Shareholder Rights and the Bargaining Structure in Control Transactions

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Abstract

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State corporate law accords shareholders two main types of rights in mergers and acquisitions (M&A). First, statutes grant to shareholders a set of special rights with respect to "fundamental transactions," including many M&A transactions (Carney, 1980). These include the right to vote on the transaction and appraisal rights for dissenting shareholders. Second, shareholders have a right to loyal conduct by corporate fiduciaries, the contours of which have been developed largely by judges. Concern about excessive merger litigation, however, has led more recently to legal changes cutting back on the right of shareholders to sue to enforce fiduciary duties, relying instead on shareholders' right to vote on any deal to ensure that shareholders receive their due. But what exactly is shareholders' due, from a functional perspective? And what mechanisms can secure it? We attack these questions from first principles by developing a general framework for understanding shareholder rights in control transactions that focuses on the bargaining structures induced by alternative legal regimes.

We begin with a baseline model of a target corporation with dispersed public shareholders in which managers have the exclusive right to initiate any sale and shareholders have only their statutory rights. This baseline model introduces a basic economic problem that motivates the rest of our analysis: protected by only their rights to vote on the transaction and to a judicial appraisal, dispersed shareholders' inability to make counteroffers leaves them vulnerable to what are effectively take-it-or-leave-it offers (TIOLIOs) from target managers. As a result, in any sale the shareholders receive only the value of their claims in the status quo and no share of deal surplus, a result that is robust both to indefinitely repeating offers and to bidder competition.

We then turn to evaluating the statutory regime based on the normative criterion of ex-ante efficiency. The outcome in the statutory regime, in which shareholders receive only the value of their claims in the status quo, results in an ex-post efficient allocation of corporate assets through the market for corporate control. The reason is that it ensures that the private deal surplus being bargained over by target managers and the acquirer is also the *social* surplus at stake. As a result, the managers' private benefits of control do not result in inefficient entrenchment.

But we show that this outcome is nonetheless socially undesirable. Ex-ante efficiency requires not only that corporate assets ultimately end up under the control of the efficient owner but also that a firm is financed if and only if it has positive social value. In general, shifting surplus to shareholders can pose tradeoffs between these two margins. On the one hand, giving target managers enough deal consideration is essential to ensure the firm is sold to efficient acquirers. But on the other hand, efficient financing behavior requires the shareholders to receive the full social value created by their investment, including in an acquisition. We show, however, that changing the statutory regime in a way that begins to shift deal surplus to target shareholders would unambiguously increase ex-ante efficiency, despite the resulting distortion in the market for corporate control. Indeed, we show that this is true in our model not just of the statutory regime but of *any* ex-post efficient regime that gives target shareholders less than all of the surplus in a sale. The key economic insight driving this result is that, starting from any ex-post efficient legal regime, the marginal deal deterred by shifting additional deal surplus to shareholders has no social value, whereas in contrast, the marginal firm that can now be financed ex ante has strictly positive social value. As well, we show that rule-design only needs to worry about compensating investors, not managers, for their ex-ante investments since managers can be compensated by up-front payments from investors, but not the other way around given managerial liquidity constraints. As a result, shifting deal surplus to shareholders expands the set of firms that can be financed even though managers too must be induced to make ex-ante investments in the firm.

A key goal of the second category of shareholder rights—target managers' fiduciary duties—should thus be to secure a greater share of deal surplus for shareholders. We extend the baseline model to analyze the ability of fiduciary duty regimes to do so. We begin with a rule that prohibits corporate fiduciaries from receiving more than their pro-rata share of deal consideration based on their share ownership, which we call the "anti-self-dealing norm." We show that if courts can police compliance with the anti-self-dealing norm sufficiently effectively, then it can deliver to shareholders a strictly positive share of deal surplus, albeit at a cost to ex-post efficiency due to managerial entrenchment. The contrast with the result in our baseline model of the statutory regime suggests that managers' fiduciary duties are a key reason why in practice target shareholders are typically paid substantial premiums over the pre-bid market price for their shares. In contrast, if courts have more difficulty detecting side payments, the anti-self-dealing norm on its own can result in shareholders doing even worse in a deal than they do in the status quo. If such a "leaky" anti-self-dealing norm is paired with a right of shareholders to vote on the deal, however, the result might seem to be the best of both worlds: shareholders' ability to reject deals that make them worse off removes the economic incentive of managers to pursue inefficient deals, while the ability of target managers to extract side payments ensures they are motivated to pursue all efficient deals, and moreover for sufficiently rich deals the target shareholders receive a share of deal surplus.

But recall our fundamental normative result that shifting surplus to shareholders can increase ex ante efficiency even when it lowers ex-post efficiency. That remains true here. In particular, we show that if one views the ability of courts to police side payments as a policy choice variable, the socially optimal regime is sufficiently strict so that shareholders receive enough surplus in any sale to produce some degree of inefficient entrenchment. Our analysis thus provides support for going beyond what is required under the conventional "undistorted choice" normative standard (Bebchuk, 1984, 1988) in policing the anti-self-dealing norm. A further implication of our analysis is that the shareholder vote plays no useful role when courts are able to efficiently enforce the anti-self-dealing norm. In other words, not only is the shareholder vote insufficient on its own to deliver a share of deal surplus to shareholders, it may also be unnecessary to protect the value of shareholders' claims in the status quo.

We further extend our model of fiduciary duties to capture another interaction with shareholder voting: the treatment of shareholder approval as "cleansing" a conflicted transaction. We first consider the case in which shareholder approval is required under the statute for a deal to go forward. Recent developments in the case law have treated such votes as also foreclosing the right of shareholders to bring fiduciary duty suits. We show that such treatment changes the bargaining structure in such a way that unravels the effectiveness of fiduciary duties in protecting shareholder interests. Somewhat paradoxically, however, we show that treating shareholder approval as cleansing does not undermine the anti-self-dealing norm if management can force through a deal unilaterally after a failed shareholder ratification vote, i.e., if shareholders do not have a legal right to veto a deal, as in a controlling shareholder squeezeout. The reason is that management's unilateral option changes shareholders' choice from one between the proposed deal or no deal to one between the proposed deal and the unilateral deal. One implication is that the seemingly shareholder-friendly feature of cleansing act doctrine of requiring controlling shareholders to condition certain transactions on a majority of the minority vote *ab initio* in order to receive more deference from judges ex post can in fact undercut shareholder protections by helping the controller make credible TIOLIOs to shareholders.

We then analyze how competition among bidders affects the operation of the fiduciary duty regime. In our baseline anti-self-dealing norm model, bidder competition can redound to the benefit of shareholders. The reason is that competition increases the total price paid by the acquirer, and the anti-self-dealing norm—unlike the statutory regime—ensures that shareholders receive at least a fixed fraction of that total price. Bidder competition and managerial bargaining power are thus substitutes in improving shareholders' payoff in a control transaction. An alternative to the anti-self-dealing norm is to simply prohibit managers from interfering with offers directly to shareholders—a "no frustration" rule—and rely solely on bidder competition. Which regime delivers a higher payoff to the Shareholder depends on how much additional surplus the Manager could extract if empowered to bargain and the cost to the Shareholder in terms of side payments and entrenchment.

Finally we use our framework to analyze target managers' "*Revlon* duties," which obligate them to sell the firm to the bidder that offers the highest value to shareholders at large once they initiate any sale. If there is a sufficient degree of bidder competition, then adding *Revlon* duties to the anti-self-dealing norm can improve the payoff to shareholders in a sale by limiting the amount of side payments the acquirer can make to target managers, albeit at a cost of increased entrenchment. On the other hand, we show that if competition is not sufficiently strong, then imposing *Revlon* duties might only weaken the bargaining leverage of target managers vis-à-vis the acquirer by making it no longer credible to threaten to sell the firm instead to a lower valuing bidder, thereby lowering the ultimate sale price of the firm, without limiting side payments.

Our paper contributes to a large literature analyzing the rules governing control transactions (e.g., Easterbrook and Fischel, 1981b; Bebchuk, 1984, 1994; Yee, 2005; Choi and Talley, 2018). Our general approach is in the spirit of the incomplete contracts approach to financial contracting (Aghion and Bolton, 1992). We focus on the decision whether to sell the company to an acquirer. While in principle control rights over that decision could be assigned to either the manager or to shareholders, as in Aghion and Bolton (1992), we assume that collective action problems that beset dispersed shareholders produce a fundamental asymmetry: the manager is the only one who can bargain effectively with potential acquirers.

Much of the takeover literature in the 1980s focused on two incentive problems that we ignore. One is that efficient deals might be derailed by hold-out shareholders free-riding on the acquirer's improvements to firm value (Grossman and Hart, 1980). This problem, however, appears in practice not to prevent takeovers in which all non-tendering shareholders are squeezed out through a back-end merger (Amihud et al., 2004). The second is that inefficient deals could be forced through by bidders employing coercive devices such as conditional two-tiered front-loaded tender offers (Brudney and Chirelstein, 1974; Bradley, 1980; Bebchuk, 1984). The problem of coercive offers, however, has been largely solved by regulation of tender offers and other legal rules. We focus instead on another collective action problem facing dispersed shareholders—their inability to make counteroffers—and how it shapes their effective bargaining power vis-à-vis both target managers and potential acquirers under alternative legal regimes governing takeovers.

Our analysis of dispersed shareholders' bargaining predicament in control transactions is closely related to an old idea in political science, that in a setting in which some group has the power to make proposals to voters, the "agenda setter" can confront voters with TIOLIOs. In the canonical paper introducing this perspective, Romer and Rosenthal (1978) show that a majority of voters may be better off when the agenda setter can impose some tax *without voter approval* than when they must seek approval for all taxes because it would result in a better status quo outcome for voters and therefore strengthen their bargaining position. Our result in the context of cleansing act doctrine that shareholders can be better off without the right to veto transactions is due to a similar dynamic.

The paper proceeds as follows. Section 1 sets the stage by analyzing the case in which shareholders have only their statutory rights. Section 2 then analyzes the design of target managers' fiduciary duties. In Section 3 we analyze the effect of competition on fiduciary duty regimes. In Section 4 we discuss a range of issues related to the interpretation of our models and the motivation for some of our key assumptions. Section 5 concludes. All proofs are in the Appendix.

1 The Statutory Regime

We begin by analyzing the bargaining structure in control transactions when shareholders have only their statutory rights, namely the right to vote on the transaction and the right to a judicial appraisal. As a general matter, under state corporation statutes, the shareholders of a target corporation in a merger must approve the transaction by majority vote of the outstanding shares of common stock.[1] The appraisal remedy, in contrast, provides dissenting shareholders in certain control transactions the right to a summary legal procedure in which a judge determines the status quo value of the shares, which the corporation must pay the shareholder in lieu of the merger consideration.[2] Our analysis in this section introduces a basic economic problem that motivates

[1] See, e.g., DGCL § 251.

[2] See, e.g., DGCL § 262(h), providing that in an appraisal proceeding with respect to a merger of a Delaware corporation, "the Court shall determine the fair value of the shares exclusive of any element of value arising from the accomplishment or expectation of the merger or consolidation."

the rest of our analysis: dispersed shareholders' inability to make counteroffers can result in target shareholders being deprived of deal surplus, potentially at a cost to ex-ante efficiency. We turn to how fiduciary duties can address this problem in Section 2.

1.1 The baseline model of statutory shareholder rights

Consider a firm that is run by a Manager who owns a fraction $s \in (0, 1)$ of the firm's shares, with the remaining $1 - s$ of the shares held by dispersed public shareholders. If $s > 0.5$ then the Manager is also a controlling shareholder. To simplify we model the behavior of the dispersed public shareholders with a representative Shareholder and capture collective action problems in reduced form by assuming restrictions on what the representative Shareholder can do, as we discuss below. The net present value of the firm's observable cash flows if it remains under the control of the Manager is normalized to 1.

In addition to the observable cash flows, the Manager also enjoys private benefits of $b \geq 0$ from running the firm. The Manager's private benefits potentially include both pecuniary benefits—often referred to as "tunneling"—and non-pecuniary benefits such as her taste for power. The critical distinction between the private benefits of b and the observable cash flows of 1 is that only rights to the observable cash flows, and not to the private benefits, can be sold to the Shareholder. We further assume that the Manager's private benefits count as a matter of social welfare.[3] The total social value of the firm in the status quo—i.e., absent an acquisition—is thus $1 + b$.

Suppose an Acquirer that values the firm at $v > 0$ wishes to buy the firm, and that v, as well as all other parameters in our model, are common knowledge. In this baseline model we assume that any deal requires the Manager's approval, which reflects managers' ability to block offers made directly to shareholders using devices like the poison pill. We thus assume that the Manager and Acquirer first bargain over the terms of the acquisition. The Manager then takes the proposed deal to the Shareholder for his approval.

Crucially, we assume that the representative Shareholder cannot make a counteroffer and gets only an up-or-down vote on the Manager's proposal. The Shareholder's inability to make counteroffers captures the fact that dispersed shareholders would be unable to coordinate on an offer. Individual shareholders lack the incentive to incur the requisite expenditure to investigate and formulate an offer and, even if they did, could not speak on behalf of other shareholders. At the same time, modeling the behavior of dispersed shareholders using a representative Shareholder avoids other collective action problems, such as coercive tender offers, that have already been analyzed in the existing literature and largely addressed through existing legal rules.

The timing of the model is:

1. The Manager and Acquirer negotiate over a sale of the company, with the Manager's bargaining power relative to the Acquirer's equal to $m \in [0, 1]$ and the deal surplus split propor-

[3] While some forms of private benefits, such as consumption of excessive perquisites, might entail deadweight costs, we assume the value of the cash flows and private benefits, $1 + b$, is net of those deadweight costs.

tionately.[4] Denote the agreed-to deal price by p.

2. The Manager chooses the amount of the deal price to offer to the Shareholder, a, with the Manager retaining the remaining $p - a$.

3. The Shareholder votes on whether to accept the Manager's offer of a. If the Shareholder votes no and $s \leq 0.5$, then the game ends and the players receive their status quo payoffs.

4. If the Shareholder voted no and $s > 0.5$, then the Shareholder decides whether to seek judicial appraisal and if so then the Shareholder and Manager receive payoffs $1 - s$ and $p - (1 - s)$, respectively. Otherwise the Manager's proposal is implemented, and the Shareholder and Manager receive payoffs a and $p - a$, respectively.

Note that we are allowing the Manager at stage 2 to propose to the Shareholder a division of deal consideration different from pro rata with their ownership shares, s and $1 - s$, which one might view as the legally required split. This underscores the counterfactual nature of our analysis in this section: we are imagining a world in which public shareholders can look *only* to their statutory voting and appraisal rights to protect their interests in control transactions. In reality, shareholders generally do have a legal right to receive deal consideration pro rata with their share ownership, and we analyze that legal rule in detail in Section 2. Our analysis of a counterfactual statutory-rights-only regime in this section should be seen as an inquiry into the motivation for these other legal rules, and it also provides a simple setting in which to elucidate how shareholders' inability to make counteroffers affects the bargaining structure in control transactions, which will continue to play a role in our subsequent analysis of other legal rules.

Depending on the value of s, and in particular whether the public shareholders or the Manager hold the majority of the shares, this bargaining structure between the Manager and the Shareholder is either "take-it-or-leave-it" or "take-it-or-seek-appraisal." The end result parallels that of the classic Ultimatum Game (Güth and Tietz, 1990): in any subgame perfect Nash equilibrium (SPNE), the Manager and Acquirer get all of the surplus from any deal.

Proposition 1. *Under the statutory regime, there is an essentially unique*[5] *SPNE outcome in which the firm is sold if and only if* $v \geq 1 + b$ *at price* $p^* = mv + (1 - m)(1 + b)$*, and the Shareholder receives only his status quo payoff,* $1 - s$.

Note that the Shareholder receives only his status quo payoff regardless of whether the Manager is a controlling shareholder (i.e., $s > 0.5$). Consider first the case in which the public shareholders own a majority of the shares. In this case, the Manager only has to offer $a = 1 - s$ in order to

[4] We use this simple proportional bargaining solution throughout. We would get similar results if we assumed that Manager and bidder split not *their* deal surplus but the *aggregate* deal surplus—including the Shareholder's—in proportions m and $1 - m$. However, this alternative assumption strikes us as less realistic. It would also stack the deck in favor of finding entrenchment, i.e., the forgoing of ex post efficient deals.

[5] In the interest of brevity, we resolve the tie in the case of $v = 1 + b$ in favor of a deal and similarly resolve ties one way or another throughout the paper without further comment when it has no substantive effect on the analysis.

induce the representative Shareholder to agree to the deal.[6] Given the inability of shareholders to make a counteroffer, the shareholders' right to vote on the sale is effective at protecting only their entitlement to the value of their claims in the status quo and no more. In contrast, when the Manager owns a majority of the shares, so that the Shareholder's vote is meaningless, the Shareholder's appraisal right guarantees that the Shareholder will receive at least their status quo value, $1 - s$, in any deal. Appraisal rights thus serve as an equivalent substitute for the shareholder vote to protect the Shareholder's entitlement to the value of his claims in the status quo.[7]

The lack of surplus going to the Shareholder results in an ex-post efficient allocation of corporate assets in the market for corporate control. Ex-post efficiency in this sense requires the firm to be sold if and only if the Acquirer values it more than its value in the status quo, $v \geq 1 + b$. Since the Shareholder gets only his status quo value in any deal in equilibrium, the deal surplus that the Manager and the Acquirer are bargaining over is also the full *social* surplus at stake.

It might be hoped that the right of shareholders to reject a deal might result in the Manager and the Acquirer coming back with a more favorable offer to shareholders (Bebchuk, 1984, p. 1769). Alas, the outcome is unchanged if one considers the realistic possibility of repeating offers. This reflects the more general result that "procedures in which all the offers are made by only one of the two bargainers ... assign all the bargaining power to the party who makes the offers" (Binmore et al., 1992, 184).[8] To see this, suppose that if the Shareholder rejects the Manager's proposal in stage 3, play goes back to stage 2 for the Manager to make a new offer, and the offers continue indefinitely until the Shareholder accepts. As is standard in bargaining models (e.g., Rubinstein, 1982), assume that the expected payoff received in each subsequent round is discounted by a factor $\delta \in (0, 1)$ because of a probability of deal failure (e.g., the bidder goes bankrupt or finds a better target between rounds).[9] First, as before there cannot be a deal where the Shareholder gets less

[6]The SPNE of an Ultimatum Game delivers a stark result that the offer gives the offeree only the value of their outside option. In experimental studies, in contrast, low-ball offers are typically rejected and players make more generous offers, even though richer experimental setups resurrect some of the starker prediction (Binmore, 2007, ch. 3). The basic messages of our models, however, do not depend on the stark result of game theory that TIOLIOs hold the Shareholder down to his status quo outcome. Rather, what is key is simply that the inability of dispersed shareholders to make counter-offers weakens their bargaining position and results in them receiving less deal surplus. As well, it is at least open to question how well these laboratory studies capture distant interactions in real-world financial markets and in which there is substantial money at stake.

[7]The equivalence of voting rights and appraisal rights depends on our assumption that the judge values the Shareholder's claims in the status quo the same as the Shareholder does. Judges only need to get this value right in expectation, however, not in every single instance, since the Shareholder, Manager, and Acquirer take their decisions in anticipation of the court ruling, not in reaction to it. Of course, systematic court errors—getting the mean wrong—would change the analysis.

[8]For the case of asymmetric information, Cramton (1984) shows that the party receiving offers will capture some surplus, but only surplus representing an information rent: all known surplus—i.e., surplus that is fixed no matter the receiver's information—is captured by the party making the offers even after that party's information is fully revealed. Since dispersed shareholders do not have any information about the firm that bidders do not have, however, they will not receive any information rent. Consequently, Schwartz (1988, 173) may be correct in the abstract that "[i]t is disadvantageous to be the only offeror when information is incomplete because offers then may be revealing," but wrong in drawing the conclusion that "[a]ccordingly, passive shareholders could do better when facing prospective buyers than single owners of the same assets would do."

[9]Alternatively, assume that the Shareholder incurs a fixed cost κ in every round of bargaining. Then analogous reasoning leads to $M_{t-1} = \max\{0, M_t - \kappa\}$ and thus $M = \max\{0, M - \kappa\}$,which again holds only for $M = 0$.

than $1 - s$ because then the Shareholder would be better off not agreeing to it; concomitantly, there cannot be a deal if $v < 1 + b$. Focus thus on the case $v \geq 1 + b$ and on the split of the bargaining surplus $v - (1 + b) \geq 0$ (if indeed there is a bargain). Let M_t be the supremum of the Shareholder's equilibrium payoff (net of the Shareholder's status quo payoff) of any SPNE of the subgame starting in round t. Then in round $t - 1$, subgame perfection requires the Shareholder to accept any offer of at least δM_t and in turn the Manager not to make offers greater than this, which in turn implies $M_{t-1} = \delta M_t$. Now notice that the game is stationary: the game at period t is the same as that at period $t - 1$. Thus we must have $M_t = M_{t-1} = M$, where M is the Shareholder's supremum payoff in any round, and thus $M = \delta M$, which only holds for $M = 0$.[10] Finally, there must nonetheless be a deal (except if $v = 1 + b$) in equilibrium for otherwise the Manager would obtain zero surplus too and could make herself better off by offering the Shareholder some strictly positive share of the deal surplus, which the Shareholder would accept.

One might also hope that competition among multiple potential acquirers on its own might help mitigate dispersed shareholders' predicament, but this is not so. Because the Manager's approval is required for any deal, and bidders cannot make offers directly to shareholders, bidder competition only strengthens the hand of the Manager in negotiating with the ultimate Acquirer, increasing the equilibrium deal price, p. Otherwise the game proceeds as before. The Shareholder's basic predicament stemming from the initiation rights of the Manager combined with the inability of the Shareholder to make counteroffers remains unchanged so that, in any SPNE, the Shareholder still receives only his status quo value, $1 - s$.

1.2 The ex-ante efficiency of the statutory regime

We view the normative criterion for evaluating merger rules as ex-ante efficiency, i.e., the expected social value of corporate assets viewed from prior to the financing of the firm. From an ex-ante perspective, social efficiency requires more than just that corporate assets ultimately end up under the control of the efficient owner. It also requires that a firm is financed if and only if its expected gross social value is greater than the costs of establishing the firm. The basic financing issue is whether enough of the social value of the firm can be pledged to investors so that they are willing to invest (Tirole, 2006). From this perspective the failure of the statutory regime to deliver deal surplus to the public shareholders is potentially problematic because it can distort ex-ante investment in the firm.

Alternative legal rules that would deliver deal surplus to shareholders, however, pose a potential efficiency tradeoff. On the one hand, giving the Manager enough deal consideration to compensate for her loss of status quo payoffs is essential for ex-post efficiency, but on the other hand, efficiency of ex-ante financing behavior requires the ability to give the Shareholder the full social value created by his investment, including the full value of the firm in an acquisition. In principle one could imagine a change to the statutory regime that would maintain ex-post efficiency while giving

[10] We have drawn inspiration from the proof technique of Shaked and Sutton (1984) for alternating offers models of bargaining.

the Shareholder all of the deal surplus. But in practice, given the inevitable incompleteness of available institutional mechanisms, reforms that shift surplus to the Shareholder risk reducing the compensation to the Manager in a deal to a level that results in inefficient entrenchment.

To analyze this tradeoff formally, consider a prior "stage 0" at which the Manager and the Shareholder bargain over the financing of the firm. Suppose the Manager has an outside option $o \geq 0$ and a project that requires a fixed investment of $i > 0$, which are drawn from a joint distribution with cdf $F(o,i)$ and density $f(o,i)$ with $f(o,i) > 0 \, \forall \, o, i > 0$. To establish a firm to pursue the project, the wealth-constrained Manager must raise the needed funds by offering the Shareholder a share of the project's cash flows in exchange for an investment of $T \geq i$. Suppose further that at stage 1, the Acquirer's valuation v is realized from a distribution with cdf $G(\cdot)$ and density $g(\cdot)$ with $g(v) > 0$ for all $v > 0$ and finite expected value.

To focus on how the Shareholder's bargaining position in a takeover affects ex-ante efficiency, consider a reduced form model of the rules governing takeovers represented simply by the amount the Shareholder would receive in any sale under the rules, given by the "sharing rule" $a^*(s,v) \in [0,v]$, with the Acquirer and Manager bargaining over the remaining deal surplus (if any), $v - a^*(s,v) - (s+b)$. In this reduced form model, the outcome under the baseline model of the statutory regime corresponds to $a^*(s,v) = 1 - s$.

We assume restrictions on the form of $a^*(s,v)$ and on feasible reforms to the bargaining structure as a simple way to model the inevitable imperfection of rules that contributes to the risk that shifting deal surplus to the Shareholder will distort ex-post efficiency. In particular, we assume that the feasible set of $a^*(s,v)$, denoted $\mathcal{A}$, consists of those that are continuously differentiable in both arguments with $\partial a^*/\partial v \in [0,1)$ and $\partial a^*/\partial s < 0$. Furthermore, we focus on reforms that simply shift deal surplus to the Shareholder by a fixed amount k, ruling out more precise mechanisms that only shift surplus in ways that do not affect ex-post efficiency. This set of potential reforms is represented by the family of sharing rules $a^*(s,v|k) = a^*(s,v) + k$ for different values of $k \geq 0$.

Consider then, for any particular pair of i and o and given a legal regime represented by the sharing rule $a^*(s,v|k)$, the ex-ante bargain between the Manager and Shareholder over financing the firm at stage 0. Denote the Manager's and Shareholder's expected gross returns from the firm by $R_M(s|k)$ and $R_S(s|k)$, respectively, which are given by

$$R_M(s|k) = G(\underline{v}(s|k))(s+b) + \int_{\underline{v}(s|k)}^{\infty} [s+b+m[v-(s+b)-(a^*(s,v)+k)]]\, g(v)\, dv, \qquad (1)$$

and

$$R_S(s|k) = G(\underline{v}(s|k))(1-s) + \int_{\underline{v}(s|k)}^{\infty} [a^*(s,v)+k]\, g(v)\, dv, \qquad (2)$$

where $\underline{v}(s|k)$ is the cutoff level of v above which the Manager will initiate a sale for given s and k (we show in the proof of Proposition 2 that such a threshold exists). The first term in each of these expressions stems from the value of the firm in the status quo; the second term from a sale of the firm.

The Manager will propose to the Shareholder the T and s that solve the following problem:[11]

$$\max_{\mathrm{T}\geq\ i, s\in[0,1]} T-i+R_M(s|k) \tag{3}$$

subject to

$$\underline{v}(s|k) \text{ is the value of } v \text{ such that } v-a^*(s,v)-k-(s+b)=0, \tag{IC}$$

$$R_S(s|k)\geq T, \tag{SPC}$$

and

$$T-i+R_M(s|k)\geq o, \tag{MPC}$$

where the objective function is the sum of the up-front payment to the Manager net of the investment cost, $T-i$, and the Manager's gross return from the firm, (IC) is the Manager's incentive compatibility constraint that defines the cutoff level of v above which she will initiate a sale, (SPC) is the Shareholder's participation constraint, and (MPC) is the Manager's participation constraint. For any particular i and o there may not exist a contract (T,s) that can satisfy all of these constraints, in which case the project cannot be financed. Indeed, we will show in the proof of Proposition 2 that there exists a maximum level of required investment i that can be funded for given o and k, which we denote $\bar{i}\,(o|k)$. The ex-ante expected value of corporate assets is then given by:

$$EV\left(k\right)\equiv\int_0^{\infty}\int_0^{\bar{i}(o|k)}\left[G\left(\underline{v}\left(s|k\right)\right)\left(1+b\right)+\int_{\underline{v}(s|k)}^{\infty}vg\left(v\right)dv-i-o\right]f\left(o,i\right)dido.$$

Consider then how shifting deal surplus to the Shareholder affects ex-ante efficiency. Reforms that shift deal surplus to the Shareholder (increasing k) would affect each of the constraints in the ex-ante financing problem above, which reflects the interconnectedness of these three key incentive margins. Intuitively, increasing k will make (IC) harder to satisfy in the sense of raising $\underline{v}(s|k)$. But it also tightens (MPC) while potentially relaxing (SPC) through its effects on $R_M(s|k)$ and $R_S(s|k)$, with corresponding nonobvious effects on $\bar{i}\,(o|k)$. While it is hard to say much in general about the socially optimal way to strike these tradeoffs, the model does deliver important insights captured in the following result.

Proposition 2. *For any ex-post efficient sharing rule $a^*(s,v)\in\mathcal{A}$, there exists a strictly more socially desirable alternative sharing rule, $a^*(s,v)+k$ with $k>0$, that gives the Shareholder strictly more deal surplus and results in lower ex-post efficiency.*

[11] For ease of exposition, we have simply assigned the Manager all of the bargaining power vis-à-vis the Shareholder in the ex-ante financing negotiations. This only affects the surplus split, not total surplus, in equilibrium.

This result points up the importance of shareholders' ex-ante investment incentives for the efficient design of takeover rules. The sharing rule induced by the statutory regime, $a^*(s, v) = 1-s$, is ex-post efficient but socially undesirable: ex-ante efficiency can be improved by shifting deal surplus to shareholders, despite the resulting loss in ex-post efficiency. To see the intuition for this result, consider a change to the statutory regime that begins to shift deal surplus to the Shareholder, i.e., increasing k from $k = 0$. On the one hand, such a shift deters some sales (i.e., raises $\underline{v}(s|k)$) because the Manager is no longer sufficiently compensated for her loss of private benefits in the sale. But because the statutory regime is ex-post efficient, the marginal deal deterred by such a change has $v = 1 + b$ and thus has no social value, so that there is no first-order social cost to the loss in ex-post efficiency.

On the other hand, shifting surplus to the Shareholder expands the set of firms that can be financed ex ante (i.e., raises $\bar{i}\,(o|k)$) by making more of the expected social value of a firm pledgable to the Shareholder. This is so even though the Manager also must be induced to bear opportunity costs to start the firm, and shifting deal surplus to the Shareholder lowers $R_M(s|k)$, which makes it harder to satisfy (MPC) *ceteris paribus*. The reason is that the Shareholder can cover those costs through up-front payments to the Manager, but not vice-versa since the Manager is wealth constrained. And because the statutory regime results in firms with strictly positive social value not being financed, since none of the portion of expected firm value attributable to a future acquisition is pledgable to the Shareholder, the marginal firm that is now financed has a strictly positive social value, resulting in a first-order efficiency gain. And the same is true for *any* ex-post efficient $a^*(s, v)$ that gives the Shareholder strictly less than all of the surplus in a sale.[12]

To be sure, our model omits several other incentive margins that complicate the analysis of the efficient bargaining structure in control transactions, including: (1) the Manager's incentive to exert effort to maximize the value of the firm in the status quo; (2) the Manager's incentive to exert effort to find an acquirer; (3) incentives to invest ex-ante in the Acquirer; and (4) the Acquirer's incentive to search for targets. Changing the bargaining structure from the statutory regime so as to shift surplus to the Shareholder might also affect these other margins. But in a richer model that includes additional incentive margins, a generalized version of Proposition 2 would hold: given any set of institutions that generates perfect efficiency in the decision whether to sell the company, it would be socially desirable to make changes to those institutions that begin to worsen ex-post efficiency so long as they on net increase efficiency along the other incentive margins. The simple reason would be the same as in our specific model: by definition, the marginal transaction in an ex post efficient regime has zero social value. Whether in such a richer model shifting surplus *to the Shareholder*—the specific change in institutions modeled above—would on net increase the efficiency of the other incentive margins is an empirical question. We focus on

[12] Our restriction that $\frac{\partial a^*(s,v)}{\partial v} < 1$ ensures that an ex-post efficient sharing rule will give the Shareholder strictly less than all of the surplus in a sale. If instead starting from the threshold v for an efficient sale, $v = 1 + b$, $a^*(s, v)$ increased one-for-one with v, so that the Shareholder received all of the surplus in any sale, then it would no longer be the case that increasing the Shareholder's cut of deal consideration would be socially desirable. The reason is that such an increase would eliminate all sales, which would lower both ex-post efficiency and ex-ante efficiency.

managers' and shareholders' incentives to invest because we view preserving them as a first-order goal of corporate law. Our result that only the shareholders', and not the managers', incentives to invest ultimately matter for rule-design would also extend to such a richer model. Note as well that even in our model, there is no necessary connection between shifting surplus to the target shareholders and taking surplus from the Acquirer's shareholders. In the case of $m = 1$, reforms that shift surplus to the Shareholder come only out of the pocket of the *Manager*, not from the Acquirer. Our model's basic normative message is that ex-post efficiency in the market for corporate control is neither a necessary nor sufficient condition for ex-ante efficiency of institutions.

Moreover, the perspective we develop here is in stark contrast to the normative approach taken in much of the existing literature, which focuses excessively on ex-post efficiency. For example, Easterbrook and Fischel (1981a) argues for appraisal as the exclusive remedy for shareholders in control transactions because giving shareholders (only) their status quo value ensures that all (and only) ex-post efficient transactions take place. Similarly, Bebchuk (1984, 1988) advances an influential normative framework for evaluating the rules governing corporate acquisitions, which he terms the "undistorted choice" or "sole owner" standard, under which "a corporation should be acquired if and only if its shareholders judge the offered acquisition price to be higher than the target's independent value" (Bebchuk, 1988, p. 198). He justifies this standard largely on ex-post efficiency grounds, arguing that enabling dispersed shareholders to decide whether to sell corporate assets is the best feasible mechanism for achieving ex-post efficiency (Bebchuk, 1984, p. 1765). Note that, under the undistorted choice standard, a majority of shareholders judging an acquisition price to be worth more than the standalone value of the target must be *sufficient* for the bid to be successful, regardless of the surplus division. This view leads in turn to a set of reforms designed to enable shareholders to choose for themselves whether the firm is sold, with target managers prohibited from obstructing any offers made to shareholders for fear they might abuse their power in order to entrench themselves (Bebchuk, 2002). The no frustration rule we model in Section 3 below represents the apotheosis of this normative vision.

The perspective we develop here, in contrast, emphasizes the social value of ensuring that target shareholders receive a sufficient share of deal surplus. Our Proposition 2 shows that, starting from an ex-post efficient legal regime, ex-ante efficiency would be improved by an alternative bargaining structure that shifts additional surplus to target shareholders, even if it increases entrenchment—that is, despite performing worse on the undistorted choice standard. In other words, designing the optimal legal regime for governing corporate acquisitions requires an analysis and evaluation of *tradeoffs* between ex-ante investment incentives and ex-post efficiency. Moreover, our analysis suggests the potential value to dispersed shareholders of having a bargaining agent empowered to act on their behalf, a role corporate law assigns to fiduciaries. Bebchuk (2002) argues that a manager could play that role effectively as a mere advisor whom the Shareholder would be free to ignore. But while an advisor could provide information, he could not make, and would not enable dispersed shareholders to make, credible counteroffers, and hence would not fundamentally address dispersed shareholders' key collective action problem.[13] In addition, in practice, U.S. corporate law empowers fiduciaries to block tender offers using devices such as the poison pill, making the operation of such a regime of substantial interest. We thus now turn to fiduciary duty regimes that try to ensure the fidelity of such a fully empowered fiduciary in bargaining on behalf of shareholders over control transactions.

2 Fiduciary Duties

In this section we extend our baseline model of the statutory regime to analyze the functioning of fiduciary duties in control transactions. We begin in Subsection 2.1 by considering a prohibition on self-dealing, i.e., transactions in which the fiduciary receives more than their pro-rata share of deal consideration based on their share ownership. In Subsection 2.2 we then analyze the treatment of shareholder approval as "cleansing" a transaction, resulting in less intensive judicial review of self dealing.

2.1 Anti-self-dealing

Suppose that the Manager's fiduciary duties prohibit her from receiving any more than her pro rata share of the deal price based on her share of the status quo cash flows, s. In principle this means that the most the Manager can receive of the deal price p is sp, with the Shareholder receiving the remaining $(1-s)p$. But a limitation on such a legal regime is the limited observability of side payments to the Manager. For example, the Manager and the Acquirer might reach an understanding that the Acquirer will provide the Manager lucrative consulting opportunities following the closing of the transaction. Let β be the fraction of the deal price that is paid to the Manager in the form of a side payment. The "public" deal price paid for the common stock is thus $(1-\beta)p$. Assume that the highest fraction that can be paid as a side payment to the Manager without a court being able to detect it is $\bar{\beta} \in [0,1]$.[14] An alternative interpretation of our model is that $\bar{\beta}$ is the additional fraction of the deal consideration the Manager is entitled to, separate from her share of the common stock in the status quo, under her executive compensation contract (e.g., in a "golden parachute").

The timing of the model is now:

1. The Manager and Acquirer negotiate over a sale of the company, including the total deal price, p, and the fraction of that price given as a side payment to the Manager, β, with the Manager's bargaining power relative to the Acquirer's equal to $m \in [0,1]$. The Manager then offers the Shareholder his pro rata share of the rest of the deal price, $(1-s)(1-\beta)p$.

2. If $s \leq 0.5$, then the Shareholder votes on whether to accept the Manager's offer of $(1-s)(1-\beta)p$. If the Shareholder votes no, then the game ends and the players receive their status quo

[13]Kahan and Rock (2003) similarly argue that shareholders might prefer empowering a board to bargain on their behalf because they cannot bargain effectively on their own.

[14]Alternatively, $\bar{\beta}$ could be interpreted as reflecting how effective independent directors are at monitoring managers on behalf of shareholders.

payoffs.

3. If $\beta > \bar{\beta}$, then the Shareholder decides whether to sue for breach of fiduciary duty and if so then the Shareholder and Manager receive payoffs $(1-s)(1-\bar{\beta})p$ and $s(1-\bar{\beta})p + \bar{\beta}p$, respectively. Otherwise the Manager's proposal is implemented, and the Shareholder and Manager receive payoffs $(1-s)(1-\beta)p$ and $s(1-\beta)p + \beta p$, respectively.

Throughout we will use the notation p^* and β^* to refer to the equilibrium deal price and side payment fraction.

In the case of $s > 0.5$, the Shareholder cannot stop a deal by voting no, so his only protection is the anti-self-dealing (ASD) norm. We omit appraisal rights from the model in this case in order to show how the ASD norm would function in isolation. The following proposition characterizes the resulting equilibrium.

Proposition 3. *Under the anti-self-dealing norm with $s > 0.5$, there is an essentially unique SPNE outcome such that the firm is sold if and only if $v \geq \underline{v}(\bar{\beta}) \equiv \frac{s+b}{s(1-\bar{\beta})+\bar{\beta}}$ at a total price $p^* = \frac{mv+(1-m)(s+b)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$ with a fraction $\beta^* = \bar{\beta}$ paid as a side payment to the Manager, and:*

1. *If $\bar{\beta} < \frac{b}{1+b}$ then $\underline{v}(\bar{\beta}) > 1+b$ and in all equilibrium sales the Shareholder receives a payoff greater than his status quo payoff, $1-s$.*

2. *If $\bar{\beta} = \frac{b}{1+b}$ then $\underline{v}(\bar{\beta}) = 1+b$ and for $v > 1+b$ the Shareholder receives a payoff greater than his status quo payoff, $1-s$.*

3. *If $\bar{\beta} > \frac{b}{1+b}$ then $\underline{v}(\bar{\beta}) < 1+b$ and there exists a threshold $\hat{v}(\bar{\beta}) > 1+b$ such that the Shareholder receives a payoff in the sale less than (greater than) his status quo payoff if and only if v is less than (greater than) $\hat{v}(\bar{\beta})$.*

The outcome depends critically on the degree of observability of side payments to the Manager. If relatively little deal consideration can be tunneled as hidden side payments to the Manager (i.e., $\bar{\beta} < \frac{b}{1+b}$), the ASD norm is effective at shifting deal surplus to the Shareholder but at a cost of deterring ex-post efficient sales (entrenchment) for $v \in [1+b, \underline{v}(\bar{\beta}))$. A perfectly enforced ASD norm, which limits the Manager to receiving only sp in a sale, results in a sale if and only if $v \geq 1 + \frac{b}{s}$. For small s and $b > 0$, this threshold is considerably higher than the socially optimal threshold of $1+b$. Intuitively, the Manager needs to be compensated for the loss of status quo private benefits b by receiving a sufficient amount of deal consideration. But since the Manager obtains only a small fraction $s < 1$ of the total deal consideration, such compensation requires a much greater increase in the overall deal consideration, potentially beyond the Acquirer's willingness to pay.

In contrast, for high $\bar{\beta}$, the Manager is able to extract much more than her pro rata share of deal consideration, which has two key effects. First, the Shareholder is made worse off than in the status quo in sales at relatively low values of v, and with $s > 0.5$ there is no way for the Shareholder to stop those deals. Second, there are socially inefficient sales to Acquirers with $v \in [\underline{v}(\bar{\beta}), 1+b)$.

Note that it is the same threshold of $\bar{\beta}$ that determines (1) whether there is inefficient entrenchment or instead inefficient sales; and (2) whether the Shareholder is made strictly worse off than in the status quo in any equilibrium sales. This is not a coincidence: the fraction of deal consideration that the Manager can extract as a hidden side payment shapes both the Shareholder's ultimate payoff in a deal as well as the Manager's economic incentive to pursue a deal. The value of this threshold, $\frac{b}{1+b}$, has a straightforward economic intuition: it is the ratio of the Manager's private benefits in the status quo to the total social value of the firm in the status quo. As is intuitive, whether the Manager can extract a higher fraction of deal surplus than this determines both whether deals can make the Shareholder worse off and whether the Manager is incentivized to pursue inefficient deals that serve to redistribute firm value to the Manager. Conversely, if the Manager can extract only a lower fraction of deal surplus than he enjoys as private benefits in the status quo, the result is that the Manager is unwilling to sell the firm, even in some cases when it is efficient to do so, in order to preserve his private benefits. Finally, if $\bar{\beta} = \frac{b}{1+b}$ then the Manager's incentives to propose a deal are exactly aligned with social efficiency.

Consider now the case with $s \leq 0.5$ so that the Shareholder can veto a deal by voting no, which yields the following outcome.

Proposition 4. *Under the anti-self-dealing norm with $s \leq 0.5$, there is an essentially unique SPNE outcome such that:*

1. *If $\bar{\beta} \leq \frac{b}{1+b}$ then the outcome is the same as in the equilibrium with $s > 0.5$ characterized in Proposition 3.*

2. *If $\bar{\beta} > \frac{b}{1+b}$ then the firm is sold if and only if $v \geq 1+b$ and there exists a threshold $\hat{v}(\bar{\beta}) > 1+b$ such that:*

   (a) *For all $v \leq \hat{v}(\bar{\beta})$, $p^* = mv + (1-m)(1+b)$, $\beta^* = 1 - \frac{1}{p^*} \leq \bar{\beta}$ with equality iff $v = \hat{v}(\bar{\beta})$, and the Shareholder receives his status quo payoff, $1-s$.*

   (b) *For all $v > \hat{v}(\bar{\beta})$, $p^* = \frac{mv+(1-m)(s+b)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$, $\beta^* = \bar{\beta}$, and the Shareholder receives a payoff greater than his status quo payoff, $1-s$.*

First, note that the shareholder vote matters only if the ASD norm is difficult to enforce. For values of $\bar{\beta}$ below the key threshold $\frac{b}{1+b}$, the outcome is the same as in the case with $s > 0.5$ since the ASD norm ensures that in any deal proposed in equilibrium, the Shareholder's cut of the deal consideration is greater than his status quo payoff. But for values of $\bar{\beta}$ above this threshold, the shareholder vote ensures that the Shareholder always receives at least his status quo payoff for the simple reason that, if not, the Shareholder will vote down the deal. In addition to putting a floor on the Shareholder's payoff in any deal, the shareholder vote with $s \leq 0.5$ results in ex-post efficiency for $\bar{\beta} > \frac{b}{1+b}$. On the one hand, the Shareholder's ability to reject any deal that makes him worse off prevents inefficient transactions with $v < 1 + b$ because they leave no deal surplus to split between the Manager and the Acquirer. On the other hand, the ability of the Manager to tunnel out relatively large amounts of the deal consideration in the form of hidden side payments sufficiently compensates the Manager for her loss of private benefits in a sale to an efficient Acquirer with $v \geq 1 + b$.

Suppose now that $\bar{\beta}$ is an endogenous policy choice variable. This is surely correct at least within some range. For example, courts can be more or less thorough in scrutinizing deals for consulting arrangements, management participation on the buy side, and the like that in effect divert deal consideration to target managers. The following proposition characterizes the ex-ante efficient value of $\bar{\beta}$.

Proposition 5. *The ex-ante efficient level of $\bar{\beta}$ is strictly lower than the ex-post efficient level, $\frac{b}{1+b}$, and results in inefficient entrenchment for all $v \in \left(1 + b, \underline{v}\left(\bar{\beta}\right)\right)$.*

The reason the socially optimal level of $\bar{\beta}$ is lower than the ex-post efficient level is the same as the logic underlying Proposition 2: reducing $\bar{\beta}$ from the ex-post efficient level of $\frac{b}{1+b}$ improves the Shareholder's ex-ante investment incentives, with the marginal firm financed having strictly positive social value, while the marginal deal deterred has no social value. This is true regardless of the value of s and whether the Shareholder has a veto right over a proposed deal. Our analysis thus provides support for courts going beyond what is required under the "undistorted choice" or "sole owner" standard for takeover policy in policing the anti-self-dealing norm, even at a cost of some degree of ex-post entrenchment.[15]

An immediate corollary of propositions 3 - 5 is that under the socially optimal $\bar{\beta}$, whether shareholders can veto a proposed deal by voting it down (i.e., $s \leq 0.5$) makes no difference (and the same would be true with respect to appraisal rights, which we omitted from this model). In other words, not only are shareholders' statutory rights ineffective on their own at delivering to shareholders a share of deal surplus (a key result from our baseline model in section 1.1), they are also unnecessary if courts are able to police compliance with the anti-self-dealing norm sufficiently effectively.

2.2 Cleansing acts

We now turn to the treatment of shareholder approval as "cleansing" a conflicted transaction, resulting in less intensive judicial review of self dealing. In adjudicating fiduciary duty suits, the Delaware courts have shown increasing deference in recent years to shareholder approval of control transactions. We distinguish between the case in which the public shareholders own a majority of the shares ($s \leq 0.5$) and the controlling shareholder self-dealing case ($s > 0.5$), which are governed by the *Corwin* and *MFW* cases, respectively.

[15] In a richer model with additional incentive margins (e.g., managerial effort to create firm value in the status quo), a similar point would apply: if reducing the value of $\bar{\beta}$ from $\frac{b}{1+b}$ would on net increase the efficiency of the other incentive margins, then it would be socially optimal to do so despite the resulting distortion in the Manager's decision whether to sell the firm since the marginal deal lost would have no first-order social cost.

2.2.1 *Corwin*

Under *Corwin*, an acquisition that was approved by uncoerced, fully informed, and disinterested holders of a majority of the target's shares is reviewed by the courts under the highly deferential business judgment rule standard.[16] The *Corwin* court based this approach on the view that the shareholder vote is an effective mechanism for protecting shareholder interests, reasoning:

> When the real parties in interest—the disinterested equity owners—can easily protect themselves at the ballot box by simply voting no, the utility of a litigation-intrusive standard of review promises more costs to stockholders in the form of litigation rents and inhibitions on risk-taking than it promises in terms of benefits to them.[17]

Subsequent cases have clarified that *Corwin* applies even if a majority of the target's directors face personal conflicts of interest in the transaction, assuming the directors' conflicts of interest were adequately disclosed, leaving as the only exception self-dealing by controlling stockholders.[18] As a result, under *Corwin* management violations of the anti-self-dealing norm are in effect only actionable in suits prior to the shareholder vote asking for injunctive relief, since the vote is treated as foreclosing a damages action. To capture this legal regime in our framework, assume $s \leq 0.5$ and let the timing of the model be:

1. The Manager and Acquirer negotiate over a sale of the company, including the total deal price, p, and the fraction of that price given as a side payment to the Manager, β, with the Manager's bargaining power relative to the Acquirer's equal to $m \in [0, 1]$. The Manager then offers the Shareholder his pro rata share of the rest of the deal price, $(1 - s)(1 - \beta)p$.

2. If $\beta > \bar{\beta}$, then the Shareholder decides whether to sue to enjoin the deal and if so then the game ends and the players receive their status quo payoffs.

3. The Shareholder votes on whether to accept the Manager's offer of $(1 - s)(1 - \beta)p$. If the Shareholder votes no then the game ends and the players receive their status quo payoffs. Otherwise the Manager's proposal is implemented and considered "cleansed," foreclosing a damages suit, and the Shareholder and Manager receive payoffs $(1 - s)(1 - \beta)p$ and $s(1 - \beta)p + \beta p$, respectively.

We now have the following result:

Proposition 6. *Under the anti-self-dealing norm but treating shareholder approval as cleansing and with $s \leq 0.5$, the outcome is the same as in the baseline model of the statutory regime characterized in Proposition 1 (in any deal, the Shareholder receives only his status quo payoff, $1 - s$).*

[16] *Corwin v. KKR Fin. Holdings LLC*, 125 A.3d 304 (Del. 2015).

[17] *Id.* at 313-14

[18] *See Larkin v. Shah*, 2016 WL 4485447 at *1 (Del. Ch. Aug. 25, 2016) ("In the absence of a controlling stockholder that extracted personal benefits, the effect of disinterested stockholder approval of the merger is review under the irrebuttable business judgment rule, even if the transaction might otherwise have been subject to the entire fairness standard due to conflicts faced by individual directors."). The *Larkin v. Shah* case involved the acquisition of a drug development start-up by a major pharmaceutical company, making it particularly apposite given our focus on ex-ante investment distortions caused by takeover rules that result in shareholders' receiving too little deal surplus.

Corwin changes the bargaining structure to completely unravel the effectiveness of fiduciary duties in protecting shareholder interests. The reason is the same as that underlying the ineffectiveness of the shareholder vote in the statutory regime. Under *Corwin*, the Shareholder can only sue to enforce $\beta \leq \bar{\beta}$ prior to the vote, and only to enjoin the deal; they can no longer sue for monetary relief after the vote. But shareholders' right to enjoin the deal is functionally equivalent to the shareholder vote: it is an up-or-down decision on management's proposal and the status quo of no deal. Public shareholders' inability to make counteroffers thus undermines suits for injunctive relief just like it undermines the effectiveness of the shareholder vote. Shareholders will be willing to accept deals for less than they are legally entitled to under the anti-self-dealing norm—both by voting for them and by declining to sue to enjoin them—so long as they are made at least as well-off as they are in the status quo.[19]

To be sure, there is an active plaintiffs' bar that is motivated to bring meritorious suits in order to receive attorneys' fees. In theory, paying the plaintiffs bar for meritorious suits could serve as a commitment device to reject deals that violate the anti-self-dealing norm. The commitment works precisely because of the conflict of interest between the plaintiff's attorneys and the shareholders: the plaintiff's attorneys do not care about whether the status quo is worse than the deal, they only care about whether the deal is compliant with the rules (and their fee if it is not). In practice, however, deals are rarely enjoined. Rather, plaintiff's attorneys and management commonly negotiate a settlement that allows the transaction to move forward, and in those negotiations the conflict between the plaintiff's attorneys' incentives and shareholder interests is commonly thought to lead to sweetheart settlements that benefit the attorneys without yielding substantial benefits to shareholders. Suits for monetary relief are also at risk of such collusion, but apparently less so given that they have at least on occasion yielded large recoveries for shareholders and, by extension, the plaintiff's attorney since the plaintiff's attorney is paid a fraction of the amount of monetary relief going to shareholders. It is precisely those suits, however, that are barred by *Corwin*. Our basic result—that *Corwin* undermines the effectiveness of fiduciary duties—thus still obtains even when considering the role of the plaintiffs bar.

2.2.2 Controlling shareholder transactions and *MFW*

Consider now cleansing acts in the case of transactions involving controlling shareholders (i.e., $s > 0.5$), who do not need the approval of the public (minority) shareholders to sell the company. To analyze this case, suppose that approval by the representative Shareholder of a proposal by the Manager would foreclose a damages suit, as in the model of *Corwin* above, but that following a failed shareholder vote, the Manager (as controlling shareholder) can implement an alternative split of deal consideration unilaterally. More specifically, assume the model begins with the same steps 1 - 2 of our model of the *Corwin* doctrine above and then proceeds as follows:

[19] Cox et al. (2019) argue that *Corwin* bundles together a positive-value decision (approving the merger itself) with a negative-value decision (absolving managerial misconduct), which makes the shareholder vote "inherently coercive." We are sympathetic to this characterization, and our analysis of the bargaining structure produced by *Corwin* shows that treating the shareholder vote as cleansing undermines the ASD norm.

3. The Shareholder votes on whether to accept the Manager's offer of $(1-s)(1-\beta)p$. If the Shareholder votes yes the Manager's proposal is implemented and considered "cleansed," foreclosing a damages suit, and the game ends with the Shareholder and Manager receiving payoffs $(1-s)(1-\beta)p$ and $s(1-\beta)p+\beta p$, respectively. Otherwise the game proceeds to the next step.

4. The Manager and the Acquirer negotiate over a sale of the company on new terms *not* subject to approval by the Shareholder, including the total deal price, p', and the fraction of that price given as a side payment to the Manager, β'.[20]

5. If $\beta' > \bar{\beta}$, then the Shareholder decides whether to sue for breach of fiduciary duty and if so then the Shareholder and Manager receive payoffs $(1-s)(1-\bar{\beta})p$ and $s(1-\bar{\beta})p+\bar{\beta}p$, respectively. Otherwise the Shareholder and Manager receive payoffs $(1-s)(1-\beta')p$ and $s(1-\beta')p+\beta' p$, respectively.

This model can be interpreted as capturing a squeeze-out merger by simply setting the Manager's bargaining power vis-à-vis the Acquirer to $m = 1$. In that interpretation, the Manager and the Acquirer are one-and-the-same, with the Manager valuing the firm post-squeeze-out at v, with the anti-self-dealing norm requiring the Shareholder to receive $(1-s)(1-\bar{\beta})v$. We now have:

Proposition 7. *Under the anti-self-dealing norm but treating shareholder approval as cleansing and with* $s > 0.5$*, the outcome is the same as in the original model of the anti-self-dealing norm without cleansing characterized in Proposition 3.*

Somewhat paradoxically, a controlling shareholder's power to implement a deal unilaterally ultimately hurts her by undermining her ability to make a take-it-or-leave-it offer to the public shareholders. At stage 3, in equilibrium the representative Shareholder will vote down any offer less than his legal entitlement of $(1-s)(1-\bar{\beta})p$, knowing that at stage 4 the Manager will nonetheless have an incentive to implement a transaction unilaterally, ensuring that the Shareholder will ultimately receive his full legal entitlement at stage 5, potentially by bringing a fiduciary duty suit. As a result, with $s > 0.5$ and in the absence of any device by which the controlling shareholder can commit not to act unilaterally, the treatment of minority shareholder approval as cleansing the transaction does not undermine the effectiveness of the ASD norm.

Our framework thus provides a new perspective on a second recent line of cases in Delaware, this one governing the cleansing of controlling shareholder squeeze-outs and culminating in the case of *MFW*.[21] Under *MFW*, controlling shareholders can elect to subject a squeeze-out to a non-waivable condition requiring approval by a majority vote of the shares not held by the controlling shareholder. If so, then following an uncoerced, informed vote of the majority of the minority shareholders approving the transaction, the court will subject any subsequent fiduciary duty claims

[20] It would make no difference to the equilibrium payoffs and transactions if we allowed the Manager to make another offer, i.e., to go back to step 2 one, many, or even infinite times. We restrict the model here to one round for simplicity.

[21] *Kahn v. M & F Worldwide Corp.*, 88 A.3d 635 (Del. 2014).

to business judgment rule review and thus treat them as effectively waived.[22] The court in *MFW* emphasized that, to receive this cleansing effect, the controller must "*irrevocably* and publicly disable[] itself from using its control to dictate the outcome of the negotiations and the shareholder vote ..."[23] The court intended the requirement of such a commitment from the controller to *protect* minority shareholders.[24]

As our analysis so far already suggests, however, the ability to commit to not implement a deal unilaterally, when combined with the treatment of majority-of-the-minority shareholder approval as cleansing the transaction, in fact undermines the protection of minority shareholders by managers' fiduciary duties. In particular, it transforms the controlling shareholder squeeze-out case from the timing given above to the timing given in our analysis of cleansing acts under the *Corwin* doctrine in section 2.2.1 above, with the same result. When a controlling stockholder makes a commitment not to pursue a deal unilaterally, the minority shareholders know that if they vote down the proposed deal, they will receive their status quo payoffs, just as in the non-controlling stockholder case. In other words, the commitment by controlling shareholders required by *MFW* helps the controlling shareholder to make a credible take-it-or-leave-it offer to minority shareholders, resulting in the reemergence of the basic bargaining predicament that undermined the effectiveness of the shareholder vote in our baseline model of the statutory regime.

A further implication of our framework is that the two forms of cleansing acts are fundamentally different in terms of the bargaining structures they induce. We show that a majority-of-the-minority vote condition is a poor substitute for judicial review, given the inability of public shareholders to make counter-offers. An effective special committee process, on the other hand, would correspond to our baseline ASD norm model with low $\bar{\beta}$, which can indeed deliver deal surplus to shareholders. The special committee may be less effective now that *MFW* has removed the specter of searching entire fairness review by judges.

3 Bidder Competition

In roughly half of corporate acquisitions the target negotiates with only a single bidder, but in the remaining half multiple bidders compete to acquire the firm (Boone and Mulherin, 2007). As we observed in Section 1, bidder competition does not help shareholders when they have only their statutory rights. But how does bidder competition interact with fiduciary duty regimes? In Subsection 3.1 we analyze how bidder competition affects the operation of the anti-self-dealing ("ASD") regime considered above. We then turn to alternative legal regimes that more directly harness competition to protect shareholders: the "no frustration" rule as well as a related legal

[22] *MFW* also requires the creation of a special committee of independent directors to negotiate the transaction. But note that in practice, prior to *MFW*, controllers in a squeeze out could receive a shift of the burden of proof using either a special committee process or a majority-of-the-minority approval condition and generally opted to use the former. The incremental effect of *MFW* is best understood as substituting a majority-of-the-minority vote condition for judicial review under the entire fairness standard of review, as we model it here.

[23] *Kahn v. M & F Worldwide Corp.*, at 644 (emphasis added).

[24] *Id.*

regime—*Revlon* duties—in Subsections 3.2 and 3.3, respectively.

3.1 Bidder competition under the anti-self-dealing norm

We begin with our baseline anti-self-dealing norm regime but assume that there are $N > 1$ bidders that compete to acquire the firm, with bidders' valuations from highest to lowest denoted $v_1, ..., v_N$. We assume that Bidder 1 is the Acquirer since it is willing to outbid any other bidder. The timing is now:

1. The Manager and Acquirer negotiate over a sale of the company, including the total deal price, p, and the fraction of that price given as a side payment to the Manager, β, with the Manager's bargaining power relative to the Acquirer's equal to $m \in [0, 1]$. The Manager's outside options are to sell to another bidder instead (also subject to any Shareholder vote and potential fiduciary duty suit in stages 2 and 3) or to remain in the status quo.

2. If $s \leq 0.5$ then the Shareholder votes on whether to accept the offer of $(1-s)(1-\beta)p$ and if the Shareholder votes no, then the game ends and the players receive their status quo payoffs.

3. If $\beta > \bar{\beta}$, then the Shareholder decides whether to sue for breach of fiduciary duty and if so then the Shareholder and Manager receive payoffs $(1-s)(1-\bar{\beta})p$ and $s(1-\bar{\beta})p + \bar{\beta}p$, respectively. Otherwise the proposal is implemented, and the Shareholder and Manager receive payoffs $(1-s)(1-\beta)p$ and $s(1-\beta)p + \beta p$, respectively.

Relative to the single-bidder case, the only difference is that the existence of competing bidders potentially increases the Manager's bargaining leverage with the Acquirer. There is a threshold of v_2, which we denote $\underline{v}(\bar{\beta}, s)$, above which the Manager's best outside option is to sell to Bidder 2 rather than the status quo. It is given by:

$$\underline{v}(\bar{\beta}, s) = \begin{cases} \underline{v}(\bar{\beta}) & \text{if} \quad s > 0.5 \\ \max\{\underline{v}(\bar{\beta}), 1+b\} & \text{if} \quad s \leq 0.5 \end{cases}, \tag{4}$$

where $\underline{v}(\bar{\beta})$ is as defined in Proposition 3. We now have:

Proposition 8. *Under the anti-self-dealing norm with competition:*

1. *If $v_2 > \underline{v}(\bar{\beta}, s)$ then competition increases the price paid by the Acquirer and:*
   - *(a) If $s > 0.5$, or $s \leq 0.5$ and $v_2 \geq \frac{1}{1-\bar{\beta}}$, then the Shareholder receives $(1-s)(1-\bar{\beta})\frac{mv_1+(1-m)[s(1-\bar{\beta})+\bar{\beta}]v_2}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$.*
   - *(b) If $s \leq 0.5$ and $v_2 < \frac{1}{1-\bar{\beta}}$ then:*
     - *i. If $v_1 \leq \frac{1}{m(1+\bar{\beta})} - \frac{1-m}{m}v_2$ then the Shareholder receives $1-s$, which is higher than the Shareholder's payoff would be with $s > 0.5$.*
     - *ii. If $v_1 > \frac{1}{m(1+\bar{\beta})} - \frac{1-m}{m}v_2$ then the Shareholder receives $(1-s)(1-\bar{\beta})\frac{mv_1+(1-m)[v_2-(1-s)]}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$, which is lower than the Shareholder's payoff would be with $s > 0.5$.*

2. *Competition and managerial bargaining power are substitutes: if* $v_2 > \underline{v}(\bar{\beta}, s)$ *then* $\frac{\partial^2 p^*}{\partial m \partial v_2} < 0$ *(where it exists).*

By driving up the price paid by the Acquirer, competition under the ASD norm generally increases the Shareholder's payoff. The Shareholder enjoys a portion of the increase in price, unlike in the statutory regime, since under the ASD norm the Shareholder gets at least a fixed fraction $(1-s)(1-\bar{\beta})$ of the deal price. The greater is the degree of competition to acquire the firm, the less the Manager's bargaining power m matters for the sale price, and vice-versa. That is, competition and managerial bargaining power are substitutes. But so long as competition is not perfect (i.e., $v_1 > v_2$) the Manager can play a potentially useful role in extracting surplus from the Acquirer by bargaining for a deal price that is greater than v_2.

The Shareholder's right to vote on a transaction is now a two-edged sword. On the one hand, it protects the Shareholder from transactions that would leave him worse off than in the status quo (part 1.(b)i. of the proposition). On the other hand, it can weaken the Manager's bargaining leverage vis-à-vis the Acquirer and thus reduce the Shareholder's payoff (part 1.(b)ii.). In particular, for $v_2 < \frac{1}{1-\bar{\beta}}$ the Shareholder would veto a sale to Bidder 2 at price $p = v_2$ and $\beta = \bar{\beta}$. In this case, the Manager's outside deal option is a sale to Bidder 2 at price $p = v_2$ with a β such that the Manager's payoff is $v_2 - (1-s)$, resulting in an equilibrium price that is strictly less than the equilibrium price in the absence of a shareholder vote. The shareholders' right to vote on the deal can thus backfire by undermining competition, harming shareholders.

So far we have assumed that bidders i differ only in their valuations v_i. The outcome could be worse, both for the Shareholder and in terms of ex post efficiency, if bidders also or exclusively differ in their ability to offer hidden side payments to the Manager, $\bar{\beta}_i$, as might well be the case in reality. In this case, and focusing for simplicity on $s > 0.5$ so that there is no shareholder vote, the maximum amount Bidder i would be willing and able to pay the Manager would be given by $\pi_i \equiv \left[s + (1-s)\,\bar{\beta}_i\right] v_i$, which is increasing in both v_i and $\bar{\beta}_i$.[25] The winning bidder would be the one who can offer the highest payment π_i to the Manager, which might not be the bidder with the highest valuation of the firm, v_i.[26] In particular, an ex-post-inefficient bidder might win based on an advantage in making side payments. In this case, on the margin competition is driven by variation in $\bar{\beta}_i$ rather than by variation in v_i. In addition to the resulting ex-post allocational inefficiency, the Shareholder would lose out on a greater fraction of the deal consideration as side payments to the Manager than could have been made in a transaction with the efficient acquirer, Bidder 1. The Manager's exclusive initiation rights play a crucial role in generating this problem by making each bidder's ability to make hidden side payments to the Manager a potentially key aspect on which bidders compete.

[25] In the case of $s \leq 0.5$, the expression is instead $\pi_i \equiv \left[s + (1-s)\min\{\bar{\beta}_i, 1 - \frac{1}{v_i}\}\right] v_i$.

[26] Let $A \equiv \operatorname{argmax}_i \pi_i$ denote the bidder willing to pay the most to the Manager and $B = \operatorname{argmax}_{i \neq A} \pi_i$ denote the bidder willing to pay the second most. This model of varying $\bar{\beta}_i$ is equivalent to the baseline model of competition with common $\bar{\beta}$ above except that Bidder A is now the Acquirer and Bidder B now represents the best alternative deal option to the Manager. The winning bidder A can have $v_A < v_1$, which is ex post inefficient; this can occur only if $\bar{\beta}_A > \bar{\beta}_1$.

3.2 The "no frustration" rule

So far we have assumed that the Manager has exclusive initiation rights and can block any offer made directly to shareholders. This represents the "empowered fiduciary" approach to protecting target shareholders' interests in control transactions. The anti-self-dealing norm attempts to align the incentives of that empowered fiduciary in bargaining on behalf of shareholders. A very different approach is to remove the Manager as middleman entirely and rely on bidder competition alone to further shareholder interests in control transactions. Indeed, some jurisdictions have adopted a "no frustration" rule that allows bidders to make competing offers directly to target shareholders without the consent of management. For example, the UK Takeover Code provides that "the board must not ... take any action which may result in any offer or bona fide possible offer being frustrated or in shareholders being denied the opportunity to decide on its merits ..."[27] As well, many U.S. legal scholars have long advocated for such a rule to be enforced as part of target managers' fiduciary duties (e.g., Gilson, 1981; Bebchuk, 2002), although that view has not prevailed. This case is also of conceptual interest because it helps reveal the extent to which target shareholders' predicament is due to the target manager's blocking power versus shareholders' inability to make counteroffers.

To model the no frustration rule, we assume that $s < 0.5$ and that $N > 1$ bidders make offers directly to the Shareholder, with the Manager's stake ultimately squeezed out at the winning price, so that the Manager cannot block a sale. Note that under the no frustration rule, allowing the bidders to make hidden side payments to the Manager would have no effect on the equilibrium outcome. Since bidders compete to be chosen by the *Shareholder*, not by the Manager, there would be no reason for any bidder to offer $\beta > 0$. Relatedly, this implies that there is no need to impose a separate ASD norm in addition to the no frustration rule.

It is natural to think of the competition among $N > 1$ bidders to acquire the firm as an English auction of competing tender offers to the Shareholder. Since the Shareholder must ultimately accept the winning offer for the deal to close, the Shareholder's status quo valuation acts as a reserve price. It is well known that in such an auction, the bidder with the highest valuation wins the auction at a price equal to the greater of the second-highest valuation and the reserve price (see, e.g., Krishna, 2009).[28] We thus now have the following result:

Proposition 9. *Under the no frustration rule with competition, the firm is sold if and only if* $v_1 \geq 1$ *at price* $p^* = \max\{v_2, 1\}$*, and the Shareholder receives* $(1 - s)\max\{v_2, 1\}$*.*

First, note that the no frustration rule is ex-post inefficient: this outcome implies a social loss of $1 + b - v_1 > 0$ for $v_1 \in [1, 1 + b)$, stemming from the Manager's loss of her private benefits of control. In other words, some of the "entrenchment" that the no frustration rule is avoiding is actually *ex-post efficient* entrenchment.

[27] UK Takeover Code, Rule 21.1.

[28] With symmetric information, as we have assumed, the equilibrium is not unique, but we think it is the most intuitive equilibrium. We omit the proof of Proposition 9 since it is simply an application of this well-known result in auction theory.

Consider now the outcome for the Shareholder. If $v_2 \leq 1$, there is effectively no competition. The game structure then reduces to a straightforward Ultimatum Game with the standard result: if and only if $v_1 \geq 1$, the Acquirer offers to buy the firm for $p^* = 1$ and the Shareholder accepts, giving the Shareholder only his status quo payoff, $1 - s$. In this case, relative to the statutory regime from Section 1, the removal of the Manager from the bargaining process has simply moved the Shareholder out of the frying pan and into the fire: he remains on the receiving end of a TIOLIO and gets no share of deal surplus.

But if $v_2 > 1$ so that there is effective competition, the Shareholder obtains positive deal surplus $(1 - s)(v_2 - 1)$. As is intuitive, the ability of *other* bidders to make offers helps mitigate the public shareholders' inability to make counteroffers. In turn, this implies that the Manager's ability to block any offer made directly to shareholders contributed to shareholders' predicament in the statutory regime from Section 1, in which they faced TIOLIOs from the Manager and received no surplus.

Consider now the comparison between the anti-self-dealing and no frustration regimes, which reflect quite different approaches to protecting shareholders. Which regime delivers a higher payoff to the Shareholder depends on how much additional surplus the Manager can extract if empowered to bargain—which depends on both the degree of competition and the Manager's bargaining power—and the cost to the Shareholder in terms of side payments and entrenchment. To show this, Figure 1 compares the payoffs the Shareholder obtains under the ASD and no frustration rules in (v_1, v_2)-space (holding other parameters constant).[29] To convey the effect of the Manager's bargaining power, m, on the comparison, we provide both a low-m and high-m scenario in panels (a) and (b), respectively.

Consider first the portion of the light-grey region above $v_1 = 1 + b$. In that region, competition is so strong that the no frustration rule outperforms the anti-self-dealing rule: for high enough v_2 relative to v_1, the Shareholder is better off getting $(1 - s)v_2$ under the no frustration rule than he is getting $(1 - \beta^*)(1 - s)p^*$ with the Manager bargaining on his behalf. Even though $p^* > v_2$, the loss of deal consideration in the form of side payments $\beta^* p^*$ results on net in a lower payoff to the Shareholder. Note that this happens even though $\bar{\beta}$ is the same for all bidders; the ASD rule could fare even worse with variable $\bar{\beta}_i$ as discussed at the end of section 3.1.

On the other hand, if competition is weak, then the no frustration rule would allow Bidder 1 to pocket the lion's share of the surplus. In that case, having a Manager who can bargain for a greater share of that surplus benefits the Shareholder, so long as the fraction diverted in side payments, $\bar{\beta}$, is not too high. That occurs in the dark-grey region. Intuitively, that region expands as the Manager's bargaining power increases, as reflected in panel (b). Finally, in the light-gray triangle for $v_1 < 1 + b$ and $v_2 > 1$, while under the no frustration rule the Shareholder profitably sells to Bidder 1 at a price greater than 1, the Manager would block this ex-post-inefficient sale under the ASD norm.

[29] In the figure we assume that $1 + b < \frac{1}{1-\bar{\beta}}$ (or equivalently $\bar{\beta} > \frac{b}{1+b}$) and that $\frac{1}{1-\bar{\beta}} < 1 + \frac{b}{s}$, but none of the results illustrated in the figure depends on these assumptions. We also assume that $s < 0.5$ so that under the no frustration rule the Manager cannot block a sale.

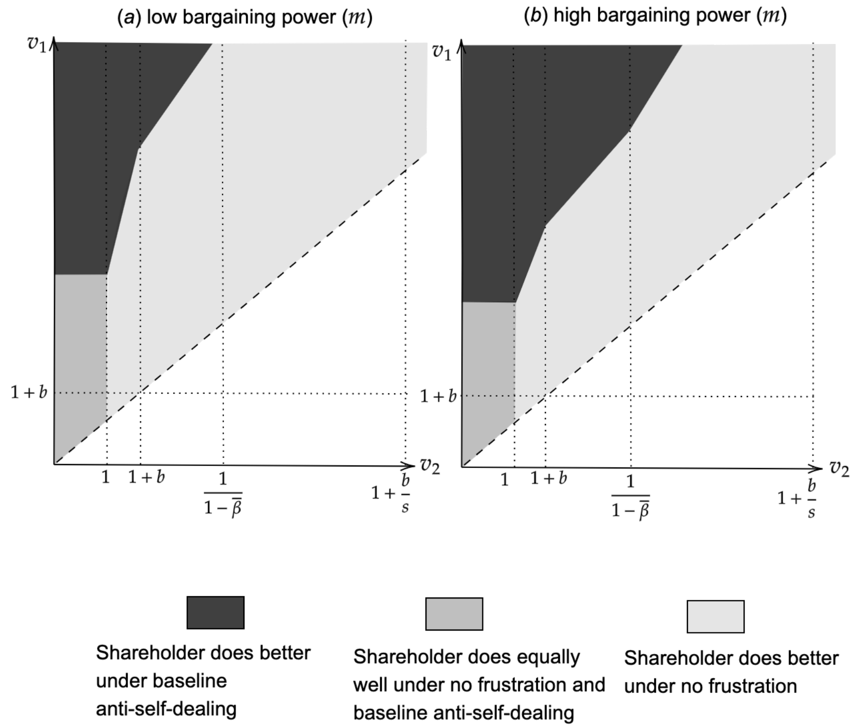

Figure 1: **Baseline anti-self-dealing vs. no frustration.**

3.3 ***Revlon*** **duties**

U.S. corporate law has introduced a qualified form of the no frustration rule through the interpretation of target managers' fiduciary duties under the *Revlon* decision.[30] Loosely speaking, *Revlon* duties require that *if* the target's managers agree to *a* sale, then a no frustration rule kicks in: the managers must accept the offer that gives the highest share price, effectively putting shareholders in the driver's seat in choosing *which* offer to accept. The *Revlon* regime retains an empowered fiduciary with exclusive initiation rights to bargain on behalf of shareholders and yet introduces a version of the no frustration rule to further constrain the Manager's ability to extract side payments. The potential promise of such a hybrid regime is that it might perform even better at protecting shareholders than either the ASD norm on its own or the no frustration rule. In positive law, *Revlon* supplements rather than replaces the ASD norm, so our "*Revlon* regime" model will combine both norms.

To model *Revlon*, we continue to focus on the case in which $s \leq 0.5$.[31] The basic setup is the

[30]Revlon, Inc. v. MacAndrews & Forbes Holdings, Inc., 506 A.2d 173 (Del. 1986).

[31]The case of $s > 0.5$ is a less natural context for the application of *Revlon* duties since it is not clear that a controlling shareholder would be forced to accept a topping bid rather than being able to reject it *qua* shareholder. In any event, the outcome in the case of $s > 0.5$ would be identical to the outcome with $s \leq 0.5$ whenever $v_2 \geq 1$ so that there is at least a minimal amount of competition, since in that case the *Revlon* constraint introduced below implies that the shareholder vote constraint is satisfied. And if instead $v_2 < 1$ then the outcome under *Revlon* with $s > 0.5$ would remain qualitatively similar to the outcome with $s \leq 0.5$ characterized below.

same as in the baseline anti-self-dealing regime considered in section 3.1 except for two changes. First, after the Manager reaches an initial deal with Bidder 1 (the "Acquirer") at stage 1, other bidders are able to make offers, with the Manager legally required to accept the deal that yields the highest "public" portion of the price, $(1-\beta)p$. The Manager can also skip negotiations and go straight to an auction of the firm. Second, the Manager's outside option in negotiating with the Acquirer at stage 1 is now just her status quo value, $s+b$. This captures in reduced form that, under *Revlon*, the Manager cannot credibly threaten to sell the company to another bidder with a lower valuation instead because, if the Manager attempted to do so, the Acquirer could simply offer the Shareholder $\epsilon > 0$ more than the most the lower valuing bidders would be willing to offer him, and the Manager would be forced to accept the Acquirer's offer. More specifically, the timing is now:

1. The Manager can either (1) run an auction to sell the firm, in which case play moves to stage 2; or (2) negotiate with the Acquirer over a sale of the company, including the total deal price, p, and the fraction of that price given as a side payment to the Manager, β, with the Manager's bargaining power relative to the Acquirer's equal to $m \in [0,1]$. If the parties do not reach an agreement, then the game ends with players receiving their status quo payoffs.

2. All bidders i (other than the Acquirer, if a tentative deal has been negotiated in stage 1) decide whether to make an offer and if so choose the price p_i and the fraction in a side payment to the Manager, β_i. Denote the offer (including any tentative deal with the Acquirer) with the highest price for the shares, $(1-\beta_i)p_i$, by p' and β'.

3. The Shareholder votes on whether to accept the offer of $(1-s)(1-\beta')p'$ and if the Shareholder votes no, then the game ends and the players receive their status quo payoffs.

4. If $\beta' > \bar{\beta}$, then the Shareholder decides whether to sue for breach of fiduciary duty and if so then the Shareholder and Manager receive payoffs $(1-s)(1-\bar{\beta})p'$ and $s(1-\bar{\beta})p' + \bar{\beta}p'$, respectively. Otherwise the proposal is implemented, and the Shareholder and Manager receive payoffs $(1-s)(1-\beta')p'$ and $s(1-\beta')p' + \beta'p'$, respectively.

First, note that if $v_2 \leq 1$ then any deal that the Shareholder would not veto could never be topped by another bidder at stage 2, since the most any other bidder would be willing to pay is less than the status quo value of the shares. In this case the *Revlon* regime reduces to the baseline anti-self-dealing model. If instead $v_2 > 1$ then the following proposition characterizes the outcome.

Proposition 10. *If $v_2 > 1$ then there is an essentially unique SPNE under* Revlon *such that:*

1. ***Entrenchment.***

   (a) *If $1 - \frac{v_2}{v_1} \geq \bar{\beta}$ then imposing* Revlon *duties has no effect on whether the firm is sold: the firm is sold if and only if $v_1 \geq \underline{v}(\bar{\beta})$.*

   (b) *If $1 - \frac{v_2}{v_1} < \bar{\beta}$, then imposing* Revlon *duties increases the threshold of v_1 for a sale: the firm is sold if and only if $v_1 \geq \underline{v}(1 - \frac{v_2}{v_1}) = (1-s)v_2 + s + b > \underline{v}(\bar{\beta})$.*

2. ***Deal terms.*** *There exist thresholds $v_2^R \equiv (1-\bar{\beta})\frac{[mv_1+(1-m)(s+b)]}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$ and $v_2^A \equiv \frac{mv_1+(1-m)(s+b)}{m+(1-m)s} \geq v_2^R$ such that in any sale:*

   (a) *If $v_2 \leq v_2^R$ then imposing* Revlon *duties does not restrict equilibrium side payments: the Manager negotiates a sale with the Acquirer for $p^* = \frac{mv+(1-m)(s+b)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$ with $\beta^* = \bar{\beta}$.*

   (b) *If $v_2 > v_2^R$ then imposing* Revlon *duties restricts equilibrium side payments: $\beta^* < \bar{\beta}$, the Shareholder receives a payoff of $(1-s)v_2$, and*

      i. *If $v_2 \in (v_2^R, v_2^A]$ then the Manager negotiates a sale with the Acquirer for $p^* = mv_1 + (1-m)[(1-s)v_2 + s + b]$ with β^* decreasing monotonically in v_2 to $\beta^* = 0$ at $v_2 = v_2^A$.*

      ii. *If $v_2 > v_2^A$ then the Manager forgoes negotiations and runs an auction in which the firm is sold to the Acquirer for $p^* = v_2$ with $\beta^* = 0$.*

Revlon duties introduce a new constraint on the ability of the Manager to extract side payments in a sale: in order to survive competition from Bidder 2, any deal with the Acquirer must give the Shareholder more than Bidder 2 would be willing to pay, which requires $(1-s)(1-\beta)p \geq (1-s)v_2$, or $\beta < 1 - \frac{v_2}{p}$. This "*Revlon* constraint" on β gets tighter as v_2 increases, *ceteris paribus*, since v_2 measures the most a competing bidder would offer in a potential topping bid. But this constraint on side payments comes at the potential cost of increased entrenchment since it reduces the Manager's incentive to sell. For there to be a deal, it must be feasible to give the Manager a sufficiently high β in a sale for the maximum price the Acquirer is willing to pay, $p = v_1$, so that the Manager receives a higher payoff than her outside option. If $1 - \frac{v_2}{v_1} > \bar{\beta}$ then it is the ASD constraint (i.e., $\beta \leq \bar{\beta}$), and not the *Revlon* constraint, that determines the maximum feasible β. In this case imposing *Revlon* duties does not change the amount of entrenchment relative to the baseline ASD regime. But if the degree of competition is sufficiently great (measured by how close v_2 is to v_1) such that $1-\frac{v_2}{v_1} < \bar{\beta}$, then it is the *Revlon* constraint that limits the maximum feasible β. In this case imposing *Revlon* duties increases the threshold of v_1 for a sale to $(1-s)v_2+s+b$. This threshold itself is increasing in v_2. Note that, unlike in the baseline ASD model, here increasing competition can harm the Shareholder by inducing entrenchment. The worst-case scenario, in terms of the prospects of entrenchment, would be if $v_2 = v_1$ so that β must be zero, in which case the deal condition becomes $v_1 \geq 1 + b/s$.

The threat of a topping bid also shapes the equilibrium deal terms through two mechanisms: (1) by constraining the fraction of side payments the Manager can extract in equilibrium, β^*; and (2) by lowering the Manager's outside option. If v_2 is less than the "public" price for the shares that the Acquirer and Manager negotiate based on the ASD constraint, given by $(1-\bar{\beta})\frac{[mv_1+(1-m)(s+b)]}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]} \equiv v_2^R$, then the first mechanism is not operative: it is the ASD constraint, and not the *Revlon* constraint, that determines β^*. With v_2 so low, Bidder 2 cannot profitably top the negotiated deal with the Acquirer. However, in this case the second mechanism results in a lower deal price. In particular, the deal price is the same as what the Acquirer would pay in the baseline ASD regime *without* competition. The reason is that *Revlon* makes non-credible the Manager's threat to instead strike a deal with Bidder 2 and thereby limits the Manager's bargaining leverage, as discussed above.

In contrast, if $v_2 > v_2^R$ then the *Revlon* constraint binds so that β^* is pushed below $\bar{\beta}$. In other words, the Manager's *Revlon* duties are in effect enforcing the ASD norm so that the ability of the courts to police it directly (captured by $\bar{\beta}$) is no longer relevant. So long as *Revlon* does not induce entrenchment, this reduction in side payments increases the Shareholder's payoff. Relatedly, in the alternative model of bidder competition in which different bidders have different $\bar{\beta}_i$'s (analyzed at the end of section 3.1), *Revlon* duties would ensure that the bidder with the highest v_i acquires the firm.[32] When the *Revlon* constraint binds, the Manager plays no useful role in bargaining on behalf of the Shareholder, since then the Shareholder's payoff, $(1-s)\,v_2$, is no longer a function of the Manager's bargaining power, m, or her outside option and is determined only by the *Revlon* constraint.

If $v_2 \in (v_2^R, v_2^A]$ then the terms of the equilibrium deal are still set by bargaining between the Acquirer and the Manager—but the Manager is negotiating only for herself. In this region, the Manager and the Acquirer negotiate exclusively, with the Manager's outside option being to "just say no" and to continue to defend the corporate bastion. Here, increasing v_2 *lowers* the payoff to the Manager because it increases the amount that must be paid to the Shareholder. This may explain why target managers often appear hostile to competing bids.

Once v_2 rises above v_2^A, however, the Manager does better simply auctioning off the firm to the highest bidder rather than negotiating based on her outside option of the status quo. At this level of competition, the Manager's interests—and the sale process—fundamentally change. The Manager becomes an auctioneer, with incentives to foster as much competition as possible because it is driving up her payoff even though she can no longer extract side-payments.

Interestingly, so long as $v_2 > 1$ (i.e., another bidder is willing to pay at least the status quo value of the shares) the outcome under *Revlon* would be the same even if the Shareholder had no right to veto the transaction at stage 3. The reason is that any deal with the Acquirer that could survive competition from other bidders at stage 2 would then provide a sufficiently high payoff to

[32]To see why, suppose the Manager negotiated a deal with a bidder with $v_i < v_1$. That deal would ultimately be subject to a topping bid from Bidder 1, which *Revlon* would require the Manager to accept. This provides another way in which imposing *Revlon* duties can lower side payments, by forcing the Manager to sell to Bidder 1 instead of Bidder A when Bidder 1 is less able to hide side payments than is Bidder A (i.e., $\bar{\beta}_1 < \bar{\beta}_A$).

the Shareholder that the Shareholder would vote in favor, so that competition under *Revlon* is a full substitute for the protection given by shareholder voting rights.

We have assumed that the Manager's and the Acquirer's outside option in bargaining in stage 1 is the status quo even in the case in which $sv_2 > s + b$ so that the Manager would do better than the status quo by running an auction. Put differently, we have implicitly assumed that, in initiating negotiations with the Acquirer, the Manager can commit to remaining in the status quo if bargaining breaks down. This strikes us as a plausible reduced form model of the bargaining environment under *Revlon*, which generally allows management to "just say no" and remain independent. While the Manager can no longer threaten the Acquirer with selling instead to Bidder 2, she has an incentive to convince the Acquirer that she will stick to the status quo unless the Acquirer pays enough.

For some targets, however, this assumption that the Manager can effectively commit to stay independent is implausible—consider for example a firm that has been publicly trying to sell itself—but this assumption is not critical for our basic results. If instead the Manager lacks any commitment power then she will run an auction following bargaining breakdown if and only if her auction payoff is higher than the status quo, i.e., $sv_2 > s + b$. In this case, whenever that condition holds, the Acquirer would not agree to any sale for $p > v_2$, and the only possible bargaining outcome would be $p = v_2$ and $\beta = 0$. As a result, the only change to the characterization of the equilibrium outcome in Proposition 10 under this alternative assumption would be that the lower bound of v_2 that defines when the firm is sold by auction would be lower, namely at $v_2 = 1 + b/s$. In other words, under this alternative modeling assumption, the Manager would be unable to bargain for additional surplus above the auction outcome whenever at least two bidders would be willing to pay the Manager more than her status quo payoff. You can think of our baseline assumption of commitment as simply allowing for greater bargaining ability by the Manager. We are implicitly assuming that for a sufficiently high degree of bargaining power m, the Manager can extract additional surplus from the Acquirer above the auction price even when $v_2 > 1 + b/s$. Note as well that, under our commitment assumption, if the Manager has no bargaining power (i.e., $m = 0$), then we do indeed get $p = v_2$ and $\beta = 0$ whenever $v_2 > 1 + b/s$. As m rises, however, this outcome happens at gradually higher values of v_2. It is as if the more bargaining power the Manager has, the higher the temptation from the auction has to be before she caves and calls the auction.

Our model of course elides some of the subtleties of *Revlon* that occupy practitioners and courts, but these simplifying assumptions are not critical to our analysis. For example, we do not explicitly model the "deal protections" that Managers and Acquirers put into their agreements, be it to further the goals of *Revlon* (e.g., to establish a good reserve price in the ensuing auction or to draw in the stalking horse) or to counteract them (e.g., to rig the auction). The first kind is captured in reduced form by m, while the latter kind would simply modestly lower the effectiveness of *Revlon* without qualitatively changing our results. Similarly, we do not allow the Acquirer to improve their offer in stage 2, which might deter other bidders to emerge in the first place (assuming, realistically, that bids are costly). But again, while this might dampen the impact of *Revlon*, nothing fundamental depends on ignoring this possibility.

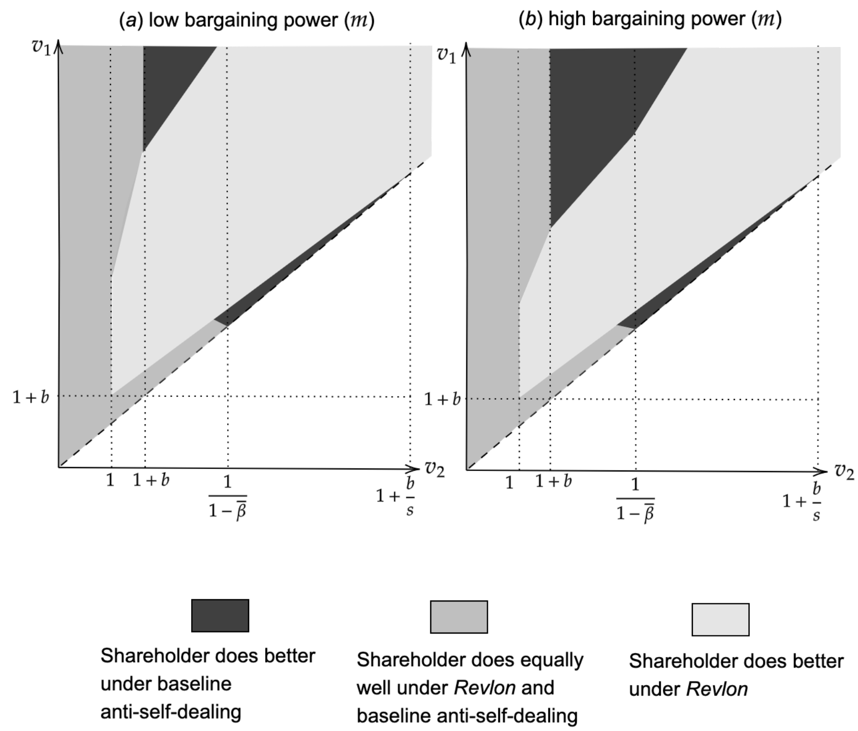

Figure 2: **Baseline anti-self-dealing v. *Revlon*.**

To summarize the results so far, effective competition under *Revlon* limits the ability of the Manager to extract side payments and obviates the need for shareholders to have (1) a vote; (2) direct judicial enforcement of the anti-self dealing norm; or (3) the Manager bargain on their behalf. But it does so at the potential cost of (1) increased entrenchment and (2) lower deal prices. Given these tradeoffs, the Shareholder's payoff might be greater under either the baseline anti-self-dealing regime or the *Revlon* regime, depending on v_1, v_2, and the other parameters. Figure 2 provides the comparison in (v_1, v_2)-space.[33] We focus on the case in which $s \leq 0.5$ to emphasize the incremental effect of *Revlon* duties on top of the shareholder vote.

Focus first on the dark-grey region in the upper part of each panel. If the level of competition (measured by how close v_2 is to v_1) is high enough to drive up the price in the baseline anti-self-dealing regime, but not high enough to constrain β^* below $\bar{\beta}$ under *Revlon*, then the Shareholder does better under the baseline anti-self-dealing norm. In this case, *Revlon* has costs, in terms of undercutting the Manager's bargaining leverage, but no benefits in terms of constraining side payments. But as competition increases, the benefits of *Revlon* in limiting self dealing kick in,

[33] In the figure we assume that $\frac{1}{1-\bar{\beta}} < 1 + \frac{b}{s}$, which is critical for the result that the entrenchment induced by *Revlon* can reduce the Shareholder's payoffs. Under that assumption, there are sales that would have left the Shareholder with more than $(1-s)$ under the baseline ASD regime that would instead result in entrenchment under *Revlon*. If instead $\frac{1}{1-\bar{\beta}} \geq 1 + \frac{b}{s}$ then any deal deterred by *Revlon* would have delivered to the Shareholder only the status quo payoff under ASD. In contrast, none of the results illustrated in the figure depends on our assumption that $1 + b < \frac{1}{1-\bar{\beta}}$.

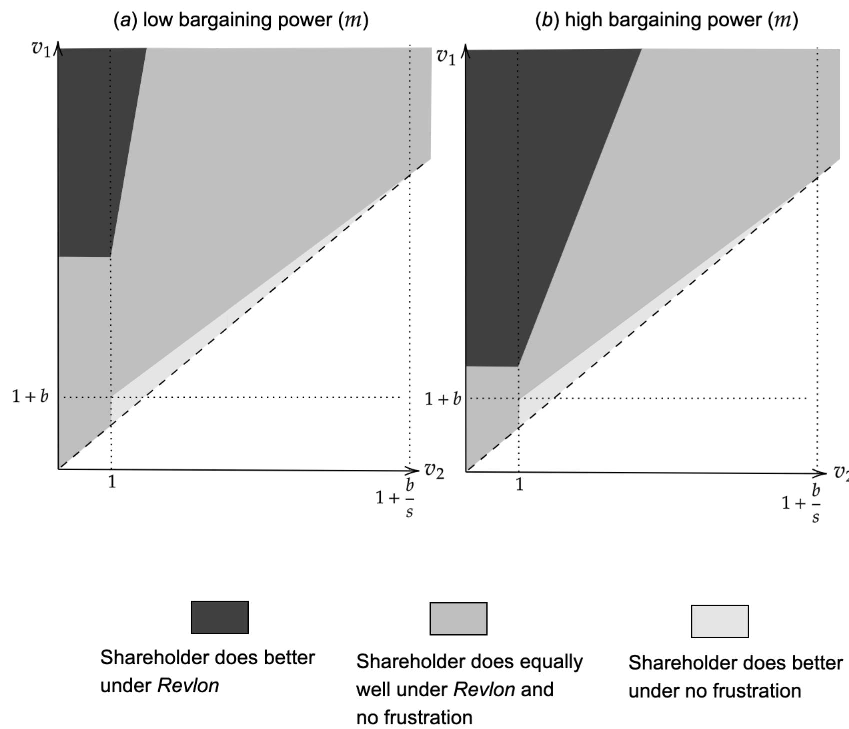

Figure 3: ***Revlon* v. no frustration.**

eventually to the degree that they outweigh its costs. This is represented by the light-grey region in the figure. Note that the dark-grey region expands, and the light-grey region shrinks, moving from the low-m panel to the high-m panel, since the advantage of the baseline anti-self-dealing regime over the *Revlon* regime stems from bargaining by the Manager. But the reduction in β^* caused by *Revlon* can ultimately hurt the Shareholder by deterring the Manager from selling if $v_1 < 1 + b/s$. This entrenchment effect is represented by the dark-grey triangle along the 45-degree line, in which the firm would be sold under anti-self-dealing, with the Shareholder getting a portion of the deal surplus, but the Manager would refuse to sell under *Revlon*.

Throughout the light-grey region of Figure 2, the Shareholder's payoff under *Revlon* is $(1-s)v_2$, which is the same as his payoff would be under the no frustration rule, reflecting that *Revlon* represents a qualified form of the no frustration rule. Consider then the comparison between the empowered fiduciary approach under *Revlon* and the unqualified no frustration rule from section 3.2, illustrated in Figure 3. Consider first the case where $v_2 > 1$. If v_2 is high enough that the *Revlon* constraint binds (i.e., $v_2 > v_2^R$ in Proposition 10), then the Shareholder receives the same payoff in any deal under *Revlon* as he would under the no frustration rule, namely $(1 - s)v_2$. That region is shaded in medium grey. This reflects a fundamental parallel between the two regimes, both of which enable potential bidders to in effect make offers directly to shareholders. But under *Revlon*, the Manager remains an empowered fiduciary free to just say no to any deal. This has two key implications. First, a disadvantage of *Revlon* is that it poses a risk of entrenchment—that occurs in the light-grey region. But second, an advantage of the *Revlon* regime is that it can enable the Manager to bargain for a better price from the Acquirer than the Shareholder would receive under the no frustration rule. This is represented in the dark-grey region, which expands as the Manager's bargaining power increases.

4 Discussion

We turn now to a discussion of a few issues related to the interpretation of our models and of some of our key assumptions.

4.1 Private vs. public ordering

Our theoretical framework was designed to shed light on the function of takeover law contained in statutes and in the caselaw on fiduciary duties, but it also applies to norms the parties could agree to by contract. For example, our model of the anti-self-dealing norm can be thought of as capturing an agreement between the Manager and the public shareholders, represented by the capital structure of the firm, to a particular division of deal consideration in the case of a sale of the company. Whatever the source of the anti-self-dealing norm, public or private, it is subject to difficulties with enforcement, which we model by assuming that up to a fraction $\bar{\beta}$ of the deal consideration can be tunneled as a hidden side payment to the Manager, undetectable by a court. Alternatively, one could interpret $\bar{\beta}$ as itself a product of private ordering. For example, it could represent a golden parachute provision agreed to by the Manager and the Shareholder ex ante.

4.2 The role of private benefits

The Manager's private benefits play a subtle role in our analysis: while most individual results do not hinge on them, it is ultimately the presence of private benefits that prevents the first-best solution. Specifically, suppose that

1. $b = 0$, i.e., the Manager gets no private benefits in the status quo; and
2. $\bar{\beta} = 0$, i.e., the ASD norm can prevent any private deal benefits from going to the Manager.

In that case, the ASD norm would implement the first-best. Ex post, the Manager's incentives to initiate a deal would be perfectly aligned with the Shareholder's interests since $\bar{\beta} = \frac{b}{1+b}$. Ex ante, the Shareholder could be assured to receive all of the social value created by their investment, if necessary, by setting $s = 0$. In the absence of these two forms of private benefits then, takeovers simply do not pose a corporate governance problem that cannot be fully addressed by the relatively simple ASD norm, which is part of current law. However, like most commentators, we believe that private benefits are, in fact, a key feature of corporate life in general and deal-making in particular.

In any event, our analysis remains meaningful even if there are no private benefits in the sense just described. At a minimum, our analysis shows why the statutory regime is insufficient to maximize ex ante welfare. Moreover, our analysis of *Corwin* and *MFW* identifies the danger that details of the legal regime can end-run the protections facially provided by the ASD norm. Ultimately, the most important insights of our analysis are about the role of the bargaining structure, particularly shareholders' inability to make counteroffers, which we discuss next.

4.3 Private-ordering solutions to public shareholders' collective action problem

A critical assumption of our analysis is that dispersed public shareholders cannot make counteroffers and as a result are vulnerable to what are effectively take-it-or-leave-it offers. This assumption drives the result of the statutory baseline model that public shareholders receive only their status quo value and no share of the deal surplus. It also plays a role in our models of fiduciary duties. This assumption limits much of our analysis to public companies with dispersed public shareholders or, in the case of a controlled public company, with dispersed minority shareholders.

Reality is of course more complicated, including because there exist private-ordering institutions that might mitigate public shareholders' bargaining predicament. Consider, for example, intermediation by institutional investors, who now hold a majority of the shares of most publicly traded firms. Their concentrated holdings and the fact that they are repeat players may help them mitigate some of the problems faced by shareholders in our model. However, negotiating effectively requires coordination, obtaining and processing information, maintaining secrecy, and making credible threats (Kahan and Rock, 2003). Institutional investors are unlikely to be able to do so for various reasons, including their concern about forming a group under Rule 13D, agency problems between the institutional investors and the beneficial owners, and standard collective action costs. In our view such private-ordering institutions do not function well enough to obviate the need for legal institutions such as fiduciary duties as a mechanism for increasing the amount of surplus that goes to public shareholders.

5 Conclusion

We conclude by emphasizing a recurring theme and key normative payoff of our analysis: the ineffectiveness or even perverse effects of public shareholders' right to vote on control transactions.

First, in our baseline model of the statutory regime, the shareholder vote was effective at securing for shareholders only the value of their claims in the status quo and not any share in the deal surplus. The ineffectiveness of the shareholder vote in the baseline model results from shareholders' inability to make counteroffers, which leaves them in a precarious bargaining position, vulnerable to take-it-or-leave-it offers, and we showed moreover that the resulting outcome is socially undesirable from an ex-ante efficiency perspective.

Second, in our model of the anti-self-dealing norm, we showed that if the fraction of deal consideration that can be paid as a hidden side payment to the Manager is set optimally, then in a setting with only a single bidder, whether shareholders get to vote on the transaction has no effect on the outcome. The reason is that a socially optimal anti-self-dealing norm would deliver a sufficient share of deal surplus to shareholders so that the shareholder vote would never be binding;

shareholders would happily agree to any equilibrium deal.

But third, if there is competition among competing bidders, then adding the shareholder vote to the anti-self-dealing norm can actually be counterproductive, *lowering* shareholders' payoffs. The reason is that the shareholder vote can weaken target manager's bargaining leverage with the acquirer by making threats to sell to an alternative bidder non-credible. And a similar result obtains in our model of *Revlon* duties, which effectively make shareholders "the deciders" once target managers initiate a sale.

Finally, we showed that treating shareholder approval as *cleansing* a transaction completely unravels the effectiveness of the anti-self-dealing norm. The reason echoes our analysis of the baseline model of the statutory regime: it results in shareholders facing what is effectively a take-it-or-leave-it offer of a deal that violates the anti-self-dealing norm, which forces shareholders down to their status quo payoff. But moreover, this result only obtains in the case in which shareholder approval is necessary for *any* transaction to go forward. We showed that in the case of a controlled corporation, the ability of the controller to implement a deal unilaterally enables public shareholders to effectively call the controller's bluff by declining to ratify a deal that gives them less than they are legally entitled to.

In contrast to the ineffectiveness (or worse) of the shareholder vote, we show that the form of shareholder rights that *is* effective at delivering deal surplus to public shareholders stems from target managers' fiduciary duties, enforced through shareholder suits brought for monetary relief. Such suits are much less susceptible to the inability of shareholders to make counteroffers, which calls into question recent trends in corporate jurisprudence cutting back on merger litigation and relying instead on the shareholder vote as a sufficient protection of shareholder interests.

More fundamentally, our analysis calls into question even the *existence* of shareholder approval rights in control transactions. A core feature of the corporate form is the centralization of control in the board of directors and hired managers. Shareholders generally do not get a vote on operational matters. Viewed in this way, shareholder voting rights on corporate acquisitions are anomalous. Our functional analysis suggests that, on closer inspection, they may also be unjustifiable.

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Appendix

Proof of Proposition 1

The proof is by backwards induction.

At stage 4, the Shareholder will seek appraisal if and only if doing so makes him better off, or $a < 1 - s$, where in the interest of brevity we arbitrarily resolve the tie in favor of not seeking appraisal and similarly resolve ties one way or another throughout the paper without further comment when it has no substantive effect on the analysis.

At stage 3, if $s > 0.5$ the Shareholder will similarly vote no and perfect his appraisal right at stage 4 if $a < 1 - s$ (and if instead $a \geq 1 - s$ then it does not matter whether the Shareholder votes no to perfect his appraisal right since he will not seek appraisal). If $s \leq 0.5$ then the Shareholder will approve the deal if and only if $a \geq 1 - s$.

A stage 2, if $s > 0.5$ then the Manager's best response is to offer any $a \leq 1 - s$, anticipating that the Shareholder will seek appraisal for $a < 1 - s$ so that the equilibrium payoff to the Manager is $p - (1 - s)$. The Manager will not offer $a > 1 - s$ since doing so would lower the Manager's payoff. If instead $s \leq 0.5$, then if $p \geq 1 + b$, the Manager's best response is to offer $a = 1 - s$ to secure Shareholder approval at stage 3 at the lowest possible cost, which yields the Manager a payoff $p - (1 - s)$, which is greater than her payoff in the status quo of $s + b$. If instead $p < 1 + b$ then the Manager's best response is to offer $a < 1 - s$ to induce the Shareholder to reject the deal at stage 3, since in this case a deal with $a = 1 - s$ would make the Manager worse off than she is in the status quo.

Finally, at stage 1, the Manager and the Acquirer will anticipate that the Shareholder must be paid $1 - s$ in any deal, given the Shareholder's equilibrium play at stages 3 and 4. The deal surplus between the Manager and the Acquirer is thus given by $v - (1 - s) - (s + b) = v - (1 + b)$. This surplus will be non-negative—and hence there will be a sale—if and only if $v \geq 1 + b$. The bargain will be at price p^* such that $p^* - (1 - s) = (s + b) + m(v - (1 + b)) \Leftrightarrow p^* = mv + (1 - m)(1 + b)$. $\square$

Proof of Proposition 2

To prove the proposition, we will show that it holds for small positive k.

For ease of exposition, we will write $\underline{v}\,(s|k)$ for the deal threshold, i.e., the threshold such that there will be a deal if and only if $v \geq \underline{v}\,(s|k)$. We briefly show that such a threshold always exists, at least for k in an open ball around zero. From the Acquirer's and the Manager's payoff functions and bargaining protocol, it is clear that they will do a deal if and only if their joint surplus is non-negative: $v - a^*\,(s, v) - k - (s + b) \geq 0$. Note first that if this relation holds with equality for some value of v, v', then the assumption $\partial a^*/\partial v < 1$ implies that the inequality is strict for all $v > v'$ and does not hold for $v < v'$. For $k = 0$ (and any s), the non-negative-surplus condition must hold with equality for $v = 1 + b$ by the assumption that $a^*\,(s, v)$ is ex post efficient because ex post efficiency requires

$$v - a^*\,(s, v) - (s + b) \begin{cases} \geq 0 & v \geq 1 + b \\ \leq 0 & v < 1 + b \end{cases} \tag{5}$$

and thus, by continuity of $a^*(s, v)$, $1 + b - a^*\,(s, 1 + b) - (s + b) = 0$ (which, incidentally, implies $a^*\,(s, 1 + b) = 1 - s$), and $\underline{v}\,(s|0) = 1 + b$. Let the function $\underline{v}(s|k)$ be implicitly defined by $\underline{v}(s|k) - a^*\,(s, v) - k - (s + b) = 0$. Existence of $\underline{v}\,(s|k)$ as a continously differentiable function of k and s in an open ball about $k = 0$ (and, again, for any s) then follows from the implicit function theorem, since $\frac{\partial a^*(s,v)}{\partial v} < 1$ implies that $\frac{\partial}{\partial v}[v - a^*(s,v) - k - (s+b)] \neq 0$.

The proof of the second part of the proposition—ex post inefficiency for $k > 0$—is now immediate. We just established that the equation $1 + b - a^*(s, 1+b) - k - (s+b) = 0$ must hold for any ex post efficient sharing rule $a^*(s, v|k)$, and that it does hold at $k = 0$. But if it holds at $k = 0$, it cannot hold at $k \neq 0$.

To prove the first part of the proposition—that there exists $k > 0$ such that $a^*(s, v|k)$ is more ex-ante efficient than $a^*(s, v)$—we will find a differentiable expression for the ex ante expected value of corporations, including managers' private benefits and any surplus captured by acquirers, under sharing rule $a^*(s, v|k)$ as a function of k, $EV(k)$, and show that its derivative is positive at $k = 0$. Let $W(k; o, i)$ be the ex ante expected value generated by any firm that does get funded for given k, o, i. Let $\bar{i}(o|k)$ be the highest level of required investment i that gets funded for given o and k (we will show below that such a cut-off level always exists). The overall ex ante expected value of corporations as a function of k can then be written

$$EV(k) \equiv \int_0^\infty \int_0^{\bar{i}(o|k)} W(k; o, i) f(o, i)\, di do.$$

The derivative of $EV(k)$ with respect to k evaluated at $k = 0$, if it exists, is:

$$\left.\frac{dEV(k)}{dk}\right|_{k=0} = \int_0^\infty \left\{ \left.\frac{d\bar{i}(o|k)}{dk}\right|_{k=0} W(0; o, \bar{i}(o|0)) f(o, \bar{i}(o|0)) + \int_0^{\bar{i}(o|0)} \left.\frac{dW}{dk}(k; o, i)\right|_{k=0} f(o, i) di \right\} do. \tag{6}$$

There are two components to this expression, one related to ex-ante financing incentives and one related to ex-post efficiency of the market for corporate control. In particular, the first summand inside the curly brackets stems from the resulting change in the maximum investment cost i that can be financed ex-ante for each o, $\frac{d\bar{i}(o|k)}{dk}$. The second summand stems from the change in the ex-post gross social value of firms, holding fixed which firms get funded, from shifting deal surplus to the Shareholder, $\frac{dW}{dk}(k; o, i)$.

We will show that this derivative $\left.\frac{dEV(k)}{dk}\right|_{k=0}$ exists and is strictly positive. In particular, we will show that the second summand in (6) is zero by the assumption that $a^*(s, v|k = 0)$ is ex-post efficient. If we knew $W(k; o, i)$ to be differentiable at $k = 0$ this would follow immediately from the first-order condition for ex-post efficiency, $\left.\frac{dW}{dk}(k; o, i)\right|_{k=0} = 0$. This result can also be viewed through the lens of the envelope theorem. In calculating the effect of increasing k from $k = 0$ on social efficiency one can ignore the effect through changing $\underline{v}$ because $\underline{v}$ is set socially optimally when $k = 0$. Intuitively, $\underline{v}(s|0)$ is at the peak of the social objective function where it is flat so that small changes in $\underline{v}$ have no first-order effect on the objective function. In other words, the marginal sale deterred by forcing the Manager to surrender more deal surplus has no social value, given ex post efficiency of $a^*(s, v)$. In contrast, we will show that the first summand is positive because the greater surplus received by the Shareholder in sales of the firm enables the Manager to pledge a larger part of firm value to the Shareholder and thus to finance higher levels of ex-ante investment.

We now show rigorously that $\bar{i}(o|k)$ and $W(k; o, i)$ are indeed differentiable w.r.t. k at $k = 0$, and that (6) is indeed positive.

We begin with differentiability of W. To show this, define

$$W_{\underline{v}}\left(\underline{v};o,i\right)\equiv G\left(\underline{v}\right)\left(1+b\right)+\int_{\underline{v}}^{\infty}vg\left(v\right)dv-i-o$$

and let $s^{*}\left(k\right)$ be the s contractually chosen by Manager and Shareholder for given k (and i and o, which we omit for readability) in the solution to the contracting problem given in equations (3) - (MPC) in the main text. Then we can write

$$W\left(k;o,i\right)=W_{\underline{v}}\left(\underline{v}\left(s^{*}\left(k\right)|k\right);o,i\right).$$

The only potential source of non-differentiability here is $s^{*}\left(k\right)$; $W_{\underline{v}}$ is clearly differentiable in $\underline{v}$ and we have shown above that $\underline{v}\left(s|k\right)$ is differentiable in s and k). We sidestep $s^{*}\left(k\right)$ and directly prove differentiability of $W\left(k;o,i\right)$—specifically $\left.\frac{dW(k;o,i)}{dk}\right|_{k=0}=0$—by bounding $W\left(k;o,i\right)$ above and below in a $\delta-$ball around $k=0$ by differentiable functions $\overline{W}\left(k;o,i\right)\equiv W_{\underline{v}}\left(1+b+kc;o,i\right)$ and $\underline{W}\left(k;o,i\right)\equiv W_{\underline{v}}\left(1+b+kC;o,i\right)$, c and C constants such that $C\geq\frac{\underline{v}(s^{*}(k)|k)-(1+b)}{k}\geq c\,\forall k\in\left(-\delta,\delta\right)\smallsetminus0$, each of which has derivative zero at $k=0$.[34] Such constants C,c exist because $\frac{\underline{v}(s^{*}(k)|k)-(1+b)}{k}$ is bounded in an open ball around $k=0$, which in turn follows from $\underline{v}\left(s|0\right)=\left(1+b\right)\forall s$ and differentiability of $\underline{v}\left(s|k\right)$ in an open ball around $k=0$, which we showed above.[35] By construction, $\overline{W}\left(0;\cdot,\cdot\right)=\underline{W}\left(0;\cdot,\cdot\right)=W_{\underline{v}}\left(1+b;\cdot,\cdot\right)=W\left(0;\cdot,\cdot\right)$, $\underline{W}\left(k;\cdot,\cdot\right)\leq W\left(k;\cdot,\cdot\right)\leq\overline{W}\left(k;\cdot,\cdot\right)\,\forall k\in\left(-\delta,\delta\right)\smallsetminus0$[36], and $\frac{d\overline{W}}{dk}\left(0;\cdot,\cdot\right)=\frac{d\underline{W}}{dk}\left(0;\cdot,\cdot\right)=0$.[37] It follows that $W\left(k;o,i\right)$ is indeed differentiable at $k=0$, and specifically that $\left.\frac{dW(k;\cdot,\cdot)}{dk}\right|_{k=0}=0$, the first-order condition for the ex-post efficiency of $a^{*}(s,v|k=0)$, as we observed above.[38]

Next, we show that $\left.\frac{d\bar{i}(o|k)}{dk}\right|_{k=0}$ exists. To find $\bar{i}(o|k)$ we characterize the Manager's and Shareholder's decision to start a firm for any pair (o,i). The Shareholder pays $T\geq i$ to the Manager in exchange for a share $1-s$ of the firm's cash flows, and the Manager in turn pays the investment cost i to establish the firm. The Manager's and Shareholder's expected gross returns from the firm

[34] Geometrically, $1+b+kc$ and $1+b+kC$ define a double-cone through $\left(0,1+b\right)$ in which $\underline{v}\left(s^{*}\left(k\right)|k\right)$ must lie. If $s^{*}\left(k\right)$ is not single-valued, i.e., not a function of k, all the arguments in this step 1 can be straightforwardly generalized to a set-valued $s^{*}\left(k\right)$ by taking the max and min over $s^{*}\left(k\right)$ of any function of $s^{*}\left(k\right)$. We do not write this out for readability.

[35] To spell this out: By definition, differentiability of $\underline{v}\left(s|k\right)$ w.r.t. k implies that for any $\epsilon>0$ and any s, there exists $\delta'>0$ such that for all $k\in\left(-\delta',\delta'\right)\smallsetminus0$, $\left|\frac{\underline{v}(s|k)-\underline{v}(s|0)}{k}-\frac{\partial\underline{v}}{\partial k}\left(s|0\right)\right|<\epsilon$. Also, $\underline{v}\left(s|0\right)=\left(1+b\right)$. Thus for any $\epsilon>0$, there exists

$$\delta=\inf_{s\in[0,1]}\sup_{\delta'>0}\left\{\delta':\left|\frac{\underline{v}\left(s|k\right)-\left(1+b\right)}{k}-\frac{\partial\underline{v}}{\partial k}\left(s,0\right)\right|<\epsilon\forall k\in\left(-\delta',\delta'\right)\smallsetminus0\right\}>0.$$

Consequently, $\frac{\underline{v}\left(s^{*}(k)|k\right)-(1+b)}{k}\in\left(\min_{s}\frac{\partial\underline{v}}{\partial k}\left(s,0\right)-\epsilon,\max_{s}\frac{\partial\underline{v}}{\partial k}\left(s,0\right)+\epsilon\right)\forall k\in\left(-\delta,\delta\right)\smallsetminus0$.

[36] By construction, $1+b+kc\geq\underline{v}\left(s^{*}\left(k\right)|k\right)\geq1+b+kC$ for $k\leq0$ and inversely for $k\geq0$. This implies the bounds because $\frac{dW_{\underline{v}}}{d\underline{v}}\gtreqless0$ for $\underline{v}\lesseqgtr1+b$ and $\underline{v}\left(s|k\right)\lesseqgtr1+b$ for $k\lesseqgtr0$.

[37] To spell this out for $\underline{W}$: $\frac{d\underline{W}}{dk}\left(0;\cdot,\cdot\right)=C\cdot\frac{dW_{\underline{v}}}{d\underline{v}}\left(1+b;\cdot,\cdot\right)=C\left\{g\left(1+b\right)\left[\left(1+b\right)-\left(1+b\right)\right]\right\}=C\cdot0=0$.

[38] To make this explicit, dropping the dependence on o,i for readability: Differentiability of $W\left(k\right)$ at $k=0$ with derivative zero requires that $\lim_{k\to0}\frac{W(k)-W(0)}{k}$ exists and equals zero, i.e., $\forall\epsilon>0\,\exists\delta'>0\,s.t.\left|\frac{W(k)-W(0)}{k}\right|<\epsilon\forall k<\delta'$. Since $\overline{W}$ and $\underline{W}$ are differentiable, such δ' exist for any ϵ for the equivalent inequalities using $\overline{W}$ and $\underline{W}$ instead of W; take δ to be the smaller of the two. Thus we have that $\forall\epsilon>0\,\exists\delta>0\,s.t.\,\epsilon>\frac{\overline{W}(k)-\overline{W}(0)}{k}\wedge\frac{\underline{W}(k)-\underline{W}(0)}{k}>-\epsilon$. From the main text preceding this footnote, we know that $\overline{W}\left(0\right)=\underline{W}\left(0\right)=W\left(0\right)$ and $\overline{W}\left(k\right)\geq W\left(k\right)\geq\underline{W}\left(k\right)$. Combining these, we have $\epsilon>\frac{\overline{W}(k)-\overline{W}(0)}{k}\geq\frac{W(k)-W(0)}{k}\geq\frac{\underline{W}(k)-\underline{W}(0)}{k}>-\epsilon$ and thus $\left|\frac{W(k)-W(0)}{k}\right|<\epsilon\forall k<\delta$, as required.

are denoted by $R_M(s|k)$ and $R_S(s|k)$, respectively, and are given in equations (1) and (2) in the main text. For convenience we provide the expressions again here:

$$\begin{aligned} R_M(s|k) &\equiv G(\underline{v}(s|k))(s+b) + \int_{\underline{v}(s|k)}^{\infty} [s+b+m(v-(s+b)-a^*(s,v)-k)]\, g(v)\, dv \\ &= s+b+m\int_{\underline{v}(s|k)}^{\infty} (v-(s+b)-a^*(s,v)-k)\, g(v)\, dv. \\ R_S(s|k) &\equiv G(\underline{v}(s|k))(1-s) + \int_{\underline{v}(s|k)}^{\infty} (a^*(s,v)+k)\, g(v)\, dv. \end{aligned}$$

In equilibrium, the Manager will propose to the Shareholder the T and s that solve the contracting problem given in equations (3) - (MPC) in the main text. In any solution to this problem, the Shareholder's participation constraint must bind, since otherwise the Manager would be better off setting a higher T.[39] Thus, we can substitute for $T = R_S(s|k)$ throughout, noting that the feasibility constraint $T \geq i$ then incorporates the Shareholder's participation constraint and becomes $R_S(s|k) \geq i$. We leave (IC) implicit because it has been subsumed into the definition of $R_M(s|k)$ and $R_S(s|k)$ via the definition of $\underline{v}(s|k)$. We thus obtain the equivalent problem:

$$\max_{s\in[0,1]} \quad R_S(s|k) - i + R_M(s|k) \tag{7a}$$

$$s.t. \quad R_S(s|k) \geq i \tag{7b}$$

$$R_S(s|k) + R_M(s|k) \geq i + o \tag{7c}$$

The only investments (o, i) that can be financed are those for which this problem has a feasible solution. Therefore the maximum investment cost i that can be financed is given by[40]

$$\bar{i}(o|k) \equiv \max_{s\in[0,1]} \min\{R_S(s|k), R_S(s|k) + R_M(s|k) - o\}. \tag{8}$$

In a ball around $k = 0$, (8) can be written

$$\bar{i}(o|k) = \begin{cases} R_S(0|k) & o \in (0, R_M(0|k)] \\ \max_{s\in\left[0,\min\left\{1,R_M^{-1}(o|k)\right\}\right]} \{R_S(s|k) + R_M(s|k) - o\} & o > R_M(0|k) \end{cases} \tag{9}$$

To see this, note that $R_S(s|k), R_M(s|k)$ have continuous derivatives w.r.t. s that are strictly negative and positive, respectively, at $k = 0$ and thus, by continuity, in a ball around it.[41] Consequently, $\min_{s\in[0,1]} R_M(s|k) = R_M(0|k)$, such that $R_M(0|k) \geq o$ implies $\min\{R_S(s|k), R_S(s|k) + R_M(s|k) - o\} = R_S(s|k)\, \forall s \in [0,1]$ and thus that (8) simplifies to $\max_{s\in[0,1]} R_S(s|k) = R_S(0|k)$. By contrast, if

[39] Note that T, being a lump sum payment, does not affect any subsequent decisions, in particular the decision whether to sell the firm.

[40] Note that $\bar{i}(o|k)$ can be negative, but that $f\left(o, \bar{i}(o|k)\right) = 0$ for $\bar{i}(o|k) < 0$.

[41] Specifically,

$$\begin{aligned} \frac{\partial R_S(s|0)}{\partial s} &= -G(1+b) + \int_{1+b}^{\infty} \frac{\partial a^*(s,v)}{\partial s} g(v)\, dv < 0 \\ \frac{\partial R_M(s|0)}{\partial s} &= 1 - m[1 - G(1+b)] - m\int_{1+b}^{\infty} \frac{\partial a^*(s,v)}{\partial s} g(v)\, dv > 0, \end{aligned}$$

and continuity follows from continuous differentiability of the components, specifically $a^*(s,v)$ by assumption and the implicit function theorem for $\underline{v}(s|k)$.

$R_M(s|k) < o \forall s \in [0,1]$, then (8) simplifies straightforwardly to $\max_{s\in[0,1]}\{R_S(s|k) + R_M(s|k) - o\}$. In the intermediate case that $R_M(0|k) < o$ but $R_M(s|k) \geq o$ for some $s \in (0,1]$, then by continuity and monotonicity of $R_M(s|k)$ we must have $R_M^{-1}(o|k) \in (0,1]$ and $R_M(s|k) > o \Leftrightarrow s > R_M^{-1}(o|k)$. In this intermediate case, no $s > R_M^{-1}(o|k)$ can be the argument of the maximum in (8) because it would be dominated by $R_M^{-1}(o|k)$ since $s > R_M^{-1}(o|k) \Rightarrow R_S(s|k) < R_S\left(R_M^{-1}(o|k)\,|k\right) = R_S\left(R_M^{-1}(o|k)\,|k\right) + R_M\left(R_M^{-1}(o|k)\,|k\right) - o$. For the complement $s \leq R_M^{-1}(o|k)$, however, $R_S(s|k) \geq R_S(s|k) + R_M(s|k) - o$, so the maximum (8) in the intermediate case is found by maximizing $R_S(s|k) + R_M(s|k) - o$ on this complement. The domain restriction $s < s' : R_M(s'|k) = o$ is equivalent to the constraint $R_M(s|k) \leq o$ since $R_M(s|k)$ is strictly increasing in s.

From (9), we see that $\bar{i}(o|k)$ is differentiable almost everywhere in a ball around $k = 0$ since $R_M(0|k)$ is continuous and $R_S(s|k), R_M(s|k)$ are well-behaved. Specifically,

$$\left.\frac{d\bar{i}(o|k)}{dk}\right|_{k=0} = \begin{cases} 1 - G(1+b) > 0 & o \in (0, R_M(0|k)) \\ [1 - G(1+b)](1-m)\,\phi(m; a^*(\cdot,\cdot), b) \geq 0 & o > R_M(0|k) \end{cases}$$

for some finite-valued function $\phi(\cdot;\cdot,\cdot) > 0, \phi(0;\cdot,\cdot) = 1$.[42] The first case—$o \in (0, R_M(0|k))$—is simply $\left.\frac{dR_S(0|k)}{dk}\right|_{k=0}$.[43] The second case—$o > R_M(0|k)$—follows from the generalized envelope theorem for constrained optima (Bonnans and Shapiro, 2000, Theorem 4.25). It holds that the value function is differentiable in the parameter provided the maximization problem is well-behaved (albeit not necessarily convex) with derivative equal to the partial derivative of the Lagrangian w.r.t. the parameter.[44]

Finally, we can now show that $\left.\frac{dEV(k)}{dk}\right|_{k=0} > 0$ by writing (6) as:

[42]Specifically, let $\bar{s} \equiv \arg\max_{s\in[0,1], R_M(s|k)\leq o}\{R_S(s|k) + R_M(s|k) - o\}$ (if there are multiple solutions, the larger associated ϕ prevails). Then

$$\phi(m; a^*(\cdot,\cdot), b) \equiv \begin{cases} 1 & R_M(\bar{s}|0) < o \\ \left\{1 - m + m\left[G(1+b) - \int_{1+b}^{\infty} \frac{\partial a^*(s,v)}{\partial s}(\bar{s})\, g(v)\, dv\right]\right\}^{-1} & R_M(\bar{s}|0) = o \end{cases}$$

[43]Specifically,

$$\begin{aligned} \left.\frac{dR_S(0|k)}{dk}\right|_{k=0} &= \left.\frac{d\underline{v}(0|k)}{dk}\right|_{k=0} g(\underline{v}(0|0))\left[1 - a^*(0, \underline{v}(0|0)) - 0\right] + \int_{\underline{v}(0|0)}^{\infty} g(v)\, dv \\ &= 1 - G(1+b) \end{aligned}$$

using $\underline{v}(s|0) = 1 + b$ and $a^*(0, 1+b) = 1$ from above to proceed from the first to the second line.

[44]The Lagrangian for the second case and its partial derivative at $k = 0$ are

$$\begin{aligned} L(s, \lambda_{R_m}, \lambda_0, \lambda_1; k) &\equiv R_S(s|k) + R_M(s|k) - o - \lambda_{R_M}(R_M(s|k) - o) - \lambda_0(-s) - \lambda_1(s-1) \\ \left.\frac{\partial L(s, \lambda_{R_m}, \lambda_0, \lambda_1; k)}{\partial k}\right|_{k=0} &= \left.\frac{\partial R_S(s|k)}{\partial k}\right|_{k=0} + (1 - \lambda_{R_M})\left.\frac{\partial R_M(s|k)}{\partial k}\right|_{k=0} \\ &= [1 - G(1+b)]\left[1 - m(1 - \lambda_{R_M})\right], \end{aligned}$$

respectively. As is well known from Kuhn-Tucker conditions, $\lambda_{R_M} = 0$ unless the associated constraint $R_M(s|k) \leq o$ binds. If it does bind, then $\lambda_0 = \lambda_1 = 0$ because neither of the other two constraints can bind simultaneously (except for measure zero knife edge cases), and we have from the Kuhn-Tucker first-order condition w.r.t. optimal $\bar{s}$

$$\begin{aligned} \left.\frac{\partial L(s, \lambda_{R_m}, \lambda_0, \lambda_1; k)}{\partial s}\right|_{s=\bar{s}} &= \left.\frac{\partial R_S(s|k)}{\partial s}\right|_{s=\bar{s}} + (1 - \lambda_{R_M})\left.\frac{\partial R_M(s|k)}{\partial s}\right|_{s=\bar{s}} = 0 \\ \Rightarrow 1 - \lambda_{R_M} &= -\frac{\partial R_S(\bar{s}|k)}{\partial s} \Big/ \frac{\partial R_M(\bar{s}|k)}{\partial s} \end{aligned}$$

$$\left.\frac{dEV(k)}{dk}\right|_{k=0} = [1-G(1+b)]\left\{\int_0^{R_M(0|0)} W(0;o,\bar{i}(o|0))f(o,\bar{i}(o|0))do \right.$$
$$\left. +(1-m)\,\phi(m;\cdot,\cdot)\int_{R_M(0|0)}^{\infty} W(0;o,\bar{i}(o|0))f(o,\bar{i}(o|0))do\right\}$$

This expression is strictly positive because $1-G(1+b)>0$ and at least one of the two summands in curly braces is strictly positive. To show the latter, we will make use of the fact—which by itself guarantees weak positivity—that

$$W\left(0;o,\bar{i}(o|0)\right) \geq R_S\left(\bar{s}\left(0;o,\bar{i}(o|0)\right)|0\right)+R_M\left(\bar{s}\left(0;o,\bar{i}(o|0)\right)|0\right)-o-\bar{i}(o|0) \tag{10}$$
$$\geq 0 \tag{11}$$

writing $\bar{s}\left(0;o,\bar{i}(o|0)\right)$ for any s that solves problem (**??**) - (**??**) at $i=\bar{i}(o|0), k=0$. The first inequality follows from the fact that the Acquirer gets non-negative deal surplus and the second from the definition of $\bar{i}$.

If $b>0$ or $m>0$, the first summand is strictly positive because then its integral's upper bound $R_M(0|0)$ is strictly positive (cf. the definition of R_M). Between the integral's bounds, $o>0$ by the lower bound, $\bar{i}(o|0)=R_S(0|0)=G(1+b)>0$ by the upper bound in combination with (9) and the definition of R_S, and thus $f\left(o,\bar{i}(o|0)\right)>0$ because $f(o,i)>0\forall o,i>0$ by assumption. Moreover, (11) is then strict and thus $W\left(0;o,\bar{i}(o|0)\right)$ strictly positive because as explained in the derivation of (9), for $o<R_M(0|0)$, the $\bar{s}$ that maximizes the right-hand-side of (10) and thus solves problem (**??**) - (**??**) is $\bar{s}=0$, such that that right-hand side simplifies to $R_S(0|0)+R_M(0|0)-o-\bar{i}(o|0)=R_M(0|0)-o>0$, where the inequality follows from the integral's upper bound and the equality from the upper bound in combination with (9).[45]

If $m<1$, the second summand is strictly positive because then $(1-m)\,\phi(m;\cdot,\cdot)>0$, (10) is strict, and $f\left(o,\bar{i}(o|0)\right)>0$ at least on the non-degenerate interval $o\in[R_M(0|0), R_M(1|0))$—a

which at $k=0$ gives

$$1-\lambda_{R_M}=\frac{G(1+b)-\int_{1+b}^{\infty}\left.\frac{\partial a^*(s,v)}{\partial s}\right|_{s=\bar{s}}g(v)\,dv}{1-m+m\left[G(1+b)-\int_{1+b}^{\infty}\left.\frac{\partial a^*(s,v)}{\partial s}\right|_{s=\bar{s}}g(v)\,dv\right]}$$
$$\Leftrightarrow 1-m(1-\lambda_{R_M})=\frac{1-m}{1-m+m\left[G(1+b)-\int_{1+b}^{\infty}\left.\frac{\partial a^*(s,v)}{\partial s}\right|_{s=\bar{s}}g(v)\,dv\right]}$$

[45] The first summand captures firms that do not get funded due to the liquidity constraint—the Manager cannot pledge all of her positive surplus to the Shareholder—that is alleviated by giving the Shareholder more of the deal surplus.

strict subset of the interval of integration—because there $o > 0$ and

$$\begin{aligned}\bar{i}\,(o|0) &= \max_{s\in\left[0,\min\left\{1,R_M^{-1}(o|0)\right\}\right]} \left\{R_S\,(s|0) + R_M\,(s|0) - o\right\} \\ &\geq R_S\left(R_M^{-1}\,(o|0)\,|0\right) + R_M\left(R_M^{-1}\,(o|0)\,|0\right) - o \\ &= R_S\left(R_M^{-1}\,(o|0)\,|0\right) \\ &> R_S\,(1|1) \\ &\geq 0\end{aligned}$$

and $f\,(o,i) > 0 \forall o, i > 0$ by assumption.[46] $\square$

Proof of Proposition 3

We solve the game by backwards induction. At stage 3, the Shareholder will sue if and only if $\beta > \bar{\beta}$. At stage 2, with $s > 0.5$ the Shareholder's vote is irrelevant. The Shareholder's equilibrium payoff in a deal is thus given by $(1-s)(1-\min\{\beta,\bar{\beta}\})p$. In turn, at stage 1, the Manager and the Acquirer's joint surplus will take the equilibrium amount of deal consideration the Shareholder will receive as a cost and is thus equal to $v - (s+b) - (1-s)(1-\min\{\beta,\bar{\beta}\})p$. This surplus is increasing in β up to $\beta = \bar{\beta}$ and hence the Manager and Shareholder will choose any $\beta \geq \bar{\beta}$ in order to maximize their deal surplus. This implies that in any SPNE in which there is a sale, the Shareholder will receive $(1-s)(1-\bar{\beta})p$ of the deal consideration.

Denote the Manager and the Acquirer's joint surplus at stage 1 by $\Delta = v-(s+b)-(1-s)(1-\bar{\beta})p$. Note that for their joint surplus to be positive, we must have $v \geq p$ (so that the Acquirer prefers a deal at price p) and $s(1-\bar{\beta})p + \bar{\beta}p \geq s+b$ (so that the Manager prefers the deal to her status quo payoff). Together these two inequalities imply that the Manager and Acquirer's surplus is positive if and only if $v \geq \frac{s+b}{s(1-\bar{\beta})+\bar{\beta}} \equiv \underline{v}(\bar{\beta})$, which is the condition for a sale stated in part 2 of the proposition.

Now note that $\underline{v}(\frac{b}{1+b}) = 1+b$, which is the status quo value of the firm and therefore also the threshold of v that determines whether it is efficient to sell the firm. Note as well that $\underline{v}(\bar{\beta})$ is strictly decreasing in $\bar{\beta}$, which implies that for $\bar{\beta} > \frac{b}{1+b}$, $\underline{v}(\bar{\beta}) < 1+b$.

The joint deal surplus depends on p, since for higher p the amount the Shareholder is entitled to receive under the anti-self-dealing norm is greater. The Manager's portion of the deal price must equal the value of her outside option plus her share m of the joint surplus, so $s(1-\bar{\beta})p + \bar{\beta}p = s+b+m\Delta$. Substituting in for Δ and solving for p we have that the price in any equilibrium sale is given by $p = \frac{mv+(1-m)(s+b)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$.

Substituting this equilibrium p into the expression for the Shareholder's equilibrium payoff derived above, we have that the Shareholder receives $(1-s)(1-\bar{\beta})\frac{mv+(1-m)(s+b)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$. This amount is less than the Shareholder's payoff in the status quo, $1-s$, if and only if:

$$(1-\bar{\beta})\frac{mv+(1-m)(s+b)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]} < 1, \tag{12}$$

which simplifies to,

[46] The second summand captures firms that are marginal for Manager and Shareholder because they generate zero private surplus for them but that generate a positive externality on acquirers in the form of expected deal surplus, which is partially internalized by increasing k, which strengthens the Manager's bargaining position with the Acquirer.

$$v < \frac{\bar{\beta}}{m(1-\bar{\beta})} + 1 - \frac{(1-m)}{m}b \equiv \hat{v}(\bar{\beta}). \tag{13}$$

Now consider the case of $\bar{\beta} = \frac{b}{1+b}$. We already have that $\underline{v}(\frac{b}{1+b}) = 1 + b$. We also have that:

$$\hat{v}(\frac{b}{1+b}) = \frac{\frac{b}{1+b}}{m(1-\frac{b}{1+b})} + 1 - \frac{(1-m)}{m}b = 1 + b \tag{14}$$

Now note that $\hat{v}'(\bar{\beta}) > 0$ and recall that $\underline{v}'(\bar{\beta}) < 0$. Together with $\underline{v}(\frac{b}{1+b}) = \hat{v}(\frac{b}{1+b})$, this implies that if $\bar{\beta} < \frac{b}{1+b}$, then $\underline{v}(\bar{\beta}) > \hat{v}(\bar{\beta})$ so that in all equilibrium sales the Shareholder receives a payoff strictly greater than his status quo payoff, $1 - s$. In contrast, if $\bar{\beta} > \frac{b}{1+b}$, then $\underline{v}(\bar{\beta}) < \hat{v}(\bar{\beta})$ and for values of v in the interval $[\underline{v}(\bar{\beta}), \hat{v}(\bar{\beta}))$, the firm is sold and the Shareholder receives a payoff less than his status quo payoff. □

Proof of Proposition 4

As we showed in the proof of Proposition 3, without a shareholder vote (i.e., $s > 0.5$), the joint surplus of the Manager and the Acquirer is increasing in β up to $\beta = \bar{\beta}$. With the Shareholder's vote at stage 2 now acting as a veto, however, there is a new constraint: the Shareholder will vote yes if and only if the amount he will receive in stage 3 is greater than his status quo payoff, or $(1 - s)(1 - \min\{\beta, \bar{\beta}\})p \geq 1 - s$.

Consider first the cases of $\bar{\beta} \leq \frac{b}{1+b}$ and $\bar{\beta} > \frac{b}{1+b} \wedge v \geq \hat{v}(\bar{\beta})$. Our analysis of these cases in the proof of Proposition 3 showed that, in the absence of a shareholder vote, the equilibrium price with $\beta = \bar{\beta}$ results in the Shareholder receiving a payoff in the deal greater than his status quo payoff, $1 - s$, so that the new constraint introduced by the shareholder vote is not binding. This proves parts 1 and 2b of the proposition.

Consider now the case of $\bar{\beta} > \frac{b}{1+b} \wedge v < \hat{v}(\bar{\beta})$. If $v < 1+b$, no deal is possible that the Shareholder would not veto and that would be rational for Manager and Acquirer: with the Shareholder able to veto a deal at stage 2, the least the Shareholder can receive in a sale in equilibrium is $1 - s$, which would leave negative joint surplus for Manager and the Acquirer at stage 1 ($v-(s+b)-(1-s) < 0$). This leaves the case of $v \in (1 + b, \hat{v}(\bar{\beta})]$. We know that at the equilibrium price in the absence of a shareholder vote, given in Proposition 3, and with $\beta = \bar{\beta}$, the Shareholder is made strictly worse off than in the status quo in this case and hence would vote down such a proposal. In order to induce the Shareholder to approve the deal, the Manager and the Acquirer would thus have to offer a $\beta < \bar{\beta}$. To maximize their joint surplus, the Manager and Acquirer will offer a p and β such that the Shareholder receives their status quo payoff and no more, so we must have $(1 - s)(1 - \beta)p = (1 - s)$ or $\beta = 1 - \frac{1}{p}$. Note that this in turn results in positive deal surplus for the Manager and the Acquirer at stage 1, since $\Delta = v - (s + b) - (1 - s) = v - (1 + b) > 0$. The Manager's portion of the deal price must equal the value of her outside option plus her share m of the joint surplus, so $s(1 - \beta)p + \beta p = s + b + m\Delta$. Substituting in for β and Δ and solving for p we have $p = (1 - m)(1 + b) + mv$. The equilibrium β is then $\beta = 1 - \frac{1}{(1-m)(1+b)+mv}$. This proves part 2a of the proposition. □

Proof of Proposition 5

The proof of the proposition closely parallels the proof of Proposition 2, with $\bar{\beta}$ analogous to k and $\bar{\beta} = \frac{b}{1+b}$ analogous to $k = 0$, and so here our exposition is much more concise. Because the model in Proposition 2 and the model in Proposition 5 are so similar in basic structure, we re-use the notation from the model in Proposition 2 (e.g., W, EV, R_M, R_S, $\bar{i}$) with new definitions to match the new model.

We have already shown in propositions (3) and (4) that, if $\bar{\beta} < \frac{b}{1+b}$,then there is a threshold $\underline{v}(\bar{\beta}) \equiv \frac{s+b}{s(1-\bar{\beta})+\bar{\beta}}$ analogous to $\underline{v}(s|k)$ such that deals will happen if and only if $v \geq \underline{v}(\bar{\beta})$, that this threshold is decreasing in $\bar{\beta}$, that the ex post efficient threshold is $\underline{v}(\bar{\beta}) = \frac{b}{1+b}$, and that therefore choosing a smaller $\bar{\beta}$ is necessarily ex post inefficient because it leads to inefficient entrenchment for all $v \in (1+b, \underline{v}(\bar{\beta}))$.

To show that some $\overline{\beta} < \frac{b}{1+b}$ is more ex ante efficient than $\overline{\beta} = \frac{b}{1+b}$, we build and differentiate an expression $EV(\bar{\beta})$ analogous to $EV(k)$ in the proof of Proposition 2. Let $W(\bar{\beta}; o, i)$ be the ex ante expected value generated by any firm that does get funded for given $\bar{\beta}, o, i$. Let $\bar{i}(o|\bar{\beta})$ be the highest level of required investment i that gets funded for given o and $\bar{\beta}$. The overall ex ante expected value of corporate assets is

$$EV\left(\bar{\beta}\right) \equiv \int_0^\infty \int_0^{\bar{i}(o|\bar{\beta})} W\left(\bar{\beta}; o, i\right) f\left(o, i\right) di do.$$

The left-hand derivative of $EV(\bar{\beta})$ with respect to $\bar{\beta}$ at $\bar{\beta} = \frac{b}{1+b}$, if it exists, is given by:

$$\begin{aligned} \left.\frac{dEV(\bar{\beta})}{d\bar{\beta}}\right|^{-}_{\bar{\beta}=\frac{b}{1+b}} = \int_0^\infty \Bigg\{ & \left.\frac{d\bar{i}(o|\bar{\beta})}{d\bar{\beta}}\right|^{-}_{\bar{\beta}=\frac{b}{1+b}} W\left(\frac{b}{1+b}; o, \bar{i}(o|\frac{b}{1+b})\right) f\left(o, \bar{i}(o|\frac{b}{1+b})\right) \\ & + \int_0^{\bar{i}(o|\frac{b}{1+b})} \left.\frac{dW}{d\bar{\beta}}(\bar{\beta}; o, i)\right|^{-}_{\bar{\beta}=\frac{b}{1+b}} f(o,i) di \Bigg\} do. \end{aligned} \tag{15}$$

This derivative indeed exists and is negative, by an argument analogous to the proof that $\left.\frac{dEV(k)}{dk}\right|_{k=0}$ exists and is positive in the proof of Proposition 2. In particular, $\left.\frac{dW}{d\bar{\beta}}(\bar{\beta}; o, i)\right|^{-}_{\bar{\beta}=\frac{b}{1+b}} = 0$ by the same basic reasoning given in the proof of Proposition 2: the marginal deal deterred by increasing $\bar{\beta}$ from $\frac{b}{1+b}$ has $v = 1 + b$ and hence no first-order effect on social efficiency. As a result, the second term in (15) drops out. In contrast, $\left.\frac{d\bar{i}(o|\bar{\beta})}{d\bar{\beta}}\right|^{-}_{\bar{\beta}=\frac{b}{1+b}} \leq 0$, with strict inequality for a positive measure set of o, again by similar reasoning to the characterization of $\left.\frac{d\bar{i}(o|k)}{dk}\right|_{k=0}$ in the proof of Proposition 2. As a result, $\left.\frac{dEV(\bar{\beta})}{d\bar{\beta}}\right|^{-}_{\bar{\beta}=\frac{b}{1+b}} < 0$. In turn this implies that there exists a $\bar{\beta} < \frac{b}{1+b}$ for which $EV(\bar{\beta}) > EV(\frac{b}{1+b})$.

Showing differentiability of this expression with respect to $\overline{\beta}$ around $\overline{\beta} = \frac{b}{1+b}$ is straightforward using an approach that parallels our proof of the differentiability of $EV(k)$ with respect to k around $k = 0$ in the proof of Proposition 2. One can show differentiability of $W\left(\bar{\beta}; o, i\right)$ in the same way as that of $W(k; o, i)$ using the bounding functions $\overline{W}\left(\bar{\beta}; o, i\right) \equiv W_{\underline{v}}\left(1 + b + \left(\bar{\beta} - \frac{b}{1+b}\right) c; o, i\right)$ and $\underline{W}\left(\bar{\beta}; o, i\right) \equiv W_{\underline{v}}\left(1 + b + \left(\bar{\beta} - \frac{b}{1+b}\right) C; o, i\right)$. Similarly, one can show differentiability of $\bar{i}\left(o|\bar{\beta}\right)$ with respect to $\bar{\beta}$ at $\bar{\beta} = \frac{b}{1+b}$ from the left[47] in the same way as that of $\bar{i}(o|k)$ in the proof of

[47] We need differentiability only from the left to show that lowering $\bar{\beta}$ from $\frac{b}{1+b}$ increases $EV(\bar{\beta})$. The argument is one-sided to avoid complications that arise for $\bar{\beta} > \frac{b}{1+b}$, in which case (1) if $s \leq 0.5$ then the deal threshold is different; and (2) if also $v \leq \hat{v}(\bar{\beta})$, the deal price and equilibrium β^* are also different.

Proposition 2 simply by replacing $R_M(s|k)$ and $R_S(s|k)$ with

$$R_M\left(s|\bar{\beta}\right) \equiv G\left(\underline{v}(\bar{\beta})\right)(s+b) + \int_{\underline{v}(\bar{\beta})}^{\infty}\left[s+b+m\left(v-(s+b)-(1-s)\left(1-\bar{\beta}\right)p^*\left(s,v,\bar{\beta}\right)\right)\right]g(v)\,dv$$

$$R_S\left(s|\bar{\beta}\right) \equiv (1-s)\left[G\left(\underline{v}(\bar{\beta})\right) + \left(1-\bar{\beta}\right)\int_{\underline{v}(\bar{\beta})}^{\infty} p^*\left(s,v,\bar{\beta}\right)g(v)\,dv\right].$$

where we have written the equilibrium deal terms as $p^*(s,v,\bar{\beta})$, which are identical for $s > .5$ and $s \leq 0.5$ since we are only considering $\bar{\beta} \leq \frac{b}{1+b}$.

All that remains is to show that $EV(\bar{\beta}) \leq EV(\frac{b}{1+b})$ for all $\bar{\beta} > \frac{b}{1+b}$ so that the ex ante efficient $\bar{\beta}$ must be less than $\frac{b}{1+b}$. First, note that $W\left(\bar{\beta}; o, i\right) \leq W\left(\frac{b}{1+b}; o, i\right)$ for $\bar{\beta} > \frac{b}{1+b}$ since $\bar{\beta} = \frac{b}{1+b}$ is ex-post efficient. Thus the only way we could nonetheless have $EV(\bar{\beta}) > EV(\frac{b}{1+b})$ for some $\bar{\beta} > \frac{b}{1+b}$ is if such a higher $\bar{\beta}$ allowed additional socially efficient firms to be financed.

Hence consider now $\bar{i}(o|\bar{\beta})$. Following the same reasoning given in the proof of Proposition 2, we can write $\bar{i}(o|\bar{\beta})$ as

$$\bar{i}\left(o|\bar{\beta}\right) \equiv \max_{s\in[0,1]} \min\left\{R_S\left(s|\bar{\beta}\right), R_S\left(s|\bar{\beta}\right) + R_M\left(s|\bar{\beta}\right) - o\right\}. \tag{16}$$

As is intuitive, $R_S(s|\bar{\beta}) < R_S(s|\frac{b}{1+b})$ for all $\bar{\beta} > \frac{b}{1+b}$ and for all s. To see this formally, suppose $s > 0.5$ so that we can ignore the Shareholder vote. (The proof of this result for values of $s \leq 0.5$ is analogous and omitted for brevity.) We can then write $R_S(s|\bar{\beta})$ as

$$R_S(s|\bar{\beta}) = G\left(\underline{v}\left(s|\bar{\beta}\right)\right)(1-s) + \int_{\underline{v}(s|\bar{\beta})}^{\infty}(1-s)\frac{mv+(1-m)(s+b)}{\frac{\bar{\beta}}{(1-\bar{\beta})}+[m+(1-m)s]}g(v)\,dv \tag{17}$$

The integrand in the second term is decreasing in $\bar{\beta}$ for all values of s, and moreover the additional transactions that occur when $\bar{\beta} > \frac{b}{1+b}$, relative to when $\bar{\beta} = \frac{b}{1+b}$, result in a lower payoff to the Shareholder than his status quo payoff, so that the first argument of the min function in (16) is lower for all $\bar{\beta} > \frac{b}{1+b}$ than it is for $\bar{\beta} = \frac{b}{1+b}$ for all values of $s > 0.5$.

We can write the second argument of the min function in (16) as:

$$\begin{aligned} R_S\left(s|\bar{\beta}\right) + R_M\left(s|\bar{\beta}\right) - o &= G\left(\underline{v}\left(s|\bar{\beta}\right)\right)(1+b) + \int_{\underline{v}(s|\bar{\beta})}^{\infty} p^*(s,v,\bar{\beta})g(v)\,dv - o \\ &= G\left(\underline{v}\left(s|\bar{\beta}\right)\right)(1+b) + \int_{\underline{v}(s|\bar{\beta})}^{\infty}\frac{mv+(1-m)(s+b)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}g(v)\,dv - o \end{aligned} \tag{18}$$

The integrand in the second term of this expression is decreasing in $\bar{\beta}$ for all values of $s \in (0.5, 1)$, and again the additional transactions that occur when $\bar{\beta} > \frac{b}{1+b}$, relative to when $\bar{\beta} = \frac{b}{1+b}$, result in a lower sum of the payoffs to the Shareholder and the Manager than the sum of their status quo payoffs. (The case of $s = 1$ can never arise in equilibrium because $R_S(1|\bar{\beta}) = 0$ and no positive i could be financed.) This shows that the second argument of the min function in (16) is lower for all $\bar{\beta} > \frac{b}{1+b}$ than it is for $\bar{\beta} = \frac{b}{1+b}$ for all values of $s > 0.5$.

This proves that $\bar{i}(o|\bar{\beta}) \leq \bar{i}(o|\frac{b}{1+b})$ for all $\bar{\beta} > \frac{b}{1+b}$, so that $EV(\bar{\beta}) \leq EV(\frac{b}{1+b})$ for all $\bar{\beta} > \frac{b}{1+b}$.
□

Proof of Proposition 6

At stage 3, the Shareholder will approve the deal if and only if his payoff in the deal is greater than his status quo payoff, $(1-s)(1-\beta)p \geq 1-s$.

At stage 2, if $\beta \leq \bar{\beta}$, then the Shareholder cannot sue. If $\beta > \bar{\beta}$ then the Shareholder will not sue to enjoin the deal if his payoff in the deal is greater than his status quo payoff, $(1-s)(1-\beta)p \geq 1-s$. If this inequality does not hold, the Shareholder is indifferent between suing or not suing because at stage 3 the Shareholder will vote down the deal anyway. Either way, a deal will pass stages 2 and 3 only if this inequality holds.

A stage 1, the Manager and the Acquirer will set β at the maximum amount such that the deal will go through given the Shareholder's equilibrium behavior in stages 2 and 3, which is the β such that $(1-s)(1-\beta)p = 1-s$. They will thus anticipate having to pay the Shareholder a total amount of deal consideration equal to $1-s$ in any deal. The deal surplus between the Manager and the Acquirer is thus given by $\Delta = v-(1-s)-(s+b) = v-(1+b)$. This is the same expression for their deal surplus under the statutory regime characterized in Proposition 1 and hence the equilibrium outcome is the same. $\square$

Proof of Proposition 7

If the game reaches stage 4, the remaining subgame (stages 4 and 5) is identical to the anti-self-dealing regime without a shareholder vote and hence has the same equilibrium as the one characterized in 3 .

Anticipating this, at stages 2 and 3, the Shareholder will enjoin or vote against, as the case may be, any deal giving the Shareholder less, whereas at stage 1, the Manager and the Acquirer will not enter into any deal giving them less. Thus, the only deals that can pass through stages 1-3 and avoid stages 4-5 give all parties at least the same payoffs. Since total deal payoffs are fixed, however, this means the equilibrium outcome must be exactly the same even if it is reached at stages 1-3. $\square$

Proof of Proposition 8

The only change relative to the anti-self-dealing model with a single bidder from section 2.1 is that the Manager's best outside option that shapes the bargaining with the Acquirer in stage 1 might be to sell to Bidder 2 rather than the status quo.

If $s > 0.5$ so that the Shareholder could not veto a deal with Bidder 2, the best alternative deal option is to sell to Bidder 2 at $p = v_2$ and $\beta = \bar{\beta}$. This yields a higher payoff than the Manager's status quo payoff if $v_2 > \underline{v}(\bar{\beta}) \equiv \frac{s+b}{s(1-\bar{\beta})+\bar{\beta}}$, where the derivation of this threshold is the same as in the proof of Proposition 3.

If instead $s \leq 0.5$ then the Shareholder would veto a transaction with $p = v_2$ and $\beta = \bar{\beta}$ if and only if $(1-\bar{\beta})v_2 < 1$ or $v_2 < \frac{1}{1-\bar{\beta}}$. In that case the best feasible deal with Bidder 2 for the Manager would give the Shareholder exactly his status quo payoff, yielding the Manager a payoff of $v_2 - (1-s)$. This would be better than the Manager's status quo payoff if $v_2 - (1-s) > s+b$ or $v_2 > 1+b$. If on the other hand $v_2 \geq \frac{1}{1-\bar{\beta}}$ then the threshold of v_2 for a deal with Bidder 2 to be better for the Manager than the status quo is the same as in the case of $s > 0.5$, namely $\underline{v}(\bar{\beta})$.

Suppose that $1+b > \underline{v}(\bar{\beta})$. Straightforward algebra shows that this is true if and only if $\bar{\beta} > \frac{b}{1+b}$, which in turn implies $1+b < \frac{1}{1-\bar{\beta}}$. In this case $1+b$ is the threshold of v_2 above which selling to Bidder 2 is the Manager's best outside option since for all $v_2 \leq 1+b$ we have $v_2 < \frac{1}{1-\bar{\beta}}$ so that the Shareholder vote binds, and the Manager's payoff in a deal increases in v_2.

Suppose instead that $1+b \leq \underline{v}(\bar{\beta})$. Then $\bar{\beta} \leq \frac{b}{1+b}$ and $1+b \geq \frac{1}{1-\bar{\beta}}$. So for all $v_2 < \frac{1}{1-\bar{\beta}}$ there is no feasible deal with Bidder 2 that would make the Manager better off than the status quo, and for $v_2 \geq \frac{1}{1-\bar{\beta}}$, the relevant threshold of v_2 at which a deal with Bidder 2 is better for the Manager than the status quo is $\underline{v}(\bar{\beta})$. This proves that, if $s \leq 0.5$, then the threshold of v_2 at which the Manager's best outside option is a deal with Bidder 2 is $\max\{\underline{v}(\bar{\beta}), 1+b\}$.

We have now shown that if $v_2 > \underline{v}(\bar{\beta}, s)$ then the Manager's outside option in bargaining with the Acquirer is a sale to Bidder 2 rather than the status quo. We now derive the equilibrium price and the Shareholder's payoff.

Consider first the case of $s > 0.5$. In that case the surplus between the Manager and the Acquirer given p and β is given by $\Delta = v_1 - (1-\beta)(1-s)p - [\bar{\beta} + s(1-\bar{\beta})]v_2$. Under our bargaining assumption, the Manager's payoff must be equal to their outside option plus $m\Delta$, or $[\beta + s(1-\beta)]p = s + b + m\Delta$. Substituting the expression for Δ into this equation and solving for p yields:

$$p^* = \frac{mv_1 + (1-m)[\bar{\beta} + s(1-\bar{\beta})]v_2}{\beta + (1-\beta)[m + (1-m)s]}, \tag{19}$$

In contrast, in the absence of competition Bidder 1 would pay $p^* = \frac{mv_1 + (1-m)(s+b)}{\beta + (1-\beta)[m+(1-m)s]}$, and $v_2 > \underline{v}(\bar{\beta})$ implies that this is strictly less than the price under competition given in (19). The Shareholder would receive $(1-s)(1-\bar{\beta})\frac{mv_1 + (1-m)[\bar{\beta}+s(1-\bar{\beta})]v_2}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$.

Consider now the case of $s \leq 0.5$. If $v_2 \geq \frac{1}{1-\bar{\beta}}$ then the Manager's outside option is a sale to Bidder 2 at $p = v_2$ and $\beta = \bar{\beta}$. The resulting bargain price in a sale to the Acquirer, assuming $\beta = \bar{\beta}$, is then $p^* = \frac{mv_1 + (1-m)[\bar{\beta}+s(1-\bar{\beta})]v_2}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]} \geq v_2$, which implies that the Shareholder would also not veto this sale (since he would not veto a sale at $p = v_2$ and $\beta = \bar{\beta}$). And again, $v_2 > \underline{v}(\bar{\beta})$ implies that this price under competition is strictly greater than the price in the absence of competition.

Suppose instead $v_2 < \frac{1}{1-\bar{\beta}}$ so that the Manager's outside option is a sale to Bidder 2 that yields the Manager $v_2 - (1-s)$. The outcome of Nash bargaining between the Manager and the Acquirer becomes $p^* = \frac{mv_1 + (1-m)[v_2 - (1-s)]}{\beta^* + (1-\beta^*)[m+(1-m)s]}$. As before, the deal surplus is increasing in β so the equilibrium contract will use the highest $\beta \in [0, \bar{\beta}]$ that the Shareholder would approve. For a contract with $\beta^* = \bar{\beta}$ to be approved by the Shareholder at stage 2 we must have $(1-\bar{\beta})(1-s)\frac{mv_1 + (1-m)[v_2-(1-s)]}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]} \geq 1-s$, which simplifies to $v_1 \geq \frac{1}{m(1+\bar{\beta})} - \frac{1-m}{m}v_2$. When that inequality is strict, then the Shareholder receives strictly more than $1-s$ in the equilibrium transaction, as stated in the proposition. Furthermore, note that, if instead $s > 0.5$, then the Manager's outside option in this case would be $[\bar{\beta} + s(1-\bar{\beta})]v_2$. Straightforward algebra shows that $v_2 < \frac{1}{1-\bar{\beta}}$ implies that this outside option is strictly greater than the outside option of $v_2 - (1-s)$ in the case of $s \leq 0.5$ so that the Shareholder's payoff would be greater in the case of $s > 0.5$, as the proposition states.

If instead $v_1 < \frac{1}{m(1+\bar{\beta})} - \frac{1-m}{m}v_2$ then the equilibrium contract will use a β^* such that the Shareholder receives exactly his status quo payoff, which requires $\beta^* = 1 - \frac{1}{p^*} < \bar{\beta}$. When $v_1 = \frac{1}{m(1+\bar{\beta})} - \frac{1-m}{m}v_2$ then $\beta^* = \bar{\beta}$ and the Shareholder receives exactly his status quo payoff.

Finally, note that there is surplus between the Manager and the Acquirer under competition if and only if there is surplus between the Manager and the Acquirer in the absence of competition, so that the presence of Bidder 2 has no effect on the condition for a sale.

We now turn to part 2 of the proposition. When $v_2 > \underline{v}(\bar{\beta}, s)$, then in the case that the Shareholder vote does not bind in the sale to the Acquirer, $p^* = \frac{mv_1 + (1-m)O(v_1,v_2)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]}$, where $O(v_1, v_2)$

is either $v_2 - (1-s)$ or $[\bar{\beta} + (1-\bar{\beta})s]v_2$, depending on whether the Shareholder vote binds in an alternative sale to Bidder 2. Taking the cross-partial of p^* yields:

$$\frac{\partial^2 p^*}{\partial m \partial v_2} = \frac{\partial O(v_1, v_2)}{\partial v_2} \frac{[-\bar{\beta} - (1-\bar{\beta})[m + (1-m)s] - (1-m)(1-\bar{\beta})(1-s)]}{[\bar{\beta} + (1-\bar{\beta})[m + (1-m)s]]^2}$$

Since the second term on the RHS of this expression is negative and $\frac{\partial O(v_1,v_2)}{\partial v_2} > 0$ for both outside-option cases, we also have $\frac{\partial^2 p^*}{\partial m \partial v_2} < 0$ in those cases.

If instead the Shareholder vote does bind in the sale to the Acquirer, the Manager's outside option is $v_2 - (1-s)$ and the surplus the Manager and Acquirer are bargaining over is given by $\Delta = v_1 - (1-s) - [v_2 - (1-s)] = v_1 - v_2$. The equilibrium price then becomes $p^* = mv_1 + (1-m)v_2$ so that $\frac{\partial^2 p^*}{\partial m \partial v_2} = -1 < 0$.

Finally, note that for the knife-edge situations at the boundary between these three cases, p^* is not differentiable so that $\frac{\partial^2 p^*}{\partial m \partial v_2}$ does not exist. □

Proof of Proposition 10

We solve the game by backwards induction, beginning with the branch of the game tree in which the Manager negotiates a deal with the Acquirer at stage 1. The Acquirer and the Manager strike a deal at stage 1, if any, in anticipation of what happens at subsequent stages. This effectively imposes constraints on possible deals. Specifically, stages 3 and 4 impose the following constraints on the terms of an equilibrium sale to the Acquirer, which are identical to the single-bidder case:

- At stage 4, the Shareholder will sue if and only if $\beta' \geq \bar{\beta}$. Since any $\beta' > \bar{\beta}$ in a surviving deal will be reduced to $\bar{\beta}$ by Shareholder suit at stage 4, it is without loss of generality from a payoff perspective to focus on the SPNE in which any deal agreed to at stage 1 has $\beta \leq \bar{\beta}$, which we refer to as the anti-self-dealing or "ASD" constraint.

- At stage 3, the Shareholder will vote in favor if and only if $(1-s)(1-\min\{\beta', \bar{\beta}\})p' \geq 1-s$. Assuming the ASD constraint is satisfied, this implies that the terms of an equilibrium deal with the Acquirer agreed to at stage 1 must satisfy $(1-\beta)p \geq 1$, which we will refer to as the shareholder vote or "SV" constraint.

Stage 2 introduces an additional "*Revlon* constraint" on the terms (β, p) of an equilibrium deal agreed to at stage 1: $(1-\beta)p \geq v_2$. To see this, suppose the *Revlon* constraint did not hold, i.e., $(1-\beta)\,p < v_2$. If (β, p) do not satisfy the ASD and SV constraints, then they are not a possible deal anyway, and additional constraints are irrelevant. Focus thus on the case in which (β, p) do satisfy the ASD and SV constraints and yet $(1-\beta)\,p < v_2$. Then Bidder 2 can and would profitably make an offer $(0, p_2)$ with $p_2 \in ((1-\beta)\,p, v_2)$, scuttling the Acquirer's and the Manager's deal. Notice that this offer, if accepted, is profitable to Bidder 2 since $p_2 < v_2$. Furthermore, the offer will be accepted: *Revlon* requires the Manager to accept it at stage 2 since $(1-0)\,p_2 > (1-\beta)\,p$, it also satisfies the SV constraint (since (β, p) does by assumption), and $\beta = 0$ trivially satisfies the ASD constraint. On the other hand, Bidder 2 cannot profitably make a topping bid that would beat the Acquirer's deal terms if the *Revlon* constraint $(1-\beta)p \geq v_2$ and other constraints do hold, since then Bidder 2's highest profitable bid $(0, v_2)$ would still offer shareholders less (namely v_2) than the Acquirer $((1-\beta)\,p)$. Finally, note that any deal with the Acquirer that satisfies $(1-\beta)\,p > v_2$ also cannot be rationally topped by any other bidder i, for the same reason, since they have an even lower valuation than Bidder 2.

Note that in equilibrium there cannot be a winning bid at stage 2 that tops the initial deal with the Acquirer at stage 1. Suppose, contrariwise, that Bidder 2, say, were to make a winning topping bid. In such a bid, Bidder 2 would set $\beta_2 = 0$ because this minimizes the price p_2 required to beat the Acquirer's offer $((1-\beta_2)\,p_2 > (1-\beta)\,p)$ and meet the SV constraint, if any $((1-\beta_2)\,p_2 \geq 1)$, which is all that Bidder 2 cares about. The highest price Bidder 2 would rationally be willing to pay is v_2. In such a winning bid by Bidder 2, the Manager would thus get only $sp_2 \leq sv_2 < sv_1$. If $v_1 > p_2$—which would have to be the case if $v_1 > v_2$—the Manager and Acquirer would both be strictly better off if they had agreed to a deal with $p \in (p_2, v_1)$ and $\beta = 0$, which would have beat Bidder 2's bid, so Bidder 2's bid winning cannot be an equilibrium. If $v_1 = v_2 = p_2$, the Manager and Acquirer are indifferent between Bidder 2 winning or the Acquirer and Manager agreeing to such a deal $p = v_1$, but under the tie-breaking rules at stage 2, Bidder 2's bid wins only if $p < v_1 = v_2 = p_2$, in which case Bidder 2 would do even better by setting $p_2' \in (p, v_2)$, so this cannot be an equilibrium either. And the same argument rules out an equilibrium topping bid from any other bidder i, which have $v_i < v_2$.

Taken together, these observations imply that there will be a deal between the Manager and the Acquirer—and no sale otherwise—if and only if there exists a $p > 0$ and β such that

$$v_1 \geq p, \tag{20}$$

$$\beta p + s(1-\beta)p \geq s + b, \tag{21}$$
$$\beta \leq \bar{\beta}, \tag{22}$$

$$(1-\beta)p \geq 1, \tag{23}$$

and

$$(1-\beta)p \geq v_2, \tag{24}$$

which represent the Acquirer's participation constraint, the Manager's participation constraint, the ASD constraint, the SV constraint, and the *Revlon* constraint, respectively. We see immediately that the *Revlon* constraint (24) is redundant when $v_2 \leq 1$ because it is then implied by the shareholder vote constraint (23), proving our observation above the proposition that in this case the *Revlon* regime reduces to the baseline anti-self-dealing model. By contrast, under the assumption $v_2 > 1$ stated in the proposition, (24) implies (23), so that we can ignore (23) from here on.

Such a β and p exist if and only if there exists a β that satisfies these constraints when $p = v_1$ (the maximum the Acquirer is willing to pay):

$$\beta v_1 + s\,(1-\beta)\,v_1 \geq s + b, \tag{25}$$
$$\beta \leq \bar{\beta}, \tag{26}$$

and,

$$\beta \leq 1 - \frac{v_2}{v_1}, \tag{27}$$

where we have solved the *Revlon* constraint for β.

If $\bar{\beta} \leq 1 - \frac{v_2}{v_1}$ then the ASD constraint implies the *Revlon* constraint, which can therefore be ignored. Since the LHS of (25) is increasing in β, we can derive the condition for a sale by substituting $\beta = \bar{\beta}$ into (25), which yields $v_1 \geq \frac{s+b}{\bar{\beta}+s\left(1-\bar{\beta}\right)} = \underline{v}(\bar{\beta})$. This condition for a sale is the same as would obtain for these parameters under the baseline ASD regime. To show this, we need only verify that the Shareholder would not veto a deal at $p = v_1$ and $\beta = \bar{\beta}$ under the baseline ASD regime so that the deal condition under that regime would also be based on inequalities (25) and (26). This requires that $(1-\bar{\beta})v_1 \geq 1$, or $v_1 \geq \frac{1}{1-\bar{\beta}}$. And we are considering the case in which $\bar{\beta} \leq 1 - \frac{v_2}{v_1}$, which implies $v_1 \geq \frac{v_2}{1-\bar{\beta}} \geq \frac{1}{1-\bar{\beta}}$, where the last inequality follows from our assumption that $v_2 > 1$.

If instead $\bar{\beta} > 1 - \frac{v_2}{v_1}$ then the *Revlon* constraint defines the maximum β that can be used with $p = v_1$. Substituting β from the *Revlon* constraint into the Manager's participation constraint, the condition for a sale becomes

$$\left(1 - \frac{v_2}{v_1}\right) v_1 + s\left(1 - \left(1 - \frac{v_2}{v_1}\right)\right) v_1 \geq s + b, \tag{28}$$

or

$$v_1 \geq (1-s)\, v_2 + s + b = \underline{v}(1 - \frac{v_2}{v_1}). \tag{29}$$

We now turn to characterizing the equilibrium (β, p) agreed to at stage 1 if there is a sale, as well as whether the Manager decides to negotiate a deal at stage 1 or instead just goes straight to an auction.

The deal surplus between the Manager and the Acquirer given p and β is given by $\Delta = v_1 - (1-\beta)(1-s)\, p - (s+b)$. Under our bargaining assumption, the Manager's payoff must be equal to their outside option plus $m\Delta$, or $[\beta + s(1-\beta)]\, p = s + b + m\Delta$. Substituting the expression for Δ into this equation and solving for p yields:

$$p^B(\beta) \equiv \frac{mv_1 + (1-m)(s+b)}{\beta + (1-\beta)[m + (1-m)s]}, \tag{30}$$

which is decreasing in β. The set of potential bargaining outcomes is thus $(\beta, p^B(\beta))$ for various values of β.

The parties will choose the maximum β possible that will satisfy the ASD constraint and the *Revlon* constraint (recall we can ignore the shareholder vote constraint since $v_2 > 1$) given p and the parameters (if it exists). (Proof: Suppose not, and the parties choose β^* and p^* such that the ASD constraint and the *Revlon* constraint are slack. Then there exists an alternative $\beta = \check{\beta} > \beta^*$ that also satisfies the ASD constraint and the *Revlon* constraint given $p = p^*$. The Acquirer is indifferent between the contracts (p^*, β^*) and $(p^*, \check{\beta})$ while the Manager strictly prefers the contract $(p^*, \check{\beta})$ to (p^*, β^*). But then (p^*, β^*) cannot be the bargaining outcome.) The equilibrium bargaining outcome is thus $(\beta, p^B(\beta))$ for the highest β that satisfies both the ASD constraint and the *Revlon* constraint. Substituting $p^B(\beta)$ into the *Revlon* constraint yields:

$$v_2 \leq (1-\beta)\frac{mv_1 + (1-m)(s+b)}{\beta + (1-\beta)[m + (1-m)s]}. \tag{31}$$

Note that the RHS of (31) is decreasing in β, so increasing β makes it harder to satisfy the *Revlon* constraint.

We now check whether the bargaining outcome with the highest β that satisfies the ASD constraint also satisfies the *Revlon* constraint. If so, then $(\bar{\beta}, p^B(\bar{\beta}))$ must be the equilibrium deal the Manager and Acquirer would negotiate. The condition is:

$$v_2 \leq (1-\bar{\beta})\frac{mv_1 + (1-m)(s+b)}{\bar{\beta} + (1-\bar{\beta})[m + (1-m)s]} \equiv v_2^R. \tag{32}$$

The RHS of (32) is the threshold v_2^R in the statement of the proposition and $p^B(\bar{\beta})$ is the equilibrium price given in part 2.(a) of the proposition.

Consider now how the Manager's payoff in a deal in this case compares to what her payoff would be if she were to instead forgo negotiations at stage 1 and just run an action. In an auction the outcome would be the same as in the no frustration rule model, with the Acquirer buying the firm for $p^* = v_2$ with $\beta^* = 0$, yielding the Manager a payoff of sv_2. In contrast, if $v_2 \leq v_2^R$ then in a negotiated deal the Manager would receive $(\bar{\beta} + (1-\bar{\beta})s)\frac{mv_1+(1-m)(s+b)}{\bar{\beta}+(1-\bar{\beta})[m+(1-m)s]} = (\frac{\bar{\beta}}{1-\bar{\beta}} + s)v_2^R > sv_2$ and hence in equilibrium must negotiate with the Acquirer at stage 1.

Consider now the case in which $v_2 > v_2^R$ so that the highest feasible β is determined by the *Revlon* constraint instead of the ASD constraint.

In this case the solution must be at the bargaining outcome at which the *Revlon* constraint binds, which we will denote $(\beta_R, p^B(\beta_R))$ where β_R is defined by the binding *Revlon* constraint using $p = p^B(\beta)$:

$$v_2 = (1-\beta_R)\frac{mv_1 + (1-m)(s+b)}{\beta_R + (1-\beta_R)[m + (1-m)s]} \tag{33}$$

Solving for β_R yields:

$$\beta_R = 1 - \frac{v_2}{mv_1 + (1-m)[(1-s)v_2 + s + b]}. \tag{34}$$

Note that β_R is strictly decreasing in v_2. The corresponding bargaining price is given by:

$$p^B(\beta_R) = mv_1 + (1-m)[(1-s)v_2 + s + b]. \tag{35}$$

The Manager's payoff in this bargaining outcome is given by $mv_1 + (1-m)(s+b) - m(1-s)v_2$, which is decreasing in v_2.

Consider now the level of v_2 at which $\beta_R = 0$. We find this by substituting $\beta_R = 0$ into (33) and solving for v_2, yielding:

$$v_2 = \frac{mv_1 + (1-m)(s+b)}{[m + (1-m)s]} \equiv v_2^A. \tag{36}$$

If $\beta_R = 0$, then the binding *Revlon* constraint simplifies to $0 = 1 - \frac{v_2}{p^B(0)}$, so that $p^B(0) = v_2$, yielding the Manager a payoff of sv_2. Thus, if $v_2 < v_2^A$ then $\beta_R > 0$ and the Manager's payoff is greater than sv_2, and the Manager does better negotiating with the Acquirer at stage 1 than she would do just running an auction. This completes the proof of part 2.(b)i. of the proposition.

If $v_2 > v_2^A$ then $\beta_R < 0$ and the Manager's payoff is less than sv_2. This case represents a situation in which, in a negotiated transaction, the Manager must accept *less* than her pro rata share s of the public price of the shares paid by the Acquirer by using a negative β to increase the Shareholder's payoff in order to prevent Bidder 2 from topping the deal at stage 2. But recall that the Manager would get a payoff of sv_2 if she forgoes negotiations at stage 1 and just auctions the firm, so that in this case she would just run an auction. This completes the proof of part 2.(b)(ii) of the proposition. □

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