# Corporate Control Activism

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**Abstract**

We identify a commitment problem that prevents bidders from unseating resisting and entrenched incumbent directors of target companies through proxy fights. We discuss potential solutions and argue that activist investors are more resilient to this commitment problem and can mitigate the resulting inefficiencies by putting such companies into play. This result holds although bidders and activists have similar expertise and can use similar techniques to challenge the incumbents, and is consistent with the evidence that most proxy fights are launched by activists, not bidders. Moreover, we show that there is complementarity between shareholder activism and takeovers: Activists benefit from the possibility that companies in which they invest will become a takeover target, while bidders, who interpret the presence of an activist as a signal that the target is available for sale, are more likely start takeover negotiations when the target has an activist as a shareholder. Combined, the analysis sheds light on the interaction between M&A and shareholder activism.

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# 1 Introduction

The separation of ownership and control in public corporations creates agency conflicts between insiders and shareholders (Berle and Means (1932)). In order to protect their private benefits of control,[1] corporate boards can resist takeovers that would otherwise create shareholder value, for example, by issuing shareholder rights plans ("poison pills"). With a de facto veto power,[2] the resistance to takeovers can be overcome only if the majority of directors are voted out in a contested election ("proxy fight"). In fact, the power of shareholders to unseat directors is often used by the courts as the basis for allowing boards to block takeovers in the first place (Gilson (2001)).

Shareholders, however, cannot vote out the incumbent directors unless an alternative slate is put on the ballot. Empirically, bidders rarely launch a proxy fight to replace all or part of the resisting target board. Fos (2015) finds that most proxy fights are launched by activist hedge funds.[3] Activists often demand from companies they invest in to sell all or part of their assets (Brav et al. (2008), Becht et al. (2015)), and if needed, use proxy fights to force them to do so. Greenwood and Schor (2009) and Boyson et al. (2016) find that the probability of a takeover is several times higher if an activist hedge fund is a shareholder of the target. For example, in 2013, the private-equity firm KKR acquired Gardner Denver for $3.7 billion after the activist hedge fund ValueAct Capital accumulated a 5% stake in the company and agitated for its sale. Commenting on the deal, KKR's co-CEO, George Roberts, said: "We wouldn't have bought Gardner Denver had not an activist shown up."[4] But, why did KKR need ValueAct to intervene? Could not KRR complete the buyout without the help of an activist? More generally, since bidders and activists can use similar techniques to challenge corporate boards (i.e., proxy fights), what is the relative advantage of activists? Do activists complement the effort of bidders to acquire companies, or do they compete away bidders' rents?

[1] Jenter and Lewellen (2015) provide evidence consistent with managers being reluctant to relinquish control due to career concerns. See also Walkling and Long (1984), Martin and McConnell (1991), Agrawal and Walkling (1994), Hartzell et al. (2004), and Wulf and Singh (2011)), who show that target CEOs typically suffer from poor career prospects following takeovers.

[2] Under most jurisdictions, including Delaware, merger proposals can be brought to a vote for a shareholder approval only by the board of directors. Alternatively, tender offers do not require a vote, but they are vulnerable to poison pills, which can be adopted on short notice and make a takeover virtually impossible.

[3] While proxy fights are also effective as threats, their observed frequency can suggest on their empirical relevance. Fos (2015) documents 632 proxy fights between 2003 and 2012, out of which only 5% were sponsored by corporations (i.e., potential bidders), 70% by activist hedge funds, and the rest by other shareholders.

[4] WSJ, 1/5/2013, "Activist Investors Gain in M&A Push."

We study these questions by analyzing a simple dynamic bargaining model in which the identity of the target board is endogenized by an interim proxy fight stage. Initially, a bidder is negotiating with the incumbent target board. Circumventing the board by making a tender offer to target shareholders is not feasible. The board, whose private benefits of control are lost if the takeover succeeds, can reject the takeover even if doing so is not in the best interests of target shareholders. However, if the negotiations fail, a proxy fight to replace the board can be initiated either by the bidder or by an activist investor, who is a target shareholder. Winning a proxy fight is not trivial, as the challenger must convince the majority of target shareholders that replacing the incumbents with his nominees is in their best interests. If the proxy fight succeeds, the winning team obtains control of the target board, and a second round of negotiations between the bidder and the newly elected directors takes place. If no proxy fight is launched or if the proxy fight fails, the incumbent board retains control of the target and can use his veto power to block the takeover indefinitely.[5]

Our first result shows that although both bidders and activists can launch a proxy fight, only activists can effectively challenge the resistance of the incumbent directors and facilitate the takeover. This result is consistent with the evidence that, unlike activists, bidders rarely launch proxy fights. The activist's relative advantage stems from their higher credibility when campaigning against the incumbents. To understand this observation, which is a novel aspect of our analysis, note that a proxy fight is not a referendum on the terms of the takeover, but rather a vote on the composition of the board. Once the bidder's nominees are elected to the board, the bidder, who is the counter-party to the transaction, will be tempted to abuse his control of the target board, exploit its access to private information, divert resources, and low-ball the takeover premium. *This is the commitment problem in takeovers.* Without a commitment to act in their best interests, target shareholders, who rationally anticipate this opportunistic behavior, are unlikely to elect the bidder's nominees to the board. By contrast, the activist buys a stake in the target with the expectation that the firm will be acquired. Unlike the bidder but similar to other shareholders of the target, the activist is on the sell-side and has incentives to negotiate the highest takeover premium possible. Therefore, shareholders trust the activist and are more likely to elect her nominees to the board, even without a commitment to act in their best interests. By credibly threatening to run a proxy fight, the activist can pressure the incumbent to sell the firm at a fair price. Making corporate assets available for sale is the added value of activist investors to the market for corporate control.

[5] The analysis focuses on takeovers, but our results can also be applied to divestitures and assets sales.

The commitment problem arises in our setup since the bidder cannot (or has no incentives to) create value unless he obtains the majority of the target's voting rights (e.g., via merger if it is a strategic buyer, or via buyout if it is an LBO fund). However, activist hedge funds, as well as other financial buyers, may have the expertise and incentives to execute operational, financial, or governance related policies that increase the standalone value of the target, even if its ownership structure does not change. We show that if the bidder can increase value this way, then the concern that he would successfully low-ball the takeover offer once he is given control of the target board is alleviated. Nevertheless, the bidder can still abuse the power of the board to tunnel assets or extract value by other means, which may be of a particular concern if the bidder is a corporation in a related industry. In this respect, financial buyers such as activist hedge funds are more resilient than strategic buyers to the commitment problem in takeovers.[6]

Generally, the severity of the bidder's commitment problem depends on the legal and economic environment in which the bidder and the target operate (e.g., enforcement of fiduciary duties, competition for the target), as well as on actions that bidders can deliberately take in order to alleviate this problem (e.g., nominating truly independent directors, building reputation). Our analysis suggests that if a bidder runs and wins a proxy fight, which in practice is rare, then either target shareholders do not have rational expectations or the commitment problem is resolved.[7] We discuss the plausible "solutions" to the commitment problem and argue that they are either imperfect or costly. We also analyze the value of a commitment to act in the best interests of target shareholders once the bidder is elected to the board, and show that in many cases the value of this commitment is zero, and when it is positive, it increases with the severity of the agency problems in the target and decreases with the likelihood that an activist investor is present.

Overall, since activist investors inherently suffer from a weaker commitment problem, their relative advantage in pressuring incumbents to sell is likely to persist even if bidders can alleviate their own commitment problem. Importantly, our argument does not require activists to be perfectly aligned with other target shareholders; activists may have their own private

[6] See our discussion in Section 5.3 of related evidence provided by Boyson et al. (2016).

[7] Our analysis does not imply that if a bidder wins a proxy fight, the offered takeover premium should drop. If the bidder believes that he can win a proxy fight and capture the target board even without resolving the commitment problem, perhaps because target shareholders are naive, he would low-ball the takeover premium in advance, anticipating his ability to abuse the power of the target board once it is given to him. If the bidder expects to capture the target board since he has already resolved his commitment problem, then by definition, the bidder cannot low-ball the takeover premium after winning a proxy fight.

benefits or suffer from short-termism. Our key observation is in relative terms: Since a bidder is a counter party to the transaction and the activist is not, the conflict of interest between the bidder and target shareholders is stronger than the conflict they might have with the activist. Our contribution should therefore be viewed as identifying the bidder's commitment problem in takeovers, discussing the potential solutions, and in particular, highlighting the role of activist investors in mitigating the inefficiencies caused by this problem. The fact that most proxy fights are launched by activists and not by bidders is consistent with this argument.

In order to study the implications of activist interventions on the M&A market, we endogenize the decision of the activist to become a target shareholder and the decision of the bidder to engage in takeover negotiations. We assume that initially the activist builds a position by trading with a market maker à la Kyle (1985). The bidder, who is uncertain about the synergetic value of the acquisition, observes the arrival of the activist (e.g., by tracking 13D filings) and then decides whether to perform due diligence and start takeover negotiations with the target board as described above.

Our second set of results highlights the complementarity between shareholder activism and takeovers. Activists profit from the possibility that companies in which they invest will become a takeover target. At the same time, bidders perform due diligence only if they believe that the target is available for sale. Activists can leverage their advantage in putting companies into play and solicit offers by reassuring bidders that they will face a weaker opposition to the takeover, if the offer is fair. The ability to solicit deals amplifies the incentives of the activist to become a target shareholder in the first place.

The complementarity between shareholder activism and takeovers has several implications. First, a takeover is more likely when the target has an activist as a shareholder. Second, activist investors not only facilitate takeovers once the offer is on the table, but they can also increase the likelihood that a company becomes a takeover target in the first place. Therefore, activists affect corporate control outcomes even if ex-post their threat of running a proxy fight is not credible. Third, small regulatory changes, such as easing the access of shareholders to the ballot or modifying the rules that govern the filing of 13D schedules, can have an amplified effect on the aggregate volume of M&A. Fourth, policies and regulations that exclusively undermine shareholder activism, such as the legalization of two-tier "anti-activism" poison pills, might adversely affect M&A even if "standard pills" that prevent takeovers are already prevalent.[8]

[8] In 2014, the Delaware court allowed Sotheby's to keep a unique two-tier poison pill that was purposely meant to block the activist hedge fund Third Point from increasing its ownership in Sotheby's above 10%. See

Finally, the complementarity between shareholder activism and takeovers also arises when the activist starts her campaign after the announcement of a takeover but before its closing. The anticipation that an activist would show up on its own affects the incentives of bidders to start takeover negotiations.

Activists invest either because they believe the company is likely to become a takeover target ("selection effect") or because they can facilitate its takeover ("treatment effect"). We provide necessary and sufficient conditions under which the treatment effect exists in equilibrium. We show that the model's comparative statics is sensitive to the existence of the treatment effect. This feature can be used to create identification strategies for empirical research. For example, if only the selection effect is in play, the volume of M&A decreases with the severity of the agency problems in target firms. This is intuitive, as with more private benefits of control the incumbents are more likely to resist takeover bids. However, when the treatment effect is in play, more resistance of incumbents to takeovers can result with a *higher* volume of M&A. Intuitively, the resistance to takeovers provides activist investors with more opportunities to profit from their ability to put firms into play, which increases their incentives to invest in these firms, and consequently, increases the benefit of potential bidders from a takeover. Based on this logic, the treatment effect can be identified by a positive relationship between the severity of agency problems in the cross section of target firms and the likelihood of a takeover.

We consider several extensions of the baseline model. First, in management buyouts the incumbent may be too motivated to sell the firm, even if the deal compromises shareholder value. In those cases, activist investors will challenge the deal by using their influence on target shareholders to either block the transaction or "force" the bidder to sweeten the bid. In other words, the activists compete away the rents of bidders from takeovers. Second, if in addition to pressuring the incumbent board to sell the firm the activist has the expertise to propose and execute policies that increase the standalone value of the target, this alternative form of activism increases (decreases) the probability of a takeover by a third party if the added value of the activist's proposal is relatively small (large). Therefore, non-control activism can *complement* corporate control activism. Last, we consider scenarios in which the target board cannot block the takeover and prevent the bidder from making a tender offer directly to shareholders. We show that there is substitution between the ability of bidders to bypass the target board through tender offers and the ability and need of activists to unseat the board through proxy fights. In this regard, our model suggests that activists should play a smaller

THIRD POINT LLC v. Ruprecht, Del: Court of Chancery 2014.

role in the market for corporate control in jurisdictions in which boards have weaker power to block deals, such as the U.K. today or the U.S. in the 1980s.

Our paper is related to the literature on takeovers and shareholder activism (for surveys, see Becht et al. (2003) and Edmans (2014), respectively). Unlike studies in which the bidder is also a target shareholder (e.g., Shleifer and Vishny (1986), Hirshleifer and Titman (1990), Kyle and Vila (1991), Burkart (1995), Maug (1998), Singh (1998), and Bulow et al. (1999)), our analysis emphasizes the benefit from separating the capacity to disentrench boards from the capacity to increase firm value through acquisitions, and implies that collaborations between activist investors and bidders are likely to fail, as they raise concerns that the activist is in fact on the buy-side of the transaction.[9] Moreover, different from Burkart et al. (2000), Cornelli and Li (2002), Gomes (2012), and Burkart and Lee (2015), who study the interaction between bidders and target blockholders, we abstract away from the free-rider problem in tender offers of Grossman and Hart (1980). Instead, we focus on agency problems in the target firm and the ability of the target board to veto the takeover.[10] Since the only mean by which the resistance of the board can be overcome is a proxy fight, our paper is also related to Shleifer and Vishny (1986), Harris and Raviv (1988), Bhattacharya (1997), Maug (1999), Yılmaz (1999), Bebchuk and Hart (2001), and Gilson and Schwartz (2001), who study proxy fights within and outside the context of takeovers. These papers, however, do not identify the commitment problem of bidders in takeovers and the ability of activist investors to mitigate its adverse consequences.

# 2 Setup of the baseline model

Consider a model with a bidder, an activist investor, passive investors (institutional or retail), and one public firm, the target. The target is run by its incumbent board of directors. We do not distinguish between the manager and other board members; we treat them as one. We normalize the total number of target shares to one. Each share carries one vote. According to its governance rules, a successful takeover of the target requires at least 50% of its voting rights. All agents are risk-neutral.

[9] For the same reason, diversified institutional investors, which often own large stakes both on the sell-side and on the buy-side of the transaction, are unlikely to be effective in exercising corporate control activism, even if they have the relevant governance expertise. See our discussion in Section 4.

[10] Models in which the target board can resist a takeover offer have also been studied by Bagnoli et al. (1989), Baron (1983), Berkovitch and Khanna (1990), Hirshleifer and Titman (1990), Harris and Raviv (1988), and Ofer and Thakor (1987).

At the outset, the incumbent board owns $n \geq 0$ shares of the target, the activist owns $\alpha > 0$ shares, the bidder owns $m \geq 0$ shares, and all other shares are owned by passive investors. We assume that collectively passive investors hold more than 50% of the target voting rights, that is, $n + \alpha + m < 0.5$.

The incumbent board has private benefits of control which are lost if the firm is acquired or if shareholders elect a new board. These benefits may include excessive salaries, perquisites, investment in 'pet' projects, access to private information, pleasure of command, prestige, or publicity. We assume that compensation contracts cannot fully align the incentives of the incumbent board with the shareholders (Jenter and Lewellen (2015)), and that the enforcement of the board's fiduciary duties is not sufficiently strong to eliminate the consumption of these private benefits. We denote the board's private benefits by $B > 0$, and its private benefits *per share* by $b \equiv B/n$.

The standalone value of the target is $q > 0$. The bidder can create a net value of $\Delta \geq 0$ by taking over the target. If the bidder is a strategic acquirer (e.g., a corporation in a related industry) then $\Delta$ is the net operational or financial synergy with the target that results from the merger of the two companies, and if the bidder is a financial acquirer (e.g., a private equity firm) then $\Delta$ is the net operational improvement from a going private transaction or the net synergy from a merger with one of its portfolio companies. Parameter $\Delta$ can also include the bidder's private benefits from acquiring the target. Under either interpretation, the bidder cannot increase the standalone value of the target. To focus the analysis on agency problems as the key friction, we abstract from information asymmetries about $q$ or $\Delta$ and assume that they are both commonly known. In the Appendix we relax these assumptions, and show that the main results continue to hold and even get stronger.[11]

Unlike the bidder, the activist cannot add value by acquiring the target. Therefore, the activist does not have incentives (or resources) to make a takeover bid. Moreover, consistent with Greenwood and Schor (2009) and Becht et al. (2015), who show that the positive abnormal returns around 13D filings by activist investors stem mostly from events in which the target is eventually acquired, we assume that the activist cannot affect the standalone value of the target. We relax this assumption in Section 7.2.

The bidder negotiates with the target board a cash offer to acquire all $1 - m$ target shares

[11] The existence of private information creates adverse selection and reduces the bidder's credibility even further. However, in spite of this adverse selection, activists can still win proxy fight and relax the resistance of incumbents to takeovers.

not held by the bidder. The bidder cannot bypass the incumbent board and make a tender offer directly to target shareholders, perhaps because the target board can block these attempts using poison pills. In Section 7.3 we relax this assumption. As depicted by Figure 1, there are two rounds of negotiations, indexed by $j \in \{I, II\}$, which are separated by a proxy fight stage. In each round, the proposer is decided randomly and independently of the other round. With probability $s \in (0, 1)$ the proposer is the target board, and with probability $1 - s$ the proposer is the bidder. The proposer makes a take-it-or-leave-it offer to the other party. Parameter $s$ can be interpreted as the bargaining power of the target firm.[12] We denote by $\pi_j$ the price per share paid by the bidder under an acquisition agreement that is reached in round $j$. If an agreement is reached, it must be approved by a majority of the target shareholders in a vote. Throughout, at any voting stage, target shareholders play undominated pure strategies. If the agreement is approved by the majority of shareholders, each shareholder of the target receives $\pi_j$ for each share he owns, and the bidder gets $q + \Delta - (1 - m)\,\pi_j$.

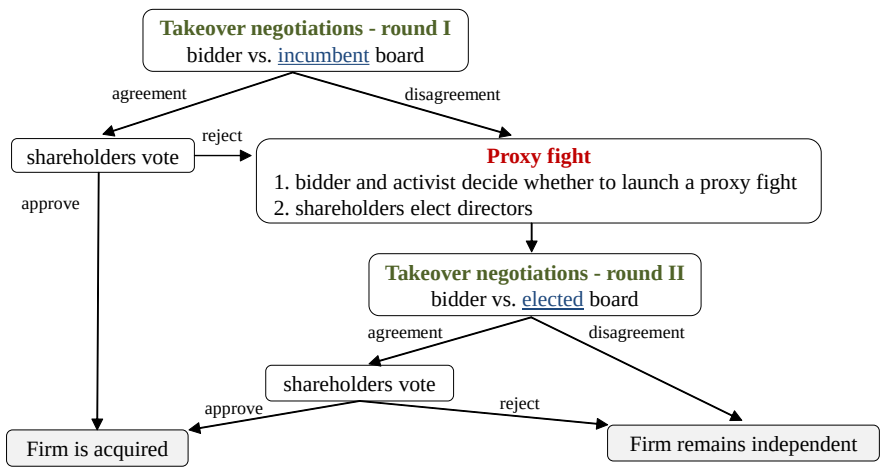


Figure 1 - Takeover negotiations and proxy fight

If no agreement is reached at the first round, or if shareholders vote down a proposed agreement, the bidder and the activist decide simultaneously whether to run a proxy fight to replace the incumbent board.[13] The ability (or incentives) to run a proxy fight is a key feature

[12] The Nash bargaining protocol can be microfounded using Rubinstein's (1982) model of alternating offers.

[13] We implicitly assume that the majority of directors stand for reelection. In 2013, only 11% of the S&P 500 companies had a classified board, down from 57% in 2003 (see sharkrepellent.net: "Governance Activists Set Their Sights on Netflix's Annual Meeting" and "2003 Year End Review".) Alternatively, winning a short slate proxy fight is sufficient to change the dynamic in the board and the ability of the incumbents to protect their private benefits of control. See Bebchuk et al. (2002) for a discussion on staggered board.

that distinguishes the activist from other passive investors. If a proxy fight is initiated, the challenger incurs a non-reimbursable private cost $\kappa > 0$, which captures administrative costs as well as the effort, time, and money that are needed in order to recruit nominees, coordinate with other shareholders, and campaign against the incumbent. For example, $\kappa$ decreases with the fraction of the firm that is held by institutional investors or the governance expertise of the challenger. Target shareholders then decide whether to vote for the incumbent board or one of the rival teams. The team that receives the largest number of votes is elected and takes control of the target board.

Winning the control of the target board has two implications for the rival team, whoever it is. First, it gives the rival the right to negotiate on behalf of the target shareholders an acquisition agreement with the bidder in the second round. That is, the newly elected directors can redeem the poison pill, if such exists, and resume negotiations.[14] Second, the rival takes control of the operations of the target, and among other things, it can divert corporate resources as private benefits if the firm remains independent, for example, by exploiting the privileged access as a board member to the target's proprietary information or through self-dealing transactions.[15] We assume that the amount that can be diverted is limited and arbitrarily small. This assumption, which we relax in the Appendix, guarantees that if shareholders are indifferent between electing the rival (the bidder or the activist) and retaining the incumbent, they will choose the latter. Importantly, both the bidder and the activist cannot commit to act in the best interests of target shareholders once they obtain control of the board. Under this assumption, the newly elected directors maximize the value of the party with which they are affiliated, even if it conflicts with maximizing target shareholder value. In Section 5.2 we analyze the model under the assumption that the bidder can commit to act in the best interests of target shareholders, and calculate the value for the bidder from this commitment.

Once the proxy fight stage ends, a second round of negotiations between the bidder and the target board (which may now be populated with the newly elected directors) takes place. The second round has the same protocol as the first round. However, if no agreement is reached or shareholders reject the deal, the target remains independent and its standalone value is realized.

[14] Provisions that make pills nonredeemable are illegal in most states, including New York and Delaware.

[15] See Atanasov et al. (2014) for a discussion on the various forms of tunneling, and Atanasov et al. (2010), Bates et al. (2006), and Gordon et al. (2004) for evidence on tunneling in the U.S.

# 3 The commitment problem in takeovers

We consider the set of Perfect Bayesian Equilibria in pure strategies and solve the game backward. All proofs and results not in the main text are given in Appendix A and the Online Appendix. We start by characterizing the second round of negotiations.

**Lemma 1** *In the second round of negotiations, the target is acquired by the bidder unless the incumbent board retains control and $\Delta < b$. The expected shareholder value is*

$$\Pi_{SH} = \begin{cases} q + \mathbf{1}_{\{b \leq \frac{\Delta}{1-m}\}} \cdot \left[ s\frac{\Delta}{1-m} + (1-s)b \right] & \textit{if the incumbent board retains control,} \\ q + s\frac{\Delta}{1-m} & \textit{if the activist controls the board,} \\ q & \textit{if the bidder controls the board.} \end{cases} \tag{1}$$

Several observations follow from Lemma 1. First, if reelected, the incumbent board can block the takeover. Therefore, he would accept a takeover offer only if the premium is higher than $b$, his private benefits of control per share. The bidder's net profit if he pays $\pi$ for each of the $1-m$ target shares is $q(1-m) + \Delta - (1-m)\pi$. Therefore, if $b \leq \frac{\Delta}{1-m}$, the bidder can afford to pay a premium of $b$, even if it means sacrificing the profit on his toehold. In this case, the entrenchment of the incumbent benefits target shareholders (at least ex-post) since it forces the bidder to offer a higher premium without endangering the deal. However, if $\frac{\Delta}{1-m} < b$, the bidder would rather walk away from the negotiations. In this case, the entrenchment of the incumbent board results with an inefficient outcome which is at the core of our analysis: a value-increasing takeover is rejected.[16]

Second, if the activist is elected to the board, the activist would negotiate a "fair" deal in which the bidder pays an expected premium of $s\frac{\Delta}{1-m}$. Indeed, the bidder would offer the lowest price that is acceptable to the activist and target shareholders, which is the standalone value of the target $q$. On the other hand, since $\alpha \geq 0$, the activist has incentives to maximize the value of her holdings, and therefore, she would ask for $q + \frac{\Delta}{1-m}$, the highest price the bidder would agree to pay for the target.

Third, if the bidder wins the proxy fight, he gains the authority to negotiate on behalf of target shareholders. Hence, the bidder sits on both sides of the negotiating table! Unlike the activist, the bidder is interested in acquiring the target for the lowest price possible (and

[16] If $n$ is small then $B < \frac{\Delta}{1-m} < b$ is likely, which means that a takeover is the efficient outcome.

perhaps diverting corporate resources). Therefore, regardless of the proposer's identity, the bidder would be tempted to offer target shareholders their reservation price, which is $q$. *This is the bidder's commitment problem in takeovers.* Target shareholders rationally expect the bidder, who is a counter party to the transaction, to abuse the power of the board. Therefore, they do not elect him to their board. Since running a proxy fight is both costly and inefficacious, the bidder does not run a proxy fight in any equilibrium of the subgame. This result holds regardless of the gains from the takeover, $\Delta$, the cost of running a proxy fight, $\kappa$, the size of the bidder's toehold, $m$, the incumbent board's private benefits of control, $b$, and whether or not the activist is also running a proxy fight.

**Proposition 1** *Suppose the first round of negotiations fails. Then:*

(*i*) *The bidder never runs a proxy fight.*

(*ii*) *The activist runs a proxy fight if and only if*

$$\frac{\kappa/s}{\alpha} \leq \frac{\Delta}{1-m} < b. \tag{2}$$

*Whenever the activist runs a proxy fight, she wins.*

Proposition 1 establishes our result that although both bidders and activists can launch a proxy fight and face the same costs of doing so, only activists can effectively challenge the resistance of incumbent directors and facilitate the takeover. Unlike the bidder, shareholders expect the activist to negotiate a premium of $s\frac{\Delta}{1-m}$ if they elect her to the board. Being on the sell-side gives the activist an advantage relative to the bidder when campaigning against the incumbent. Nevertheless, shareholders elect the activist only if she is expected to outperform the incumbent. If the incumbent is reelected, he negotiates a premium of $s\frac{\Delta}{1-m} + (1-s)\,b$ if $b \leq \frac{\Delta}{1-m}$ and blocks the takeover otherwise. Therefore, shareholders elect the activist only if $b > \frac{\Delta}{1-m}$. The activist, however, does not necessarily start a proxy fight even if she expects to win one. If the activist does not challenge the incumbent, the target remains independent and the value of her stake remains $\alpha q$. If the activist runs a proxy fight, the value of her stake increases to $\alpha\left(q + s\frac{\Delta}{1-m}\right)$. The activist runs a proxy fight if the increase in the value of her stake is higher than the cost of running a proxy fight, which holds if and only if $\frac{\kappa/s}{\alpha} \leq \frac{\Delta}{1-m}$. As expected, the activist is more likely to run a proxy fight when the target's bargaining power is strong, the number of shares owned by the activist is large, and the cost of running a proxy

fight is low. Condition (2) is the intersection of the activist's incentives to run a proxy fight and the shareholders' incentives to support her in the challenge.

**Proposition 2** *A unique equilibrium exists and has the following properties:*

(*i*) *If* $\min\{b, \frac{\kappa/s}{\alpha}\} \leq \frac{\Delta}{1-m}$ *then the bidder reaches an agreement in the first round of negotiations with the incumbent board in which the bidder pays*

$$\pi^* = q + s\frac{\Delta}{1-m} + (1-s)b \cdot \mathbf{1}_{\{\frac{\Delta}{1-m} \geq b\}} \tag{3}$$

*per share and acquires full control of the target.*

(*ii*) *If* $\frac{\Delta}{1-m} < \min\{b, \frac{\kappa/s}{\alpha}\}$ *then the target remains independent.*

Proposition 2 describes the equilibrium of the game. If $b \leq \frac{\Delta}{1-m}$ then regardless of the size of the activist's stake in the target, the bidder reaches an agreement with the incumbent board in the first round in which he pays $q + s\frac{\Delta}{1-m} + (1-s)b$. However, if $\frac{\kappa/s}{\alpha} \leq \frac{\Delta}{1-m} < b$ then all parties involved correctly anticipate that if the first round of negotiations fails, the activist would run and win a proxy fight, and then negotiate an acquisition agreement with an expected premium of $s\frac{\Delta}{1-m}$. Since the activist's threat of running a proxy fight is credible, any first round offer below $q + s\frac{\Delta}{1-m}$ is rejected by shareholders, and any offer above $q + s\frac{\Delta}{1-m}$ is rejected by the bidder. The incumbent board understands that the takeover is inevitable, and therefore accepts any offer higher than $q + s\frac{\Delta}{1-m}$ in order to avoid the adverse consequences of losing the proxy fight (e.g., embarrassment or the loss of reputation). As a result, the bidder reaches an agreement with the incumbent board in the first round in which he pays $q + s\frac{\Delta}{1-m}$. In all other cases, the incumbent board's entrenchment is too high ($\frac{\Delta}{1-m} < b$) and the threat of a proxy fight is not credible ($\frac{\Delta}{1-m} < \frac{\kappa/s}{\alpha}$). Therefore, the incumbent retains control of the board and successfully blocks the takeover.

# 4 Implications of the commitment problem

The commitment problem in takeovers has several implications, which we discuss below.

## 4.1 Collaborations between activist investors and bidders

The relative advantage of the activist in relaxing the opposition of the incumbent to the takeover crucially depends on the belief of target shareholders that unlike the bidder the activist is truly on their side of the negotiating table. Therefore, the resistance of incumbents to takeovers can be overcome only if the capacity to disentrench the board is separated from the capacity to increase value through acquisitions. In particular, collaborations between activist investors and bidders are likely to fail. A case in point is the unsolicited bid of Valeant for Allergan in 2014. Valeant teamed up with the activist hedge fund Pershing Square, with the intention that the latter would build a toehold in Allergan and push for its sale to Valeant. The sophisticated maneuver failed. Our analysis suggests that by teaming up with Valeant, Pershing Square lost its credibility (with respect to the Valeant's bid) since shareholders of Allergan could not trust Pershing Square to act in their best interests (rather than in Valeant's) once elected to the board. Without the trust of the shareholders of Allergan, Pershing Square was as ineffective as Valeant in pressuring the Allergan's board to accept Valeant's offer.[17]

## 4.2 Can diversified investors be corporate control activists?

Large shareholders of the target can play the role of an activist in the context of takeovers only if they are truly on the sell-side of the transaction. Matvos and Ostrovsky (2008) and Harford et al. (2011) find that in many cases large target shareholders also hold large positions in the acquiring firm. With ownership on both sides of the transaction, these investors lack the credibility that pure sell-side investors would have. Since the ability to win a proxy fight crucially depends on the credibility of the challenger, these investors are likely to be ineffective in relaxing the opposition of the board to the takeover. Therefore, our analysis suggests that large institutional investors with diversified portfolios (e.g., Vanguard, Fidelity, State Street, and BlackRock) are unlikely to play an active role in takeovers (at least when the bidder is a public corporation). This result holds even if these investors own large stakes in the target and have the relevant governance expertise.

[17] Allergan was eventually acquired by Actavis, however, from the perspective of Valeant, the takeover attempt failed. See NYT, 11/18/2014, "The Flaws in Valeant's Activist Deal Effort".

## 4.3 Should a takeover premium drop after the bidder wins a proxy fight? No!

The commitment problem implies that if the bidder wins a proxy fight, he would abuse the power of the target board and low-ball the takeover premium. Does the model predict that the takeover offer should drop after the bidder wins a proxy fight? The answer is no, and for two reasons. To see why, suppose the activist is absent ($\alpha = 0$) and consider the following thought experiment: Target shareholders are naive and would elect the bidder to the board in spite of his inability to commit to act in their best interests once elected. Based on Lemma 1, the bidder would abuse the power of the board and offer target shareholders $q$, the lowest offer they would accept. Therefore, if the first round of negotiations fails, the bidder would run (and win) a proxy fight if and only if

$$q + \Delta - (1 - m)\, q - \kappa \geq qm \Leftrightarrow \Delta \geq \kappa,$$

and make an expected profit of $\Delta - \kappa$. Suppose $\Delta \geq \kappa$ and consider the first round of negotiations.[18] If the bidder is the proposer, he would offer to buy the target for $q$. The target board and shareholders accept this offer since if they do not, the bidder would run and win a proxy fight, and then offer them the same amount. Therefore, even if the target board or shareholders unexpectedly reject the initial offer $q$ (e.g., a trembling hand), the post proxy fight negotiations would yield the same offer, not a lower one! Intuitively, the anticipation of winning a proxy fight and low-balling the takeover offer incentivizes the bidder to low-ball the takeover offer at the beginning of first round of negotiations. Moreover, notice that the expected takeover premium in this equilibrium is strictly positive. Indeed, when the target board is the proposer he asks for $q + \kappa$, the highest offer that the bidder would accept. The bidder is willing to pay more than $q$ in order to save the cost of running a proxy fight. Therefore, the lack of commitment does not imply that the expected takeover premium should be zero.

The second reason why a takeover offer is unlikely to drop after a bidder wins a proxy fight is that if a bidder was able to win a proxy fight, and target shareholders have rational expectations, then it is likely that the bidder found a way to commit to act in their best interests. In Section 5, we discuss different channels through which such commitment can be obtained, and analyze a variant of the model in which the bidder obtains this commitment.

[18] If $\Delta < \kappa$ then the bidder never runs a proxy fight even if he can win one. In these cases, the analysis is reduced to the baseline model where $\alpha \leq \frac{\kappa/s}{b}$.

# 5 Overcoming the commitment problem

The commitment problem stems from the assumption that the newly elected directors maximize the value of the party with which they are affiliated rather than the value of target shareholders. In practice, the severity of this commitment problem depends on the legal and economic environment in which the bidder and the target operate, as well as on actions that the bidder can deliberately take in order to alleviate this problem.

We start this section by discussing the potential "solutions" to the commitment problem, and then analyze the benefit for the bidder if the problem is resolved. In this respect, our contribution should be viewed as identifying the bidder's commitment problem in takeovers and the potential solutions. The extent to which these solutions are implemented by bidders or have any effect is an empirical question. However, the possibility of alleviating the commitment problems using these solutions, although costly or imperfect, may explain instances in which bidders do run or threaten to run a proxy fight. While activist investors do not solve the bidder's commitment problem directly, they can mitigate its adverse consequences on the market for corporate control. The fact that most proxy fights are launched by activists is consistent with this argument. To strengthen our claim, we show that the commitment problem is alleviated if the bidder can also increase the standalone value of the target without changing its ownership structure, a feature which characterizes some financial buyers, including activist hedge funds. Furthermore, we argue that activist investors can mitigate the resulted inefficiencies of the bidder's commitment problem even if they are themselves conflicted with target shareholders.

## 5.1 Solutions to the commitment problem

The bidder's commitment problem can be alleviated in several ways, but as we argue below, each channel is either costly or imperfect.

1. Effective investor protection laws and a strong legal environment can help shareholders enforce directors' fiduciary duties, thereby committing the bidder not to abuse the power of the target board if it is given to him. However, litigation and enforcement are costly, uncertain, and limited to verifiable outcomes.

2. Competition for the target firm (whenever exists) can also limit the bidder's ability to expropriate target shareholders. Low-balling the takeover premium while a superior competing bid is outstanding can be challenging (e.g., the Revlon Rule under the Delaware

corporate law). Yet, by controlling the target board, the bidder can still exploit his access to the target's private information and divert resources, thereby deterring competition.

3. The bidder might consider recruiting "independent" nominees to represent him on the target board. However, finding truly independent nominees that are willing to represent the bidder not only requires time and effort, but may also be expensive as these individuals, if are truly independent, are likely to charge higher compensation. Moreover, these nominees may also be vulnerable to side payments from the bidder. If the bidder can offer compensation contracts (explicit or implicit) that are unobserved by target shareholders, he will be tempted to incentivize the nominees to maximize his value.

4. Serial acquirers or private equity funds, who repeatedly interact in the market for corporate control, might be able to develop reputation for not expropriating target shareholders. However, building and maintaining good reputation is costly (i.e., avoiding the temptation to extract value today), it depends on the presence of public histories of past outcomes, and it can create unintended distortions.

5. In the U.S., the bidder can run a proxy fight and at the same time make a tender offer that remains pending until after the director elections. However, the bidder can amend the terms of the tender offer without restriction, at least as long as any of the conditions to the tender offer remains unsatisfied.[19] Even if the bidder can commit not to revise the tender offer, by doing so, he is exposed to the free-rider problem of Grossman and Hart (1980), which is costly.[20]

## 5.2 The value of commitment

While bidders might have the ability to solve their commitment problem (through either channel), they may not have the incentives to do so. Suppose that before the first round of negotiations starts, the bidder could fully commit to act in the best interests of target shareholders if they elect him to their board. What is the value of such commitment? If the bidder chooses

[19] Since the tender offer is made prior to the proxy fight, typically it has a condition that the offer is valid only if the poison pill is redeemed. Therefore, the newly elected directors can always choose not to redeem the pill, thereby paving the way for the bidder to revise the offer.

[20] Bebchuk and Hart (2001) propose amending the existing rules governing mergers to allow acquirers to bring a merger proposal directly to a shareholder vote without the approval of the board of directors. Under these rules, the bidder can effectively commit to a certain acquisition price.

to commit, he would use the control of the target board to maximize the target shareholder value whenever he is negotiating on their behalf, which happens with probability $s$. Therefore, shareholders are confident that if they elect the bidder to their board, he will negotiate the "fair price", which is $q + s\frac{\Delta}{1-m}$. Since both the bidder and the activist can "promise" an expected premium of $s\frac{\Delta}{1-m}$, target shareholders reelect the incumbent whenever $b \leq \frac{\Delta}{1-m}$, and are indifferent between electing the bidder or the activist when $\frac{\Delta}{1-m} < b$. Therefore, the bidder and the activist will run a proxy fight only if the other party is not expected to do so. Subject to this constraint, the incentives of the activist to run a proxy fight are the same as in Proposition 1 part (ii). However, unlike part (i) of Proposition 1, here the bidder can win a proxy fight. The bidder's expected profit from running a proxy fight is $\Delta(1-s) - \kappa$, and therefore, the bidder will run (and win) a proxy fight if and only if the activist does not run a proxy fight and

$$\frac{1}{1-m}\frac{\kappa}{1-s} \leq \frac{\Delta}{1-m} < b. \tag{4}$$

It follows that by committing to act in the best interests of target shareholders, the bidder obtains the option to unseat the incumbent via proxy fight if the first round of negotiations fails. The next result characterizes the value of this option.

**Proposition 3** *The net expected value that the bidder obtains from a commitment to act in the best interests of target shareholders is*

$$R = \int_{(1-m)\min\{b,\frac{\kappa/s}{\alpha},\frac{1}{1-m}\frac{\kappa}{1-s}\}}^{(1-m)\min\{b,\frac{\kappa/s}{\alpha}\}} \left[(1-s)\Delta - s\kappa\right] dF(\Delta), \tag{5}$$

*which is decreasing in $\alpha$ and increasing in $b$.*

Proposition 3 has several implications. First, since $R$ is decreasing in $\alpha$ and increasing in $b$, bidders would have stronger incentives to incur the costs of resolving their commitment problem when the prospective target companies have more severe agency problems and face weaker pressure from activist investors. This observation, however, ignores the possibility that the cost of obtaining a commitment might also depend on factors that affect the benefit $R$. For example, higher $b$ may be the result of weak investor protection laws, which could make it harder for the bidder to obtain a credible commitment. Moreover, note that $R$ is an upper bound on the value from commitment, since in practice the bidder may only be able to obtain partial rather than full commitment. Second, if $b \leq \frac{1}{1-m}\frac{\kappa}{1-s}$ then $R = 0$ and the analysis is

identical to Section 3. There, the bidder's threat of running a proxy fight was not credible because target shareholders would never elect him to the board, while here it is not credible because the benefit from replacing the incumbent is not high enough to compensate for the cost of running (and winning) a proxy fight whenever the incumbent board resists the takeover. Interestingly, if $\frac{\kappa/s}{\alpha} < b \leq \frac{1}{1-m}\frac{\kappa}{1-s}$ then the activist's threat of running a proxy fight is credible even though the bidder's threat is not.[21] Third, the bidder's threat of running a proxy fight is credible if and only if

$$\frac{1}{1-m}\frac{\kappa}{1-s} \leq \frac{\Delta}{1-m} < \min\left\{b, \frac{\kappa/s}{\alpha}\right\}. \tag{6}$$

If $\frac{\Delta}{1-m} \geq \min\{b, \frac{\kappa/s}{\alpha}\}$ then as in Proposition 8 part (i), the takeover goes through even if the bidder can never win a proxy fight. If $\frac{\Delta}{1-m} < \min\{b, \frac{\kappa/s}{\alpha}, \frac{1}{1-m}\frac{\kappa}{1-s}\}$ then as in Proposition 8 part (ii), the target remains independent. The key difference arises when (6) holds.[22] In those cases, the activist's threat of running a proxy fight is not credible, and unless the bidder initiates his own challenge, the target would remain independent. In equilibrium, the bidder reaches an agreement in the first round of negotiations with the incumbent board in which he pays an expected price of $q + s\frac{\Delta+\kappa}{1-m}$ per share. The bidder pays more than $q + s\frac{\Delta}{1-m}$, the "fair price", since the incumbent exploits the fact that the bidder would be willing to pay a higher price up-front in order to avoid the cost of running a proxy fight later on. This explains why $\kappa$ appears in the integrand in (5).

## 5.3 Increasing the target's standalone value

The commitment problem arises in our setup since the bidder cannot (or has no incentives to) create value unless he acquires more than 50% of the voting rights of the target. Intuitively, a strategic bidder can realize the synergy only if the target is merged into the acquiring firm, and a private equity fund can execute the operational improvements only if the firm is taken private, insulating it from public markets. However, activist hedge funds, as well as other financial buyers, may have the expertise and incentives to propose and execute policies that increase the value of the target, even without acquiring 50% of its voting right. In those cases,

[21] The activist's advantage can also stem from having more governance expertise (i.e., lower costs of running a proxy fight) due to their experience in challenging entrenched incumbents of other public companies.

[22] In Proposition 3 we implicitly assume that whenever both conditions (2) and (4) hold, the equilibrium of the subgame in which the activist runs a proxy fight is in play. This selection is conservative in the sense that it gives an upper bound on the bidder's value from commitment. Similar results hold under a different selection.

the commitment problem is alleviated.

To understand this argument, consider the baseline model but suppose that the activist is absent (i.e., $\alpha = 0$) and a value of $\Delta$ can be created if the bidder's proposal is implemented. The proposal can be successfully implemented either by the incumbent or by the bidder, regardless of the target's ownership structure. In particular, the proposal can be implemented even if the target remains independent after the failure of the second round of negotiations. Either way, the incumbent loses his private benefits of control if the proposal is implemented.

**Proposition 4** *Suppose the first round of negotiations fails. If the bidder can increase the standalone value of the target, he runs a proxy fight if and only if*

$$\frac{\kappa/m}{1-m} \leq \frac{\Delta}{1-m} < b, \tag{7}$$

*and whenever the bidder runs a proxy fight, he wins.*

Since the bidder does not have to acquire more than 50% of the target and take it private in order to create value, she can increase the standalone value of the target even if its ownership structure does not change. Therefore, while the bidder may be tempted to low-ball the takeover offer once she gets control of the target board, these attempts are doomed to fail since target shareholders know that if they reject the offer, the bidder will inevitably implement the value-increasing proposal in order to maximize the value of his own stake in the target. Essentially, the bidder cannot commit to not increasing the value of the target if his takeover offer is rejected. Therefore, shareholders would not fear electing the bidder to the board in those cases.

Our model predicts that bidders who can increase the standalone value of the target are more resilient to the commitment problem in takeovers. Activist hedge funds, which often take positions in public companies and push for a change, seem to fit to this characterization. Consistent with this argument, Boyson et al. (2016) find that in 15% of the events in their sample the activist is also making a takeover bid to the target company.

Finally, note that while the ability to increase the standalone value of the target alleviates the concerns of shareholders that the bidder would low-ball the takeover premium, it does not alleviate the concern that the bidder would try to abuse the power of the target board to tunnel assets or extract value from the target. Consistent with this argument, Boyson et al. (2016) also find that takeover bids made by activists result in a significantly lower probability

of success relative to bids made by a third party when an activist is present.[23] However, there is a bigger danger that the bidder would extract value and abuse his exposure to the target's private information once elected to the board if he is a corporation in a related industry than if he is not. In this respect, financial bidders (and in particular activist hedge funds) are more resilient than strategic bidders to the commitment problem in takeovers.

## 5.4 Can target shareholders trust an activist?

The relative advantage of activists in overcoming the commitment problem does not rely on their perfect alignment of interests with the other target shareholders. We only require that the activist has a higher credibility than the bidder and that she would resist the takeover to a lesser extent than the incumbents. In Appendix B.4, we show that the main results continue to hold even if the activist is expected to divert a non-trivial amount of corporate resources once elected to the board. Moreover, we show that even if the activist is biased toward selling the firm (e.g., because of short-termism), she will maintain a higher credibility than the bidder. Essentially, the activist still has incentives to maximize the value of her holdings by asking for the highest premium the bidder would agree to pay. The activist might be willing to accept low offers (because of her short-termism), but target shareholders, who must approve any acquisition agreement, would reject offers below the perceived standalone value of the target.

The analysis above rules out the possibility of side-payments. With side-payments, the bidder will generally find it beneficial, if possible, to offer target shareholders proportionally less than it is offered to whoever controls the target board. The bidder can essentially compensate the board (i.e., bribe) for the loss of private benefits of control if such exist, and thereby overcome the resistance to the takeover. Clearly, side-payments are illegal, and they cannot be contracted or formalized. By nature, side-payments are kept out of sight, and the possibility of misconduct leaves target shareholders suspicious about the motives of their board, even if it is controlled by an activist investor. Nevertheless, we argue that the activist's credibility is higher than the bidder's even if side-payments are possible. Importantly, it is the credibility of the activist *relative* to the bidder's, rather than its absolute level, that is at the core of our argument.

Intuitively, offering illegal side-payments requires pushing envelopes underneath the table,

[23] This evidence is also consistent with non-activist bidders having higher ability to create value through acquisition than activists as bidders.

explicit communications, or tacit agreements of future favours or transfers, all of which entail the risk of being spotlighted, which can result with destroyed reputation, litigation, and significant penalties or even jail time for all parties involved. When the bidder controls the board, it is often the same person who makes decisions on behalf of the bidder and target shareholders. In this case, no physical transfers or communications have to take place, and so the risk of anyone finding a "smoking gun" that can be used in courts as evidence for misconduct is small. However, this risk is much higher when the bidder has to bribe a third party, such as an activist investor, with whom the bidder does not necessarily have tight and close relationship.[24] Since side-payments are riskier when the activist controls the board, they are less expected.[25] Therefore, target shareholders are likely to be more suspicious about the bidder's motives, and as in the baseline model, the bidder has lower credibility than the activist.

# 6 Activist's position building and deal solicitation

Our analysis suggests that activist investors can mitigate the inefficiencies caused by the bidder's commitment problem in takeovers. In order to study the implications of interventions by activist investors on the M&A market, we extend the model in Section 2 by endogenizing the initial decision of the activist to become a target shareholder and the decision of the bidder to engage in takeover negotiations. We maintain the assumption that the bidder cannot commit to act in the best interests of the target shareholders once elected to the board.

## 6.1 Modified setup

Suppose that $\Delta$ is initially unknown and let $\zeta \in \{0, 1\}$ be a random variable with a common prior $\Pr[\zeta = 1] = \mu \in (0, 1)$. If $\zeta = 0$ then the firm is not a viable target and $\Delta \leq 0$ with certainty. If $\zeta = 1$ then the acquisition can create value and $\Pr[\Delta > 0 | \zeta = 1] > 0$. The cumulative distribution function of $\Delta$ conditional on $\zeta = 1$ is given by $F$, which is differentiable

[24] Even if the representative of the bidding firm on the target board is not the same person as the CEO of the bidding firm (or of whoever controls it), that person is likely to have a tighter relationship with the bidding firm (e.g., employment) than a third party like an activist investor has, and therefore, tacit collusion is more likely when the bidder has the control of the board.

[25] A similar argument can be made against the attractiveness of offering side-payments to the incumbent board. However, as long as side-payments impose risks and costs on the parties involved, the incumbent's resistance to the takeover (resulting from his private benefits) is harder to overcome, in which case, a deal is more likely when the target board is controlled by the activist.

and has full support over the real line. We assume that $E[\Delta|\zeta = 1] \leq 0$. Intuitively, finding a corporate asset with which the bidder can create synergies is hard.[26] This assumption guarantees that the bidder will not acquire the target without first performing due diligence, as we specify below.

The bidder and the activist are endowed with private information about $\zeta$. The bidder perfectly observes $\zeta$ while the activist receives a private signal $y \in \{0, 1\}$ with precision $\phi \in (0, 1]$ where

$$\Pr[y = 1|\zeta] = \begin{cases} 1 & \text{if } \zeta = 1 \\ 1 - \phi & \text{if } \zeta = 0. \end{cases} \tag{8}$$

If $y = 0$ then the activist infers with certainty that $\zeta = 0$, and if $y = 1$ then the activist updates her beliefs about $\zeta = 1$ from $\mu$ to $\hat{\mu} \equiv \frac{\mu}{1-\phi(1-\mu)}$.

At the outset, the bidder and the activist do not own shares of the target. The activist privately observes signal $y$ and submits an order to buy $\alpha \geq 0$ shares from a risk-neutral and competitive market maker. Short sales are not allowed. The share price $p$ is set equal to the expected value of the target conditional on the total order flows for the firm, denoted by $z$. The market maker cannot distinguish between orders that are generated by the activist or by liquidity traders. With probability $\frac{1}{2}$ liquidity traders submit an order to buy $L \in (0, \frac{1}{2})$ shares, and with probability $\frac{1}{2}$ they do not trade. We assume that purchasing up to $2L$ shares does not trigger a poison pill if such exists, and the activist cannot buy more than $2L$ shares of the target, because of either wealth constraints or the concern of triggering a poison pill. After trading, the activist's ownership in the target becomes public (e.g., by filing schedule 13D). The bidder observes $\zeta$ and $\alpha$, and then decides whether to perform due diligence. Specifically, the bidder can pay $c$ and learn the exact value of $\Delta$. The cost $c$, which is privately observed by the bidder, is drawn from a continuous cumulative distribution $G$ with full support on $[0, \infty)$ and is independent of all other random variables.[27] For simplicity, we abstract from the bidder's decision to build a toehold and assume $m = 0$. If the bidder performs due diligence, then $\Delta$ becomes public and the takeover negotiations unfold as in the baseline model.

[26] The integration of companies often distracts management and employees, increases uncertainty, and requires additional compliance with regulation, all of which are detrimental to firm value, i.e., $\Delta < 0$.

[27] The assumptions on the bidder's due diligence technology are made for simplicity. The main results continue to hold if instead the cost is $c(\lambda)$, where $c', c'' > 0$ and $\lambda$ is the probability the bidder learns $\Delta$.

## 6.2 Analysis

Consider first the decision of the bidder to perform due diligence. Since the takeover on average does not create value, the bidder never acquires the target without first performing due diligence, irrespective of the activist's position in the target. If the bidder has performed due diligence, his expected profit is given by the following corollary of Proposition 2.

**Corollary 1** *Suppose the bidder performed due diligence and the activist owns $\alpha$ target shares. Conditional on $\zeta$, the expected shareholder value is $q + \zeta v(\alpha)$, the bidder's expected profit is $\zeta(w(\alpha) - v(\alpha))$, and the expected value created by the takeover is $\zeta w(\alpha)$, where*

$$v(\alpha) = \int_b^\infty [s\Delta + (1-s)b]\, dF(\Delta) + \int_{\min\{b, \frac{\kappa/s}{\alpha}\}}^b s\Delta dF(\Delta) \tag{9}$$

*and*

$$w(\alpha) = \int_{\min\{b, \frac{\kappa/s}{\alpha}\}}^\infty \Delta dF(\Delta). \tag{10}$$

*All three terms strictly increase in $\alpha$ when $\frac{\kappa/s}{\alpha} < b$ and are invariant to $\alpha$ otherwise.*

Based on Corollary 1, if the bidder performed due diligence his expected net profit conditional on $\zeta$ and $\alpha$ is $\zeta \cdot (w(\alpha) - v(\alpha)) - c$. As a result, if the activist owns $\alpha$ target shares then the bidder performs due diligence if and only if $\zeta = 1$ and $c < w(\alpha) - v(\alpha)$. The expected takeover premium conditional on $\zeta = 1$ and $\alpha$ is given by

$$h(\alpha) \equiv G(w(\alpha) - v(\alpha))v(\alpha). \tag{11}$$

As we explain below, both $w(\alpha) - v(\alpha)$ and $v(\alpha)$ increase in $\alpha$, and therefore, the incentives of the bidder to perform due diligence and the expected takeover premium increase with the size of the activist's stake in the target.[28]

Let $\alpha^*(y)$ be the number of shares bought by the activist in equilibrium as a function of her private signal. If $y = 0$ then the activist expects any takeover attempt to fail and she does not invest in the target. If $y = 1$ and the activist owns $\alpha$ target shares then her expected profit

[28] The analysis in the previous sections microfounded $h(\alpha)$, the effect of the activist on firm value. However, the results in this section continue to hold even if $h(\alpha)$ stems from a different microfoundation, as long as $h(\alpha)$ is an increasing function. See Back et al. (2016) for a dynamic model of shareholder activism where the mapping from activist's ownership to firm value is exogenous.

is

$$\Pi(\alpha) = \alpha \left( q + \hat{\mu} h(\alpha) - \frac{p(\alpha) + p(\alpha + L)}{2} \right). \tag{12}$$

Generally, the activist's informational advantage stems from knowing whether the firm is likely to be a viable target and the fact she is becoming a target shareholder. The latter matters not only because the activist can pressure the incumbent board to accept a future takeover bid, but also because the anticipation of this pressure increases the incentives of the bidder to perform due diligence of the target. In other words, the activist can affect the takeover process even if ex-post her threat of running a proxy fight is not credible. Based on Proposition 1, the activist's threat of running a proxy would be credible with a positive probability if and only if $\frac{\kappa/s}{\alpha^*(1)} < b$. In equilibrium, the market maker sets the target share price equal to its standalone value plus the expected takeover premium, accounting for the potential effect of the activist on the takeover. In turn, the activist tries to disguise her trade as a liquidity and uninformed demand, and generally conceals the exact number of shares she buys from the market maker. These considerations affect the number of target shares that the activist purchases, and consequently, her ability to affect the takeover in equilibrium.[29]

**Proposition 5** *In any equilibrium, $\alpha^*(0) = 0$ and the bidder performs due diligence if and only if $\zeta = 1$ and $c < w(\alpha^*(1)) - v(\alpha^*(1))$. Given $\Delta$ and $\alpha^*(y)$, the takeover negotiations unfold as described by Proposition 2. Moreover,*

*(i) An equilibrium in which $\alpha^*(1) = 0$ exists if and only if*

$$2 - \frac{\mu}{\hat{\mu}} \frac{h(0)}{h(L)} \leq \frac{h(2L)}{h(L)}. \tag{13}$$

*The target share price is given by $p(z) = q + \mu h(0)$ for $z \in \{0, L\}$.*[30]

*(ii) An equilibrium in which $\alpha^*(1) > 0$ is unique and it exists if and only if $\frac{h(2L)}{h(L)} < 2$. In this equilibrium, $\alpha^*(1) = 2L$ with probability $\sigma^* \in [0, 1)$ and $\alpha^*(1) = L$ with probability*

[29] We impose two restrictions on the equilibrium. First, if in equilibrium $\alpha^* > 0$ then the activist's expected profit (conditional on her private information) must be strictly positive. Intuitively, the activist would exercise her outside option if she cannot make a profit on her investment. Second, the market maker's off-equilibrium beliefs conditional on order flow $z$ are bounded from above by the highest value that the activist would ascribe to the firm, which is obtained when $y = 1$ and $\alpha = \min\{z, 2L\}$.

[30] The off-equilibrium beliefs that support the equilibrium are described in the proof in the Appendix.

$1-\sigma^*$, *where*

$$\sigma^* = 1 + \frac{\hat{\mu}}{2\mu} - \sqrt{\left(1+\frac{\hat{\mu}}{2\mu}\right)^2 - \frac{2\hat{\mu}}{\mu}\max\left\{0, \frac{\frac{h(2L)}{h(L)} - 1 - \frac{1}{2}\frac{\hat{\mu}-\mu}{\hat{\mu}}}{\frac{h(2L)}{h(L)} - 1}\right\}}. \tag{14}$$

*The target share price is given by*

$$p(z) = q + \hat{\mu} \times \begin{cases} 0 & \text{if } z = 0 \\ \frac{1-\sigma^*}{\hat{\mu}/\mu - \sigma^*} h(L) & \text{if } z = L \\ (1-\sigma^*)\, h(L) + \sigma^* h(2L) & \text{if } z = 2L \\ h(2L) & \text{if } z = 3L \text{ and } \sigma^* > 0. \end{cases} \tag{15}$$

Proposition 5 has several interesting implications. First, if $\frac{h(2L)}{h(L)} \geq 2$ then there is no equilibrium in which the activist becomes a target shareholder. Since $\frac{h(2L)}{h(L)} \geq 2$ implies $\frac{\kappa/s}{2L} < b$ (and sometimes $\frac{\kappa/s}{L} < b$), the activist could build a position and pressure the incumbent to sell the target, but she chooses not to. Why? When $\frac{h(2L)}{h(L)} \geq 2$ the marginal effect of increasing the activist's position on the expected takeover premium is very large. Unless it is fully priced, the activist cannot avoid the temptation of buying $2L$ target shares and using them to facilitate a takeover. However, the market maker realizes this temptation and prices the shares accordingly, leaving the activist with no profit in equilibrium. Without a profit, the activist refrains from investing in the target.

Can the activist ever profit from buying $2L$ shares in equilibrium? After all, the liquidity demand is either $L$ or zero. While buying $2L$ shares fully reveals that the activist is becoming a target shareholder and her private information about $\Delta$, the market maker cannot infer the exact number of shares that the activist purchased. This latter piece of private information, which is the source of the activist's profit, is valuable only if the activist can exert more pressure on the incumbent by increasing the size of her stake from $L$ to $2L$. According to Proposition 5, there is an equilibrium in which the activist buys $2L$ shares with a positive probability (i.e., $\sigma^* \in (0,1)$) if and only if $1 + \frac{1}{2}\frac{\hat{\mu}-\mu}{\hat{\mu}} < \frac{h(2L)}{h(L)} < 2$. That is, the marginal effect of the activist's stake on the expected takeover premium must be moderate.

Generally, when $\frac{h(2L)}{h(L)} < 2$ the equilibrium exhibits either a "selection effect", a "treatment effect", or both. Under the selection effect, the activist's threat of running a proxy fight is

not credible, that is, $\frac{\kappa/s}{\alpha^*(1)} \geq b$. Since the activist has no informational advantage relative to the bidder, she cannot affect his decision to perform due diligence by sharing her information either. However, since $\phi > 0$, the activist has incentives to speculate: Knowing the firm is likely to be a target when $y = 1$ gives the activist informational advantage (relative to the market maker) that makes the purchase of shares a profitable investment. In these cases, the activist invests in firms that are likely to be targets, but her investment has no real effect.

Under the treatment effect, the activist invests in firms that are likely to be targets, and by doing so, she increases the probability of a takeover. There are two effects. First, if $\frac{\kappa/s}{\alpha^*(1)} < \Delta < b$ then the activist can effectively pressure the incumbent to accept an offer that he would otherwise reject. Second, if $\frac{\kappa/s}{\alpha^*(1)} < b$, regardless of the value of $\Delta$, the activist increases the likelihood that a takeover offer is made by *soliciting* a deal: The presence of the activist as a target shareholder signals the bidder that the incumbent is likely to be pressured by its shareholders to sell the firm, and therefore, the bidder has stronger incentives to perform due diligence and start takeover negotiations. We call this ex-ante effect the *solicitation effect*.

Interestingly, the solicitation effect increases the value of the activist's private information of her being a shareholder of the target, and thereby increases her incentives to become a shareholder in the first place. Due to this feedback, small changes to the environment can have a large effect on the equilibrium. For example, a small decrease in $\kappa$ (e.g., a change in regulation that eases the proxy access) can have an amplified positive effect on the probability that the activist becomes a shareholder of the target and the probability of a takeover. Related, policies that undermine shareholder activism but do not affect bidders directly will still have a significant effect on takeovers. This implies that legalization of two-tier "anti-activism" poison pills will adversely affect M&A even if "standard pills" that prevent takeovers are already prevalent.

**Corollary 2** *Suppose* $\frac{h(2L)}{h(L)} < 2$ *and consider the unique equilibrium with* $\alpha^*(1) > 0$. *Then:*

(*i*) *The equilibrium exhibits only treatment if and only if*

$$\frac{\kappa/s}{L} < b. \tag{16}$$

(*ii*) *The equilibrium exhibits both selection and treatment if and only if*

$$\frac{\kappa/s}{2L} < b \leq \frac{\kappa/s}{L} \text{ and } 1 + \frac{1}{2}\frac{\hat{\mu} - \mu}{\hat{\mu}} < \frac{h(2L)}{h(L)}. \tag{17}$$

*(iii) The equilibrium exhibits only selection if and only if*

$$b \leq \frac{\kappa/s}{2L}, \text{ or } \quad \frac{\kappa/s}{2L} < b \leq \frac{\kappa/s}{L} \text{ and } \frac{h(2L)}{h(L)} \leq 1 + \frac{1}{2}\frac{\hat{\mu}-\mu}{\hat{\mu}}. \tag{18}$$

Corollary 2 identifies the regions in which the selection and the treatment effects appear in equilibrium. Interestingly, if $\frac{\kappa/s}{2L} < b \leq \frac{\kappa/s}{L}$ then treatment and selection can occur simultaneously, depending on the size of the position that the activist builds in the target: If the activist buys $2L$ shares then the treatment effect is in play, and if she buys $L$ shares then the selection effect is in play. Nevertheless, as we discussed above, whether the activist actually chooses to buy $2L$ shares depends on the ratio $\frac{h(2L)}{h(L)}$, and in this respect, the appearance of the treatment effect in equilibrium is endogenous. Since the liquidity demand is smaller than $L$, but the activist can exert pressure on the incumbent only if she buys strictly more than $L$ shares, thereby revealing her presence and private information, the result that in equilibrium the activist chooses to buy $2L$ shares demonstrates that activists can mitigate the inefficiencies caused by the bidder's commitment problem even though building a position is costly.

According to Proposition 5, the ex-ante probability of a takeover is[31]

$$\theta^* = \mu \times \begin{cases} (1-\sigma^*)\,\theta(L) + \sigma^*\theta(2L) & \text{if } \frac{h(2L)}{h(L)} < 2 \\ \theta^*(0) & \text{if } \frac{h(2L)}{h(L)} \geq 2 \end{cases} \tag{19}$$

where

$$\theta(\alpha) = G(w(\alpha) - v(\alpha)) \int_{\min\{b, \frac{\kappa/s}{\alpha}\}}^{\infty} dF(\Delta). \tag{20}$$

If $\alpha > 0$ then $\hat{\mu}\theta(\alpha)$ is the probability of a takeover conditional on the activist owning $\alpha$ target shares.

When the equilibrium exhibits selection, the activist has no real effect. Yet, the probability of a takeover is higher when the activist is present as a target shareholder than when she is not. To see why, suppose $\frac{h(2L)}{h(L)} < 2$. If $y = 0$ then he activist buys no target shares, and since $\zeta = 0$, a takeover never takes place. If $y = 1$ then the activist becomes a target shareholder and the conditional probability of a takeover is strictly positive. Intuitively, since $\phi > 0$ the activist uses her private information on $\zeta$ to speculate on a takeover of the target. Therefore, her

[31] When multiple equilibria exist, we assume that the equilibrium with higher ex-ante probability of takeover (or, equivalently the equilibrium with $\alpha^*(1) > 0$) is in play.

presence is correlated with a higher expected synergy and a higher probability that the bidder makes an offer. This observation suggests that one should not conclude from the empirical evidence that targets are more likely to be acquired when they have activist as a shareholder (e.g., Greenwood and Schor (2009) and Boyson et al. (2016)) that activists are necessarily affecting the takeover process.

The next result shows that the comparative statics of $\theta^*$ with respect to $b$, the incumbent board's private benefits of control, can help to distinguish between the selection and the treatment effects in equilibrium.[32]

**Proposition 6** *If the equilibrium exhibits only selection then $\theta^*$ is strictly decreasing in $b$. If the equilibrium exhibits treatment then $\theta^*$ is non-monotonic in $b$.*

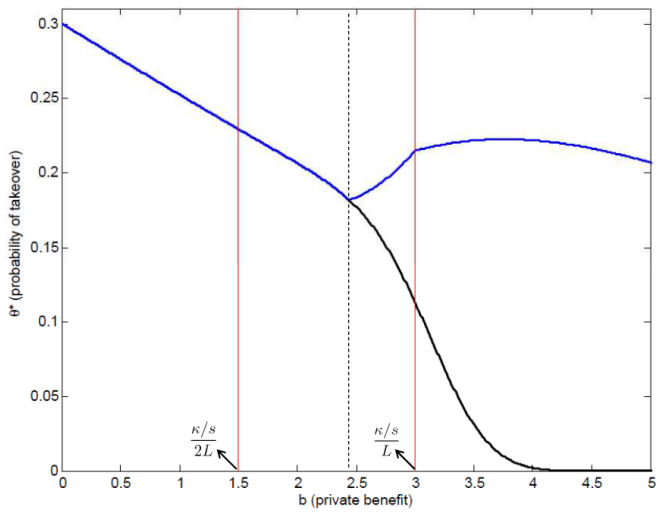


*Figure 2 - The effect of $b$ on the probability of a takeover, $\theta^*$*

$L = 0.1, s = 0.75, \kappa = 0.225, \mu = 0.6, \phi = 0.5,\ \Delta \sim N(0,5), c \sim LogN(-1.62, 0.13)$

If the equilibrium exhibits only selection then either $b \leq \frac{\kappa/s}{2L}$, or $\frac{\kappa/s}{2L} < b \leq \frac{\kappa/s}{L}$ and $\sigma^* = 0$. Either way, $\theta^* = \mu\theta(0)$, and the probability of a takeover is decreasing in $b$. Intuitively, higher $b$ implies that the bidder has a lower probability of reaching an agreement with the incumbent at favorable terms, and hence, weaker incentives to perform due diligence. This can be seen in Figure 2: At any point left to the dotted vertical line, the equilibrium exhibits only selection, and the probability of a takeover is decreasing in $b$. Since in the selection region the activist

[32] We focus on local comparative statics of the equilibrium in which $\alpha^*(1) > 0$, where the equilibrium continues to exist upon a small change in the parameter.

has no effect on the takeover, the same pattern holds if the activist is not present as a target shareholder. This can be seen by the black curve in Figure 2.

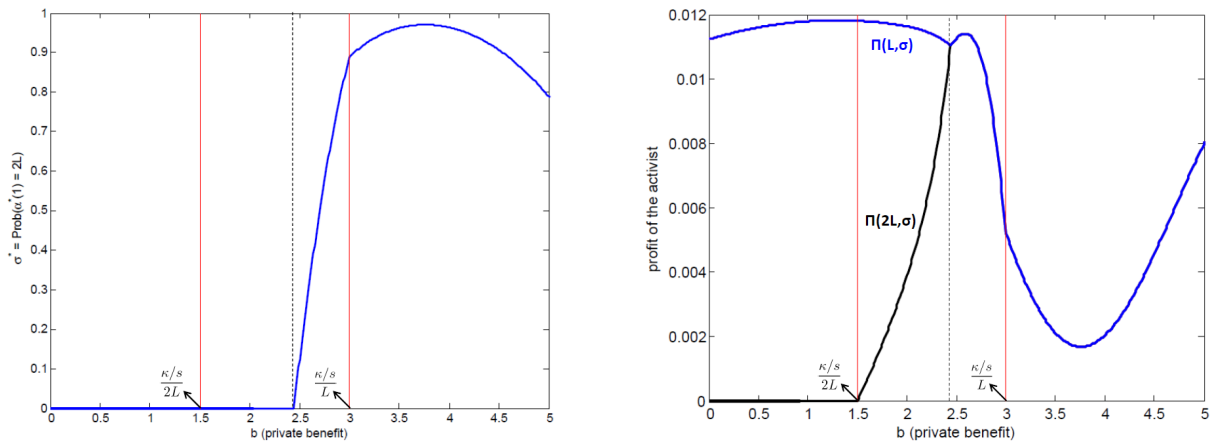


Figure 3 - The effect of $b$ on $\sigma^*$ and $\Pi(\cdot, \sigma^*)$

$L = 0.1, s = 0.75, \kappa = 0.225, \mu = 0.6, \phi = 0.5, \Delta \sim N(0, 5), c \sim LogN(-1.62, 0.13)$

Interestingly, as shown by Figure 2, the probability of a takeover can *increase* with $b$ when the equilibrium exhibits treatment. Indeed, starting at the dotted vertical line, the blue curve in Figure 2 is increasing in $b$. To understand this result, note that all else being equal, higher $b$ increases the takeover premium paid by the bidder conditional on reaching in agreement with incumbent. While the bidder's incentives to perform due diligence may decrease, the activist's incentives to buy shares of the target increase. Not only the activist expects a higher premium when the bidder negotiates the takeover with the incumbent, but also her threat of running a proxy fight becomes more credible (the interval $[\frac{\kappa/s}{2L}, b]$ expands), where both channels increase the value of the activist's private information. This can be seen in the left panel of Figure 3: the activist starts buying $2L$ shares with a positive probability when $b$ reaches the dotted line. The right panel of Figure 3 shows that up to this point, the profit from buying $2L$ shares is lower than the profit from buying $L$. Since in this region $\frac{\kappa/s}{2L} < b \leq \frac{\kappa/s}{L}$, the equilibrium starts exhibiting treatment exactly at the dotted line. Since the bidder benefits from the activist's presence, the indirect effect of $b$ on the bidder's incentives can be positive, and the overall probability of a takeover can increase. Therefore, contrary to the common wisdom, the probability of a takeover and the likelihood of an activist campaign can increase with the resistance of the incumbents, as such resistance creates more investment opportunities for the

activist.[33]

### 6.2.1 Arbitrage activism - activist moves last

Our assumption that the bidder's decision to perform due diligence is made *after* the activist's position in the target is revealed is consistent with Boyson et al. (2016), who find that in 70% of the events in their sample a takeover bid is announced within 2 years of a hedge fund initiating an activist campaign. In 30% of the events, however, the activist enters *after* the announcement of an acquisition agreement but before closing. Nevertheless, the complementarity between shareholder activism and takeovers extends to these cases as well.

To see why, consider a variant of the model in which the activist (and the market) observes the decision of the bidder's to perform due diligence before she decides if and how many target shares to buy (i.e., the bidder moves first). Since the activist "waits" with her investment decision until the bidder makes his own decision, we assume that with probability $\delta$ the activist has found an alternative investment and therefore cannot invest in the target. The emergence of this outside option is the activist's private information.

If the bidder does not perform due diligence, he does not make an offer, the activist never buys shares of the target, and the target remains independent. The interesting case is when the bidder has performed due diligence of the target. In this case, the analysis is similar to Section 6.2 with the following two exceptions: the function $h(\alpha)$ is replaced by $v(\alpha)$, and the decision of the activist not to invest is not a bad signal on firm value. It can be shown that the activist can still profit from investing in the target since buying shares with the intent of pressuring the incumbent to accept the offer is still the activist's private information. The anticipation that the activist will put pressure on the target board to accept the bidder's offer once it is on the table increases the bidder's incentives to perform due diligence and make the offer in the first place. In this respect, the complementarity between shareholder activism and takeovers extends to this setup.

[33] In some cases, higher $b$ increases the bidder's incentives to conduct due diligence even if the the size of the activist's stake does not change. Intuitively, if $b$ is small, the bidder can reach an agreement even if the activist does not intervene, and the bidder pays a premium of $s\Delta + (1-s)b$. If $b$ is large, the bidder can reach an agreement only if the activist intervenes, in which case, he pays a lower premium of $s\Delta$.

# 7 Extensions

We consider several extensions of the baseline model. For simplicity, we assume $m = 0$.

## 7.1 Incumbent boards as motivated sellers

In management buyouts or when incumbents are promised large bonuses if the takeover succeeds (Grinstein and Hribar (2004) and Hartzell et al. (2004)), the agency problem between the incumbents and shareholders flips as the former are too motivated to sell the firm. If there is a concern that the interests of target shareholders are compromised, activist investors will challenge the deal with the intent of either blocking it or "forcing" the bidder to sweeten the bid (see Jiang et al. (2015)).

To stress this point, suppose that unless forced otherwise, the incumbent board would sell the firm for a zero premium. Unlike the incumbent, the activist would negotiate a premium of $s\Delta$. Therefore, target shareholders elect the activist whenever she runs a proxy fight. As in the baseline model, the activist would run a proxy only if $\frac{\kappa/s}{\alpha} \leq \Delta$. It follows that the target is always acquired by the bidder when $\Delta > 0$: If the activist owns $\alpha$ shares of the target and $\frac{\kappa/s}{\alpha} \leq \Delta$ then the bidder pays $q + s\Delta$, and in all other cases the bidder pays $q$. Unlike the baseline model, here the activist increases the expected premium the bidder is required to pay without increasing the likelihood that the incumbent board agrees to sell the firm. Therefore, the acquisition is less profitable from the bidder's perspective.

Similar to the discussion in Section 6.2.1, the activist can make a profit by challenging the deal although she invests after the deal is announced. Different from that discussion, however, the anticipation that the activist will put pressure on the target board to reject the bidder's offer or demand a higher premium weakens the bidder's incentives to perform due diligence. Therefore, when the incumbent is a motivated seller, there is *substitution* between shareholder activism and takeovers.

## 7.2 Activist's proposals

As described in Section 5.3, activist investors often have the capacity to propose ways to increase the standalone value of the target. Does it complement or substitute the activist's ability to pressure the incumbent to sell the firm? To answer this question, suppose that the bidder can increase the value of the target by $\Delta$ only through its acquisition, while the

activist can make a proposal that increases the value of the target by $\varepsilon \geq 0$, but only if it remains independent. The incumbent loses his private benefits if the target is acquired or the proposal is implemented. The proposal can be implemented by the incumbent or the activist, but without the activist, the incumbent is either unaware or does not have the expertise to implement this proposal.

Suppose $\varepsilon < \min\{b, \kappa/\alpha\}$. Since $\varepsilon < b$, the incumbent would not voluntarily implement the activist's proposal. The activist's intervention can be interpreted as the removal of inefficiencies caused by the incumbent's consumption of private benefits. However, since $\varepsilon < \kappa/\alpha$, the activist does not have enough incentives to run a proxy fight if the sole purpose is implementing the proposal. Nevertheless, the analysis in the baseline model continues to hold with the exception that the activist's threat of running a proxy fight is credible if and only if $\frac{\kappa/\alpha}{s} - \frac{1-s}{s}\varepsilon < \Delta < b$, and in this region, the takeover premium is $s\Delta + (1-s)\varepsilon$. Intuitively, the upside from the takeover increases the incentives of the activist to run a proxy fight. Since the proposal increases the standalone value of the firm once the activist obtains control of the target board, it also increases the takeover premium that the activist can negotiate with the bidder. Similarly, the ability to increase the standalone value of firm increases the credibility of the activist's threat to run a proxy fight when the incumbent resists selling the firm. In this respect, corporate control activism and non-control activism are *complements*. Moreover, since the activist relaxes the resistance of the incumbent to the takeover, the bidder's expected profit is higher when the activist is present. In fact, it can increase with $\varepsilon$ even conditional on the activist's presence, if increase in the likelihood of a takeover is first order relative to increase in premium once the takeover takes place. That said, if $\varepsilon$ is sufficiently large, the bidder's expected profit would decrease with $\varepsilon$, and a takeover is less likely when the activist is present than when she is not. In those cases, corporate control activism and non-control activism are *substitutes*.

## 7.3 Limited veto power and tender offers

In this section we relax the assumption that the target board has the full power to block the deal. Specifically, we assume that if at the end of the second round of negotiations no agreement is reached between whoever controls the target board and the bidder, with probability $\lambda \in [0,1]$ the deal is blocked and the target remains independent, but with probability $1-\lambda$ the bidder can make a tender offer directly to target shareholders. For simplicity, we focus on conditional

tender offers for all target shares. The baseline model is a special case where $\lambda = 1$. Tender offers exhibit collective action problems such as free-riding: Target shareholders reject offers lower than their perception of the post takeover value of their shares (Grossman and Hart (1980)). Suppose $\Delta > 0$ and assume that the post takeover value of the minority shares under the bidder's control is $q + \varphi\Delta$ where $\varphi \in [0, 1]$. The term $(1 - \varphi)\Delta$ can be interpreted as either the bidder's private benefits from the acquisition or the expected dilution of minority shareholders under the bidder's control.

Similar to the baseline model, the bidder never runs a proxy fight, but the activist runs a proxy fight if and only if $\frac{\kappa/s}{\alpha\lambda} \leq \Delta < b$. That is, the activist is more likely to run a proxy fight when $\lambda$ is larger. In this respect, there is *substitution* between the bidder's ability to bypass the target board through tender offers and the activist's ability or need to unseat it through proxy fights. Intuitively, if $\lambda$ is low then the bidder has an alternative mean by which he can overcome the resistance of the board, and hence, the activist has fewer incentives to run a proxy fight in order to facilitate the takeover. Therefore, one would expect activists to play a smaller role in the market for corporate control in jurisdictions in which boards have weaker power to block deals, such as the U.S. in the 1980s or the U.K.

# 8 Conclusion

This paper studies the role of activist investors in the market for corporate control. Unlike bidders, activists are on the same side of the negotiating table as other shareholders of the target, and hence, enjoy higher credibility when campaigning against the incumbent board. Building on this insight, we demonstrate that although both bidders and activists can use similar techniques to challenge corporate boards (i.e., proxy fights), activists are more effective in relaxing the resistance of incumbent directors to takeovers. More generally, our analysis suggests that this resistance can be overcome only if the capacity to disentrench incumbents is separated from the capacity to increase value through acquisitions.

Our analysis also highlights the complementarity between shareholder activism and takeovers. While activists benefit from the possibility that companies in which they invest will become a takeover target, bidders have stronger incentives to perform due diligence and start takeover negotiations when activists are present as target shareholders. We show that activists can solicit offers in two different ways. First, they leverage their advantage in pressuring management by reassuring bidders that they will face a weaker opposition to the takeover, if the offer

is fair. Second, activists use their private information about the target to signal bidders that the synergy from its acquisition is expected to be high. Overall, the analysis sheds light on the interaction between shareholder activism and M&A and provides a framework to identify the treatment and the selection effects of shareholder activism.

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# A Proofs of main results

**Proof of Lemma 1.** Generally, there are three scenarios to consider. The scenarios differ with respect to the composition of the target board after the proxy fight stage. Under all scenarios, target shareholders approve the acquisition agreement if it is brought to a shareholder vote if and only if the takeover offer is weakly higher than the standalone value of the firm, $q$. Moreover, the bidder will not agree to pay more than $q + \frac{\Delta}{1-m}$ per share.

In the first scenario, the incumbent board is reelected and retains control of the target. The incumbent board would agree to sell the firm if and only if the bidder offers at least $q + b$ per share. Therefore, if $\frac{\Delta}{1-m} < b$ no agreement is reached and the target remains independent under the control of the incumbent. If $\frac{\Delta}{1-m} \geq b$ then the incumbent board and the bidder reach an agreement in which the expected takeover premium is $s\frac{\Delta}{1-m} + (1-s)b$: with probability $1-s$ the bidder proposes to pay $q+b$, which is the lowest price that is acceptable by both the incumbent board and the shareholders, and with probability $s$ the incumbent board propose to receive $q + \frac{\Delta}{1-m}$, which is the highest price that the bidder would agree pay for the firm.

In the second scenario, the activist wins the proxy fight and controls the target board. If no agreement is reached with the bidder, the target remains independent, and the activist's payoff per share is $q$, which is the value of the target as a standalone firm. Therefore, the activist would agree to sell the firm if and only if the offer is at least $q$. Since $\Delta > 0$, the bidder and the activist always reach an acquisition agreement that is also acceptable to target shareholders. With probability $1-s$ the bidder offers $q$, which is the lowest price that is acceptable by both the activist and the shareholders, and with probability $s$ the activist asks for $q + \frac{\Delta}{1-m}$, which is the highest price the bidder would pay for the firm.

In the third scenario, the bidder wins the proxy fight and controls the target board. The argument is given in the main text. ■

The next result is a generalization of Proposition 1 for cases where the bidder commits to act in the best interests of target shareholders once elected to their board.

**Proposition 7** *Suppose the first round of negotiations fails. Then:*

(*i*) *The bidder runs a proxy fight if and only if he has committed to act in the best interests of target shareholders once elected to the target board, the activist does not run a proxy fight, and*

$$\frac{1}{1-m}\frac{\kappa}{1-s} \leq \frac{\Delta}{1-m} < b. \tag{21}$$

*Whenever the bidder runs a proxy fight, he wins.*

(*ii*) *If the activist owns $\alpha$ shares of the target, the activist runs a proxy fight if and only if the bidder does not run a proxy fight and*

$$\frac{\kappa/s}{\alpha} \leq \frac{\Delta}{1-m} < b. \tag{22}$$

*Whenever the activist runs a proxy fight, she wins.*

**Proof.** If the bidder has not committed to act in the best interests of target shareholders once elected to the target board, then the proposition reduces to Proposition 1, which is proved in the main text. Suppose throughout the rest of the proof that the bidder has made this commitment. If the incumbent board retains control of the target in the second round of negotiations, then shareholder value is $q + \mathbf{1}_{\{b \leq \frac{\Delta}{1-m}\}} \cdot \left[s\frac{\Delta}{1-m} + (1-s)b\right]$. If the activist or the bidder obtains control of the target board, an agreement will be reached in the second round and the expected shareholder value is $q + s\frac{\Delta}{1-m}$. Therefore, if $b \leq \frac{\Delta}{1-m}$ then neither the bidder nor the activist can win a proxy fight, and hence, they will not initiate one. Suppose $\frac{\Delta}{1-m} < b$ and the first round of negotiations failed. Shareholders will support whoever runs a proxy fight, knowing that in both cases an agreement will be reached in the second round of negotiations and that the expected shareholder value will be $q + s\frac{\Delta}{1-m}$. Therefore, if one player is going to run a proxy fight, the other player does not have incentives to run a proxy fight, since by doing so he will obtain the same profit but will in addition incur the cost $\kappa$. Consider the case in which the bidder runs a proxy fight. If the bidder runs a proxy fight then his expected profit is

$$q + \Delta - (1-m)\left(q + s\frac{\Delta}{1-m}\right) - \kappa - qm = \Delta(1-s) - \kappa.$$

If neither the bidder nor the activist runs a proxy fight, the firm will remain independent and the bidder's profit will be zero. Therefore, the bidder will run a proxy fight if and only if $\frac{\kappa}{1-s} \leq \Delta$. This completes part (i). Consider the case in which the activist runs a proxy fight. If the activist runs a proxy fight then her expected payoff is $\alpha\left(q + s\frac{\Delta}{1-m}\right) - \kappa$. If neither the bidder nor the activist runs a proxy fight, then the firm will remain independent, and the activist's payoff will be $\alpha q$. Therefore, the activist will run a proxy fight if and only if $\frac{\kappa/s}{\alpha} \leq \frac{\Delta}{1-m}$. This completes part (ii). ■

The next result is a generalization of Proposition 2 for cases where the bidder commits to act in the best interests of target shareholders once elected to their board.

**Proposition 8** *A unique equilibrium exists and has the following properties:*

(*i*) *If* $\frac{\Delta}{1-m} \geq \min\{b, \frac{\kappa/s}{\alpha}\}$ *then the bidder reaches an agreement in the first round of negotiations with the incumbent board in which he pays* $q + s\frac{\Delta}{1-m} + (1-s)b \cdot \mathbf{1}_{\{\frac{\Delta}{1-m} \geq b\}}$ *per share and acquires the target.*

(*ii*) *If* $\frac{1}{1-m}\frac{\kappa}{1-s} \leq \frac{\Delta}{1-m} < \min\{b, \frac{\kappa/s}{\alpha}\}$ *and the bidder has committed to act in the best interest of target shareholders, then the bidder reaches an agreement in the first round of negotiations with the incumbent board in which he pays an expected price of* $q + s\frac{\Delta+\kappa}{1-m}$ *per share and acquires the target.*

(*iii*) *If* $\frac{\Delta}{1-m} < \min\{b, \frac{\kappa/s}{\alpha}, \frac{1}{1-m}\frac{\kappa}{1-s}\}$ *and the bidder has committed to act in the best interest of target shareholders or if* $\frac{\Delta}{1-m} < \min\{b, \frac{\kappa/s}{\alpha}\}$ *and the bidder has not committed, then the target remains independent.*

**Proof.** We start by proving that if $b \leq \frac{\Delta}{1-m}$ the bidder pays $q + s\frac{\Delta}{1-m} + (1-s)b$ and acquires the target after the first round of negotiations. Based on Proposition 7, if $b \leq \frac{\Delta}{1-m}$ then neither the bidder nor the activist will run a proxy fight. Therefore, both the bidder and the incumbent board expect that in the second round of negotiations they will reach an agreement with an expected premium of $s\frac{\Delta}{1-m} + (1-s)\,b$. For this reason, the bidder will not agree to pay more than this amount and the incumbent board will not accept less than this amount. If there are arbitrarily small waiting costs to either the bidder or the incumbent board, they will reach an agreement in the first round of negotiations in which the bidder pays a premium of $s\frac{\Delta}{1-m} + (1-s)\,b$.

Second, suppose $\max\{\frac{\kappa/s}{\alpha}, \frac{1}{1-m}\frac{\kappa}{1-s}\} \leq \frac{\Delta}{1-m} < b$ and the bidder has committed to act in the best interest of target shareholders. Based on Proposition 7, there is an equilibrium of the subgame in which the bidder the runs a proxy fight and an equilibrium in which the activist runs a proxy fight. Consider the former equilibrium. We prove that the bidder pays an expected price of $q + s\frac{\Delta+\kappa}{1-m}$ and acquires the target in the first round of negotiations. If the first round of negotiations fails, the bidder will run a proxy fight and win. In the second round, the expected premium is $q + s\frac{\Delta}{1-m}$, and the bidder's expected profit is $\Delta\,(1-s) - \kappa > 0$. In the first round of negotiations, shareholders would reject any offer lower than $q + s\frac{\Delta}{1-m}$, and accept any offer higher than that amount. If the bidder is the proposer, he will offer $q + s\frac{\Delta}{1-m}$, and both the board and the shareholders will accept it. If the board is the proposer, he will offer $q + \frac{s\Delta+\kappa}{1-m}$, which leaves the bidder with a profit of $\Delta\,(1-s) - \kappa \geq 0$. Indeed,

$$q + \Delta - (1-m)\,p - qm = \Delta\,(1-s) - \kappa \Leftrightarrow p = q + \frac{s\Delta + \kappa}{1-m}.$$

The bidder will accept this deal. Overall, the expected takeover premium is $q + s\frac{\Delta+\kappa}{1-m}$, as required. Consider the latter equilibrium. Based on Lemma 1, all players expect that once the activist obtains control of the board, she will reach a sale agreement in which the bidder pays in expectation $q + s\frac{\Delta}{1-m}$ per share. The bidder realizes that any lower offer will be rejected by shareholders, who expect the activist to negotiate a higher offer at the second round. The bidder can afford to pay $q + s\frac{\Delta}{1-m}$, but he will not pay more than $q + s\frac{\Delta}{1-m}$, since he always has the option to pay that much in the second round when he negotiates with the activist. The incumbent board understands the bidder's incentives and that the takeover of the target is inevitable, and therefore, he will lose his private benefits of control. However, by accepting the offer $q + s\frac{\Delta}{1-m}$ the board can avoid the costly proxy fight. Therefore, the incumbent and the bidder reach an agreement in the first round of negotiations where the offer is $q + s\frac{\Delta}{1-m}$, as required.

Third, suppose either $\frac{\kappa/s}{\alpha} \leq \frac{\Delta}{1-m} < \min\{b, \frac{1}{1-m}\frac{\kappa}{1-s}\}$ and the bidder has committed to act in the best interest of target shareholders, or $\frac{\kappa/s}{\alpha} \leq \frac{\Delta}{1-m} < b$ and the bidder has not committed. Based on Proposition 7, the only equilibrium of the subgame is one in which the activist runs a proxy fight. Therefore, as in the second step above, the bidder reaches an agreement in the first round of negotiations with the incumbent board in which he pays $q + s\frac{\Delta}{1-m}$ per share and acquires the target.

Fourth, suppose $\frac{1}{1-m}\frac{\kappa}{1-s} \leq \frac{\Delta}{1-m} < \min\{b, \frac{\kappa/s}{\alpha}\}$ and the bidder has committed to act in the best interest of target shareholders. Based on Proposition 7, the only equilibrium of the subgame is one in which the bidder runs a proxy fight. Therefore, as in the second argument above, the bidder reaches an agreement in the first round of negotiations with the incumbent board in which he pays an expected price of $q + s\frac{\Delta+\kappa}{1-m}$ per share and acquires the target.

Fifth, suppose either $\frac{\Delta}{1-m} < \min\{b, \frac{\kappa/s}{\alpha}, \frac{1}{1-m}\frac{\kappa}{1-s}\}$ and the bidder has committed to act in the best interest of target shareholders, or $\frac{\Delta}{1-m} < \min\{b, \frac{\kappa/s}{\alpha}\}$ and the bidder has not committed. We prove that the target remains independent under the incumbent board's control. Based on Proposition 7, in both cases, neither the bidder nor the activist runs a proxy fight if the first round of negotiations fails. Since $\frac{\Delta}{1-m} < b$, the incumbent board and the bidder will not reach an agreement in the second round of negotiations. Therefore, in the first round of negotiations, the incumbent board will reject any offer lower than $q + b$, and the bidder will reject any offer higher than $q + \frac{\Delta}{1-m}$. Thus, the parties will not reach an agreement in the first round as well, and the target remains independent.

Finally, the statement of the proposition is the union of the arguments above subject to the assumption that if $\max\{\frac{\kappa/s}{\alpha}, \frac{1}{1-m}\frac{\kappa}{1-s}\} \leq \frac{\Delta}{1-m} < b$ and the first round of negotiations fails,

then the equilibrium in which the activist runs a proxy fight is selected. ■

**Proof of Proposition 3.** The proof follows directly from Proposition 2. ■

**Proof of Proposition 4.**

If the second round of negotiations succeeded and the target is acquired by the bidder, then the bidder implements his proposal if it has not been implemented yet. Therefore, the post takeover target value is $q + \Delta$. If the second round of negotiations failed and the firm remains independent (that is, its ownership structure did not change), there are two cases. First, if the bidder controls the target board then he implements her proposal if it has not been implemented yet, and the target value is $q + \Delta$. Second, if the incumbent board retains control then he implements the proposal if and only if $b \leq \Delta$, and hence, the target value is $q + \mathbf{1}_{\{b \leq \Delta\}}\Delta$.

Consider the second round of negotiations. There are two cases. First, suppose that either the bidder controls the target board or the incumbent retains control and $b \leq \Delta$. The bidder's proposal is implemented whether or not the bid fails. For this reason, the bidder will not offer more than $q + \Delta$ per share. Moreover, target shareholders will not accept offers lower than $q + \Delta$, since they can always reject the bid and obtain a value of $q + \Delta$ once the proposal is implemented. Therefore, whether or not target is acquired, the bidder's payoff is $m(q+\Delta)$ and the shareholder value is $q + \Delta$. Second, suppose incumbent board retains control and $b > \Delta$. If the negotiations fail, the proposal will not be implemented and the bidder's payoff would be $mq$. If the bidder acquires the firm, her payoff is $q+\Delta-(1-m)\,\pi_2$, where $\pi_2$ is the offer made to target shareholders. Therefore, the bidder is willing to offer up to $q + \frac{\Delta}{1-m}$ per share. The incumbent board and the bidder will reach an agreement if and only if $b \leq \frac{\Delta}{1-m}$. If $\frac{\Delta}{1-m} < b$ then the takeover fails and the shareholder value is $q$. If $\Delta < b \leq \frac{\Delta}{1-m}$ then the incumbent and the bidder reach an agreement in which $\pi_2 \geq q + b > q + \Delta$. Therefore, target shareholders approve any agreement reached by the bidder and the incumbent, and target is acquired by the bidder. In this case, the expected shareholder value is $q + s\frac{\Delta}{1-m} + (1-s)\,b$.

Consider the proxy fight stage. There are three cases to consider. First, if $b \leq \Delta$ then the bidder's payoff is $m(q + \Delta)$ whether or not she gets the control of the board. Therefore, she has no reason to run and incur the cost of a proxy fight. Second, if $\Delta < b \leq \frac{\Delta}{1-m}$ then the bidder always loses the proxy fight if he decides to start one. The reason is that shareholders know that if they elect the bidder they will get $q + \Delta$ whereas if they reelect the incumbent, the bidder will takeover the target and pay shareholders on average $q+s\frac{\Delta}{1-m}+(1-s)\,b$, which is strictly higher. Anticipating his defeat, the bidder never runs a proxy fight in this region.

Third, if $\frac{\Delta}{1-m} < b$ then the shareholder value is $q+\Delta$ if the bidder gets the control of the board, and $q$ otherwise. Therefore, shareholders always elect the bidder if he runs a proxy fight. The bidder's payoff is $m(q+\Delta)-\kappa$ if he runs a proxy fight, and $mq$ otherwise. Therefore the bidder runs a proxy fight only if $\kappa/m \leq \Delta$. Combining this condition with $b > \frac{\Delta}{1-m}$ yields (7).

Finally, consider the first round of negotiations.[34] There are four cases to consider. First, if $b \leq \Delta$ then the target value is $q+\Delta$ whether or not the bidder acquires the target. Second, if $\Delta < b \leq \frac{\Delta}{1-m}$ then the bidder reaches an agreement in the first round of negotiations with the incumbent board in which he pays $q + s\frac{\Delta}{1-m} + (1-s)b$ per share and acquires full control of the target. If $\frac{\Delta}{1-m} < b$ and $\Delta < \kappa/m$ then the target remains independent and the proposal is not implemented. If $\frac{\Delta}{1-m} < b$ and $\Delta \geq \kappa/m$ then the bidder reaches an agreement in the first round of negotiations with the incumbent board in which he pays on average $q + s\left(\Delta + \frac{\kappa}{1-m}\right) + (1-s)\Delta$ per share and acquires full control of the target. ■

**Proof of Proposition 5.** We first prove that in any equilibrium $\alpha^*(0) = 0$. If $y = 0$ then the activist infers that $\zeta = 0$ with certainty, and hence, $\Delta < 0$ with certainty. Based on Proposition 2, the probability of a takeover is zero and firm value is $q$. Since the share price cannot be smaller than $q$, regardless of the beliefs of the market maker (on or off the equilibrium path), the activist's expected profit from submitting any order $\alpha > 0$ is non-positive. Given our assumption that the activist does not buy shares if the expected profit is zero, $\alpha^*(0) = 0$.

Second, we prove that in any equilibrium the bidder performs due diligence if and only if $\zeta = 1$ and $c < w(\alpha^*(1)) - v(\alpha^*(1))$. Based on Corollary 1, if the bidder performed due diligence his expected net profit conditional on $\zeta$ and $\alpha$ is $\zeta \cdot (w(\alpha) - v(\alpha)) - c$. As a result, if the activist owns $\alpha$ target shares then the bidder performs due diligence if and only if $\zeta = 1$ and $c < w(\alpha) - v(\alpha)$. This condition reduces to $\zeta = 1$ and $c < w(\alpha^*(1)) - v(\alpha^*(1))$ because $\zeta = 1$ implies that $y = 1$, i.e, if the bidder has received $\zeta = 1$ then the activist must have bought $\alpha^*(1)$ shares in the target.

Third, consider an equilibrium in which the activist buys no shares regardless of the realization of $y$. The only order flows on the equilibrium path are $z = 0$ and $z = L$. In those cases, the market maker sets the price on $p(z) = q + \mu h(0)$. If $z \notin \{0, L\}$ then $p(z) \leq \Gamma(\max\{z, 2L\})$ where

$$\Gamma(\alpha) \equiv q + \frac{\mu}{1-\phi(1-\mu)} h(\alpha) \tag{23}$$

is the firm value from the activist's perspective if $y = 1$ and she owns $\alpha$ shares of the target. Note that $\Gamma(\alpha)$ is strictly increasing in $\alpha$ if $\alpha > \frac{\kappa/s}{b}$ and invariant to $\alpha$ if $\alpha < \frac{\kappa/s}{b}$. Suppose (13)

[34] This part is not discussed in the main text and only provided for completeness.

does not hold. The worst off-equilibrium beliefs from the activist's perspective are set when $z \notin \{0, L\} \Rightarrow p(z) = \Gamma(\max\{z, 2L\})$. Suppose that is the case, and consider the following deviation of the activist: She buys $L$ shares of the target if $y = 1$ and no shares otherwise. Her expected profit conditional on $y = 1$ is

$$\begin{aligned}\Gamma(L) - \frac{p(L) + p(2L)}{2} &= \Gamma(L) - \frac{q + \mu h(0) + \Gamma(2L)}{2} \\ &= \frac{1}{2}\left[2\frac{\mu}{1-\phi(1-\mu)}h(L) - \mu h(0) - \frac{\mu}{1-\phi(1-\mu)}h(2L)\right]\end{aligned}$$

which is strictly positive if and only if (13) does not hold. Therefore, such equilibrium cannot exist. If (13) holds, then the same off-equilibrium beliefs sustain an equilibrium in which the activist never buys any shares. Indeed, given these off-equilibrium beliefs neither the above deviation to buying $L$ shares nor any other deviation to buying $\alpha' \notin \{0, L, 2L\}$ shares gives the activist strictly positive profit.

Fourth, we prove that in any equilibrium, if $\alpha^*(1) > 0$ then either $\alpha^*(1) = L$ or $\alpha^*(1) = 2L$. Suppose on the contrary there is an equilibrium in which the activist submits $\alpha^*(1) = \hat{\alpha} \in (0, 2L) / \{L\}$ with a positive probability. From the activist's perspective, the value of the firm conditional on $y = 1$ is $\Gamma(\hat{\alpha})$. The activist expects a total order flow of $\hat{\alpha}$ or $\hat{\alpha} + L$ with equal probabilities, and therefore, she expects to pay $\frac{p(\hat{\alpha})+p(\hat{\alpha}+L)}{2}$. Since $\hat{\alpha} > 0$, by revealed preferences,

$$\Gamma(\hat{\alpha}) - \frac{p(\hat{\alpha}) + p(\hat{\alpha} + L)}{2} > 0. \tag{24}$$

We proceed in two steps. First, if $\hat{\alpha} \in (0, L)$ then $\hat{\alpha} < L < \hat{\alpha} + L$. Therefore, if $z \in \{\hat{\alpha}, \hat{\alpha} + L\}$ then the market maker must infer that the activist submitted an order to buy at least $\hat{\alpha}$ shares of the target. Since $\hat{\alpha} > 0$, the market maker also infers that $y = 1$.[35] Since $\Gamma(\alpha)$ is weakly increasing in $\alpha$, conditional on $z \in \{\hat{\alpha}, \hat{\alpha} + L\}$, the market maker believes that the value of the firm is at least $\Gamma(\hat{\alpha})$, which implies $p(z) \geq \Gamma(\hat{\alpha})$ for $z \in \{\hat{\alpha}, \hat{\alpha} + L\}$. However, this condition contradicts (24). Second, if $\hat{\alpha} \in (L, 2L)$ then $\hat{\alpha} - L < L < \hat{\alpha}$. However, since submitting $\alpha \in (0, L)$ is never an equilibrium (by the first step), if $z \in \{\hat{\alpha}, \hat{\alpha} + L\}$ then the market maker must infer that the activist submitted an order to buy at least $\hat{\alpha}$ shares of the target. As in the first step, this conclusion creates a contradiction.

Fifth, consider an equilibrium such that if $y = 0$ the activist buys no shares, and if $y = 1$ she buys zero shares with probability $\psi$, $L$ shares with probability $1-\sigma-\psi$, and $2L$ shares with

[35] Since $\alpha > 0$ is a weakly dominated strategy when $y = 0$, we restrict the off-equilibrium beliefs of the market maker and the bidder to be such that the activist observes $y = 1$ with probability one whenever $\alpha > 0$.

probability $\sigma$. Notice that if $\psi \in (0,1)$ then the activist must be indifferent between buying no shares and buying a strictly positive number of shares, which is not possible in equilibrium since the activist must make a strictly positive profit if she buys a strictly positive number of shares. Therefore, $\psi \in \{0,1\}$ in equilibrium. Hence, in equilibrium if $\sigma > 0$ or $\psi < 1$ then it must be $\psi = 0$, and if $\psi > 0$, it must be $\sigma = 0$ and $\psi = 1$. The latter case is addressed by the step number 2 above. Therefore, consider an equilibrium with $\psi = 0$. There are at most four possible order flows on the equilibrium path. First, if $z = 0$ then the liquidity demand is zero and the activist did not buy a stake because she received $y = 0$. In this case, firm value is $q$. Second, if $z = 3L$ and $\sigma > 0$ then the market maker infers that the activist bought $2L$ shares and $y = 1$, and therefore, $p(3L, \sigma) = \Gamma(2L)$. If $\sigma = 0$ then $z = 3L$ is off-equilibrium, and setting the off-equilibrium price as $\Gamma(2L)$, which is the highest possible and yielded by the off-equilibrium beliefs that $y = 1$ and the activist submitted $\min\{z, 2L\}$ shares, will ensure that if in equilibrium $\sigma^* = 0$, the activist will not deviate to choosing $2L$ with a positive probability. Third, suppose $z = L$. There are two events the market maker considers:

1. With probability $\frac{1}{2}\phi(1-\mu)$ the liquidity demand is $L$ and the activist did not buy a stake because she received $y = 0$. In this case, firm value is $q$.

2. With probability $\frac{1}{2}[1-\phi(1-\mu)](1-\sigma)$ the liquidity demand is zero, the activist received signal $y = 1$, and she bought a stake $L$. In this case, firm value is $\Gamma(L)$.

Combined, the share price is

$$\begin{aligned} p(L,\sigma) &= \frac{\frac{1}{2}\phi(1-\mu)q + \frac{1}{2}[1-\phi(1-\mu)](1-\sigma)\Gamma(L)}{\frac{1}{2}\phi(1-\mu) + \frac{1}{2}[1-\phi(1-\mu)](1-\sigma)} \\ &= q + \frac{1-\sigma}{\frac{1}{1-\phi(1-\mu)} - \sigma}(\Gamma(L) - q). \end{aligned} \tag{25}$$

Fourth, suppose $z = 2L$. There are two events the market maker considers:

1. With probability $\frac{1}{2}[1-\phi(1-\mu)](1-\sigma)$ the liquidity demand is $L$, the activist received signal $y = 1$, and she bought a stake $L$. In this case, firm value is $\Gamma(L)$.

2. With probability $\frac{1}{2}[1-\phi(1-\mu)]\sigma$ the liquidity demand is zero, the activist received signal $y = 1$, and she bought a stake $2L$. In this case, firm value is $\Gamma(2L)$.

Combined, the share price is

$$\begin{aligned} p\left(2L,\sigma\right) &= \frac{\frac{1}{2}[1-\phi(1-\mu)]\left(1-\sigma\right)\Gamma(L)+\frac{1}{2}[1-\phi(1-\mu)]\sigma\Gamma\left(2L\right)}{\frac{1}{2}[1-\phi(1-\mu)]\left(1-\sigma\right)+\frac{1}{2}[1-\phi(1-\mu)]\sigma} \\ &= \left(1-\sigma\right)\Gamma(L)+\sigma\Gamma\left(2L\right) \end{aligned} \tag{26}$$

Given $\sigma$, the activist's expected profit conditional on $y=1$ from buying $L$ and $2L$ shares, respectively, is

$$\begin{aligned} \Pi\left(L,\sigma\right) &= L\left[\Gamma\left(L\right)-\frac{p\left(L,\sigma\right)+p\left(2L,\sigma\right)}{2}\right] \\ &= \frac{1}{2}\frac{\mu}{1-\phi(1-\mu)}Lh\left(L\right)\left[\frac{\frac{\phi(1-\mu)}{1-\phi(1-\mu)}}{\frac{\phi(1-\mu)}{1-\phi(1-\mu)}+1-\sigma}-\sigma\left(\frac{h\left(2L\right)}{h\left(L\right)}-1\right)\right] \end{aligned} \tag{27}$$

and

$$\begin{aligned} \Pi\left(2L,\sigma\right) &= 2L\left[\Gamma\left(2L\right)-\frac{p\left(2L,\sigma\right)+p\left(3L,\sigma\right)}{2}\right] \\ &= \frac{\mu}{1-\phi(1-\mu)}L\left(1-\sigma\right)\left(h\left(2L\right)-h\left(L\right)\right). \end{aligned} \tag{28}$$

Note that $\Pi\left(L,\sigma\right)>\Pi\left(2L,\sigma\right)\Leftrightarrow\Upsilon\left(\sigma\right)>\frac{h(2L)}{h(L)}$ where

$$\Upsilon\left(\sigma\right)=1+\frac{\frac{\phi(1-\mu)}{1-\phi(1-\mu)}}{\frac{\phi(1-\mu)}{1-\phi(1-\mu)}+1-\sigma}\frac{1}{2-\sigma}, \tag{29}$$

is strictly increasing in $\sigma\in[0,1]$, where

$$\begin{aligned} \Upsilon\left(0\right) &= 1+\frac{1}{2}\phi(1-\mu) \\ \Upsilon\left(1\right) &= 2 \end{aligned}$$

Therefore, there is a unique $\sigma^*\in[0,1]$ such that $\Pi\left(L,\sigma\right)>\Pi\left(2L,\sigma\right)$ if and only if $\sigma>\sigma^*$. In particular, if there is an equilibrium in which the activist buys a positive number of shares when $y=1$ then:

1. If $\frac{h(2L)}{h(L)}\leq 1+\frac{1}{2}\phi(1-\mu)$ then $\Upsilon\left(0\right)\geq\frac{h(2L)}{h(L)}$ and $\Upsilon\left(\sigma\right)>\frac{h(2L)}{h(L)}$ for all $\sigma\in(0,1]$. Therefore, it must be $\sigma^*=0$.

2. If $\frac{h(2L)}{h(L)} \geq 2$ then $\Upsilon(1) \leq \frac{h(2L)}{h(L)}$ and $\Upsilon(\sigma) < \frac{h(2L)}{h(L)}$ for all $\sigma \in [0,1)$. Therefore, it must be $\sigma^* = 1$.

3. If $1 + \frac{1}{2}\phi(1-\mu) < \frac{h(2L)}{h(L)} < 2$ then $\Upsilon(0) < \frac{h(2L)}{h(L)} < \Upsilon(1)$. Therefore, it must be $\sigma^* = \Upsilon^{-1}(\frac{h(2L)}{h(L)}) \in (0,1)$, where

$$\Upsilon^{-1}(\frac{h(2L)}{h(L)}) = 1 + \frac{1}{2}\frac{1}{1-\phi(1-\mu)} - \sqrt{\begin{array}{c}\left[1+\frac{1}{2}\frac{1}{1-\phi(1-\mu)}\right]^2 \\ -\frac{2}{1-\phi(1-\mu)}\left[\frac{\frac{h(2L)}{h(L)}-1-\frac{1}{2}\phi(1-\mu)}{\frac{h(2L)}{h(L)}-1}\right]\end{array}}. \tag{30}$$

However, notice that $\Pi(2L,1) = 0$, and hence, if $\frac{h(2L)}{h(L)} \geq 2$ then an equilibrium in which the activist buys a positive number of shares when $y = 1$ does not exist. Suppose $\frac{h(2L)}{h(L)} < 2$, and note that in this region, $\Pi(L,\sigma^*) \geq \Pi(2L,\sigma^*)$ and $\sigma^* < 1$. Since $\sigma < 1 \Rightarrow \Pi(2L,\sigma) > 0$, both $\Pi(L,\sigma^*)$ and $\Pi(2L,\sigma^*)$ are strictly positive. It is left to show that conditional on $y = 1$ the activist cannot make an expected profit larger than $\Pi(L,\sigma^*)$ (recall $\sigma^* \in (0,1)$ implies $\Pi(2L,\sigma^*) = \Pi(L,\sigma^*)$) by deviating to $\alpha \neq L, 2L$. We support the equilibrium with off-equilibrium beliefs of the market marker when he observes $z \notin \{0, L, 2L\}$ such that $y = 1$ and the activist submitted an order to buy $\min\{z, 2L\}$ shares. Therefore, if $z < 2L$ then $p(z) = \Gamma(z)$, and if $z \geq 2L$ then $p(z) = \Gamma(2L)$. If $\alpha \notin \{L, 2L\}$ then the activist's expected profit conditional on $y = 1$ is

$$\Gamma(\alpha) - \frac{p(\alpha) + p(\alpha+L)}{2} = \Gamma(\alpha) - \frac{\Gamma(\alpha) + \Gamma(\min\{\alpha+L, 2L\})}{2} \leq 0,$$

and so a deviation is not profitable, as required. Finally, the term in (14) gives $\Upsilon^{-1}(\frac{h(2L)}{h(L)})$ if $1 + \frac{1}{2}\phi(1-\mu) < \frac{h(2L)}{h(L)} < 2$ and zero if $\frac{h(2L)}{h(L)} \leq 1 + \frac{1}{2}\phi(1-\mu)$. ■

**Proof of Proposition 6.** If the equilibrium exhibits only selection then, either $b \leq \frac{\kappa/s}{2L}$, or $\frac{\kappa/s}{2L} < b \leq \frac{\kappa/s}{L}$ and $\sigma^* = 0$. Either way, $\theta^* = \mu\theta(0)$. Note that

$$\begin{aligned}\frac{\partial\theta(0)}{\partial b} &= \frac{\partial}{\partial b}\left[G\left((1-s)\int_b^\infty (\Delta - b)\,dF(\Delta)\right)\int_b^\infty dF(\Delta)\right] \\ &= -\left[\begin{array}{c} g\left((1-s)\int_b^\infty (\Delta-b)\,dF(\Delta)\right)(1-s)\left[\int_b^\infty dF(\Delta)\right]^2 \\ +G\left((1-s)\int_b^\infty (\Delta-b)\,dF(\Delta)\right)f(b)\end{array}\right] < 0,\end{aligned}$$

as required.

Next, suppose the equilibrium exhibits treatment. For example, suppose $\sigma^* = 0$ and $\frac{\kappa/s}{L} < b$. Then

$$\begin{aligned}
\theta^* &= \mu G(w(L) - v(L)) \int_{\frac{\kappa/s}{L}}^{\infty} dF(\Delta) \\
&= \mu G \left( (1-s) \left( \int_{\frac{\kappa/s}{L}}^{b} \Delta dF(\Delta) + \int_{b}^{\infty} (\Delta - b)\, dF(\Delta) \right) \right) \int_{\frac{\kappa/s}{L}}^{\infty} dF(\Delta)
\end{aligned}$$

where

$$\begin{aligned}
\frac{\partial \theta^*}{\partial b} &= \mu g \left( (1-s) \left( \int_{\frac{\kappa/s}{L}}^{b} \Delta dF(\Delta) + \int_{b}^{\infty} (\Delta - b)\, dF(\Delta) \right) \right) \int_{\frac{\kappa/s}{L}}^{\infty} dF(\Delta) \\
&\quad \times (1-s)\,(bf(b) - (1 - F(b)))
\end{aligned}$$

Therefore,

$$\frac{\partial \theta^*}{\partial b} > 0 \Leftrightarrow b > \frac{1 - F(b)}{f(b)},$$

as required. ■

# Online Appendix for "Corporate Control Activism"

# B Extensions

## B.1 Activist's proposals

**Proposition 9** *Suppose the activist can make a proposal as described in Section 7.2, then:*

(*i*) *If the first round of negotiations fails, then the bidder never runs a proxy fight, while the activist runs a proxy fight if and only if* $\kappa/\alpha \leq \varepsilon < b$, *or* $\varepsilon < \kappa/\alpha$ *and* $\varepsilon + \frac{\kappa/\alpha - \varepsilon}{s} \leq \Delta < b$. *If the activist runs a proxy fight, she wins.*

(*ii*) *The expected shareholder value is* $q + v(\alpha, \varepsilon)$ *where*

$$v(\alpha,\varepsilon) = \begin{cases} v(0) + \int_{\min\{b,\varepsilon+\frac{\kappa/\alpha-\varepsilon}{s}\}}^{b} [\varepsilon + s(\Delta - \varepsilon)]\, dF(\Delta) & \text{if } \varepsilon < \min\{b, \kappa/\alpha\} \\ \varepsilon + s\int_{\varepsilon}^{\infty} (\Delta - \varepsilon)\, dF(\Delta) & \\ +(1-s)\int_{b}^{\infty} \max\{0, b-\varepsilon\}\, dF(\Delta) & \text{if } \varepsilon \geq \min\{b, \kappa/\alpha\}. \end{cases} \tag{31}$$

(*iii*) *The expected value created by the takeover is*

$$w(\alpha,\varepsilon) = \begin{cases} \int_{\min\{b,\varepsilon+\frac{\kappa/\alpha-\varepsilon}{s}\}}^{\infty} \Delta dF(\Delta) & \text{if } \varepsilon < \min\{b, \kappa/\alpha\} \\ \int_{\varepsilon}^{\infty} (\Delta - \varepsilon)\, dF(\Delta) & \text{if } \varepsilon \geq \min\{b, \kappa/\alpha\}. \end{cases} \tag{32}$$

(*iv*) *Let* $\Pi_B(\alpha, \varepsilon)$ *be the bidder's expected profit. Then:*

(*a*) *If* $\varepsilon < \min\{b, \kappa/\alpha\}$ *then* $\alpha > 0 \Rightarrow \Pi_B(\alpha,\varepsilon) \geq \Pi_B(0,\varepsilon)$ *and* $\lim_{b \to \varepsilon + \frac{\kappa/\alpha-\varepsilon}{s}} \frac{\partial \Pi_B(0,\varepsilon)}{\partial \varepsilon} > 0$.

(*b*) *There is* $\overline{\varepsilon} > \min\{b, \kappa/\alpha\}$ *such that if* $\varepsilon > \overline{\varepsilon}$ *then* $\Pi_B(\alpha,\varepsilon) < \Pi_B(0,\varepsilon)$ *for all* $\alpha > 0$.

**Proof.** Consider the following three cases:

1. First, suppose $\max\{\varepsilon, b\} \leq \Delta$. If the incumbent retains control of the board and the firm remains independent, the incumbent implements the activist's proposal if and only if $\varepsilon \geq b$. Therefore, the reservation value of the incumbent in this case is $q + \max\{\varepsilon, b\}$

per share. Since $\max\{\varepsilon, b\} \leq \Delta$, an agreement in which the bidder pays an expected premium of $s\Delta + (1-s)\max\{\varepsilon, b\}$ is always reached under the control of the incumbent board. On the other hand, if the activist obtains control of the board, she will reach an agreement with the bidder in which the expected takeover premium is $s\Delta + (1-s)\varepsilon$. Therefore, the activist has no incentives to run a proxy fight. Overall, the expected firm value is $q + s\Delta + (1-s)\max\{\varepsilon, b\}$.

2. Second, suppose $\max\{\Delta, b\} < \varepsilon$. Since $\max\{\Delta, b\} < \varepsilon$, the incumbent is willing to implement the activist's proposal, but refuses the sell the firm. Since $\Delta < \varepsilon$, a takeover cannot increase the value of the firm even if shareholders extract all the surplus. Therefore, the activist has no incentives to run a proxy fight, and the value of the firm under the incumbent's control is $q + \varepsilon$.

3. Third, suppose $\max\{\varepsilon, \Delta\} < b$. Since $\max\{\varepsilon, \Delta\} < b$, the incumbent refuses the sell the firm or implement the activist's proposal. Therefore, under the incumbent's control the firm value is $q$. Suppose the activist controls the target board. If $\varepsilon > \Delta$ then she would implement the proposal, and if $\varepsilon \leq \Delta$ then she would reach an acquisition agreement in which the bidder pays an expected premium of $s\Delta + (1-s)\varepsilon$. Therefore, under the activist's control firm value is $q + \varepsilon + s\max\{0, \Delta - \varepsilon\}$. Therefore, shareholders always elect the activist if she decides to run a proxy fight. The activist has incentives to run a proxy fight if and only if

$$\alpha\left[q + \varepsilon + s\max\{0, \Delta - \varepsilon\}\right] - \kappa > \alpha q,$$

which holds if and only if $\varepsilon \geq \kappa/\alpha$ or, $\varepsilon < \kappa/\alpha$ and $\Delta > \varepsilon + \frac{\kappa/\alpha - \varepsilon}{s}$. Part (i) follows from the intersection of this condition with $\max\{\varepsilon, \Delta\} < b$.

Consider the first round of negotiations. All parties involved anticipate the dynamic above if the first round fails. Therefore, if $\max\{\varepsilon, b\} \leq \Delta$ then the bidder pays $q + s\Delta + (1-s)\max\{\varepsilon, b\}$ and takes over the target after the first round of negotiations. If $\max\{\Delta, b\} < \varepsilon$ then the target remains independent and the activist's proposal is implemented. If $\max\{\varepsilon, \Delta\} < b$ then the bidder pays $q + \varepsilon + s\max\{0, \Delta - \varepsilon\}$ if $\varepsilon \geq \kappa/\alpha$ or, $\varepsilon < \kappa/\alpha$ and $\Delta > \varepsilon + \frac{\kappa/\alpha - \varepsilon}{s}$, and otherwise, the target remains independent but the activist's proposal is not implemented. Integrating

over all values of $\Delta$, firm value is $q + v(\alpha, \varepsilon)$ where

$$v(\alpha,\varepsilon) = \begin{cases} \varepsilon + s\int_{\varepsilon}^{\infty}(\Delta-\varepsilon)\,dF(\Delta) & \textit{if } b \leq \varepsilon \\ v(0) + \int_{-\infty}^{b}\left[\varepsilon + s\max\{0,\Delta-\varepsilon\}\right]dF(\Delta) & \textit{if } \kappa/\alpha \leq \varepsilon < b \\ v(0) + \int_{\min\{b,\varepsilon+\frac{\kappa/\alpha-\varepsilon}{s}\}}^{b}\left[\varepsilon + s(\Delta-\varepsilon)\right]dF(\Delta) & \textit{if } \varepsilon < \min\{b,\kappa/\alpha\}, \end{cases}$$

which can be rewritten as in the statement. Parts (ii) and (iii) follow directly from the analysis above.

Consider part (iv) and note that $\Pi_B(\alpha,\varepsilon) = w(\alpha,\varepsilon) - v(\alpha,\varepsilon)$. Based on parts (i)-(iii), if $\varepsilon < \min\{b,\kappa/\alpha\}$ then

$$\Pi_B(\alpha,\varepsilon) = (1-s)\left[\int_{b}^{\infty}(\Delta-b)\,dF(\Delta) + \int_{\min\{b,\varepsilon+\frac{\kappa/\alpha-\varepsilon}{s}\}}^{b}(\Delta-\varepsilon)\,dF(\Delta)\right].$$

Clearly, $\Pi_B(\alpha,\varepsilon) \geq \Pi_B(0,\varepsilon)$ for $\alpha > 0$ where the inequality is strict if $b > \varepsilon + \frac{\kappa/\alpha-\varepsilon}{s}$. Suppose $b > \varepsilon + \frac{\kappa/\alpha-\varepsilon}{s}$, and note that

$$\frac{\partial\Pi_B(\alpha,\varepsilon)}{\partial\varepsilon} = \left(\frac{1-s}{s}\right)^2(\kappa/\alpha-\varepsilon)\,f\left(\varepsilon+\frac{\kappa/\alpha-\varepsilon}{s}\right) - (1-s)\int_{\varepsilon+\frac{\kappa/\alpha-\varepsilon}{s}}^{b}dF(\Delta)$$

and $\lim_{b\to\varepsilon+\frac{\kappa/\alpha-\varepsilon}{s}}\frac{\partial\Pi_B(\alpha,\varepsilon)}{\partial\varepsilon} > 0$. This completes part (iv.a). To see part (iv.b), notice that if $\alpha > 0$, $\varepsilon \geq \min\{b,\kappa/\alpha\}$, and $\varepsilon \geq b$ then

$$\Pi_B(\alpha,\varepsilon) = (1-s)\times\begin{cases}\int_{\varepsilon}^{\infty}(\Delta-\varepsilon)\,dF(\Delta) & \textit{if } \alpha > 0 \\ \int_{b}^{\infty}(\Delta-b)\,dF(\Delta) & \textit{if } \alpha = 0.\end{cases}$$

Since

$$\varepsilon > b \Rightarrow \int_{\varepsilon}^{\infty}(\Delta-\varepsilon)\,dF(\Delta) < \int_{b}^{\infty}(\Delta-b)\,dF(\Delta)$$

and $\int_{\varepsilon}^{\infty}(\Delta-\varepsilon)\,dF(\Delta)$ is decreasing in $\varepsilon$, there is $\overline{\varepsilon}$ as required in the statement. ■

## B.2 Limited veto power and tender offers

**Proposition 10** *Suppose the bidder can make a tender offer as described in Section 7.3, then:*

(*i*) *If the first round of negotiations fails then the bidder never runs a proxy fight, while the*

*activist runs a proxy fight if and only if*

$$\frac{\kappa/s}{\lambda\alpha} \leq \Delta < b, \tag{33}$$

*in which case she wins.*

(*ii*) *The expected shareholder value is*

$$q + \lambda v(\alpha\lambda) + (1-\lambda)\varphi \int_0^\infty \Delta dF(\Delta) \tag{34}$$

*where* $v(\cdot)$ *is given by (9).*

**Proof.** Suppose the second round of negotiations fails. All parties involved expect that with probability $1-\lambda$ the bidder will offer target shareholders $q+\varphi\Delta$ and take over the firm, and with probability $\lambda$ the target would remain independent. The bidder's expected profit is $(1-\lambda)(1-\varphi)\Delta$, and hence, he will not agree to pay a premium larger than

$$\Delta(1-(1-\lambda)(1-\varphi)).$$

Therefore, if the bidder controls the target board in the second round then he would "reach an agreement" in which the takeover offer is $q$. Suppose the incumbent controls the target board in the second round. If no agreement is reached with the bidder, the incumbent's expected payoff per share is

$$q + \lambda b + (1-\lambda)\varphi\Delta.$$

Therefore, the incumbent would reject any premium lower than $\lambda b + (1-\lambda)\varphi\Delta$. It follows that an agreement between the bidder and the incumbent is reached if and only if

$$\lambda b + (1-\lambda)\varphi\Delta \leq \Delta(1-(1-\lambda)(1-\varphi)) \Leftrightarrow b \leq \Delta.$$

If $b \leq \Delta$ then the target is taken over by the bidder and the expected premium is

$$s(1-(1-\lambda)(1-\varphi))\Delta + (1-s)[\lambda b + (1-\lambda)\varphi\Delta] = (1-\lambda)\Delta\varphi + \lambda[s\Delta + (1-s)b],$$

and if $b > \Delta$ then no agreement is reached between the incumbent and the bidder. In this case, the target is taken over through tender offer with probability $1-\lambda$, in which case, the premium is $\varphi\Delta$.

A similar analysis follows when the activist controls the board, only then $b$ is replaced by zero everywhere. That is, the bidder always reaches an agreement with the activist, and the expected premium is

$$(1-\lambda)\,\Delta\varphi + \lambda s\Delta.$$

To conclude, in the second round of negotiations the expected shareholder value conditional on $\Delta$ is

$$\Pi_{SH}(\Delta) = \begin{cases} q + (1-\lambda)\,\Delta\varphi + \mathbf{1}_{\{b\leq\Delta\}}\cdot\lambda\left[s\Delta + (1-s)\,b\right] & \textit{if the incumbent board retains control} \\ q + (1-\lambda)\,\Delta\varphi + \lambda s\Delta & \textit{if the activist controls the board,} \\ q & \textit{if the bidder controls the board.} \end{cases} \tag{35}$$

Therefore, shareholders are always worse off under the control of the bidder, and prefer the activist over the incumbent if and only if $b > \Delta$. Similar to part (i) of Proposition 1, shareholder never elect the bidder to the board, and the latter never runs a proxy fight. Similar to part (ii) of Proposition 1, the activist runs a proxy fight if and only if $b > \Delta$ and

$$\alpha\left(q + \lambda s\Delta + (1-\lambda)\,\Delta\varphi\right) - \kappa > \alpha\left(q + (1-\lambda)\,\varphi\Delta\right) \Leftrightarrow \Delta > \frac{\kappa/s}{\alpha\lambda}. \tag{36}$$

This concludes part (i) of the proposition.

Consider part (ii). Given the arguments above, all parties involved expect that if the first round of negotiations fails, the expected takeover premium would be

$$(1-\lambda)\,\Delta\varphi + \lambda\times\begin{cases} s\Delta + (1-s)\,b & \textit{if } \Delta \geq b \\ 0 & \textit{if } \Delta < b \text{ and } \Delta \leq \frac{\kappa/s}{\alpha\lambda} \\ s\Delta & \textit{if } \Delta < b \text{ and } \Delta > \frac{\kappa/s}{\alpha\lambda} \end{cases} \tag{37}$$

Therefore, similar to Proposition 2, in the first stage the bidder and incumbent reach an agreement where the premium is (37). The term $\lambda v(\alpha\lambda) + (1-\lambda)\,\varphi\int_0^\infty \Delta dF(\Delta)$ is the integration of (37) over all values of $\Delta$. ■

## B.3 Hidden values

In reality, corporate boards often have private information about the standalone value of the target $q$, and bidders often have private information about the expected synergy $\Delta$. The

baseline model abstracts from these information asymmetries and the resulted adverse selection in order to focus on agency problems as the key friction. This Appendix shows that the asymmetric information can in fact exacerbate the commitment problem of bidders in takeover, and sometime enhance the ability of the activist to resolve it.

### B.3.1 Uncertainty about $q$

Incumbent boards often justify their resistance to takeovers by claiming that the fundamental value of the target under their control is higher than the proposed takeover offer, even if the offer presents a significant premium relative to the unaffected stock price. Essentially, they claim that based on their private information the target is undervalued by the market as a standalone firm. In this section we solve the takeover negotiations and proxy fights phase under the assumption that $q \in \{q_L, q_H\}$ is uncertain, $q_H > q_L \geq 0$, and $q$ is privately observed by whoever controls the target board, including the activist and the bidder if they win a proxy fight. We denote the prior by $\varphi = \Pr[q = q_H]$. We also assume that the identity of the proposer, the value of the offer, and the counter-party response (i.e., accept or reject) are made public in each round. We focus attention on Perfect Bayesian Equilibria in pure strategies. Therefore, any equilibrium is either pooling or fully separating.

**Lemma 2** *Suppose no information about $q$ is revealed in the first round of negotiations, and consider the second round of negotiations.*

(*i*) *If the bidder controls the target board then:*

(*a*) *If $E[q] \leq q_L + \Delta$ then the bidder offers shareholders $E[q]$ and takes over the target with probability one.*

(*b*) *If $E[q] > q_L + \Delta$ then the bidder offers shareholders $q_H$ and takes over the firm if and only if $q = q_H$.*

(*ii*) *If the target board has private benefits of control per share $\beta \in \{0, b\}$ and the bidder makes an offer to the target board then:*

(*a*) *If $\Delta \geq \beta + \frac{1-\varphi}{\varphi}(q_H - q_L)$ then the bidder offers $q_H + \beta$ and the board accepts the offer with probability one.*

(*b*) *If $\beta \leq \Delta < \beta + \frac{1-\varphi}{\varphi}(q_H - q_L)$ then the bidder offers $q_L + \beta$ and the board accepts the offer if and only if $q = q_L$.*

(c) *If* $\Delta < \beta$ *then the takeover always fails.*

(iii) *If the target board has private benefits of control per share* $\beta \in \{0, b\}$ *and the target board makes an offer to the bidder then:*

(a) *If* $\Delta \geq \beta + (1-\varphi)(q_H - q_L)$ *then the target board asks for* $E[q] + \Delta$ *regardless of his type and the bidder accepts the offer.*

(b) *If* $\beta \leq \Delta < \beta + (1-\varphi)(q_H - q_L)$ *then the target board asks for* $q_L + \Delta$ *if* $q = q_L$ *and the bidder accepts the offer. If* $q = q_H$ *the target remains independent.*

(c) *If* $\Delta < \beta$ *then the takeover always fails.*

**Proof.** Suppose information about $q$ is not revealed in the first round. The proxy fight stage does not reveal any information about $q$, since $q$ is only observed by this stage by the incumbent.

Suppose the bidder controls the target board. There is no information asymmetry between the bidder and the target board, but target shareholders still need to approve the deal. Consider a pooling equilibrium. Shareholders accept the pooling offer only if it is higher than $E[q]$. The bidder has incentives to make the pooling offer when $q = q_L$ only if it is smaller than $q_L + \Delta$. Therefore, a pooling equilibrium exists if and only if $E[q] \leq q_L + \Delta$. In this case, the target is taken over for sure. Notice that the only pooling equilibrium that survives the Grossman and Perry (1986) criterion is one in which the pooling offer is $E[q]$.

Consider a separating equilibrium, there are three cases to consider:

1. The bidder makes different offers depending on $q$ and the takeover always takes place. However, the bidder has incentives to deviate to offering the lower offer even if $q = q_H$. So this equilibrium cannot exist.

2. The takeover takes place if and only if $q = q_L$. Suppose the bidder offers $\pi^*$ when $q = q_L$. However, the bidder has incentives to deviate by offering $\pi^*$ also when $q = q_H$. So this equilibrium cannot exist.

3. The takeover takes place if and only if $q = q_H$: if $q = q_L$ the bidder does not take over the firm and if $q = q_H$ the bidder offers $q_H$ and the offer is accepted by shareholders. This can be an equilibrium only if shareholders reject any offer lower than $q_H$. However, off-equilibrium beliefs that support this equilibrium and satisfy the Grossman and Perry (1986) criterion exist if and only if $E[q] > q_L + \Delta$.

Overall, if the off-equilibrium beliefs are required to satisfy the Grossman and Perry (1986) criterion, then the unique outcome is as described part (i) of the proposition's statement. In this case, target shareholder expected value is $E[q]$.

Next, suppose the target board has private benefit of control per share $\beta \in \{0, b\}$ and the bidder makes an offer to the target board ($\beta = 0$ if the activist controls the board and $\beta = b$ if the incumbent retains control). If $\Delta < \beta$ then the takeover can never take place and the firm remains independent. Suppose $\Delta - \beta \geq 0$. Since $\beta \geq 0$ shareholders approve any offer that is approved by the target board. If the bidder offers $q_H + \beta$ then the takeover succeeds for sure. If the bidder offers $q_L + \beta$ the takeover succeeds with probability $1 - \varphi$, only when $q = q_L$. The bidder prefers the higher offer if and only if

$$\begin{aligned} E[q] + \Delta - q_H - \beta &> (1-\varphi)(q_L + \Delta - q_L - \beta) \Leftrightarrow \\ \Delta &\geq \beta + \frac{1-\varphi}{\varphi}(q_H - q_L). \end{aligned}$$

Next, suppose the target board has private benefit of control per share $\beta \in \{0, b\}$ and the target board makes an offer to the bidder. A takeover can succeed only if $\Delta \geq \beta$. Suppose the target board makes a pooling offer. Then, he must ask the bidder to pay no more than $E[q] + \Delta$. The board has incentives to make this offer when $q = q_H$ only if it is higher than $q_H + \beta$. Therefore, the pooling equilibrium exists if and only if

$$E[q] + \Delta - q_H - \beta \geq 0 \Leftrightarrow \Delta \geq \beta + (1-\varphi)(q_H - q_L).$$

When it exists, the pooling equilibrium requires that the off-equilibrium beliefs are such that higher offers are rejected by the bidder. Notice, however, that the only pooling equilibrium that survives the Grossman and Perry (1986) criterion is the one in which the pooling offer is $E[q] + \Delta$.

Suppose the target board makes a separating offer, then it must be he is asking from the bidder no more than $q_L + \Delta$ when $q = q_L$ and this offer is accepted, and when $q = q_H$ his offer is rejected by the bidder. Moreover, the target board has no incentives to ask for the separating offer when $q = q_H$ if and only if the separating offer is smaller than $q_H + \beta$. Therefore, the separating equilibrium exists if and only if

$$\Delta \leq \beta + q_H - q_L.$$

Notice, however, that the separating equilibrium survives the Grossman and Perry (1986) criterion only if the separating offer is $q_L+\Delta$. This equilibrium, however, survives the Grossman and Perry (1986) criterion if and only if $E[q]+\Delta-q_H-\beta<0$.

We conclude, if $\Delta \geq \beta+(1-\varphi)(q_H-q_L)$ the offer is pooling and shareholder value is $E[q]+\Delta$, and if $\beta<\Delta<\beta+(1-\varphi)(q_H-q_L)$ the offer is separating, and shareholder value is $E[q]+(1-\varphi)\Delta$. ■

**Lemma 3** *Suppose the first round of negotiations fails and no information about $q$ is revealed. Then:*

(*i*) *The bidder never runs a proxy fight.*

(*ii*) *If the activist owns $\alpha$ shares of the target, the activist runs a proxy fight if and only if $\Delta \in \Gamma(\alpha)$ where*

$$\Gamma(\alpha)=\left\{\Delta: \frac{\frac{1}{\varphi}\frac{\kappa/\alpha}{s}-\frac{1-\varphi}{\varphi}\frac{1-s}{s}\left[\begin{array}{c}(q_H-q_L)\cdot \mathbf{1}_{\left\{\frac{1-\varphi}{\varphi}(q_H-q_L)\leq\Delta\right\}}\\ -b\cdot \mathbf{1}_{\{b\leq\Delta\}}\end{array}\right]}{\frac{1-\varphi}{\varphi}\cdot \mathbf{1}_{\{\Delta<b\}}+\mathbf{1}_{\{(1-\varphi)(q_H-q_L)\leq\Delta<b+(1-\varphi)(q_H-q_L)\}}}\leq \Delta<b+\frac{1-\varphi}{\varphi}(q_H-q_L)\right\} \tag{38}$$

*Whenever the activist runs a proxy fight, she wins.*

**Proof.** Suppose no information about $q$ is revealed in the first stage. Based on part (i) of Lemma 2, shareholder value under the bidder's control is $E[q]$. Therefore, electing the bidder to the board is a weakly dominated strategy, and strictly dominated if extraction of value is possible. Based on parts (ii) and (iii) of Lemma 2, the expected shareholder value under the incumbent's control is

$$s\left[\begin{array}{c}E[q]\\ +(1-\varphi)\Delta\cdot \mathbf{1}_{\{\Delta\geq b\}}+\varphi\Delta\cdot \mathbf{1}_{\{\Delta\geq b+(1-\varphi)(q_H-q_L)\}}\end{array}\right]$$
$$+(1-s)\left[\begin{array}{c}E[q]+(1-\varphi)b\cdot \mathbf{1}_{\left\{b+\frac{1-\varphi}{\varphi}(q_H-q_L)>\Delta\geq b\right\}}\\ +((1-\varphi)(q_H-q_L)+b)\cdot \mathbf{1}_{\left\{\Delta\geq b+\frac{1-\varphi}{\varphi}(q_H-q_L)\right\}}\end{array}\right],$$

and the expected shareholder value under the activist's control, if she chooses to run a proxy fight is,

$$s\left[\begin{array}{c} E[q] \\ +(1-\varphi)\Delta+\varphi\Delta\cdot\mathbf{1}_{\{\Delta\geq(1-\varphi)(q_H-q_L)\}}\end{array}\right]+(1-s)\left[\begin{array}{c} E[q] \\ +(1-\varphi)(q_H-q_L)\cdot\mathbf{1}_{\left\{\Delta\geq\frac{1-\varphi}{\varphi}(q_H-q_L)\right\}}\end{array}\right].$$

The activist runs a proxy fight if and only if the increase in value under her control is greater than $\kappa/\alpha$, which holds if and only if $\Delta\in\Gamma(\alpha)$. ■

**Remark:** Based on Lemma 3, notice that $\lim_{q_H\to q_L}\Gamma=\lim_{\varphi\to 0,1}\Gamma=\frac{\kappa/\alpha}{s}\leq\Delta<b$, which demonstrates that as the adverse selection problem disappears, the outcome converges to the baseline model. Moreover, as $\lim_{b\to 0}\Gamma=\varnothing$, that is, on the absence of agency problems, the activist never runs a proxy fight. Also, note that

$$\begin{aligned}\lim_{b\to\infty}\Gamma(\alpha) &= \left\{\Delta:\frac{\frac{1}{\varphi}\frac{\kappa/\alpha}{s}-\frac{1-\varphi}{\varphi}\frac{1-s}{s}(q_H-q_L)\cdot\mathbf{1}_{\left\{\frac{1-\varphi}{\varphi}(q_H-q_L)\leq\Delta\right\}}}{\frac{1-\varphi}{\varphi}+\mathbf{1}_{\{(1-\varphi)(q_H-q_L)\leq\Delta\}}}\leq\Delta\right\} \\ &= \begin{cases}\left[\min\left\{\frac{\kappa/\alpha}{s}\frac{1}{1-\varphi},(1-\varphi)(q_H-q_L)\right\},\infty\right) & \text{if } \frac{\kappa/\alpha}{s}\frac{1}{1-\varphi}<q_H-q_L \\ \left[\frac{\kappa/\alpha}{s},\infty\right) & \text{if } \frac{\kappa/\alpha}{s}\frac{1}{1-\varphi}\frac{1}{\frac{1}{\varphi}+\frac{1-s}{s}}<q_H-q_L<\frac{\kappa/\alpha}{s}\frac{1}{1-\varphi} \\ \left[\frac{\kappa/\alpha}{s}-(1-\varphi)\frac{1-s}{s}(q_H-q_L),\infty\right) & \text{if } q_H-q_L<\frac{\kappa/\alpha}{s}\frac{1}{1-\varphi}\frac{1}{\frac{1}{\varphi}+\frac{1-s}{s}}\end{cases}\end{aligned}$$

This demonstrates that if $q_H-q_L$ is large then $\lim_{b\to\infty}\Gamma(\alpha)\subset\left[\frac{\kappa/\alpha}{s},\infty\right)$ and if $q_H-q_L$ is small then $\left[\frac{\kappa/\alpha}{s},\infty\right)\subset\lim_{b\to\infty}\Gamma(\alpha)$. Thus, adverse selection can either increase or decrease the incentives of the activist to run a proxy a fight. Finally, note that

$$\lim_{s\to 0}\Gamma(\alpha)=\begin{cases}\left[\frac{1-\varphi}{\varphi}(q_H-q_L),b+\frac{1-\varphi}{\varphi}(q_H-q_L)\right) & \text{if } \frac{\kappa/\alpha}{1-\varphi}+b<q_H-q_L \\ \left[\min\left\{b,\frac{1-\varphi}{\varphi}(q_H-q_L)\right\},b\right) & \text{if } \frac{\kappa/\alpha}{1-\varphi}\leq q_H-q_L<\frac{\kappa/\alpha}{1-\varphi}+b \\ \varnothing & \text{if } q_H-q_L<\frac{\kappa/\alpha}{1-\varphi}\end{cases}$$

This demonstrates that unlike the baseline model, here the activist may run a proxy fight even if $\Delta>b$. Intuitively, the activist who is less biased against the takeover, can overcome he adverse selection problem while the incumbent cannot.

To conclude, the existence of private information reduces the bidder's credibility even further since it creates adverse selection and additional opportunities for the bidder to abuse the

power of the target board once it is given to him. The existence of private information, however, has an ambiguous effect on the activist. On the one hand, private information increases the activist's incentives to run a proxy fight since the activist can extract information rents from the bidder once she gets access to the target's private information. On the other hand, private information creates adverse selection which decreases the probability of reaching an acquisition agreement with the bidder, and thereby, weakens the activist's incentives to run a proxy fight. The latter effect dominates the former if $q_H - q_L$ is large.

### B.3.2 Uncertainty about $\Delta$

In this section we solve the baseline model under the assumption that $\Delta \in \{\Delta_L, \Delta_H\}$ is uncertain, $\Delta_H > \Delta_L > 0$, and $\Delta$ is privately observed by the bidder. We denote the prior by $\psi = \Pr[\Delta = \Delta_H]$. We also assume that the identity of the proposer, the value of the offer, and the counter-party response (i.e., accept or reject) are made public in each round. We focus attention on Perfect Bayesian Equilibria in pure strategies. Therefore, any equilibrium is either pooling or fully separating. We invoke the Grossman and Perry (1986) criterion to restrict the off-equilibrium beliefs.

**Lemma 4** *Suppose the first round of negotiations fails and no information about $\Delta$ is revealed in the first stage or in the proxy fight stage. Consider the second round of negotiations. Then:*

- $(i)$ *If the bidder controls the target board then the bidder offers shareholders $q$ and takes over the target with probability one.*
- $(ii)$ *If the target board has private benefit of control per share $\beta \in \{0, b\}$ and the bidder is the proposer then:*
  - $(a)$ *If $\beta \leq \Delta_L$ then the bidder offers $q + \beta$ and the board accepts the offer.*
  - $(b)$ *If $\Delta_L < \beta \leq \Delta_H$ then the bidder offers $q + \beta$ when $\Delta = \Delta_H$ and the board accepts the offer, and when $\Delta = \Delta_L$ the takeover fails.*
  - $(c)$ *If $\Delta_H < \beta$ then the takeover always fails.*
- $(iii)$ *If the target board has private benefit of control per share $\beta \in \{0, b\}$ and the target board is the proposer then:*
  - $(a)$ *If $\beta \leq \frac{\Delta_L - \psi\Delta_H}{1-\psi}$ then the target board asks for $q + \Delta_L$ and the bidder accepts the offer with probability one.*

(b) *If* $\frac{\Delta_L - \psi\Delta_H}{1-\psi} < \beta \leq \Delta_H$ *then the target board asks* $q + \Delta_H$ *and the bidder accepts the offer if and only if* $\Delta = \Delta_H$.

(c) *If* $\Delta_H < \beta$ *then the takeover always fails.*

**Proof.** Suppose information about $\Delta$ is not revealed in the first round or in the proxy fight stage. There are three cases. First, suppose the bidder controls the target board. There is no information asymmetry between the bidder and the target board, but target shareholders still need to approve the deal. Shareholders will approve any offer higher than $q$ regardless of their beliefs about $\Delta$. Since $\Delta_L \geq 0$, regardless of the realization of $\Delta$ the bidder offers shareholders $q$ and the offer is accepted. In this case target shareholder value is $q$. Notice that this argument holds for any set of shareholder beliefs about $\Delta$.

Second, suppose the target board has private benefit of control per share $\beta \in \{0, b\}$ and the bidder is the proposer. Notice that regardless of his beliefs about $\Delta$, the target board rejects any offer below $q + \beta$ and accepts any offer above $q + \beta$. Therefore, the bidder has incentives to offer $q + \beta$, provided that her expected profit is non-negative. This completes part (ii).

Third, suppose the target board has private benefits of control per share $\beta \in \{0, b\}$ and the target board is the proposer. If $\Delta_H < \beta$ then the takeover can never take place and the firm remains independent. Suppose $\Delta_H \geq \beta$. Since $\beta \geq 0$, shareholders approve any offer that is approved by the target board. If the board asks for $q + \Delta_L$ then the takeover succeeds for sure, and the board's expected profit is $\Delta_L - \beta$. If the board asks for $q + \Delta_H$ then the takeover succeeds with probability $\psi$, only when $\Delta = \Delta_H$, and the board's expected profit is $\psi(\Delta_H - \beta)$. The board prefers the former over the latter if and only if

$$\Delta_L - \beta \geq \psi(\Delta_H - \beta) \Leftrightarrow \beta \leq \frac{\Delta_L - \psi\Delta_H}{1-\psi},$$

where $\frac{\Delta_L - \psi\Delta_H}{1-\psi} < \Delta_L < \Delta_H$. This completes part (iii). ■

**Lemma 5** *Suppose the first round of negotiations failed and no information about* $\Delta$ *was revealed. Then:*

(i) *The bidder never runs a proxy fight, and no information about* $\Delta$ *is revealed.*

(ii) *If the activist owns* $\alpha$ *shares of the target, the activist runs a proxy fight if and only if*

$b \in \Lambda(\alpha)$ *where*

$$\Lambda(\alpha) = \left\{ b : 0 \leq b < \frac{\max\{\psi\Delta_H, \Delta_L\} - \psi\Delta_H \cdot \mathbf{1}_{\left\{\frac{\Delta_L - \psi\Delta_H}{1-\psi} < b \leq \Delta_H\right\}} - \Delta_L \cdot \mathbf{1}_{\left\{b \leq \frac{\Delta_L - \psi\Delta_H}{1-\psi}\right\}} - \frac{\kappa/\alpha}{s}}{\frac{1-s}{s}\left[\mathbf{1}_{\{b \leq \Delta_L\}} + \psi \cdot \mathbf{1}_{\{\Delta_L < b \leq \Delta_H\}}\right]} \right\}$$

*Whenever the activist runs a proxy fight, she wins.*

**Proof.** Based on part (i) of Lemma 4, shareholder value under the bidder's control is $q$ regardless of their beliefs about $\Delta$. Therefore, electing the bidder to the board is a weakly dominated strategy, and strictly dominated if extraction of value is possible. This also implies that the bidder's decision not to run a proxy fight is not informative about $\Delta$.

Based on parts (ii) and (iii) of Lemma 4, the expected shareholder value when the target board's private benefits are $\beta \in \{0, b\}$ is

$$\begin{aligned} \Pi_{SH} \quad (\beta) = q + s &\left[\psi\Delta_H \cdot \mathbf{1}_{\left\{\frac{\Delta_L - \psi\Delta_H}{1-\psi} < \beta \leq \Delta_H\right\}} + \Delta_L \cdot \mathbf{1}_{\left\{\beta \leq \frac{\Delta_L - \psi\Delta_H}{1-\psi}\right\}}\right] \\ &+ (1-s)\,\beta\left[\mathbf{1}_{\{\beta \leq \Delta_L\}} + \psi \cdot \mathbf{1}_{\{\Delta_L < \beta \leq \Delta_H\}}\right]. \end{aligned}$$

Therefore, the activist runs a proxy fight if and only if

$$\Pi_{SH}(0) - \Pi_{SH}(b) \geq \kappa/\alpha,$$

which holds if and only if $b \in \Lambda(\alpha)$. Since $\kappa > 0$, whenever the activist runs a proxy fight, she is elected by shareholders. ■

**Remark:** Based on Lemma 5, if $b \to \infty$ then the activist runs a proxy fight if and only if $\max\{\psi\Delta_H, \Delta_L\} \geq \frac{\kappa/\alpha}{s}$.

**Target shareholders are uninformed about $\Delta$** Suppose the incumbent board, the activist, and the bidder are informed about $\Delta$, but other target shareholders are not. We argue that the equilibrium we derive under baseline model still holds. To see why, notice that at the second round shareholders approve any takeover offer higher than the perceived standalone value of the target, $q$, and regardless of their beliefs about $\Delta$. Since the target board never signs on an offer lower than $q$, whether it is controlled by the incumbent, the activist, or the bidder, the outcome of the second round is the same as in the baseline model. Consider the proxy fight stage. Regardless of their beliefs about $\Delta$, shareholders never elect the bidder, since the

bidder will surely offer them $q$ or less. While shareholders may be uncertain about the value of $\Delta$, they know the activist will run a proxy fight only if she can increase the value of each share by at least $\kappa/\alpha$. Therefore, if the activist chooses to run a proxy fight, shareholders will elect her. Knowing that, the activist will choose to run a proxy fight if and only if $\frac{\kappa/\alpha}{s} \leq \Delta < b$. Finally, consider the first round. Since the second round and the proxy fight stage unfold as in baseline model, the analysis will be the same. Indeed, notice that incumbent has weakly stronger preferences than shareholders to reject the deal, and so, any offer that is acceptable to the incumbent, will be acceptable to the target shareholders.

## B.4 Biased Activist

In this section we analyze the takeover negotiations and proxy fights phase under the assumption that the activist is biased. Specifically, we assume that the activist and the bidder can divert a non-trivial amount of corporate resources as private benefits after winning control of the target board, if the target remains independent. We denote the value transfer by $q\eta$, where $\eta \in (0,1)$. In the baseline model, $\eta \to 0$. For simplicity, we assume that the transfer involves no deadweight loss. Moreover, consistent with the common critique that activist investors have a short-term investment horizon (for example, because of their desire to establish reputation, higher alternative cost of capital, or the need to meet interim fund out-flows), we assume that the activist discounts the standalone value of each firm by $1-\gamma \in [0,1]$. Since the proceeds from a takeover are received by shareholders before the standalone value of the firm is realized, this assumption implies that relative to other investors, the activist is biased toward selling the firm.

**Lemma 6** *In the second round of negotiations, the target is acquired by the bidder unless the incumbent board retains control and $\Delta < b$, or the activist obtains control and $\Delta < \beta(\alpha,\eta)$ where*

$$\beta(\alpha,\eta) \equiv q[\eta(1-\alpha)/\alpha - \gamma(1-\eta)]. \tag{39}$$

*Moreover, the expected shareholder value is given by*

$$\Pi_{SH} = \begin{cases} q + \mathbf{1}_{\{b \leq \Delta\}} \cdot [s\Delta + (1-s)b] & \textit{if the incumbent board retains control,} \\ (1-\eta)\, q & \textit{if the bidder controls the board,} \\ (1-\eta)\, q & \textit{if the activist controls the board and } \beta(\alpha,\eta) > \Delta, \\ q + s\Delta + (1-s)\, m(\alpha,\eta) & \textit{if the activist controls the board and } \beta(\alpha,\eta) \leq \Delta. \end{cases} \tag{40}$$

*where*

$$m(\alpha,\eta) \equiv \max\{-\eta q, \beta(\alpha,\eta)\} \tag{41}$$

**Proof.** There are three scenarios to consider. In the first scenario, the incumbent board retains control of the target. Then the proof is identical to the first scenario of Lemma 1. In the second scenario, the bidder controls the board. With control, the bidder uses the board's authority to sign on a deal that offers target shareholders the lowest amount they would accept. Moreover, by controlling the target board, the bidder can extract $\eta q$ from the target's standalone value. Therefore, in this case, the bidder offers shareholders $(1-\eta)q$, and shareholders, who at this point cannot prevent the bidder from extracting $\eta q$, accept this offer. In the third scenario, the activist controls the target board. If no agreement is reached with the bidder, the activist's payoff is $\alpha q\,(1-\eta)\,(1-\gamma) + q\eta$. Abusing her control of the board, the activist extracts $q\eta$ from the target. In addition, each share of the target has a value of $q\,(1-\eta)\,(1-\gamma)$, which is the standalone value of the target from the activist's perspective, taking into account the adverse effect of the value extraction and the activist's higher discount rate, $1-\gamma$. The activist agrees to sell the firm if and only if her proceeds from the takeover are higher than $\alpha q\,(1-\eta)\,(1-\gamma) + q\eta$, which holds if and only if $q + \beta(\alpha,\eta) \leq \pi_2$. Once the activist has control of the board, shareholders would vote to approve the takeover if and only if the price is higher than $q(1-\eta)$, and the bidder will never offer more than $q+\Delta$. The bidder and the activist reach an acquisition agreement that is acceptable to shareholders if and only if $\beta(\alpha,\eta) \leq \Delta$. If $\beta(\alpha,\eta) > \Delta$ then the firm remains independent, and the long term shareholder value is $q\,(1-\eta)$. If $\beta(\alpha,\eta) \leq \Delta$ then the firm is sold to the bidder in the second round of negotiations. With probability $s$ the activist offers $\pi_2 = q + \Delta$, an offer which is always accepted by the bidder and the target shareholders, and with probability $1-s$ the bidder offers $\pi_2 = q + \max\{-\eta q, \beta(\alpha,\eta)\}$, which is always accepted by the activist and the shareholders. ■

**Lemma 7** *Suppose the first round of negotiations fails. Then:*

(*i*) *The bidder never runs a proxy fight.*

(*ii*) *If the activist owns $\alpha$ shares in the target, the activist runs a proxy fight if and only if*

$$\rho(\alpha,\eta) \leq \Delta < b \quad or \quad b + \frac{\kappa/\alpha}{1-s} \leq \beta(\alpha,\eta) \leq \Delta, \tag{42}$$

*where*

$$\rho(\alpha,\eta) \equiv \max\left\{\beta(\alpha,\eta), -\frac{1-s}{s}m(\alpha,\eta), \frac{\kappa/\alpha - q\gamma}{s} - \frac{1-s}{s}m(\alpha,\eta)\right\}. \tag{43}$$

*Whenever the activist runs a proxy fight, she wins.*[36]

**Proof.** Consider part (i). Based on Lemma 6, without the ability to commit not to abuse the power of the board, target shareholders are always worse off if they elect the bidder. Since $\kappa > 0$, no party initiates a proxy fight she expects to lose. Hence, in equilibrium the bidder never runs a proxy fight. Consider part (ii). Based on Lemma 6, if $\beta(\alpha,\eta) > \Delta$ and the activist obtains control, shareholder value is $q(1-\eta)$, and therefore, shareholders would support the incumbent. Suppose $\beta(\alpha,\eta) \leq \Delta$. There are two cases to consider. First, if $b \leq \Delta$ then under the incumbent's control $\Pi_{SH}(\Delta) = q + s\Delta + (1-s)b$, while under the activist's control $\Pi_{SH}(\Delta) = q + s\Delta + (1-s)\,m(\alpha,\eta)$. Therefore, shareholder support the activist if and only if $b \leq m(\alpha,\eta)$. Since $b \geq 0$, this condition becomes $b \leq \beta(\alpha,\eta) \leq \Delta$. The activist runs a proxy fight only if

$$\alpha\left[q + s\Delta + (1-s)\,\beta(\alpha,\eta)\right] - \kappa \geq \alpha\left[q + s\Delta + (1-s)\,b\right] \Leftrightarrow \beta(\alpha,\eta) \geq b + \tfrac{\kappa/\alpha}{1-s}. \tag{44}$$

Combined, the activist runs a proxy fight if and only if $b + \frac{\kappa/\alpha}{1-s} \leq \beta(\alpha) \leq \Delta$, as required. Second, suppose $\Delta < b$. Under the incumbent's control $\Pi_{SH}(\Delta) = q$, while under the activist's control $\Pi_{SH}(\Delta) = q + s\Delta + (1-s)\,m(\alpha,\eta)$. Therefore, shareholders support the activist only if $-\frac{1-s}{s}m(\alpha,\eta) \leq \Delta$. Combined, the condition becomes

$$\max\left\{\beta(\alpha,\eta), -\tfrac{1-s}{s}m(\alpha,\eta)\right\} \leq \Delta < b. \tag{45}$$

[36] If $b + \frac{\kappa/L}{1-s} \leq \beta(L,\eta) \leq \Delta$ then shareholders do not elect the activist to the board because otherwise the incumbent would block the takeover (as in the baseline model), but rather, they elect the activist since she can negotiate a higher takeover premium, similar to our analysis in Section 7.1.

Provided the activist is getting the support from shareholders, she runs a proxy fight if and only if

$$\alpha\left[q+s\Delta+(1-s)\,m(\alpha,\eta)\right]-\kappa\geq\alpha q\left(1-\gamma\right)\Leftrightarrow\tfrac{\kappa/\alpha-q\gamma}{s}-\tfrac{1-s}{s}m(\alpha,\eta)\leq\Delta \tag{46}$$

Combined, the activist initiates a proxy fight if and only if $\rho(\alpha,\eta)\leq\Delta<b$, as required. ■

**Proposition 11** *Suppose the bidder identifies firm $i$ as a target and the activist owns $\alpha$ shares of that firm. Then, the unconditional shareholder value of firm $i$ is $q+\tilde{v}\left(\alpha\right)$, where $\tilde{v}\left(\cdot\right)$ is given by*

$$\begin{aligned}\tilde{v}\left(\alpha\right) &= \int_{b}^{\infty}\left[s\Delta+(1-s)b\right]dF\left(\Delta\right)+\int_{\min\{b,\rho(\alpha,\eta)\}}^{b}\left[s\Delta+(1-s)\,m(\alpha,\eta)\right]dF\left(\Delta\right) \\ &\quad+\mathbf{1}_{\{b+\frac{\kappa/\alpha}{1-s}\leq\beta(\alpha,\eta)\}}\int_{\beta(\alpha,\eta)}^{\infty}(1-s)\left(\beta(\alpha,\eta)-b\right)dF\left(\Delta\right),\end{aligned} \tag{47}$$

**Proof.** Given Lemma 7 and Lemma 6, the proof is similar to the proof of Proposition 2, and for brevity, we only highlight the differences. Based on Lemma 7, if the activist owns $\alpha$ shares of the target and either $b+\frac{\kappa/\alpha}{1-s}\leq\beta(\alpha,\eta)\leq\Delta$ or $\rho\left(\alpha,\eta\right)\leq\Delta<b$, then the activist would run a successful proxy fight if the first round of negotiations fails. Based on Lemma 6, all players expect that once the activist obtains control of the board, she will reach a sale agreement in which the bidder pays in expectations $\pi_2''=q+s\Delta+(1-s)\,m(\alpha,\eta)$ per share. Therefore, similar to the proof of Proposition 2, the incumbent and the bidder reach an agreement in the first round where the offer is $\pi_2''$. Note that if $b+\frac{\kappa/\alpha}{1-s}\leq\beta(\alpha,\eta)\leq\Delta$ then $0<\beta(\alpha,\eta)$ and hence, $m\left(\alpha,\eta\right)=\beta\left(\alpha,\eta\right)$. In all other cases, if $b\leq\Delta$ the incumbent and the bidder reach an agreement in the first round where the offer is $q+s\Delta+(1-s)b$, and if $b>\Delta$ the target remains independent under the incumbent board's control. This explains the term behind $\tilde{v}\left(\alpha\right)$. ■