european corporate governance institute

ecgi

The Evolution of the Market for Corporate Control

Finance Working Paper N° 956/2024
December 2025

Mike Burkart
London School of Economics and Political Science, Swedish House of Finance, CEPR and ECGI

Samuel Lee
Santa Clara University, Swedish House of Finance and ECGI

Paul Voss
HEC Paris

© Mike Burkart, Samuel Lee and Paul Voss 2025. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

This paper can be downloaded without charge from:
http://ssrn.com/abstract_id=4709037

www.ecgi.global/content/working-papers

european corporate governance institute

ECGI Working Paper Series in Finance

The Evolution of the Market for Corporate Control

Working Paper N° 956/2024

December 2025

Mike Burkart
Samuel Lee
Paul Voss

We would like to thank Ulf Axelson, Bruno Biais, Philip Bond, Jean-Edouard Colliard, Adrian Corum, Johan Hombert, Wei Jiang, Deniz Kattwinkel, Christopher Kummer, Doron Levit, Andrey Malenko, Robert Marquez, Martin Oehmke, Alessio Piccolo, Cara Vansteenkiste, Zhe Wang, Mark Westerfield, Chenzi Xu, Kostas Zachariadis, and (seminar) audiences at Cambridge Corporate Finance Theory Symposium (2023), CEU, Cornell, ESSFM 2023, Federico II, FIRS (2023), FTG Summer Meeting (2022), HEC Paris, LawFin Center (Goethe University), LSE, Mannheim, Queen Mary, SAET (2024), Seminars in Economic Theory (SET), SFS Cavalcade North America (2023), Stockholm School of Economics, University of Vienna, University of Washington, Vienna Festival of Finance Theory (2022), and WFA (2023) for helpful comments, suggestions, and sharing of data. Burkart gratefully acknowledges financial support from the Economic Social Research Council (ESRC Research Grant ES/S016686/1) and Voss acknowledges financial support from the HEC Foundation. There are no conflicts of interest to be disclosed.

© Mike Burkart, Samuel Lee and Paul Voss 2025. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Abstract

We consider an informed large shareholder who can choose between making a takeover bid herself and initiating a sale to another acquirer. Such takeover activism complements direct takeovers because the very choice mitigates the asymmetric information problem, thereby improving efficiency. As more investors enter the market for corporate control, takeover activism increasingly replaces direct takeovers as the prevailing mode of disciplinary control change---matching the evolution in practice. Our model shows how such an evolution, characterized by a symbiotic relationship between investor activism and private equity, arises to overcome asymmetric information and collective action problems through intermediated transactions.

Keywords: Tender offers, takeover activism, free-rider problem, asymmetric information, market for corporate control

JEL Classifications: G34

Mike Burkart*
Professor of Finance
London School of Economics
Houghton Street
London, WC2A 2AE, United Kingdom
e-mail: m.c.burkart@lse.ac.uk

Samuel Lee
Associate Professor of Finance
Santa Clara University
500 El Camino Real
Santa Clara, CA California 95053, United States
e-mail: sslee@scu.edu

Paul Voss
Assistant Professor of Finance
HEC Paris
1 Rue de la Libération
78350 Jouy-en-Josas, France
e-mail: voss@hec.fr

*Corresponding Author

The Evolution of the Market for Corporate Control*

Mike Burkart†, Samuel Lee‡ and Paul Voss§

Journal of Finance, forthcoming

November 22, 2025

Abstract

We consider an informed large shareholder who can choose between making a takeover bid herself and initiating a sale to another acquirer. Such takeover activism complements direct takeovers because the very choice mitigates the asymmetric information problem, thereby improving efficiency. As more investors enter the market for corporate control, takeover activism increasingly replaces direct takeovers as the prevailing mode of disciplinary control change—matching the evolution in practice. Our model shows how such an evolution, characterized by a symbiotic relationship between investor activism and private equity, arises to overcome asymmetric information and collective action problems through intermediated transactions.

*We would like to thank Ulf Axelson, Bruno Biais, Philip Bond, Jean-Edouard Colliard, Adrian Corum, Johan Hombert, Wei Jiang, Deniz Kattwinkel, Christopher Kummer, Doron Levit, Andrey Malenko, Robert Marquez, Martin Oehmke, Alessio Piccolo, Cara Vansteenkiste, Zhe Wang, Mark Westerfield, Chenzi Xu, Kostas Zachariadis, and (seminar) audiences at Cambridge Corporate Finance Theory Symposium (2023), CEU, Cornell, ESSFM 2023, Federico II, FIRS (2023), FTG Summer Meeting (2022), HEC Paris, LawFin Center (Goethe University), LSE, Mannheim, Queen Mary, SAET (2024), Seminars in Economic Theory (SET), SFS Cavalcade North America (2023), Stockholm School of Economics, University of Vienna, University of Washington, Vienna Festival of Finance Theory (2022), and WFA (2023) for helpful comments, suggestions, and sharing of data. Burkart gratefully acknowledges financial support from the Economic Social Research Council (ESRC Research Grant ES/S016686/1) and Voss acknowledges financial support from the HEC Foundation. There are no conflicts of interest to be disclosed.

†London School of Economics, Swedish House of Finance, CEPR, ECGI, & FTG

‡Santa Clara University, ECGI, & Swedish House of Finance

§HEC Paris & FTG

Keywords: Tender offer, hostile takeover, takeover activism, asymmetric information, free-rider problem, market for corporate control

JEL Classification: G34.

The lower the stock price, relative to what it could be with more efficient management, the more attractive the takeover becomes to those who believe that they can manage the company more efficiently. And the potential return from the successful takeover and revitalization of [a] poorly run company can be enormous. — Henry G. Manne (1965, p.118)

1 Introduction

The market for corporate control has come a long way since the above quote. Professional control-oriented investors such as activist hedge funds and private equity funds, which have grown enormously since the 1990s (e.g., Barry et al. 2020, Renneboog & Vansteenkiste 2017), are now central players in this market.[1] Furthermore, hostile tender offers were the prominent feature of the market in the 1980s, but the mode of control change has since shifted from such direct takeovers to takeover activism—large shareholders do not take over firms themselves but broker a sale to outside bidders.

We propose that the growth of (capital at the disposal of) control-oriented investors leads to such a shift in the mode of control changes. Our explanation builds on large shareholders being crucial to overcoming collective action problems in corporate governance. The novelty of our theory is to recognize that control-oriented investors need not have ex-ante designated roles on the buy- or sell-side. They can choose to become large shareholders, who possess the option to acquire firms themselves or put firms in play, or to become outside bidders for firms that are put in play. We show that both modes of control change can coexist and that the choice between them allows to overcome free-riding and asymmetric information problems, leading to an efficient control allocation. Moreover, the optimal role choice depends on the number of control-oriented investors in the market. The resulting equilibrium patterns of

[1] We reference detailed statistics on the growth of hedge fund activism and private equity in Section 5. The rise of this professional investor class is a remarkable development that has taken place over the last decades. Manne (1965) himself did not focus on financial acquirers, which were less prominent at the time; among those he saw as most apt to identify managerial inefficiencies and take over firms were competitors, customers, and suppliers (Coffee 1984).

control transactions match the observed secular trend: an emergence and rise of takeover activism and a decline of tender offers.

Our analysis begins at the single-firm level. We examine what determines a large shareholder's choice between being on the buy- or the sell-side and how this choice impacts the efficiency of the control allocation. To this end, we add to the seminal framework of Shleifer & Vishny (1986) the option of *initiating a sale of the firm* in lieu of making a tender offer. Concretely, a large shareholder is privately informed about a value improvement that can be realized by restructuring the firm. Restructuring requires a control change. The large shareholder can acquire control through a direct takeover and implement the value improvement herself. Alternatively, she can invite an outside bidder to take control. In such an invited merger, the large shareholder negotiates on behalf of all shareholders a binding agreement with the bidder.[2] The outside bidder lacks the large shareholder's private information about the value improvement at the time of the merger negotiation. Once in control, the outside bidder has access to the same restructuring technology as the large shareholder, learns the value improvement, and implements it.

The equilibrium features a simple cut-off structure: For all firm types above the cutoff, the large shareholder takes over the firm herself, whereas she initiates a sale to the outside bidder otherwise. Her choice is driven by the information rents that accrue at opposite ends of the value improvement distribution. In equilibrium, all firms taken over directly by the large shareholder receive the same bid price. Consequently, the large shareholder buys a firm with large value improvements at a discount, whereas she buys a firm with moderately large value improvements at a premium. With redistribution from moderately large to large firm types, the information rents in tender offers accrue at the upper end of the value improvement distribution. For all firm types below the cutoff, the outside bidder pays the same expected price in equilibrium. Therefore, large shareholders of firms with moderately small value improvements sell their stakes below their true value, while those of firms with small value improvements sell them above their true value. With redistribution from moderately small to small firm types, the information rents in invited mergers accrue at the lower end of the value improvement distribution. Large shareholders owning stakes in firms with moderately large or moderately small value improvements thus earn negative information rents in either

[2]While a collectively binding merger agreement precludes dispersed shareholders from free-riding, this is not crucial for our results as we discuss later.

control change mode and are left with choosing the "lesser evil."

When direct takeovers are the sole mode of control change (as in Shleifer & Vishny 1986), the conjunction of free-riding and asymmetric information prevents an efficient control allocation. Firms with value improvements below a cutoff are not taken over and restructured. The gains the large shareholder would make on her initial stake are not enough to offset the premium at which she would have to acquire the dispersedly held shares. By contrast, we show that adding the option to be on the sell-side results in an efficient control allocation. All firms are taken over either by the large shareholder or by the outside bidder. The efficiency gains arise because selling the stake at a positive (expected) price dominates staying passive irrespective of the value improvement. Therefore, informed control sales are a more effective mechanism to bring about value-creating control changes than informed control acquisitions. Furthermore, takeover activism does not only complement direct takeovers but also replaces the latter for some firms as the mode of control change. By increasing the value of the large shareholder's "outside option" from staying passive to selling her stake with a positive profit, a tender offer is the large shareholder's preferred strategy for a smaller set of firm types than in the setting of Shleifer & Vishny (1986).

To explore the implications of our single-firm analysis for the evolution of the *market* for corporate control, we embed it into a market model. There exists a continuum of firms, each with a potential value improvement, among which control investors look for targets. Each control investor chooses whether to become a large shareholder and buy an initial stake or to be a potential outside bidder, putting in place human and financial capital, prior to being randomly matched to a particular target. Thus, we assume the presence of search frictions but no ex-ante designated buyers or sellers in our framework.

We characterize the evolution of the market by comparing the market composition as the number of control investors grows. With relatively few control investors (in the early stage), everyone enters the market as large shareholders. Consequently, direct takeovers are the sole means to effectuate (hostile) control changes. Intuitively, a large shareholder can implement a control change through a direct takeover herself, whereas an outside bidder has to rely on a large shareholder to put a firm in play. When the market for corporate control is thin, the likelihood of receiving a merger invitation is simply too small. Hence, all control investors become large shareholders.

When a sufficient fraction of firms has large shareholders, entering as a bidder is profitable.

The more large shareholders there are, the more likely outside bidders are to receive a merger invitation. Furthermore, as more outside bidders are in the market, it becomes increasingly profitable to enter as a large shareholder: A large shareholder can then not only acquire a firm with substantial value improvements, but she is also more likely to find an outside bidder to extend a merger invitation for modest value improvements. Because of this complementarity, the (expected) profits of both large shareholders and outside bidders do not erode but keep on growing as more control investors enter the market. In this transformation phase, control changes are also increasingly often carried out through takeover activism relative to direct takeovers. Control investor profits and the relative frequency of takeover activism continue to increase until all firms are matched with large shareholders and the market for corporate control reaches its mature stage. In the mature stage, some firms may be matched with two outside bidders who compete in case of a merger invitation. Such outside bidder competition shifts takeover gains to the sell side, making it even more likely that large shareholders opt for takeover activism over direct takeovers.

The market for corporate control becomes overall more efficient as the number of control investors grows. In the early stage, this is due to a standard "scale" effect: a growing number of control investors identifies a growing number of potential targets. In the transformation stage, with the rise of takeover activism, an additional source of gains is the increase in the probability that identified potential targets are successfully restructured. This reflects that the market evolves toward a more efficient mode of control change, capturing the efficiency gains from takeover activism that we identify in our single-firm model.

As is well documented, there has been a decline in hostile tender offers since the late 1980 (e.g., Eckbo (2009)) with a contemporaneous rise in shareholder activism (e.g., Fos (2017)). In the extant literature this shift is usually attributed to the proliferation of takeover defenses and legal changes that facilitate shareholder activism. We contend that this does not provide a comprehensive explanation. Takeover defenses necessitate activism to remove resistance before a disciplinary control change. But they do not dictate what mode that control change takes, which can occur through a merger invitation as much as through a tender offer. For example, Carl Icahn—known as both raider and activist—ran a campaign in 2021 to "replace Southwest Gas Holdings' (SWX) board and commence a tender offer for all common shares at $75 per share in cash."[3] Conceptually, therefore, takeover defenses explain a rise in activism

[3]CNBC 2021, https://www.cnbc.com/2021/10/23/carl-icahns-tender-offer-for-southwest-

but do not necessitate a shift from tender offers to merger invitations.

On a factual level, the rise in shareholder activism has not eliminated disciplinary control transactions. Many activist campaigns and the most profitable ones result in outside bidders such as private equity funds acquiring the firm (Greenwood & Schor 2009, Boyson et al. 2017). Furthermore, governance-driven (going-private) buyouts have not declined but rather risen over this time period (Kaplan & Stromberg 2009, Renneboog & Vansteenkiste 2017). These observations do not suggest a shift away from disciplinary takeovers but a change in how they are carried out. In our theory, the market evolves due to the growth of (funds managed by) control investors. In its mature stage it is characterized by an interplay of control investors in specialized roles: outside acquirers and large shareholders who supply them with targets. This resonates with the specialization and the "symbiotic relationship between private equity funds and hedge funds" that has indeed evolved in the market for corporate control.[4]

One may conjecture that the efficiency gain due to takeover activism relies on the assumption of the binding merger agreement preventing free-riding in mergers. This is not true. We consider a setting where, instead of extending a merger invitation, the large shareholder can negotiate a sale of her initial stake to the outside bidder, who afterwards makes a tender offer for the remaining, widely held shares. Alternatively, the large shareholder can make a bid for the firm herself. The equilibrium of this modified game has the same cut-off structure with an identical cut-off value. The control allocation remains fully efficient because this variant of takeover activism separates free-riding from the asymmetric information problem. In the block trade, the large shareholder has private information about the value improvement. Yet, the bilateral trade is efficient because there are known gains from trade. In the ensuing tender offer, the outside bidder faces free-riding by dispersed shareholders but has no information advantage, and efficient trade is again feasible.

Even when the outside bidder learns the value improvement after the block trade but prior to the tender offer, takeover activism leads to more firms being taken over and restructured compared to a setting where the large shareholder can only make a tender offer. By selling the block instead of acquiring the firm, the large shareholder reveals that the value improvement is not substantial. After a block trade, the dispersed shareholders expect a moderate value

gas-sets-the-table-for-a-proxy-fight.html .

[4]Financial Times 2007, https://www.ft.com/content/6a3e50b2-1070-11dc-96d3-000b5df10621. This and other empirical patterns consistent with our model predictions are discussed in detail in Section 5.

improvement and the outside bidder can make a successful bid at a lower price. Thus, more control changes are realized. Still, firms with too small a value improvement are not taken over because the gains on the stake acquired in the block trade are not enough to offset the premium at which the outside bidder would have to acquire the dispersedly held shares.

We show that this remaining inefficiency can be completely eliminated if there are many bidders located in a "bidder chain." In this extension, each bidder can, after having acquired the block, either make a tender offer to the dispersed shareholders or sell on the block to the next bidder in the chain.[5] Adding more bidders increases efficiency and, in the limit, all value-increasing control changes are realized. Independent of how small the value improvement is, sufficiently many bidders can collectively signal through a sequence of block trades that the value improvement is small until one bidder makes a successful tender offer at a sufficiently low price. The bidder chain allows to incrementally separate the free-rider problem from the asymmetric information problem. This result distills our argument that takeover activism is a form of intermediation that arises to overcome the conjunction of those market frictions.

We build on the canonical model of large shareholders and corporate control by Shleifer & Vishny (1986). Subsequent papers on takeovers with asymmetric information and free-riding are Hirshleifer & Titman (1990), At et al. (2011), Burkart & Lee (2015, 2016), Marquez & Yılmaz (2008, 2012), Ekmekci & Kos (2016) and Voss & Kulms (2022). We show that those frictions can be overcome at the firm level when large shareholders can choose to be on the buy- or the sell-side of the transaction. None of the above papers consider this choice.

There is a large literature on investor activism (reviewed, e.g., by Edmans & Holderness (2017)). Four papers in this literature allow for a choice between intervention modes: Shleifer & Vishny (1986), Bebchuk & Hart (2001), Maug (1998), and Burkart & Lee (2022).[6] The first three papers compare activism and takeovers as alternative ways for a large shareholder to gain control. By contrast, we study a large shareholder who chooses between two alternative ways to bring about a takeover: make a takeover bid herself or initiate the sale of the target to another party. In the moral hazard framework of Burkart & Lee (2022), takeover activism is superior to tender offers. In our asymmetric information framework, takeover activism and

[5] Contrary to the typical intermediation chains in the literature following Glode & Opp (2016), each bidder becomes perfectly informed before making an offer.

[6] We abstract here from exit as an intervention mode. There is, of course, a literature comparing voice and exit in a variety of settings. See, e.g., Hirschman (1970), Edmans & Manso (2010), Dasgupta & Piacentino (2015), Edmans et al. (2018), Levit (2018), Broccardo et al. (2020) and Voss (2022).

direct takeovers coexist and complement each other. Corum & Levit (2019) focus on takeover activism. They argue that activists possess an inherent advantage to campaign for a merger compared to bidders who as buyers suffer from a conflict of interest.

Three aspects of our analysis are unique compared to all of the above papers. First, direct takeovers and takeover activism endogenously coexist in equilibrium and are complementary in overcoming market frictions. Second, we combine this with the idea of control investors choosing "roles" in the market for corporate control and find an endogenous evolution from direct takeovers to takeover activism as the number of control investors grows.[7] Lastly, the efficiency gains from takeover activism in our model do not hinge on negotiated mergers that simply circumvent free-riding or an exogenous restriction on tender offers.

2 Control Change in the Firm

2.1 Model

Consider a single firm with a one share - one vote structure and a mass 1 of shares. A large shareholder L owns a minority block $\alpha \in (0, \bar{\alpha})$, while the remaining $1 - \alpha$ shares are distributed among a continuum of shareholders whose individual holdings are equal and indivisible. The firm value under the incumbent management is normalized to 0.

The firm value can increase to V if the firm is taken over and restructured. The dispersed shareholders only know that V is drawn from $[0, 1]$ according to a continuously differentiable density function f with full support and cumulative distribution function F. By contrast, L knows the realized value of V and has the restructuring capability to implement the value improvement if she takes over the firm. We also refer to value improvement V as L's type.

The two preceding paragraphs describe the basic setting of Shleifer & Vishny (1986) to which we add the option to sell the firm to an outside bidder B. Initially, B does not own a stake and due to a lack of prior involvement with the firm merely knows the distribution of V. However, she has access to the same restructuring technology as L. That is, if she takes over the firm, she learns the realized value of V and can also implement it.

[7] Interpreting tender offers and takeover activism as buy-side and sell-side driven takeovers loosely relates our paper also to Gorbenko & Malenko (2024) who argue that trades of common value assets are more likely to be sell-side initiated.

After observing V, the large shareholder chooses between making a tender offer or getting the firm taken over by the outside bidder. We refer to the latter strategy interchangeably as merger invitation or takeover activism. Figure 1 illustrates the sequence of events.

Tender offer. The large shareholder makes a take-it-or-leave-it cash bid at a price P per share. The offer is conditional and becomes void if fewer than $1/2 - \alpha$ shares are tendered, that is, if L fails to gain control. The incumbent management is by assumption unwilling or unable to make a counter-bid.[8] If L makes a bid, target shareholders decide simultaneously and non-cooperatively whether to tender their shares. If the bid succeeds, L takes control and realizes the value improvement V. Otherwise, the incumbent management remains in control, and the firm value continues to be 0.

Merger invitation. The large shareholder negotiates on behalf of all target shareholders a sale of the firm to the outside bidder.[9] We model the negotiation over the merger price as a Nash bargaining game: With probability ρ, L makes a take-it-or-leave-it offer for all shares to be bought at price P_L, and B either accepts or rejects the offer. With the complementary probability $1-\rho$, B offers to buy all shares at price P_B, and L accepts or rejects the offer. If an offer is rejected, the incumbent management stays in control, and the firm value remains 0. If either of the offers is accepted, all shareholders must sell their shares at that price. Having acquired the firm, B gets to know the value improvement V and implements it. Since the merger agreement is binding, it circumvents the free-rider problem. We show in Section 4, however, that this is not crucial for our results.

As in Shleifer & Vishny (1986), signaling by the large shareholder and coordination problems among dispersed shareholders give raise to multiple equilibria. To obtain a unique equilibrium outcome we impose the following assumptions: (A1) Target shareholders tender their shares to L if the price P weakly exceeds the expected post-takeover share value; (A2) off-equilibrium beliefs satisfy the credible beliefs criterion of Grossman & Perry (1986); and

[8] An alternative interpretation is that the incumbent management (under pressure or on its own accord) cooperates with the large shareholder as part of a (management) buyout of the firm or in shopping for buyers. One can also view incumbent managers with minority stakes *as* the large shareholder, aware of misaligned incentives and considering a (management or third-party) buyout of the firm.

[9] In practice, boards have the prerogative power to enter into merger negotiations. An activist shareholder must convince the incumbent board, or alternatively take control of the board, to initiate merger negotiations. We abstract from how L achieves this. We do not allow for L to negotiate a merger with herself. This is in accordance with Corum & Levit (2019) who argue that if L is on the buy side of the merger, she cannot get approval to negotiating the deal on the sell side. Internet Appendix A.1 elaborates on these issues.

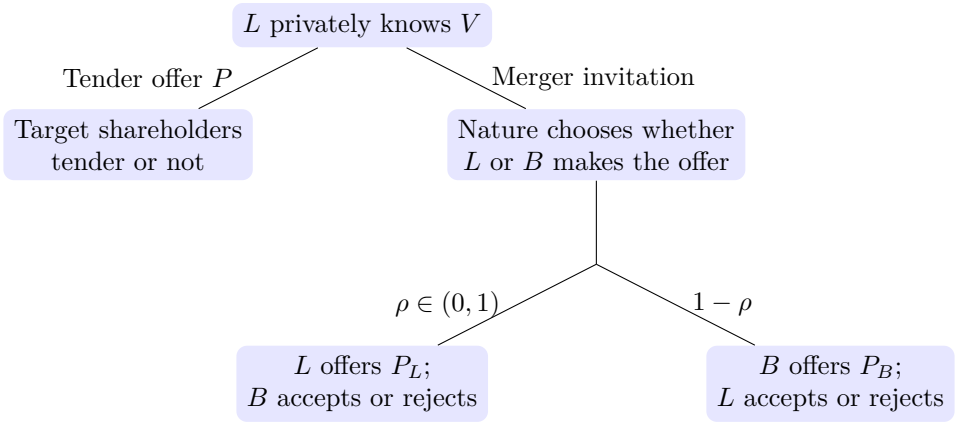


Figure 1: Sequence of events.

(A3) the type distribution has a log-concave density function. This is a common assumption in signaling games with threshold strategies (Bagnoli & Bergstrom 2005). We point out the role of each assumption where it is material. Following Grossman & Perry (1986), we refer to Perfect Bayesian Equilibria that satisfy A2 as Perfect Sequential Equilibria.

2.2 Benchmark

To highlight how the option of extending a merger invitation affects the functioning of the market for corporate control, we solve as a benchmark the model without the outside bidder. This corresponds to the basic setting in Shleifer & Vishny (1986, Section II) and to the left-hand side of Figure 1.

When the large shareholder makes a bid P, dispersed shareholders update their beliefs about the value improvement, respectively L's type, and condition their expectation on the offered price. Since no shareholder deems herself pivotal for the outcome, each shareholder tenders only if the price at least matches the expected post-takeover share value (Grossman & Hart 1980). Thus, a successful tender offer must satisfy the free-rider condition $P \geq \mathbb{E}[V|P]$.

Assumption A1 ensures a unique outcome for any bid P: When the free-rider condition is violated, the bid fails. Otherwise, the unique equilibrium outcome is that all shareholders tender their shares. In any successful bid offered in equilibrium, L offers the same price since

all L types would prefer the lowest successful bid if different bids were to succeed.[10]

Given a bid P, shareholders infer in equilibrium that such a bid must come from any L type for whom such a bid is profitable. Since all shareholders tender in a successful offer, L is willing to offer at most V for the $(1-\alpha)$ shares. Thus, her participation constraint is $V-(1-\alpha)P \geq 0$, and the shareholders' conditional expectation about the post-takeover share value is $\mathbb{E}[V|P] = \mathbb{E}[V|V \geq (1-\alpha)P]$. A tender offer is made in equilibrium if the above participation constraint of the large shareholder and the free-rider condition

$$P \geq \mathbb{E}[V|V \geq (1-\alpha)P] \tag{1}$$

are satisfied. A continuum of prices satisfies these conditions and can be supported as Perfect Bayesian Equilibria. The reason is that bids P for which (1) is slack can be supported as Perfect Bayesian Equilibria by attributing any deviation $P' < P$ to the highest type ($V = 1$). Under these beliefs, such deviations violate the free-rider condition and thus fail.

Assumption A2 selects the "minimum bid" equilibrium $P^* = \mathbb{E}[V|V \geq (1-\alpha)P^*]$ as the unique Perfect Sequential Equilibrium. The credible beliefs criterion imposes that a deviation is attributed, consistent with prior beliefs, to *all and only* types that would gain from this deviation. This eliminates all bids $P \in (P^*, 1]$ for which the free rider condition (1) is slack as Perfect Sequential Equilibrium candidates.

Lemma 1. ***Shleifer & Vishny (1986)*** *In the unique Perfect Sequential Equilibrium, the large shareholder makes a bid for all $V \geq V_0^*$ offering the same price $P^* = \mathbb{E}[V|V \geq V_0^*]$, where V_0^* is the solution to $\alpha V_0^* + (1-\alpha)\Big(V_0^* - \mathbb{E}[V|V \geq V_0^*]\Big) = 0$.*

Because all successful types pay the same price $P^* = \mathbb{E}[V|V \geq V_0^*]$, L types with $V \in [V_0^*, P^*)$ pay more than the true value improvement whereas types with $V \in (P^*, 1]$ pay less. Such mispricing deters L types whose gain on their initial stake is too small to compensate for the loss at which they would have to buy the $(1-\alpha)$ shares. More specifically, since L's payoff from a successful bid,

$$\alpha V + (1-\alpha)(V-P), \tag{2}$$

[10] Assumption A1 rules out (semi-)separating equilibria in which offers succeed at different prices. Allowing for probabilistic tendering strategies generates separating equilibrium outcomes (Hirshleifer & Titman 1990).

monotonically increases in V for a given P, the equilibrium has the cut-off structure shown in Figure 2: All and only types above the cut-off V_0^* make a bid offering $P^* = \mathbb{E}[V|V \geq V_0^*]$. The information asymmetry has two consequences. First, it causes redistribution among successful types: Types $V \in (P^*, 1]$ extract information rents at the expense of types $V \in [V_0^*, P^*)$. Second, it exacerbates the free-rider problem: Types $V < V_0^*$ do not make a bid, that is, there is a cut-off "at the bottom." This reflects that L as a buyer has an incentive to *under*state V, which we refer to as a *smart buyer problem* (Burkart & Lee 2016). By contrast, under full information, every type would make a successful bid at $P^* = V$.

Figure 2: Cutoff equilibrium with only tender offers.

2.3 Modes of Control Change

Since we just have established the large shareholder's payoff from a tender offer, we merely need to work out her payoff from a merger invitation to determine how she chooses between the two control change modes (and remaining passive). When L extends a merger invitation, either she or B makes a take-it-or-leave-it offer with probabilities ρ and $1-\rho$, respectively. Thus, L's expected profit from selling her initial stake α to the outside bidder is

$$\alpha[\rho P_L + (1-\rho)P_B]. \tag{3}$$

A failed negotiation leaves the incumbent management in control and firm value at 0. Hence, B's optimal offer is $P_B^* = 0$, and she extracts the full surplus. If L's is chosen to make an offer, she cannot ask for more than B's posterior expectation about the firm value $\mathbb{E}[V|invite]$. Given B either accepts or rejects an offer, there can only be one price P_L offered in equilibrium by L and accepted by B since all L types would prefer the highest accepted P_L otherwise.

Yet, any price P_L' below $\mathbb{E}[V|invite]$ being accepted by B can also be supported as a Perfect Bayesian Equilibrium by attributing any deviation from P_L' to the lowest type ($V = 0$). In parallel to the tender offer stage, the credible beliefs criterion (Assumption A2) eliminates all Perfect Bayesian Equilibria for which P_L is below the posterior expectation of

V. That is, a successful offer at the "maximum ask" price $P_L^* = \mathbb{E}[V|invite]$ is the unique Perfect Sequential Equilibrium of the merger invitation stage when L makes the offer.

Given the offers P_L^* and P_B^*, L's expected payoff from a merger invitation is $\alpha\rho\mathbb{E}[V|invite]$ which does not depend on her own type. Consequently, below-average types among those who extend a merger invitation sell their stake (the firm) at a price above the true value, while above-average types sell at less than the true value. This reflects that L as an informed seller has an incentive to overstate V, that is, mergers are plagued by the *lemons problem* (Akerlof 1970). Thus, information rents accrue to the low types at the expense of the high types, which is the opposite redistribution pattern than in the tender offer stage.

The difference between her tender offer profit (2) and her expected merger profit (3) is

$$\Delta(V,\mathcal{P}) = \underbrace{V-(1-\alpha)P}_{\text{Direct Takeover}} - \underbrace{\alpha[\rho P_L + (1-\rho)P_B]}_{\text{Merger Invitation}}. \tag{4}$$

$\Delta(V,\mathcal{P})$ is increasing in V for a given set of prices $\mathcal{P}$ because merger profits are independent of V while tender offer profits strictly increase in V. As a result, there is a cut-off type above which all L types prefer to make a tender offer and below which all L types prefer to invite B to a merger. Because $f(V)$ is log-concave (Assumption A3), the cut-off type is unique.

Proposition 1. *In the unique Perfect Sequential Equilibrium, the large shareholder extends a merger invitation for all $V \in [0, V_1^*)$ and makes a bid for all $V \in [V_1^*, 1]$, where V_1^* is the solution to $(1-\alpha)(V_1^* - \mathbb{E}[V|V \geq V_1^*]) + \alpha V_1^* - \alpha\rho\mathbb{E}[V|V \leq V_1^*] = 0$ The equilibrium prices are $P^* = \mathbb{E}[V|V \geq V_1^*]$, $P_B^* = 0$, and $P_L^* = \mathbb{E}[V|V \leq V_1^*]$.*

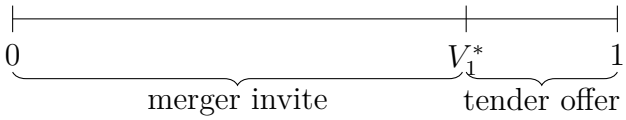


Figure 3: Cut-off equilibrium with tender offer and merger invitation.

High L types acquire the firm themselves, while low L types choose to invite the outside bidder to take the firm over.[11] The partial separation of types is rooted in the ability of

[11] This implies that direct takeovers should be associated with larger premia and value improvements than takeover activism. As discussed in Internet Appendix A.1, this need no longer be true in a more general setting where bidders are heterogeneous in their ability to restructure the firm. In that setting, merger

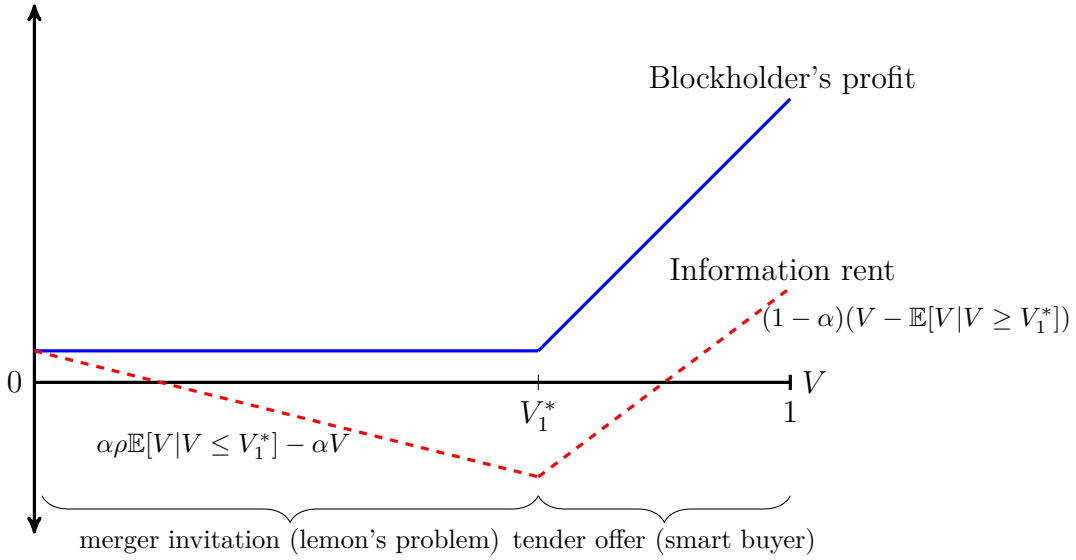


Figure 4: The large shareholder's profit and information rent as a function of her type. The graph is based on a numeric example in which V is uniformly distributed on $[0,1]$ and α is 25%. The cut-off is $V_1^* \approx 0.67$. In the benchmark without an outside bidder, the cut-off is $V_0^* = 0.6$. Hence, merger invitations primarily complement rather than replace tender offers here. Last, if α is reduced to 10%, the cut-off increases to $V_1^* \approx 0.86$, illustrating that smaller initial stakes favor merger invitations.

the informed party to choose to be either a seller or buyer. This choice prevents pooling on one control change mode because an informed acquisition (smart buyer problem) and an informed sale (lemons problem) imply opposite distributions of information rents across types (see dashed line in Figure 4).[12] Information rents accrue "at the top" in the tender offer but "at the bottom" in the merger invitation. Hence, high L types are drawn to the former and low L types to the latter, while intermediate types pick the "lesser evil."

Merger invitations and tender offers appeal to L types at opposite ends of the distribution. Still, the former does not merely complement the latter. With the possibility to extend a merger invitation, fewer L types choose a tender offer, that is, $V_1^* > V_0^*$, because the expected

invitations can capture high idiosyncratic restructuring abilities among potential outside bidders. This can cause merger invitations to be associated with larger gains than tender offers. It also represents another benefit of takeover activism, in addition to the gains from resolving the asymmetric information problem.

[12]The option to choose between the smart buyer problem and the lemons problem is instrumental for achieving separation. Security design cannot achieve a finer type separation *within* the smart buyer problem (Burkart & Lee 2015) or within the lemons problem (Myers & Majluf 1984, Nachman & Noe 1994).

payoff from a merger invitation is positive compared to zero when remaining passive. Hence, the marginal type V_0^* and some types above her prefer a merger invitation to a tender offer. As a result, firm types $V \in [V_0^*, V_1^*)$ are now taken over by the outside bidder rather than by the large shareholder herself as in the benchmark.

Corollary 1. *For $V \in [V_0^*, V_1^*]$ takeover activism substitutes tender offers. For $V \in [0, V_0^*)$ takeover activism complements tender offers, thus ensuring an efficient allocation of control.*

The control allocation in Proposition 1 is efficient: All firms are successfully restructured. In Shleifer & Vishny (1986), the inefficiency results from the interaction of the free-rider problem with asymmetric information; neither friction alone impairs efficiency (Burkart & Lee 2015). At first glance, it may seem that the equilibrium in Proposition 1 is fully efficient only because the merger invitation circumvents the free-rider problem. This aspect of the merger invitation is, however, not indispensable to the efficiency result. Full efficiency obtains even if one imposes merger prices that satisfy the free-rider condition $P_L = P_B = \mathbb{E}[V|invite]$. We moreover show in Section 4 that Proposition 1 holds under a variation of takeover activism that does not impose a merger on the dispersed shareholders.

The key feature of takeover activism responsible for the efficiency result is that the large shareholder is an informed seller rather than an informed buyer. In a tender offer, L's payoff $V-(1-\alpha)P$ is *negative* when the actual value improvement V is sufficiently below the pooling price P. Thus, low L types prefer remaining passive to making a bid, which is the inefficiency in Shleifer & Vishny (1986). In contrast, L's expected merger payoff $\alpha[\rho P_L + (1-\rho)P_B]$ is independent of her type and never below the share value without a control change. Hence, the merger invitation dominates the option of remaining passive for all V. Indeed, even if L were restricted to only extending a merger invitation, all L types would be taken over by the outside bidder, and the outcome would be efficient. The lemons problem does not create an inefficiency here because the maximal reservation value of the seller (0) is below the minimal valuation of the buyer ($V \geq 0$). As a result, when free-riding and asymmetric information problems impede value creating takeovers, informed control sales (merger invitations) are a (more) effective mechanism than informed control acquisitions (tender offers).

This also explains why the control allocation in Proposition 1 is efficient irrespective of the size of L's stake. Smaller stakes α decrease the payoff from either control change mode. This makes a tender offer unprofitable for more L types, but a merger invitation is profitable

for all L types as long as $\alpha > 0$. Hence, smaller α increase the cut-off V_1^*, making takeover activism more likely ex ante.

Discussion of Assumptions. Internet Appendix A.1 discusses the effects of value-decreasing control changes, value improvements that occur without accompanying control transfers, negotiated sales of target firms to large shareholders, competing bids from outside parties in response to tender offers by the large shareholder, competition among multiple outside bidders, heterogenous restructuring abilities across potential acquirers, the removal of takeover defenses, and private information held by outside bidders.

3 Control Changes in the Market

In the previous section we assumed the existence of a large shareholder and of an outside bidder. In this section, we study under which conditions investors prefer to finance, or pursue, strategies that involve becoming a large shareholder (i.e., buying minority blocks to monitor a firm) or strategies that involve acquiring firms as an outside bidder when they are put in play. We proxy the influx of capital into the market for corporate control by a growth in the number of investors who choose between the "large-shareholder" or the "outside-bidder" strategy. We are interested in how this role choice unfolds as the market grows.

3.1 Model

Consider an economy with a continuum of ex ante identical firms of measure one. As in the single-firm model, each firm has a current (normalized) value of 0 and a potential value improvement $V \sim F[0,1]$, distributed identically and independently across firms. The value improvement is realized through restructuring which requires a control change. At the outset, no firm is matched with a large shareholder or an outside bidder. Rather, there is a measure n of control investors. These investors are ex ante not designated as large shareholders or outside bidders but choose in which role to enter the market.

Large Shareholder. A control investor can buy an initial minority stake $\alpha \in (0, \overline{\alpha})$ in a firm. For simplicity, she can acquire the stake at the current share value of 0 and will, thus, acquire the maximal amount $\overline{\alpha}$.[13] By virtue of becoming a large shareholder, she learns V

[13] As in Shleifer & Vishny (1986), L's profit is increasing in α (see Internet Appendix A.2) and it is

privately. If there are multiple large shareholders in the same firm, we assume that a "lead" L is determined randomly. All other Ls can tender their stakes to the lead L if she makes a tender offer or must sell to the outside bidder in a negotiated merger. Throughout, we assume that $\overline{\alpha}$ is sufficiently small so that the combined stake of multiple Ls never exceeds $1/2$. Hence, a control change requires either a direct takeover by the lead L or a sale to an outside bidder. In Internet Appendix A.3, we outline a precise game featuring these assumptions, and show that they render the expected payoff of an L independent of the number of Ls in the same firm, substantially simplifying the analysis.[14]

Outside bidder. A control investor can alternatively become an outside bidder for a specific firm. We think of this as the investor setting aside financial and human capital to be ready to acquire a specific firm if invited by a L. If there are multiple Bs and at least one L in a firm, extending a merger invitation leads to a second price auction among those Bs. As discussed in Internet Appendix A.1, competition between outside bidders yields zero bidder profits in our setting and amounts to L having full bargaining power in a merger ($\rho = 1$).

A control investor cannot perform her chosen role in any arbitrary firm due to, for example, search frictions, lack of industry expertise, or capital constraints. To capture such limitations, each control investor with her chosen role is randomly matched to a single firm according to the subsequent matching protocol: Let n_L (n_B) denote the measure of control investors entering the market as large shareholders (outside bidders) with $n = n_L + n_B$. For $n_L \leq 1$ each L is randomly assigned to a firm such that a fraction n_L of firms is matched with one L. In particular, there are no firms with multiple Ls if $n_L \leq 1$. For $n_L > 1$, each L is randomly allocated to a firm such that a measure $(n_L - \lfloor n_L \rfloor)$ has $\lceil n_L \rceil$ Ls and a measure $(\lceil n_L \rceil - n_L)$ has $\lfloor n_L \rfloor$ Ls.[15] Matching of Bs is independent and works analogously.

To portray the evolution of the market for corporate control we explore how the market composition (n_L^*, n_B^*) changes as the measure n of control investors increases. We consider the following equilibrium.

Definition 1. *An equilibrium of the entry subgame for a given measure n of control investors*

assumed that the size of L's initial take is limited by constraints such as disclosure regulation and stock market liquidity. As for the price of the initial stake, rational investors would anticipate the possibility of a restructuring, so the price at which the control investor can buy the stake would be above the current share value. We abstract from this point in our model but discuss it in more detail in Internet Appendix A.3.

[14] We discuss there also how multiple Ls might affect each other and the chosen mode of control transfer.

[15] $\lfloor n_L \rfloor$ gives the highest integer smaller than n_L and $\lceil n_L \rceil$ gives the smallest integer larger than n_L.

is characterized by the measures (n_L^*, n_B^*) *of* L *and* B *such that neither any* L *nor any* B *has an incentive to deviate given the chosen roles of all other investors and* $n = n_L^* + n_B^*$.

3.2 Choosing Roles in the Market for Corporate Control

Let $\Pi^L(V)$ and $\Pi^B(V)$ denote the payoff of a large shareholder and an outside bidder, respectively. When the firm is not matched with a B, L's payoff is

$$\mathbb{E}[\Pi^L(V)|V^* = V_0^*] = \int_{V_0^*}^{1} V - (1-\alpha)\mathbb{E}[V|V \geq V_0^*]dF(V).$$

This is simply the expected profit from a direct takeover as in the benchmark (Section 2.2). Conditional on the firm being matched with one B, L's payoff is

$$\mathbb{E}[\Pi^L(V)|V^* = V_1^*] = \int_0^{V_1^*} \alpha\rho\mathbb{E}[V|V \leq V_1^*]dF(V) + \int_{V_1^*}^{1} V - (1-\alpha)\mathbb{E}[V|V \geq V_1^*]dF(V).$$

This is the sum of the expected revenues from selling the stake in an invited merger and the expected profit from a direct takeover. As discussed in Section 2.3, a direct takeover is less likely than in the benchmark ($V_1^* > V_0^*$) because the expected sale price in a merger is strictly positive. When the firm is matched with two (or more) bidders, L's payoff is

$$\mathbb{E}[\Pi^L(V)|V^* = V_2^*] = \int_0^{V_2^*} \alpha\ \mathbb{E}[V|V \leq V_2^*]dF(V) + \int_{V_2^*}^{1} V - (1-\alpha)\mathbb{E}[V|V \geq V_2^*]dF(V).$$

The cut-off value for a direct takeover, V_2^*, is in this case even higher because the price in the bidding competition is the expected post-merger share value. Recall that multiple Ls in the same firm do by assumption not affect $\Pi^L(V)$.

An outside bidder who is matched with a firm with at least one L receives the expected merger profit of

$$\mathbb{E}[\Pi^B(V)|V^* = V_1^*] = \int_0^{V_1^*} V - \rho\mathbb{E}[V|V \leq V_1^*]dF(V).$$

In any other constellation, her expected payoff is zero. Either there is no L, and she never receives a merger invitation, or competition with other Bs obliterates expected profits.

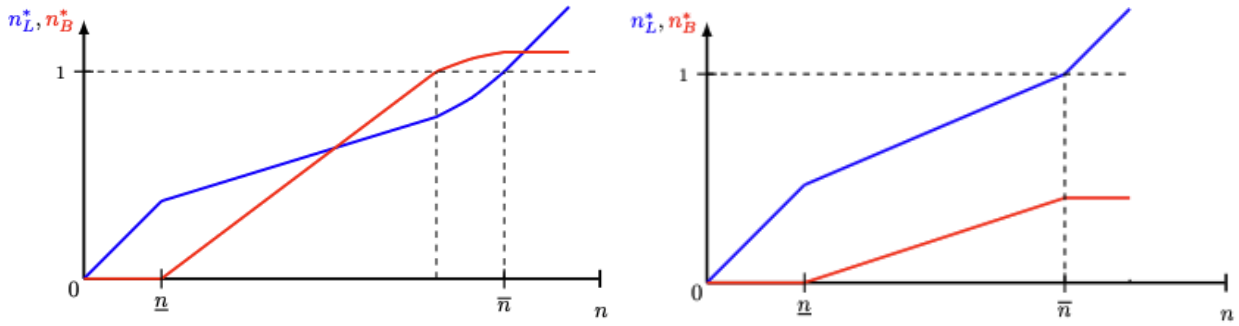
For some parameter values (α, ρ, and $f(V)$), $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] < \mathbb{E}[\Pi^L(V)|V^* = V_0^*]$

such that no control investor ever enters as a B. To focus on the interesting case where both roles are viable, let $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_0^*]$ (Assumption A4).[16]

Proposition 2. *There are three stages in the evolution of the market for corporate control:*

- ***Early stage*** *($n < \underline{n}$): All control investors enter as large shareholders and their profits are independent of n.*
- ***Transformation stage*** *($n \in [\underline{n}, \overline{n}]$): Control investors enter as large shareholders and bidders. Both make the same expected profit which strictly increases in n.*
- ***Mature stage*** *($n > \overline{n}$): Control investors beyond $\overline{n}$ enter only as large shareholders, and control investor profits attain their maximum and are constant in n.*

Figures 5*a* and 5*b* depict the entry decisions as the measure n of control investors increases. In a thin market ($n < \underline{n}$), all control investors enter as large shareholders. L acquires the firm herself whenever the value improvement is large ($V \geq V_0^*$), thereby generating a strictly positive expected payoff $\mathbb{E}[\Pi^L(V)|V^* = V_0^*]$. By contrast, a bidder makes zero profit unless there is a L in the firm who extends a merger invitation. With relatively few control investors, the likelihood of receiving a merger invitation is too small, even if all others were to choose to be a L. Thus, the red n_B^* line in Figures 5*a* and 5*b* is flat for $n \leq \underline{n}$, whereas the blue n_L^* line increases one-to-one with n.



(a) $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$ (b) $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] < \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$

Figure 5: Equilibrium measures n_L^* and n_B^* as a function of the market size n.

[16] If L's payoff when the firm is not matched with a B exceeds B's payoff when the firm is matched with a L, becoming a L is the dominant strategy for any measure n of control investors. Assumption 4 is likely to hold for small ρ and α. For example, if $V \sim \mathcal{U}[0,1]$ and $\alpha = 0.1$, Assumption 4 holds for all $\rho < 0.958851$.

Given $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_0^*]$ (by Assumption A4), there exists a measure of control investors $\underline{n} < 1$ such that becoming an outside bidder becomes equally attractive as being a large shareholder, that is, $\mathbb{E}[\Pi^L(V)|V^* = V_0^*] = \underline{n}\mathbb{E}[\Pi^B(V)|V^* = V_1^*]$. Once n crosses this threshold the market enters its transformation stage in which control investors assume both roles. Importantly, a complementarity arises and either role becomes more profitable as more control investors enter the market (see Internet Appendix A.4): The expected payoff of B is strictly increasing in n_L^* because the probability of a merger invitation increases. Conversely, the expected payoff of L is increasing in n_B^* because the likelihood of being able to extend a merger invitation increases.

For a given $n \in [\underline{n}, \overline{n}]$, control investors are indifferent between the two roles in equilibrium. As long as $n_B^* < 1$ and $n_L^* < 1$, the equilibrium entry condition is

$$(1 - n_B^*)\mathbb{E}[\Pi^L(V)|V^* = V_0^*] + n_B^*\mathbb{E}[\Pi^L(V)|V^* = V_1^*] = n_L^*\mathbb{E}[\Pi^B(V)|V^* = V_1^*]. \quad (5)$$

There are two cases of relative entry rates that satisfy condition (5). For $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$ being a single outside bidder in a firm with a large shareholder is more profitable than vice versa (case (a)). Therefore, in the transformation phase, more control investors enter as Bs, and n_B^* reaches 1 before n_L^* does. That is, all firms are matched with a B before every firm has been matched with a L. Once $n_B \geq 1$, the equilibrium entry condition becomes

$$(n_B^* - 1)\mathbb{E}[\Pi^L(V)|V^* = V_2^*] + (2 - n_B^*)\mathbb{E}[\Pi^L(V)|V^* = V_1^*] = n_L^*(2 - n_B^*)\mathbb{E}[\Pi^B(V)|V^* = V_1^*]. \quad (6)$$

When control investors enter as B for $n_B \geq 1$, some firms end up with two Bs each making zero profits either due to bidding competition or because the firm does not have a L. At the same time, the payoff of L is increasing since the sale price may be determined in a bidding competition rather than in a merger negotiation. Consequently, more control investors enter as Ls than as Bs to meet condition (6). Still, the expected profits of Ls and Bs keep increasing because there are more Bs and Ls in the market. This holds true until all firms have one L ($n_L^* = 1$) and the transformation stage ends. These are the reasons why the red n_B^* line in the interval $[\underline{n}, \overline{n}]$ is initially steeper than the blue n_L^* line until $n_B^* = 1$ and then

flatter in Figure 5*a*.

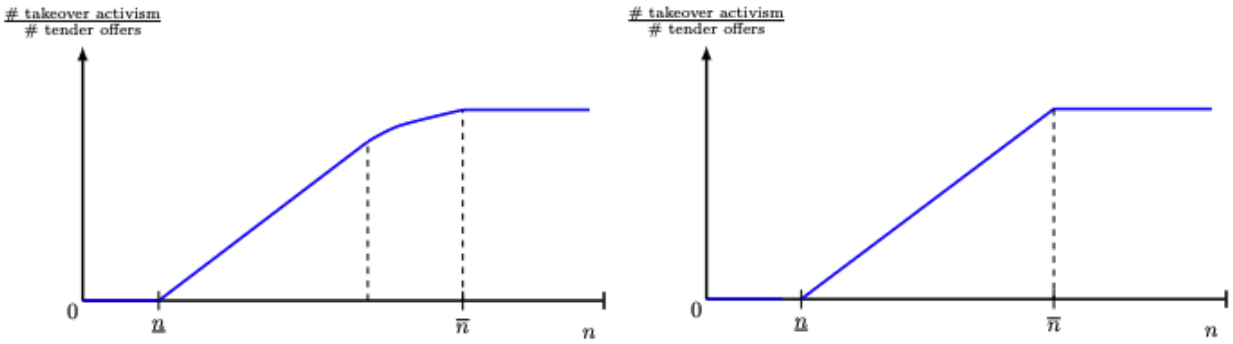
For $\mathbb{E}[\Pi^L(V)|V^* = V_1^*] > [\Pi^B(V)|V^* = V_1^*]$, being a large shareholder in a firm matched with a single bidder is more profitable than vice versa (case (b)). Entry condition (5) implies in this case that more control investors enter as Ls than as B until the transformation stage ends and each firm has one L ($n_L^* = 1$) but not necessarily one B ($n_B^* < 1$). Accordingly, the blue n_L^* line is steeper in the interval $[\underline{n}, \overline{n}]$ and always above the red n_B^* line in Figure 5*b*.

Once each firm is matched with a large shareholder ($n_L^* = 1$), the market for corporate control has reached its mature stage ($n \geq \overline{n}$). The expected payoff of each B no longer depends on n_L. The reason is that, whenever a B is matched with a firm, this firm already has a L to initiate a merger negotiation or bidding competition for low value improvements. By contrast, the expected payoff of L still increases in n_B because it makes either bidding competition (case (a)) or a merger invitation (case (b)) more likely for low value improvements. In either case, however, more Bs entering would violate equilibrium condition (6), respectively condition (5), so no more control investors enter as Bs. By Assumption A4, multiple Ls in a firm do not dilute the expected payoff of each L. Consequently, all control investors beyond $\overline{n}$ enter as Ls. Hence, the red n_B^* line is flat for $n \geq \overline{n}$ in Figures 5*a* and 5*b*, whereas the blue n_L^* line increases one-to-one with n. In this mature stage, the expected payoffs of Bs and of Ls are the same and reach their highest level. This results from our simplifying assumption that L's profits are independent of the number of other Ls in the same firm. However, in practice, we would expect that at some point in the mature phase, when more control investors want to enter the same firm as Ls, competition will reduce the toehold size per L. While we conjecture that this would reinforce our main findings, because smaller toeholds lead to more takeover activism in our single-firm model, a formal analysis of this is not feasible in the market model.

The equilibrium market composition (n_L^*, n_B^*) as a function of the measure n of control investors determines which mode of control change is more prevalent as the market grows.

Proposition 3. *Relative to direct takeovers, takeover activism becomes more likely as the measure n of control investor increases.*

Figures 6a and 6b depict the relative frequency of takeover activism and direct takeovers. In a thin market for corporate control ($n < \underline{n}$), only large shareholders enter; the ratio of takeover activism to direct takeovers stays constant at 0.



(a) $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$ (b) $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] < \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$

Figure 6: Equilibrium frequency of takeover activism relative to outright tender offers as a function of the market size n.

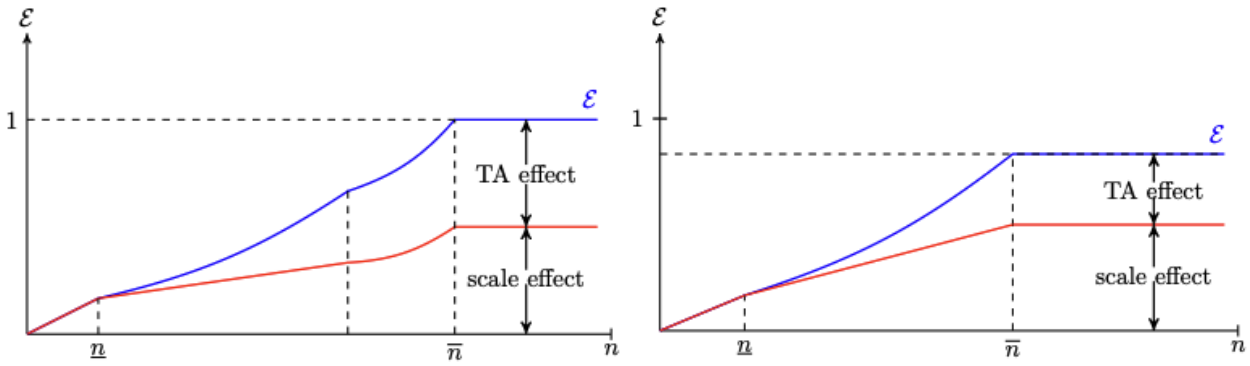
Once the market for corporate control is in the transformation stage ($n \geq \underline{n}$), some control investors start entering as outside bidders, giving rise to first incidences of takeover activism. As the market for corporate control expands further (larger n), takeover activism becomes more prevalent due to the asymmetric impact that more Ls and Bs have on the mode of control change. More Bs bring about more control changes because takeovers are realized also for low value improvements through takeover activism. At the same time direct takeovers are being replaced by takeover activism for value improvements $V \in [V_0^*, V_1^*]$. That is, an increase in n_B^* leads to more merger invitations in part at the expense of direct takeovers. By contrast, more Ls bring about more control changes but do not affect the relative frequency of direct takeovers and takeover activism. This is because Ls are necessary for either mode of control change. Hence, takeover activism becomes increasingly more frequent for $n \in [\underline{n}, \overline{n})$, as the ratio in Figures 6a and 6b shows.

For $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$ (case (a)) the relative frequency of takeover activism increases at a slower rate once n_B^* reaches 1. Given the firm has a L, a second B leads to a substitution of direct takeovers with takeover activism for $V \in [V_1^*, V_2^*]$ because bidding competition results in a higher sale price. The second B does, however, not alter the mode of control change for value improvements $V \in [0, V_1^*]$ since the first B already ensures that a control change takes place through takeover activism. At the same time, control investors enter now at a slower rate as Bs. Ceteris paribus, bidder competition increases Ls' profits and decreases Bs' profits. Hence, to keep control investors indifferent between the two roles, Ls need to enter at a faster rate to increase Bs' profits. This reinforces the slower

increase in takeover activism.

Once every firm is matched with a L ($n_L^* = 1$), no control investors enters the market as a B anymore. Consequently, the relative frequency of takeover activism reaches a "steady state" and the line depicting the ratio of takeover activism to direct takeovers in Figures 6a and 6b becomes horizontal.

As the market for corporate control evolves and more control investors enter, it becomes more efficient. Let $\mathcal{E}$ denote market efficiency measuring the percentage of potential value improvements in the economy realized in equilibrium. Figure 7 shows that $\mathcal{E}$ is a weakly increasing function of the measure of control investors n in both cases. While all potential value improvements are realized in case (a), the market does not attain full efficiency in case (b). In case (b) being a L in a firm matched with a B is more profitable than vice versa. As a result not all firms are in equilibrium matched with a B ($n_B^* < 1$) for all values of n. This is due to our simplifying assumption that multiple Ls in one firm do not dilute each other's profits. As we discuss in Internet Appendix A.3, allowing for such dilution would lead to more control investors entering as B, thereby improving efficiency. With a firm population



(a) $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$ (b) $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] < \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$

Figure 7: Equilibrium efficiency $\mathcal{E}$ of the market for corporate control as a function of the market size n.

of mass one, the efficiency measure $\mathcal{E}$ can also be interpreted as the probability of each individual firm to be taken over and restructured. This in turn can be decomposed into first the probability of being matched with a L, which is a prerequisite for a control change, and,

second, the probability of being restructured conditional on being matched with a L.

$$\mathcal{E} = \underbrace{min\{n_L^*, 1\}}_{\mathbb{P}[\text{matched } L]} \underbrace{min\{n_B^* + (1 - n_B^*) \int_{V_0^*}^{1} V dF(V) \frac{1}{\mathbb{E}[V]}, 1\}}_{\approx \mathbb{P}[\text{control change} \mid \text{matched}]} \tag{7}$$

The probability that a firm is matched with a L is simply the equilibrium measure of large shareholders n_L^* or 1 once $n_L^* \geq 1$. Conditional on being matched with an L, a firm matched with a B is always restructured while—for $n_B^* < 1$—a firm not matched with a B is restructured only if $V \geq V_0^*$.

The two components of the efficiency gain $\mathcal{E}$ capture distinct effects. First, when control investors enter only as Ls in the early stage, the sole source of gains is that more control investors are able to identify more restructuring opportunities, that is, more firms. This is a common "scale" effect of more market entry. Second, an additional source of gains materializing in the transformation stage is the increase in the probability that a potential firm, once identified, is actually restructured. This is not a scale effect but reflects the evolution of the market toward a *more effective mode of control change*. It corresponds to the efficiency gains of takeover activism identified in the firm-level analysis. Formally, we can decompose the increase in efficiency for $n_L^*, n_B^* \in (0, 1)$ into

$$\frac{\partial \mathcal{E}}{\partial n} = \underbrace{\frac{\partial n_L^*}{\partial n}\Big(n_B^* + (1 - n_B^*) \int_{V_0^*}^{1} V dF(V) \frac{1}{\mathbb{E}[V]}\Big)}_{>0, \text{ scale effect}} + \underbrace{\frac{\partial n_B^*}{\partial n} n_L^* \int_{0}^{V_0^*} V dF(V) \frac{1}{\mathbb{E}[V]}}_{>0, \text{ TA effect}} > 0. \tag{8}$$

The additional "takeover-activism effect" arises from entry of outside bidders who allow to restructure also companies with value improvements below V_0^*. This effect becomes more dominant if many firms are already matched with a large shareholder as the likelihood that an outside bidder is matched to a firm, where she is needed to restructure the firm, increases.

While we have framed our results in terms of market growth, in Internet Appendix A.5, we discuss why a mere increase in the number of control investors without the assumed market frictions would not lead to a transition from direct takeovers to takeover activism. The latter evolution is the emergence of a specific "industrial organization" to overcome free-riding and asymmetric information problems in the market for corporate control.

Discussion of Assumptions. In Internet Appendix A.3 we further discuss the effects of toehold acquisitions in a standard noise-trader setting, multiple large shareholders in the same firm, the same investors having multiple roles in different firms, and the endogenous growth of the control investment sector (market entry).

4 On the Efficiency Gains from Takeover Activism

Shleifer & Vishny (1986) initiated a strand of research in which inefficiencies arise due to the conjunction of free-riding and asymmetric information. In our baseline model, full efficiency is attainable due to takeover activism. In this section, we show on the basis of an alternative set of transactions that the efficiency result does not hinge on avoiding the free-rider problem. Rather, the choice between undertaking and brokering a takeover allows for a *separation* of the asymmetric information problem from the free-rider problem. Thus, the efficiency gains can be realized even when shareholder support for a merger negotiation cannot be garnered.

4.1 Block Trade and Bidder Tender Offer

Consider a variation of the single-firm model in which "takeover activism" is carried out through a block trade between the large shareholder and the outside bidder who subsequently makes a tender offer for the widely held shares. That is, L can make a tender offer τ_L herself or sell her stake α to B. After a block trade, B can make a tender offer τ_B to the dispersed shareholders, which exposes her to the free-rider problem. To keep a level playing field, we assume the same bargaining protocol for the block trade as we did for the merger invitation: With probability ρ, L makes a take-it-or-leave-it offer p_L for the α stake, and with probability $1-\rho$, B makes a take-it-or-leave-it offer p_B. The difference in L's payoff from making a tender offer herself and trading the α stake to B is

$$\underbrace{(1-\alpha)(V-\tau_L)+\alpha V}_{\text{Direct Takeover}} - \underbrace{\alpha[\rho p_B+(1-\rho)p_L]}_{\text{Takeover Activism}}. \tag{9}$$

If $P=\tau_L$, $P_B=p_B$ and $P_L=p_L$, L's choice between a direct takeover and takeover activism is the same as in the baseline model (see Equation (4)).

After the block acquisition, the dispersed shareholders accept the tender offer from B

only if her offer τ_B at least matches the conditonal expected share value $\mathbb{E}[V|invite]$. Since B and the dispersed shareholders share the common posterior $\mathbb{E}[V|invite]$, her bid τ_B does not alter their expectation of V. So they accept the offer $\tau_B = \mathbb{E}[V|invite]$.

Proposition 4. *The model with block trades and subsequent tender offers replicates the equilibrium outcome of Proposition 1: For $V \in [V_1^*, 1]$, the large shareholder makes a bid herself. For all $V \in [0, V_1^*)$, she sells her block to the bidder, who then makes a successful bid.*

The equilibrium structure and even the cut-off V_1^* are the same as in the baseline model and all firms are taken over. Intuitively, L's choice is unaffected because she sells her entire stake both in a block trade and in a merger negotiation (under the same bargaining protocol). All firm types are taken over in this variant of takeover activism because asymmetric information and the free-rider problem are separated. In the block trade, there is an asymmetric information problem, but no free-riding. As there are known gains from trade, asymmetric information itself does not prevent efficient trade. In the subsequent tender offer B has the same posterior as the dispersed shareholders. So, B is only exposed to free-riding which per se does not preclude efficient trade. As a result, the control allocation is efficient.

4.2 Informed Bidder after Block Trade

The efficiency gains associated with takeover activism arise because block trade and subsequent tender offer permit a full separation of asymmetric information and the free-rider problem. One wonders whether takeover activism still generates efficiency gains when the bidder learns the true value improvement V after the block trade but before a tender offer. In this case, B—like L—knows more than the dispersed shareholders. The tender offer is then again plagued by both asymmetric information and the free-rider problem. Still, takeover activism improves efficiency, albeit to a lesser extent.

Proposition 5. *When the bidder learns V after the block trade, the large shareholder makes a bid for $V \in [\overline{V}_1^*, 1]$ and otherwise sells her block. Subsequently, the bidder makes a bid for all $V \in [\underline{V}_1^*, \overline{V}_1^*)$ but does not bid for $V \in [0, \underline{V}_1^*)$ with $\underline{V}_1^* < V_0^*$.*

This equilibrium is characterized by two cutoffs (see Figure 8). For substantial improvements ($V \geq \overline{V}_1^*$), L makes a direct acquisition, offering the expected post-takeover share

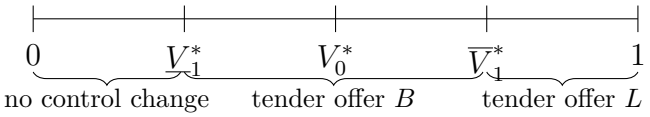


Figure 8: Equilibrium cutoffs with informed bidder.

value $\tau_L^* = \mathbb{E}[V|V \geq \overline{V}_1^*]$. For moderate value improvements ($V < \overline{V}_1^*$), L negotiates a block trade with B.

Once B learns the value improvement V, she is in a situation similar to the large shareholder in the Shleifer & Vishny (1986) setting, but with one crucial difference. The fact that L abstained from making a tender offer credibly reveals that the possible value improvements are truncated to the subset $[0, \overline{V}_1^*]$ when B makes her bid. Consequently, B can succeed with a lower offer price than L. In parallel to the tender offers made by L, all successful B types pay the same price $\tau_B^* = \mathbb{E}[V|V \in [\underline{V}_1^*, \overline{V}_1^*]]$, and those types with a smaller (larger) value improvement buy the firm at a premium (discount). The mispricing deters B types with sufficiently small value improvements $V < \underline{V}_1^*$. Their gain on the block α does not compensate for the loss they make on the $1 - \alpha$ shares purchased in the tender offer.

Since the block trade only occurs if $V \in [0, \overline{V}_1^*]$, the bid price τ_B that B has to pay and the cutoff type $\underline{V}_1^*$ above which a bid is profitable must be smaller than in the setting where only L can acquire the firm (Section 2.2). Therefore, more firms are taken over and restructured than without takeover activism. Finally, anticipating the outcome at the tender offer stage, B values the block at $\alpha\mathbb{E}[V \mathbb{1}_{V \geq \underline{V}_1^*} | V \leq \overline{V}_1^*] = \alpha\mathbb{P}[V \geq \underline{V}_1^* | V \leq \overline{V}_1^*] \times \mathbb{E}[V|\underline{V}_1^* \leq V \leq \overline{V}_1^*]$. Thus, L cannot ask more than $p_L^* = \mathbb{E}[V \mathbb{1}_{V \geq \underline{V}_1^*} | V \leq \overline{V}_1^*]$ for her stake in the block trade negotiations. Since L's payoff is zero should the negotiations fail, B offers $p_B^* = 0$.

4.3 Bidder Chain

We now allow for the possibility of multiple block trades prior to the tender offer. Suppose there are $i \in \{1, \ldots, n\}$ outside bidders where L is, for ease of notation, bidder 1. Bidder 1 owns α shares and learns the realization of V. He can make a tender offer τ_1 or negotiate a block trade with bidder 2. The bargaining protocol remains unchanged: with probability ρ, bidder 1 makes an offer p_1^{ask}, and with probability $1 - \rho$, bidder 2 makes an offer p_2^{bid}. If bidder 2 acquires the block, she in turn learns the realization of V and decides to either

make a bid or negotiate a block trade with bidder 3. Generally, if some bidder $i < n$ does not make a tender offer, she can sell the block to bidder $i + 1$. Bidder n can only make a tender offer. The game ends when some bidder $i \in \{1, \ldots, n\}$ makes a tender offer or when bidder n does not make a bid. Figure 9 depicts the sequence of moves.

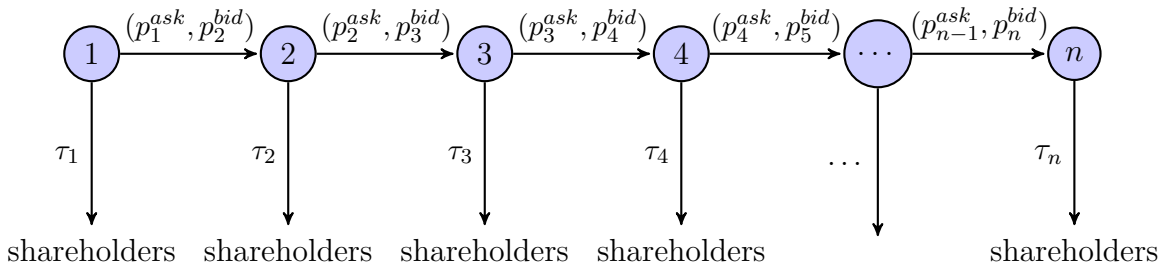


Figure 9: Bidder chain.

Proposition 6. *There exists an equilibrium with n cutoffs $1 > V_1 > V_2 > \cdots > V_n > 0$. A bidder i makes a tender offer if $V \in [V_i, V_{i-1})$ and otherwise sells the block to bidder $i + 1$.*

Each bidder $i < n$ makes a tender offer $\tau_i = \mathbb{E}[V | V \in [V_i, V_{i-1})]$ if the value improvement V is in the interval $[V_i, V_{i-1})$ and enters a block trade if the improvement is smaller ($V < V_i$). In a block trade, bidder $i + 1$ offers with probability $(1 - \rho)$ to buy at the bid price $p_{i+1}^{bid} = 0$ as bidder i's outside option is zero. With probability ρ, bidder i offers to sell at the ask price $p_i^{ask} = \sum_{j=i}^{n-1} \rho^{j-i}\, \mathbb{E}[V\ \mathbb{1}_{V \in [V_{j+1}, V_j)}\ | V \leq V_j]$. The price p_i^{ask} is the expected value of the block to bidder $i + 1$ which comprises the expected profits from a takeover and a block trade. The block trade profits, in turn, are given by bidder $i + 2$'s expected profits from a takeover and a block trade. Iterating until bidder n gives the price formula above.

If bidder i buys the block at the ask price p_{i-1}^{ask} she realizes a profit if she afterward makes a bid. Otherwise, she makes a loss as $p_{i-1}^{ask} > p_i^{ask} > p_{i+1}^{bid}$. If she pays her bid price p_i^{bid}, she never makes a loss. If the block ends up with bidder n, she makes a bid $\tau_n = \mathbb{E}[V | V \in [V_n, V_{n-1})]$ if $V \in [V_n, V_{n-1})$. For $V < V_n$, she does not acquire and restructure the firm.

Proposition 7. *The set of firms that are not being taken over and restructured shrinks with the length of the bidder chain. As $n \to \infty$, the control allocation becomes efficient.*

The control allocation is more efficient when the bidder chain is longer. In the limit, the control allocation is fully efficient, even though every potential tender offer is subject to

free-riding and asymmetric information. Intuitively, more bidders must forgo the option to acquire the firm to *collectively* signal lower realizations of V. Only then are dispersed shareholders willing to sell at a price that makes a bid profitable for small value improvements. If sufficiently many bidders forego to option to acquire the firm, a takeover becomes profitable for some bidder for any given value improvement, however small.

The efficiency gains from takeover activism (via merger invitations) identified in Sections 2 and 3 are equivalent to those generated by a bidder chain that successfully separates the free-rider problem and the asymmetric information problem. We therefore view the evolution of the market for corporate control toward takeover activism as the emergence of a form of intermediation that allows for those two frictions to be uncoupled.[17]

Propositions 4-6 also suggest that combinations of block trades and subsequent takeovers are an alternative to merger invitations in the absence of shareholder support for the latter. Such transaction sequences do occur. Barclay & Holderness (1992) study a sample of 106 block trades (all involving blocks of at least 5 percent of the outstanding shares). Most of the block trades do not lead to an immediate increase in ownership concentration but merely change the identity of the firm's largest shareholder. However, half of these block trades ultimately lead to the firm being acquired by the block purchaser or a subsequent owner of the same block. In some (but not all) cases, the ensuing acquisition is announced at the time of the block trade. The study also shows that, in such follow-up acquisitions, "most block purchasers pay minority shareholders at least as much per share as they report paying the block seller" (p. 266).[18]

5 Disciplinary Ownership Changes: Empirical Patterns

Our theory posits that a growing influx (of funds at the disposal) of control-oriented investors causes a shift from direct takeovers towards takeover activism. This transition can be broken down into four trends that unfold in parallel: the control-oriented investment sector grows; yet the incidence of hostile tender offers declines; the decline in hostile tender offers is not tantamount to a drop in disciplinary control changes; and takeover activism becomes a prevalent mode of effectuating disciplinary control change in public companies. Documented

[17] We discuss the relation to the intermediation literature in Internet Appendix A.6.

[18] See also Barclay & Holderness (1991).

developments in the market for corporate control broadly match these predictions.

Growth of control-oriented investment. Both hedge fund activism (Brav et al. 2022) and private equity buyouts (Kaplan & Stromberg 2009, Mauboussin & Callahan 2020, Braun et al. 2023) have grown enormously over the last decades in terms of capital inflow, assets under management, and number of funds. Not all of this growth maps directly into a growth of the "control-oriented investors" in our model: Neither do all activist campaigns seek a sale of the target, nor do all private equity buyouts involve a public company. Still, the numbers show a secular increase in capital flows to investors who pursue *corporate governance* changes or *controlling ownership* stakes (in public or private firms).

While there has been an absolute increase in many asset classes due to economic growth, control-oriented investments have undergone a particularly strong expansion since the 1980s. There are both supply and demand side explanations for why investors have increasingly been drawn to this asset class during this time period. On the supply side, there were a number of developments that have made it easier for control-investment intermediaries to execute their strategies and to raise external financing. This includes innovations in financing instruments, fund structures, and compensation design (Kahan & Rock 2007, Kaplan & Stromberg 2009); regulatory changes enabling active shareholders to press for changes more effectively (Sharara & Hoke-Witherspoon 1993, Fos 2017); and attendant capital accumulation by intermediaries themselves (Rampini & Viswanathan 2018). On the demand side, institutional investors have increasingly shifted capital to alternative asset classes in search of higher yields, and activist hedge funds and private equity funds have been able to deliver attractive returns (Orol 2007). Moreover, capital flows to private equity also stimulated capital flows to hedge fund activism and *vice versa*. We would argue that the developments both on the side of the intermediaries and on the side of investor demand have driven an increase in the number of control investors (n) in the market.[19]

Decline of tender offers. Hostile tender offers experienced a secular decline over the same time period, as has already been pointed out by several scholars (e.g., Holmstrom & Kaplan 2001, Fos 2017). Figure 10 shows the secular decline in hostile takeovers.[20] The upper

[19] Internet Appendix A.3 discusses how some of these supply- and demand-side narratives could be modeled.

[20] The deal attitude is defined as hostile when the takeover is opposed by the incumbent board of directors. In the data, this usually involves tender offers or proxy fights by the acquirer. Negotiated mergers that occur under or in the aftermath of activist pressure are likely not classified as "hostile" in empirical data (e.g., under pressure, the board of directors may agree to pursue a merger with a potential acquirer). Indeed,

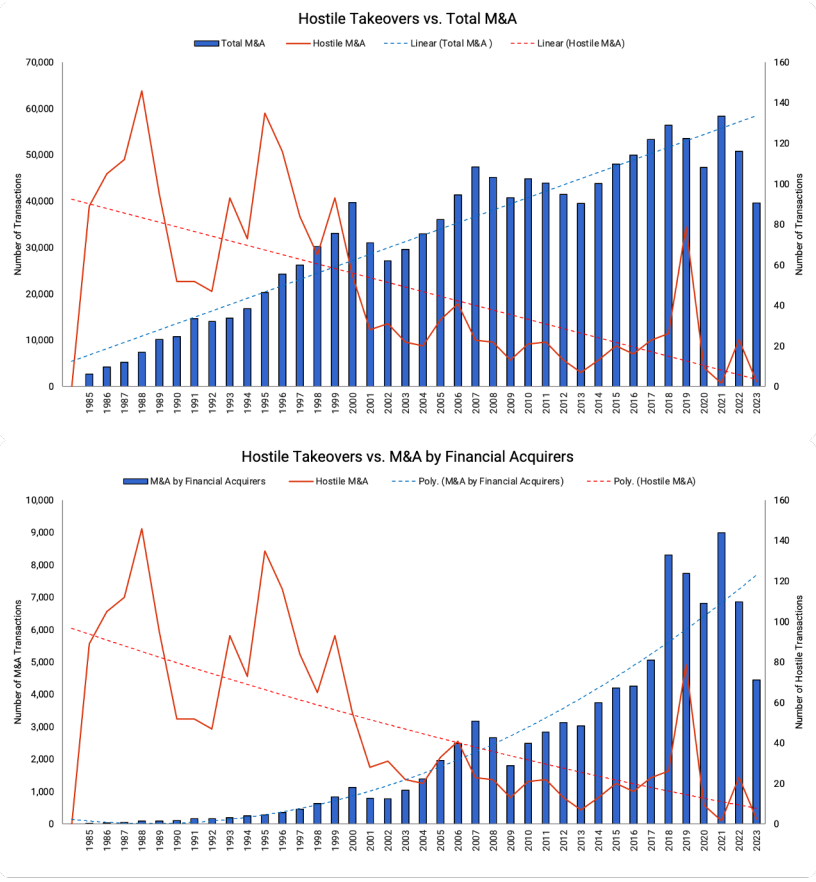


Figure 10: Hostile takeovers, total M&A, and M&A by financial acquirers. Source: The numbers were downloaded from the Institute for Mergers, Acquisitions and Alliances https://imaa-institute.org/mergers-and-acquisitions-statistics/

graph contrasts this with the growth of total M&A. Since the latter includes friendly mergers with strategic acquirers, the lower graph shows a comparison to M&A by financial acquirers, which are more likely motivated by governance objectives. Since both sets of M&A statistics include a lot of private targets especially after the 1980s (Kaplan & Stromberg 2009), Figure 11 uses the number of public firms in the U.S. as a reference point to check that the decline in hostile takeovers is not just proportional to the widely documented decline in the number of

Greenwood & Schor (2009) document that activist campaigns concerned with corporate governance issues tend to pave the way for control changes further down the road even if short-term campaign objectives did not explicitly include (but tacitly accounted for the potential of) ownership changes. In our model such episodes fall under takeover activism even if the eventual deal is not classified as "hostile" in empirical data.

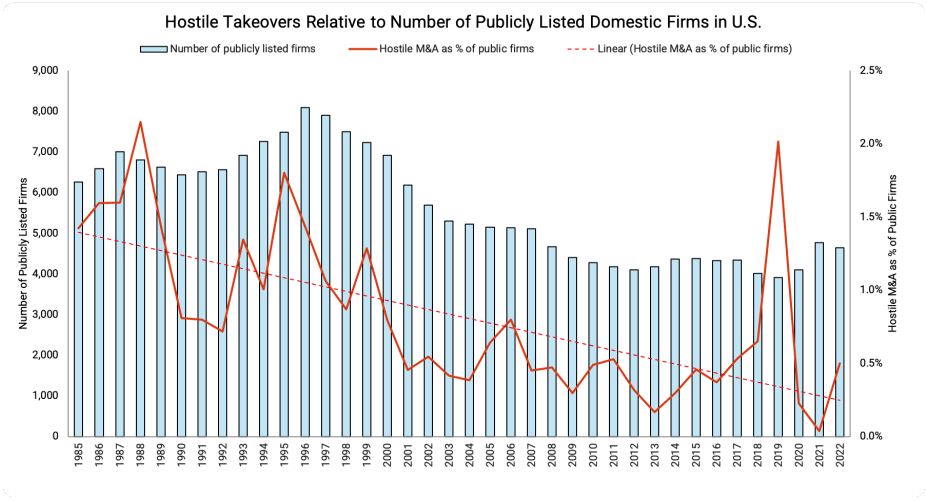


Figure 11: Hostile takeovers relative to the number of publicly listed U.S. companies. Source: The numbers for publicly listed companies were downloaded from the World Bank Group https://data.worldbank.org/indicator/CM.MKT.LDOM.NO?locations=US.

public companies.[21] In all graphs we see a dramatic dip in the 1989-1992 period, attributable to the confluence of a brief recession and the rise of anti-takeover mechanisms. The decline of hostile takeovers has been more continuous afterwards, however, and the normalization in Figure 11 shows that it outpaced the decline in the number of public firms.

Public-to-private buyouts. Despite the rise of activism and decline in hostile takeovers, there was no decline in disciplinary control changes. The buyout sector expanded and public company buyouts increased across the period of declining tender offers (Kaplan & Stromberg 2009).[22] Extending the data to 2016, Renneboog & Vansteenkiste (2017, Figure 2) find cycles but no downward trend in public company buyouts even as public firms declined in number. In fact, public-to-private buyouts significantly contributed to this decline since the mid-1990s (Ljunqvist et al. 2016, Figure 2). Such buyouts undo the separation of ownership and control to realign incentives and effect major changes (Kaplan & Stromberg 2009, Davis et al. 2019). They are in this sense "disciplinary." The upper graph of Figure 12 compares the numbers of public-to-private buyouts and hostile takeovers (normalized by the number of public firms). The drift in the ratio of these numbers shows that disciplinary control changes have become

[21] See, e.g., Kahle & Stulz (2017).

[22] This is notwithstanding that much of overall private equity activity involves private target firms. At the same time, there have also been many divisional buyouts and spin-offs which, aside from public-to-private buyouts, also constitute (disciplinary) control changes in the sphere of public firms.

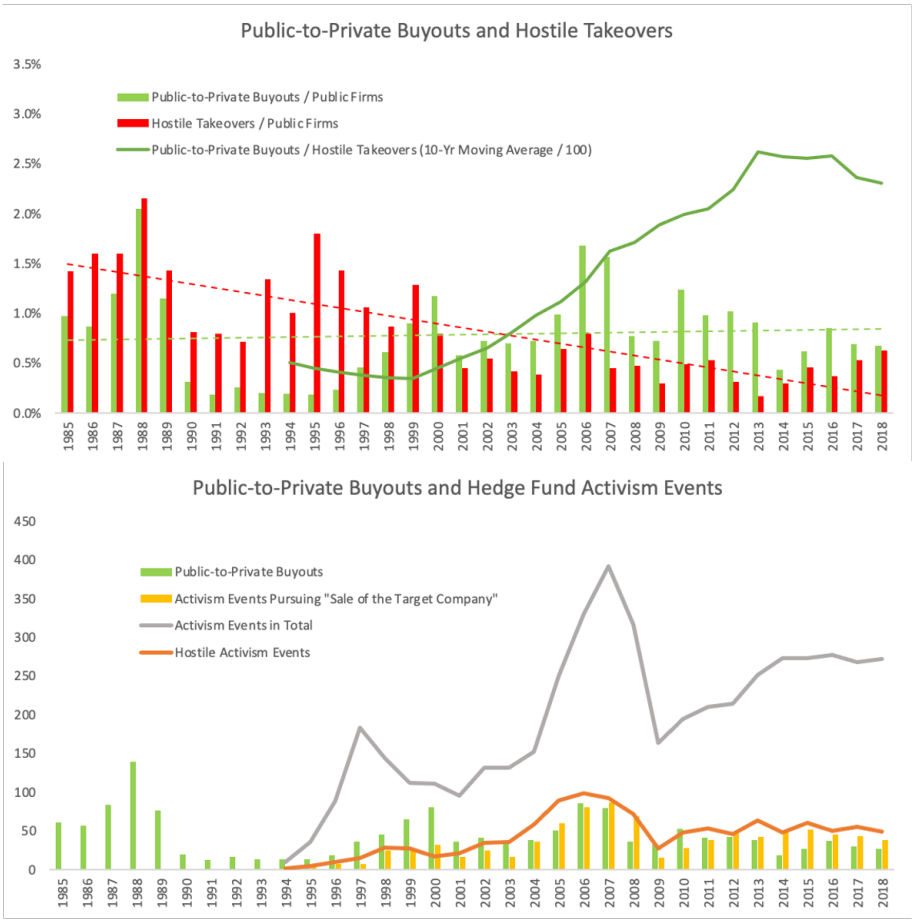


Figure 12: Public-to-Private Buyouts, Hostile Takeovers, and Hedge Fund Activism. Source: The numbers for public-to-private buyouts and hedge fund activism were generously provided by Renneboog & Vansteenkiste (2017) and Brav et al. (2022).

gradually decoupled from hostile takeovers over time.[23]

Takeover activism. In Brav et al. (2021, Table 1), "Governance" and "Sale of target" are the stated objective for, respectively, about 35.5% and 18.5% of activist campaigns.[24] In Fos (2017), the dissidents demand governance changes in about 39%, and the sale of the

[23]It is not improbable for public company buyouts to occur in a context of hostility. While hostile tender offers have become rare, activists often use hostile tactics (e.g., Fos 2017, Gantchev 2013, Brav et al. 2008) to such a degree that firms have begun to use anti-activism pills (Eldar et al. 2023). Against the backdrop of such activism, it would be surprising if public-to-private buyouts occurred in a bubble of amicability.

[24]Governance-motivated campaigns often lead to a sale of the target even when that was not an explicitly declared objective (Greenwood & Schor 2009). The "Sale of target" category in Brav et al. (2022) includes campaigns in which activists demand a sale of the target to a third party or seek to acquire the target.

target company in about 29%, of the proxy fights. Greenwood & Schor (2009), Boyson et al. (2017), and Becht et al. (2017) show that takeover activism accounts for a significant portion of the aggregate returns to hedge fund activism.

Brav et al. (2021, Figure 1) report that the number of activist campaigns (hedge funds) grew from below 10 in 1994 to around 200 (175) in 2018 despite a fall in the number of public firms. The share of public firms targeted by activism thus rose substantially, and 20%-40% of the campaigns addressed governance or control issues. The lower graph of Figure 12 plots the number of activist campaigns that sought a sale of the target firm or were (openly) hostile next to the number of public-to-private buyouts. The patterns suggest that such campaigns facilitate buyouts. This view is widespread among practitioners. For example, private equity pioneer Thomas H. Lee is quoted in the New York Times (Sorkin 2007) thanking

> Carl Icahn, Nelson Peltz, Jana Partners, Third Point... for teeing up deals because they're coming in there and shaking up the management and many times these companies are being driven into some form of auction.

Because of such interactions, "activism has been dubbed 'the new M&A' " (Campbell 2014). Many commentators view this as the result of the growing capital flow into control-oriented investment funds and refer to this as a *symbiosis* or a *convergence* of the two strategies (e.g., Billings & Gump 2005, Sorkin 2007, Barker 2007, Klein et al. 2020, Goldfarb 2020).[25]

Role specialization One should not map the large shareholders and outside bidders in our model too narrowly into activist hedge funds and private equity funds. The latter taxonomy started emerging in the mid-1990s and was not yet established in the early phases of the market for corporate control. A better starting point for mapping our model to reality is to recognize that the pioneers of control-oriented investing were aware of the choice between acquiring a firm and putting it into play.[26] (Internet Appendix A.7 lists examples of activist investors having played different roles in different deals.) In 1976, Carl Icahn wrote:

[25] Practitioners view this as an ongoing, permanent change (see, e.g., the conclusion in Glass & Polonyk 2019). Most discussions focus on the overlap and complementarity of private equity and hedge fund activism, but there have also been signs of conflict because of intensified competition among control-oriented investors in the now more "saturated" market for corporate control (e.g., Moeser 2019, Crawford & Gruenberg 2020). The emergence of such conflicts is interesting but they are not a focus of our paper.

[26] It is safe to say that both private equity funds and activist hedge funds have their roots in the activities of the raiders of the 1980s. This link is not just a conceptual one but involves direct interpersonal connections and networks spanning across buyouts and activism, as highlighted, e.g., in Chapters 1 and 2 of Orol (2007).

> It is our contention that sizeable profits can be earned by taking large positions in 'undervalued' stocks and then attempting to control the destinies of the companies in question by: a) trying to convince management to liquidate or sell the company to a 'white knight'; b) waging a proxy contest; c) making a tender offer and/or; d) selling back our position to the company.

While these options were known, our theory posits that in the ("thin") early-stage market, tender offers were often the chosen course of action, and a clear distinction between investors *specialized* in mainly acquiring *or* mainly putting firms into play was not yet meaningful.[27] Such a distinction emerged over time, and in our model, it is in the mature market stage that Ls transition more to the sell side with Bs on the buy side. For parameters under which firms are matched with multiple Bs and Ls own small blocks, our model predicts indeed that Ls nearly always put their firms in play, such that mapping Ls and Bs to activist funds and buyout funds is fitting. We would argue that the emergence of specialized activist funds and buyout funds corresponds to this mature stage prediction. In the sample of Brav et al. (2021), activists aim to make a takeover bid for the target firm in only 3.2% of all activist campaigns; in the sample of Boyson et al. (2017), only 15% of takeover bids are made by activists rather than outside bidders; and in Greenwood & Schor (2009), only 18.11% of activist campaigns seeking a "sale of asset" involve a bid by the activist. These numbers reflect a certain degree of specialization, and yet indicate that these investors benefit from having both strategies in their arsenal, as publicly expressed, e.g., by the activist investor Paul Singer (Dowd 2022).

Alternative explanations. In Internet Appendix A.8 we discuss alternative interpretations for the documented evolution of the market for corporate control. Specifically, we argue that explanations based on law changes, takeover defenses, and takeovers becoming obsolete due to activism cannot fully explain the empirical patterns discussed above.

6 Concluding Remarks

We provide a model of the market for corporate control that allows large shareholders to make a tender offer or to put the firm in play, that is, to broker a sale to an outside bidder. We show in a single-firm setting that the option to be on the sell side gives rise to an efficient

[27] This is not to argue that there were no instances in which large shareholders put target firms into play, e.g. to "white knights." The point is that tender offers were, compared to today, still a common outcome.

allocation of control by overcoming two fundamental governance problems: free-riding and asymmetric information. We then embed our single-firm model into a market model to study the evolution of the market of corporate control. After an early phase with buy-side driven tender offers, the market shifts gradually towards sell-side driven mergers.

Our theory offers an explanation for secular changes in the market for corporate control: the decline of hostile takeover bids and the concurrent rise of takeover activism. This trend is typically attributed to legal changes. But as we show, it emerges endogenously as the capital available to investors who seek to implement control changes in underperforming firms grows. The reason is that the combination of asymmetric information and free-rider problem is most effectively overcome when active investors begin to populate both sides of the market—as activist investors who acquire firms themselves or put them in play and as outside bidders who stand ready to acquire firms that have been put in play. The strategic complementarities between these control-oriented investment strategies are being increasingly exploited as the market matures, and drive the "industrial organization" of the market for corporate control.

References

Akerlof, G. A. (1970), 'The market for "lemons": Quality uncertainty and the market mechanism', *The Quarterly Journal of Economics* **84**(3), 488–500.

At, C., Burkart, M. & Lee, S. (2011), 'Security-voting structure and bidder screening', *Journal of Financial Intermediation* **20**, 458–76.

Bagnoli, M. & Bergstrom, T. (2005), 'Log-concave probability and its applications', *Economic Theory* **26**(4), 445–469.

Barclay, M. J. & Holderness, C. G. (1991), 'Negotiated block trades and corporate control', *The Journal of Finance* **46**(3), 861–878.

Barclay, M. J. & Holderness, C. G. (1992), 'The law and large-block trades', *The Journal of Law Economics* **35**(2), 265–294.

Barker, T. (2007), 'On wall street: Symbiotic relationship between private equity and hedge funds', *The Financial Times* .

Barry, J., Brav, A. & Jiang, W. (2020), Hedge fund activism updated tables and figures, Technical report, Working paper.

Bebchuk, L. A. & Hart, O. D. (2001), 'Takeover bids vs. proxy fights in contests for corporate control'.

Becht, M., Franks, J., Grant, J. & Wagner, H. F. (2017), 'Returns to Hedge Fund Activism: An International Study', *The Review of Financial Studies* **30**(9), 2933–2971.

Billings, D. & Gump, A. (2005), 'The convergence of hedge funds and private equity funds', *The Hedge Fund Journal* .

Bond, P. & Eraslan, H. (2010), 'Information-based trade', *Journal of Economic Theory* **145**(5), 1675–1703.

Boyson, N. M., Gantchev, N. & Shivdasani, A. (2017), 'Activism mergers', *Journal of Financial Economics* **126**(1), 54 – 73.

Braun, R., Dorau, N., Jenkinson, T. & Urban, D. (2023), 'Size, returns, and value added: Do private equity firms allocate capital according to manager skill?', *Working Paper* .

Brav, A., Dasgupta, A. & Matthews, R. D. (2022), 'Wolf pack activism', *Management Science* **68**(8), 5557–6354.

Brav, A., Jiang, W. & Li, R. (2021), 'Governance by persuasion: Hedge fund activism and market-based shareholder influence'.

Brav, A., Jiang, W., Partnoy, F. & Randall, T. (2008), 'Hedge Fund Activism, Corporate Governance, and Firm Performance', *Journal of Finance* **63**(4), 1729–1775.

Broccardo, E., Hart, O. & Zingales, L. (2020), 'Exit vs. voice'.

Brown, G. W., Fei, C. Y. & Robinson, D. T. (2023), Portfolio management in private equity, Technical report, Working Paper.

Brown, W. O., Liu, T. & Mulherin, J. H. (2022), 'The development of the takeover auction process: The evolution of property rights in the modern wild west', *The Journal of Law and Economics* **65**(4), 715–751.

Burkart, M. & Lee, S. (2015), 'Signalling to dispersed shareholders and corporate control', *The Review of Economic Studies* **82**(3), 922–962.

Burkart, M. & Lee, S. (2016), 'Smart buyers', *The Review of Corporate Finance Studies* **5**(2), 239–270.

Burkart, M. & Lee, S. (2022), 'Activism and takeovers', *The Review of Financial Studies* **35**(4), 1868–1896.

Campbell, A. (2014), 'Activist pershing square teams up with valeant pharmaceuticals to target allergan inc.', *Mondaq* . May 8.

Coffee, J. C. (1984), 'Regulating the market for corporate control: A critical assessment of the tender offer's role in corporate governance', *Columbia Law Review* **84**, 1145–1149.

Corum, A. & Levit, D. (2019), 'Corporate control activism', *Journal of Financial Economics* **133**(1), 1–17.

Crawford, A. S. & Gruenberg, M. J. (2020), 'Friend or foe? the convergence of private equity and shareholder activism', *Harvard Law School Forum on Corporate Governance* . March 21, 2020.

Dasgupta, A. & Piacentino, G. (2015), 'The wall street walk when blockholders compete for flows', *The Journal of Finance* **70**(6), 2853–2896.

Davis, S. J., Haltiwanger, J. C., Handley, K., Lipsius, B., Lerner, J. & Miranda, J. (2019), 'The economic effects of private equity buyouts'.

Denes, M. R., Karpoff, J. M. & McWilliams, V. B. (2017), 'Thirty years of shareholder activism: A survey of empirical research', *Journal of Corporate Finance* **44**, 405–424.

Dowd, K. (2022), 'Wall street's most feared activist investor is changing his game after shaking up twitter, at&t and samsung', *Forbes Magazine* . February 7, 2022.

Eckbo, B. E. (2009), 'Bidding strategies and takeover premiums: A review', *Journal of Corporate Finance* **15**(1), 149–178.

Eckbo, B. E., Malenko, A. & Thorburn, K. S. (2020), 'Strategic decisions in takeover auctions: Recent developments', *Annual Review of Financial Economics* **12**(1), 237–276.

Edmans, A. & Holderness, C. G. (2017), 'Blockholders: A survey of theory and evidence', *The handbook of the economics of corporate governance* **1**, 541–636.

Edmans, A., Levit, D. & Reilly, D. (2018), 'Governance Under Common Ownership', *The Review of Financial Studies* **32**(7), 2673–2719.

Edmans, A. & Manso, G. (2010), 'Governance Through Trading and Intervention: A Theory of Multiple Blockholders', *The Review of Financial Studies* **24**(7), 2395–2428.

Ekmekci, M. & Kos, N. (2016), 'Information in tender offers with a large shareholder', *Econometrica* **84**(1), 87–139.

Eldar, O., Kirmse, T. & Wittry, M. D. (2023), 'The rise of anti-activist poison pills', *ECGI Finance Working Paper No. 869/2023* .

Fos, V. (2017), 'The disciplinary effects of proxy contests', *Management Science* **63**(3), 655–671.

Gantchev, N. (2013), 'The Costs of Shareholder Activism: Evidence from a Sequential Decision Model', *Journal of Financial Economics* **107**(3), 610–631.

Gilson, R. J. & Gordon, J. N. (2013), 'The agency costs of agency capitalism: Activist investors and the revaluation of governance rights', *Colum. L. Rev.* **113**, 863.

Glass, M. C. & Polonyk, O. (2019), 'Market trends 2019/20: Hostile takeovers and proxy contests', *A Practical Guidance Practice Note by Jenner & Block LLP* .

Glode, V. & Opp, C. (2016), 'Asymmetric information and intermediation chains', *American Economic Review* **106**(9), 2699–2721.

Goldfarb, B. (2020), 'Companies need to plan for the convergence of private equity and shareholder activism', *Forbes* .

Gorbenko, A. S. & Malenko, A. (2024), 'Auctions with endogenous initiation', *The Journal of Finance* **79**(2), 1353–1403.

Goshen, Z. & Steel, R. (2022), 'Barbarians inside the gates: Raiders, activists, and the risk of mistargeting', *Yale Law Journal* **132**, 411–486.

Greenwood, R. & Schor, M. (2009), 'Investor activism and takeovers', *Journal of Financial Economics* **92**(3), 362–375.

Grossman, S. J. & Hart, O. D. (1980), 'Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation', *Bell Journal of Economics* **11**(1), 42–64.

Grossman, S. J. & Perry, M. (1986), 'Perfect sequential equilibrium', *Journal of Economic Theory* **39**(1), 97 – 119.

Hirschman, A. O. (1970), *Exit, voice, and loyalty: Responses to decline in firms, organizations, and states*, Vol. 25, Harvard university press.

Hirshleifer, D. & Titman, S. (1990), 'Share tendering strategies and the success of hostile takeover bids', *Journal of Political Economy* **98**(2), 295–324.

Holmstrom, B. & Kaplan, S. N. (2001), 'Corporate governance and merger activity in the united states: Making sense of the 1980s and 1990s', *Journal of Economic Perspectives* **15**(2), 121–144.

Kahan, M. & Rock, E. B. (2007), 'Hedge funds in corporate governance and corporate control', *University of Pennsylvania Law Review* **155**, 1021–1093.

Kahle, K. M. & Stulz, R. M. (2017), 'Is the us public corporation in trouble?', *Journal of Economic Perspectives* **31**(3), 67–88.

Kaplan, S. N. & Stromberg, P. (2009), 'Leveraged buyouts and private equity', *Journal of economic perspectives* **23**(1), 121–46.

Karpoff, J. M. & Wittry, M. D. (2022), 'Corporate takeover defenses', *Fisher College of Business Working Paper* (2022-03), 009.

Klein, E., Crawford, A. S., Mahon, J. J. & Swartz, M. E. (2020), 'Shareholders' rights shareholder activism', *Chambers: Global Practice Guides* .

Kyle, A. S. (1985), 'Continuous auctions and insider trading', *Econometrica* **53**(6), 1315–1335.

Kyle, A. S. & Vila, J.-L. (1991), 'Noise trading and takeovers', *The RAND Journal of Economics* **22**(1), 54–71.

Levit, D. (2018), 'Soft shareholder activism', *Review of Financial Studies, Forthcoming* .

Liu, T. & Mulherin, J. H. (2019), 'How has takeover competition changed over time?', *Journal of Applied Corporate Finance* **31**(1), 81–94.

Ljunqvist, A., Persson, L. & Tag, J. (2016), 'Private equity's unintended dark side: On the economic consequences of excessive delistings'.

Manne, H. G. (1965), 'Mergers and the market for corporate control', *Journal of Political Economy* **73**(2), 110–120.

Marquez, R. & Yılmaz, B. (2008), 'Information and efficiency in tender offers', *Econometrica* **76**, 1075–1101.

Marquez, R. & Yılmaz, B. (2012), 'Takeover Bidding and Shareholder Information', *The Review of Corporate Finance Studies* **1**(1), 1–27.

Masulis, R. W. & Simsir, S. A. (2018), 'Deal initiation in mergers and acquisitions', *The Journal of Financial and Quantitative Analysis* **53**(6), pp. 2389–2430.

Mauboussin, M. J. & Callahan, D. (2020), 'Public to private equity in the united states: A long-term look', *Morgan Stanley Counterpoint Global Insights* . August 4, 2020.

Maug, E. (1998), 'Large shareholders as monitors: Is there a trade-off between liquidity and control?', *Journal of Finance* **53**(1), 65–98.

Moeser, A. (2019), 'Private equity and activism', *Harvard Law School Forum on Corporate Governance* . April 10, 2019.

Myers, S. C. & Majluf, N. S. (1984), 'Corporate financing and investment decisions when firms have information that investors do not have', *Journal of Financial Economics* **13**(2), 187–221.

Nachman, D. C. & Noe, T. H. (1994), 'Optimal design of securities under asymmetric information', *Review of Financial Studies* **7**(1), 1 – 44.

Orol, R. D. (2007), *Extreme Value Hedging: How Activist Hedge Fund Managers Are Taking on the World*, Wiley.

Rampini, A. A. & Viswanathan, S. (2018), 'Financial intermediary capital', *The Review of Economic Studies* **86**(1), 413–455.
URL: *https://doi.org/10.1093/restud/rdy020*

Renneboog, L. & Vansteenkiste, C. (2017), 'Leveraged buyouts: Motives and sources of value', *Annals of Corporate Governance* **2**(4), 291–389.

Sharara, N. & Hoke-Witherspoon, A. (1993), 'The evolution of the 1992 shareholder communication proxy rules and their impact on corporate governance', *Business Lawyer* **49**, 327–58.

Shleifer, A. & Vishny, R. W. (1986), 'Large shareholders and corporate control', *Journal of Political Economy* **94**(3), 461–488.

Sorkin, A. R. (2007), 'Will credit crisis end the activists' run?', *The New York Times* . August 27, 2007.

Voss, P. (2022), 'Short-term debt and corporate governance'.

Voss, P. & Kulms, M. (2022), 'Separating ownership and information', *American Economic Review* **112**(9), 3039–62.

Main Proofs

Proof of Lemma 1

See proof of Theorem 1 in Shleifer & Vishny (1986) and footnote 14. □

Proof of Proposition 1

Step 1: *In any equilibrium, there is a cutoff* $\hat{V} \in (0,1)$ *such that all* $V < \hat{V}$ *extend a merger invitation and all* $V \geq \hat{V}$ *make a tender offer.*

If all types were to pool on tender offer P_T, the free-rider condition would imply $P_T \geq \mathbb{E}[V]$ such that $V = 0$ (and, by continuity, slightly higher types) make a strict loss. Conversely,

if all types extend a merger invitation, $\alpha[\rho P_L + (1-\rho)P_B] \leq \alpha P_B \leq \alpha \mathbb{E}[V]$. Hence, $V = 1$ (and, by continuity, slightly lower types) have a profitable deviation to a tender offer of $P = 1$. All shareholders would tender at $P_T = 1$ such that this deviation yields $\alpha 1 > \alpha \mathbb{E}[V]$.

In equilibrium, all successful tender offers need to have the same price. If offers P_T and P_T' with $P_T' > P_T$ were successful, it would be strictly profitable to deviate to P_T. The bargaining protocol for the merger invitations directly implies $P_B = 0$. Further, all offers accepted by B and issued by L in equilibrium must have the same price P_L. If two offers P_L and P_L' with $P_L' < P_L$ were accepted by B, it would be strictly profitable for L to deviate to only issue P_L.

For fixed (unique) prices (P_T, P_B, P_L) accepted in equilibrium, L's payoff difference is given by $\Delta(V, P_T, P_B, P_L) := (1-\alpha)(V - P_T) + \alpha V - \alpha[\rho P_L + (1-\rho)P_B]$ which is strictly and continuously increasing in V. Hence, there is unique $\hat{V}$ such that all $V \geq \hat{V}$ prefer a tender offer and all $V < \hat{V}$ prefer a merger invitation. In addition, type $V = 1$ makes a tender offer because $P = 1$ is accepted and $\Delta(V = 1, P_T = 1, P_B, P_L) = \alpha 1 - \alpha[\rho P_L + (1-\rho)P_B)] \geq \alpha 1 - \alpha \mathbb{E}[V] > 0$. Type $V = 0$ extends a merger invitation because $\Delta(V = 0, P_T, P_B, P_L) < 0$ and $\alpha[\rho P_L + (1-\rho)P_B] > 0$ provided $P_L > 0$. $P_L = 0$ can only hold if all types $V \in (0, \hat{V}]$ do nothing which is inconsistent with credible off-equilibrium beliefs by Grossman & Perry (1986). Any type $V \in (0, \hat{V}]$ would like to deviate to any $P_L > 0$ if it was accepted by B. Since such a deviation is profitable for all $V \in (0, \hat{V}]$, and possibly some $V \in (\hat{V}, 1]$, the bidder accepts any $P_L < \mathbb{E}[V | V \leq \hat{V}]$ under credible off-equilibrium beliefs by Grossman & Perry (1986). Hence, $\hat{V} \in (0, 1)$.

Step 2: *In any equilibrium,* $P_T = \mathbb{E}[V | V \geq \hat{V}]$, $P_L = \mathbb{E}[V | V \leq \hat{V}]$ *and* $P_B = 0$.

Suppose $P_T > \mathbb{E}[V | V \geq \hat{V}]$ in an equilibrium with cutoff $\hat{V} \in (0, 1)$. Deviating to $P_T' = \mathbb{E}[V | V \geq \hat{V}]$ is profitable for all $V \geq \hat{V}$ if shareholders tender at P_T'. By continuity and monotonicity, it is also profitable for some non-empty interval $[V', \hat{V})$ of types with $V' > 0$. Hence, credible off-equilibrium beliefs imply $\mathbb{E}[V | P_T'] = \mathbb{E}[V | V \geq V'] < P_T' = \mathbb{E}[V | V \geq \hat{V}]$ and the tender offer P_T' succeeds. Hence, $P_T = \mathbb{E}[V | V \geq \hat{V}]$ in equilibrium.

Similarly, suppose $P_L < \mathbb{E}[V | V \leq \hat{V}]$ in an equilibrium with cutoff $\hat{V} \in (0, 1)$. Deviating to $P_L' = \mathbb{E}[V | V \leq \hat{V}]$ is profitable for all $V \leq \hat{V}$. By continuity and monotonicity, it is also profitable for some interval $(\hat{V}, V']$ of types with $V' < 1$. Hence, credible off-equilibrium beliefs imply $\mathbb{E}[V | P'] = \mathbb{E}[V | V \leq V'] > P_L' = \mathbb{E}[V | V \leq \hat{V}]$ and B accepts P_L'. Hence,

$P_L = \mathbb{E}[V|V \leq \hat{V}]$ in equilibrium. Obviously, L always accepts $P_B = 0$.

Step 3: *There is a unique equilibrium with cutoff* $V_1^* \in (0,1)$.

For a given $\hat{V}$, $\Delta(V;\hat{V}) = (1-\alpha)(V - \mathbb{E}[V|V \geq \hat{V}]) + \alpha V - \alpha\rho\mathbb{E}[V|V \leq \hat{V}]$ strictly increases in V. Since $\Delta(V=0;\hat{V}=0) = -(1-\alpha)\mathbb{E}[V] < 0$ and $\Delta(V=1;\hat{V}=1) = \alpha 1 - \alpha\rho\mathbb{E}[V] > 0$, there exists a cutoff $\hat{V}$ such that $\Delta(\hat{V};\hat{V}) = (1-\alpha)(\hat{V} - \mathbb{E}[V|V \geq \hat{V}]) + \alpha\hat{V} - \alpha\rho\mathbb{E}[V|V \leq \hat{V}] = 0$. This cutoff is also unique since $(\hat{V} - \mathbb{E}[V|V \geq \hat{V}]) = (-1)MRL(\hat{V})$, where $MRL(\hat{V}) = \mathbb{E}[V|V \geq \hat{V}] - \hat{V}$ is the mean residual life function which is monotonically decreasing if f is log-concave (Bagnoli & Bergstrom 2005). Since $\alpha(\hat{V} - \mathbb{E}[V|V \leq \hat{V}])$ is increasing due to log-concavity (Bagnoli & Bergstrom 2005), so is $\alpha\hat{V} - \alpha\rho\mathbb{E}[V|V \leq \hat{V}]$. Thus, there exists a unique cutoff V_1^* such that $\Delta(V_1^*, V_1^*) = 0$ and equilibrium prices are $P_T = \mathbb{E}[V|V \geq V_1^*]$, $P_B = 0$, and $P_L = \mathbb{E}[V|V \leq V_1^*]$.

Step 4: *Given the conjectured cutoff equilibrium* V_1^**, neither* L *nor* B *want to deviate from the conjectured equilibrium prices* $P_T = \mathbb{E}[V|V \geq V_1^*]$, $P_B = 0$ *and* $P_L = \mathbb{E}[V|V \leq V_1^*]$.

Suppose L deviates to a lower tender offer $P_T' \in (0, \mathbb{E}[V|V \geq V_1^*])$ and it succeeds. Hence, all $V \geq V_1^*$ deviate to P_T'. By continuity, there is a $V' < V_1^*$ such that this deviation is also strictly profitable for all $V \in (V', V_1^*]$. Credible off-equilibrium beliefs imply that $\mathbb{E}[V|P_T'] = \mathbb{E}[V|V > V']$ such that the free-rider condition then requires that $P_T' \geq \mathbb{E}[V|V > V']$. Because P_T' is profitable for types $V \in (V', V_1^*]$, it has to hold that $V' \geq (1-\alpha)\mathbb{E}[V|V > V'] + \alpha\rho\mathbb{E}[V|V \leq V_1^*]$. Since $V' < V_1^*$ it must also hold that $V' > (1-\alpha)\mathbb{E}[V|V > V'] + \alpha\rho\mathbb{E}[V|V \leq V']$. Because $\Delta(0,0) < 0$ an $\Delta(V';V') > 0$, by continuity, there has to be a $V'' < V' < V_1^*$ such that $\Delta(V'', V'') = 0$. This is a contradiction because $\Delta(V,V) = 0$ can hold only at the unique cutoff V_1^*. Hence, there are no profitable deviations to $P_T' < P_T^*$. Obviously, L never wants to deviate to any higher tender offer since P_T^* succeeds.

Suppose L deviates to $P_L' > \mathbb{E}[V|V \leq V_1^*]$ and B accepts. By continuity, this deviation is profitable for all $V \in [0, V']$ where $V' > V_1^*$ Hence, credible off-equilibrium beliefs imply $\mathbb{E}[V|P_L'] = \mathbb{E}[V|V \leq V']$. Further, B's acceptance requires $P_L' \leq \mathbb{E}[V|V \leq V']$. Deviation is most profitable if $\rho = 1$ which we assume henceforth. Thus, for a profitable deviation there has to be a $V' > V_1^*$ such that $V' - (1-\alpha)\mathbb{E}[V|V > V_1^*] - \alpha\rho\mathbb{E}[V|V \leq V'] < 0$. Hence, $\Delta(V';V') < 0$. Because $\Delta(1,1) > 0$ and $\Delta(V';V') < 0$, by continuity, there has to be a $V'' > V' > V_1^*$ such that $\Delta(V'', V'') = 0$. Hence, there are no profitable deviations to

$P'_L > P^*_L$. Also, L never wants to deviate to any lower merger offer since P^*_L is accepted. □

Proof of Proposition 2

At $n = 0$, $\mathbb{E}[\Pi^L(V)] = \mathbb{E}[\Pi^L(V)|V^* = V_0^*] > 0 = n_L\mathbb{E}[\Pi^B(V)|V^* = V_1^*] = \mathbb{E}[\Pi^B(V)]$ such that the first entrant is a L. By continuity and $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_0^*]$, there is a $\underline{n} > 0$ such that $\underline{n}\ \mathbb{E}[\Pi^B(V)|V^* = V_1^*] = \mathbb{E}[\Pi^L(V)|V^* = V_0^*]$. Hence, for all $n < \underline{n}$, only L's enter. For $n \geq \underline{n}$ and as long as $n_L \in [\underline{n}, 1)$ and $n_B < 1$, control investors must be indifferent between entering as a L or a B, i.e.,

$$\mathbb{E}[\Pi^L(V)|V^* = V_0^*] + n_B\ (\mathbb{E}[\Pi^L(V)|V^* = V_1^*] - \mathbb{E}[\Pi^L(V)|V^* = V_0^*]) = n_L\ \mathbb{E}[\Pi^B(V)|V^* = V_1^*] \tag{10}$$

From $n = n_L + n_B$, it follows that $n_B^* = \frac{n\ \mathbb{E}[\Pi^B(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*]}{\mathbb{E}[\Pi^L(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*]+\mathbb{E}[\Pi^B(V)|V^*=V_1^*]}$, and $n_L^* = \frac{n\ (\mathbb{E}[\Pi^L(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*])+\mathbb{E}[\Pi^L(V)|V^*=V_0^*]}{\mathbb{E}[\Pi^L(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*]+\mathbb{E}[\Pi^B(V)|V^*=V_1^*]}$.

Case *I*: For $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] < \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$, indifference condition (10) implies that $n_B < 1$ and $n_B < n_L\ \forall n$. At $n_L^* = 1$, the total mass of control investors is $1 + \frac{\mathbb{E}[\Pi^B(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*]}{\mathbb{E}[\Pi^L(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*]} = n := \overline{n} < 2$. For all $n \geq \overline{n}$, the control investor's indifference condition is given by

$$\mathbb{E}[\Pi^L(V)|V^* = V_0^*] + n_B\ (\mathbb{E}[\Pi^L(V)|V^* = V_1^*] - \mathbb{E}[\Pi^L(V)|V^* = V_0^*]) = \mathbb{E}[\Pi^B(V)|V^* = V_1^*]. \tag{11}$$

As a result, all new entrants become Ls and $n_B^* = \frac{\mathbb{E}[\Pi^B(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*]}{\mathbb{E}[\Pi^L(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*]}$, and $n_L^* = \frac{n\ (\mathbb{E}[\Pi^L(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*])+\mathbb{E}[\Pi^L(V)|V^*=V_0^*]-\mathbb{E}[\Pi^B(V)|V^*=V_1^*]}{\mathbb{E}[\Pi^L(V)|V^*=V_1^*]-\mathbb{E}[\Pi^L(V)|V^*=V_0^*]}$.

Case *II*: For $\mathbb{E}[\Pi^B(V)|V^* = V_1^*] > \mathbb{E}[\Pi^L(V)|V^* = V_1^*]$, indifference condition (10) implies that n_B must reach 1 before $n_L = 1$. Since B makes zero profit in bidding competition, her expected payoff is $n_L(2 - n_B)\mathbb{E}[\Pi^B(V)|V^* = V_1^*]$ once $n_B \geq 1$ and provided that $n_L < 1$. Since Ls payoff increases due to bidder competition from $\mathbb{E}[\Pi^L(V)|V^* = V_1^*]$ to

$\mathbb{E}[\Pi^L(V)|V^* = V_2^*]$, an entrant's indifference condition is

$$\begin{aligned}&(2-n_B)\mathbb{E}[\Pi^L(V)|V^* = V_1^*] + (n_B - 1)\left(\mathbb{E}[\Pi^L(V)|V^* = V_1^*] - \mathbb{E}[\Pi^L(V)|V^* = V_0^*]\right)\\ =&n_L(2-n_B)\mathbb{E}[\Pi^B(V)|V^* = V_1^*].\end{aligned} \tag{12}$$

Rearranging, plugging in $n_L = n - n_B$ and solving for n_B yields

$$\begin{aligned}n_B^* = &\frac{2\mathbb{E}[\Pi^B(V)|V^* = V_1^*] + n\mathbb{E}[\Pi^B(V)|V^* = V_1^*] - \mathbb{E}[\Pi^L(V)|V^* = V_1^*] + \mathbb{E}[\Pi^L(V)|V^* = V_2^*]}{2\mathbb{E}[\Pi^B(V)|V^* = V_1^*]} - \frac{\mathbb{E}[\Pi^B(V)|V^* = V_1^*]}{2\mathbb{E}[\Pi^B(V)|V^* = V_1^*]}\\ &\times \frac{\sqrt{\begin{array}{l}(n-2)^2\mathbb{E}[\Pi^B(V)|V^* = V_1^*]^2 - 2(n-2)\mathbb{E}[\Pi^B(V)|V^* = V_1^*]\mathbb{E}[\Pi^L(V)|V^* = V_1^*]\\ \quad + (\mathbb{E}[\Pi^L_{LB}(V,\rho=1) - \mathbb{E}[\Pi^L(V)|V^* = V_1^*])^2 + 2n\mathbb{E}[\Pi^B(V)|V^* = V_1^*]\mathbb{E}[\Pi^L(V)|V^* = V_2^*]\mathbb{E}[\Pi^B(V)|V^* = V_1^*]^2\end{array}}}{2\mathbb{E}[\Pi^B(V)|V^* = V_1^*]}\end{aligned} \tag{13}$$

and

$$\begin{aligned}n_L^* = &\frac{\mathbb{E}[\Pi^L(V)|V^* = V_2^*] - \mathbb{E}[\Pi^L(V)|V^* = V_1^*]}{2\mathbb{E}[\Pi^B(V)|V^* = V_1^*]}\\ &- \frac{\mathbb{E}[\Pi^B(V)|V^* = V_1^*](n-2) + \sqrt{\begin{array}{l}(n-2)^2 + \frac{(\mathbb{E}[\Pi^L(V)|V^*=V_2^*] - \mathbb{E}[\Pi^L(V)|V^*=V_1^*])^2}{\mathbb{E}[\Pi^B(V)|V^*=V_1^*]^2}\\ \quad + \frac{4\mathbb{E}[\Pi^L(V)|V^*=V_1^*] + 2n\mathbb{E}[\Pi^L(V)|V^*=V_2^*] - 2n\mathbb{E}[\Pi^L(V)|V^*=V_1^*]}{\mathbb{E}[\Pi^B(V)|V^*=V_1^*]}\end{array}}}{2\mathbb{E}[\Pi^B(V)|V^* = V_1^*]}\end{aligned} \tag{14}$$

as the unique admissible solutions. Both n_B^* and n_L^* strictly increase in n. As a result, there is a n' such that $n_L^*(n') = 1$ and $n_B^*(n') > 1$. For all $n' \geq n$, the equilibrium conditions are $(n_B - 1)\mathbb{E}[\Pi^L(V)|V^* = V_2^*] + (2 - n_B)\mathbb{E}[\Pi^L(V)|V^* = V_1^*] = (2 - n_B)\,\mathbb{E}[\Pi^B(V)|V^* = V_1^*]$ and $n = n_L + n_B$. Together, these yield
$n_B^* = \frac{2\ \mathbb{E}[\Pi^B(V)|V^*=V_1^*] - 2\mathbb{E}[\Pi^L(V)|V^*=V_1^*] + \mathbb{E}[\Pi^L(V)|V^*=V_2^*]}{\mathbb{E}[\Pi^B(V)|V^*=V_1^*] - \mathbb{E}[\Pi^L(V)|V^*=V_1^*] + \mathbb{E}[\Pi^L(V)|V^*=V_2^*]}$ and
$n_L^* = n - \frac{2\ \mathbb{E}[\Pi^B(V)|V^*=V_1^*] - 2\mathbb{E}[\Pi^L(V)|V^*=V_1^*] + \mathbb{E}[\Pi^L(V)|V^*=V_2^*]}{\mathbb{E}[\Pi^B(V)|V^*=V_1^*] - \mathbb{E}[\Pi^L(V)|V^*=V_1^*] + \mathbb{E}[\Pi^L(V)|V^*=V_2^*]}$,
where n_B^* is constant in n and n_L^* strictly increases in n. □

Proof of Proposition 3

Obviously if $n_B^* = 0$ and $n_L^* > 0$, $\frac{\#\text{ takeover activism}}{\#\text{ tender offers}} = 0$, which corresponds to $n \leq \underline{n}$ for either case. If $n_B^* \in (0, 1]$ and $n_L^* \in (0, 1]$, a firm is matched with a B and L with probability $n_L^* n_B^*$. Conditional on such a match, the probability of a merger invitation is $F(V_1^*)$. Conversely, conditional on a match of a firm with both a L and a B, the probability that an outright

tender offer occurs is $1-F(V_1^*)$. With probability $n_L^*(1-n_B^*)$ a firm is only matched with a L such that a tender offer occurs with probability $1-F(V_0^*)$. Taken together, the probability of a tender offer is $n_L^* n_B^*(1-F(V_1^*)) + n_L^*(1-n_B^*)(1-F(V_0^*))$. Hence, $\frac{\#\text{ takeover activism}}{\#\text{ tender offers}} = \frac{n_L^* n_B^* F(V_1^*)}{n_L^* n_B^*(1-F(V_1^*))+n_L^*(1-n_B^*)(1-F(V_0^*)} = \frac{n_B^* F(V_1^*)}{n_B^*(1-F(V_1^*))+(1-n_B^*)(1-F(V_0^*))}$, which increases in n_B^* and is constant in n_L^*. If $n_B^* \in (0,1]$ and $n_L^* \geq 1$, every firm is matched with at least one L such that $\frac{\#\text{ takeover activism}}{\#\text{ tender offers}} = \frac{n_B^* F(V_1^*)}{n_B^*(1-F(V_1^*))+(1-n_B^*)(1-F(V_0^*))}$, which again increases in n_B^* and is constant in n_L^*. If $n_B^* \geq 1$ and $n_L^* \in (0,1]$, every firm is matched with at least one B such that $\frac{\#\text{ takeover activism}}{\#\text{ tender offers}} = \frac{n_L^*(n_B^*-1)F(V_2^*)+n_L^*(2-n_B^*)F(V_1^*)}{n_L^*(n_B^*-1)(1-F(V_2^*))+n_L^*(2-n_B^*)(1-F(V_1^*))} = \frac{(n_B^*-1)F(V_2^*)+(2-n_B^*)F(V_1^*)}{(n_B^*-1)(1-F(V_2^*))+(2-n_B^*)(1-F(V_1^*))}$. If $n_B^* \geq 1$ and $n_L^* \geq 1$, every firm is matched with at least one L and one B such that $\frac{\#\text{ takeover activism}}{\#\text{ tender offers}} = \frac{(n_B^*-1)F(V_2^*)+(2-n_B^*)F(V_1^*)}{(n_B^*-1)(1-F(V_2^*))+(2-n_B^*)(1-F(V_1^*))}$. All expressions are constant in n_L^* and increase in n_B^* because $V_2^* > V_1^* > V_0^*$. Since n weakly increases in n across all cases, takeover activism becomes more likely relative to tender offers if n increases. □

Proof of Proposition 4

Suppose $\mathbb{E}[V|\text{invite}] > 0$. If B has acquired the block of L and holds the common posterior $\mathbb{E}[V|\text{invite}]$ with the dispersed shareholders, she can acquire the remaining $1-\alpha$ shares at $\mathbb{E}[V|\text{invite}]$ (by $A1$) yielding an expected profit of 0 on each of these shares. Since the price paid for the α-block is sunk at the stage of the tender offer, B obtains an expected profit $\alpha\mathbb{E}[V|\text{invite}] > 0$ and, thus, it is a unique best response to take over the firm.

When L decides between a direct takeover and a block trade, her payoff difference is given by $(1-\alpha)(V-\tau_L)+\alpha V-\alpha[\rho p_B+(1-\rho)p_L]$. As one can easily see, if $P=\tau_L$, $P_B=p_B$ and $P_L=p_L$, L's decision between a direct takeover and takeover activism is the same as in the baseline model (see Equation (4)). By steps $1-4$ of the proof of Proposition 1, there exists a unique equilibrium characterized by exactly the cutoff V_1^* from Proposition 1 and, indeed, $\mathbb{E}[V|\text{invite}] = \mathbb{E}[V|V \leq V_1^*] > 0$. □

Proof of Proposition 5

Suppose L issues a tender offer whenever $V \geq \overline{V}_1^*$ and sells her block to B otherwise. Given the conjectured equilibrium cutoff $\overline{V}_1^*$, the free-rider condition B faces becomes $\tau_B \geq \mathbb{E}[V|\tau_B, V \leq \overline{V}_1^*]$. If B has acquired the α-block, B's profits from a tender offer are $V-(1-\alpha)\tau_B$. Hence, for a fixed τ_B, B's payoff is monotonically increasing in V such that all and

only types above some cutoff $\underline{V}_1^*$ conduct a tender offer. By credible off-equilibrium beliefs and the same arguments as in the proof of Proposition 1, $\tau_B = \mathbb{E}[V|V \in [\underline{V}_1^*, \overline{V}_1^*]]$. Denote $\Delta_B(\underline{V}_1^*) = \underline{V}_1^* - (1-\alpha)\mathbb{E}[V|V \in [\underline{V}_1^*, \overline{V}_1^*]] = 0$, then there is a unique $\underline{V}_1^* \in (0, \overline{V}_1^*)$ since $\Delta_B(0) < 0$, $\Delta_B(\overline{V}_1^*) > 0$ and $\Delta_B(\underline{V}_1^*)$ strictly increases by log concavity (because truncations preserve log-concavity).

Now consider L's initial decision. Since, by Proposition 1 (step 2), all L types conduct a takeover (block-sale) need to pool on the same τ_L (p_L). Further, because L's outside option of the block trade is 0, $p_B = 0$. Thus, L's payoff difference is $V - (1-\alpha)\tau_L - \alpha\rho p_L$ and, thus, is strictly increasing in V for fixed prices, verifying our conjecture that L's decision is characterized by a cutoff $\overline{V}_1^*$. By credible off-equilibrium beliefs, $p_L = \mathbb{E}[V\ \mathbb{1}_{V \in [[\underline{V}^*, \overline{V}_1^*)} | V \leq \overline{V}_1^*]$ which is B's expected profit from owning the block. L's cutoff $\overline{V}_1^*$ is the solution to her payoff difference from a tender offer and a block sale: $(1-\alpha)(\overline{V}_1^* - \mathbb{E}[V|V \geq \overline{V}_1^*]) + \alpha\overline{V}_1^* - \alpha\Big(\rho\mathbb{E}[V\ \mathbb{1}_{V \geq \underline{V}_1^*(\overline{V}_1^*)} | V \leq \overline{V}_1^*]\Big) = 0$. Note that $\underline{V}_1^*(\overline{V}_1^*)$ is a strictly increasing function in $\overline{V}_1^*$. As a result, by log-concavity, $\alpha[\overline{V}_1^* - \rho\mathbb{E}[V\ \mathbb{1}_{V \in [\underline{V}_1^*, \overline{V}_1^*)} | V \leq \overline{V}_1^*]]$ strictly increases in $\overline{V}_1^*$ such that, by the arguments in Proposition 1, there is a unique cutoff $\overline{V}_1^* \in (0,1)$ which concludes the proof. Last, $\overline{V}_1^* > V_0^* > \underline{V}_1^*$ follows by log-concavity and a simple comparison of the following (implicit) equations: $(1-\alpha)(\overline{V}_1^* - \mathbb{E}[V|V \geq \overline{V}_1^*]) + \alpha\overline{V}_1^* - \alpha\rho\mathbb{E}[V\ \mathbb{1}_{V \geq \underline{V}_1^*(\overline{V}_1^*)} | V \leq \overline{V}_1^*] = 0$, $(1-\alpha)(V_0^* - \mathbb{E}[V|V \geq V_0^*]) + \alpha V_0^* = 0$, and $(1-\alpha)(\underline{V}_1^* - \mathbb{E}[V|V \in [\underline{V}_1^*, \overline{V}_1^*)]) + \alpha\underline{V}_1^* = 0$. □

Proof of Proposition 6

Consider an outside bidder $i \in \{1, \ldots, n-1\}$. Her payoff difference between a takeover and selling the block to the next bidder is $(1-\alpha)(V - \tau_i) + \alpha V - \alpha[\rho p_i^{ask}]$. Hence, by monotonicity and because tender offer and block price are type-independent by previous arguments from Proposition 1, i's decision can again be characterized by a cutoff V_i. For larger types, i opts for a tender offer, whereas she negotiates a block trade for lower ones. Given the cutoff structure, by credible off-equilibrium beliefs, $\tau_i = \mathbb{E}[V|V \in [\underline{V}_i, \underline{V}_{i-1})]$ and p_i^{ask} is the expected value of the block to the next bidder $i+1$ whereas $p_{i+1}^{bid} = 0$ as i's outside option is 0.

Consider the last bidder n in the chain. Given that bidder n is offered the block by bidder $n-1$, she faces the same problem as L in Shleifer & Vishny (1986) with V distributed according to the truncation of F at V_{n-1}. Hence, n values the block at $\alpha\mathbb{E}[V\ \mathbb{1}_{V \in [V_n, V_{n-1})}\ | V \leq$

$V_{n-1}]$ because she realizes a takeover if and only if V is larger than some cutoff $V_n \in (0, V_{n-1})$ at a tender offer $\tau_i = \mathbb{E}[V|V \in [V_n, V_{n-1})]$ (by credible off-equilibrium beliefs). Bidder $n-1$ then, in turn, values the block offered to her by bidder $n-2$ at $\alpha\mathbb{E}[V\mathbb{1}_{V\in[V_{n-1},V_{n-2})}|V \leq V_{n-2}]+\rho\alpha\mathbb{E}[V\ \mathbb{1}_{V\in[V_n,V_{n-1})}\ |V \leq V_{n-2}]$. Hence, in the conjectured equilibrium, some arbitrary bidder $(i+1) \in \{1, \ldots, n-1\}$, who is offered the block by bidder i, values the block at

$$\alpha\mathbb{E}[V\mathbb{1}_{V\in[V_{i+1},V_i)}|V \leq V_i] + \rho\alpha\mathbb{E}[V\ \mathbb{1}_{V\in[V_{i+2},V_{i+1})}\ |V \leq V_i] + \rho^2\alpha\mathbb{E}[V\ \mathbb{1}_{V\in[V_{i+3},V_{i+2})}\ |V \leq V_i]$$
$$+ \cdots + \alpha\rho^{n-1-i}\mathbb{E}[V\mathbb{1}_{V\in[V_{n-1},V_{n-2})}|V \leq V_i] = \sum_{j=i}^{n-1} \rho^{j-i}\ \mathbb{E}[V\ \mathbb{1}_{V\in[V_{j+1},V_j)}\ |V \leq V_i] \tag{15}$$

which is the maximal price i can ask L for such that, by credible off-equilibrium beliefs, $p_i^{ask} = \sum_{j=i}^{n-1} \rho^{j-i}\ \mathbb{E}[V\ \mathbb{1}_{V\in[V_{j+1},V_j)}\ |V \leq V_i]$. Hence, plugging in block prices and tender offers, the cutoffs are implicitly defined by

$$\begin{cases} (1-\alpha)(V_1 - \mathbb{E}[V|V \geq V_1]) + \alpha V_1 - \alpha\rho \sum_{j=1}^{n-1} \rho^{j-1}\ \mathbb{E}[V\ \mathbb{1}_{V\in[V_{j+1},V_j)}\ |V \leq V_1] = 0 \\ \vdots \\ (1-\alpha)(V_i - \mathbb{E}[V|V \in [V_i, V_{i-1}]]) + \alpha V_i - \alpha\rho \sum_{j=i}^{n-1} \rho^{j-i}\ \mathbb{E}[V\ \mathbb{1}_{V\in[V_{j+1},V_j)}\ |V \leq V_i] = 0 \\ \vdots \\ (1-\alpha)(V_n - \mathbb{E}[V|V \in [V_n, V_{n-1}]]) + \alpha V_n = 0. \end{cases}$$

By log concavity of $f(V)$ and the arguments of Proposition 1, each equation i has a unique solution $V_i \in (0,1)$ for a given vector of $(V_1, \ldots, V_{i-1}, V_{i+1}, \ldots, V_n) \in [0,1]^{n-1}$. We now argue that the system of n equations has a unique solution vector $(V_1, V_2, \ldots, V_n) \in (0,1)^n$. Consider the last of the n equations ($(1-\alpha)(V_n - \mathbb{E}[V|V \in [V_n, V_{n-1}]]) + \alpha V_n = 0$). By log-concavity of $f(V)$ and the arguments of Proposition 1, this equation has a unique, interior solution for any V_{n-1}. Then, by the same arguements, for any value of $V_{n-2} \in (0,1)$, the next to last equation $(n-1)$ has a unique, interior solution. Iterating forward, the first equation has a unique solution given the boundary condition of $V_0 = 1$. Last, we need to establish that $1 > V_1 > V_2 > \cdots > V_n > 0$. Observe that for any $V_{n-1} \in (0,1)$, the last equation implies that $V_n = (1-\alpha)\mathbb{E}[V|V \in [V_n, V_{n-1}]] < V_{n-1}$. Again, iterating forward shows for any i that $V_i = (1-\alpha)\mathbb{E}[V|V \in [V_i, V_{i-1}]]) + \alpha\rho \sum_{j=i}^{n-1} \rho^{j-i}\ \mathbb{E}[V\ \mathbb{1}_{V\in[V_{j+1},V_j)}\ |V \leq V_i] < V_{i-1}$, which concludes the proof. $\square$

Proof of Proposition 7

We start by establishing that $\left(V_n\right)_{n\in\mathbb{N}}$ strictly decreases in n. Suppose this was not the case, then for some $n \in \mathbb{N}$ it has told that $V_n^n \leq V_{n+1}^{n+1}$, where the superscript ℓ in V_n^ℓ denotes the length of the bidder chain, whereas the subscript denotes, as before, the particular element. Because the cutoff for the last bidder in the chain is determined by $(1-\alpha)(V_n - \mathbb{E}[V|V \in [V_\ell^\ell, V_{\ell-1}^\ell]])+\alpha V_\ell^\ell = 0$, where $V_n^n \leq V_{n+1}^{n+1}$ implies that $V_{n-1}^n \leq V_n^{n+1}$. Furthermore, because the next to last bidder in the chain is determined by $h_{\ell-1}^\ell \equiv (1-\alpha)(V_{\ell-1}^\ell - \mathbb{E}[V|V \in [V_{\ell-1}^\ell, V_{\ell-2}^\ell]])+ \alpha V_{\ell-1}^\ell - \alpha\rho\ \mathbb{E}[V\ \mathbb{1}_{V\in[V_\ell^\ell, V_{\ell-1}^\ell)}\ |V \leq V_{\ell-1}^\ell] = 0$, and because $h_{\ell-1}^\ell$ strictly increases in $V_{\ell-1}^\ell$ (by log-concavity) and strictly decreases in $V_{\ell-2}^\ell$, $\frac{\partial V_{\ell-1}^\ell}{\partial V_{\ell-2}^\ell} = -\frac{\frac{\partial h_{\ell-1}^\ell}{\partial V_{\ell-2}^\ell}}{\frac{\partial h_{\ell-1}^\ell}{\partial V_{\ell-1}^\ell}} > 0$ so that $V_{n-1}^n \leq V_n^{n+1}$ can only hold if $V_{n-2}^n \leq V_{n-1}^{n+1}$. Iterating forward yields that $V_1^n \leq V_2^{n+1}$ can only hold if $1 = V_0^n \leq V_1^{n+1}$ which yields a contradiction as $V_1^{n+1} < 1$ for all $\rho < 1$.

Because $\left(V_n\right)_{n\in\mathbb{N}}$ decreases monotonically in n and is bounded below by 0, it converges. On the way to a contradiction, suppose $\lim_{n\to\infty} V_n = b > 0$. Now consider the sequence of $\left(V_{n-1}\right)_{n\in\mathbb{N}}$ which also decreases monotonically in n and is bounded below by b so that it has to converge to some $B_1 \geq b$. If $\lim_{n\to\infty} V_{n-1} = b$, then $\lim_{n\to\infty} V_n = (1-\alpha)\mathbb{E}[V|V \in [V_n, b]] < b$ which yields a contradiction. Thus, it has to hold that $B_1 > b$. Now consider two sequences $\left(V_{n-k}\right)_{n\in\mathbb{N}}$ and $\left(V_{n-k-1}\right)_{n\in\mathbb{N}}$ for some arbitrary $k \in \{2, \ldots, n-2\}$. Both sequences decrease monotonically in n and are bounded below by b so that they have to converge to some $B_k > b$ and $B_{k-1} \geq B_k$, respectively. $|V_{n-k-1} - V_{n-k}|$ has to converge to zero as otherwise, in the limit, $\sum_{i=1}^{\infty} |V_{i-1} - V_i| > 1$ (we define $V_0 = 1$), yielding a contradiction. However, if $\lim_{n\to\infty} V_{n-k} = \lim_{n\to\infty} V_{n-k-1} = B_k$, it follows that

$$
\begin{aligned}
V_{n-k} &= (1-\alpha)\mathbb{E}[V|V \in [V_{n-k}, V_{n-k-1}]] + \alpha\rho \sum_{j=i}^{n-1} \rho^{j-(n-k)}\ \mathbb{E}[V\ \mathbb{1}_{V\in[V_{j+1}, V_j)}\ |V \leq V_{(n-k)}] \\
&< (1-\alpha)\mathbb{E}[V|V \in [V_{n-k}, V_{n-k-1}]] + \alpha\mathbb{E}[V|V \leq V_{(n-k-1)}] \overset{n\to\infty}{=} (1-\alpha)B_k + \alpha B_k < B_k
\end{aligned}
$$

which yields a contradiction so that we can conclude that $\lim_{n\to\infty} V_n = 0$. $\square$

A Internet Appendix

A.1 Discussion of Firm Modeling Assumptions

Value-decreasing control changes. Allowing also for value-decreasing control transfers, i.e., $V < 0$, does not undermine the efficient allocation of control in our framework. When the large shareholder learns that V is negative, she opts for a merger invitation as she does for small positive realizations of V. This lowers the ask price in the merger negotiation which, in turn, shifts down the cutoff V_1^*. Having acquired the firm, the bidder learns that restructuring decreases firm value and refrains from implementing it since she internalizes the full cost as the sole owner. If there are some private benefits from restructuring that exceed the value destruction, the bidder would restructure which would be efficient.

Value improvements without control changes. In practice, there are activist campaigns that do not involve a sale of the firm. However, those that lead to changes in control generate the largest gains (Greenwood & Schor 2009, Boyson et al. 2017). This is consistent with arguments that incentives to improve firm value are stronger for the acquirer of a majority stake than for an activist with a minority stake (Burkart & Lee 2022). Control changes may also allow for more radical changes than a process of lobbying incumbent management. In such situations where the potential to improve firm value is greater after a control change, "standard" activist campaigns may be dominated by a direct takeover and takeover activism (provided L's bargaining power in a negotiated merger is sufficiently large). Of course, when a control change is not needed to achieve a given objective or infeasible, a standard campaign may be the best or only viable option.

Negotiated sale of target firm to L. Our model assumes that L does not campaign for a negotiated sale of the firm to herself. Corum & Levit (2019) show that, because a merger in which the activist sits on both sides of the negotiation is fraught with conflict, such a campaign may not garner the support of the other shareholders. At the same time, letting the sell-side negotiation be led by incumbent managers who do not welcome a control change may not be much more effective. Notwithstanding these issues, suppose a randomly selected group G of target shareholders other than L represents the target in a negotiated sale to L. As before, let the merger negotiations be a Nash bargaining game in which L or G is chosen to make a take-it-or-leave-it offer with probability ρ and $1-\rho$, respectively. L would offer G's reservation value and appropriate the entire surplus. G, if chosen, faces a

screening problem in which it trades off rent extraction and efficiency. Specifically, it would make an offer that risks failure for lower realizations of V. Thus, with L being on the buy side, rents accrue at the upper end of the type distribution and inefficiency looms "at the bottom" as in a tender offer.

Whether (a high-valued) L prefers a tender offer or a negotiated acquisition depends on her stake α (which drives her tender offer profit) and her bargaining power ρ (which drives her profit in a negotiation). With variation in these parameters, it is possible for negotiated acquisitions by L to arise as a third viable alternative. But importantly, since the above two alternatives both feature inefficiency at the bottom, introducing (the possibility of a sale to) an outside bidder B still improves efficiency as in our baseline model. Higher L-types would make a tender offer or negotiate an acquisition, while lower L-types would negotiate a sale of the firm to B.

Counter-bids. When L opts for a tender offer, our model neither allows B to submit a counter-bid nor L to respond and revise her initial bid. One may suspect that this restriction affects the control change mode that L chooses in equilibrium. Yet, precluding B from competing after L made an initial bid is without loss of generality. The reason is that any winning bid by B would result in an expected loss due to the winner's curse. Suppose L bids P and B were to make a winning counter-bid P'. This bid must satisfy the free-rider condition $P' \geq \mathbb{E}[V|P]$. Unlike the dispersed shareholders, L tenders her block only if $V < P'$. Consequently, B acquires all shares if the bid is overpriced but merely $1-\alpha$ shares if the bid is underpriced, therefore making an expected loss.

Bidding competition. While the bidder does not want to counter a tender offer by L, another bidder may want to compete with B after a merger invitation. In this case, the merger invitation transforms into letting the bidders compete in a standard second-price auction. In our common value framework, all bidders (and L) have the same restructuring capability. Hence, L's merger payoff with two bidders (or more) is the same as if she had full bargaining power in the bilateral negotiations ($\rho = 1$). Thus, competition results in a higher merger price, making takeover activism relatively more attractive, that is, increasing the cutoff V^*.

Heterogeneous restructuring capabilities. In our common value model, a merger invitation signals a lower value improvement and mergers are associated with lower prices and returns compared to tender offers. In practice, large shareholders and outside bidders differ

in their ability to improve firm value. While some activist shareholders focus on governance-oriented strategies, outside bidders, such as specialized private equity funds or non-financial bidders, aim to exploit synergies. If one adds idiosyncratic restructuring abilities to our common value framework, merger invitations typically lead on average to higher prices and returns compared to tender offers. We provide a formal analysis in Internet Appendix A.9.

By way of illustration, consider two hypothetical target firms. For target 1 there are multiple bidders who can exploit large synergies. Anticipating a high price due to competition among these bidders, the large shareholder is very likely to opt for a merger invitation, respectively, initiating a bidding competition. By contrast, bidders for firm 2 have no such synergies and L is therefore more likely to take over the firm herself. While in both firms tender offer prices are larger than merger prices, the average tender offer price is lower than that of the average merger. The reason is that when there are large value improvements due to synergies, they are more often implemented through a merger with an outside bidder.

Consistent with an extended framework with heterogeneous restructuring abilities, Boyson et al. (2017) find larger expected acquisition premia and returns if outside bidders take over a firm relative to incumbent shareholders. Boyson et al. (2017) hypothesize that "[t]he lower premia could reflect the lack of synergies available to hedge fund buyers."

Takeover defenses. Explicitly accounting for takeover defenses requires modeling a shareholder proposal to remove the defenses prior to the decisions analyzed above. Trivially, the dispersed shareholders would back the proposal as they gain from either mode of control change compared to none. They are further unlikely to restrict L's mode of control change. Requiring a merger invitation if L seeks a tender offer would make them worse off. If L petitions for a merger invitation, thus revealing a valuation below the cut-off type, requiring a tender offer can benefit dispersed shareholders *provided* L's valuation is close to the cut-off type (which is hidden information). But if L's valuation is low, such a requirement frustrates the takeover (i.e., reintroduces the inefficiency found in Shleifer & Vishny (1986)). This risk outweighs the potential upside unless B's bargaining power in the merger is very high.

Strikingly, any restriction dispersed shareholders might impose would go *against* takeover activism. This is because L and the dispersed shareholders have aligned interests in a merger but opposite interests in a tender offer. That is, L opts against a tender offer when it would allocate more of the surplus to the dispersed shareholders (which is why the latter might like it). In fact, in the case of symmetric information, dispersed shareholders always prefer

limiting L to a *tender offer*.[28] Hence, the role for takeover activism in our model arises from the asymmetric information problem, regardless of (whether we formalize) the presence and removal of defensive mechanisms.

Informed outside bidder. Allowing B to become better informed (during the merger negotiation) than dispersed shareholders would strengthen the point that takeover activism complements and partly replaces direct takeovers. If B can learn as much about the firm as L prior to a deal, takeover activism replaces tender offers completely (due to the information advantage and unraveling). However, it is plausible that owning a toehold—for some time—provides L with more information than analysing the firm like B as an outsider. Assuming that B is uninformed is the simplest way of maintaining information frictions and to not give takeover activism a trivial advantage. It is also the only way to maintain Shleifer & Vishny (1986) as a clean benchmark, by adding the outside bidder *without* relaxing the information asymmetry. Last, we should emphasize that this assumption does not play up the role of L. Even if B is informed, she *alone* cannot acquire the firm given asymmetric information and free-riding—L is needed either way; that is the essence of Shleifer & Vishny (1986) after all.

A.2 Large shareholder profits and stake size α

In this section, we show that L's expected profits strictly increase in her stake α from an ex-ante perspective. Thus, L would always acquire the maximal stake. Consider L's profits and recall that the cutoffs V_0^*, V_1^*, V_2^* are all strictly decreasing in α. To this end, note that V_0^*, V_1^*, V_2^* are the solutions to

$$\Delta(V_i^*, \alpha, \rho) = (1-\alpha)(V_i^* - \mathbb{E}[V|V \geq V_i^*]) + \alpha V_i^* - \alpha\rho\mathbb{E}[V|V \leq V_i^*] = 0,$$

for $\rho = 0, \rho \in (0,1)$ and $\rho = 1$, respectively. Recall that $\Delta(V_i^*, \alpha, \rho)$ strictly increases in V_i^*. Moreover,

$$\frac{\partial \Delta(V_i^*, \alpha, \rho)}{\partial \alpha} = \mathbb{E}[V|V \geq V_i^*] - \rho\mathbb{E}[V|V \leq V_i^*].$$

[28] This outcome is excluded in Corum & Levit (2019)'s model because it exogenously restricts tender offers and abstracts from free-riding. In general, they only allow campaigning for the right to negotiate a merger, not for a vote on the removal of takeover defenses in conjunction with a tender offer. For the latter see Bebchuk & Hart (2001).

Thus,

$$\frac{\partial V_i^*(\alpha)}{\partial \alpha} = -\frac{\frac{\partial \Delta(V_i^*,\alpha,\rho)}{\partial \alpha}}{\frac{\partial \Delta(V_i^*,\alpha,\rho)}{\partial V_i^*}} = -\frac{\mathbb{E}[V|V \geq V_i^*] - \rho\mathbb{E}[V|V \leq V_i^*]}{\frac{\partial \Delta(V_i^*,\alpha,\rho)}{\partial V_i^*}} < 0 \ \forall \rho \in [0,1]. \tag{16}$$

Hence, V_0^*, V_1^*, V_2^* indeed all decrease in the stake size α. L's profits conditional on being matched with $0, 1$, or 2 outside bidders are

$$\mathbb{E}[\Pi^L(V)|V^* = V_i^*] = \int_0^{V_i^*} \alpha\rho\mathbb{E}[V|V \leq V_i^*]dF(V) + \int_{V_i^*}^1 V - (1-\alpha)\mathbb{E}[V|V \geq V_i^*]dF(V),$$

for $\rho = 0, \rho \in (0,1)$ and $\rho = 1$, respectively. Rewriting L's profits yields

$$\begin{aligned}
&\alpha\rho \int_0^{V_i^*} \mathbb{E}[V|V \leq V_i^*]dF(V) + \alpha \int_{V_i^*}^1 VdF(V) + (1-\alpha)\int_{V_i^*}^1 V - \mathbb{E}[V|V \geq V_i^*]dF(V) \\
=&\alpha\rho\mathbb{E}[V|V \leq V_i^*] \int_0^{V_i^*} dF(V) + \alpha \int_{V_i^*}^1 VdF(V) + (1-\alpha)\Big(\int_{V_i^*}^1 VdF(V) - \int_{V_i^*}^1 dF(V)\mathbb{E}[V|V \geq V_i^*]\Big) \\
=&\alpha\rho \int_0^{V_i^*} VdF(V) + \alpha \int_{V_i^*}^1 VdF(V).
\end{aligned}$$

Taking the derivative with respect to α yields

$$\rho \int_0^{V_i^*} VdF(V) + \int_{V_i^*}^1 VdF(V) - V_i^* f(V_i^*)\frac{\partial V_i^*}{\partial \alpha}(1-\rho) > 0.$$

Because $\frac{\partial V_i^*}{\partial \alpha} < 0$, L's profits conditional on being matched with $0, 1$, or 2 outside bidders strictly increase in α. The unconditional profits form being a L are just convex combinations of the profits conditional on a match with 0, 1, or 2 Bs. As the conditional profits increase in α, so does any convex combination. Hence, any large shareholder wants to acquire the largest stake possible.

A.3 Discussion of Market Modeling Assumptions

Prices of initial stakes. In a setting with rational investors and noise traders (e.g., Kyle (1985), Kyle & Vila (1991)), share prices should generally reflect that control investors buy shares in some firms and bring about value improvements. Hence, as more control investors

enter the market, the price at which they can buy initial stakes should be increasing because each firm is more likely to experience a value improvement. This leads to the standard effect that increased entry reduces investor profits.

We intentionally abstract from this effect because it is orthogonal to our main result that takeover activism increasingly replaces direct takeovers as the prevalent mode of control change when more control investors enter the market. Moreover, it allows us to highlight a countervailing effect: In the transformation stage, more entry leads to *higher* control investor profits because of the complementarity between outside bidders and large shareholders.[29]

Multiple large shareholders. When there are multiple large shareholders in the same firm, we assume that a lead activist is picked at random and all other large shareholders can sell to her (in a tender offer) or must sell to the outside bidder (in a negotiated merger). We argue in the main text that this keeps L's profit independent of the number of other large shareholders in the same firm. We here substantiate the claim by explicitly spelling out a game in which this is true.

Suppose there are $m \in \mathbb{N}$ Ls in a firm, each has a stake of α and $m\alpha < 1/2$. There is one outside bidder B (the other two cases of zero or two Bs work analogously). Nature chooses randomly one L as "lead activist" and each L is chosen with equal probability $1/m$ as the lead activist. Only the lead L learns the realization of V and then chooses between a tender offer or a merger invitation as in the baseline model.[30] In a merger invitation, the lead L negotiates a merger price at which all target shareholders (including the other Ls) have to sell their shares to B. Clearly, both the lead activist and the other Ls obtain the same expected payoff $\alpha\Big(\rho P_L + (1-\rho)P_B\Big)$. By contrast, if the lead L makes a tender offer to buy the company herself, she still has to satisfy the free-rider condition (1) because $m\alpha < 1/2$ by assumption. Furthermore, the free-rider condition is binding in equilibrium (by credible off-path beliefs, A2). Hence, the other $m-1$ Ls are indifferent between tendering and retaining and sell per assumption A1. Since the lead L faces the same optimization problem as before, the equilibrium features the same cutoff V_1^*. Before knowing V, the expected profits as a

[29] In a model that allows for both of these countervailing effects, prices and profits would depend on the mass of control investors through multiple channels, preventing clear-cut closed-form solutions.

[30] The assumption can easily be microfounded with a small information acquisition cost.

lead L are

$$\int_0^{V_1^*} \alpha\rho\mathbb{E}[V|V \leq V_1^*]dF(V) + \alpha\int_{V_1^*}^1 VdF(V) + (1-\alpha)\underbrace{\int_{V_1^*}^1 V - \mathbb{E}[V|V \geq V_1^*]dF(V)}_{=0}.$$

Similarly, a non-lead L obtains

$$\int_0^{V_1^*} \alpha\rho\mathbb{E}[V|V \leq V_1^*]dF(V) + \alpha\int_{V_1^*}^1 VdF(V),$$

which is exactly the same payoff. That is, the ex-ante expected payoff is independent of the likelihood of becoming a lead L and thus independent of the number m of large shareholders.

Multiple large shareholders and toehold size In our model, multiple outside bidders compete in an auction while there is no competition among multiple large shareholders. Arguably, multiple Ls render the purchase of a stake more difficult and expensive. Such dilution of profits could be captured for instance by assuming that $\Pi^L(V)$ drops by some fraction or amount with each integer n_L^* reaches. In such a setting, multiple Ls would not only erode each L's profits but also lead to more Bs entering since in equilibrium control investors must be indifferent between assuming either role. Overall, the expected profits to be made in the market for corporate control would be first increasing and then decreasing in the measure of control investors. Ultimately, the market for corporate control would become saturated, that is, expected profits would be so low that further investors would not want to enter. These effects are intuitive, but formalizing them would be rather cumbersome. In particular, capturing multiple Ls as a reduction in the stake size would introduce non-linearities and prevent an analytical solution.

Roles in multiple firms. To keep the analysis tractable we restrict control investors to a single role matched to a single firm. Alternatively, control investors could adopt different roles in different firms, in particular an investor could be a large shareholder in one firm and a potential outside bidder in (an)other firm(s). Clearly, such multiple roles would lead to higher expected profits, making entering the control market more attractive. The resulting larger influx of investors and capital would accelerate the evolution of the market for corporate control. That is, takeover activism would spring into existence "earlier", and the transition from direct takeovers to takeover activism as the prevalent mode of control change would

occur faster. Still, as long as there are search frictions in finding a bidder for a particular firm, such a model would continue to generate a growth of takeover activism relative to direct takeovers as more control investors enter the market.

In practice, there seems to be a specialization to particular roles, at least in a sufficiently developed market: Activist hedge funds perform the role of Ls and private equity funds those of Bs focused on certain industries. Brown et al. (2023) present evidence that private equity funds specialize in specific industries and geographies, and that these funds can use their specialized expertise to generate higher returns. However, such specialization renders executing multiple roles unfeasible for many control investors, albeit not for all as the example of Carl Icahn shows.

Growth of control market. We capture the evolution of the market for corporate control by comparing the market composition (n_L^*, n_B^*) for exogenous increases in the measure of control investors n.[31] A richer framework would endogenize the growth of the market for corporate control. We can think of two ways to accomplish this. The first approach formalizes the idea that investors allocate their capital across different asset classes in search of yield and that capital flows into activism and private equity are complementary in generating superior returns. The second approach highlights that intermediaries are typically capital-constrained and that such constraints become relaxed over time as the intermediation strategy continues to be profitable. Both of these approaches could explain why, over some period of time, the control-investment sector grows faster than other investment sectors.

Portfolio choice problem. Given an absolute growth in the capital at the disposal of investors, we argue that our model suggests that there would also be a relative growth in the capital invested in the control investor industry. To this end, consider investors who face a portfolio choice problem of investing in a fixed set of assets or the control investor industry. As more money is invested in the fixed set of assets, prices rise and returns fall. By contrast, the control market exhibits nondecreasing returns to scale in the early and the transformation phase. In the early phase, only large shareholders enter in the market for corporate control as these are self-sufficient. Since large shareholders do not compete but merely cover a larger fraction of firms, there are constant returns to scale. Hence, investors would increase their portfolio weight on the control market if the overall available

[31] For a view on the broader developments that have driven the growth of activist hedge funds and private equity funds, see, e.g., Chapter 1 in Orol (2007).

capital grows. Because more funds are allocated to the market for corporate control, more funds are deployed by investors pursuing the "large shareholder strategy." When enough firms have large shareholders, outside bidders emerge and the market for control enters its transformation phase. This transformation phase is characterized by a complementarity between large shareholders and outside bidders: profits of outside bidders increase as there are more large shareholders and vice versa. Hence, in the transformation phase, the control market exhibits increasing returns to scale—inducing investors to increase their portfolio weight on the market for corporate control even further. At some point, as the market matures (and most potential targets have large shareholders and outside bidders), these non-decreasing scale effects diminish and the control investor industry will start exhibiting more conventional decreasing returns to scale.

Intermediary constraints. While our model collapses the managers and outside investors of a control investment fund (buyout or hedge fund) into a single entity (L or B), a micro-foundation for how fund managers attract outside capital might include an agency problem between fund managers and outside investors. Due to such agency problems, the amount of outside capital that control investment firms can attract may depend on their own skin in the game, i.e., their own "intermediary capital." Hence, even if deregulation or financial innovations provide a first impetus for control investment strategies, the control investment sector may start out at a relatively small scale, constrained by the initial endowment of intermediary capital among potential control investment firms. Over time, as (the early rounds of) investments start to pay off, the stock of intermediary capital in the control investment sector grows, allowing the control investment firms to attract larger amounts of outside capital, gradually capturing more of the available set of investment opportunities. This could explain a period of growth relative to investment sectors, asset classes, or sub-markets that were already in a more mature phase of intermediation. This perspective can be extended to include the stock of *human* capital or expertise (in addition to financial intermediary capital). The overall argument is thus that financial and human capital among control investment intermediaries, which constrain how much outside financing can be raised and deployed toward control investment opportunities, needed time to grow.

It is beyond the scope of this paper to incorporate a fully fledged model of endogenous growth in the control investment sector. However, the approaches outlined above and other related dynamics may be a fruitful area for future research.

An alternative way to model the growth of the control market would include entry costs with investors entering once this cost drops below some threshold. Due to the complementarity, all investors would immediately enter once it becomes worthwhile for the first few. In reality, market entry and capital formation take time. Our reduced form model delivers the relevant dynamics and is, therefore, better equipped to speak to the evolution over time.

A.4 Expected Profits

Expected Profits as a function of n

- If $n \leq \overline{n}$, only Ls enter such that profits are given by $\mathbb{E}[\Pi^L(V)|V^* = V_0^*] > 0$ and are, thus, independent of n.
- If $n \in (\underline{n}, \overline{n})$ and Case I prevails, we know $n_L^* < 1$ and $n_B^* < 1$. Hence, profits are given by

$$\underbrace{\mathbb{E}[\Pi^L(V)|V^* = V_0^*] + n_B \left(\mathbb{E}[\Pi^L(V)|V^* = V_1^*] - \mathbb{E}[\Pi^L(V)|V^* = V_0^*]\right)}_{L' \text{sexpected profit}} = \underbrace{n_L \, \mathbb{E}[\Pi^B(V)|V^* = V_1^*]}_{B' \text{sexpected profit}}$$

  Clearly, LHS is increasing in n_B and RHS is increasing in n_L. As n increases, either n_B or n_L needs to increase strictly. To keep indifference, both L's and B's expected profit must increase.

- For Case I, if $n \geq \overline{n}$, then, we know $n_L^* \geq 1$ and $n_B^* < 1$. Hence, profits are given by

$$\underbrace{\mathbb{E}[\Pi^L(V)|V^* = V_0^*] + n_B \left(\mathbb{E}[\Pi^L(V)|V^* = V_1^*] - \mathbb{E}[\Pi^L(V)|V^* = V_0^*]\right)}_{L' \text{sexpected profit}}$$
$$= \underbrace{\mathbb{E}[\Pi^B(V)|V^* = V_1^*]}_{B' \text{sexpected profit}}$$

  Clearly, LHS is increasing in n_B and RHS is constant in n_L. To keep indifference, both L's and B's expected profit must remain constant. This also implies that only n_L can increase.

- Case II: n_B^* hits one first. If $n_L^* < 1$ still, entry profits are

$$\underbrace{\mathbb{E}[\Pi^L(V)|V^* = V_1^*] + n_B \ (\mathbb{E}[\Pi^L(V)|V^* = V_2^*] - \mathbb{E}[\Pi^L(V)|V^* = V_1^*])}_{L' \text{sexpected profit}}$$
$$= \underbrace{n_L(2 - n_B)\mathbb{E}[\Pi^B(V)|V^* = V_1^*]}_{B' \text{sexpected profit}}$$

  As n increases, either n_B, or n_L (or both) must increase. If n_B increases, LHS increases which means that RHS also increases, which can only be accomplished through an increase in n_L. If n_L increases, RHS increases (for fixed) n_B such that n_B must increase as well so both sides increase. As a result, in either case, LHS and RHS increase such that both expected profits still increase.

- Case II: n_B^* hits one first. If $n_L^* \geq 1$ as well, entry profits are

$$\underbrace{\mathbb{E}[\Pi^L(V)|V^* = V_1^*] + n_B \ (\mathbb{E}[\Pi^L(V)|V^* = V_2^*] - \mathbb{E}[\Pi^L(V)|V^* = V_1^*])}_{L' \text{sexpected profit}}$$
$$= \underbrace{(2 - n_B)\mathbb{E}[\Pi^B(V)|V^* = V_1^*]}_{B' \text{sexpected profit}}$$

  Here, expected profits do not depend on n_L anymore. Further n_B is constant. Hence, profits are flat.

A.5 Market Growth without Frictions

Our theory stresses how entry into the market for corporate control facilitates the transition from direct takeovers to takeover activism. As more control investors enter, more firms have gotten large shareholders to put them in play for potential buyers. Because this induces more control investors to become outside bidders, there is a shift from "buy-side" initiated direct takeovers to "sell-side" initiated takeover activism. This trend is reinforced when greater market entry also leads to competition among outside bidders, which further shifts surplus from the buy side to the sell side.

However, it is important to note that increased entry per is not sufficient to produce this pattern over time; it is rooted in the frictions generated by the separation of ownership

and control. In the absence of free-riding and asymmetric information, another pattern emerges: All value-improving bidders—even ones with no toehold—could succeed by paying (at least) a price equal to the share value under the incumbent management. There is neither a need nor an efficiency rationale for takeover activism. This is the case even with takeover defenses; a large shareholder removing these is as able to make a tender offer as anyone else. In fact, there is little gain from specializing in outside-bidder roles since bidding competition against large shareholders (bidders with toeholds), who unlock targets, makes this strategy unattractive.[32] In such a model, no control investor chooses to become an outside bidder and all takeovers would be undertaken by large shareholders. As a result, an increase in the number of control investors only leads to the standard scale effect but not a shift in the mode of control change. More potential targets are identified and, after a removal of defenses if necessary, taken over directly. Further, each control investor's profit (weakly) falls as more of them enter; there is no endogenous complementarity between the entry of large shareholders and that of outside bidders to create a countervailing positive effect on profits. Hence, the evolution described in Section 3.2 is not merely a consequence of market entry but an emergence of a peculiar "industrial organization" among control investors to overcome frictions in the market for corporate control. Moreover, the complementarity between large shareholders and outside bidders can actually enhance profits for both entities, which can explain why there is market entry in the first place.

A.6 Relation of Bidder Chains and "Intermediation Chains

Glode & Opp (2016) study a screening problem where an uninformed seller makes a take-it-or-leave-it offer to a buyer who has private information about her willingness to pay. Intermediation chains increase efficiency if intermediaries are increasingly better informed in a way that reduces the dispersion of the seller's belief about the "next buyer's" valuation.

We consider a signalling model with known gains from trade in which the combination of asymmetric information and free-riding is the source of inefficiency. Similar to Glode & Opp (2016), a chain of transactions improves efficiency. In our setting, each consecutive block trade further truncates the shareholders' posterior belief. This *endogenous* concentration of shareholder beliefs makes takeovers with smaller value improvements feasible. In contrast

[32] In our model, bidding contests between L and B are endogenously absent because of the very information asymmetry that provides the rationale for takeover activism (cf. Section A.1).

to Glode & Opp (2016), each intermediary (bidder) can become perfectly informed after the block trade while still increasing efficiency in our model.[33]

A.7 Selected Campaigns and Takeover Bids of Activist Investors

Carl Icahn

1978: Acquisition of stake in Tappan Company, forcing the sale of the company to Electrolux.
(https://hedgefundalpha.com/carl-icahn-portfolio/)
1983: Acquisition of stake and subsequent takeover of ACF Industries.
(https://www.nytimes.com/1983/12/21/business/icahn-seeks-acf-in-337-million-deal.html)
1985: Acquisition of stake and subsequent takeover bid for Phillips Petroleum.
(https://www.nytimes.com/1985/02/06/business/icahn-bids-8.1-billion-for-phillips.html)
1986: Acquisition of stake and subsequent takeover bid for U.S. Steel Corporation.
(https://www.nytimes.com/1986/10/07/business/icahn-bids-8-billion-for-usx.html)
1990: Acquisition of stake and subsequent takeover bid for Pan Am.
(https://www.nytimes.com/1990/12/26/business/icahn-gives-a-warning-to-pan-am.html)
1997: Acquisition of stake in RJR Nabisco, pushing for separation of its tobacco unit.
(https://www.latimes.com/archives/la-xpm-1998-dec-23-fi-56746-story.html)
2006: Acquisition of Time Warner stake, pushing for a break-up of the company.
(https://money.cnn.com/2006/02/07/news/companies/timewarner$_i$*cahn*/)
2007: Acquisition of stake and subsequent takeover bid for Lear Corporation.
(https://www.svd.se/a/c0e0b175-e17e-3d58-9af2-5f2fccd6b6d9/storinvesterare-koper-upp-lear)
2007: Acquisition of stake in BEA Systems, pushing for a sale of the company.
(https://money.cnn.com/2008/01/16/news/companies/oracle/?postversion=2008011608)

Paul Singer

2024: Acquisition of stake in Honeywell, pushing for a break-up of the conglomerate.
(https://finance.yahoo.com/news/honeywell-hon-bows-elliott-aerospace-162950194.html)

[33] More broadly, our paper contributes to the literature on trade under asymmetric information in financial markets. Information revelation through block trades allows for a subsequent trade with the dispersed shareholders. At a conceptual level, this is a variant of information-based trade à la Bond & Eraslan (2010).

2017: Acquisition of stake in Akzo Nobel, pushing for a sale of the company (https://www.nytimes.com/2017/08/16/business/dealbook/elliott-management-akzonobel.html)
2024: Acquisition of stake in BHP, pushing for a separation of its U.S. petroleum business. (https://www.bhp.com/es/news/media-centre/releases/2017/04/bhp-billiton-notes-elliott-proposal)
2024: Acquisition of stake and subsequent takeover bid for American Greetings (https://www.pehub.com/elliott-investment-management-to-acquire-greeting-card-producer-american-greetings/)

Bill Ackman

2004: Acquisition of a stake in Wendy's, pressuring it to sell off its Tim Hortons brand. (https://www.sec.gov/Archives/edgar/data/105668/000110465905032049/a05-11692$_1$$ex$2.$htm$)
2009: Acquisition of stake in Target, pushing for a separation of its real estate holdings. (https://www.reuters.com/article/business/ackman-pushes-for-change-at-target-corp)
2014: Acquisition of a stake in Allergan, pushing for a sale of company to Valeant. (https://corpgov.law.harvard.edu/2018/01/22/activist-driven-dealmaking-falls-flat/)
2025: Acquisition of stake and subsequent takeover bid for Howard Hughes Holdings. (https://finance.yahoo.com/news/bill-ackman-raises-howard-hughes-233034423.html)

A.8 Alternative Explanations

A different narrative for the observed trends is based on legal changes. It is in our view incomplete. The emergence of takeover defenses made disciplinary control changes costlier, as the defenses must be removed first. The reform of shareholder communication laws in 1992 made it easier for shareholders to challenge management, e.g., through proxy fights. These changes paved the way for takeovers to be replaced, or preceded, by activism. However, they do not require a shift from tender offers to merger invites since an activist is not bound to a particular mode of control change in conjunction with removing takeover defenses. Activists can in principle remove them *and* make a takeover bid, as seen in the data in Brav et al. (2021) and Boyson et al. (2017) and implied in Icahn's manifesto.[34] Another caveat is the timing. A majority of firms already had two or more takeover defenses in place by 1990,

[34]As Karpoff & Wittry (2022) write, "takeover defenses are not acquisition showstoppers that impose a corner solution of zero takeovers" (p.10).

and the adoption of the best-known provisions (e.g., staggered boards and poison pills) plateaued through the 1990s and declined after 2000 (Karpoff & Wittry 2022), arguably due to activism.[35] By contrast, Figures 10 to 12 sketch a longer, continued transition from tender offers to takeover activism.

We would argue that, at the same time that the growth of the control-oriented investment sector reversed the proliferation of takeover defenses, it also brought about a permanent shift in market thickness and structure that favors takeover activism over direct takeovers. This matches the reduced spread of takeover defenses and yet continuing paucity of hostile tender offers. This line of thought also resonates with the observation that takeover processes have become more sell-side driven since the 1990s but, in spite of takeover defenses, nevertheless remained competitive (Liu & Mulherin 2019, Brown et al. 2022).[36] While takeover defenses *ceteris paribus* dampen takeover activity, in our theory, both the returns to control-oriented investment and the efficacy of the market for corporate control continue to grow over time. The reason is that strategic complementarities between activism and private equity promote entry and shift the market toward sell-side driven takeover activism as a more effective mode of control change.

Another proposed explanation for the decline in hostile tender offers is that other corporate governance mechanisms—such as incentive-based compensation, board monitoring, and especially investor activism—have made disciplinary takeovers obsolete. Holmstrom & Kaplan (2001, p.132f) argue that hostility and leveraged buyouts faded in the 1990s because, in the wake of the pioneering 1980s takeover wave,

> corporations began to emulate the beneficial attributes of leveraged buyouts. This could explain why hostility declined: hostile takeovers were no longer needed, as companies voluntarily restructured and adopted a shareholder value perspective.

[35] On a different note, the evolution of the market in our theory makes being a control-oriented blockholder more profitable relative to a world with only direct takeovers. Therefore, deterring control changes would require firms to adopt more potent "takeover defenses" to reduce the gains from equity stakes that enable takeover activism. Eldar et al. (2023) documents an increased use of poison pills with low trigger thresholds, so-called anti-activism pills, which may precisely play this role of indirectly deterring takeovers.

[36] The fact that many acquisitions of public firms are seller-initiated is explored in Masulis & Simsir (2018) and Eckbo et al. (2020). Gorbenko & Malenko (2024) provide a theory of deal initiation. Concerning disciplinary buyouts (rather than synergistic mergers), our theory also analyzes the choice between a buy-side driven "tender offer" and a sell-side driven "merger invitation."

Focusing squarely on shareholder activism, Fos (2017) documents that much of the hostility "moved" to (the increased use of) proxy contests that challenged incumbent managements. In similar spirit, Gilson & Gordon (2013, p.867) argue that activist investors "function to monitor company performance and then to present to companies and institutional shareholders concrete proposals for business strategy through mechanisms less drastic than takeovers." In other words, they argue that investor activism offers a "low-cost-low stakes" alternative that made costlier interventions, such as takeovers, superfluous in many cases. This either-or-view of investor activism as a substitute for a takeover also shapes Goshen & Steel (2022)'s comparative discussion of the two governance mechanisms. The scope of non-takeover activism is evidenced by campaigns that do not seek the sale of the target firm (cf. Figure 12). At the same time, however, the overall statistics on public-to-private buyouts and takeover activism do not show a substitution away from disciplinary ownership changes. Since firms are acquired in takeover activism, the cumulative intervention costs and stakes are ultimately comparable to those in hostile takeovers. Rather than a substitute, activism is in these cases a mechanism that facilitates the market for corporate control (Denes et al. 2017).

Last, we want to note that a mere increase in capital at the disposal of control investors, without the market frictions in our model, does not per se create a shift to takeover activism. On the contrary, the growth of the demand side and of the potential for bidding competition would render it optimal for control investors to enter as large shareholders to gain a "toehold" advantage in the bidding process (cf. Section A.5). One would then merely see the scale effect: an increase in direct takeovers by toehold bidders and a decrease in control-investor profits. In practice, direct takeovers have become rarer and most targets are now acquired by outside bidders with no toeholds.

A.9 Bidder Heterogeneity

Suppose there are $n \geq 2$ potential outside bidders and one large shareholder L. We now add to the common value improvement $V \sim F[0,1]$ an idiosyncratic, bidder-specific component θ_i, privately observed by each outside bidder $i \in \{1,\ldots,n\}$. Due to her experience with the target company, V is still the large shareholder's private information. We assume that θ_i are independently (also from V) distributed according to some cdf $G[0,1]$. The bidder specific component may stem from the fact that, in contrast to L, the outside bidders are

often non-financial bidders who have the potential to realize additional synergies or private equity funds with specific expertise. If invited, outside bidders again compete in a second price auction. By standard arguments, i's optimal bid is given by $b_i = \mathbb{E}[V|invite] + \theta_i$. Hence, L's choice between a tender offer and merger invitation becomes

$$\Delta(V^*, \mathcal{P}^*(V^*)) = V^* - (1-\alpha)\mathbb{E}[V|V \geq V^*] - \alpha\mathbb{E}[V|V \leq V^*] - \alpha\mathbb{E}[\theta_2^{(n)}], \tag{17}$$

where $\mathbb{E}[\theta_2^{(n)}]$ is the expected second order statistic of n independent draws from $G[0,1]$. Since $\mathbb{E}[\theta_2^{(n)}]$ is fixed from L's perspective, the cutoff structure of the equilibrium prevails.

Lemma 2. *When bidders are heterogeneous, the likelihood of takeover activism increases in the number of bidders.*

Proof. Let

$$\xi(n, V^*) := V^* - (1-\alpha)\mathbb{E}[V|V \geq V^*] - \alpha\mathbb{E}[V|V \leq V^*] - \alpha\mathbb{E}[\theta_2^{(n)}] = 0.$$

Because $\mathbb{E}[\theta_2^{(n)}]$ is independent of V and $\xi(n, V^*)$ strictly increases in V^* by log-concavity, there is an implicit function $V^*(n)$ such that $\frac{\partial V^*(n)}{\partial n} > 0$. Note that $\lim_{n\to\infty} \mathbb{E}[\theta_2^{(n)}] = 1$ such that $V^*(n = \infty) > 1$ since $\xi(\infty, 1) = \alpha(1 - \mathbb{E}[V] - 1) < 0$, and by log-concavity. By continuity, we can conclude that there is a $\overline{n} < \infty$ such that $V^* \geq 1$ for all $n \geq \overline{n}$ and no direct tender offers ever take place. □

Example. Suppose there is a sample of 2 transactions, $F = G = \mathcal{U}[0,1]$, $\alpha = 0.1$. The first firm has one L and $n = 2$ outside bidders. One can easily see that in this case $V^* = 1$ and, even for only 2 outside bidders, no direct tender offer ever occurs. The expected merger price P^*_{merger} is $\mathbb{E}[V] + \mathbb{E}[\theta_2^{(n)}] = 1$. The second firm has one L and no outside bidder. One can easily see that in this case $V^* = \frac{1-\alpha}{1+\alpha} = \frac{0.9}{1.1}$ such that the equilibrium tender offer is $P^* = \frac{1}{1.1} < 1$.

Hence, the tender offer price is smaller than the expected merger price, i.e., $P^* = \frac{1}{1.1} < 1 = P^*_{merger}$. Further, the expected increase in firm value is also larger for takeover activism since $\mathbb{E}[V|V \geq V^*] = \frac{1}{1.1} < 1$ is smaller than the expected value improvement for a merger ($\mathbb{E}[V] + \mathbb{E}[\theta_1^{(n)}] > 1$).

european corporate governance institute

about ECGI

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

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

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

www.ecgi.global

european corporate governance institute

ECGI Working Paper Series in Finance

Editorial Board

Editor	Nadya Malenko, Professor of Finance, Boston College
Consulting Editors	Renée Adams, Professor of Finance, University of Oxford Franklin Allen, Nippon Life Professor of Finance, Professor of Economics, The Wharton School of the University of Pennsylvania Julian Franks, Professor of Finance, London Business School Mireia Giné, Associate Professor, IESE Business School Marco Pagano, Professor of Economics, Facoltà di Economia Università di Napoli Federico II
Editorial Assistant	Asif Malik, Working Paper Series Manager

www.ecgi.global/content/working-papers

european corporate governance institute

Electronic Access to the Working Paper Series

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

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

www.ecgi.global/content/working-papers