Using Auction Theory to Inform Takeover Regulation

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1. Introduction

This paper focuses on certain mechanisms that govern the sale of corporate assets. Under Delaware law, when a potential acquirer makes a serious bid for a target, the target's Board of Directors is required to act as would "auctioneers charged with getting the best price for the stock-holders at a sale of the company.''[1] The Delaware courts' preference for auctions follows from two premises. First, a firm's managers should maximize the value of their shareholders' investment in the company. Second, auctions maximize shareholder returns. The two premises together imply that a target's board should conduct an auction when at least two firms would bid sums that are nontrivially above the target's prebid market price.

Legal commentators generally share the Delaware courts' preference for auctions. According to these commentators, the state should pursue efficiency, which here requires a target's assets to be sold to the highest-valuing possible acquirer at the least cost. An auction is thought best to achieve the efficiency goal (Gilson, 1982). Also, auctions reduce the target shareholders' collective action problem. This problem may prevent atomized shareholders from getting the highest price (Bebchuk).

The broad preference for auctions in the legal community does not rest on serious study of the properties of the typical "takeover auction." Rather, auction proponents implicitly suppose that takeover auctions are similar to classic English auctions, in which the bidders gather in a room and bid in ascending order until all but one of them drops out. In equilibrium, the winner has the highest valuation for the auctioned object, so English auctions do ensure that the right buyer wins. These auctions also generate high prices because the winner is able to pay the most. Actual takeover auctions differ in material respects from this auction model that dominates legal thought.

The desirable properties of English auctions obtain when three assumptions hold. Potential bidders (a) know what, when, and where objects are offered for sale, (b) can costlessly acquire information about the value of the objects being sold, and (c) can bid as often as they like. More formally, bidders have zero search, investigation, and bidding costs. These assumptions imply that the bidder with the highest valuation for the auctioned object always buys it, but none of these assumptions hold in the takeover context. Instead, (a) search costs are positive—it is expensive to find possibly desirable acquisition partners; (b) investigation costs are positive; (c) bidding costs are positive because the forms in which bids must be cast are subject to extensive legal regulation.[2] In addition, target boards use strategies that are prohibited in the classic English auction, such as refusing to sell to the auction winner without further negotiation respecting price. The question whether actual "takeover auctions" perform similarly to the English auctions of theory has received little attention in the legal and economic literatures.

This paper draws on auction theory to evaluate current regulation of the takeover auction.[3] Our analysis of these questions is preliminary. Actual takeovers are too complex and auction theory too undeveloped to permit us to model the takeover auction in its full particularity. Nevertheless, our early results are suggestive.

We show that the appropriate form of auction regulation is a function of three factors: the takeover auction environment, the policy goal the state wants to pursue, and whether target managers are trustworthy (as a rule). Respecting the first factor, the auction literature distinguishes between two ideal auction environments. An auction is a *common-value auction* if every bidder has the same value for the

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1. *Revlon v. MacAndrews & Forbes,* 506 A.2d 173 (Del. 1986). In December 1989, the Delaware Supreme Court described the Revlon case as holding that "when several suitors are actively bidding for control of a corporation, the directors may not use defensive tactics that destroy the auction process . . . the board must act in a neutral manner to encourage the highest possible price for shareholders." In addition, if only one offer is outstanding, the target board ordinarily must make "a canvass of the market to determine if higher bids may be elicited" [*Barkan v. Amsted Industries, Incorporated, et al.* (Del. Sup. Ct. December 18, 1989)]. Delaware law is significant because many public companies are incorporated in Delaware. The Williams Act requires takeover bids to remain open for 20 or more business days. This minimum offer period is justified on the ground that it facilitates auctions.

2. Macey recently added to the legal literature on takeover auctions by recognizing that sunk costs influence bidding behavior in the acquisition context. Our analysis differs substantially from his; we note relevant differences later.

3. See McAfee and McMillan (1987a) and Wilson for recent surveys of auction theory.

auctioned object. For example, an auction of oil leases approximates a common-value auction because the ex post value of a lease is roughly the same for all. An auction is an *independent private-values auction* if the value of the auctioned object differs across potential acquirers. For example, an auction of an antique would resemble an independent private-values auction if bidders purchase for use rather than resale. In the theoretical literature, these auction environments are analytic rather than descriptive. Actual bidders rarely have identical valuations for an auctioned object nor are their valuations completely uncorrelated.[4] To make auction theory useful the analyst must ask which ideal auction environment does a particular real world selling institution more closely resemble. We argue that a takeover can be analyzed as if it were a common-value auction if the takeover is made to cure target mismanagement. In this case, each of the potential acquirers would pursue roughly the same postacquisition business strategy were it to win. A takeover should be viewed as an independent private-values auction if it is made for synergy purposes. Then the postacquisition surplus is likely to vary considerably with the nature and plans of the winning bidder.

A second factor influencing takeover regulation is the policy goal, either efficiency or revenue maximization. Under efficiency, the state adopts takeover rules that maximize the social gain. Under revenue maximization, the adopted rules maximize returns to target shareholders given the appearance of at least one bidder. The revenue maximization goal entered the law because of the way takeover litigations are conducted, but has no intellectual support. Parties affected by takeovers commonly litigate against the target's board, claiming that the board either took or failed to take an appropriate action. The board is a fiduciary for target shareholders. Hence, the question for courts is whether the board fulfilled its fiduciary duty; in the takeover context, the duty is fulfilled by maximizing revenue to target shareholders. There is, however, no moral or distributional case for benefitting target shareholders as a group rather than benefitting society as a whole (Schwartz, 1986). Hence, the right question for the state is which takeover mechanisms advance the common good. We consider both policy goals here, but stress efficiency considerations.

The final factor influencing regulation is the behavior of target boards and managers when facing bids. Call boards and managers "faithful" if they act to maximize revenue to target shareholders. The courts' preference for auctions reflects the view that target officers sometimes are unfaithful.

In Section 2, a model of the bidding process is set out that captures some of its actual complexity. Common-value auctions are discussed in Section 3 and independent private-values auctions are discussed in Section 4. Because legal regulation is strongly influenced by the goal of target shareholder revenue maximization, takeover auctions are evaluated under both the efficiency and revenue maximization goals in Sections 3 and 4. In addition, in these sections the effect of frequent board practices such as paying breakup fees, granting lockups, and prohibiting racheting bids are discussed. In Section 5, we consider the policy implications of our analysis. We show that a ban on auctions is the preferred policy if most takeovers occur in a common-value environment; whereas, if takeovers more often take place in an independent private-values environment and target boards are unfaithful, then requiring auctions is the best policy. We conclude in Section 6.

2. The Takeover Institution

Legal regulation of the takeover process is rapidly evolving, especially in the courts, and some of the rules remain unclear. Nevertheless, enough has been settled concerning important features of the institution to justify an attempt to analyze what is happening now. Our effort at relative realism follows.

There is a set of potential bidders $\{b_1, b_2, ..., b_N\}$ and a set of potential targets. Some of the bidders search for desirable targets to buy. A search may reveal a potential target that is worth investigating seriously. We denote b_1 as the first possible bidder to discover such a target. This firm can investigate further at a cost k.[5] Investigation may reveal the value of the target to b_1 with certainty or just cause b_1 to update its valuation. An initial bid is made at a cost c; later bids are made at zero marginal cost— b_1 simply alters a number.[6] We assume that the bidding cost c is fixed partly for analytical tractability. The assumption also seems relatively weak. The bulk of a bidder's transaction costs—paying lawyers and

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[4] The oil lease auction is not a pure common-value auction because bidders likely have different production costs and so would derive different surplus from winning. The antique auction is not a pure independent private-values auction because bidders usually consider the possibility of resale; hence, their views of an antique's value are partly based on estimates of future market prices. Milgrom and Weber provide an analysis of a more general model with affiliated values.

[5] For simplicity, the investment decision is binary. For the case where bidders can choose an amount of information see Hausch and Li, and Matthews. Also, b_1 investigates before it contacts the target. Any information that an alerted target later provides concerning its own value is ignored unless the information is credible—that is, consistent with or inferable from the target's books or based on observable circumstances.

[6] Note that the transaction costs $k + c$ routinely sum to millions of dollars. We have assumed that the investigation and bidding costs are the same for each potential bidder. This simplifies the decisions to investigate and to bid. Bidding behavior only depends indirectly on these costs to the extent they influence the expected number of bidders, since the costs are sunk at the time of bidding.

investment bankers, arranging financing, etc.— apparently is exhausted in the preparation and making of the first bid. Consequently, transaction-cost considerations appear not to deter potential acquirers from rebidding. Also, some takeovers function much as sealed-bid auctions: there is one round of bidding and each bidder is ignorant of its competitors' bids. In this case, c is the only bidding cost.

When b_1 decides whether to investigate the target seriously, its search costs are sunk and so b_1 will ignore them. Hence, b_1 will investigate if the expected gain from owning at least some of the target exceeds k. After investigation, b_1 may (a) go away; (b) buy a share a of the target, publicly announce that it owns a shares, and await events;[7] or (c) buy α of the target, make the public announcement, and bid. We focus on the third case. When b_1 decides whether to bid, its investigation costs also are sunk. Hence, b_1 will bid if the expected gross profit from bidding exceeds the bidding cost c. A necessary condition for bidding is that the value of the target to b_1 exceeds $c + p_1$ where p_1 is the lowest price that will induce tender.

Bidders may be imperfectly informed after investigation for two reasons. First, information relevant to the target's value to a bidder—how a merger would actually work—sometimes can be inferred only from data that is private to the target. Second, a thorough investigation may disclose the seriousness of a bidder's interest before the bidder wants this information known. The desire for secrecy partly rests on the ability of bidders to make gains by purchasing a shares of the target before the market fully incorporates the news that an acquisition of the target is likely. Accordingly, initial bids today typically are accompanied by a letter to the target offering to negotiate all aspects of the offer, including the price, if the target provides the bidder with information that would justify changing the terms of the initial bid. Further, these initial bids are often "openers"; they are lower than the bid that b_1 expects will be necessary to win. Openers are made because bidders know they are imperfectly informed, and also because, as is shown soon, bidders know they are in a bargaining game. To demonstrate bidder seriousness—why this is necessary is discussed immediately below—openers are nontrivially above the target's prebid market price, and thus might induce tender were shareholders permitted to respond to them. Hence, we also denote an opener bid as p_1.

A target's board can block any initial offer. This power primarily arises from the target's prior issuance of a poison pill. In essence, a poison pill makes any acquisition unprofitable.[8] Hence, all bids are made conditional on the target board redeeming its pill. The question is whether the board will do this. Under the law, the board need not redeem a pill in face of a "coercive" offer—a two-tier offer with a second stage price that is lower than the bid price. Hence, these bids no longer are made; rather, bids are for any and all shares. Otherwise, the board is under a legal duty to maximize revenue to target shareholders. In furtherance of this duty, the board can reject an initial offer and take no further action if the offer is not serious—that is, if the offer is inadequate in the opinion of the target's investment bankers.[9] This ability to reject offers as nonserious gives the target's board a limited ability to set a reserve price in the takeover auction. If the initial offer is adequate, or if it is reasonable to believe that the initial bidder would make an adequate offer were it encouraged to do so, the board must conduct an auction for the company.[10] The board is required to redeem its pill in favor of the highest bidder if this bidder's offer is fair (a "fair" offer is larger than an "adequate" offer). Once the pill is redeemed, the shareholders are free to decide whether to tender. Shareholders commonly do tender to the offers that emerge from this bidding process. Thus we analyze takeover auctions as games between bidders and the target's board.[11]

Tender offers are news. Firms therefore will consider whether to overbid an initial offer. Call one such firm b_2. This potential bidder, to preserve its reputation for seriousness, will not approach the board

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[7] The share of the firm, α, that can be purchased before the public announcement was typically between 5 and 15 percent when the Williams Act alone governed. The public announce ment is not optional with the firm, but is legally required. More recently, the Hart-Scott-Rodino Act requires firms contemplating mergers to notify the Justice Department. These notifications quickly become public. As a result, the percent of a target's shares that can be purchased "privately" is smaller than it once was.

[8] The use of poison pills is described and the law relating to them criticized in Macintosh.

[9] Considerable legal uncertainty exists concerning when an offer is good enough to put a company in play and when it is good enough to create a legal obligation on the board's part to let its shareholders vote. See Bebchuk and Kahan. We ignore this question here because our concern is not with whether a board should take a particular offer but rather with the rules governing the bidding institution generally.

[10] The board's duty in this regard should not be overstated. The board is required to "canvass the market" in some fashion and to entertain bids. It is not required to go through a prescribed set of auction procedures. The Delaware Chancery Court recently upheld a "post merger agreement check procedure." Under this procedure, the target's board signed a merger agreement with the initial bidder that permitted the board to withdraw if a higher offer materialized and to provide information to later interested parties, and the deal could not close until other bidders had time to appear. In the case, the board did provide information to a second possible bidder, but no one else actually bid. See *Myron Roberts v. General Instrument Corporation* (Del. Ch. August 13, 1990).

[11] Our analysis then is in contrast to prior work that models takeovers as games between a single bidder and a set of target shareholders, such as Grossman and Hart. These models remain useful but treating the target board as the most important player on the selling side adds realism given current legal regulation.

without making some investigation to ensure that it has a real interest. Also, the board will ignore firms that cannot credibly demonstrate an interest in an acquisition. If bidder valuations are uncorrelated, as in a pure independent private-values auction, then b_2 will have to spend k in investigation costs; if b_1's bid reveals information relevant to b_2 about the target's value, b_2 may spend less. In any event, after b_2 investigates, it may (a) go away; (b) bid and request further information concerning target value; or (c) give credible assurances that it will bid if the data so justify, and request the data. We focus on the latter two cases. Boards now apparently must make information available on a nondiscriminatory basis to all serious entrants that are willing to sign confidentiality agreements. If b_2 bids, it must spend c. Hence, a necessary condition for b_2 to bid is that its expected gross profits from participation exceed its bidding cost c.

Sometimes, there will be further rounds of bidding; other times, the board announces that it will entertain just one round of offers from firms that have examined the target's books.[12] As said above, the board will redeem its pill in favor of the highest bidder that makes a fair offer. Other common features of the takeover auction process are discussed below.

3. Common-Value Auctions

Common-value takeover auctions are inefficient in the usual case when investigation leaves bidders uncertain of the target's value. Nevertheless, target boards are required to maximize revenue from acquisitions. Accordingly, we ask what target board practices advance the goal of revenue maximization in a common-value setting. The analysis initially supposes that target managers are faithful, and then relaxes this assumption.

3.1 Common-Value Auctions without Residual Uncertainty

When investigation is costly but reveals the value of the target with certainty, auctions are efficient because only *one* bidder will enter the auction. To see this, suppose that the (common) value of a target to any acquirer is v. Let b_1 know v with certainty if it spends k. Assume next that b_1 bids p_1 at a cost of c. A second firm, b_2, that learns of the bid would anticipate that if it entered the auction, the price would be bid up to v because b_1 knows v and can bid further at zero marginal cost. Hence, b_2 will not enter because its expected value of participation,—c, is negative. Thus, b_1 will purchase the target and gain $v - p_1 - (k + c)$. This conclusion illustrates a general result in auction theory: a bidder's profit in a common-value auction equals the value of the private information that the bidder brings to the auction.[13] Here b_2 would bring no new information to the auction, so b_2's gross profit is zero.

An auction in the certainty case also is revenue maximizing when the target's board knows the common-value v and has the power to block bids. Such a board, if faithful, could refuse to redeem the poison pill unless an offer of $v - (k + c)$ is made. Alternatively, the board could threaten to induce entry of a second bidder by agreeing to pay its transaction costs if the initial offer is too low. If the initial bidder anticipates either action, then its best offer is $v - (k + c)$; any lower offer would induce entry and result in a payoff of $-(k + c)$. Thus, the target's revenue is the entire surplus in the common-value certainty case.[14]

3.2 Common-Value Auctions with Residual Uncertainty

There is scope for an auction when an investigation of the target would leave bidders unsure of its actual value. In this case, it is revenue maximizing for the target's board to limit the number of entrants if the board can negotiate higher bids in return for entry restrictions. Indeed, the board may maximize gross revenue by negotiating with the first firm that expresses a serious interest; the possibility of an auction would then function as a threat in the event negotiations break down. A negotiation strategy is also likely to maximize net revenue because the costs of a single bilateral negotiation probably are lower than the costs of an auction. Hence, auctions are desirable in the common-value residual uncertainty case only if target boards are unfaithful.[15]

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[12] In the RJR/Nabisco buyout, the board initially announced that it would entertain one round of offers but relented to permit further bids when this latter strategy promised to increase the ultimate price. See In re RJR Nabisco, Inc. Shareholders Litigation (Del. Ch. January 31, 1989). A possible explanation for the change in strategies is discussed in note 19, *infra,* and accompanying text.

[13] See Milgrom and Weber. Macey recognizes that the optimal number of bidders in a common-value open English auction without uncertainty is 1 but he apparently argues that the state should run a sealed-bid first-price auction in this case. No more than one bidder can enter in equilibrium, however, assuming its entry is observed. It would cost c to bid. Given that c is sunk, if more than one enters, the equilibrium bid is v. Hence, for more than one to enter would generate a negative expected gain of $-c$ for each bidder.

[14] If the poison pill were unenforceable, then the target's hoard could not pursue the strategies described in the text, and b_1 would get the entire surplus. Awarding b_1 the surplus would be efficient because it would increase search for mismanaged targets (we argue in section 5.1, *infra,* that common-value environments typically involve mismanaged targets).

[15] Auctions also ate desirable under the revenue maximization goal when the costs of the auction are negligible. McAfee et al. show that the seller's optimal auction in a common-value environment without transaction costs ($k = c = 0$) extracts the full surplus from the bidders.

We begin by setting out a symmetric model of the bidding process based on Harstad.[16] Let the value of the target be a random variable v with expected value $E(v)$. A potential buyer initially values the target at $E(v)$, but can obtain better information by spending k. Let this bidder b_1 spend k to get an estimate x_1 of the target's value. Each potential bidder b_i can also spend k to get an independent and identically distributed estimate x_i. Potential bidders then decide, based on their information x_i, whether to bid and incur the bidding cost c.

Denote the type of auction (sealed-bid, English, etc.) by t. Let $n(t) < N$ be the equilibrium expected number of firms to investigate given the auction type t, and let $a(t) \leq n(t)$ be the equilibrium expected number of firms that decide to bid. Let $p(t,a,n,u)$ be the expected price paid by the winner with auction type t when n firms investigate and $a \leq n$ firms bid, conditional on $v = u$. The expected profit from winning then is

$$w(t,a,n) = E\{v - E[p(t,a,n,\cdot)|v]\}. \tag{1}$$

We assume a symmetric equilibrium, so the probability of winning is 1 In. In equilibrium, entry will occur until the expected profit is equal to the expected transaction cost:

$$\frac{w(t,a,n)}{n} = k + \frac{a}{n}c. \tag{2}$$

Substituting (2) into (1) yields

$$E\{E[p(t,a,n,\cdot)|v] = E(v) - nk - ac.$$

The expected revenue to the target, then, can be calculated as in Harstad to be

$$\begin{aligned} R[t,a(t),n(t)] &= E[p(t,a(t),n(t),\cdot] \\ &= E\{E[p(t,a(t),n(t),\cdot)|v] \\ &= E(v) - n(t)k - a(t)c. \end{aligned}$$

Hence, with the equilibrium number of bidders, the target's revenue is equal to the expected value of the target $E(v)$ less the sum of the bidders' transaction costs.

This result has implications for the type of auction a revenue maximizing target should adopt: the target should select the auction that leads to the least participation (Harstad). Restricting entry reduces aggregate transaction costs. But if the board merely restricts entry without inducing higher bids in return, its revenue would be reduced. Hence, boards must negotiate higher bids in exchange for creating barriers to entry. In an extreme case, the target could get $E(v) – c$ by negotiating the sale with the initial bidder before investigation costs are incurred. In practice, such a negotiation may not be feasible because the target's board has private information. The bidder may investigate to avoid an adverse selection problem. Boards may also achieve the goal of restricting entry in return for higher prices in indirect ways. As we later show, certain practices of target boards may be explained, and can only be justified, as efforts by faithful boards to restrict the number of bidders in a common-value auction in return for receiving higher bids.

This analysis has several legal implications. Cases that require target boards to make information available to prospective bidders advance the goals of revenue maximization and efficiency. Providing information has two effects. It reduces the costs of bidding and investigation. Since the seller bears these costs, reducing them raises the size of winning bids. Further, reducing uncertainty decreases the informational rents that the bidders receive: bidders are willing to offer more, since they are less susceptible to the winner's curse. Indeed, there is no justification for targets not to open their books, confidentiality considerations aside.[17] Less obviously, target boards can reduce uncertainty by running English auctions—that is, by encouraging rounds of bidding and by keeping bidders fully informed of competing bids.[18] When bidder valuations are correlated, as in common-value auctions, and when entry into the auction is costly, the fact and size of b_1's bid is informative to b_2. Specifically, b_1's bid reflects

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[16] Related analyses are found in French and McCormick and Hausch and Li.

[17] Requiring a confidentiality agreement may be insufficient when bidders are in the same industry as the target. In this case, an auction loser could use the information so obtained to improve its competitive position relative to the target. The goals of revenue maximization by means of reducing bidder costs and protecting the target's ability to compete seem best harmonized case by case; a court should refuse to order a target to produce information when to do so is likely to impair its ability to compete.

[18] Milgrom and Weber derive this result when values are affiliated.

its updated estimate of the target's true value; b_2 can add inferences derived from b_1's bid—that b_1 believes that entry is worthwhile—to b_2's own updated estimate to form a more precise measure of the target's value. Thus uncertainty is lower in English auctions than in sealed-bid auctions. When uncertainty shrinks, the winning bid is higher and the equilibrium number of bidders falls. Hence, if target boards do run auctions in the common-value case, these auctions should mimic English auctions as closely as possible. In particular, the practice of some boards to attempt to approximate sealed-bid auctions and to agree to bidder requests not to "shop" offers are inconsistent with revenue maximization in the common-value context.[19]

In sum, the target board can increase revenue by reducing bidder uncertainty and by adopting an auction form that leads to few participants. Actually, the board may maximize revenue by negotiating with a promising bidder. Since the target board is likely to be better informed than any of the bidders about the target's true value and since boards have considerable bargaining power— the poison pill permits them to reject any offer they dislike—a target probably will do better on net if it negotiates with a promising bidder individually rather than holds an auction.[20]

If boards are faithful, the efficiency and shareholder revenue maximization goals therefore coalesce. Auctions are inefficient in the common-value uncertainty case and faithful boards will not conduct them. If boards are unfaithful, and so will negotiate in bad faith or sabotage an auction in order to remain independent, the efficiency goal implies auctions never; bids should be made directly to the shareholders.[21] The implications of the revenue maximization goal are less clear because the loss of the poison pill may reduce revenue. However, to the extent that the initial bid is nontrivially above the target's prebid price, target shareholders will do better all in all with auctions never than with rule by faithless boards.

3.3 Particular Board Strategies

This section considers strategies that have the effect of reducing the number of entrants but increasing the size of the winning bid. We anticipate later analysis by noting that restricting the number of entrants in independent private-values auctions is undesirable. Thus, our approval of the entry restricting effect of these practices is limited to the common-value context with faithful boards, where restricting entry is desirable under both policy goals: it is efficient to reduce entrants because this reduces transaction costs and appropriate entry restrictions increase revenue.

3.3.1 Breakup Fees.

A breakup fee is a sum that a target board promises to pay to a serious potential buyer in the event that it loses the auction, if the buyer either enters or raises an existing bid. Breakup fees are substantial, sometimes amounting to as much as 3 percent of a target's value. These fees may be used by the target's board either to increase or reduce the number of auction entrants in an effort to increase the size of the winning bid. Hence, they may advance the goal of revenue maximization in the common-value context.

Breakup fees seem more commonly used to deter entry in the auction. To understand how they function, suppose that b_1 investigates the target and announces to the board that it plans to bid p_1. The board then promises to pay b_1 a fee f if it bids p but loses the auction, where $p - f > p_1$ This promise will reduce the value of the target to all bidders by the fee f. The initial bidder's value is reduced, since by winning it forgoes the payment of f; any later bidder's value for the target will also be reduced by f since, if this bidder wins, it will have to pay f to b_1. The breakup fee deters entry by later bidders because it reduces the value of the target and raises b_1's bid. The promise of the fee will induce b_1 to increase its bid over the bid it otherwise would have made for two reasons. First, deterring entry increases b_1's probability of winning; second, the reduced competition reduces the severity of the winner's curse (Varaiya). Therefore, a breakup fee may be desirable in a common-value setting when there is residual uncertainty about the target's value because the fee increases the size of the winning bid

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[19] The legality of "no shop" clauses is in dispute but the clauses apparently have not been flatly prohibited. The RJR/Nabisco buyout probably involved a common-value auction; it was widely believed at the time that any buyer would pursue a similar postacquisition strategy of making substantial sell-offs. The board's switch (see note 12, *supra)* from a sealed bid to a form of English auction may have reflected the board's belated recognition that the latter mechanism was revenue maximizing relative to the former mechanism.

[20] This is the case in Vincent.

[21] This claim is normatively sound if (a) the target's prebid market price approximates its value under current management and (b) the initial bid is nontrivially above the prebid price. The first assumption follows from semistrong efficiency. For the second assumption, a recent study showed that the mean cash tender offer premium in the period from 1963 through July 29, 1968 (just before passage of the Williams Act) was 45 percent. See Nathan and O'Keefe. Since auctions were rare then, bids under the auctions never rule should be high enough.

in return for restricting entry.[22] Since transaction costs are reduced as well, both social goals are served if the breakup fee is used by a faithful board.

3.3.2 Lockups.

A lockup is an agreement between a target's board and a serious potential buyer under which the buyer is permitted to purchase target shares or target assets at favorable prices it if loses an auction, provided that the buyer either enters or raises an existing bid. Lockups are nearly indistinguishable from breakup fees: a lockup with value f and a breakup fee of f both have the effect of reducing the target's value by the amount f A lockup, however, has one advantage over a breakup fee. Since a lockup involves shares or other assets of the target, it may be valued differently, ex ante, by different bidders. This is because the value that a bidder attaches to the "locked-up" target assets is increasing in the bidder's estimate of the target's value. Hence, the target's board can use the lure of a lockup to discover and then bargain with bidders that have high estimates of the target's value.

A lockup thus has the same entry deterring effects as a breakup fee, but it tends to identify a desirable acquirer, one with a high estimate of the target's value. In practice, lockups have more pronounced effects than breakup fees, because they tend to involve larger amounts.[23]

3.3.3 Racheting Bids.

A bidder makes a "racheting bid" when it announces that it will top any other bid in the field.[24] Target boards commonly refuse to entertain racheting bids. We show here that only the initial bidder has an incentive to make racheting bids in common-value auctions. Therefore, if a racheting bid is attempted by a firm other than the initial bidder, one should infer that the auction setting is not common value.

When there is no residual uncertainty about target value after investigation, a common-value auction can profitably support only one bidder. Hence, the initial bidder need not make a racheting bid to deter possible rivals, nor would a rival enter with a racheting bid to induce existing bidders to withdraw. In the uncertainty case, suppose that b_1 spends $k + c$ and bids p_1 It would be unprofitable for b_2 to pursue the strategy of saving k—not investigating—and always bidding a finite sum above b_1's last bid. Because b_1's costs are sunk, it will bid up to its updated estimate of target value. Hence, under the proposed strategy the uninformed bidder can win only by topping the informed bidder's maximum bid. This is a losing plan ex ante. A later bidder that has itself incurred investigation costs also will not make racheting bids. Rather, it will bid until bidding would no longer yield positive expected gains, all things considered. Therefore, only the initial bidder has an incentive to make a racheting bid in a common-values auction. Boards should not entertain such bids because they either will have no effect on the auction outcome—b_2 investigates and bids—or they will deter entry without raising the winning bid—b_2 does not investigate and stays out.

4. Independent Private-Values Auctions

A takeover resembles an independent private-values auction when the social surplus that would be produced varies substantially across potential bidders. For example, a competition between b_1 and b_2 would generate an independent private-values auction if b_1 planned to use the target's assets to produce ordinary wire while b_2 planned to produce a room temperature superconductor. The goals of maximizing social welfare and maximizing target shareholder revenue partly coincide for independent private-values acquisitions. The purpose of an independent private-values auction, from a social point of view, is to ensure that the bidder with the highest valuation for the target buys it. Let b_h be that bidder. A revenue maximizing board wants to sell to b_h because b_h can be induced to make the best offer, having the highest valuation.

The social and private goals also diverge. There is no efficiency justification for requiring or permitting a target board to maximize the price that b_h will pay, once b_h is identified; the social goal is satisfied if b_h wins. A revenue maximizing board should try to get the best price. Tactics that are designed to extract this price, however, may waste social resources and risk compromising the social goal. This is because such tactics may prevent b_h from entering and because a misbehaving board can use these tactics to favor bidders other than b_h. Thus the goals of efficiency and revenue maximization only partly coincide.

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[22] A target board also may promise a breakup fee to induce another firm to enter after the equilibrium number of bidders have already entered. The increased competition will have the effect of increasing the winning bid. This use of breakup fees is not an equilibrium strategy, however, since bidders that anticipate it may not enter. we discuss this form of ex post opportunism in greater detail when we analyze independent private-values auctions. See Section 4.3.1, *infra.*

[23] The legality of lockups is unclear. Some courts have upheld them [*Crouse-Hinds Company v. InterNorth, Inc.,* 634 F.2d 690 (2d. Cir. 1980)]. Other courts have not [*Hanson Trust PLC v. ML SCM Acquisition, Inc.,* 781 F. 2d 264 (2d Cir. 1986)]. Lockups should be permitted in common-value settings assuming that the normative goal is revenue maximization. A generally favorable view of sales of treasury shares, which is a form of lockup, is in Ayres.

[24] The initial hostile bidder in the well-known Revlon case made a racheting bid.

We will evaluate independent private-values auctions in light of both goals in this section. From a social welfare viewpoint, target boards should be required to conduct English auctions insofar as these are possible, and to sell to the highest bidder without further negotiations. From a revenue maximization point of view, target boards apparently should have discretion to choose the best strategy.[25]

4.1 The Independent Private-Values Case when Valuations Are Known

An auction is pointless when the seller can rank buyer valuations accurately, because the auction's object is to induce revelation of these valuations. When this is unnecessary, the target board should negotiate directly with b_h. The cellar price in these negotiations will be the reservation price of the second-highest-valuing bidder less transaction costs. The transaction price will be a function of the highest-valuing bidder's and the target's respective bargaining powers. Hence, if boards are faithful and have discretion, they would act in the independent private-values certainty case just as they would act in the common-value case, negotiating rather than running auctions. A faithless board may exploit this discretion by rejecting an auction in the *uncertainty* case in order to negotiate with a favored potential buyer such as its own management team (or negotiate in bad faith to remain independent). Boards could do this because an assertion that the buyer with whom a board negotiated had the highest valuation with certainty would be difficult to test.[26] Also, when bidder valuations differ substantially, boards seldom could rank these valuations precisely without auctions. Therefore, even if target boards are faithful in general, the state probably should require some form of auction in the independent private-values context.

4.2 Independent Private-Values Auctions with Uncertain Valuations

In this case, each potential bidder values the target differently and the value is private information. Let bidder valuations be independently distributed according to the distribution $F(v)$. We suppose, following convention, that $F(v)$ is common knowledge—the target's board and potential bidders know the distribution of valuations—but a bidder's own valuation is private information. A potential bidder spends search costs to learn the distribution and to get some idea of its valuation; an "informed bidder" spends investigation cost k to improve its estimate, and then incurs a bidding cost c if it decides to bid.

When transaction costs are negligible ($k = 0$, $c = 0$), the goals of efficiency and revenue maximization imply a different choice of the auction form. Efficiency is best served by an English auction without a reserve price, which guarantees that the target goes to the highest-valuing firm even when firm values are not identically distributed. Revenue maximization is achieved by an auction (either English or sealed-bid) with a reserve price that exceeds the target's own value. The reserve is used to extract rents from the winning bidder.[27] The reserve leads to an inefficient outcome whenever the highest-valuing bidder has a value that is below the reserve but above the target's value under current management. This is a potential problem in takeover auctions, since the enforcement of poison pills gives the target board the power to set a reserve.[28]

4.3 Frequent Practices in Independent Private-Values Auctions

We now discuss practices that are in common use in independent private-values takeover auctions. This discussion has a theme: the practices are unambiguously objectionable from a social welfare point of view because they waste resources and because, in some cases, they risk deterring entry by the bidder with the highest valuation. On the other hand, a faithful target board has an incentive to choose the

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[25] Section 6.02(a), Discussion Draft No. 2, of the American Law Institute's proposed Principles of Corporate Governance (1989) authorizes a target board to block "an unsolicited tender offer unless the action would materially disfavor the long-term interests of the shareholders." The phrase "long-term interests" is not defined but apparently is meant to permit a board to reject an offer that is above the target's prebid market price if the board could plausibly believe that its shareholders ultimately would receive more value. Comment *a* to Section 6.02(a) explains that the section "does not place on directors who are responding to an unsolicited tender offer the duty to conduct an auction of the corporation's business." This proposed addition to U.S. corporate law is justifiable only on the ground that the state should encourage boards to maximize revenue to target shareholders, but the drafters of Section 6.02(a) do not say why the state should pursue this goal. Also, auctions are preferable in the independent private-values case as we argue later.

[26] Section 5.15 of the proposed Principles of Corporate Governance (note 25, *supra)* encourages the use of auctions when the target's management is a potential purchaser. The section is analyzed by Gilson (1989).

[27] Another reason for setting a reserve is to protect against bidder collusion (McAfee and McMillan, 1987c).

[28] However, when investigation is costly but bidding is costless ($k > 0$, $c = 0$), both efficiency and revenue maximization are served by setting the reserve equal to the target's own value (McAfee and McMillan, 1987b). When investigation is costless but bidding is costly *($k = 0$, $c > 0$)*, the efficiency goal is achieved by a sealed-bid auction without a reserve (Samuelson). The target, however, has an incentive to set a reserve above its value, and may profit from limiting the number of bidders. McAfee and McMillan (1988) determine the optimal selling mechanism for this case, assuming the seller directly bears the bidding costs and knows the set of potential bidders. Revenue is maximized by setting a reserve and sequentially offering the firm at this reserve price. If the set of potential bidders is exhausted without anyone accepting the reserve price, then the target holds an auction. This result seems inapplicable in the takeover setting, where both investigation and bidding costs are positive, bidding costs are only indirectly borne by the target, and the target probably cannot identify the set of potential bidders.

strategy that maximizes the net expected gain to target shareholders from an acquisition. Any such strategy would require a board to be sensitive not only to price but also to bidder costs and the identity of the bidders. Boards probably can balance these competing considerations better than reviewing courts can. Thus, from a revenue maximization point of view, the legality of the practices considered here should turn on the question whether target boards are motivated to maximize shareholder gains.

4.3.1 Postauction Negotiations. A target board sometimes conducts a preliminary auction to discover the probable identity of the highest-valuing bidder; the board then negotiates a purchase price individually with it. This practice risks deterring entry by high-valuing firms. To see how, recall that in an English auction each bidder has a dominant strategy that directs it to bid until all others drop out or its reservation price is reached, at which point it drops out. We assume here that when the time to bid arrives, investigation costs are sunk and that a firm must pay a fixed cost to bid, with further bids made at zero marginal cost. These assumptions imply that an English takeover auction will function among those firms that enter the bidding just as the classic English auction does. The target will be sold for the reservation price of the second-highest bidder. This bidder drops out when its reservation price is reached while the highest-valuing firm stays in and wins. Thus its surplus is the difference between the highest and second-highest values. Will postauction negotiations change this result?

To pursue this issue, let b_h denote the firm with the highest valuation v_h and let b_s denote the firm with the second-highest valuation v_s among those that enter the auction. By symmetry, the probability that a firm with valuation v wins the auction if n firms bid is $F(v)^{n-1}$; this is the probability that all other firms have valuations (and bids) below v. By submitting a bid at cost c, a firm with valuation v gets a net profit of $\pi_n(v) = [v - E(v_s|v)]F(v)^{n-1} - c$. The firm will bid if and only if $\pi_n(v) > 0$.

Postauction negotiations create the possibility of ex post opportunism and consequent ex ante welfare losses in this model. Respecting the former, the target's board knows that the winning auction price will ensure the highest-valuing bidder a positive surplus. If the board refused to sell to the winner b_h unless it got a share of this surplus, b_h would have to yield. It made a "relation specific investment" of $k + c$ in the expectation of earning a positive gain, but because its investment is sunk at the second stage, the board can exploit it by refusing to deal unless it gets a share. If the share is large enough, the winning bidder will earn negative returns. The existence of sunk costs in the acquisition context thus permits target boards to engage in ex post opportunism.

If bidders anticipate this board strategy, however, the auction could unravel; no one would enter.[29] Every potential bidder would reason that either it will have the highest valuation among those that enter, in which case it will win the auction but could earn negative returns on net, or it will not have the highest valuation and so will lose, in which case its entry costs will have been wasted. Deterring entry is inefficient so postauction negotiations produce ex ante welfare losses.

A revenue maximizing target board could increase entry by agreeing to limit the share of the winner's surplus that it takes through ex post negotiation. This solution seems unattractive, however, since the winning bidder's valuation is private information. If the target's board announced that it would demand a fixed percentage of the difference between the winning bid and the winner's true valuation, the winner would have an incentive to understate its valuation. Since the auction process is used just because bidder valuations are hard to measure, bidder understatements would be difficult to disprove.[30] Further, a board could not easily commit to demanding no more than a particular share. Under current statutory law, board agreement on a price is subject to approval by the target's shareholders, who must independently decide whether to tender. Also, current case law does not require a board to announce its negotiating strategy in advance or to stick to a strategy it announces; such obligations probably could not be derived from current doctrine. Reputational considerations, largely relevant to lawyers and investment bankers, partly constrain boards from exploiting bidders. Nevertheless, the considerations identified here suggest that postauction negotiations may deter high-valuing bidders from entering.

A target board, however, could commit indirectly not to exploit the winning bidder by promising the set of potential entrants in a preliminary   auction that it will pay the auction winner a breakup fee or lockup if postauction negotiations break down. The promise of either is equivalent to giving the ultimate winner a "hostage" to protect against ex post opportunism (Williamson). The breakup fee or lockup would be set equal to the total expected transaction costs, so that the possibility of postauction negotiations would not discourage entry . Granting such a fee would not otherwise affect the outcome: the highest-valuing bidder would still win the auction at the price of the second-highest-valuing bidder. Postauction negotiations, then, would only be effective if the value of the target to the auction winner or

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[29] Spulber emphasizes the importance of commitment in auctions for contracts.

[30] Winning bidders generally want to keep their valuations secret (or understate because they must negotiate with other commercial parties after they win. It may not be helpful to reveal true (high) valuations to later bargaining partners. See Rothkopf et al.

to a late arriving bidder exceeds the winning bid by more than the breakup fee or lockup. Whether boards use breakup fees and lockups to preserve their ability to conduct postauction negotiations without discouraging entry is unknown.

The law can respond to the difficulties that postauction negotiations create in several ways. The efficiency goal implies the prohibition of postauction negotiations altogether. Their cost is a deadweight loss and they risk deterring entry by high-valuing bidders. If the law pursues the goal of target shareholder revenue maximization, then it should enforce promises to pay breakup fees or grant lockups when these are used to induce entry. Also, a board's ability to promise not to bargain for an excessive share of the winner's surplus should be legally binding (though such a promise would be hard to enforce).

4.3.2 Practices that Facilitate or Discourage Entry.

In a common-value auction with uncertainty, a public bid reveals information about the target's value; in an independent private-values auction, a public bid reveals information about the bidder's own value. Hence, bidders in independent private-values auctions may use bids as signals. In particular, if the initial bidder b_1 has a high valuation, it can make a high initial bid to preempt entry by other bidders. These bidders may take b_1's bid as a signal that it believes it has the highest valuation, and thus they may decide not to waste costs by entering.[31] Successful preemptive bids create two difficulties. First, they may deter the highest-valuing potential buyer from incurring investigation costs k to learn its true valuation. If this buyer drops out, the social welfare goal is compromised. Second, preemptive bids may reduce the price that is paid. To see why, suppose that b_h enters but that the buyer with the true second-highest valuation is deterred. Then, since in an English auction the highest bidder wins at the reservation price of the second-highest bidder that participates, b_h will win with a lower bid. This compromises the revenue maximization goal.

The latter difficulty is probably more common than the former. Preemptive bids are made by bidders with high valuations because a bidder with a low valuation would find it unprofitable to deter entry with a high bid. Thus, permitting preemptive bids may have small efficiency costs, and indeed may improve efficiency to the extent it reduces transaction costs. High-valuing bidders, however, may pay substantially less if a preemptive strategy succeeds. Thus, while in common-value auctions a revenue maximizing target board wants to restrict entry, in independent private-values auctions such a board wants to increase it.

Whether preemptive bids are common is unknown; street lore holds that such bids are unusual. Because they are possible, this section discusses three methods that a target board could use to increase entry and the size of the winning bid. First, the board can offer a breakup fee or a lockup to a later possible bidder to induce it to enter the auction. To see how this method may work, let b_1 enter with bid p_1 Then, b_1's costs are sunk and it will stay in unless it wins or is overbid by a higher-valuing firm. Thus, the target board can agree to pay a breakup fee or grant a lockup to b_2 to induce it to enter and bid $p_2 > p_1$.Recall that breakup fees and lockups reduce a bidder's costs if it loses; hence, they can be used to stimulate entry as well as deter it. The breakup fee or lockup reduces the value of the target to all, but does not distort the auction aside from inducing b_2 to enter: b_1 will win if and only if it has the highest value. The revenue maximization goal is served because b_1 may have to pay a higher price to surpass b_2.

If b_1 anticipates that the target board will promise a breakup fee or give a lockup to later bidders, however, it may not enter. This possibility makes these practices questionable from a social welfare point of view; initial bidders should be encouraged because they are more likely to have high valuations. Therefore, unless evidence exists that preemptive bids are frequent, the efficiency goal implies that the practice of promising lockups or breakup fees to later potential entrants in independent private-values auctions should be unlawful. That b_1 may not play also is risky from a revenue maximization point of view. Hence, breakup fees and lockups should be prohibited in connection with independent private-values auctions, except as means of solving a target board's commitment problem if it chooses to engage in postauction negotiations.

A board also can increase entry by making private information available to all potential bidders. This practice would serve both the efficiency and revenue maximization goals. Hence, boards should be required to make disclosure to serious bidders in independent private-values auctions as well as in common-value auctions.

Finally, a board can attempt to increase entry by running the equivalent of a sealed-bid auction. In such auctions, each participant makes one bid and participants know only their own offers. Thus it is difficult to signal valuations by bids, and so difficult to deter entry by bidding preemptively. Despite this desirable property of sealed-bid auctions, conducting one is questionable in the takeover context. Entry deterring bids are more likely to be made by initial bidders, who often have high valuations. Also, since

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[31] Fishman and Bhattacharyya analyze preemptive bidding.

a board cannot conduct any form of auction unless it first receives a bid, there is no way to prevent b_1 from bidding preemptively. Once it does, there may be little point to conducting a sealed-bid auction.

4.3.3 Racheting Bids and Offer Shopping. A racheting bid is another type of preemptive bid. A potential buyer that announces publicly that it will top any other bid is attempting to deter entry by telling other firms that their bidding costs will be wasted. Since revenue maximizing target boards want to encourage entry, they should refuse to entertain racheting bids. In fact, most target boards do refuse to entertain them. Also, racheting bids are not necessarily made by the bidders with the highest valuations. Thus there seems little reason on efficiency or revenue maximizing grounds for overruling the common board practice of refusing to entertain racheting bids.

Bidders commonly request not to have an offer shopped, but rather to take the offer as a basis for individual negotiation. Such a request should not be granted; it conflicts with both the efficiency and revenue maximizing goals. Boards sometimes do yield to requests not to shop bids. This practice can only be justified as a means of reducing transaction costs, as in McAfee and McMillan (1988), when boards are faithful and an unusually high offer is made. If boards are unfaithful, the practice should be banned.

4.3.4 Affiliated Auctions. The efficiency and revenue maximization goals are best served by English auctions to the extent that bidder valuations are affiliated. In a pure independent private-values auction, each bidder's valuation of the auctioned object is independent of the valuations of other bidders. Complete independence, however, is not satisfied for most auctions. For example, although each bidder in an art auction may subjectively value a painting differently, the bidders may also have an investment objective. If so, bidder valuations are correlated because each is attempting to predict the future market price of the object. This notion is captured in auction theory by the concept of affiliation proposed by Milgrom and Weber. When values are affiliated, each bidder believes that as its estimate of the value of the auctioned object rises, other bidders' estimates will rise too. Bidder values are affiliated in takeover auctions to the extent that potential acquirers attempt to estimate common random factors, such as the effect of inflation or foreign trade legislation.

When bidder valuations are affiliated, open English auctions produce higher prices than sealed-bid auctions and have fewer bidders (Milgrom and Weber, Harstad). This is because the process of the English auction reveals information about the common elements of the auctioned object's value. A bidder's willingness to continue bidding reveals information about that bidder's estimate. The other bidders can condition their bids on this information, thereby reducing the winner's curse and letting them make higher bids. In a sealed-bid auction, no information is revealed by the auction process; each bid depends only on the bidder's private signal of the auctioned object's value. The possibility that bidder values may be affiliated provides another reason to require open English auctions.[32]

5. Policy Implications

The form of auction regulation should turn on three factors: the applicable policy norm, the auction environment, and whether target managers are faithful. As argued in Section 1, the revenue maximization goal is unjustifiable. Thus, we ask here what rules the efficiency norm implies.[33] Only the common-value and independent private-values auction environments are considered. In the hybrid case of affiliated values, the appropriate policy will depend on which of the two ideal auction environments is a better approximation of the takeover setting.

Common-value takeover auctions are inefficient. When each potential buyer has roughly the same valuation for the target's assets, the efficiency norm is neutral respecting which of them buys. Rather, this norm directs the state to minimize the costs of transfer. Legally required auctions are more costly than an unregulated bidding process. In contrast, auctions are desirable in the independent private-values case if there is uncertainty about which potential bidder has the highest valuation. Then a selling mechanism such as an English auction would reveal the highest-valuing bidder. Hence, the efficiency goal implies that if bidders in a large majority of acquisitions have similar valuations, then auctions

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[32] Another difficulty with the sealed-bid auction is that once the bids are in the target may have an incentive to continue to negotiate with the second-highest bidder to better the highest bid. With renegotiation of this sort, the sealed-bid auction is much closer to an English auction. Takeover auctions seldom can be conducted at one meeting, as is customary with English auctions. Entrants in a takeover auction often bid a combination of cash and a security, with different bidders offering different types of security. Hence, the target board must value the securities to determine the initial prices. Bidders seem not to alter the form of security in later rounds but rather offer more cash or more of the security (or both). Hence, target boards could conduct later rounds of bidding much as is done in the usual English auction.

[33] The revenue maximization norm would favor auctions, since auctions maximize target revenues relative to an unregulated process where bids are made directly to shareholders.

should be banned. An auction ban is convenient to implement, by eliminating the board's power to block bids with poison pills and by eliminating currently required minimum offer periods.

Should too few takeovers resemble common-value auctions to justify a total auction ban, a second possible rule would prohibit common-value auctions but require independent private-values auctions. This rule has two serious defects. First, a selective ban would be hard to implement. To see why, let the rule be enacted and suppose that a target's managers decide to run an auction after receiving a bid. The initial bidder could litigate to enjoin the auction on the ground that the takeover was common-value, but there would be a form of auction even if the bidder won the case. Potential entrants would have time to investigate the target and announce their intentions. If the initial bid then appeared low, the target's shareholders would reject it because better bids are forthcoming. Thus, if the target's shareholders are permitted to decide, and if the target's managers are required to conduct auctions in the independent private-values case, the managers could force auctions in every case. The second defect of a selective auction ban is that it is largely unnecessary if target managers are faithful. Faithful managers and boards would avoid auctions in the common-value case in favor of negotiating individually with bidders and would run some form of auction in the independent private-values case.

Therefore, what rule is appropriate under the efficiency norm should turn on the proportion of takeovers that are common value and whether target managers and boards are faithful. Three candidate rules seem defensible. If a substantial majority of takeovers are common value, takeover auctions should be barred. If not, and if target managers and boards are faithful (in general), the boards should be given discretion to conduct the takeover process, subject to policing for occasional bad faith. Unfaithful managers would sabotage auctions or negotiations in order to retain the target's independence or to sell to a favorite bidder. In the independent private-values case, auctions are efficient and revenue maximizing; in the common-value case, auctions are preferable on both policy goals to no sales at all. Thus, if private-values takeovers are frequent and target managers are unfaithful (in general), there should be auctions in every case. We argue below that (a) a substantial majority of takeovers are common value; and (b) target managers are often unfaithful. Hence, the rule of auctions never seems preferable to the rule of auction always. The data supporting this claim are scanty so this conclusion should be regarded as tentative.

The conclusion also rests on a local analysis that focuses only on the mechanisms for transferring assets given at least one serious bid. A global analysis would run something like this: auctions are undesirable because they deter search for desirable targets (Schwartz, 1986, 1989) and waste resources in a large class of cases—when the takeover is common value. On the other hand, auctions are desirable because when bidders have private values, auctions ensure that the highest-valuing bidder wins, and also save the transaction costs and avoid the inefficiencies that would attend a series of resales initiated by a successful but lower-valuing first bidder, who purchased in a no-auction world.[34] We do not make the global choice between the cases for and against auctions. Rather, we show that the case for auctions is weak when the bidding process is studied in isolation. The case for auctions is even weaker when one recognizes that auctions discourage the search for mismanaged firms.

5.1 What Auction Environment is Prevalent?

An acquisition made to cure mismanagement is likely to be common value. If a firm would be worth approximately the same in any owner's hands, then no one would bid for it unless it was being mismanaged (and so was worth less than the common value in its current owners' hands). Mismanagement is the failure to take steps that would maximize shareholder value.[35] The evidence suggests that a majority of hostile acquisitions and management buyouts are common value. This evidence shows that acquirers commonly take steps that the targets could have taken and that increase value. For example, a major source of gains from takeovers is increases in leverage and the related deductibility of interest payments on debt. One analyst recently claimed that tax savings from leverage explain 50 percent of the takeover premium in management buyouts (Kaplan). Targets obviously could have leveraged themselves; indeed, many firms have increased leverage to avoid takeovers.

Other significant postacquisition activity also suggests that many acquisitions are common value. The breakup value of conglomerates commonly exceeds their market price (LeBaron and Speidell). This

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[34] An auction leads to efficient trades, so long as the seller's reserve price does not exceed its valuation. Subsequent sellers, because of private information, may find it easier to commit to reserve prices that exceed their valuations, as in Cramton et al. In addition, Samuelson shows in an independent private-values model with bidding costs that an auction without a reserve price maximizes the gains from trade less bidding costs. The magnitude of the inefficiencies from a series of sales is an open question.

[35] We do not claim that common-value takeovers always are efficient. For example, a takeover made to exploit the interest deduction from debt is common value (the text next claims) but such takeovers primarily transfer wealth from the Treasury to private parties. Rather, we claim that a takeover is common value if the postacquisition surplus, whatever its source, does not vary substantially with the identity of the winning bidder. Auctions are undesirable in this common-value case because they waste resources when bidders have similar valuations. It is a separate question whether certain categories of takeovers are welfare increasing, all things considered.

implies that target managers could have broken up targets and that acquirers will break up targets. A recent study of 62 hostile acquisitions found that quantifiable sell-offs occurred in 42 cases; the study concluded that "selling off divisions is one of the most pervasive consequences of hostile takeovers" (Bhagat et al.:35). Seventy percent of the value of the assets sold went to firms in the target's industry or in a related industry. Sell-offs usually did not occur when the acquirer was in the same industry as the target; horizontal mergers often are motivated by economies of scale or a desire to increase market power. Other than horizontal acquisitions, the sell-off evidence implies that "the role of the raiders and MBO boutiques seems to be largely to take diversified firms, bust them up, and sell the divisions to other firms in the same business" (Bhagat et al.:44). Sell-off gains too were equally available to the targets.

A related line of evidence shows that the targets of hostile bids have lower Tobin q's (a measure of a firm's intangible assets) than their industry peers, and industries that experience significant hostile acquisitions generally have low q's (Mϕrck et al., 1988a,b). Also, bidding firms have higher q's than targets, with the size of the premium varying inversely with the target's q (Servaes). This evidence suggests that good performers take over poor performers, which is consistent with target mismanagement. Consistent with this view, acquirers sometimes reduce investment activity and lay off employees, especially central staff (Lichtenberg and Siegel).[36] These savings too could have been realized by the targets, provided they are not simply coming from economies of scale or scope.

The evidence thus suggests that hostile acquisitions primarily are common value. This evidence is not conclusive, but conclusive evidence would be hard to get. For example, if bidders' projected cash flows for acquisitions commonly have substantial variance, then acquisitions would often be independent private values (or considerable uncertainty respecting the common value exists). Recovering the projections of bidders seems excessively difficult. A policy analyst content with making the best guess that the data permit should conclude that hostile acquisitions generally are common value. Since the efficiency norm holds that auctions are undesirable in the common-value case, such an analyst would vote to bar takeover auctions altogether.

5.2 Are Target Managers and Boards Faithful?

If auctions are permitted or required, there is a question whether target boards and managers are faithful fiduciaries in acquisition contexts. We think they are unfaithful. The courts think they might be unfaithful, and their articulated suspicions have led to the now standard practice of having acquisitions conducted by committees of nonmanagement directors when an unsolicited bidder appears. Nonetheless, the target's managers probably exert substantial control over these committees. That many takeovers are made to cure mismanagement suggests that target managers and insider directors will attempt to ensure that the target stays independent or sells to a favored bidder. The insiders can influence the information that the independent directors and investment bankers see, and in this and other ways influence the outcome. Also, even outside directors are predisposed to take the side of the managers who chose them and with whom they have worked for years.[37] Further, since managers pick directors, a reputation for being understanding regarding management concerns is valuable to persons who like being directors. Management is concerned to retain their jobs.

Some evidence is consistent with these considerations. Target boards often behave badly in takeover contexts, as revealed in legal reports and the financial press. For example, boards often seem reluctant to disclose information to potential bidders and frequently look for white knights (or try to facilitate sales to their own management team). It is common for management to adopt anti-takeover tactics that have significant negative stock price effects (Jarrell et al.). Also, the extent of target resistance to unsolicited bids is decreasing in the amount of stock that controlling managers own (Walking and Long). Indeed, manager controlled firms generally tend to behave less efficiently in acquisition contexts (Lloyd et al.). Top management owns little stock in many publicly held companies.[38]

In sum, supposing that target managers and boards are unfaithful in acquisition contexts may be a more accurate premise for public policy than the opposite assumption.

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[36] Reducing investment is predicted by Jensen's free cash flow theory, which holds that companies are taken over when and because they adopt negative net present value projects.

[37] This point is made vividly in the dissenting opinion in *Panter v. Marshall Fields & Co.,* 681 F.2d 271 (7th Cir. 1981). A similar expression of skepticism, by a Delaware Chancellor, can be found in Allen.

[38] For another type of evidence, the Editor of the *Journal of Merger and Acquisition Analysis* asked one author of this paper, by letter of March 31, 1989, to make a research presentation. The Editor, Joseph O'Donoghue, wrote that the Journal "recently asked the Chief Executive Officers of the Forbes 500 Corporations to list, in order of priority, the research topics of most interest to them in the area of mergers and acquisitions." The first conference at which research so identified was to be presented "will focus exclusively on the research topic assigned the highest priority by the Chief Executive Officers: *what policies and tactics* are *most effective in preventing hostile takeovers."* The Chief Executives wanted solicited researchers to analyze *"a particular strategy, or cluster of tactics, found to be effective or ineffective in resisting hostile takeovers"* (emphasis in original).

5.3 The Common-Value/Independent Private-Values Distinction

If auctions are required, then, as shown in Sections 3 and 4, the appropriate use of practices ancillary to auctions, such as lockups, should be a function of the auction environment and whether boards are faithful. Hence, courts must be able to distinguish one auction environment from another. The grounds suggested in Section 5.1, *supra,* for believing that a majority of auctions are common value supply criteria for making this distinction. For example, takeovers motivated by tax or sell-off considerations or that are initiated by outsiders bidding for firms in stagnant industries probably are common value. An independent private-values acquisition is made to exploit economies of scale or scope. Thus vertical and product extension acquisitions probably are independent private values, as are some horizontal acquisitions.

Two other considerations are relevant to distinguishing between auction environments. First, the evidence suggests that common-value takeovers are the more prevalent environment. Consequently, a presumption that a takeover is common value both is consistent with the data and would ease the task of courts considerably. Second, courts would have substantial information with which to apply the criteria set out here. Federal law requires bidders and targets to provide a large amount of public data about their plans in connection with acquisitions. The penalties for supplying false or misleading information are severe. Also, takeovers are news, and so are discussed extensively in the press. Our claim here is not that courts will draw the relevant distinction perfectly, but rather that the distinction is no harder to draw than many others that courts routinely make.

5.4 Related Literature

Our analysis differs from other recent models of the takeover auction process. Initially, our analysis is broader. Other commentators model takeovers as independent private-values auctions without considering how common that takeover environment is. Also, these models suppose that target managers are faithful rather than ask what the rules should be if the managers are not. Apart from these differences, Fishman shows that preemptive bids are possible and that the likelihood of such bids falls as the bidding cost of later possible entrants falls. This implies that a target should lower the bidding and investigation costs of later entrants to facilitate competition, so long as these steps do not deter the initial bidder from playing. These conclusions are roughly consistent with ours.

Hirshleifer and P'ng conclude that targets in independent private-values takeovers should not reduce the investigation costs of later bidders, but their analysis seems of limited value for policy purposes. They initially suppose that rebidding costs are infinite (each of two bidders can bid once) and that an initial potential bidder can discover the target's value to it with certainty (at a cost). This bidder can bid high or low. If it bids high, the second bidder neither investigates nor bids. If b_1 bids low, b_2 investigates and bids if its value is high enough. Since ties are resolved in favor of the later bidder, if b_1 bids low, b_2 purchases if it enters. In this model, the size of the preemptive bid varies inversely with the second bidder's investigation costs; if these are high, its entry can be deterred with a lower bid. A revenue maximizing target board would not want to reduce b_2's investigation costs because then b_1 might bid low initially, thereby reducing the gain to target shareholders (recall that the target sells at b_1's bid). Hirshleifer and P'ng later show that this result also holds if each bidder has a constant rebidding cost.

This analysis is not germane here for two reasons. First, Hirshleifer and P'ng recognize that the target's dominant strategy is to facilitate entry given an initial bid. Thus their policy prescription holds that firms should commit not to reduce the investigation costs of later potential entrants. They do not show how a firm could commit, however, and commitment seems infeasible (a determined board always could supply information to promising bidders). Second, Hirshleifer and P'ng remark that the optimal target strategy is to minimize the investigation costs of later bidders if rebids are costless (this strategy also is optimal if there are economies of scale to bidding). Costless rebids imply that b_1 will rebid if anyone else enters, so the target should facilitate entry. We assume that rebids are costless for the reasons given in Section 2. Hirshleifer and P'ng never defend their apparently implausible assumption that rebidding costs are constant and high.

6. Conclusion

An attempt has been made to clarify the policy choices for acquisitions in light of recent auction theory and to suggest what choice is best in light of the limited data. Three rules seem defensible.

(i) Auctions never. An auction wastes resources when potential acquirers' valuations for a target's assets are similar. The evidence tentatively suggests that a substantial majority of acquisitions resemble such common-value auctions.

(ii) Target's choice. If target managers and boards are faithful fiduciaries in acquisition contexts, then boards should be given discretion to choose the acquisition mechanism. Faithful boards will run auctions in the independent private-values case but negotiate with promising buyers in the common-

value case. Target's choice thus is the best policy with faithful boards *if* a substantial portion of takeovers resemble independent private-values auctions.

(iii) Auctions always. This should be the rule if target managers and boards are unfaithful and if many takeovers are private values.

The evidence suggests that target managers and boards are unfaithful. This evidence eliminates rule (ii). Our preference is for "auctions never" rather than "auctions always" because many hostile acquisitions apparently are common value. To implement auctions never, the target board's ability to block bids with poison pills would have to be eliminated, as well as legal provisions requiring offers to stay open for minimum periods.

Further research would be helpful. Policy recommendations could be made with more assurance were there more data. In this vein, the analysis here suggests a way to test our view of board behavior. We show that particular practices conduce to revenue maximization in some contexts but not in others. For example, it is revenue maximizing to reduce the number of entrants in common-value auctions but not in independent private-values auctions. In the common-value setting, breakup fees or lockups may be offered in exchange for higher bids in order to reduce entry; whereas, these practices would not be revenue maximizing in the independent private-values setting, except as devices to encourage entry by protecting the auction winner from ex post opportunism.

There also is more theoretical work to do. We suggest two avenues. First, we modified the standard auction model by rejecting the idea that bidding is costless in favor of the assumption that there is a lump sum cost to bid. Would our conclusions be materially affected if a positive but declining marginal cost for subsequent bids is assumed? Second, one of us has attempted to model the search process for targets and this paper describes the auction process, but there are few auction models that are nested in search models.[39] An analysis of how search and auctions are related would provide a richer picture of the takeover institution. Our conclusion, however, that a policy of auctions never is desirable is likely to be robust to this extension, because auctions reduce the incentive for potential acquirers to search for mismanaged firms.

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[39] McAfee and McMillan (1988) and Wolinsky are exceptions

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