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Lucian Arye Bebchuk

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by

Lucian Arye Bebchuk*

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This paper builds on some ideas that were put forward in an earlier, non-mathematical work which was eventually published as Bebchuk (1985). That informal article also provides a more detailed discussion of the institutional and legal dimensions of the issues examined in the present paper.

A MODEL OF THE OUTCOME OF TAKEOVER BIDS

L. A. Bebchuk

Abstract

The concern of this paper is with the outcome of takeover bids. First, the paper presents a game-theoretic analysis of the factors that determine shareholders' tender decisions. This analysis identifies the likely outcome of a bid -- as a function of the bid's terms, the distribution of the shareholders' estimates of the independent target's value, and the other parameters involved.

Second, the paper evaluates the outcome of bids from the perspectives of efficiency and of target shareholders. The paper shows that a bid's success might be substantially affected by factors that have little to do with whether or not a takeover would be efficient (or with whether or not a takeover would be in the interest of the target's shareholders). The identified distortions appear to operate systematically in favor of bidders.

Third, the paper puts forward an arrangement that might be adopted, either by private parties or by law, to address the identified distortions. Under the proposed arrangement, shareholders would be able to indicate whether or not they "approve" a takeover, and the bidder would be allowed to purchase shares only if it attracts the required number of approving tenders. In addition, the paper examines the effectiveness and costs of several alternative remedies.

I. INTRODUCTION

Takeover bids, public offers to purchase shares of a target corporation, are an important and popular method of acquiring widely held corporations. The concern of this paper is with the outcome of takeover bids. Specifically, the paper: (1) develops a game-theoretic model of the factors that determine the outcome of takeover bids; (2) evaluates the outcome of bids from the perspectives of efficiency and of target shareholders, analyzing the possible divergence between actual and desirable outcomes; and (3) examines remedies that might be adopted, either by private parties or by law, to address the indentified distortions.

1. Modelling the Outcome of Takeover Bids. The model developed in this paper is consistent with the following observed facts: (i) the post-takeover value of minority shares is generally lower than the bid's price; (ii) most bids are successful, but some are not; (iii) a target's shareholders often differ in their tender decisions.[1]

The model's analysis of shareholders' tender decisions proceeds roughly as follows. Supposing that the bid is going to succeed, a shareholder's best course of action will be to tender: as will be later explained, the post-takeover value of minority shares is generally expected to be lower than the bid price, due to controlling shareholders' ability to take advantage of minority shareholders. Supposing that the bid is going to fail, however, either tendering or holding out might be preferable -- depending on whether or not the bid price exceeds the value of a share in the independent target. Thus, a shareholder's best course of action might depend on his expectations concerning other shareholders' decisions -- and in forming these expectations the shareholder will recognize that other shareholders reason in a way similar to his. The paper therefore identifies the shareholders' equilibrium strategy. This

strategy specifies whether or not a shareholder will tender -- as a function of the bid's terms, of the shareholder's estimate of the independent target's value, and of the other parameters involved.

After examining a given shareholder's tender decision, the analysis proceeds to consider the bid's outcome. Because shareholders might hold different estimates of the independent target's value, the identified equilibrium strategy might lead some shareholders to tender and others to hold out. A takeover will occur if the number of tendered shares is sufficient for the bidder to gain control. The analysis identifies the conditions for the bid's success and for its failure -- as a function of the bid's terms, of the distribution of the shareholders' estimates of the independent target's value, and of the other parameters involved.

The model developed in this paper differs in many important respects from those provided by the existing literature. For example, the existing literature does not adequately analyze how the prospect of ending up with minority shares in the acquired target pressures shareholders to tender their shares. The work of Grossman and Hart (1980a, 1980b, 1981), the first formal modelling of takeovers, did demonstrate that the expected post-takeover value of minority shares might importantly affect tender decisions. Grossman and Hart pointed out that when the bid price is lower than the expected value of minority shares, shareholders might hold out even if they view the bid price as higher than the independent target's per share value; therefore, bidders will usually set the bid price at or above the expected post-takeover value of minority shares. Grossman and Hart, however, did not devote attention to the other side of the issue -- namely, that when the bid price exceeds the expected value of minority shares, shareholders might tender even if they view the bid price as lower than the independent target's per share value.[2] Subsequently, several authors (Bradley, 1980; Bebchuk, 1982a; DeAngelo and Rice, 1983;

Jensen and Ruback, 1983) pointed out that, because the expected post-takeover value of minority shares is usually lower than the bid price, a shareholder who attaches a sufficiently high likelihood to a takeover will tender even if he views the bid price as lower than the independent target's per share value. The work of these authors was very preliminary, however, since they did not attempt to explain what determines shareholders' estimates of the likelihood of a takeover.[3]

2. Evaluating the Outcome of Takeover Bids. The normative issue on which the paper focuses is the following: given that a bid has been made, will its outcome correspond to that which is desirable? From the perspective of efficiency, given that a bid has been made, a takeover would be desirable if and only if it would move the target's assets to a more valuable use -- that is, if and only if the independent target's value is lower than the value of the target's assets in the bidder's hands. The paper puts forward this standard of social desirability, and discusses the relationship between the efficient outcome and the outcome that would be desirable from the perspective of the target's shareholders. The paper shows that a bid's success might be substantially affected by factors that have little to do with whether or not a takeover would be socially desirable (or with whether or not a takeover would be in the interest of the target's shareholders). The paper also examines the direction of these distortions -- they appear to operate systematically in favor of bidders -- and discusses their magnitude.

The existing literature has by and large ignored the distortions on which this paper focuses.[4] Instead, the literature has focused on the adequacy of potential bidders' incentives to search for takeover targets and to make bids for identified targets. Grossman and Hart expressed concern about the sub-optimality of the existing incentives, and subsequent work has followed them in focusing on the adequacy of these incentives. (See, e.g., Barron, 1983;

Bebchuk, 1982a; P'ng, 1985; Vishny and Shleifer, 1984). Except for a brief discussion in Section IX, this paper will abstract from the issue of potential buyers' incentives to search for targets and to bid for them, in order to focus on evaluating the outcome of those bids that buyers make.

3. Examining Remedies. The paper examines various remedies that might be adopted to address the identified distortions. The remedies to be considered could be adopted either through appropriate legal rules or through appropriate provisions in companies' charters. In particular, the paper puts forward an arrangement (indeed, two versions of it) that would provide an adequate remedy. Under one version of the arrangement, tendering shareholders would be able to indicate whether or not they "approve" a takeover, and the bidder would be allowed to purchase shares only if it attracts "approving" tenders from shareholders holding a majority of shares. It is shown that this arrangement would practically ensure that a target will be acquired if and only if the offered acquisition price exceeds the independent target's value.

In addition, the paper examines three types of alternative remedies -- arrangements that enhance the post-takeover value of minority shares, arrangements that increase the threshold of ownership necessary for control, and arrangements that give the target's management some degree of veto power. I discuss the effectiveness and costs of each of these arrangements.

* * *

The rest of the paper is organized as follows. Section II describes the model's assumptions. Section III studies the factors that determine a given bid's outcome, and Section IV evaluates such outcomes from a welfare point of view. Section V puts forward the proposed remedy for the identified distortions, and Section VI examines alternative remedies. Section VII extends the analysis to conditional bids, and Section VIII extends the analysis to the trading in

the target's shares during the bid period. Finally, Section IX provides a detailed discussion of the assumptions and interpretation of the analysis.

II. FRAMEWORK OF ANALYSIS

A takeover bid is made for the shares of a given target. The bid's price is X, which is assumed to exceed significantly the pre-bid market price of the target's shares.

The target is assumed to have (2n+1) risk-neutral shareholders. Each shareholder holds one divisible share, which might be viewed as representing a given block of shares.

To gain control over the target the bidder has to acquire k or more shares ($k < 2n+1$). It is worth noting that, in the absence of special anti-takeover provisions in the target's charter, a majority ownership is generally sufficient for controlling the target, i.e., $k \leq n+1$; indeed, in the absence of such articles, acquiring a substantial plurality of the target's shares is often sufficient for gaining effective control, i.e., $k < n+1$.[5]

While the bidder wishes to buy a controlling interest, it might or might not wish to buy all of the target's shares. Let m denote the maximum number of shares that the bidder is willing to acquire for the bid price, where $2n+1 \geq m \geq k$. A bid is "for all shares" when $m = 2n+1$, and "partial" when $m < 2n+1$. A partial bid might be oversubscribed, in which case the bidder is required by law to have a proration -- that is, to acquire for the bid price an identical fraction of each tendering shareholder's share.

It will be assumed at this stage that the bid is not conditional on the bidder's receiving any minimal number of tendered shares. Thus, any tendering shareholder can expect to have his share -- or, in a partial bid, at least a fraction of it -- acquired for the bid price.

The tender decisions of all shareholders are assumed to be made at one point in time (the "moment of truth") -- just prior to the bid's closing. This assumption is reasonable because early tenders can by law be withdrawn until the moment of truth and hence become final and irrevocable only at that moment; consequently, at the moment of truth, shareholders who made early tenders make a decision whether to withdraw their shares -- a decision that is equivalent to a tender decision.[6] Note that some of the target's shareholders at the moment of truth might not have been shareholders of the target when the bid was made: between the bid's announcement and the moment of truth there is market trading in the target's shares, trading that will be discussed in Section VIII. The analysis will largely focus on the shareholders' tender decisions at the moment of truth, however, because it is these decisions that will determine the bid's outcome.

If the target comes under the bidder's control, shares unacquired through the bid will become "minority" shares. The expected per share value of such shares is Y, where $Y < X$.[7]

The assumption that $Y < X$ is based on strong theoretical and empirical grounds which are discussed in detail in Bebchuk (1985, pp. 1708-13). Following a bid's success, the acquirer has various means of taking advantage of minority shareholders. For one thing, the acquirer can effect an immediate takeout in which minority shareholders will be "frozen out" and receive instead of their shares either cash or securities of the bidder; and current law enables the bidder to pay frozen out minority shareholders a takeout consideration with a value lower than the bid price. Furthermore, even if the acquirer decides against an immediate takeout, the acquirer will still be able to take advantage of minority shareholders -- either by effecting a takeout later on, or by using its control over the target's management to divert to itself some of the target's earnings. Indeed, it can be shown that in those instances

where an immediate takeout does not occur the post-takeover value of minority shares is even lower than the consideration required in an immediate takeout (which in turn is generally lower than the bid price); for it can be shown that the acquirer would not refrain from effecting an immediate takeout unless it believed that this strategy would enable it to leave minority shareholders with even less than the consideration required in an immediate takeout.[8] Finally, it should be noted that the empirical evidence (Bradley, 1980; Office of the SEC Chief Economist, 1985) confirms the above analysis: the post-takeover value of minority shares is indeed significantly lower than the bid price.

If the target remains independent, at least temporarily, its per share value will be V. V depends not only on the potential stream of profits that the target's assets can generate in an indefinite independent existence, but also on the prospect of receiving other acquisition offers in the future.

At the time of the shareholders' tender decisions, each shareholder i has a probability distribution over V with a mean U_i;[9] I shall refer to the mean U_i as the estimate of shareholder i. The shareholders' probability distributions might differ due to the possession of private information.[10] Specifically, it will be assumed that $U_i = V + \varepsilon_i$, where ε_i is a random error term, and where the error terms are identically and independently distributed. That is, shareholders' estimates are assumed to be identically and independently distributed around V. $U_{(i)}$ and $\varepsilon_{(i)}$ will denote the estimate and the error term of the shareholder with the i-th lowest estimate among the estimates of the target's shareholders.[11]

It is worth emphasizing that the shareholders' estimates might well differ from the pre-bid market price of the target's shares. As Section IX will explain, shareholders are likely to receive a great deal of new information about the target's value in the period between the last pre-bid trading time and the time of their tender decisions; such new information is likely to be

"good news," and shareholders' estimates at the time of their tender decisions are therefore likely to exceed the pre-bid market price.

III. THE OUTCOME OF THE BID

A. The Equilibrium Strategy

Assuming that the bid is going to succeed, then, since $Y < X$, each shareholder will prefer to tender no matter how high his U is. Assuming that the bid is going to fail, however, either tendering or holding out might be preferable -- depending on how X compares with V. Thus, since shareholders' optimal course of action might depend on other shareholders' tender decisions, the question is what are the shareholders' equilibrium strategies.

Each shareholder has two possible actions: tendering (T) and holding out (NT). The shareholder might be viewed as following a strategy $s: R \rightarrow \{T,NT\}$. This strategy specifies for each possible value of U, the shareholder's estimate of V, whether the shareholder will tender or hold out.

I shall limit myself to studying equilibrium strategies which are weakly monotonic. Weak monotonicity of s implies that if $s(U^*) = T$ for some U^*, then $s(U) = T$ for every $U < U^*$.[12]

There are two weakly monotonic equilibrium strategies. One is the constant strategy $s(U) = T$ for any U. It is easy to see that this strategy constitutes an equilibrium strategy. Supposing that other shareholders are going to tender, any given shareholder will view the bid's success as certain -- and therefore, since $Y < X$, he will elect to tender no matter how high his estimate U is.[13]

The second weakly monotonic equilibrium strategy -- and the one on which I wish to focus -- is a non-constant strategy, under which a shareholder will hold out if his estimate is sufficiently high. This equilibrium strategy deserves most of our attention because we know that in fact some shareholders

do hold out and some bids do fail, and because an equilibrium in which all bids are bound to succeed no matter how high V is seems implausible.

Any non-constant weakly monotonic strategy s is defined by a value H for which $s(U) = NT$ if and only if $U > H$.[14] To identify the non-constant equilibrium strategies, let us consider the tender decision that a shareholder i will make if he supposes that all other shareholders are going to follow the strategy defined by H. And let us denote by $t_i(H)$ the number of shareholders with an estimate lower than H among the target's shareholders excluding shareholder i. (That is, $t_i(H)$ is the size of the set $\{Uj: Uj<H, j\neq i\}$.)

If the shareholder i tenders, then he will have his share, or at least a fraction of it, acquired for the bid price. If $t_i(H)<m$ (that is, if the bid is not oversubscribed, which is always the case in a bid for all shares, and might be the case in a partial bid), then the shareholder will have his whole share acquired and will thus end up with X. If $t_i(H)\geq m$ (that is, if the bid is partial and oversubscribed), then a proration will take place; in such a proration, the shareholder will have a fraction $\frac{m}{t_i(H)+1}$ of his share acquired for the bid price and will have a fraction $\frac{t_i(H)+1-m}{t_i(H)+1}$ of his share become a minority share -- and the shareholder will thus end up with a per share value of $X - (\frac{t_i(H)+1-m}{t_i(H)+1})(X-Y)$. Thus, if the shareholder tenders, his expected position will be

$$(1) \qquad X - \sum_{j=m}^{2n} P(t_i(H)=j \;/\; U_i)(\frac{j+1-m}{j+1})(X-Y).$$[15]

If the shareholder holds out, then he might end up in one of two positions. First, if $t_i(H) \geq k$, then a takeover will occur and his holding out will lead to ending up with a minority share worth Y. Second, if $t_i(H) < k$, then the bid will fail and his holding out will lead to ending up with a share in the

independent target. Note that in evaluating this scenario, the shareholder will use not his unconditional estimate U_i, but rather his estimate of V conditional on the bid's failure -- that is, $E(V / U_i, t_i(H)<k)$; this conditional estimate is at least as high as -- and might well exceed -- the unconditional estimate U_i. Thus, if the shareholder holds out, his expected position will be

$$(2) \qquad P(t_i(H)\geq k / U_i)\cdot Y + P(t_i(H)<k / U_i)\cdot E(V / U_i, t_i(H)<k) \ .^{16}$$

The shareholder will of course elect to tender if and only if the value of (1) exceeds that of (2), or, equivalently, if and only if

$$(3) \qquad P(t_i(H)\geq k / U_i)\cdot\left[1- \sum_{j=m}^{2n} \frac{P(t_i(H)=j / U_i)}{P(t_i(H)\geq k / U_i)}\left(\frac{j+1-m}{j+1}\right)\right]\cdot(X-Y) \ +$$

$$+ \ P(t_i(H)<k / U_i)\cdot[\ X - E(V / U_i, t_i(H)<k] \ > \ 0.$$

The left-hand side of (3) is equal to the expected difference between the consequences of tendering and those of holding out. The first expression on the left-hand side represents the case in which the bid is going to succeed regardless of the shareholder's decision; in this case tendering will produce a gain of (X-Y) per share for that fraction of the tendering shareholder's share which he can expect to have acquired. (The second term in the first expression is the expected value of that fraction; it is equal to 1 in a bid for all shares but might be lower than 1 in a partial bid.) The second expression on the left-hand side of (3) represents the case in which holding out will lead to retaining a share in the independent target.

For H to define an equilibrium strategy, (3) must hold if and only if U_i is lower than H. Now, the value of the left-hand-side of (3) is negative for sufficiently low values of U_i and increases without bound as U_i is raised. Consequently, it is a sufficient and necessary condition for H to define an

equilibrium strategy that the left-hand-side of (3) be equal to zero for $U_i=H$; that is,

$$(4) \qquad P(t_i(H)\geq k \;/\; U_i=H)\cdot[1-\sum_{j=m}^{2n}\frac{P(t_i(H)=j \;/\; U_i=H)}{P(t_i(H)\geq k \;/\; U_i=H)}(\frac{j+1-m}{j+1})]\cdot(X-Y) +$$

$$+ P(t_i(H)<k \;/\; U_i=H)\cdot[\,X - E(V \;/\; U_i=H, t_i(H)<k)] = 0.$$

It is easy to see that $P(t_i(H)=j \;/\; U_i=H) = \frac{1}{2n+1}$, that $P(t_i(H)\geq k \;/\; U_i=H) = \frac{2n+1-k}{2n+1}$, and that $P(t_i(H)<k \;/\; U_i=H) = \frac{k}{2n+1}$. Furthermore, $E(V \;/\; U_i=H, t_i(H)<k)$ is equal to $H - E(\varepsilon_i \;/\; U_i\leq U_{(k)})$. Making the above substitutions in (4) and rearranging terms gives us a unique value for H and provides us with the following proposition.

Proposition 1: The unique non-constant weakly monotonic equilibrium strategy is for a shareholder to tender his shares if and only if his estimate of V is lower than

$$(5) \qquad H = X + [\frac{m}{k}\,(1 + \sum_{j=m}^{2n}\frac{1}{j+1}) - 1]\cdot(X-Y) + E(\varepsilon i \;/\; U_i\leq U_{(k)}).$$

Remark 1: Under the identified equilibrium strategy, a shareholder's tender decision will not be based on a comparison of U_i with the bid price of X. Rather, the shareholder will compare U_i with the right-hand-side of (5), which is the sum of X with two other expressions.

The second expression on the right-hand side of (5) reflects the fact that, in examining his best course of action in the event that the bid succeeds, a shareholder will always conclude that tendering is superior to non-tendering. Thus, the prospect of a takeover -- and the (X-Y) gap between the bid price and the post-takeover value of minority shares -- pressure the shareholder to tender his shares. The second expression is always positive, working in favor of the bidder by raising the non-tendering threshold.

The third expression on the right-hand side of (5) reflects the fact that, in examining his best course of action in the event that the bid fails, the shareholder will not use his unconditional estimate but rather an estimate conditional on the bid's failure. The absolute value of this third expression is equal to the extent to which a shareholder with an unconditional estimate H has to revise his estimate upwards to get an estimate conditional on the bid's failure -- that is, conditional on there being less than k shareholders with (unconditional) estimates lower than his (or, equivalently, conditional on his estimate being among the k lowest estimates). The third expression is always negative, working against the bidder by lowering the non-tendering threshold.

The precise value of the third expression of course depends on the distribution of shareholders' estimates. This value can be calculated or at least approximated for any form that the distribution might take (see Gibbons, 1971). For example, assuming that the error term is uniformly distributed in (-e,e), the value of the third expression is equal to $-\frac{2n+1-k}{2(n+1)}e$.

Remark 2: From (5) the following conclusions might be deduced:

(i) The non-tendering threshold H will increase as Y (the expected post-takeover value of minority shares) decreases (i.e., as X-Y increases); this is because decreasing Y enhances the pressure to tender that is introduced by the prospect of ending up with a minority share in case of a takeover.

(ii) H will increase as k (the control threshold) decreases, because decreasing k raises the likelihood of a takeover and thus strengthens the pressure to tender that is introduced by the prospect of a takeover.

(iii) H will increase as m (the maximum number of shares sought by the bidder) decreases; for decreasing m raises the likelihood of a proration and thus decreases the difference between the expected consequences of tendering and holding out in case of a takeover -- a difference that creates the pressure to tender.

(iv) H will increase as the distribution of the error terms becomes more widespread (without a change in its shape); such a change in the distribution will increase the extent to which a shareholder must revise his unconditional estimate upwards to get an estimate conditional on the bid's failure.

B. The Resulting Outcome

Supposing that all the shareholders will follow the identified equilibrium strategy, the number of tendered shares, denoted by t, will be the highest integer that satisfies $U_{(t)} < H$. Since a takeover will take place if and only if $t \geq k$, we have the following proposition.

Proposition 2: A takeover will occur if and only if

$$(6) \qquad U_{(k)} < X + [\frac{m}{k}\,(1 + \sum_{j=m}^{2n} \frac{1}{j+1}) - 1]\cdot(X-Y) + E(\varepsilon_i \;/\; U_i \leq U_{(k)}).$$

Note that a successful bid might not attract all of the target's shares. That (6) holds implies that $t \geq k$ but not that $t = 2n+1$; for (6) does not imply that all of the target's shareholders have estimates exceeding the right-hand side of (6) -- some shareholders might have estimates which exceed that value and these shareholders will hold out. This observation is supported by the evidence that there is a substantial incidence of non-tendering in successful bids (Office of the SEC Chief Economist, 1985).

Note also that a successful bid might attract more than k shares (the minimal number of shares necessary for gaining control). To be sure, if the bidder knew $U_{(k)}$, then the bidder would set the bid price at the lowest level that would satisfy (6), and consequently t would be equal to (or just slightly higher than) k. The bidder, however, presumably has only imperfect information about $U_{(k)}$. Consequently, the X chosen by the bidder might exceed the minimal level that would work, and t might significantly exceed k.

Finally, denoting by q the number of shares that the bidder will acquire, it should be noted that q will be equal to min(t,m).

IV. EVALUATING THE OUTCOME OF BIDS

A. The Consequences of a Takeover

The acquisition of a controlling interest in a target is likely to affect the target's management and the allocation of the target's assets, and is likely to affect the position of non-selling shareholders. Non-selling shareholders have their shares in the independent target turn into minority shares in the acquired target: whether the latter have a higher or a lower value than the former, the two are different assets, representing different streams of future earnings. Consequently, the purchase of a controlling, partial interest of q shares ($k \leq q < 2n+1$) should not be viewed as involving only the selling shareholders and the sold shares. Rather, such an acquisition should be viewed as an acquisition of the whole target (i.e., of all the target's shares) for a total consideration of $qX + (2n+1-q)Y$ or a per-share consideration of $\frac{q}{2n+1} X + \frac{2n+1-q}{2n+1} Y$.

The above characterization of the transaction is clearly true from the point of view of the target's shareholders. The shareholders, as a group, lose all of their (2n+1) shares in the independent target. Instead, they end up with t times the bid price of X, and with (2n+1-q) minority shares worth Y each.

The above characterization of the transaction is also true from the bidder's point of view. The total value of minority shares -- $(2n+1-q)Y$ -- represents the part of the acquired target's future earnings that the minority shareholders can expect to capture; the successful bidder, in turn, can expect to capture all of the acquired target's future earnings minus $(2n+1-q)Y$. Therefore, from the bidder's point of view, the takeover is equivalent to a transaction in which the bidder would first purchase all of the target's

shares for a total consideration of qX + (2n+1-q)Y and then sell to investors (2n+1-q) minority shares worth Y each for a total consideration of (2n+1-q)Y.

B. The Desirable Outcome of a Bid

Given that a bid has occurred (that is, abstracting from the issues of incentives to search for targets and to make bids), what is the socially desirable outcome of the bid? From the point of view of efficiency, a takeover is desirable if and only if it would lead to a more efficient allocation of the target's assets. Thus, denoting by W the expected value of the target's assets in the bidder's hands, a takeover is socially desirable if and only if

(7) $V < W$.[17]

While (7) is the true standard of social desirability, it is one which would be difficult to use for our purposes. Therefore, in the analysis below I shall largely use a proxy standard. According to this proxy standard, a takeover should occur if and only if

(8) $V < Z$,

where Z is the expected per share acquisition price that the bidder expects to pay in case of a takeover. Denoting by q* the expected number of shares that the bidder expects to purchase in case of a takeover,[18] the value of Z is defined by

(9) $$Z = \frac{q^*}{2n+1}X + \frac{2n+1-q^*}{2n+1}Y \ .$$

And since q* is likely to be lower than (2n+1), Z is likely to be lower than X.

It is important to point out the extent to which the true standard (7) differs from the proxy standard (8). Assuming that the bidder is profit-maximizing and has all the available information about W, Z cannot exceed W. Consequently, whenever $V < Z$ both (7) and (8) hold, and whenever $V > W$ both (7) and (8) do not hold. Therefore, using (8) instead of (7) is questionable only in case $Z < V < W$. In such a case, a takeover is socially desirable according to the true standard (7) but not according to the proxy standard

(8). Thus, ensuring that outcomes will conform to the proxy standard (8) would produce an undesirable failure of the bid in the case of $Z < V < W$. To be sure, the failing bidder might in such a case raise its offer beyond V and consequently gain control; after all, an acquisition for any price lower than W would be profitable to the bidder. But the failing bidder might also walk away, because of strategic considerations or because of the transaction costs involved in raising its offer.

Below I shall evaluate the outcome of bids in light of the proxy standard (8), and I shall examine which legal rules or charter provisions would ensure outcomes conforming to that standard. The conclusions of this analysis should be of course taken with the caveat that the proxy standard (8) does not perfectly overlap with the true standard (7). Nonetheless, I suggest, these conclusions are of significance. In judging this significance, two points should be kept in mind.

First, the proxy standard (8) is equivalent to the standard of desirability that is implicit in the legal rules governing the sale of a sole owner's assets. The law conditions the sale of a sole owner's assets upon his consent. Consequently, such a sale will take place if and only if the owner views the offered acquisition price as higher than the value to himself of retaining (at least for the time being) his assets. Thus, the mechanism that society employs for the allocation of sole owners' assets is imperfect in the same way that the proposed standard (8) is imperfect: when the value that a potential buyer attaches to a sole owner's assets exceeds the value that the owner attaches to the assets, the desirable acquisition might still not occur, because the buyer might insist on offering a price below the assets' value to the owner. Therefore, one who questions public policy recommendations based on the proxy standard (8) should also question the legal rules that make the sale of a sole owner's assets conditional upon his consent (rules which are widely believed to provide the best mechanism we can employ for the allocation of sole owners' assets).

Second, while (8) is not the true standard of desirability from the social point of view (but only a proxy standard), (8) is the true standard of desirability from the perspective of the target's shareholders. The problem with (8) as a standard of social desirability is that it requires preventing an acquisition that is undesirable from the perspective of the target's shareholders (due to $V > Z$) even if the acquisition would be socially desirable (due to $V < W$). The standard (8) thus does not suggest preventing any acquisition that is desirable from the perspective of the target's shareholders: given that the bid has occured, the wealth of these shareholders will be maximized by ensuring that the bid will succeed if and only if Z exceeds V. Thus, even if we were to assume that the conclusions of the analysis below (concerning how to ensure outcomes conforming with the standard (8)) are irrelevant to efficiency-seeking social planners, these conclusions would still be clearly relevant for those who design corporate charters to maximize the value of their firm.

C. The Acutal Outcome vs. The Desirable Outcome

Let us now turn to evaluate the actual outcome of bids in light of the proposed standard of desirability. Supposing that shareholders follow the unique non-constant weakly monotonic equilibrium strategy, a takeover will take place if and only if (6) holds.[19] Rewriting (6), we see that a takeover will occur if and only if

$$(10) \qquad V < Z + [\frac{m}{k}\,(1 + \sum_{j=m}^{2n} \frac{1}{j+1}) - 1] \cdot (X-Y) + (X-Z) + E(\varepsilon_i \;/\; U_{i-} \leq U_{(k)}) + [V - U_{(k)}].$$

According to our working standard of desirability, however, a takeover is desirable if and only if V is lower than Z (see (8)). Thus, the relationship between the actual outcome and the desirable one depends on the value of

$$(11) \qquad [\frac{m}{k}\,(1 + \sum_{j=m}^{2n} \frac{1}{j+1}) - 1] \cdot (X-Y) + (X-Z) + E(\varepsilon_i \;/\; U_{i-} \leq U_{(k)}) + [V - U_{(k)}].$$

The actual outcome will certainly coincide with the desirable one only if the value of (11) is zero, and there is no reason whatsoever to expect this to be generally the case. It follows that the actual outcome might well differ from the desirable one.

When (11) is positive, the outcome might be distorted in favor of the bidder: the target will be acquired whenever a takeover is desirable -- and might also be acquired when a takeover is undesirable. When (11) is negative, the outcome might be distorted against the bidder: the target might remain independent even if a takeover is desirable.

D. Analysis of the Possible Divergence

While the desirability of the bid's success depends on how V and Z compare, the actual outcome is not determined by this comparison -- for four reasons which are represented by the four expressions in (11).

When a shareholder i considers what will be his best course of action in case $t_i(H) \geq k$ (i.e., in case that the bid is going to succeed regardless of his decision), his conclusion will depend not on comparing Z and U_i but rather on comparing X and Y. Since X > Y, tendering will be his best course of action in the event that $t_i(H) \geq k$ no matter how U_i and Z compare. The first expression in (11) represents the pressure on the shareholder to tender which is introduced by the prospect of ending up with a minority share in the acquired target. This first expression is always positive -- and hence always works in favor of the bidder.

When a shareholder i considers what will be his best course of action in case $t_i(H) < k$, then again his conclusion will not depend on how U_i and Z compare. Rather, his conclusion will depend on another comparison that differs from comparing U_i and Z in two ways, each of which is represented by an expression in (11). First, if $t_i(H) < k$ and the shareholder tenders, then he will end up not with Z but rather with X. The second expression in (11) represents

the fact that the shareholder will be considering not the expected per share acquisition price of Z but rather the bid price of X. Because Z is usually lower than X, this second expression is usually positive, thus working in favor of the bidder.

The second way in which the shareholder's examination of the scenario $t_i(H) < k$ will differ from comparing of U_i and Z is as follows. If $t_i(H) < k$ and the shareholder holds out, he will end up with a share in the independent target which he values not at U_i but rather at $E(V / U_i, t_i(H)<k)$. The third expression in (11) represents the fact that the shareholder will be using not V_i, his unconditional estimate of V, but rather a higher, conditional estimate. This third expression is always negative, hence working against the bidder. The precise value of this third expression depends of course on the distribution of the error term, and it can be calculated or approximated for any given distribution.

Finally, because the bid's success depends on attracting at least k shares, it depends on $U_{(k)}$ -- the k-th lowest estimate among the estimates of the target's shareholders. $U_{(k)}$ might differ from V, however, and the fourth expression in (11) represents this fact. In particular, when $k < n+1$ (as is likely to be the case when the target has no anti-takeover charter provisions) and the distribution of estimates is symmetric, then $U_{(k)}$ is a downwards biased estimate of V. In such a case, the fourth expression is positive, thus working in favor of the bidder.

E. Comparative Statics

(1) The Expected Post-Takeover Value of Minority Shares. A decrease in Y (i.e., an increase in X-Y) would work in favor of the bidder. Decreasing Y would raise the value of the first expression in (11), because it would increase the pressure to tender that is introduced by the prospect of ending up with a minority share in the acquired target. Also, decreasing Y would raise

the value of the second expression in (11), because it would increase the gap between X and Z.

(2) The Control Threshold. A decrease in k would work in favor of the bidder. Decreasing k would raise both the first expression in (11) (by raising, other things equal, the likelihood of a takeover) and the fourth expression in (11) (by lowering the expected value of $U_{(k)}$ vis-a-vis V). Note that decreasing k would also increase the absolute value of the third expression in (11) (an increase that works against the bidder); but it can be shown that this last effect is dominated by the effect that decreasing k is expected to have on the fourth expression in (11).

(3) The Distribution of Estimates. Expanding the distribution of the shareholders' estimates around V (i.e., the distribution of the error term), leaving unchanged the shape of this distribution, would work against the bidder. Such an expansion would raise the absolute value of the third expression in (11), because it would raise the gap between conditional and unconditional estimates. Note that such an expansion would also raise the expected absolute value of the fourth expression in (11); but it can be shown that when this latter effect works in favor of the bidder (as would be the case, for example, when $k < 2n+1$ and the distribution of the error term is symmetric), it would still be dominated by the effect on the third expression.

(4) The Maximum Number of Shares to be Acquired. Decreasing m (say, from m_1 to m_2) has an ambiguous effect on the size of (11). On the one hand, decreasing m reduces the value of the first expression in (11). This first expression represents the pressure on shareholders to tender that is introduced by the prospect of ending up with a minority share in case of a takeover. Decreasing m would reduce this first expression because it would reduce the penalty that a takeover is expected to impose on non-tendering shareholders: decreasing m would lower the expected fraction of a tendering shareholder's

share which he can expect to have acquired in the event of a takeover -- and in this way it would reduce the gap between tendering and non-tendering in terms of their expected consequences for the shareholder's position in the event of a takeover.

On the other hand, decreasing m from m_1 to m_2 would increase the value of the second expression in (11). This second expression represents the gap between X and Z. Decreasing m would reduce Z because it would lower q*, the expected number of shares that the bidder would purchase in the event of a takeover. Supposing that the bidder attaches a positive probability to the contingency that the number of tenders will exceed m_2 (otherwise, the bidder would have no reason to lower the maximum number of shares to m_2), the decrease in m would lower q*.

In sum, decreasing m works in favor of the bidder by raising the second expression in (11) and works against the bidder by decreasing the first expression in (11) -- with the total effect being ambiguous. In particular, we have to reject the widely held view (e.g., SEC Advisory Committee on Tender Offers, 1983) that partial bids generally lead to greater distortions than do bids for all shares. Thus, there is no basis for believing that legal rules or charter provisions which would eliminate or discourage partial bids would systematically reduce the divergence between actual and desirable outcomes.

F. The Likely Direction of the Distortions

The sign of (11) -- and hence the direction of the identified distortions -- clearly depend on the values of the parameters involved. Nonetheless, making reasonable assumptions about the values of these parameters leads to a clear conclusion concerning the direction of the distortions: in the absence of anti-takeover charter provisions, the distortions appear to operate systematically in favor of bidders.

For example, suppose that X-Y=.1X. (The evidence of Bradley (1980) suggests a value of .08X, while that of the Office of the SEC Chief Economist

(1985) suggests a value of .2X). Suppose also that $k \tilde{=} .8n$ (i.e., about 40% of the target's shares); that $m=2n+1$ (i.e., the bid is for all shares); and that the error term is distributed uniformly in the interval (-e,e). Then, as long as e is lower than .37X, (11) will surely be positive and the distortions will operate in favor of the bidder.

In particular, supposing that in the above example e=.1X, then (11) will be about .11X. That is, the target will be aquired as long as V does not exceed Z by a margin wider than .11X.

V. A PROPOSED REMEDY

Below I put forward an arrangement (indeed, two versions of it) that would effectively address the described distortions. The arrangement would apply to all bids aimed at purchasing a controlling interest, and would thus have to include a specification of the fraction of a target's shares that would be assumed to provide a buyer with a "controlling interest." The idea behind the design of the arrangement is to enable shareholders to express their preferences concerning a bid's success in isolation from their desire to receive their prorata share of the acquisition price in the event of a takeover.

A. The Scheme of Approving and Disapproving Tenders

One version of the arrangement would enable tendering shareholders to indicate whether or not they "approve" a takeover. Technically, tendering shareholders would indicate their approval or disapproval of a takeover by marking an appropriate box on the tender form which accompanies all tendered shares. As will be seen, under the proposed scheme all the shareholders would tender their shares (either approvingly or disapprovingly). The bidder would be allowed to purchase shares and gain control, however, only if its bid attracts approving tenders from at least (n+1) shareholders.

If the bidder receives the required number of approving tenders, a takeover would take place. In purchasing tendered shares, the bidder would be

prohibited from penalizing shareholders who tendered disapprovingly -- that is, the bidder would have to treat equally all tendered shares. In a bid for all shares, the bidder would have to purchase all tendered shares; in a partial bid, the bidder would have to acquire the same fraction of each tendering shareholder's share.

If the bidder fails to attract the required number of approving tenders, then the bidder would have to return all tendered shares, and the target would remain independent.[21]

B. The Outcome under Approving and Disapproving Tenders

Let us first observe that under the proposed scheme holding out would always be dominated by making a disapproving tender. The two actions will produce different results for a shareholder only if the bid is going to succeed regardless of his decision; and if the bid is going to succeed, the shareholder will be better off tendering disapprovingly rather than holding out. Therefore, under the proposed scheme, all the shareholders would elect to tender, either approvingly or disapprovingly.

Since all the shareholders are expected to tender, the expected per share acquisition price in case of a takeover is $Z = \frac{m}{2n+1} X + \frac{2n+1-m}{2n+1} Y$. Furthermore, since all the shareholders will tender and since all the tendering shareholders will be equally treated in case of a takeover, each tendering shareholder will end up in case of a takeover with Z.

Let us now consider a tendering shareholder's choice between making an approving tender (AT) and making a disapproving tender (DT). A shareholder strategy is a function s: R→(AT,DT), which specifies for each possible value of the shareholder's estimate of V whether he will choose AT or DT. As before, I shall focus on the possibility of a non-constant weakly monotonic equilibrium strategy. Such a strategy is defined by a threshold H such that S(U)=DT if and only if $U \geq H$.

Consider the tender decision of a shareholder i who supposes that all the other shareholders are going to follow the strategy defined by H. Under the proposed scheme, the shareholder's choice will affect his position only in the event that his decision will determine the bid's fate -- that is, only in the event that $t_i(H) = n$. In such a case, an approving tender by the shareholder will lead to a takeover, and the shareholder will end up with Z. On the other hand, a disapproving tender will lead in such a case to the bid's failure and to the shareholder's ending up with a share in the independent target; the shareholder's estimate of the value of such a share conditional on his decision being pivotal is $E(V / U_i, t_i(H)=n)$. Thus, the shareholder will make an approving tender if and only if

(12) $\quad Z > E(V / U_i, t_i(H)=n).$

The right-hand side of (12) increases in U_i. It follows that a sufficient and necessary condition for H to define an equilibrium strategy is that the left-hand side and the right-hand side of (13) are equal for $U_i=H$. After rearranging terms, this condition yields

(13) $\quad H = Z + E(\varepsilon_i / U_i=U_{(n+1)}) = Z + E(\varepsilon_{(n+1)}).$

Thus, under the identified equilibrium strategy, a shareholder i will tender approvingly if and only if

(14) $\quad U_i < Z + E(\varepsilon_{(n+1)}),$

or, equivalently, if and only if

(15) $\quad Z > U_i - E(\varepsilon_{(n+1)}) = E(V / U_i=U_{(n+1)}).$

Proposition 3: Under the proposed scheme of approving and disapproving tenders, the unique non-constant weakly monotonic equilibrium strategy is for a shareholder to tender approvingly if and only if Z exceeds $E(V / U_i=U_{(n+1)})$, his estimate of V conditional on his estimate being the median one.[22]

Supposing that all the shareholders follow the identified equilibrium strategy, the bid will attract a majority of approving tenders if and only if

(16) $$U_{(n+1)} < H = Z + E(\varepsilon_{(n+1)}),$$

and we thus have the following proposition.

Proposition 4: Under the proposed scheme of approving and disapproving tenders, a takeover will occur if and only if

(17) $$Z > U_{(n+1)} - E(\varepsilon_{(n+1)}) = V + \varepsilon_{(n+1)} - E(\varepsilon_{(n+1)}).$$

The expected value of the right-hand side of (17) is equal to V, and its variance is decreasing in n. Thus, since in our context n is usually fairly large, the right-hand side of (17) is usually a good approximation of V. Thus, Proposition 4 implies that the proposed scheme would practically ensure that a takeover will take place if and only if Z is higher than V -- which is our working standard of desirability (see (8)).[20]

C. The Separate Vote Scheme

Under the scheme of approving and disapproving tenders, shareholders would be able to express their preferences concerning the bid's success in conjunction with the tendering of shares. An alternative version of the proposed arrangement would enable shareholders to express these preferences in a separate vote. Under this alternative version, a vote would be conducted among the target's shareholders prior to the closing of the bid. The bidder would be allowed to proceed with its bid and buy shares only if a majority of the voting shareholders vote in favor of a takeover.

This version of the arrangement would operate in a similar way to the one already described. To be sure, while the scheme of approving and disapproving tenders would induce all shareholders to express their preferences concerning the bid's success, not all shareholders would participate in a separate vote. Since the likelihood of a shareholder's affecting the vote's outcome would be small, and since voting would involve transaction costs, some shareholders would refrain from voting. The important point, however, is that a voting

shareholder would choose between voting for or against a takeover in a way similar to that in which a tendering shareholder would choose between tendering approvingly and disapprovingly.

A voting shareholder's choice will affect his position only in the event that his choice will determine the bid's fate. In such a case, voting in favor of a takeover would lead to a takeover and to the shareholder's ending up with his prorata share of the acquisition price; voting against a takeover, on the other hand, would in such a case lead to the shareholder's retaining his share in the independent target. The unique non-constant equilibrium strategy of a voting shareholder is to vote in favor of a takeover if and only if Z exceeds his estimate of V conditional on his estimate being the median among the voting shareholders' estimates. Consequently, under the separate vote scheme, the outcome of bids would practically conform to the proposed standard of desirability.

D. Adoption

Both versions of the proposed arrangement could in principle be adopted through appropriate charter provisions. The problem, however, is that the arrangement involves some restrictions on the transfer of shares -- and both the New York Stock Exchange and the American Stock Exchange generally refuse to list companies whose charters impose such restrictions. This is presumably one reason why the proposed arrangement has not emerged through private initiative. Thus, the analysis above indicates that the stock exchanges should change their policy and allow listed companies to adopt the proposed arrangement through their charters.

Alternatively, the proposed arrangement could be provided by law. Indeed, so long as the exchanges' restrictions remain, the arrangement could be provided only by law. Of course, provision by law does not necessary imply that the arrangement will be mandatory: companies might be allowed to opt out of

the prescribed arrangement -- that is, to adopt charter clauses exempting bids for their shares from the prescribed restrictions.[23]

VI. ALTERNATIVE REMEDIES

I wish now to examine three alternative types of remedies. Again, these remedies might be adopted either through appropriate charter provisions or through appropriate legal rules. As the analysis will show, these three alternative approaches are all somewhat inferior (though to varying degrees) to the arrangement put forward in the preceding Section.

A. Enhancing the Post-Takeover Value of Minority Shares

As we have seen, the fact that Y is lower than X plays an important role in creating the described distortions. Consequently, one is naturally drawn to examine whether the distortions could be remedied by an arrangement which would protect minority shareholders and ensure that Y be equal to X. In particular, Brudney and Chirelstein (1977) proposed a legal rule that would prohibit immediate takeouts at less than X. Similarly, in recent years many companies have adopted "fair price" charter provisions -- provisions which require that the consideration paid to minority shareholders in an immediate takeout be equal to X.

It should be first noted that, while precluding immediate takeouts below X would raise Y in some instances, it would not ensure that Y be equal to X. An acquirer that is prevented from effecting an immediate takeout below X might well have other means of taking advantage of minority shareholders (Bebchuk, 1985, pp. 1710-13); for example, the acquirer might be able to use its control to divert some of the target's earnings to itself. Although precluding immediate takeouts below X would not ensure equality between Y and X, such an equality could be nonetheless ensured by adopting some supplemental or alternative measures. In particular, such equality could be ensured by

providing minority shareholders in the aftermath of a takeover with the option of redeeming their shares at X.

Let us first observe that providing an option to redeem minority shares at X would all but preclude partial acquistions, since most minority shareholders would be likely to use their redemption rights. Similarly, it appears that any alternative measure that would ensure equality between Y and X would also practically preclude partial acquisitions (Bebchuk, 1985, p. 1740). This prevention of partial acquisition would be likely to involve some efficiency costs, because a partial acquisition might sometimes be the most efficient form of a given transaction.

The main problem with the approach under consideration, however, is not that it would preclude partial acquisitions but rather that it would not ensure a desirable outcome of bids. From (10) it follows that when X-Y=0 a bid will succeed if and only if

$$(18) \qquad V < Z + E(\varepsilon_i \ / \ U_{i-} \leq U_{(k)}) + (V-U_{(k)}).$$

Thus, the outcome will not necessarily conform to our standard of desirability, which requires that a bid will succeed if and only if $V < Z$. It can be shown that the expected value of the right-hand side of (18) is lower than Z -- and the outcome is therefore likely to be distorted <u>against</u> the bidder (<u>i.e.</u>, in a direction opposite to the direction in which outcomes are likely to be distorted in the absence of measures ensuring equality between X and Y).

Now, for any particular case, there is a given level of (X-Y) which would cancel out the four expressions in (11) -- and would thus ensure that the bid will succeed if and only if $Z > V$. This "optimal" level of (X-Y), however, depends on the bid's terms and on the distribution of the shareholders' estimates. Consequently, this optimal level is likely to vary from case to case and thus cannot be determined ex ante, <u>i.e.</u>, before the bid is made. Therefore, no arrangement that guarantees a certain level for the post-takeover value of

minority shares (or for the gap between this post-takeover value and the bid price) could be designed to ensure that the outcome of a future bid (whose particular features are unknown at the time of adopting the arrangement) would not be distorted either in favor of or against the bidder.

B. Increasing the Control Threshold

As was explained earlier, increasing the control threshold k reduces the value of (11) and thus works against the bidder. Therefore, since the identified distortions appear to operate systematically in favor of bidders, one might consider raising k as a remedy. Indeed, in recent years many companies have adopted "supermajority" charter provisions, provisions which raise the control threshold.

Raising k is an imperfect remedy, however, for the same reason that raising Y is an imperfect remedy. For any particular case, there might exist an optimal level of k which would cancel out the four expressions in (11) and would thus ensure a desirable outcome. This optimal level, however, depends on the bid's terms and on the distribution of the shareholders' estimates, and thus might vary from case to case. Therefore, it is impossible to choose a level of k that would ensure that the outcome of a future bid situation (whose particular features are yet unknown) would not be distorted either in favor of or against the bidder.

C. Giving Veto Power to Management

At present, applicable legal rules and companies' charters leave a target's management free to use some defensive tactics which prevent the bid (at least temporarily) from reaching the shareholders. Furthermore, in recent years some companies have adopted charter provisions that establish a staggered board and thus strengthen the incumbents' ability to impede a bidder's quest for control.

It might be suggested that giving management some degree of veto power over an acquisition provides a remedy for the distortions of shareholder choice. If shareholders' tender decisions might lead to a suboptimal outcome, then it might be sometimes desirable to take the decision away from them. Management will use its power, it might be hoped, to obstruct bids in those instances where the independent target's value exceeds the expected acquisition price.

Giving management the power to obstruct acquisitions, however, is a very costly and inadequate remedy for the identified distortions. Most importantly, managers are not perfectly loyal agents of the shareholders and they might well abuse their power to impede or block a takeover. To start with, management might refrain from using their power against an inadequate offer by management's favored acquisition partner -- a potential buyer that promises management some attractive job prospects or side payments. Even worse, management might decide to block a bid whose success would be desirable; management might choose to do so in order to retain its independence, or to extract side payments from the obstructed bidder, or to facilitate an acquisition by a rival bidder offering a lower acquisition price to shareholders but a better deal for the managers.

Thus, giving management the power to impede bids not only cannot ensure undistorted outcomes, but also might distort outcomes that would otherwise conform to our standard of desirability. Therefore, it would be desirable to deny managers any veto power over acquisitions and to address the identified distortions in an alternative way (such as the arrangement put forward in Section V). The elimination of managerial obstructions could be accomplished by law (as was recommended, for example, by Easterbrook and Fischel (1981)), or it could be accomplished through appropriate charter provisions.

VII. CONDITIONAL BIDS

A. The Outcome of Conditional Bids

Thus far we have assumed that the bid under consideration is unconditional. Let us now assume that the bidder conditions its commitment to purchase tendered shares on receiving at least ℓ shares, $m \geq \ell \geq k$; that is, the bidder retains an option to return tendered shares if it receives less than ℓ shares. The effect of the bidder's retaining this option obviously depends on the likelihood that the bidder will use it in the event that the condition is not satisfied. To get some sense of this effect, however, let us consider the simple and extreme case in which it is certain that the bidder will use its option if the condition is not satisfied.

Consider the tender decision of a shareholder i who supposes that other shareholders follow a non-constant weakly monotonic strategy defined by H. The only way in which his considerations differ from those analyzed in Section III concerns his expected position in case $t_i(H) < \ell-1$. In this case, the condition will not be satisfied and the bidder will return all tendered shares (regardless of the shareholder's tender decision); consequently, the shareholder's expected position will be the same whether he tenders or holds out: either way he will end up with a share in the independent target. Making the appropriate changes in (3), the shareholder will elect to tender if and only if

$$(19) \quad P(t_i(H)\geq\ell \;/\; U_i)\cdot(X-Y) + P(t_i(H)=\ell-1 \;/\; U_i)\cdot[X - E(V \;/\; U_i, t_i(H)=\ell-1)] > 0 \; .$$

As in (3), the left-hand-side of (19) is the expected difference between the consequences of tendering and those of holding out. (19), however, reflects the fact that under the present assumption tendering and holding out are equivalent in case $t_i(H)<\ell-1$. The first expression on the left-hand side of (19) represents the case in which $t_i(H)\geq\ell$ and the condition is thus going to

be satisfied regardless of the shareholder's decision. The second expression on the left-hand side represents the case in which $t_i(H)=\ell-1$ and the shareholder's decision is going to determine whether the condition will be satisfied.

Proceeding from (19) in a way similar to that used in Section III, it can be shown that the non-tendering threshold which defines the unique non-constant weakly monotonic equilibrium strategy is

$$H = X + (2n+1-\ell)(X-Y) + E(\varepsilon_i \;/\; U_i=U_{(\ell)}). \tag{20}$$

Thus, supposing that all the shareholders follow the identified equilibrium strategy, the bid's outcome will be as described in the following proposition.

Proposition 6: If the bid is conditional on tendering by at least ℓ shareholders, and if it is certain that the bidder will use its option to return tendered shares in the event that its condition is not satisfied, then a takeover will take place if and only if

$$U_{(\ell)} < X + (2n+1-\ell)(X-Y) + E(\varepsilon_i \;/\; U_i=U_{(\ell)}). \tag{21}$$

B. Evaluating the Outcome of Conditional Bids

In the conditional bid under consideration, the distortion in favor of the bidder is clearly very large. Since n is presumably large, (20) indicates that a given shareholder will tender even if his estimate of V is many times higher than X. Indeed, if (in contrast to what we have assumed) the shareholder were to ignore the possibility that his decision will be pivotal (i.e., if he were to assume that $P(t_i(H)=\ell-1)$ is equal to 0), then tendering would always be his dominant strategy: if the bid is going to succeed, tendering will be his best course of action; and if the bid is going to fail, there will be no difference between tendering and holding out.

The large magnitude of the described distortions is very much due to the assumption that the bidder will certainly return tendered shares if its condi-

tion is not satisfied. This assumption eliminates from a given shareholder's considerations the case in which the bid fails, and this elimination works in favor of the bidder. This assumption, however, usually does not hold: while bidders commonly retain an option to return tendered shares if their bid fails, failing bidders often elect to purchase tendered shares (see Bradley, Desai and Kim, 1983). In the common case where the probability that the bidder will use its option is less than one, the distortion will be weaker than what is suggested by Proposition 6.

The discussion above suggests that bidders' optimal strategy might well be to commit themselves to return tendered shares in the event that their bid fails. To be sure, ex post -- that is, given that the bid has failed -- it might well be preferable for the bidder to purchase tendered shares (since the market price of the independent target's shares following the bid's failure is likely to exceed the bid price). This is presumably the reason why bidders usually do not commit themselves to return tendered shares in the event that their bid fails but rather retain an option to do so. What bidders miss, however, is that making such a commitment is likely to be optimal ex ante, because it is likely to maximize the chances that their bid will succeed.

C. The Outcome under the Proposed Arrangement

It is easy to see that under the arrangement proposed in Section V the outcome of conditional bids would correspond to our working standard of desirability. Indeed, under the proposed arrangement, the existence of a condition would have no significance, and bidders would therefore have no reason to stipulate such conditions. Consider the scheme of approving and disapproving tenders, and recall that under the scheme all the shareholders would tender their shares (either approvingly or disapprovingly). If the bidder fails to attract the required majority of approving tenders, then the bidder would be

prohibited from purchasing any tendered shares, and the existence of a condition would thus be irrelevant. If the bidder succeeds in attracting a majority of approving tenders, then the bidder would be able to purchase any number of shares that it wishes to acquire -- and the existence of a condition would again be irrelevant.

VIII. MARKET TRADING

Thus far the paper has ignored the trading in the target's shares that takes place throughout the period in which the bid is open. I wish now to briefly discuss this market trading.

(A) I wish first to point out that the fact that the paper did not attempt to model the market trading during the bid period does not undermine the validity of its analysis of the outcome of bids. The paper's analysis has focused on shareholders' decisions at "the moment of truth" (the time just prior to the bid's closing) because it is these decisions which determine the bid's outcome. No matter how many times the target's shares have changed hands since the bid's announcement, at the moment of truth they are all necessarily owned by someone. At this point in time, the shares' ultimate owners face only two alternatives -- they must either tender their shares or retain them beyond the bid's expiration.

Thus, the only way in which the market trading during the bid period might affect the shareholders' subsequent, crucial decisions at the moment of truth is by affecting shareholders' estimates of V. Shareholders might infer from the market price some information about others' estimates of V and might consequently revise their own estimates. The possibility of shareholders' drawing such inferences, however, does not detract from the validity of the article's analysis. To be sure, the analysis has assumed that at the moment

of truth shareholders' estimates of V might vary. This assumption is consistent, however, with the possibility that the shareholders might have inferred from the preceding market prices some information about others' estimates: the variance in the shareholders' estimates at the moment of truth might be lower than what it would have been in the absence of market trading. That is, the assumption has not been that the market trading revealed no private information but rather that it did not reveal all private information; and there are good theoretical reasons for holding such an assumption (see, e.g., Grossman & Stiglitz, 1980). Finally, even assuming that the market prices during the bid period did reveal all private information, the paper's main points would still hold: as Section IX will point out, these main points would hold even if we were to assume that at the moment of truth all the shareholders share a common estimate of V.

(B) While constructing a complete model of the market trading during the bid period is beyond the scope of this paper, I wish to discuss briefly the implications that the paper's analysis of the moment of truth has for the preceding market trading. Because the market trading in the target's shares is conducted against the background of an open offer and an eventual moment of truth, this market trading might significantly differ from the trading in the shares of a company that is not a takeover target. In particular, I wish to show (i) that the market price during the bid period might be significantly lower than the estimates of V held by most or even all shareholders, and (ii) that this market price might transmit no information to investors about others' estimates of V.

To see the validity of these two claims, consider the following situation. Let e denote the maximum absolute value that the error term might take (i.e., 2e is the size of the interval around V in which shareholders' estimates are

distributed). As before, let H denote the non-tendering threshold (as given in (5)). Now, let us suppose that the independent target's value satisfies

(22.a) $V + 3e < H$, and

(22.b) $V - e > \frac{m}{2n+1} X + \frac{2n+1-m}{2n+1} Y$.

From (5) it is clear that the right-hand side of (22.a) exceeds that of (22.b). Thus, supposing that e is not too large, the considered situation is definitely possible.

(22.a) implies that each shareholder will realize that every shareholder's estimate of V is lower than H. To see this, note first that each shareholder knows that no shareholder might have an estimate of V that exceeds his own estimate by more than 2e. And since no shareholder's estimate might exceed V+e, (22.a) implies that even the shareholder with the highest estimate of V will realize that not only he but also every other shareholder has an estimate lower than H. Consequently, all the shareholders will expect the bid to succeed, and at the moment of truth they will all tender their shares. Thus, a takeover will take place and each shareholder will end up with $\frac{m}{2n+1} X + \frac{2n+1-m}{2n+1} Y$.

The general expectations that a takeover will take place will of course affect the preceding market trading. Because each investor believes that holding the target's shares will bring a per share value of $\frac{m}{2n+1} X + \frac{2n+1-m}{2n+1} Y$, the market price of the target's shares will be set at this very level. Two features of this market price are clear: (i) as follows from (22.a), this market price is lower than all the estimates of V held by shareholders; and (ii) because this market price does not reflect the shareholders' estimates, no shareholder can infer from it any information concerning other shareholders' estimates.

IX. DISCUSSION

A. The Practical Significance of the Problem

The analysis of the model has shown that a takeover bid might succeed even if V exceeds Z -- an outcome which is undesirable according to the proposed standard of desirability. It might be argued, however, that this problem is purely hypothetical because there are no instances in which V indeed exceeds Z.

In particular, the existence of instances in which V exceeds Z might be denied on the grounds that Z is usually at a premium over the pre-bid market price of the target's shares, a price which reflects investors' pre-bid estimates of the independent target's value. This argument, however, ignores the dynamic nature of shareholders' estimates and the fact that shareholders usually make their tender decisions several weeks after their company becomes a takeover target. Investors' estimates of a given company's value are continuously revised as new information is revealed. In the case of a takeover target, the amount of new information revealed between the last pre-bid trading time and the moment of truth is likely to be substantial.

For example, a target's shareholders might draw inferences concerning the target's value from the very making of the bid and from the bid's terms. The shareholders might also revise their estimates, especially in a hostile bid, in reaction to disclosures by the target's management concerning future plans, proposed structural changes, and previously undisclosed facts. Finally, a bid attracts the investment community's attention, and intensified investigations by market participants are likely to reveal a wealth of new information concerning the target. Because the new information is likely to be on the whole "good news," shareholders are likely to hold at the moment of truth estimates of V that exceed the pre-bid market price of the target's shares.

The existence of instances in which V exceeds Z might also be denied on the grounds that the threat of a competing bid forces bidders to offer a Z exceeding V. If a bidder were to offer a Z lower than V, so the argument goes, then a rival bidder would make a higher offer with an expected per share acquisition price of $\bar{Z}$, where $Z < \bar{Z} < V$; this rival bidder would make such an offer, the argument asserts, because it would hope to acquire the target for $\bar{Z}$ per share, resell the target to investors as an independent entity for V per share, and thus make a per share profit of $(V-\bar{Z})$.

Although the threat of competing bids mitigates the problem under consideration (see Bebchuk, 1982a, 1982b), it does not eliminate it. When a bid is closing and the target's shareholders view V as higher than Z, a higher rival offer is in no way certain to be made. A potential rival bidder might be deterred by the uncertainty concerning the value of V, by the transaction costs involved in acquiring and then reselling the target, and by the short time it might have to put together its offer. Furthermore, the potential rival bidder might also be deterred by the prospect that its offer would trigger a bidding contest which would drive the price up to V; in such a bidding contest the rival bidder would of course make no profit but only bear the costs involved in entering the contest.[24]

That there are instances in which remaining independent would be the shareholders' value-maximizing course of action is also indicated by the empirical evidence. Bradley, Desai, and Kim (1983) identified several dozen instances in which shareholders rejected a premium bid and remained independent. In these instances, remaining independent indeed proved to be value-maximizing: once the bid was rejected, the market price of the target's shares was significantly higher than the offered per share acquisition price.

Among the various reasons that at the moment of truth might lead a target's shareholders to view V as higher than Z, there are several which I would like to highlight. First, the shareholders might expect that another bidder, which can put the target's assets to a more valuable use than can the present bidder, will come forward later on with a higher offer. Indeed, in the cases of bid rejection studied by Bradley, Desai, and Kim, many of the targets that remained independent were later acquired through a higher offer by another bidder.

Second, the shareholders might believe that the bidder's motive for making the bid was the possession of private information that the target's shares were undervalued by the market (see Grossman and Hart, 1981). And the shareholders might conclude that the target's accurate value exceeds the offered acquisition price.

Third, the shareholders might judge V to be higher than Z as a result of plans and proposals that the target's management has put forward subsequent to the bid. Management might, for example, put forward a plan for a financial or economic restructuring of the target.

It is not possible, of course, to assess with certainty the number of current instances in which the identified distortions lead to a takeover even though V exceeds Z. But it appears that there might be a significant number of such instances. As the analysis of the model has indicated, at present a target is likely to remain independent only if V exceeds Z by a significant margin; the instances of bid failure identified by Bradley, Desai, and Kim presumably belong to that category. Because bidders wish to pay as little as possible, they presumably attempt to set the offered acquisition price at or just above the level that, given the existing distortions, will be sufficient for the bid's success. The existing instances of bid failure are thus those in which the bidder undershoots even that minimal level. Thus, continuity reasoning suggests that there might well be many takeovers in which the Z

offered by the bidder is lower than V -- but not by a sufficiently large margin for shareholders to overcome the distortions and reject the bid.

B. The Distribution of Shareholders' Estimates

(1) The Independence of the Errors in Shareholders' Estimates. Thus far I have assumed that the error terms ε_i (ε_i=V-U_i) are independently distributed. Dropping this assumption has implications for assessing the effectiveness of the proposed arrangement. Recall (see (17)) that under this arrangement the target will be acquired if and only if

(17) $$Z > U_{(n+1)} + E(\varepsilon_{(n+1)}) = V - \varepsilon_{(n+1)} + E(\varepsilon_{(n+1)}).$$

The expected value of the right-hand side of (17) is of course equal to V. Furthermore, given the assumption that the error terms are independently distributed, the variance of this right-hand-side is very small. Consequently, the right-hand-side is a very good proxy for V. This indicates that the arrangement would practically ensure outcomes conforming to the proposed standard of desirability.

Suppose, however, that the error terms are not independent. Specifically, suppose that $\varepsilon_i = \Theta + \psi i$, where Θ is a common error term, and where ψi are independently distributed error terms. In such a case, the expected value of the right-hand side of (17) is still V but its variance might no longer be very small, since it will be at least as large as the variance of Θ. Consequently, the right-hand side of (17) is no longer a perfect proxy of V; the extent of this imperfection depends of course on the magnitude of the variance of the common error term Θ. Since the right-hand side of (17) is an imperfect proxy of V, the proposed arrangement might occasionally produce outcomes that do not conform to the proposed standard of desirability. This problem cannot be eliminated by altering the design of the proposed arrangement: the problem

is the inevitable consequence of the fact that, when the error terms are not independent, it is not possible to identify a perfect proxy of V even with the knowledge of all the shareholders' estimates.

Note, however, that the above problem does not imply that the proposed arrangement is not the mechanism that would bring us closest to attaining outcomes conforming to the proposed standard of desirability. In this connection it is worthwhile to consider for a moment the sole owner context. According to the proposed standard of desirability, a sole owner's assets should be acquired if and only if the offered acquisition price exceeds the value to the owner of retaining his assets. Because a sole owner might err in assessing the value to himself of retaining his assets, giving sole owners the power to accept or reject offers might occasionally lead to undesirable outcomes. Yet, giving owners such power still appears to be the mechanism that would be most likely to produce desirable outcomes. Similarly, it appears that the proposed arrangement provides the mechanism that would be most likely to produce outcomes conforming to the proposed standard of desirability. For there does not appear to be any feasible mechanism that would effectively utilize estimates of V that would be systematically better estimates than the right-hand side of (17).

(2) The Assumed Variance Among Shareholders' Estimates. Thus far I have assumed that shareholders' estimates differ (however slightly) due to the possession of private information. This assumption was very useful to the analysis because it enabled the derivation of a unique non-constant equilibrium strategy. Yet, the main qualitative points of the paper do not depend on this assumption.

Suppose that all of a target's shareholders share the same probability distribution over V, and let U denote the mean of this common distribution. While it would not be possible in this case to derive a unique non-constant equilibrium strategy, the following two points are still valid.

First, in the absence of a remedial arrangement, the outcome of the bid might be distorted in favor of the bidder (vis-a-vis the benchmark established by the proposed standard of desirability). If $U < X$, then the bid will surely succeed (as is desirable), because all the shareholders will elect to tender. And if $U > X$, then the bid might either fail (as is desirable) or succeed. This is because for every value of U that exceeds X, tendering by all shareholders clearly constitutes an equilibrium strategy (though holding out by all shareholders also constitutes an equilibrium strategy).

Second, the arrangement put forward in this paper would address the above distortion. Under the scheme of approving and disapproving tenders, a shareholder's choice between tendering approvingly and disapprovingly would matter only in the event that his decision will prove pivotal for the bid's outcome; and, assuming that his decision is going to be pivotal, the shareholder will prefer that the bid succeed if and only if $Z > U$. Thus, under the proposed scheme, a shareholder's dominant strategy would be to tender approvingly if $Z > U$ and disapprovigly if $Z < U$. Consequently, the target will be acquired if and only if Z exceeds U, the shareholders' common estimate of the independent target's value.

C. Search for Takeover Targets

Thus far I have abstracted from the issue of incentives to search for takeover targets. I have taken the existence of bids as exogenously given, and have consequently evaluated the outcome of bids from a purely ex post perspective. As Grossman and Hart (1980a, 1980b) have emphasized, however, bids are often made as a result of prospective bidders' search for potential targets. Bidders' search for targets is thus desirable, ex ante, from the perspectives of both society and target shareholders. Bidders will of course invest in search only to the extent that they can expect to capture an adequate

return on their investment. Ensuring that bids succeed only if Z exceeds V (i.e., ensuring outcomes that are desirable ex post) would increase acquisition premiums and reduce the return to search. It is therefore necessary to examine whether the need to provide incentives to search undermines the desirability of ensuring that bids succeed only if Z > V.

It should be first noted that ensuring that bids succeed only if Z exceeds V is consistent with the existence of substantial rewards for search and thus with substantial search activity. For one thing, searchers can make substantial gains on their pre-bid purchases of the target's stock (Bebchuk, 1982a, 1982b; Vishny and Shleifer, 1984). Prior to making a bid for an identified target, a searcher can and often does make secret purchases of the target's shares. Whether or not the searcher ultimately acquires the target, the searcher will usually make a substantial profit on its pre-bid purchase: if the searcher acquires the target, then its pre-bid purchases will enable it to save the bid premium on the stock that it already owns; if another buyer acquires the target, the searcher will earn on its stock the premium paid by that buyer; finally, if the target's shareholders reject all available bids, the searcher will still make a gain because in such a case the market price of the independent target's shares will probably be substantially higher than the pre-bid price for which the searcher bought its shares.[25]

In addition to making a profit on pre-bid purchases, a searcher that identifies a target might gain by paying an acquisition price lower than its valuation of the target's assets. Of course, under an arrangement ensuring that bids succeed only if Z > V, the searcher would have to pay at least the competitive price -- that is, the price that other potential buyers would be willing to pay. But the searcher might place a higher value on the target's assets than do other potential buyers -- buyers often vary substantially in

the amount of efficiency gains that they can produce by acquiring the target. In such a case, the searcher would usually capture a substantial fraction of those gains from the acquisition that other buyers would be unable to produce. Indeed, the searcher would likely capture most of these gains: in the takeover context only the bidder can make offers (which the target's shareholders must then either accept or reject) -- and such a "bargaining procedure" is likely to provide the bidder with a substantial advantage in the "bargaining" with the shareholders over the division of these gains (see, e.g., Rubinstein, 1981).

Thus, an arrangement ensuring that bids succeed if and only if $Z > V$ is consistent with a substantial (though probably still suboptimal) level of search. Moreover, without such an arrangement, the identified distortions might lead to an excessive level of search. Search is socially beneficial only to the extent that searchers look for targets whose acquisition would produce efficiency gains. When targets might be acquired even if $V > Z$, bidders would often go after targets whose acquisition would profit the bidder but produce no efficiency gains; consequently, prospective bidders would make socially excessive investments in search.

In sum, it is unclear whether an arrangement ensuring that bids succeed if and only if $V > Z$ would move us closer to, or further away from, attaining an optimal level of search. It is of course even less clear that the search consideration justifies sacrificing the benefits that such an arrangement would produce.

FOOTNOTES

1. These facts are observed by, for example, Bradley (1980) and Bradley, Desai, and Kim (1984).

2. This problem was ruled out in Grossman and Hart's analysis by their assumption that shareholders will not tender their shares if the independent target's value exceeds the bid price.

3. In addition, the present model differs from the models in the literature in many other important features. For example, unlike the present model, the existing literature does not explain the observed variance in shareholders' reactions to a bid, nor does it examine the possibility that shareholders might differ in their estimates of the independent target's value or in their estimates of the likelihood of a takeover.

4. Some limited discussion of the issue can be found in Bebchuk (1982a, 1982b) and in DeAngelo and Rice (1983).

5. See Bebchuk (1985, p.1718). Articles of incorporation which increase k beyond (n+1) will be considered in Section VI.

6. Furthermore, because shareholders can always postpone tendering until the moment of truth, a shareholder will not tender early unless he expects that at the moment of truth he will still prefer to tender. Therefore, for our purpose -- that of understanding how a bid's outcome is determined -- the critical question is what determines shareholders' explicit or implicit tender decisions at the moment of truth.

7. It is assumed that all the shareholders have the same estimate of the expected value of Y. The model can be adjusted to apply to the case in which shareholders have private information -- and therefore different estimates -- concerning the value of Y.

8. Let A denote the per share value of the consideration that would be required in an immediate takeout, and let B denote the post-takeover per share value that investors would attach to minority shares if they expected no takeout to occur until at least, say, t years following the takeover. It is easy to see that the acquirer would refrain from effecting an immediate takeout only if B is lower than A. When B exceeds A, it would be profitable for the acquirer to effect an immediate takeout even if the acquirer does not wish to remain the owner of all of the target's shares. For the acquirer could effect an immediate takeout at A, and then resell the acquired minority shares to public investors, committing itself not to effect another takeout within t years. Given this commitment, the acquirer would be able to sell the shares for B per share and hence make a profit of (B-A) per share. Thus, because an immediate takeout would be profitable if B exceeded A, it follows that the acquirer would decide against an immediate takeout only if B were lower than A.

The above analysis is confirmed by the empirical evidence. Jarrell (1985) found that the post-takeover value of minority shares is higher in those instances where an immediate takeout takes place than in those where it does not.

9. The shareholder's probability distribution is of course based on all the information that he has -- including whatever information he might have inferred from the very making of the bid, from the bid's terms, and from the market trading prior to his tender decision.

10. The probability distributions might be viewed as being generated by a common prior revised in light of each shareholder's private information. It is assumed that at the moment of truth shareholders have some private information because the trading up to that time has not revealed all private information (though it might have revealed part of it). There are good theoretical reasons for believing that indeed not all private information is revealed through market trading. (See, e.g., Grossman & Stiglitz, 1980). In any event, as Section IX will explain, the main points of the analysis below would hold even if we were to assume that shareholders have no private information and consequently share the same estimate of V.

11. The present formulation of the error term requires us to allow for the possibility that V is negative. Of course, this assumption is unrealistic, because the existence of limited liability ensures that $V \geq 0$. If one wishes to rule out the possibility of a negative V, it would be possible to do that by assuming that $U_i = V(1+\varepsilon_i)$, where the error terms ε_i are identically and independently distributed in an interval which is a subset of $(-1,\infty)$. Under that assumption the model's results would be essentially the same, but the presentation would be much more cumbersome.

12. Indeed, I conjecture that there exists no equilibrium strategy that violates weak monotonicity on a range with a non-zero measure.

13. The considered strategy is the only constant equilibrium strategy, because holding out for all values of U is not an equilibrium strategy: If U is sufficiently low, then tendering will be preferable regardless of whether the bid is going to fail or succeed.

14. It is assumed that the set of values for which the strategy requires tendering is an open one. The model's results would be the same under the assumption that the set is a closed one.

15. Obviously, in a bid for all shares, where $m = 2n+1$, the value of the second expression in (1) is always zero and the value of (1) is always X. Only in a partial bid may the value of (1) fall below X.

16. It is assumed that the shareholder will hold out if he is indifferent between holding out and tendering. The model's results would be the same under the opposite assumption.

17. In putting forward this standard of desirability, I assume that the acquisition of the target would not produce any private gains (losses) that do not represent social gains (losses). In reality, however, some of the gains produced by an acquisition might be a result of tax savings, increased market power, and reduced obligations towards employees -- private gains that come at the expense of tax revenues, consumers, or employees. This problem is present not only in the context of acquiring a company with a divided ownership but also in the context of acquiring a company (or, more generally, a business) with a single owner. I abstract from this problem because I wish to focus on the problems that result from the divided ownership of takeover targets. In

particular, I wish to examine which measures would make the outcome of takeover bids attain that level of efficiency which would be attained if the shares of any given target were concentrated in a sole owner's hands.

In proposing (7) as the standard of desirability I also assume that there are instances in which (7) holds and instances in which it does not. It might be argued that W must exceed V because a successful bidder could always duplicate the path that the independent target would have followed. While this proposition might indeed hold in most instances, it appears implausible that it holds generally. That the proposition holds generally implies, it might be noted, that concentrating all corporate assets in the economy in one company could not be less efficient than any other (more divided) organizational structure.

18. Formally, q^* is equal to $E(q \mid \phi, q \geq k)$, where ϕ is the bidder's information set.

19. As was explained earlier, the equilibrium strategy on which I wish to focus is the unique non-constant weakly monotonic equilibrium strategy. It might be worthwhile, however, to consider briefly the outcome that will obtain supposing that the target's shareholders will follow the constant equilibrium strategy of tendering no matter what U is. In such a case, the resulting outcome might clearly differ from the desirable one -- for the resulting outcome will be always a takeover regardless of how V and Z compare.

20. In Bebchuk (1985) I explain that, once we drop three assumptions of the model, three refinements of the required number of approving tenders appear necessary to maintain the effectiveness of the proposed scheme. First, it is assumed in the model that all of the target's shareholders have an opportunity to tender their shares. In reality, however, there are some shareholders who lack such an opportunity -- either because they are unaware of the bid or because they are unable to deliver their shares in time to the bidder. Examination of this issue suggests that the bidder should be required to attract approving tenders not from a majority of the target's shareholders but rather from a majority of the tendering shareholders (Bebchuk, 1985, pp. 1759-60).

Second, it is assumed in the model that all of the target's shareholders are "disinterested" -- in the sense that their preferences concerning the bid's success are determined by the effect that a takeover would have on the value of their shareholdings. It is possible, however, to identify some categories of shareholders who are not "disinterested." In particular, the bidder might have a stake in the target, and the bidder would presumably prefer the bid to succeed regardless of its judgement as to how V and Z compare. Examination of this issue has led me to suggest that the bidder should be required to attract approving tenders not from a majority of the tendering shareholders but rather from a majority of the disinterested tendering shareholders (Bebchuk, 1985, pp. 1760-61).

Third, while it is assumed in the model that the target's shareholders hold identical blocks, in reality shareholders' blocks obviously vary. As the size of a shareholder's block increases, he is likely to invest more in acquiring information about V and thus to have a more accurate estimate of it. Examination of this issue has led me to suggest that approving and disapproving tenders by larger shareholders should receive increased weight; in particular, I suggested that a bidder should be required to attract approving tenders from shareholders who together hold a majority of the shares held by disinterested tendering shareholders (Bebchuk, 1985, pp. 1774-75).

21. Thus, a bidder would not be able to use a failing control bid to purchase a non-controlling block: to purchase a non-controlling block, a new transaction would be necessary. Under an alternative scheme, which I discuss in Bebchuk (1985), a failing bidder would be able to purchase a non-controlling block. Under that scheme, a bidder that wants the option of purchasing a non-controlling block if its bid fails would have to include in its tender form a second question (in addition to the question whether the tenderer approves a takeover). Tenderers would be asked to indicate, by marking an appropriate box, whether or not they permit the bidder to purchase their shares in the event that the bid fails. If the bid indeed fails, the bidder would be allowed to purchase shares of those tendering shareholders who granted it permission to purchase their shares in such a case.

22. Note that if the distribution of the error term is symmetric, then $E(V / U_i=U_{(n+1)})$ is equal to the unconditional estimate U_i. If the distribution is not symmetric, however, then the conditional estimate $E(V / U_i=U_{(n+1)})$ might differ from the unconditional estimate U_i.

23. Indeed, even if the exchanges were to amend their policies, adopting the proposed arrangement in a centralized regulatory fashion (while allowing companies to opt out) would have some advantages over adoption through numerous private initiatives. Such centralized adoption would save transaction and information costs, reduce uncertainty, and make planning easier.

24. Finally, it should be noted that a bidding contest might not always end in the victory by the bidder with the highest offer. The existing distortions afflict not only shareholders' choices between selling their company and remaining independent but also their choice between rival offers. Suppose that both A and B make bids, that both bids are conditional on the bidder's success in gaining control, and that A's offered acquisition price exceeds B's. To see that B might still win, it is sufficient to note that tendering to B is an equilibrium strategy (though not the only one): assuming that other shareholders are going to tender to B and that B might consequently win, each shareholder will prefer to tender to B. For a detailed discussion of how the outcome of a bidding contest might be distorted, see Bebchuk (1985, pp. 1801-08). (That discussion suggests, it might be worth noting, that the bidder whose offer closes earlier is likely to have an advantage, and this advantage might further deter potential rival bidders in the situation considered above.)

25. Under Current U.S. law, the amount of the target's shares that a searcher can secretly purchase (without being required to disclose its purchases) is limited to 5% of the target's shares. As long as the searcher is required to remain below the effective control threshold, however, an increase in the disclosure threshold would be consistent with ensuring (say, through the proposed arrangement) that bids succeed only if Z exceeds V. Thus, if it were deemed desirable to enhance searchers' rewards, a significant enhancement could be accomplished by increasing the disclosure threshold. Thus, such a measure should be adopted before seeking to further enhance search by enabling bids to succeed even if $V > Z$.

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