibly threaten exit will make them keen and successful users of voice. There is a growing body of empirical papers that provides evidence that hedge funds produce substantial gains to shareholders of target companies by using voice (see, for example, Becht, Franks, and Grant (2010), Brav, Jiang, Thomas, and Partnoy (2008), and Klein and Zur (2009)). In contrast, however, it is commonly observed that mutual funds do not use voice to a similar degree. For example, Kahan and Rock (2007) argue that mutual funds do not typically sponsor shareholder proposals, do not uniformly use proxy voting to improve corporate governance, and do not even seem to make significant demands to management during “behind-the-scenes” negotiations. The “silence” of mutual funds is also evident from the survey of Gillan and Starks (2007), who list the prominent roles of different institutional investors in using voice across different decades since the 1930s. Viewed through the lens of Hirschman’s hypothesis, this evidence is entirely consistent with our theoretical results.³

The rest of the paper is organised as follows. In section 2 we introduce the underlying governance problem. Section 3 reviews Admati and Pfleiderer’s core result that exit can act as a governance mechanism when the blockholder is a principal. Then, in section 4 we enrich the analysis by introducing delegated blockholding by funds. Section 5 shows that when these funds are sufficiently career concerned the threat of exit fails to improve governance. Section 6 characterizes equilibria with and without exit. In section 7 we discuss our results and consider variations and extensions. Section 8 concludes.

2 The Governance Problem

We consider a publicly traded all equity-financed firm with a given ownership structure. We ask how changes in the ownership structure—the presence of blockholders of different types—can influence the nature of corporate governance in that firm. The underlying model of the

³Needless to say, there may well be many reasons why mutual funds are not effective users of voice, such as, for example, business ties with portfolio firms (see Davis and Kim (2007) or Dasgupta and Zachariadis (2010)). In general, the higher-powered incentives of hedge funds may induce them to spend more effort on activism.

firm is identical to that of Admati and Pfleiderer (2009).⁴

The firm exists over three dates ($t = 0, 1, 2$). It is run by a manager and is characterized by a moral hazard problem. The manager may take an action (action 1) which is undesirable from the point of view of shareholders but generates private benefits β for him. We refer to this as the “perverse action,” as in Admati and Pfleiderer. If the manager does not take action 1, we write that he takes action 0.

The value of the firm at $t = 2$ is affected by the manager’s action choice at $t = 0$ — $a \in \{0, 1\}$. If he chooses $a = 0$ the value of the firm is v . If he chooses $a = 1$, the value of the firm is $v - \tilde{\delta}$, where $\tilde{\delta}$ is distributed on $[0, \bar{\delta}]$ with a continuous density $f(\cdot)$. The manager observes the realisation of $\tilde{\delta}$ at $t = 0$ and then chooses his action. The value of v is common knowledge throughout, but realisation of $\tilde{\delta}$ is private information available only to the manager at $t = 0, 1$. All information becomes public at $t = 2$.

We assume, following Admati and Pfleiderer, that the manager’s contractual payoff depends on the market prices at $t = 1$ and $t = 2$. If he takes action 0, his payoff is $\omega_1 P_1 + \omega_2 P_2$, where $\omega_1 > 0$ and $\omega_2 > 0$ represent the sensitivities of managerial compensation to market prices P_1 and P_2 at times 1 and 2. If the manager instead takes action 1, his payoff is $\omega_1 P_1 + \omega_2 P_2 + \beta$, where $\beta \geq 0$ is fixed and common knowledge.

The firm is publicly traded, and the prices P_1 and P_2 are set by a risk-neutral market maker on the basis of all available public information. The firm’s equity is the only risky asset in the economy. The only other available asset is a risk-free asset with unit gross rate of return and that is in infinitely elastic supply.

The firm is owned by many small passive direct shareholders as well as by a large blockholder. The identity of the blockholder will change across different variants of our model. In the baseline case, which is identical to Admati and Pfleiderer’s, the blockholder is a principal, and we think of her as a large private blockholding investor. In the core of our paper, motivated by the large degree of blockholding by institutional asset managers in Anglo-Saxon financial systems, we think of the blockholder as a fund who acts on behalf of a continuum of identical investors.

In all variants, the blockholder is able to observe the action chosen by the manager at $t = 0$, and is able to sell her stake in the firm at $t = 1$ in response. Because the blockholder’s potential sales are based on her observation of the manager’s action, which in turn affects

⁴To be precise, we focus on Admati and Pfleiderer’s Model B. This is the version of the model in which they show exit to be most effective as a governance mechanism. In other variants of their model, they show that—even when the blockholder is a principal—exit has potentially less desirable effects. We wish to take as a starting point the version of their model that gives exit its best chance as a governance mechanism and still show (see Proposition 1 below) that agency frictions arising from the delegation of portfolio management can reduce its effectiveness.

firm value, the price at the interim date ($t = 1$) will be affected by the trading decision of the blockholder. This, in turn, will affect the payoffs of the manager, generating the core corporate governance mechanism. If the blockholder can credibly threaten to exit when the manager takes action 1, thus lowering the firm's traded price at $t = 1$, the resulting reduction in payoff to the manager can induce him to take the perverse action less often, thus reducing the agency costs and increasing the value of the firm.

It is useful at the outset to outline the incidence of the perverse action in the absence of a blockholder. In such a setting, since small shareholders are passive (implicitly, they have neither the skill nor the incentive to acquire private information about the manager's actions) the price of the firm at $t = 1$ is insensitive to the manager's choice of action. Accordingly, the manager compares his rents from taking the perverse action $\beta + \omega_1 P_1 + \omega_2(v - \delta)$ with that of taking the non-perverse action $\omega_1 P_1 + \omega_2 v$; he takes the perverse action if and only if $\tilde{\delta} \leq \frac{\beta}{\omega_2} =: \delta_{No-L}$.

In what follows, we consider whether the presence of different types of blockholders can reduce the incidence of the manager's perverse action. We begin with the important benchmark case in which the blockholder acts as a principal. This is the case considered by Admati and Pfleiderer.

3 The Blockholder as Principal: Governance via Exit

Admati and Pfleiderer (2009) show that when the blockholder acts as a principal, the threat of exit can act as a disciplining device. We sketch their result here.

An equilibrium of the game is *disciplining* if the blockholder can credibly commit to sell her holdings at $t = 1$ if the manager takes the perverse action. Since, taking the perverse action in a disciplining equilibrium reduces the contractual payoff to the manager via a lowered interim price P_1 , the incidence of the perverse action is strictly lower in a disciplining equilibrium than in the equilibrium in the absence of a blockholder. Admati and Pfleiderer show that there exists a unique equilibrium and it is always disciplining. Their equilibrium is characterised by a cutoff $\delta_L < \delta_{No-L}$ such that the manager takes the perverse action if and only if $\tilde{\delta} < \delta_L$ and the large blockholder sells her shares if the manager takes that action.

The intuition for the result is as follows. Admati and Pfleiderer's blockholder may face a liquidity shock at $t = 1$ with probability $\theta \in (0, 1)$ which forces her to liquidate her position. This allows her to gain from trade when she is not hit by a liquidity shock and observes the fund taking the perverse action: the market maker does not know the large shareholder's motive to trade. When the blockholder observes that the manager has taken the perverse action at $t = 1$, she realizes that the firm's value will be lower at $t = 2$ when all information

becomes public. If she has not been hit by the liquidity shock she has the choice to hold her block until $t = 2$, and realize these gains or sell at $t = 1$. Of course, her sale at $t = 1$ will lower the price of the block, because her trade may reflect her private information. However, because the market assigns positive probability to the sale being driven by the blockholder’s liquidity shock rather than by private information, the loss in value from the early sale will be smaller than the loss from holding until $t = 2$. Thus, the blockholder will exit, lowering P_1 . Knowing this, the manager will hesitate to take the perverse action.

We now turn to the case where the blockholder is not a principal, but an agent: In the remainder of the paper, the blockholder is a delegated portfolio manager who holds shares on behalf of many (identical) small investors.

4 The Blockholder as Agent: A Model

We consider now the case where the blockholder is a delegated portfolio manager such as a mutual fund, hedge fund, pension fund, etc. We assume that these delegated blockholders act on behalf of a large number of small investors who would have no access to blockholding other than via delegation. We do not analyse interactions amongst investors at this stage. Instead, we treat all investors symmetrically. As a result, in what follows, we shall often refer to this collection of investors simply as “the investor” (I). We refer to the delegated blockholder as the fund (F). The delegated blockholder, like the principal blockholder of the previous section, can observe the manager’s actions at $t = 0$, and can choose whether to exit at $t = 1$ or hold until $t = 2$.

As discussed in the introduction, an important strand of the empirical literature has documented that investors chase performance across funds of different ability, generating career (or reputational) concerns for these funds. We consider how the career concerns of funds may impact their effectiveness in monitoring via the threat of exit. In order to incorporate career concerns, we augment the model by adding some crucial, but minimal, ingredients.

First, we assume a degree of heterogeneity across funds. There are two types of funds: good funds ($\tau^F = g$) and bad funds ($\tau^F = b$), with $\Pr(\tau^F = g) = \gamma_F$. Good funds are better monitors than bad funds: by monitoring, good funds are able to eliminate the manager’s access to the perverse action, while bad funds can do so only with probability $\gamma_M < 1$.⁵ Our baseline results are insensitive to whether funds know their type. In addition, during an unmodelled final period (period 2+) a good fund if matched to the investor generates a

⁵Our qualitative results will hold as long as the good fund is able to eliminate, via monitoring, access to the perverse action with higher probability than the bad fund.

continuation payoff to the investor of π_g^I . If, instead, the investor ends up matched to a bad fund, his payoff is $\pi_b^I < \pi_g^I$.⁶ The fund that is employed by the investor during this final period, receives a payoff of $\pi^F \geq 0$.⁷

Second, we introduce a hiring and replacement process between investors and funds which induces career concerns for funds. The set up is as follows. The investor does not know the type of the fund at $t = 0$ and he is randomly matched to one. Both at $t = 1$ and $t = 2$ he can update his inference about the type of the fund that he is randomly matched to: at $t = 1$ he observes the price of the fund's portfolio (which depends on whether the fund sold or not) and at $t = 2$ he observes the realisation of $\tilde{\delta}$. At either $t = 1$ or $t = 2$, the investor may either retain or fire his fund. The fund who is fired at t dies immediately and cannot be rehired.⁸ The investor can only hire a new fund at $t = 2$.⁹ If he hires a new fund, the match is random, and thus the investor's continuation value in the final period is $\bar{\pi}^I := \gamma_F \pi_g^I + (1 - \gamma_F) \pi_b^I$. If, on the other hand he chooses to retain his fund at both $t = 1$ and $t = 2$, then his continuation value depends on his endogenous beliefs about the type of the fund to whom he was matched at $t = 0$. The investor's beliefs are equilibrium quantities and are computed below in the relevant contexts. Thus, both at $t = 1$ and at $t = 2$, the investor makes a rational decision in equilibrium to retain or fire his current fund on the basis of information observed up to that point.

Third, we introduce rents from employment for funds: The reason funds care about investor's perception of their ability is that, for each period that they are employed, they receive a fixed wage w . In addition to this, the fund also receives a fraction $\alpha \in (0, 1)$ of any liquidating portfolio value (at $t = 1$ or at $t = 2$, depending on when the portfolio is

⁶For concreteness, consider a final single period in which there is a new independent project, with payoff v' , run by a manager who can lower the value to $v' - \delta'$ by taking some perverse action. The good type of fund if employed by the investor, can costlessly eliminate this perverse action. The bad type can do so only probabilistically. This generates a difference in continuation values across matches with different types of funds.

More generally, such a continuation value will be endogenously generated (in equilibrium) of an infinitely repeated version of our game. Such an extended formulation would come at a significant algebraic cost, which would distract from our core message.

⁷Our model is isomorphic to one in which managerial ability is defined by skill at "stock picking" (a more common formulation in the literature outside corporate governance). Good funds are simply better stock pickers—they can identify firms that have no agency problems, while bad funds only can do so probabilistically.

⁸Implicitly, there is a sufficiently significant reputational loss from being fired. Alternatively, it could be that funds are simply indistinguishable from each other by an investor who is not in a current employment relationship with them—thus a fired fund cannot be identified to be rehired.

⁹This is without loss of generality, because there are no productive investments between $t = 1$ and $t = 2$, so a fund hired by the investor at $t = 1$ cannot take any actions to affect the investor's payoff. By the same token, since a new fund if hired at $t = 1$ takes no action, observing δ at $t = 2$ conveys no information about the type of this newly hired fund. Thus, the investor would have no incentive to hire a new fund until $t = 2$.

liquidated), with the investor receiving the rest.¹⁰ The investor’s payoff is complementary to the fund’s in the sense that he pays a fixed wage to the fund in each period he employs the fund and gets a fraction $(1 - \alpha)$ of the liquidating portfolio.

It is worth pointing out here that the fund’s payoff parameters α and w represent, respectively, the fund’s compensation sensitivity to earned profits and investor flows. The fund can be retained or fired at $t = 1$. While the profit-contingent component of compensation may either rise or fall, depending on the sequence of events, the profit-uncontingent component of compensation is certainly higher if the fund is retained instead of fired at $t = 1$. It is in this sense that the size of w captures the fund’s concern for flows: it is only by retaining the current investors (i.e., preventing outflows) that the fund can earn w for another period. The relative size of α vs w , in turn, captures the relative importance of explicit (profit-related) and implicit (flow-related) compensation.

Finally, to match the liquidity shock of Admati and Pfleiderer (2009) in our revised context, we assume that the investor has a probability $\theta \in (0, 1)$ of being impatient—of receiving a shock that forces him to liquidate his holding at $t = 1$. When a block liquidation occurs at $t = 1$, the market cannot tell whether it is the investor or the fund who initiated the sale. However, needless to say, the investor knows the source of the liquidation.¹¹

4.1 Some useful notation

It is useful to introduce some notation at this stage. The objects for which we define notation here are equilibrium quantities, and thus will derive economic meaning only in our formal analysis below.

We define the following:

$$\tilde{a} := s_M(\tilde{\delta}) = \begin{cases} 0 & \text{if } a = 0 \\ 1 & \text{if } a = 1, \end{cases} \quad (1)$$

which represents the manager’s strategy: he takes an action after having observed the realization of $\tilde{\delta}$.

¹⁰While we treat contracts as exogenous at present, it is worth noting that all that we need for our core results (Propositions 1 and 3 below) is the *existence* of a class of funds for whom $\alpha = 0$ and $w > 0$. The existence of such a class of funds is essentially guaranteed by the regulatory framework in the United States. The Investment Companies Act of 1940 features a clause often referred to as the “fulcrum fee rule” which requires that mutual fund’s performance fees are symmetric in gains and losses. As a result, the vast majority of US mutual funds charges fees that are uncontingent (see, for example, Elton, Gruber, and Blake (2003)).

¹¹It would be possible, without changing the qualitative results, to replace this liquidity shock by some other form of inefficiency (e.g., noise traders) in the interim date market. In this case, the fund would still be able to “hide” behind the noise when trading at $t = 1$, while investors upon seeing a sale by their fund would still know that the fund *chose* to exit.

Since the investor infers the fund's action from the value of the portfolio he observes at $t = 1$, we write the investor's information set to include $a^F \in \{s, ns\}$ and we define

$$\mathbb{E}_s := \mathbb{E} \left(\tilde{a}\tilde{\delta} \mid a^F = s \right) \quad (2)$$

as the ex ante expected change in firm's value when the investor observes the fund selling the shares ($a^F = s$) and

$$\mathbb{E}_{ns} := \mathbb{E} \left(\tilde{a}\tilde{\delta} \mid a^F = ns \right) \quad (3)$$

the ex ante expected change in firm's value when he observes the fund not selling ($a^F = ns$), where $a^F \in \{s, ns\}$.

At $t = 1$ the investor updates his expectation of his continuation payoff (for period 2+) using the information available to him:

$$\mathbb{E} \left(\tilde{\pi}^I \mid a^F \right), \quad (4)$$

where $a^F \in \{s, ns\}$ and which will depend on equilibrium quantities and will be computed in each relevant section. If the investor fires the fund at $t = 1$ he is randomly matched to a new fund and his continuation payoff is

$$\bar{\pi}^I := \mathbb{E}(\tilde{\pi}^I) = \gamma_F \pi_g^I + (1 - \gamma_F) \pi_b^I. \quad (5)$$

We denote by $a^I \in \{f, r\}$ the action of the investor at time 1 where he either fires (f) or retains (r) the fund.

Finally, denote the collection of deep model parameters with the exception of α, w, π_g^I and π_b^I by Θ . Thus our game is defined by payoff parameters $\{\Theta, \alpha, w, \pi_g^I, \pi_b^I\}$.

5 The Failure of Governance via Exit

We show that, with delegated blockholding, exit may no longer act as an effective disciplining device. In particular, we ask: Is it feasible for delegated blockholders to credibly threaten managers with exit conditional on a perverse action being taken? We answer this question as follows:

Proposition 1 *For $\frac{\alpha}{w}$ small enough and for $\pi_g^I - \pi_b^I$ large enough, there is never an equilibrium in which any type of fund sells if and only if she observes $a = 1$.*

In other words, this proposition highlights two conditions under which the beneficial effect of the threat of exit identified by Admati and Pfleiderer does not survive when the blockholder is an agent. First, the blockholder must be principally motivated by flows rather than by

profits. Second, investors must be sufficiently interested in retaining only good funds, which in turn generates career concerns for delegated blockholders.

Our argument will proceed as follows. We first establish conditions under which, if the fund adopts a strategy of selling the block at $t = 1$ if and only if she observes that the manager has taken the perverse action, then the investor chooses to retain the fund if and only if the fund has not sold at $t = 1$. We then establish conditions under which, such a retention strategy on the part of the investor induces the fund *not* to sell at $t = 1$ even if she has observed the manager taking the perverse action. This, then, establishes a set of conditions under which it is impossible for the fund to sell (in equilibrium) at $t = 1$ if and only if she observes the perverse action. We first establish the formal proof and then provide an intuitive discussion of the ingredients delivering our main result.

Proof: Consider any putative equilibrium in which the fund's strategy is as follows:

$$s_F(a) = \begin{cases} \text{ns} & \text{if } a = 0 \\ \text{s} & \text{if } a = 1. \end{cases} \quad (6)$$

We first outline the manager's best response to the fund's behaviour.

To determine the manager's strategy we compare his expected utility from taking the perverse action with that from not taking the perverse action, once he observes the realization of $\tilde{\delta}$ at $t = 0$.

If he takes the perverse action, he knows that the fund will sell his shares at $t = 1$ so $P_1 = v - \mathbb{E}_s$ and $P_2 = v - \delta$. Thus his expected utility is

$$\beta + \omega_1 P_1 + \omega_2 P_2 = \beta + \omega_1(v - \mathbb{E}_s) + \omega_2(v - \delta). \quad (7)$$

If he does not take the perverse action, he knows that the fund will sell his shares at $t = 1$ only for liquidity reasons—which occurs with probability θ —and that $P_2 = v$. Thus his expected utility is

$$\omega_1 P_1 + \omega_2 P_2 = \omega_1\{v - \theta \mathbb{E}_s - (1 - \theta) \mathbb{E}_{ns}\} + \omega_2 v. \quad (8)$$

Hence, the manager's strategy is

$$s_M(\delta) = \begin{cases} 1 & \text{if } \beta - \omega_1(1 - \theta)(\mathbb{E}_s - \mathbb{E}_{ns}) - \omega_2 \delta \geq 0 \\ 0 & \text{otherwise.} \end{cases} \quad (9)$$

Since $\beta - \omega_1(1 - \theta)(\mathbb{E}_s - \mathbb{E}_{ns}) - \omega_2 \delta$ is decreasing in δ , the manager's best response will be characterised by a cutoff point δ_{sep} , such that he takes the perverse action for any $\delta \leq \delta_{\text{sep}}$, where the cutoff is equal to the fixed point of the following equation:

$$\delta_{\text{sep}} = \frac{\beta - \omega_1(1 - \theta)(\mathbb{E}_s(\delta_{\text{sep}}) - \mathbb{E}_{ns}(\delta_{\text{sep}}))}{\omega_2}. \quad (10)$$

We can thus write the strategy of the manager as follows:

$$s_M(\delta) = \begin{cases} 1 & \text{if } \delta \leq \delta_{\text{sep}} \\ 0 & \text{otherwise.} \end{cases} \quad (11)$$

The cutoff point δ_{sep} is unique if $\mathbb{E}_s(\delta_{\text{sep}}) - \mathbb{E}_{n_s}(\delta_{\text{sep}})$ is increasing in δ_{sep} . To establish this, we compute \mathbb{E}_s and \mathbb{E}_{n_s} as functions of δ_{sep} .

When the fund sells her shares, the market does not know whether it is for liquidity or speculative reasons and hence

$$\mathbb{E}_s(\delta_{\text{sep}}) = \frac{(1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta} | \tilde{\delta} \leq \delta_{\text{sep}})\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})}{\theta + (1 - \theta)(1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})}. \quad (12)$$

Computations for equations (12) are shown in the appendix.

If the fund does not sell, the market infers that the manager has not taken the perverse action and that the value of the firm is v . Hence,

$$\mathbb{E}_{n_s}(\delta_{\text{sep}}) = 0. \quad (13)$$

It is now easy to see that $\mathbb{E}_s(\delta_{\text{sep}}) - \mathbb{E}_{n_s}(\delta_{\text{sep}})$ is increasing in δ_{sep} establishing the uniqueness of δ_{sep} . The proof of this result is detailed in the appendix. We now proceed to compute the best response of the patient investor—the investor who at $t = 1$ has not been hit by a liquidity shock and has not liquidated his position.

The investor's decision at $t = 1$ relies on what inference he expects to make at $t = 2$. At $t = 2$, there are three mutually exclusive and exhaustive events:

$$E_1 = \{\delta \leq \delta_{\text{sep}}\} \cap \{a = 0\} \quad (14)$$

$$E_2 = \{\delta > \delta_{\text{sep}}\} \cap \{a = 0\} \quad (15)$$

$$E_3 = \{a = 1\} \quad (16)$$

The investor also infers the action of the fund from the portfolio value. Thus, the investor's $t = 2$ information set consists of six possible paired events, which are the elements of

$$\{E_1, E_2, E_3\} \times \{s, ns\}.$$

Each of these events conveys different information to the investor and may affect his retention vs firing decision at $t = 2$. We first consider the events that can arise on the putative equilibrium path. These are $(E_1, a^F = ns)$, $(E_2, a^F = ns)$, and $(E_3, a^F = s)$. For each of these cases, the investor can compute the probability that he is matched with a good fund

using Bayes Rule as follows:

$$\mathbb{P}(\tau^F = g | E_1, a^F = ns) = \frac{\gamma_F}{\gamma_F + (1 - \gamma_F)\gamma_M} > \gamma_F \quad (17)$$

$$\mathbb{P}(\tau^F = g | E_2, a^F = ns) = \gamma_F, \quad (18)$$

$$\mathbb{P}(\tau^F = g | E_3, a^F = s) = 0. \quad (19)$$

Clearly, the investor retains at $t = 2$ in the events $(E_1, a^F = ns)$ and $(E_2, a^F = ns)$ and replaces at $t = 2$ in the event $(E_3, a^F = s)$. For the other three events— $(E_1, a^F = s)$, $(E_2, a^F = s)$, and $(E_3, a^F = ns)$ —it is impossible to assign posteriors based on Bayes Rule, and, since we are proving an impossibility result, we make no assumption whatsoever on the investor's behaviour in these cases. It is easy to see that our arguments below will be unaffected by the specific posterior chosen by the investor under these off-(putative)-equilibrium events.¹²

Having thus computed the investor's decision rule at $t = 2$, we proceed to compute his strategy at $t = 1$. In order to make his $t = 1$ decision, he first observes the fund's portfolio and infers her action, then computes the probability of ending up in one of the three events conditional on the action he observes. Finally, he computes his continuation payoff in each event conditional on his retention vs firing decision at $t = 2$ as specified above.

If he observes $a^F = ns$, he must compute the following quantities: $\mathbb{P}(E_1 | a^F = ns)$, $\mathbb{P}(E_2 | a^F = ns)$, and $\mathbb{P}(E_3 | a^F = ns)$. It is easy to see that:

$$\mathbb{P}(E_1 | a^F = ns) = \frac{\mathbb{P}(\tilde{\delta} \leq \delta_{sep}) (\gamma_F + (1 - \gamma_F)\gamma_M)}{1 - (1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_{sep})} \quad (20)$$

$$\mathbb{P}(E_2 | a^F = ns) = \frac{1 - \mathbb{P}(\tilde{\delta} \leq \delta_{sep})}{1 - (1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_{sep})} \quad (21)$$

$$\mathbb{P}(E_3 | a^F = ns) = 0. \quad (22)$$

In this putative equilibrium if the investor observes the fund not selling, it must be that the manager has taken action $a = 0$, hence E_3 will never realise. We have already shown above that, conditional on events E_1 and E_2 , the investor will choose to retain at $t = 2$. Thus, if the investor observes $a^F = ns$ and retains the fund at $t = 1$, his expected payoff is:

$$(1 - \alpha)\mathbb{E}(P_2 | a^F = ns) - 2w + \mathbb{E}(\tilde{\pi}^I | a^F = ns),$$

¹²In particular, since the investor assigns probability zero at $t = 1$ to each of these continuation events, his $t = 1$ decision (which is what determines the behaviour of the fund) is unaffected by any assumptions about his behaviour under these events.

where

$$\begin{aligned} \mathbb{E}(\tilde{\pi}^I | a^F = \text{ns}) = & \\ & \mathbb{P}(E_1 | a^F = \text{ns}) [\mathbb{P}(\tau^F = g | E_1, a^F = \text{ns}) \pi_g^I + (1 - \mathbb{P}(\tau^F = g | E_1, a^F = \text{ns})) \pi_b^I] \\ & + \mathbb{P}(E_2 | a^F = \text{ns}) [\mathbb{P}(\tau^F = g | E_2, a^F = \text{ns}) \pi_g^I + (1 - \mathbb{P}(\tau^F = g | E_2, a^F = \text{ns})) \pi_b^I]. \end{aligned} \quad (23)$$

Simplifying, we have that if the investor observes $a^F = \text{ns}$ and retains the fund at $t = 1$, his expected payoff is:

$$(1 - \alpha)v - 2w + \bar{\pi}^I + \frac{\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}}) \gamma_F (1 - \gamma_F) (1 - \gamma_M)}{1 - (1 - \gamma_F)(1 - \gamma_M)} (\pi_g^I - \pi_b^I). \quad (24)$$

Instead, if the investor observes $a^F = \text{ns}$ and fires the fund, his expected payoff is:

$$(1 - \alpha)P_1 - w + \mathbb{E}(\tilde{\pi}_F^I) = (1 - \alpha)(v - \mathbb{E}_s(\delta_{\text{sep}})) - w + \bar{\pi}^I, \quad (25)$$

because he gets his share of the liquidating portfolio, he pays the fixed wage and receives the unconditional expected continuation payoff by being randomly matched to a fund at $t = 2$.

Hence, the investor will choose to retain the fund conditional on no sale if

$$(1 - \alpha)v - 2w + \bar{\pi}^I + \frac{\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}}) \gamma_F (1 - \gamma_F) (1 - \gamma_M)}{1 - (1 - \gamma_F)(1 - \gamma_M)} (\pi_g^I - \pi_b^I) \geq (1 - \alpha)(v - \mathbb{E}_s(\delta_{\text{sep}})) - w + \bar{\pi}^I \quad (26)$$

i.e.

$$(1 - \alpha)\mathbb{E}_s(\delta_{\text{sep}}) + \frac{\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}}) \gamma_F (1 - \gamma_F) (1 - \gamma_M)}{1 - (1 - \gamma_F)(1 - \gamma_M)} (\pi_g^I - \pi_b^I) \geq w \quad (27)$$

It is clear that, for a given $\{\alpha, w, \Theta\}$, as long as $\pi_g^I - \pi_b^I$ is large enough, equation (27) holds. It is also clear that the lower bound on $\pi_g^I - \pi_b^I$ is increasing in α , since $\mathbb{E}_s(\delta_{\text{sep}}) > 0$. Let us denote the relevant lower bound on $\pi_g^I - \pi_b^I$ as a function of α by $B_{\Delta\pi}(\alpha; w, \Theta)$.

If, instead, the investor observes that the fund sold at $t = 1$, if he fires the fund he gets:

$$(1 - \alpha)P_1 - w + \mathbb{E}(\tilde{\pi}^I) = (1 - \alpha)(v - \mathbb{E}_s(\delta_{\text{sep}})) - w + \bar{\pi}^I. \quad (28)$$

If instead he retains the fund, he needs to compute his expected continuation value. For this we note:

$$\mathbb{P}(E_1 | a^F = s) = 0 \quad (29)$$

$$\mathbb{P}(E_2 | a^F = s) = 0 \quad (30)$$

$$\mathbb{P}(E_3 | a^F = s) = 1, \quad (31)$$

and we have already shown that

$$\mathbb{P}(\tau^F = g | \mathbb{E}_3, a^F = s) = 0.$$

He knows, therefore, that in the only potential event that can arise at $t = 2$, he will wish to replace the fund. Thus, his expected payoff from retention is:

$$(1 - \alpha)P_1 - 2w + \bar{\pi}^I = (1 - \alpha)(v - \mathbb{E}_s(\delta_{\text{sep}})) - 2w + \bar{\pi}^I. \quad (32)$$

Thus, it is clear that the investor will fire at $t = 1$ if he observes a sale.

Thus, as long as $\pi_g^I - \pi_b^I$ is large enough, the investor retains the fund if and only if she chose not to sell at $t = 1$. We now show that, when α is small, the investor's behaviour leads the fund to deviate from her proposed equilibrium strategy.

Suppose the fund observes $a = 0$. If she chooses to hold, she is retained by the investor and thus gets

$$2w + \alpha \mathbb{E}(P_2 | a = 0) + \mathbb{P}(\text{retained in } t = 2)\pi^F = 2w + \alpha v + \pi^F.$$

If she chooses to sell she instead gets

$$w + \alpha P_1 = w + \alpha(v - \mathbb{E}_s(\delta_{\text{sep}})).$$

It is clear that she will always choose to hold.

Suppose the fund observes $a = 1$. If she sells, given the investor's strategy above, she is fired and receives

$$w + \alpha P_1 = w + \alpha(v - \mathbb{E}_s(\delta_{\text{sep}})).$$

If, instead, she chooses not to sell she will be retained at $t = 1$, but may or may not be fired at $t = 2$, depending on the investor's beliefs at the time. Upon observing $a = 1$, the fund realizes that the investor will observe event $(\mathbb{E}_3, \text{ns})$ at $t = 2$. As noted above, we are agnostic about the investor's beliefs upon observing such off-equilibrium events. Thus, the argument here must hold for *all possible* beliefs $\mathbb{P}(\tau^F = g | \mathbb{E}_3, a^F = \text{ns})$. From the fund's perspective, the *lowest possible* payoff from not selling arises if the investor fires for sure (which arises if $\mathbb{P}(\tau^F = g | \mathbb{E}_3, a^F = \text{ns}) < \gamma_F$). For all other possible off-equilibrium beliefs, the fund must assign at least positive probability to receiving, in addition to the payoffs at $t = 1$ and $t = 2$, a continuation payoff of $\pi_F > 0$ at $t = 2+$. Thus, a *upper bound* on the fund's payoff from not selling is:

$$2w + \mathbb{E}(P_2 | a = 1) = 2w + \alpha \left(v - \mathbb{E}(\tilde{\delta} | \tilde{\delta} \leq \delta_{\text{sep}}) \right).$$

Thus, a *necessary* condition for the the fund to adopt strategy

$$s_F(a) = \begin{cases} \text{ns} & \text{if } a = 0 \\ \text{s} & \text{if } a = 1, \end{cases} \quad (33)$$

is that

$$w + \alpha(v - \mathbb{E}_s(\delta_{\text{sep}})) \geq 2w + \alpha \left(v - \mathbb{E}(\tilde{\delta} | \tilde{\delta} \leq \delta_{\text{sep}}) \right), \quad (34)$$

which we can rewrite as:

$$\mathbb{E}(\tilde{\delta} | \tilde{\delta} \leq \delta_{\text{sep}}) \left[1 - \frac{(1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})}{\theta + (1 - \theta)(1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})} \right] \geq \frac{w}{\alpha}. \quad (35)$$

It is clear that fixing Θ , as $\frac{w}{\alpha}$ increases, inequality (35) is harder to satisfy. Let's define $B_{\frac{\alpha}{w}}(\Theta)$ as the smallest $\frac{\alpha}{w}$ satisfying inequality (35). Define $\underline{\alpha}(w, \Theta) = \frac{w}{B_{\frac{\alpha}{w}}(\Theta)}$ as the lowest α that satisfies inequality (35). Let

- (i) $\frac{\alpha}{w} < \frac{\underline{\alpha}(w, \Theta)}{w}$,
- (ii) $\pi_g^I - \pi_b^I > B_{\Delta\pi}(\underline{\alpha}(w, \Theta), w, \Theta)$.

Since $B_{\Delta\pi}(\underline{\alpha}(w, \Theta), w, \Theta)$ is increasing in α , for α and $\pi_g^I - \pi_b^I$ satisfying (i) and (ii) it is clear that inequality (27) holds and (35) does not, giving a contradiction. This concludes the formal argument. ■

We now proceed to discuss the intuition behind our result.

For exit to impose discipline, funds must sell in equilibrium if they observe the perverse action being taken. We show that the career concerns of funds—their desire to be retained by clients—endogenously prevent them from acting in this manner. Since good funds can eliminate the perverse action without the need to exit, the only funds that can be seen to exit must be the bad ones. But then exit reveals that the fund is of the bad type, which will induce the investor to fire the fund—keeping a fund on an extra period is expensive to investors because in each period that they do so, they pay an uncontingent assets-under-management fee w for employing the fund. When observing the perverse action being taken, the bad fund therefore faces the choice between two options: She may either hold the block, be retained by the investor and earn w for an extra period, but suffer from an α -share of smaller profits at $t = 2$ or she may sell the block early, be fired by the investor and lose the assets-under-management fee for the second period, but realize larger profits on the actual position. When w is large and α is small, the former option is more attractive. This is the first of two conditions identified in Proposition 1.

However, notice that for the argument above to be valid, it is not just necessary for the investor to fire the fund conditional on an early block sale, but also to retain the fund in the absence of such a sale. Why would the investor choose to pay w for an extra period when the fund cannot take any further productive actions on his behalf during $t = 2$? He would do so because by retaining the fund, he gathers further information about her type.

Since in the continuation game the investor would rather be matched with a good than a bad fund, this additional information about the type is valuable to the investor. Indeed, it is most valuable—and worth paying w for an extra period—precisely when good and bad funds produce significantly different continuation values for the investor, i.e., when $\pi_g^I - \pi_b^I$ is large enough. This is the second condition identified in Proposition 1.

It is also worth commenting on the applied relevance of these two conditions. The second condition (a lower bound on $\pi_g^I - \pi_b^I$) identifies circumstances under which investors endogenously retain funds if and only if they have not sold at $t = 1$. When funds sell at $t = 1$ their portfolio value is lower than it would have been at $t = 1$ had they not sold. Thus, the second condition guarantees that investors retain funds with relatively high $t = 1$ portfolio values and replace those with low $t = 1$ portfolio values. In other words, investors chase short-term performance. Short-term performance chasing by investors appears to be a robust feature of the data, and holds *across* very different classes of delegated portfolio managers. For example, flow performance relationships have been identified both for mutual funds (e.g. Chevalier and Ellison (1997)) and for hedge funds (e.g. Agarwal, Daniel, and Naik (2009)). In contrast, the first condition (a lower bound on $\frac{\alpha}{w}$) *separates* different types of funds. For example, at one end of the spectrum, US mutual funds receive typically purely uncontingent fees.¹³ In contrast, at the other end of the spectrum, hedge funds receive a significant component of their compensation from contingent fees explicitly linked to portfolio value.

Finally, from a theoretical perspective, it is worth noting that while the two conditions in Proposition 1 are *jointly* sufficient for our result—absent restrictions on the set of parameters (Θ, w, α) —they are *individually* necessary. It is clear that, if $\pi_g^I - \pi_b^I$ is large enough to guarantee that investors will retain the fund if and only if she does not sell but α is large relative to w , the fund will still prefer (despite the presence of career concerns) to sell upon observing $a = 1$. Similarly, even if α was sufficiently small relative to w , if $\pi_g^I - \pi_b^I$ is small, then—depending on the parameters (Θ, w, α) —it is possible that the fund would *always* be replaced at $t = 1$, and therefore may as well maximize portfolio value which is achieved by selling early whenever $a = 1$.

To conclude this section, we provide a variation of our main result. We have shown that sufficient career concerns on the part of delegated blockholders precludes the existence of equilibria in which blockholders can punish funds *non-stochastically* when they take the perverse action. The careful reader may wonder if it is possible, despite the career concerns of delegated blockholders, to have equilibria in which, if the manager takes the perverse action, the delegated blockholder punishes him with *arbitrarily* high probability $\mu < 1$. While threats involving mixed strategies are, in our view, of limited applied relevance, we nevertheless show

¹³ Elton, Gruber, and Blake (2003) note that over 97% of US mutual funds charge purely flat fees.

that even such stochastic punishment fails in the presence of sufficient career concerns. In particular, we show that:

Proposition 2 *There exists $\hat{\mu} \in (0, 1)$ such that for any $\mu \geq \hat{\mu}$ there are bounds $B_{\Delta\pi}(\mu)$ and $B_{\frac{\alpha}{w}}(\mu)$ such that if $\pi_g^I - \pi_b^I > B_{\Delta\pi}(\mu)$ and $\frac{\alpha}{w} < B_{\frac{\alpha}{w}}(\mu)$, it cannot be an equilibrium for the fund to choose to sell with probability μ if and only if she observes $a = 1$ because, upon observing $a = 1$, the fund will strictly prefer not to sell.*

This and all subsequent proofs are provided in the appendix. Taken together, Propositions 1 and 2 show that exit cannot act as an effective disciplining device when delegated blockholders are principally concerned about retention. Needless to say, while Propositions 1 and 2 establish impossibility results, in order to have empirical content, we need to delineate what happens in equilibrium. In the next section, we address this question.

6 Who Exits in Equilibrium and Who Does Not

In this section, we construct equilibria with minimal and maximal amounts of exit. We begin with the case of minimal exit. For an important class of institutional investors, our result shows that exit can be an entirely ineffective disciplining device in equilibrium.

Proposition 3 *For $\frac{\alpha}{w}$ small enough and $\pi_g^I - \pi_b^I$ large enough, there is an equilibrium in which*

- (i) *The patient investor fires a fund if she sells at $t = 1$ and retains her otherwise;*
- (ii) *No fund sells at $t = 1$ regardless of the action chosen by the manager.*

The proposition identifies two conditions under which there is an equilibrium with no exit. The conditions are qualitatively similar to those of Proposition 1. First, the fund must be sufficiently more interested in flows than in profits. Second, the investor must care sufficiently more about being matched with a good than a bad fund. A voluntary sale at $t = 1$ is an off-equilibrium event which leads to the replacement of the fund. In contrast, the lack of a voluntary sale leads to retention, because by retaining the fund the investor gains further information about her type—which is most valuable exactly when $\pi_g^I - \pi_b^I$ is high. Since the investor is willing to pay w for an extra period if the fund does not sell at $t = 1$, a sufficiently flow motivated fund does not sell even upon observing the perverse action because she is willing to sacrifice profits for flows.

We then move on to consider the polar opposite case, where exit occurs whenever the manager takes the perverse action. Needless to say, exit cannot arise in equilibrium if both the conditions identified in Proposition 1 are satisfied. However, as we have noted above, the

two conditions are jointly sufficient but are individually necessary. Thus, there is a degree of freedom in relaxing these conditions in order to construct equilibria with exit. Since our main applied motivation in this section is to theoretically delineate the prevalence of exit across different classes of delegated portfolio managers, we feel that it is appropriate to motivate our choice on the basis of what is ex ante empirically plausible. Given the empirical relevance of short-term performance chasing by investors across different types of delegated portfolio managers (see the discussion in section 5), we therefore maintain the assumption that guarantees that investors retain only those funds who have performed relatively better in the recent past. Fixing this assumption, we show that, if $\frac{\alpha}{w}$ is large, exit can function effectively as a disciplining device. In particular, we show that:

Proposition 4 *For $\frac{\alpha}{w}$ and $\pi_g^I - \pi_b^I$ large enough, there is an equilibrium in which*

- (i) The patient investor fires a fund if she sells at $t = 1$ and retains her otherwise.*
- (ii) The fund sells at $t = 1$ whenever the manager chooses $a = 1$.*

Propositions 3 and 4 generate clear empirical implications. In Proposition 3, we have shown that for $\frac{\alpha}{w}$ small enough, a delegated blockholder will never be effective in using exit to discipline management. In Proposition 4, we have shown that for $\frac{\alpha}{w}$ large enough, there will be equilibria in which delegated blockholders can credibly threaten management with exit. Thus, the effectiveness of exit as a governance mechanism will be determined by variations in the contractual incentives of the delegated blockholder.¹⁴

Across the different classes of delegated portfolio managers, there is clear variation in the size of $\frac{\alpha}{w}$. As mentioned above, mutual funds typically receive no explicit profit-based compensation. Thus, the vast majority of mutual funds have $\frac{\alpha}{w} = 0$. Other portfolio managers, such as hedge funds, for example, derive a significant fraction of their payoffs from explicit profit-based compensation. For these investment vehicles, $\frac{\alpha}{w} \gg 0$. Thus, our results taken together suggest that mutual funds would be less effective in using exit as a disciplining device than hedge funds. This is a testable implication of our model. While we are aware of no direct empirical examination of this prediction, as we have pointed out in the introduction, this result is broadly consistent with an existing body of empirical evidence.

¹⁴A critique of our results may argue that variation in the contractual parameters is not necessarily relevant for exit because, if $\pi_g^I - \pi_b^I$ is small, then even low $\frac{\alpha}{w}$ funds (i.e., mutual funds) will use exit. However, we note that this critique requires that $\pi_g^I - \pi_b^I$ is small for low $\frac{\alpha}{w}$ funds, i.e., for mutual funds, which implies that mutual fund investors do not chase performance. This is highly counterfactual, as there is a wealth of empirical evidence to the contrary.

7 Discussion

In this section, we discuss some of our modelling assumptions and conclusions. We begin by discussing the nature of the inferences made by investors who observe early liquidation of blocks by their funds.

7.1 Could exit be a good signal of managerial ability?

Our core observation (Proposition 1) relies on the fact that investors who observe that their fund sold conclude that she will not generate high returns for them in the future. This is because the need to execute on a threat to exit implies that this fund was unable to prevent management from acting perversely (or perhaps chose the wrong firm to hold a block in, see footnote 7). Needless to say, implicit in this conclusion is a modelling choice: observable evidence of governance via exit is a negative signal, because fund managers who hold blocks are distinguished by their ability to influence management (or by their ability to select the right set of firms to hold blocks in). While this assumption seems more natural to us in a corporate governance context, it is conceivable to construct alternative models in which delegated blockholders—while being identical in other ways—differ only in their ability to observe the actions of management in firms in which they hold blocks. In such models, it is possible for exit to be a *positive* signal, because it signals to investors that the exiting fund knows that management is acting suboptimally. Are our results robust to such a modification?

We would argue that—as in our baseline model—the career concerns of delegated blockholders would again interfere with the ability of exit to effectively discipline management. If exit is a good signal of ability, career concerned blockholders would exit excessively, i.e., they would exit not because the manager had taken a perverse action but because they wished to attract or retain flows. Any incentive mechanism that breaks the precise link between the action choice of the manager and the exit of the blockholder would make exit less effective as a form of voice. To formalize this intuition, we develop a simple model in the appendix (see section 8.1) in which funds are distinguished by the quality of their information about the internal working of firms in which they hold blocks. Firms are heterogeneous in the degree to which they suffer from agency problems, with differences arising from the extent of private benefits that the management can extract by effort avoidance. We show that when blockholders are career concerned, excessive exit will arise—and thus limit the disciplinary ability of exit—exactly for those firms in which the moral hazard problem is most severe. It is for these firms that exit will endogenously be viewed as a positive signal of ability on the part of the delegated blockholder. Consequently, for these firms, a career concerned blockholder will exit too often, breaking the link between managerial misbehaviour and punishment by

blockholders.

While the core economic content of our results are thus robust to this alternative formulation of managerial ability, we should note that the two alternative models of exit differ in their empirical plausibility. If exit was viewed as a positive signal about ability (as in the alternative formulation), then exit should be associated with inflows (or the lack of exit with outflows). Since exit lowers share prices, and thus indirectly the portfolio value of the fund (the sale of a block is likely to have a first-order effect on the value of even a large fund), the alternative model would require investor flows to be *negatively* related to performance at least over some range. This is highly counterfactual. The empirical literature presents persuasive evidence for the existence of an increasing flow-performance relationship. In contrast to the alternative, our baseline mechanism is consistent with an *increasing* flow-performance relationship. Indeed, such a flow performance relationship is (endogenously) instrumental in our baseline model: It is exactly when investors observe low performance at $t = 1$ that they fire the fund (i.e., withdraw their funds).

7.2 Non-linear compensation for money managers

In our baseline analysis we have assumed that, in addition to the essentially universal uncontingent assets under management fee, the fund receives an α -share of realized portfolio value. In reality, funds often receive compensation that takes the form of a “2 and 20” contract: a 2% uncontingent assets under management fee plus 20% of realized *profits* (i.e., $\max(\text{profits}, 0)$). It is worth noting that our core results would not change if we introduced such non-linear payoffs for funds.

Our results only rely on the relative value of the portfolio values from early vs late liquidation if the manager took the perverse action. At no stage does our analysis require that the explicit compensation of the fund be negative. Thus, conditional on $a = 1$, if p_E represents the portfolio value from early liquidation, and p_L represents the portfolio value from late liquidation, our analysis uses only the fact that $p_E > p_L$. Suppose the block was initially established at some (unmodelled) price p_0 . Then $p_E > p_L$ implies that $\max(p_E - p_0, 0) \geq \max(p_L - p_0, 0)$, with strict inequality unless $p_0 \geq p_E > p_L$. Except in this perverse latter case, our qualitative analysis remains unchanged: the fund’s career concerns push her in the direction of not exiting, while her profit motivations push her to do the opposite. Thus, more career concerned funds will not exit, while less career concerned funds will. In the perverse case in which $p_0 \geq p_E > p_L$, profit motivations no longer affect the choice to exit, and the only remaining motivation remains the fund’s career concerns. In this case, no fund would choose to exit, *regardless* of the relative sizes of α and w .

7.3 Is delegation rational?

The empirical relevance of Proposition 3 is predicated on the existence of investors who would choose to invest in delegated funds with low α and high w in spite of their inability to use exit as a disciplining mechanism. There are two separate components to this question. First, since funds with high α and low w (e.g. hedge funds) generate higher value through exit than funds with low α and high w , it is clear that investors would prefer to invest in hedge funds rather than in mutual funds. It is clear that there are a variety of frictions that lead to the segmentation of markets with regard to delegated portfolio management. Investment in hedge funds requires, for example, that the investors pass significant net-worth thresholds which make hedge funds inaccessible for large groups of retail investors. However, despite the evident existence of such a class of investors, it is also relevant to ask whether those investors who can only access mutual funds would prefer to do so (despite the payment of fees and the perverse behaviour identified in Proposition 3) rather than invest in the storage asset.¹⁵ To answer this question we compute the ex ante expected utility for the investor at time 0:

$$U^I(\delta_{\text{pool}}) = (1 - \alpha) [v - \theta \mathbb{E}_s(\delta_{\text{pool}}) - (1 - \theta) \mathbb{E}_{ns}(\delta_{\text{pool}})] - w(2 - \theta) \\ + (1 - \theta) [\bar{\pi} + \gamma_F(1 - \gamma_F)(1 - \gamma_M)(\pi_g^I - \pi_b^I)] \geq 1$$

The first term refers to the investors share of the liquidated portfolio value, the second term refers to the payment of the uncontingent fee, and the final term arises from the additional value obtained by each investor from learning about the fund from delegation. We can rewrite this as follows:

$$U^I(\delta_{\text{pool}}) = (1 - \alpha) \left[v - (1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}) \mathbb{E}(\tilde{\delta} \mid \tilde{\delta} \leq \delta_{\text{pool}}) \right] - w(2 - \theta) \\ + (1 - \theta) [\bar{\pi} + \gamma_F(1 - \gamma_F)(1 - \gamma_M)(\pi_g^I - \pi_b^I)] \geq 1. \quad (36)$$

Fixing $(\alpha, w, \Theta, \pi_g^I - \pi_b^I)$ to satisfy the conditions of Proposition 3, it is clear that if v is large enough this inequality is satisfied.¹⁶

¹⁵One could think of the storage asset as some benchmark portfolio, so that the returns from investing in active management with blockholding are viewed as being *relative* to such an alternative.

¹⁶An alternative comparison that we could have done is the delegation with pooling vs non-delegated blockholding by a coalition of investors. Here too, since good funds can eliminate the perverse action with probability one and bad funds only with some positive probability there will be conditions that guarantee the optimality of delegation. However, we would argue that this condition is not economically meaningful as small investors do not meaningfully have the ability to participate directly in blockholding.

8 Conclusions

Blockholders are often seen as a solution to the problems arising from the separation of ownership and control in publicly traded corporation. In order for the various elements of blockholder activism to be successful, it may be helpful for blockholders to be able to credibly threaten management by exit. Admati and Pfleiderer (2009) show that the threat of exit can be an effective form of corporate governance when the blockholder is a profit-maximizing principal. Motivated by the prevalence of equity blocks that are held by delegated portfolio managers, we analyze whether agency frictions arising out of delegated portfolio management—career concerns—may affect the ability of blockholders to govern through exit.

We show that when blockholders are sufficiently career concerned, exit will fail as a disciplining device. Our results have testable implications on the relative degree to which different classes of delegated portfolio managers use exit as a form governance. We relate our results to the existing empirical literature on corporate governance by institutional blockholders and argue that there is both direct and indirect empirical evidence in support of our findings.

Our analysis examines the interplay of two distinct agency problems: between the managers and equity holders of firms on the one hand, and between delegating investors and their portfolio managers on the other. Both of these problems are ubiquitous. Our results suggest that the two agency problems interact in crucial ways: the existence of the latter may undermine traditional solutions to the former. Needless to say, our analysis represents only a benchmark first step, and much remains to be done. It may be interesting, for example, to examine how the career concerns of delegated portfolio managers interact with Edmans’s (2009) elegant formulation for governance via exit. Edmans shows how blockholder trading can impound information into prices giving rise to better governance. In a different context, Dasgupta and Prat (2006, 2008) have examined the link between the career concerns of money managers and the price-informativeness of assets they trade. The exploration of such interactions is an interesting direction for future research.

Appendix

Derivation of equation 12: We show that expected change of the firm when the fund sells is

$$\mathbb{E} \left(\tilde{a}\tilde{\delta} \mid a^F = s \right) = \mathbb{E}_s(\delta_{\text{sep}}) = \frac{(1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta} \mid \tilde{\delta} \leq \delta_{\text{sep}})\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})}{\theta + (1 - \theta)(1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})}, \quad (37)$$

where

$$\tilde{a} := s_M(\tilde{\delta}) = \begin{cases} 0 & \text{if } a = 0 \\ 1 & \text{if } a = 1. \end{cases} \quad (38)$$

We call $\tilde{e} \in \{e, ne\}$ a random variable that is equal to e if the fund costlessly eliminates the manager's perverse action, for example through voice, whereas it is equal to ne when the perverse action is not eliminated and the fund has only access to exit as a disciplining device. We also introduce another random variable $\tilde{l} = \{ls, nls\}$ that indicates whether the fund has been hit by a liquidity shock.

Let's fix the strategy of the fund: she sells if she observes the perverse action or if she is hit by a liquidity shock, and does not sell otherwise. Recall that only the bad fund can observe $a = 1$ because the good fund has eliminated access to the perverse action for the manager. Hence,

$$s_F(a, \tau^F, \tilde{l}) = \begin{cases} s & \text{if } a = 1 \text{ and } \tau^F = b \text{ or if } \tilde{l} = ls, \\ ns & \text{otherwise.} \end{cases} \quad (39)$$

The manager's strategy, which is a best response to the fund's strategy, is

$$s_M(\delta, \tilde{e}, \tau^F) = \begin{cases} 1 & \text{if } \delta \leq \delta_{\text{sep}} \text{ and } \tilde{e} = ne \text{ and } \tau^F = b \\ 0 & \text{otherwise.} \end{cases} \quad (40)$$

Then,

$$\begin{aligned} \mathbb{E}(\tilde{a}\tilde{\delta} | a^F = s) &= \mathbb{E} \left[\mathbf{1}_{\{s_M(\tilde{\delta}, \tilde{e}, \tau^F) = 1\}} \tilde{\delta} \mid a^F = s \right] = \\ &= \frac{1}{\mathbb{P}(a^F = s)} \mathbb{E} \left[\mathbf{1}_{\{s_M(\tilde{\delta}, \tilde{e}, \tau^F) = 1\}} \mathbf{1}_{\{a^F = s\}} \tilde{\delta} \right] \\ &= \frac{1}{\mathbb{P}(a^F = s)} \mathbb{E} \left[\mathbf{1}_{\{\tilde{\delta} \leq \delta_{\text{sep}}\} \cap \{\tilde{e} = ne\} \cap \{\tau^F = b\}} \cap \{\tilde{\delta} \leq \delta_{\text{sep}}\} \cap \{\tau^F = b\} \cup \{\tilde{l} = ls\}} \tilde{\delta} \right] \\ &= \frac{1}{\mathbb{P}(a^F = s)} \mathbb{E} \left[\mathbf{1}_{\{\tilde{\delta} \leq \delta_{\text{sep}}\}} \mathbf{1}_{\{\tau^F = b\}} \mathbf{1}_{\{\tilde{e} = ne\} \cap \{\tilde{l} = ls\}} \tilde{\delta} \right] \\ &= \frac{1}{\mathbb{P}(a^F = s)} \mathbb{E} \left[\mathbf{1}_{\{\tilde{\delta} \leq \delta_{\text{sep}}\}} \mathbf{1}_{\{\tau^F = b\}} \mathbf{1}_{\{\tilde{e} = ne\}} \tilde{\delta} \right] \end{aligned}$$

Given independence, we have that

$$\begin{aligned} \mathbb{E}(\tilde{a}\tilde{\delta} | a^F = s) &= \frac{1}{\mathbb{P}(a^F = s)} \mathbb{P}[\tilde{e} = ne] \mathbb{P}[\tau^F = b] \mathbb{E} \left[\mathbf{1}_{\{\tilde{\delta} \leq \delta_{\text{sep}}\}} \tilde{\delta} \right] \\ &= \frac{(1 - \gamma_M)(1 - \gamma_F) \mathbb{E} \left[\mathbf{1}_{\{\tilde{\delta} \geq \delta_{\text{sep}}\}} \tilde{\delta} \right]}{\theta + (1 - \theta)(1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})} \\ &= \frac{(1 - \gamma_F)(1 - \gamma_M) \mathbb{E}(\tilde{\delta} | \tilde{\delta} \leq \delta_{\text{sep}}) \mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})}{\theta + (1 - \theta)(1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})}. \end{aligned}$$

Proof of the uniqueness of the manager's cutoff in the putative disciplining equilibrium: If $\delta_{\text{sep}} < \bar{\delta}$ is a cutoff, then $\beta - \omega_1(1 - \theta)(\mathbb{E}_s(\delta_{\text{sep}}) - \mathbb{E}_{ns}(\delta_{\text{sep}})) - \omega_2\delta_{\text{sep}} = 0$ where

$$\mathbb{E}_s(\delta_{\text{sep}}) = \frac{(1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \leq \delta_{\text{sep}})\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})}{\theta + (1 - \theta)(1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})} \quad (41)$$

and

$$\mathbb{E}_{ns}(\delta_{\text{sep}}) = 0. \quad (42)$$

The cutoff will be unique if $\mathbb{E}_s(\delta_{\text{sep}}) - \mathbb{E}_{ns}(\delta_{\text{sep}})$ is increasing in δ_{sep} ; this difference is simply equal to $\mathbb{E}_s(\delta_{\text{sep}})$ which it is easy to see that is increasing in δ_{sep} . In fact,

$$\mathbb{E}_s(\delta_{\text{sep}}) - \mathbb{E}_{ns}(\delta_{\text{sep}}) = \mathbb{E}_s(\delta_{\text{sep}}) = \frac{(1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \leq \delta_{\text{sep}})}{\frac{\theta}{\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})} + (1 - \theta)(1 - \gamma_F)(1 - \gamma_M)}, \quad (43)$$

is increasing in δ_{sep} since both $\mathbb{E}(\tilde{\delta}|\tilde{\delta} \leq \delta_{\text{sep}})$ and $\mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})$ are increasing in δ_{sep} .

Proof of Proposition 2: The structure of the proof is similar to that of Proposition 1. We sketch the proof here, highlighting only the points of departure from that argument. Consider any putative equilibrium in which the fund's strategy is to sell with probability μ if $a = 1$ and not to sell otherwise. The manager's expected utility from $a = 0$ remains unchanged (see 8) whereas his utility from $a = 1$ changes from (7) to

$$\beta + \omega_1 \{v - \theta\mathbb{E}_s - (1 - \theta)[\mu\mathbb{E}_s + (1 - \mu)\mathbb{E}_{ns}]\} + \omega_2(v - \delta). \quad (44)$$

As before the manager's strategy will be characterized by a threshold δ_μ which is now implicitly defined by:

$$\delta_\mu = \frac{\beta - \omega_1(1 - \theta) \mu (\mathbb{E}_s(\delta_\mu) - \mathbb{E}_{ns}(\delta_\mu))}{\omega_2}, \quad (45)$$

where

$$\mathbb{E}_s(\delta_\mu) = \frac{(1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \leq \delta_\mu)\mathbb{P}(\tilde{\delta} \leq \delta_\mu)(\theta + (1 - \theta)\mu)}{\theta + \mu(1 - \theta)(1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_\mu)} \quad (46)$$

and

$$\mathbb{E}_{ns}(\delta_\mu) = \frac{(1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \leq \delta_\mu)\mathbb{P}(\tilde{\delta} \leq \delta_\mu)(1 - \mu)}{1 - \mu(1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_\mu)}. \quad (47)$$

The threshold δ_μ is uniquely defined as long as $\mathbb{E}_s(\delta_\mu) - \mathbb{E}_{ns}(\delta_\mu)$ is increasing in δ_μ . This is true as long as μ is not too small as the following lemma shows:

Lemma 5 *There exists a $\hat{\mu} \in (0, 1)$ such that for $\mu \geq \hat{\mu}$, $\mathbb{E}_s(\delta_\mu) - \mathbb{E}_{ns}(\delta_\mu)$ is increasing in δ_μ .*

Proof of Lemma: Let $A = (1 - \gamma_F)(1 - \gamma_M)$, $E(\delta_\mu) = \mathbb{E}(\tilde{\delta} | \tilde{\delta} \leq \delta_\mu)$, and $P(\delta_\mu) = \mathbb{P}(\tilde{\delta} \leq \delta_\mu)$. Note that E and P are both increasing functions of δ_μ . Then,

$$\mathbb{E}_s(\delta_\mu) = \frac{AE(\delta_\mu)(\theta + (1 - \theta)\mu)}{\frac{\theta}{P(\delta_\mu)} + \mu(1 - \theta)A},$$

which is clearly monotone increasing in δ_μ . Denoting the denominator by D ,

$$\frac{\partial}{\partial \delta_\mu} \mathbb{E}_s(\delta_\mu) = \frac{A(\theta + (1 - \theta)\mu)}{D^2} \left(\left(\frac{\theta}{P(\delta_\mu)} + \mu(1 - \theta)A \right) E' + E(\delta_\mu) \frac{\theta}{P(\delta_\mu)^2} P' \right),$$

which is clearly bounded below by a strictly positive number for all μ . In addition,

$$\mathbb{E}_{ns}(\delta_\mu) = \frac{AE(\delta_\mu)(1 - \mu)}{\frac{1}{P(\delta_\mu)} - \mu A},$$

which is clearly also monotone increasing. Again, denoting the denominator by D :

$$\frac{\partial}{\partial \delta_\mu} \mathbb{E}_{ns}(\delta_\mu) = \frac{A(1 - \mu)}{D^2} \left(\left(\frac{1}{P(\delta_\mu)} - \mu A \right) E' + E(\delta_\mu) \frac{1}{P(\delta_\mu)^2} P' \right).$$

This implies that $\frac{\partial}{\partial \delta_\mu} \mathbb{E}_{ns}(\delta_\mu)$ converges continuously to 0 as $\mu \rightarrow 1$. Thus, there exists a $\hat{\mu} \in (0, 1)$ such that for $\mu \geq \hat{\mu}$, $\mathbb{E}_s(\delta_\mu) - \mathbb{E}_{ns}(\delta_\mu)$ is increasing in δ_μ . This concludes the proof of the lemma. \square

Consider first the best response of the patient investor at $t = 2$. Define the events E_1 , E_2 , and E_3 as before, so that at $t = 2$ the investor observes elements of the cross product $\{E_1, E_2, E_3\} \times \{s, ns\}$. In contrast to the proof of Proposition 1, now events $(E_1, a^F = ns)$, $(E_2, a^F = ns)$, $(E_3, a^F = ns)$, and $(E_3, a^F = s)$ can arise in equilibrium, and the posterior attached at $t = 2$ for each of these events is as follows:

$$\mathbb{P}(\tau^F = g | E_1, a^F = ns) = \frac{\gamma_F}{\gamma_F + (1 - \gamma_F)\gamma_M} > \gamma_F \quad (48)$$

$$\mathbb{P}(\tau^F = g | E_2, a^F = ns) = \gamma_F, \quad (49)$$

$$\mathbb{P}(\tau^F = g | E_3, a^F = ns) = 0 \quad (50)$$

$$\mathbb{P}(\tau^F = g | E_3, a^F = s) = 0. \quad (51)$$

This implies that the investor retains at $t = 2$ in the first two events and replaces at $t = 2$ in the last two events. As before, we make no assumption about the investor's behaviour in the other two events.

At $t = 2$, if the patient investor observes $a^F = \text{ns}$, he computes:

$$\mathbb{P}(E_1 | a^F = \text{ns}) = \frac{\mathbb{P}(\tilde{\delta} \leq \delta_\mu) (\gamma_F + (1 - \gamma_F)\gamma_M)}{1 - (1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_\mu) \mu} \quad (52)$$

$$\mathbb{P}(E_2 | a^F = \text{ns}) = \frac{1 - \mathbb{P}(\tilde{\delta} \leq \delta_\mu)}{1 - (1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_\mu) \mu} \quad (53)$$

$$\mathbb{P}(E_3 | a^F = \text{ns}) = \frac{(1 - \gamma_F)(1 - \gamma_M)(1 - \mu) \mathbb{P}(\tilde{\delta} \leq \delta_\mu)}{1 - (1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_\mu) \mu}. \quad (54)$$

Thus, if the investor observes $a^F = \text{ns}$ and retains the fund at $t = 1$, his expected payoff can be written as:

$$(1 - \alpha)(v - \mathbb{E}_{ns}(\delta_\mu)) - 2w + \bar{\pi}^I + \frac{\mathbb{P}(\tilde{\delta} \leq \delta_\mu) \gamma_F (1 - \gamma_F) (1 - \gamma_M)}{1 - (1 - \gamma_F)(1 - \gamma_E) \mathbb{P}(\tilde{\delta} \leq \delta_\mu) \mu} (\pi_g^I - \pi_b^I). \quad (55)$$

Instead, if the investor observes $a^F = \text{ns}$ and fires the fund, his expected payoff is:

$$(1 - \alpha)P_1 - w + \mathbb{E}(\tilde{\pi}_F^I) = (1 - \alpha)(v - \mathbb{E}_s(\delta_\mu)) - w + \bar{\pi}^I. \quad (56)$$

Hence, the investor will choose to retain the fund conditional on no sale if

$$(1 - \alpha)(\mathbb{E}_s(\delta_\mu) - \mathbb{E}_{ns}(\delta_\mu)) + \frac{\mathbb{P}(\tilde{\delta} \leq \delta_\mu) \gamma_F (1 - \gamma_F) (1 - \gamma_M)}{1 - (1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_\mu) \mu} (\pi_g^I - \pi_b^I) \geq w \quad (57)$$

It is clear that, for a given $\mu \geq \hat{\mu}$ and $\{\alpha, w, \Theta\}$, as long as $\pi_g^I - \pi_b^I$ is large enough, equation (57) holds. It is also clear that the lower bound on $\pi_g^I - \pi_b^I$ is increasing in α , since $\mathbb{E}_s(\delta_\mu) - \mathbb{E}_{ns}(\delta_\mu) > 0$. Let us denote the relevant lower bound on $\pi_g^I - \pi_b^I$ by $B_{\Delta\pi}(\mu)$.

If the investor observes a sale at $t = 1$, an argument identical to that in Proposition 1 establishes that it is optimal for him to fire the fund immediately.

Finally, we turn to the fund's best response. The case for when a fund observes $a = 0$ is identical to that in Proposition 1. When the fund observes $a = 1$, in the putative equilibrium with $\mu \in (0, 1)$ she must be indifferent between selling and not selling at $t = 1$. If she sells her expected payoff is:

$$\alpha P_1 + w = \alpha(v - \mathbb{E}_s(\delta_\mu)) + w \quad (58)$$

whereas if she does not sell and condition (57) holds then she is retained at $t = 1$ and gets:

$$\alpha(v - \mathbb{E}(\tilde{\delta} | \tilde{\delta} \leq \delta_\mu)) + 2w \quad (59)$$

Therefore, it must be the case that

$$\alpha(v - \mathbb{E}_s(\delta_\mu)) + w = \alpha(v - \mathbb{E}(\tilde{\delta} | \tilde{\delta} \leq \delta_\mu)) + 2w, \quad (60)$$

i.e.

$$\mathbb{E}(\tilde{\delta}|\tilde{\delta} \leq \delta_\mu) \left[\frac{\theta(1 - (1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_\mu))}{\theta + \mu(1 - \theta)(1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_\mu)} \right] = \frac{w}{\alpha}. \quad (61)$$

It is clear that fixing Θ and $\mu \geq \hat{\mu}$, we can find a $\frac{\alpha}{w}$ that satisfies equation (61). Let's define $B_{\frac{\alpha}{w}}(\mu)$ as the $\frac{\alpha}{w}$ satisfying the equality above. Let

$$(i) \quad \pi_g^I - \pi_b^I > B_{\Delta\pi}(\mu)$$

$$(ii) \quad \frac{\alpha}{w} < B_{\frac{\alpha}{w}}(\mu).$$

Since $B_{\Delta\pi}(\mu)$ is increasing in α , for α and $\pi_g^I - \pi_b^I$ satisfying (i) and (ii) it is clear that inequality (57) holds and (61) does not, giving a contradiction.¹⁷ ■

Proof of Proposition 3: We construct a perfect Bayesian equilibrium in which the action of the bad fund who observes the perverse action is the same as the action of the fund who observes the non-perverse action.

We denote the equilibrium by a triplet (s_M, s_F, s_I) of strategies for the three sets of players.

Let's start with the manager's strategy. The manager's expected utility if he chooses $a = 1$ is

$$\beta + \omega_1 [v - \theta\mathbb{E}_s - (1 - \theta)\mathbb{E}_{ns}] + \omega_2(v - \delta). \quad (62)$$

This is because he knows that at time 1 the fund is going to sell only if the investor is hit by a liquidity shock (which happens with probability θ). Similarly, the manager's expected utility if $a = 0$ is

$$\omega_1 [v - \theta\mathbb{E}_s - (1 - \theta)\mathbb{E}_{ns}] + \omega_2 v, \quad (63)$$

Hence, the strategic manager's strategy is:

$$s_M(\delta) = \begin{cases} 1 & \text{if } \beta - \omega_2\delta \geq 0 \\ 0 & \text{otherwise.} \end{cases} \quad (64)$$

Since $\beta - \omega_2\delta \geq 0$ is decreasing in δ if the manager prefers to take the perverse action for a given δ , he must strictly prefer to take action for all smaller values. An equilibrium is then characterised by a cutoff point δ_{pool} , such that the manager takes action for any $\delta \leq \delta_{\text{pool}}$. The cutoff point δ_{pool} is

$$\delta_{\text{pool}} = \frac{\beta}{\omega_2} \quad (65)$$

¹⁷It is, of course, possible to violate equality (61) by picking $\frac{\alpha}{w} > B_{\frac{\alpha}{w}}(\mu)$. However, in this case $\mu = 1$, because the fund strictly prefers selling to not selling. This case has been dealt with already in Proposition 1.

and is unique. Now, we can compute \mathbb{E}_s and \mathbb{E}_{ns} as functions of δ_{pool} as follows (we show detailed computations separately later in the appendix):

$$\mathbb{E}_s(\delta_{\text{pool}}) = \mathbb{E}_{ns}(\delta_{\text{pool}}) = (1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta}|\tilde{\delta} \leq \delta_{\text{pool}})\mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}). \quad (66)$$

We now proceed to compute the strategy of the patient investor.

The investor's decision at $t = 1$ relies on what inference he expects to make at $t = 2$. At $t = 2$ the investor will observe one of the following three mutually exclusive and exhaustive events:

$$E_1 = \{\delta \leq \delta_{\text{pool}}\} \cap \{a = 0\} \quad (67)$$

$$E_2 = \{\delta > \delta_{\text{pool}}\} \cap \{a = 0\} \quad (68)$$

$$E_3 = \{a = 1\} \quad (69)$$

In addition, the investor will have observed either $a^F = s$ or $a^F = ns$ at $t = 1$. Thus, the investor's information set consists of six possible paired events, which are the elements of

$$\{E_1, E_2, E_3\} \times \{s, ns\}.$$

Each of these events conveys different information to the investor and may affect his retention vs firing decision at $t = 2$. We first consider the events that can arise on the putative equilibrium path. These are $(E_1, a^F = ns)$, $(E_2, a^F = ns)$, and $(E_3, a^F = ns)$. For each of these cases, the investor can compute the probability that he is matched with a good fund using Bayes Rule as follows:

$$\mathbb{P}(\tau^F = g|E_1, a^F = ns) = \frac{\gamma_F}{\gamma_F + (1 - \gamma_F)\gamma_M} > \gamma_F \quad (70)$$

$$\mathbb{P}(\tau^F = g|E_2, a^F = ns) = \gamma_F \quad (71)$$

$$\mathbb{P}(\tau^F = g|E_3, a^F = ns) = 0 \quad (72)$$

Clearly, the investor retains at $t = 2$ in the events $(E_1, a^F = ns)$ and $(E_2, a^F = ns)$ and fires at $t = 2$ in the event $(E_3, a^F = ns)$. For the other three events, which are off-equilibrium, we assign $\mathbb{P}(\tau^F = g|E_i, a^F = s) = 0$ for all i .¹⁸

Turning to $t = 1$, if the investor observes $a^F = ns$ he computes $\mathbb{P}(E_1|a^F = ns)$, $\mathbb{P}(E_2|a^F = ns)$ and $\mathbb{P}(E_3|a^F = ns)$ as follows:

$$\mathbb{P}(E_1|a^F = ns) = (\gamma_F + (1 - \gamma_F)\gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}) \quad (73)$$

$$\mathbb{P}(E_2|a^F = ns) = 1 - \mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}) \quad (74)$$

$$\mathbb{P}(E_3|a^F = ns) = (1 - \gamma_F)(1 - \gamma_M) \mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}). \quad (75)$$

¹⁸It will be clear in the sequel that these off-equilibrium beliefs are consistent with the $t = 1$ off-equilibrium belief that $\mathbb{P}(\tau^F = g|a^F = s) = 0$.

In this equilibrium observing the fund not selling does not convey any information.

Hence, if the investor observes $a^F = \text{ns}$, by retaining the fund he gets

$$(1 - \alpha)\mathbb{E}(P_2 \mid a^F = \text{ns}) - 2w + \mathbb{E}(\tilde{\pi}^I \mid a^F = \text{ns}) \quad (76)$$

where

$$\begin{aligned} \mathbb{E}(\tilde{\pi}^I \mid a^F = \text{ns}) = & \\ & \mathbb{P}(E_1 \mid a^F = \text{ns}) [\mathbb{P}(\tau^F = g \mid E_1, a^F = \text{ns})\pi_g^I + (1 - \mathbb{P}(\tau^F = g \mid E_1, a^F = \text{ns}))\pi_b^I] + \\ & \mathbb{P}(E_2 \mid a^F = \text{ns}) [\mathbb{P}(\tau^F = g \mid E_2, a^F = \text{ns})\pi_g^I + (1 - \mathbb{P}(\tau^F = g \mid E_2, a^F = \text{ns}))\pi_b^I] + \\ & \mathbb{P}(E_3 \mid a^F = \text{ns}) [\mathbb{P}(\tau^F = g \mid E_3, a^F = \text{ns})\pi_g^I + (1 - \mathbb{P}(\tau^F = g \mid E_3, a^F = \text{ns}))\pi_b^I]. \quad (77) \end{aligned}$$

Simplifying we have that if the investor observes $a^F = \text{ns}$ and retains at $t = 1$ his expected payoff is

$$(1 - \alpha)(v - \mathbb{E}_{ns}(\delta_{\text{pool}})) - 2w + \bar{\pi}^I + \gamma_F (1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}) (\pi_g^I - \pi_b^I). \quad (78)$$

If at $t = 1$ he observes $a^F = \text{ns}$ and fires the fund his expected payoff is

$$(1 - \alpha)P_1 - w + \mathbb{E}(\tilde{\pi}^I) = (1 - \alpha)(v - \mathbb{E}_s(\delta_{\text{pool}})) - w + \bar{\pi}^I. \quad (79)$$

The investor would rather retain the fund when she does not sell if:

$$\begin{aligned} (1 - \alpha)(v - \mathbb{E}_{ns}(\delta_{\text{pool}})) - 2w + \bar{\pi}^I + \gamma_F (1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}) (\pi_g^I - \pi_b^I) \geq \\ (1 - \alpha)(v - \mathbb{E}_s(\delta_{\text{pool}})) - w + \bar{\pi}^I \quad (80) \end{aligned}$$

i.e.,

$$\gamma_F (1 - \gamma_F)(1 - \gamma_M)\mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}) (\pi_g^I - \pi_b^I) \geq w \quad (81)$$

For a given Θ and w , for $\pi_g^I - \pi_b^I$ large enough, the investor would retain the fund if she does not sell. Let us denote the relevant lower bound on $\pi_g^I - \pi_b^I$ as $B_{\Delta\pi}(w, \Theta)$ which is independent of α .

Now, let's suppose that the fund sells at $t = 1$. This is an off-equilibrium action for the fund and we assign investor's beliefs to be $\mathbb{P}(\tau^F = g \mid a^F = s) = 0^{19}$. Hence, he computes

$$\mathbb{P}(E_1 \mid a^F = s) = \mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})\gamma_M \quad (82)$$

$$\mathbb{P}(E_2 \mid a^F = s) = (1 - \mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})) \quad (83)$$

$$\mathbb{P}(E_3 \mid a^F = s) = \mathbb{P}(\tilde{\delta} \leq \delta_{\text{sep}})(1 - \gamma_M). \quad (84)$$

¹⁹Our selected belief is consistent with a natural perturbation of the model in which a small measure $\epsilon > 0$ of funds act naively: i.e., sell whenever they observe $a = 1$.

We know from the above that in each of these events, the fund will be replaced at $t = 2$. If the investor observes $a^F = s$ and fires the fund he gets

$$(1 - \alpha)P_1 - w + \mathbb{E}(\tilde{\pi}^I) = (1 - \alpha)(v - \mathbb{E}_s(\delta_{\text{pool}})) - w + \tilde{\pi}^I,$$

whereas if he retains the fund his expected payoff is:

$$(1 - \alpha)\mathbb{E}(P_2 \mid a^F = s) - 2w + \mathbb{E}(\tilde{\pi}^I \mid a^F = s) = (1 - \alpha)(v - \mathbb{E}_s(\delta_{\text{pool}})) - 2w + \tilde{\pi}^I,$$

Therefore, the investor will always fire the fund. Thus, for $\pi_g^I - \pi_b^I$ large enough, the investor's strategy is

$$s_I(a^F) = \begin{cases} r & \text{if } a^F = \text{ns} \\ f & \text{if } a^F = s. \end{cases} \quad (85)$$

It remains for us to show that the fund will choose not to sell regardless of whether she observes $a = 0$ or $a = 1$.

If the fund observes $a = 0$ and chooses to hold, she is retained by the investor and thus receives

$$2w + \mathbb{E}(P_2 \mid a = 0) + \mathbb{P}(\text{retained in } t = 2)\pi^F = 2w + v + \pi^F$$

If, instead, she sells, she is fired by the investor and thus receives

$$w + P_1 = w + v - \mathbb{E}_s(\delta_{\text{pool}}).$$

Clearly, she will choose to hold.

If, on the other hand, the fund observes $a = 1$ and chooses to hold, she is retained by the investor at $t = 1$ but fired at $t = 2$ and thus receives

$$2w + \alpha \left(v - \mathbb{E} \left(\tilde{\delta} \mid \tilde{\delta} \leq \delta_{\text{pool}} \right) \right) + \mathbb{P}(\text{retained at } t = 2)\pi^F = 2w + \alpha \left(v - \mathbb{E} \left(\tilde{\delta} \mid \tilde{\delta} \leq \delta_{\text{pool}} \right) \right).$$

Instead, if she chooses to sell, she is fired by the investor and thus receives

$$w + \alpha \left(v - \mathbb{E}_s(\delta_{\text{pool}}) \right).$$

Thus the fund will prefer not to sell upon observing $a = 1$ if

$$w + \alpha(v - \mathbb{E}_s(\delta_{\text{pool}})) \leq 2w + \alpha \left(v - \mathbb{E} \left(\tilde{\delta} \mid \tilde{\delta} \leq \delta_{\text{pool}} \right) \right), \quad (86)$$

which can be rewritten as:

$$\mathbb{E} \left(\tilde{\delta} \mid \tilde{\delta} \leq \delta_{\text{pool}} \right) \left(1 - (1 - \gamma_F)(1 - \gamma_M)\mathbb{P} \left(\tilde{\delta} \leq \delta_{\text{pool}} \right) \right) \leq \frac{w}{\alpha}. \quad (87)$$

Clearly for a given Θ as $\frac{\alpha}{w}$ gets small, the inequality holds and the fund does not sell even when she observes $a = 1$. Let $B_{\frac{\alpha}{w}}(\Theta)$ be the largest $\frac{\alpha}{w}$ satisfying inequality (87). Let

1. $\pi_g^I - \pi_b^I > B_{\Delta\pi}(w, \Theta)$
2. $\frac{\alpha}{w} < B_{\frac{\alpha}{w}}(\Theta)$.

Both inequalities (81) and (87) are satisfied. This concludes the formal argument. ■

Derivation of equation 66. Using the definitions provided above we show that

$$\mathbb{E}(\tilde{a}\tilde{\delta} \mid a^F = s) = \mathbb{E}_s(\delta_{\text{pool}}) = (1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta} \mid \tilde{\delta} \leq \delta_{\text{pool}})\mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}) \quad (88)$$

In the equilibrium with minimal exit the strategy of the fund is

$$s_F(\tilde{l}) = \begin{cases} s & \text{if } \tilde{l} = ls, \\ ns & \text{otherwise} \end{cases} \quad (89)$$

and the strategy of the manager is

$$s_M(\delta, \tilde{e}, \tau^F) = \begin{cases} 1 & \text{if } \delta \leq \delta_{\text{pool}} \text{ and } \tilde{e} = ne \text{ and } \tau^F = b \\ 0 & \text{otherwise.} \end{cases} \quad (90)$$

Then,

$$\begin{aligned} \mathbb{E}(\tilde{a}\tilde{\delta} \mid a^F = s) &= \mathbb{E}\left[\mathbf{1}_{\{s_M(\delta, \tilde{e}, \tau^F)=1\}}\tilde{\delta} \mid a^F = s\right] = \\ &= \frac{1}{\mathbb{P}(a^F = s)}\mathbb{E}\left[\mathbf{1}_{\{s_M(\delta, \tilde{e}, \tau^F)=1\}}\mathbf{1}_{\{a^F=s\}}\tilde{\delta}\right] \\ &= \frac{1}{\mathbb{P}(a^F = s)}\mathbb{E}\left[\mathbf{1}_{\{\tilde{\delta}\leq\delta_{\text{sep}}\}\cap\{\tilde{e}=ne\}\cap\{\tau^F=b\}}\cap\{\tilde{l}=ls\}}\tilde{\delta}\right] \\ &= \frac{1}{\mathbb{P}(a^F = s)}\mathbb{E}\left[\mathbf{1}_{\{\tilde{\delta}\leq\delta_{\text{sep}}\}}\cdot\mathbf{1}_{\{\tilde{e}=ne\}}\cdot\mathbf{1}_{\{\tau^F=b\}}\cap\{\tilde{l}=ls\}}\tilde{\delta}\right] \\ &= \frac{1}{\mathbb{P}(a^F = s)}\mathbb{E}\left[\mathbf{1}_{\{\tilde{\delta}\leq\delta_{\text{sep}}\}}\cdot\mathbf{1}_{\{\tilde{e}=ne\}}\cdot\mathbf{1}_{\{\tau^F=b\}}\cdot\mathbf{1}_{\{\tilde{l}=ls\}}\tilde{\delta}\right] \\ &= \frac{1}{\mathbb{P}(a^F = s)}\mathbb{P}[\tilde{e} = ne]\mathbb{P}[\tau^F = b]\mathbb{P}[\tilde{l} = ls]\mathbb{E}\left[\mathbf{1}_{\{\tilde{\delta}\leq\delta_{\text{sep}}\}}\tilde{\delta}\right] \\ &= \frac{1}{\theta}(1 - \gamma_M)(1 - \gamma_F)\theta\mathbb{E}\left[\mathbf{1}_{\{\tilde{\delta}\leq\delta_{\text{sep}}\}}\tilde{\delta}\right] \\ &= (1 - \gamma_F)(1 - \gamma_M)\mathbb{E}(\tilde{\delta} \mid \tilde{\delta} \leq \delta_{\text{pool}})\mathbb{P}(\tilde{\delta} \leq \delta_{\text{pool}}). \end{aligned}$$

Proof of Proposition 4: Referring to the proof of Proposition 1, recall that $\underline{\alpha}(w, \Theta) = \frac{w}{B_{\frac{\alpha}{w}}(\Theta)}$ is the lowest α that satisfies inequality (35). Choose a particular $\alpha > \underline{\alpha}(w, \Theta)$ and

then choose $\pi_g^I - \pi_b^I > B_{\Delta\pi}(\alpha, w, \Theta)$. Now it is clear that both (27) and (35) hold, completing the construction of the equilibrium. ■

8.1 A Different Formulation of Managerial Ability

The purpose of this model is to show that allowing for exit as a positive signal of ability (which can arise if blockholders differ in their ability to obtain information about the perverse actions of the manager) does not eliminate our core result that the career concerns of blockholders will get in the way of discipline via exit. In particular, we show below that it is precisely for firms in which the moral hazard problem is most severe—and thus discipline is most necessary—that (i) exit will be viewed as a positive signal of ability and (ii) simultaneously, career concerned blockholders will engage in excessive exit, reducing the disciplining effect of exit.

Consider the following model of delegated blockholding. Firms are indexed by i . In each firm i there is a manager and a blockholder. Time runs over two periods $t = 1, 2$. At $t = 1$, the manager can take action $a = 0$ or $a = 1$, where 1 is the perverse action as before. The manager's payoff is proportionate to the $t = 1$ share price. For any i , firm value v is \bar{v} if $a = 0$ and \underline{v} if $a = 1$, with $\bar{v} > \underline{v}$. The manager faces a moral hazard problem: if he takes action $a = 0$ he sacrifices a private benefit β , where β is distributed according to CDF $f_i(\beta)$. Only the manager knows β . The market has the prior belief $f_i(\beta)$.

For any two firms i and j , the the moral hazard problem will be greater in i than in j if f_i first order stochastically dominates f_j . We loosely refer to firms with greater moral hazard problems as firms with “high” f_i .

For any firm i , at $t = 1$, the blockholder observes the manager's action with noise. The type of the blockholder determines the precision of this information. In particular, he observes a signal ν , with type dependent precision: $\Pr(\tilde{\nu} = \underline{\nu} | \tilde{v} = \underline{v}) = \Pr(\tilde{\nu} = \bar{\nu} | \tilde{v} = \bar{v}) = \sigma_\tau$ for $\tau \in \{g, b\}$, where $\sigma_g > \sigma_b > \frac{1}{2}$. Blockholders do not know their type. The measure of type g blockholders is $\pi_g > 0$. Upon observing the signal, the blockholder has the choice to sell the block at $t = 1$ ($a_F = s$) or to hold until $t = 2$ ($a_F = ns$). At $t = 1$, there is noise in the market, so that the blockholder may be mistaken with positive probability for a noise trader who trades without information. At $t = 2$ all information becomes public. The blockholder is a delegated fund manager whose action, as well as the final firm value v are observed by a principal, who can make Bayesian inferences $\Pr(\tau = g | a_F, v)$. Denote by $p_1(s)$ and $p_1(ns)$ the equity price for the firm at $t = 1$ corresponding to the actions of the blockholder and by p_2 the full-information price at $t = 2$. The blockholder's payoff is given by

$$\alpha (I(a_F = s)p_1(s) + I(a_F = ns)p_2) + (1 - \alpha) \Pr(\tau = g | a_F, v),$$

where $I(\cdot)$ is the indicator function which is 1 if the argument is true and 0 otherwise. Thus, α measures the weight placed on profits by the blockholder while $1 - \alpha$ measures the weight placed on career concerns.

What is the first best from the perspective of corporate governance? Since $\sigma_g > \sigma_b > \frac{1}{2}$, the information of blockholding funds is correct on average, the highest average discipline (which minimizes the incidence of $a = 1$ by the manager) is for the blockholder to sell if and only if $\tilde{\nu} = \underline{\nu}$. We refer to this as the first-best. We first show that if $\alpha = 1$, the first-best is an equilibrium irrespective of $f_i(\cdot)$. We then show that, for any $\alpha < 1$, for sufficiently high f_i , the first best is not an equilibrium.

Remark 6 *For $\alpha = 1$, the first-best is an equilibrium irrespective of $f_i(\cdot)$.*

Note that $p_1(s) \in (E(\tilde{\nu}|\tilde{\nu} = \underline{\nu}), E(\tilde{\nu}|\tilde{\nu} = \bar{\nu}))$ because of the noise in the market. If the blockholder observes $\tilde{\nu} = \bar{\nu}$, then his payoff from selling— $p_1(s)$ —is lower than his payoff from not selling— $E(\tilde{\nu}|\tilde{\nu} = \bar{\nu})$ —and he is better off not selling. If the blockholder observes $\tilde{\nu} = \underline{\nu}$, the opposite is true: his payoff from selling— $p_1(s)$ —is higher than his payoff from not selling— $E(\tilde{\nu}|\tilde{\nu} = \underline{\nu})$ —and he is better off selling.

Remark 7 *For any $\alpha < 1$, for sufficiently high f_i , the first best is not an equilibrium, and there is excessive exit.*

Suppose the first best is an equilibrium. Consider the manager's incentives in an arbitrarily chosen firm i . If the manager chooses $a = 0$, he receives

$$(\pi_g \sigma_g + (1 - \pi_g) \sigma_b) p_1(ns) + (\pi_g (1 - \sigma_g) + (1 - \pi_g) (1 - \sigma_b)) p_1(s);$$

if he chooses $a = 1$ he receives

$$(\pi_g \sigma_g + (1 - \pi_g) \sigma_b) p_1(s) + (\pi_g (1 - \sigma_g) + (1 - \pi_g) (1 - \sigma_b)) p_1(ns) + \beta.$$

Thus, he chooses $a = 0$ if and only if

$$\beta < \beta_{FB} \equiv (\pi_g \sigma_g + (1 - \pi_g) \sigma_b) - (\pi_g (1 - \sigma_g) + (1 - \pi_g) (1 - \sigma_b)) (p_1(ns) - p_1(s)).$$

Note that $\beta_{FB} > 0$ since $p_1(ns) > p_1(s)$ and $\sigma_g > \sigma_b > \frac{1}{2}$. Let $\pi_v = \Pr(a = 0) = \Pr(\tilde{\nu} = \bar{\nu}) = f_i(\beta_{FB})$. High f_i corresponds to low π_v .

Now consider a blockholder who has observed signal $\nu = \bar{\nu}$. His payoff from not selling is

$$\begin{aligned} & \alpha E(\tilde{\nu}|\nu = \bar{\nu}) + (1 - \alpha) E(\Pr(\tau = g|ns, \tilde{\nu})|\nu = \bar{\nu}) = \\ & \alpha E(\tilde{\nu}|\nu = \bar{\nu}) + (1 - \alpha) [\Pr(\tilde{\nu} = \bar{\nu}|\tilde{\nu} = \bar{\nu}) \Pr(\tau = g|\bar{\nu}, \bar{\nu}) + \Pr(\tilde{\nu} = \underline{\nu}|\tilde{\nu} = \bar{\nu}) \Pr(\tau = g|\bar{\nu}, \underline{\nu})]. \end{aligned} \tag{91}$$

His payoff from selling is

$$\begin{aligned} & \alpha p_1(s) + (1 - \alpha) E(\Pr(\tau = g|s, \tilde{v})|\tilde{\nu} = \bar{\nu}) = \\ & \alpha p_1(s) + (1 - \alpha) [\Pr(\tilde{v} = \bar{v}|\tilde{\nu} = \bar{\nu}) \Pr(\tau = g|\underline{\nu}, \bar{v}) + \Pr(v = \underline{\nu}|\tilde{\nu} = \bar{\nu}) \Pr(\tau = g|\underline{\nu}, \underline{v})] \end{aligned} \quad (92)$$

Remarks:

1. $E(\tilde{v}|\nu = \bar{\nu}) > p_1(s)$, but as $\pi_v \rightarrow 0$, $E(\tilde{v}|\nu = \bar{\nu}) - p_1(s) \rightarrow 0$.
2. $\Pr(\tau = g|\bar{\nu}, \bar{v}) > \Pr(\tau = g|\underline{\nu}, \bar{v})$ and $\Pr(\tau = g|\bar{\nu}, \underline{v}) < \Pr(\tau = g|\underline{\nu}, \underline{v})$.
3. As $\pi_v \rightarrow 0$ $\Pr(v = \bar{v}|\tilde{\nu} = \bar{\nu}) \rightarrow 0$ and $\Pr(v = \underline{v}|\tilde{\nu} = \bar{\nu}) \rightarrow 1$.

Thus, combining these three remarks, we have that, fixing α , there exists a $\underline{\pi}_v \in (0, 1)$ such that if $\pi_v < \underline{\pi}_v$, the blockholder will prefer to sell instead of not sell. Thus, the first best is not an equilibrium, because there will be excessive exit.

It is clear that $\underline{\pi}_v$ is decreasing in α , so more career concerned blockholders will engage in more excessive exit.

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