TENDER OFFERS AND LEVERAGE*

Holger M. Müller and Fausto Panunzi

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Abstract

This paper examines the role of leverage in tender offers for widely held firms. We show that leveraged buyouts play a role similar to the dilution mechanism envisioned by Grossman and Hart (1980). Leveraged buyouts are typically accomplished as two-step transactions, consisting of a front-end tender offer and a back-end merger between the target company and the raider's acquisition subsidiary. The fact that the acquisition subsidiary is highly indebted dampens the increase in net worth that would otherwise result from the raider's value improvement, thus reducing the incentives for target shareholders to become minority shareholders in the raider-controlled firm. This allows the raider to offer a lower bid price in the tender offer, make a profit, and mitigate the free-rider problem. The raider's ability to make a profit is constrained by the laws protecting minority shareholders. Among other things, these laws ensure that inefficient takeovers are strictly unprofitable.

What this all comes down to is simply withdrawing the warm blood of equity and replacing it with the cold water of debt.

Fred Hartley, CEO of Unocal.[1]

I. Introduction

The 1980s marked a dramatic change in corporate governance. Buyout firms like Kohlberg, Kravis, Roberts, & Co and raiders like Carl Icahn, T. Boone Pickens, and Ronald Perelman challenged some of the nation's largest companies. Connie Bruck [1998], in her book *The Predators' Ball*, writes: "No prey was too large and no predator too inconsequential—so long as Milken could tap into his magic pools of capital. Overnight, all the rules of survival in the corporate jungle had been rewritten" [p. 14].

The ownership structure of target firms was often dispersed. To gain control of the target, the raider would typically make a tender offer. One of the characteristic features of the 1980s takeover wave was that tender offers were highly leveraged [Scherer 1988; Holmström and Kaplan 2001]. As the raider had often no, or only few, assets of his own, the assets and cash flows of the target firm would serve as security for his debt. This is commonly known as *bootstrap acquisition*, as it enables "the buyer to 'bootstrap' the acquisition of a business and pay off the indebtness with money earned in the acquired company's operations" [Crawford 1987, p. 1]. The vast majority of leveraged buyouts (LBOs) were accomplished this way.

Compared to its empirical relevance, the role of leverage in tender offers has received relatively little attention. Beginning with Grossman and Hart [1980], a large literature analyzes

[1] When faced with a hostile takeover bid by T. Boone Pickens (quoted in Wasserstein [2000, p. 168]).

tender offers in which target shareholders are nonpivotal, leading to the well-known free-rider problem (e.g., Shleifer and Vishny [1986], Stulz [1988], Grossman and Hart [1988], Hirshleifer and Titman [1990], Hirshleifer [1995], Burkart, Gromb, and Panunzi [1998]). All these papers *assume*, however, that the raider finances his bid with cash out of his own pocket. Hence, the role of leverage—and the choice of financing in general—remains largely unexplored.[2]

An important implication of the free-rider problem is that the tender offer bid price must reflect all future value gains associated with the takeover. If not, an individual shareholder would rather not tender and capture these gains through the posttakeover appreciation in the share price. But if the raider must cede all future gains to the target shareholders, the takeover is unprofitable for him and will not take place. This is potentially a severe problem, as it casts doubt on the efficiency of the market for corporate control.

Grossman and Hart [1980] show that the free-rider problem can be solved if the raider can dilute the value of minority shares after he assumes control. Dilution lowers the value of minority shares, and thus the incentives for target shareholders to become minority shareholders in the raider-controlled firm. The raider can consequently offer a lower bid price in the tender offer, which implies the takeover may be profitable. Examples of dilution are the sale of assets or goods to another company owned by the raider at an artificially low price, and the issuance of additional shares exclusively to the raider.

This paper shows that LBOs implement an outcome which—from an economic perspective—is quite similar to the dilution mechanism envisioned by Grossman and Hart. Unlike dilution,

[2] On the other hand, papers that do consider the role of debt in takeovers—either as a means of payment (e.g., Hansen [1987], Fishman [1989]) or as a commitment device to deter entry by rival bidders [Chowdhry and Nanda 1993]—do not consider the free-rider problem that is potentially relevant for widely held firms.

however, the mechanism underlying LBOs is (i) consistent with the law and legal practice in the United States, and (ii) widely used, especially in the 1980s takeover wave.[3]

LBOs come in many different forms, ranging from management buyouts of small, privately held companies to hostile takeovers of large, publicly held companies by buyout firms and corporate raiders. This paper focuses on LBOs of publicly held companies. Such LBOs are typically accomplished as two-step transactions consisting of a front-end tender offer and a back-end merger between the target company and the raider's acquisition subsidiary, a special purpose vehicle founded for the purpose of purchasing the target shares and issuing the debt. The back-end merger is commonly called "freezeout," "squeezeout," or "cashout" merger. The fact that the acquisition subsidiary is highly indebted dampens the increase in net worth that would otherwise result from the implementation of the raider's business plan, and thus—in a fashion similar to the Grossman-Hart dilution mechanism—the incentives for target shareholders to become minority shareholders in the raider-controlled firm.

The following bargaining analogy may provide some additional intuition. Suppose the raider and the target shareholders could bargain over the takeover gains. The Grossman-Hart assumption that target shareholders are nonpivotal implies that they have the full bargaining power. Hence, they appropriate the entire takeover gains, which implies the takeover is unprofitable for the raider. In contrast, under the LBO mechanism the raider pledges—and therefore effectively sells—some or all of the gains created by the takeover to debtholders as security for his debt. While the raider cannot affect bargaining powers, he has de facto shrunk the "size of the pie" over which he and the shareholders subsequently bargain. Debtholders, in turn, are willing to pay the raider the expected value of the pledged cash flows ex ante, which constitutes the raider's

[3] In 1986, for instance, LBOs represented nearly 40 percent of all public acquisitions [Jensen 1988].

profit.

The effect described here is similar to the use of debt as a commitment device in the union bargaining literature [Bronars and Deere 1991; Perotti and Spier 1993; Dasgupta and Sengupta 1993]. There, a firm borrows against its future profits and pays out the proceeds to its shareholders, with the result that it need not share these profits in the future bargaining with unions.[4] Bronars and Deere summarize this idea as follows [p. 231]:

> "A union can extract no more than the present value of future net cash flows at the time of unionization. By issuing debt instead of equity, firms are obligated to repay a portion of future revenues to creditors. Hence, these obligations limit the revenues that a union can extract without driving the firm into bankruptcy."

Our argument suggests that the returns to target shareholders should be decreasing—and the raider's profit increasing—in the raider's leverage. This is consistent with empirical evidence provided by Maloney, McCormick, and Mitchell [1993], who document a positive relation between bidder returns and the bidder's debt-equity ratio, and Lang, Stulz, and Walkling [1991], who find that the returns to target shareholders are inversely related to the bidder's leverage. As for the *size* of the takeover premium, our predictions depend on the bidding environment. In our numerical example, for instance, bidding competition generates low bidder returns and high takeover premia, while all our comparative statics results are preserved.

The paper proceeds as follows. Section II gives a brief account of how LBOs are structured and financed. Section III illustrates our main point by means of a simple numerical example. This section also addresses the question of why—given the second-step merger—the raider cannot

[4] There is one fundamental difference, however: in the union bargaining literature, a firm borrows against its own cash flows, while under the LBO mechanism the raider borrows against the cash flows of the target firm.

achieve the same result by issuing equity, examines the role of bidding competition, and discusses welfare and policy implications. Section IV provides a detailed discussion of legal foundations, with a focus on the remedies that are available to minority shareholders to challenge the freezeout merger. It shows that the laws protecting minority shareholdes make value-decreasing takeovers unprofitable, and it sheds light on why the law treats LBOs and dilution differently, even though the two are similar from an economic perspective.

Section V examines stochastic takeover gains. It shows that, if debt financing involves bankruptcy costs, the raider takes on too much debt relative to the social optimum. Morever, unless bankruptcy costs are so high that the takeover fails altogether, an increase in bankruptcy costs raises the takeover premium and therefore benefits target shareholders. In the same section, we also consider toeholds and defensive target-management strategies such as leveraged recapitalizations and asset sales. Such defensive strategies reduce the raider's ability to pledge target assets and cash flows as collateral for his debt and hence the likelihood that the takeover goes through.[5] Section VI concludes by reviewing the 1980s LBO wave in the light of our model.

II. Organizational Structure and Financing of LBOs

This section gives a brief account of how LBOs are structured and financed.[6] As we noted in the Introduction, LBOs of publicly held companies are frequently accomplished as two-step transactions consisting of a front-end tender offer and a back-end merger.

A typical LBO transaction may look as follows. To provide a vehicle with limited liability,

[5] In a previous version of this paper [Müller and Panunzi 2003], we also considered the possibility that the takeover gains depend endogenously on the raider's effort. This creates a debt overhang problem, with the effect that the raider might want to take on less debt ex ante to provide himself with better incentives ex post.

[6] For further details, see, e.g., Scharf, Shea, and Beck [1991], and Gaughan [1999].

the raider organizes a new, assetless company—often called "shell company" or "acquisition subsidiary". The acquisition subsidiary obtains a loan commitment from one or more lenders by pledging the assets and cash flows of the target firm as security for its debt.[7] To provide the lender(s) with a legal recourse to the pledged assets, the loan agreement stipulates that the acquisition subsidiary be subsequently merged with the target firm [Reisman 1981; Garfinkel 1991].

If a majority of the target shareholders tenders, the acquisition subsidiary draws on the loan facility to purchase the tendered shares. Until the merger is completed, these shares constitute the only security for the acquisition subsidiary's liabilities [Reisman 1981]. The cash from the acquisition loan is *not* added to the combined firm's assets. It is paid out directly to the target's shareholders in exchange for their shares and to the raider and LBO investors to cover administrative expenses and management fees: "In fact, at no time does the target actually have the funds" [Silverman 1999, p. 523].[8]

In a second step, the target company is merged with the assetless acquisition subsidiary. All outstanding shares are cancelled as a matter of law. In exchange for their cancelled shares, minority shareholders receive a merger consideration consisting of cash and/or securities issued by the surviving firm. The legal aspects of this merger are discussed in Section IV. As a

[7] "The lender is willing to look initially to the future cash flow and earnings of the acquired enterprise as the source of funds from which its loans will be repaid and to the assets of the acquired entity as collateral for such loans. The seller receives most or all of the purchase price in cash and the acquisition loans become direct liabilities of the new enterprise" [Reisman 1981, p. 313].

[8] The following is a typical example [Silverman 1999, p. 540]: "The Panfida group [the acquirer] promised to give liens to Munford's [the target] assets, in exchange for a line of credit with which it would finance the transaction. The money passed from Citicorp to the exchange agent, Citizens and Southern Trust Company, and finally to Munford's premerger shareholders. The money never became Munford's corporate asset."

consequence of the merger, the acquisition subsidiary's liabilities are assumed by the surviving firm, which implies they become secured by the surviving firm's assets and cash flows [Garfinkel 1991; Silverman 1999].[9] As Garfinkel points out, "the target company has incurred an obligation and received no benefit, because the funds have passed, in essence, directly from the lender to the shareholders" [p. 58]. Following the merger, the raider implements his business plan, which often involves a partial sale or restructuring of the target company. Also, the acquisition loan is frequently replaced by other forms of debt, such as, e.g., junk bonds.

III. Example

III.A. The Model

Consider a widely held firm (the "target") facing a raider. The target has assets of $A = 50$, no debt, and hence equity of $A = 50$. If the raider gains control, he can improve the value of the assets by $v = 100$. The control majority is 50 percent.

To acquire control, the raider must make a tender offer to the target's shareholders.[10] Following Grossman and Hart [1980], we assume that target shareholders are so small that they ignore the strategic effects of their tender decision on the outcome of the tender offer. In our general model in Section V, this follows naturally from our assumption that the target shareholders are nonatomic. In this example, by contrast, we assume that there are 100 target shareholders

[9] "The liabilities of the subsidiary, evidenced largely by the borrowing and debt securities issued by the subsidiary, are then assumed by and become the obligations of the resulting company" [Frome and Getzoff 1981, p. 523]. The consequence is that "the acquired company usually becomes highly indebted or leveraged, displaying a dramatic increase in debt on its balance sheet" [Schwartz 1986, p. 491].

[10] We restrict ourselves to tender offers. Bebchuk and Hart [2001] consider combinations of tender offers and proxy contests and show that such combinations can sometimes yield superior outcomes.

holding one share each. To rule out strategic effects, we must consequently *assume* that the target shareholders perceive themselves as nonpivotal.

The sequence of events is as follows. At $t = 0$ the raider makes a take-it-or-leave-it, conditional, unrestricted cash tender offer. The offer is conditional on acquiring at least 50 percent of the target's shares and unrestricted in the sense that the raider is willing to acquire all shares up to 100 percent. The raider's offer price per share is denoted by B.

At $t = 1$ the target shareholders noncooperatively decide whether to tender their shares. We use the Pareto-dominance criterion to select among multiple equilibrium outcomes.[11] The fraction of tendered shares is denoted by β. If $\beta < 0.5$ the takeover fails. By contrast, if $\beta \geq 0.5$ the takeover succeeds, tendering shareholders receive B per share, and the raider incurs administrative expenses of $c = 10$.

III.B. The Free-Rider Problem

Since $v > c$, the takeover is socially efficient. And yet, Grossman and Hart [1980] show that it may nonetheless fail due to the free-riding behavior of target shareholders. Suppose the tender offer is financed with cash out of the raider's pocket, and consider the tender decision of an individual shareholder. If he does not tender and the takeover succeeds, he ends up with a minority share worth $(A + v)/100 = 1.5$. To make him indifferent between tendering and not tendering, the raider must consequently offer him also $B = 1.5$ in the tender offer. But then the raider makes no profit: he pays $\beta 150$ for the tendered shares and receives shares worth $\beta 150$ in

[11] This is a standard way of ruling out "unreasonable" Nash equilibria (see Grossman and Hart [1980]). For instance, no matter how high the raider's offer price B is, there is always a Nash equilibrium where nobody tenders: if nobody else tenders, shareholder i is indifferent between tendering and not tendering, since the takeover fails regardless of what he does. This equilibrium outcome is ruled out by Pareto dominance.

return. In fact, as he also incurs administrative expenses of $c = 10$, he makes a strict loss.

Grossman and Hart also provide a solution to the free-rider problem. Suppose the raider can dilute the value of the target's equity by $D = 80$, e.g., by selling assets to another firm owned by himself at below the market price. The value of a minority share in the raider-controlled firm is then only $(A + v - D)/100 = 0.7$, which implies the raider must only offer $B = 0.7$ in the tender offer. Consequently, the raider makes a profit of $-\beta 100B + \beta 70 + 80 - 10 = 70$, which implies the takeover takes place.

III.C. Leveraged Buyouts

Let us now consider LBOs. The acquisition subsidiary's debt is denoted by D. For reasons that will become transparent in the following section, the raider implements his value improvement v *after* the second-step merger. As noted earlier, minority shareholders must be compensated for surrendering their shares. We assume that this compensation is in the form of cash, which implies that the raider eventually holds 100 percent of the surviving firm's equity. The compensation paid to an individual shareholder is denoted by P.[12]

In the United States, the legal system protects minority shareholders from being cashed out at an unfair price. In the following section, we show that this imposes a lower bound on the

[12] Target shareholders must have rational expectations about the second-step merger, the raider's business plan, and the acquisition subsidiary's debt. In practice, this information is known to any target shareholder at the tender offer stage: the *Offer to Purchase*, which is mailed directly to all target shareholders, incorporates all essential information contained in the Schedule 14D-1, which is the principal tender offer regulatory document required by Section 14(d) of the Williams Act. This information includes " ... 3. The source and amounts of the funds being used for the offer. 4. The purpose of the offer, including any plans to acquire control, liquidate, sell the assets or merge the target, or to make other major changes in the business or corporate structure of the target" [Wasserstein 2000, p. 714].

merger consideration P :

$$P \geq \frac{A + \max\{0, \alpha(v - D)\}}{100}. \tag{1}$$

Accordingly, minority shareholders receive at least the equivalent of the premerger share value, which is $A/100$ in our example. If the firm's net worth increases as a result of the merger, minority shareholders may additionally receive a share of this gain. In the following, we shall set $\alpha = 1$, which implies the gains are shared proportionately.[13] The constraint (1) then has the convenient interpretation that minority shareholders receive the maximum of the pre- and postmerger share value. Our results straightforwardly extend to $\alpha < 1$, though. In fact, as long as $\alpha > 0$ an increase in D relaxes (1), which is our main point. Finally, α can also be interpreted as a probability: with probability α minority shareholders obtain a fraction of the merger gains, while with probability $1-\alpha$ they do not. Hence, at the very least, there must be some possibility that the gains are shared. As we show in Section IV.C, this is an innocuous assumption given the legal practice in the United States.

The assumption that minority shareholders receive cash is only for simplicity: our results straightforwardly extend to the case where the merger consideration is a mix of cash and securities. For instance, if the surviving firm has 100 shares, (1) stipulates that every minority shareholder receives one share in the surving firm—which is worth $(A + v - D)/100$—plus $\max\{0, (D-v)/100\}$ in cash. Hence, just like in the original Grossman-Hart setting, nontendering shareholders end up with a minority share in the posttakeover firm. Moreover, just like in their setting, if the posttakeover equity value exceeds the pretakeover equity value, minority shareholders receive a pro-rata fraction of this increase. Since the raider's profit depends only

[13] In Delaware case law, pro-rata sharing plays a predominant role: "The 'proportionate interest' language could fairly be described as dicta" [Carney and Heimendinger 2003, p. 853].

on the *value* of the merger consideration, and not on its form (cash or securities), the qualitative results are the same as in the case where P is paid in cash. In practice, if the merger consideration is in the form of stock, it will typically be nonvoting stock, whereas the surviving firm's common stock is usually held by the raider.

III.D. Illustration

As an illustration, consider a given debt level of, say, $D = 80$. By optimality, the raider sets P such that (1) holds with equality. The fair merger consideration is then $P = (50+20)/100 = 0.7$ per share. To make target shareholders indifferent between tendering and not tendering, the raider must then also offer $B = 0.7$ in the tender offer, with the result that in equilibrium a fraction $\beta \geq 0.5$ of the target shareholders tenders.[14]

The raider's profit is

$$\Pi = D - \beta 100B - (1-\beta)100P + (A + v - D) - c. \tag{2}$$

By (2), the raider obtains D from the debt issue, pays $\beta 100B$ to tendering shareholders, $(1-\beta)100P$ to minority shareholders, c to cover administrative expenses, and ends up with 100 percent of the surviving firm's equity, which is worth $A+v-D$. With $D = 80$ and $B = P = 0.7$, this implies he makes a profit of 70.

Target shareholders, on the other hand, end up with cash of $B = P = 0.7$ whether they

[14] There cannot be an equilibrium where $B = P$ but $\beta < 0.5$. In this case, the raider would want to deviate and offer $B' = B + \varepsilon > P$, in which case $\beta = 1$. There also cannot be an equilibrium where $B > P$. In this case, the raider would want to offer $B' = B - \varepsilon > P$. Finally, there cannot exist an equilibrium where $B < P$ and $\beta \geq 0.5$, for then any individual shareholder would be better off by not tendering. Hence, the only (Pareto-undominated) equilibrium outcome is $B = P$ and $\beta \geq 0.5$. Since the raider pays the same amount in the front and back end of the transaction, he is indifferent with respect to any $\beta \geq 0.5$.

tender or not. Compared to the pretakeover share value of $A/100 = 0.5$, this implies a profit—or takeover premium—of 0.2 per share. Since there are 100 shares, the total takeover premium is 20. Together with the raider's profit of 70, this adds up to the overall efficiency gain of $v - c = 90$.

This example nicely illustrates the similarity between debt and dilution. In our earlier dilution example, dilution lowered the value of minority shares by 0.8 per share. Here, the acquisition subsidiary's indebtness lowers the surviving firm's net worth—and hence the consideration to minority shareholders in the cashout merger—by 0.8 per share. Since the optimal bid price equals the value of minority shares, the raider not only gains 0.8 on each minority share, but also on every share that is tendered. His profit is consequently $(0.8)100 - c = 70$.

III.E. Equity Financing

Equity financing has no effect on the raider's profit. Under equity financing, the acquisition subsidiary sells a fraction of its equity to outside investors. All that changes is that the fraction β of the target's equity held by the aquisition subsidiary is now jointly owned by the raider and outside investors. We can simply replace "raider" by "investor group," and everything remains the same. Specifically, the relative fraction of the target's equity held by the minority, $1 - \beta$—and thus the splitting of the merger gains—remains unchanged. Similarly, the net increase in assets minus liabilities—and thus the gains created by the merger—remains the same regardless of whether the acquisition subsidiary has one or many owners.

Since equity financing is "neutral" with respect to the raider's profit, the raider can always issue equity at a fair price to cover any remaining financing needs. This simplifies our analysis greatly, as it implies that we can safely focus on the *optimal* debt level, even if the optimal debt level by itself is insufficient to pay for the target's shares and cover the raider's administrative expenses.

III.F. Budget Balancing

In the above example with $D = 80$, the raider fully uses up the proceeds from the debt issue: he pays 70 for the target's shares and 10 for administrative expenses. In a certain sense, he has a "balanced budget". The raider's profit comes exclusively in the form of 100 percent ownership of the surviving firm's equity, which is worth $A + v - D = 70$. Indeed, $D = 80$ is the unique solution if we introduce a "budget-balancing" constraint of the sort

$$D = \beta 100B + (1 - \beta)100P + c,$$

which stipulates that the funds raised in the debt issue must equal the funds needed to (i) pay for the tendered shares, (ii) cash out the minority in the merger, and (iii) cover administrative expenses. Inserting (1) (with equality and $\alpha = 1$), this budget-balancing constraint simplifies to $D = A + \max\{0, v - D\} + c$, which has a unique solution $D = (A + v + c)/2 = 80$.

Unless we impose a budget-balancing constraint of the above sort, the optimal debt level will not be $D = 80$. Indeed, in the following example we show that if the raider can choose D freely subject only to the constraint that the lenders break even, he might want to raise additional debt to pay himself an upfront management fee.

III.G. Optimal Debt Level

We now solve for the raider's optimal debt level subject to the constraint that the lender(s) break even. The raider's profit function is again given by (2). By optimality, the raider sets $B = P$, in which case (2) simplifies to

$$\Pi = v - \max\{0, v - D\} - c.$$

Any debt level $D^* \in [v, A + v] = [100, 150]$ is consequently optimal. By setting $D^* \geq 100$, the raider lowers the merger gains to zero, implying a merger consideration of $P = 0.5$ per share.

The raider's profit is then $v - c = 90$, i.e., he appropriates the full efficiency gains. Target shareholders, on the other hand, each receive $B = P = 0.5$, which implies they are just as well off as before. Under this solution, the raider does not fully use up the proceeds from the debt issue: he raises $D^* \geq 100$ but needs only $\beta 100B + (1 - \beta)100P = 50$ to pay for the target's shares and $c = 10$ to cover administrative expenses. The acquisition subsidiary has consequently leftover funds of $D^* - 60 \geq 40$, which it can pay out to the raider in the form of an upfront "management fee".[15]

In practice, raiders and buyout investors indeed pay themselves generous upfront fees. In the Revco LBO in 1986, for example, upfront fees to the acquirer group, i.e., the group that would later constitute the common stockholders of the surviving firm, amounted to $54.4 million. This was considerably more than the value of the common stock itself, which was only $35 million [Wruck 1997]. Similarly, in the RJR Nabisco takeover by KKR in 1989, upfront fees to the acquirer group amounted to $780 million [Burrough and Helyar 1990]. Further evidence on the magnitude of upfront fees is provided by Kaplan and Stein [1993].

While upfront fees appear to arise naturally from the raider's optimization calculus, our basic point that LBOs may be profitable does not depend on upfront fees. In the above "budget-balancing" example, for instance, upfront fees were zero. And yet, the raider's profit was positive. Rather, the purpose of this example was to illustrate why LBO investors might want to pay themselves generous fees even if this implies that they must raise additional debt, which in turn reduces the postmerger value of their shareholdings.

[15] As we noted in Section II, the cash from the acquisition loan is fully disbursed—either to the target shareholders or to the raider—to pay for tendered shares, administrative expenses, and management fees. Any remaining cash kept by the acquisition subsidiary would only add to the merged firm's assets, where it would increase P and hence the equilibrium bid price B.

III.H. Bidding Competition

Bidding competition shifts profits from the raider to target shareholders, thus raising the takeover premium. It does not, however, affect our basic point that efficient takeovers may go through. Suppose there are two identical raiders, both with a value improvement of $v = 100$ and administrative expenses of $c = 10$. Under perfect (Bertrand) competition, the two raiders compete to the point where their profits are zero, implying that $B = P = (A + v - c)/100 = 1.4$ and $D^* \in [c, A + v] = [10, 150]$.[16] While the (winning) raider makes no profit, he is at least able to recoup his administrative expenses, which implies the takeover takes place. By contrast, in the original Grossman-Hart setting, the raider must pay 150 for the target shares with or without bidding competition, which implies his profit—taking into account his administrative expenses—is strictly negative.

The fact that the raider makes no profit is an artefact of our assumption that the two raiders are identical. If one raider creates value of $v_1 = 100$ while the other creates value of, say, $v_2 = 80$, the winning bidder (raider 1) sets $B_1 = P_1 = (A + v_2 - c)/100 = 1.2$ and $D_1^* \in [v_1 - v_2 + c, A + v_1] = [30, 150]$, which yields a profit of $\Pi_1 = v_1 - v_2 = 20$. Target shareholders obtain a takeover premium of $(v_2 - c)/100 = 0.7$ per share, or 70 in total. Again, the two profits add up to the total efficiency gain of 90.

This last example shows that it is relatively easy to reconcile our basic comparative statics implications—namely, that the returns to target shareholders are decreasing and the raider's profit increasing in the raider's leverage—with the empirical observation that takeover premia are high even in LBOs (see Section VI). If $D_1 = 20$, for instance, the takeover premium is 0.8 per share. By contrast, if $D_1^* = 30$, it is only 0.7 per share. And yet, the premium is high in

[16] To ensure that $P = 1.4$ satisfies (1), the debt must be at least $D^* \geq 10$.

absolute terms, namely, 140 percent. This is in marked contrast to the monopoly case, where the takeover premium was either zero (no budget balancing) or 0.2 per share (budget balancing). What this illustrates is that the *size* of the takeover premium—or the *level* of the raider's profit—naturally depends on the bidding environment. By contrast, the fundamental question we are interested in here—whether efficient takeovers take place or not—does not depend on the bidding environment, which is why we confine ourselves to the simpler monopoly case.

III.I. Welfare and Policy Implications

In the previous examples, issuing debt was costless. Our general model in Section V, by contrast, has both risky debt and bankruptcy costs, which yields interesting welfare implications. We can illustrate these welfare implications in a simple way by assuming that promising a repayment of D allows the raider to raise funds of only $D - D^2/K$, where D^2/K represents deadweight bankruptcy costs. Note that the marginal cost of debt is increasing in D : each additional unit of debt increases the probability of bankruptcy, which imposes bankruptcy costs on all inframarginal units.

Modifying (2) accordingly and inserting $b = P$, the raider's profit function simplifies to

$$\Pi = v - \max\{0, v - D\} - \frac{D^2}{K} - c. \tag{3}$$

Since debt is costly, it is now strictly suboptimal to increase D beyond v. The raider's optimal debt level is thus unique and given by $D^* = \min\{v, K/2\}$.

The *socially optimal debt level* D_s is the smallest value of D at which the raider's profit is zero. Precisely, under the socially optimal debt level the proceeds from the debt issue, $D_s - D_s^2/K$, are *just sufficient* to cover the raider's administrative expenses of $c = 10$. In this case, the takeover just takes place, while the use of costly debt is minimized. By (3), this implies that

$D_s = \frac{K}{2}(1 - \sqrt{1 - 40/K})$. As we noted above, the resulting financing gap can be easily filled by issuing equity.

If bankruptcy costs are prohibitive ($K < 40$), the takeover is unprofitable. By contrast, if $K = 40$, the raider breaks even, the solution is $D^* = D_s = 20$, and social and private optimality coincide. Finally, if $K > 40$, the raider's privately optimal debt level exceeds the socially optimal level. This is because the raider trades off higher bankruptcy costs against a lower takeover premium. From a social welfare perspective, however, the takeover premium is merely a wealth transfer between the raider and target shareholders. Any debt level above the absolute minimum needed to ensure that the takeover goes through socially wasteful.

This yields the following policy implications:

(i) Imposing a cap on leverage ratios in LBOs can improve welfare. If $K = 45$, for instance, a cap of $D_s = 15$ implements the social optimum, while without this cap the raider would choose $D^* = 22.5$. Having said this, we want to emphasize that in our model the only benefit of debt is to mitigate the free-rider problem. If there also other benefits, the socially optimal cap may be higher, or there may be no socially optimal cap at all.

(ii) Rules encouraging bidding competition, such as the various SEC amendments to the Williams Act of 1968, can improve welfare. Bidding competition puts a natural bound on the raiders' profit, and thus on the use of costly debt to extract takeover gains. For instance, if $K = 45$ a monopolistic raider creating value of $v = 100$ would choose $D^* = 22.5$. At the other extreme, if there are two identical raiders with $v = 100$ each, the unique equilibrium outcome has $D^* = D_s = 15$ and $B = P = (A + v - c - D^{*2}/K)/100 = 1.35$. In this case, bidding competition implements the socially optimal outcome: the winning bidder makes zero profits, and target shareholders earn a takeover premium of 0.85 per share.

IV. Legal Foundations

This section discusses the legal foundations of two-step LBO transactions, with a focus on the second-step merger and the remedies that are available to minority shareholders to challenge this merger. Among other things, it provides the foundations for our "fair-price" constraint (1) (see especially Section IV.C). We limit our discussion to Delaware law, where more than half of the Fortune 500 firms are incorporated. Laws in other states are largely similar.

To put some structure on the discussion, we use a question and answer format.

IV.A. What Are the Formal Requirements to Effect the Freezeout Merger?

Under Delaware law, the raider can effect a freezeout merger between the target and his acquisition subsidiary against the will of minority shareholders if he holds 50 percent of the target's voting stock [Del. Gen. Corp. L. §251]. If he holds 90 percent, he can alternatively effect a short-form merger, which is quicker as it requires no formal shareholder vote [Del. Gen. Corp. L. §253]. Any outstanding shares are cancelled as a matter of law. Since the raider can force minority shareholders to surrender their shares, they must be protected from being cashed out at an unfair price, which brings us directly to the next question.

IV.B. Is It Sufficient to Offer a Merger Consideration Equal to the Tender Offer Bid Price?

No. The merger consideration P must be fair in its own right—irrespective of the tender offer bid price. The fact that a majority of the target shareholders indicated their approval by tendering at a price of B does not by itself render a merger consideration of $P = B$ fair. To give an example, suppose the raider could get away with $P = B = A/500$, where $A/100$ is the true premerger share value. Indeed, a constellation where a majority $\beta \geq 0.5$ of the target shareholders tenders is a Nash equilibrium of the tender game, as target shareholders are just

indifferent between tendering and not tendering. But this would imply that the raider can force (!) the minority to sell their shares for one fifth of the premerger share value. Without having yet explained what "fair" means, it is obvious that this cannot be fair.[17]

This has important procedural implications. First, we must determine the fair value of P from the constraints imposed by the law. Working backwards, we can then solve for the optimal tender offer bid price B. While the unique equilibrium outcome in our model also has the feature that $B = P$, it has been derived backwards, not forwards.[18]

IV.C. Is it Sufficient to Offer a Merger Consideration Equal to the Premerger Share Value? and What Remedies Are Available to Minority Shareholders to Challenge the Merger?

As for the first question, the answer is no, which refers especially refers to "sufficient". The raider's discretion in setting P is constrained by the remedies available to minority shareholders to challenge the merger consideration, as well as the courts' notion of what constitutes a fair merger consideration. Since the two questions are closely linked, we begin with the second question. The first question will be answered along the way.

[17] There are numerous cases where the second-step merger was found to be unfair even though the raider offered the same consideration as in the preceding tender offer. Perhaps the most famous case is the landmark case *Weinberger v. UOP, Inc.* [457 A.2d, 701 (Del. 1983)], which Gilson and Gordon [2003] call the beginning of the "modern law of minority freeze outs" [p. 796].

[18] There is one instance where B has legal implications for P : if $B > P$, the offer is coercive, which is commonly known as "front-end loaded, two-tiered tender offer." In the 1980s, SEC rules (especially Rule 13e-3) and state laws have been modified to discourage such offers. The rationale for a two-tiered offer is *not* that it allows the raider to set P arbitrarily low: as we just argued, P must be fair in its own right. Rather, setting $B > P$ forces shareholders to tender quickly, which shortens the timetable for competing offers. Absent a motive to impede competition, however, the raider would only leave money on the table by setting $B > P$. For this reason, the optimal offer in our model is $B = P$. For a good discussion of two-tiered tender offers, see Prentice [1989].

Minority shareholders have two basic remedies to challenge the fairness of the merger consideration: they can seek a judicial appraisal of their shares and they can sue the raider for breach of fiduciary duty. By discussing each remedy in turn, we show that (i) the first remedy is de facto useless for a small shareholder while the second is practicable, and (ii) the second remedy imposes a stricter—and thus binding—constraint on the merger consideration P. This provides the foundations for our "fair-price" constraint (1).

Appraisal Remedy. In an appraisal action, the court determines the fair value of the minority shares independently of the raider's offer. The Delaware appraisal statute explicitly denies minority shareholders any share in the merger gains by stipulating that the shares be evaluated "exclusive of any element of value arising from the accomplishment or expectation of the merger" [Del. Gen. Corp. L. §262(h)].[19] Hence—from an appraisal point of view—a merger consideration in which minority shareholders merely receive the premerger share value may be indeed considered as fair. Evidently, a law that guarantees (!) that the raider can cash out the minority at the premerger share value would be socially efficient [Yarrow 1985; Gomes 2001; Amihud, Kahan, and Sundaran 2003]. The Delaware appraisal statute does *not* provide such a guarantee, however, as minority shareholders can—and typically will—also sue the raider for breach of fiduciary duty, where they may get more than the premerger share value.

Not only does an appraisal leave minority shareholders with little prospect of appropriating a share of the merger gains, it is also costly. In fact, for a small shareholder—the sort of shareholder in our model—an appraisal is prohibitively costly as it cannot be pursued as a class-

[19] In an appraisal proceeding, the court determines the intrinsic value of the target's stock using DCF and related methods. Simply taking the stock's market price is inappropriate, as it will naturally also include elements of value associated with the merger [Bebchuk and Kahan 2000].

action suit. The American Law Institute consequently regards the appraisal remedy so costly as "to deter all but the largest and most determined shareholders."[20]

Suit for Breach of Fiduciary Duty. As a controlling shareholder, the raider owes a fiduciary duty to the minority shareholders. Unlike an appraisal action, a claim of breach of fiduciary duty can be brought as a class-action suit, which makes it affordable also for small shareholders.[21]

In *Weinberger* [supra], the Supreme Court held that a freezeout merger in which a breach of fiduciary duty is alleged must meet the strict test of "entire fairness", which includes "fair dealing" and "fair price". The concept of fair price in a breach of fiduciary duty claim differs from the concept of fair value in an appraisal proceeding in two respects: (i) it has developed through the common law (especially post-*Weinberger* case law), and (ii) it can—on top of the premerger share value—include a share of the increase in net worth caused by the merger:

> "Under an appraisal remedy, the sole question is the value of the shares on the date of the merger. Under an entire fairness review, however, the court may award a rescission remedy ... that could reflect an *increased value of the shares* subsequent to the merger" [Resnick 2003, p. 259, italics added].

Similarly, Campbell [1999, p. 127] notes that "the measure of the obligation to offer a fair price to minority stockholders in affiliated acquisitions necessarily includes a portion of the synergy

[20] Not surprisingly, appraisal rights have rarely been exercised. Out of 16,479 mergers in the United States between 1972-1981, only 19 led to appraisal cases, all of which involved large blockholders [Seligman 1984].

[21] In a *friendly* takeover, the raider can potentially insulate the merger from being challenged in a suit for breach of fiduciary duty by negotiating a merger agreement with the target board prior to the tender offer. This case is uninteresting, however: *if* the raider and target board can reach a friendly agreement, the raider must at least be able to recoup his transaction cost. Efficient takeovers then take place by assumption.

created by the transaction [i.e., the merger]," and Brudney [1983, p. 1104] concludes that "there is no doubt that they [i.e., the Delaware courts] contemplate some sort of sharing of the benefits of the merger."[22]

With regard to both, administrative costs and expected remedy, a small shareholder would thus prefer to challenge a freezeout merger in a class action suit alleging breach of fiduciary duty rather than in an appraisal action [Wertheimer 1998; Mahoney and Weinstein 1999]. Courts, in turn, have systematically granted minority shareholders the right to file a breach of fiduciary claim in cases where the appraisal remedy was available.[23] This suggests that the relevant constraint regarding P derives from the stricter notion of fair price in a fiduciary duty claim, which—on top of giving shareholders back what has been taken away from them—also provides for a sharing of the increase in net worth from the merger. As we noted in Section II, one important consequence of the merger is that the acquisition subsidiary's debt is assumed by, and becomes the obligation of, the surviving firm. This dampens the increase in net worth resulting from the implementation of the raider's business plan. The net increase is then only $\max\{0, v - D\}$, which provides the foundations for our constraint (1).[24] Incidentally, for the

[22]The *Weinberger* court also offered procedural guidelines how the raider can demonstrate fairness: by setting up a committee of disinterested directors with whom he bargains over the gains from the merger. This "serves to assure that the non-controlling shareholders receive some portion of the gain" [Gilson and Gordon 2003, p. 804].

[23]See, especially, *Rabkin v. Philip A. Hunt Chemical Corp.* [498 A.2d 1099 (Del. 1985)] and *Cede & Co. v. Technicolor, Inc.* [634 A.2d 345 (Del. 1993)].

[24]The *Weinberger* court made clear that "the latter aspect of fairness [i.e., fair price] relates to the economic and financial considerations of the *proposed* merger" [p. 711, italics added]. Hence, hypothetical transactions in which, e.g., the raider implements his business plan but the acquisition subsidiary is not merged into the target, are not up for discussion—even if they were to generate higher value. See, especially, *In re First Boston, Inc. Shareholders Litigation* [No. CIV.A. 10338 (Cons.), (Del. Ch. 1990), p. 21]: "The fiduciaries' [majority] position

raider's value improvement v to be included in the merger gains, his business plan must be implemented *after* the merger—or else it may be included in the statutorily appraised premerger share value.[25,26] In the latter case, fairness would imply that $P \geq (A + v)/100 = 1.50$, with the implication that the takeover would be unprofitable.

IV.D. Can the Raider Make a Profit Without Creating Any Value?

No. By our previous discussion, minority shareholders must receive at least the statutorily appraised premerger share value. Hence, even if D is large (high leverage) or if $v < c$ (value-decreasing takeover), the raider must pay at least $P \geq 0.5$ for the minority shares. Accordingly, leveraging the acquisition does not allow the raider to acquire target shares for less than their pretakeover value—it merely allows him to extract gains created by the takeover itself. This also implies that takeovers in which no gains are created are unprofitable. Hence, by protecting minority shareholders from being cashed out at an unfair price, the law ensures that raiders must indeed create value to make a profit.

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may preclude the emerge of alternative transactions at a higher price."

[25] *Cede & Co. v. Technicolor, Inc.* [684 A.2d 289 (Del. 1996)] ("Technicolor IV"). In this landmark case, the raider, Ronald Perelman, did the unusual and began implementing his business plan already prior to the freezeout merger, which prompted the Supreme Court to include it in the valuation of the premerger share value. The general opinion is that Perelman could have avoided this by waiting with the implementation of his business plan until the merger was completed (e.g., Mahoney and Weinstein [1999]).

[26] To evaluate the raider's business plan, the court determines the intrinsic value of the target's stock both under the raider's plan and under the target's existing plan [*Technicolor IV,* supra]. As lawsuits are usually decided years after the merger, courts may additionally use postmerger evidence "to show that plans in effect at the time of the merger have born fruition" [*Gonsalves v. Straight Arrow Publishers, Inc.,* 701 A.2d 357 (Del. 1997), p. 17]. In the Grossman-Hart model, such issues do not arise as everything is assumed to be common knowledge.

IV.E. Why Does the Law Treat Economically Similar Mechanisms Differently?

From an economic perspective, the freezeout merger in an LBO is similar to the dilution mechanism envisioned by Grossman and Hart [1980]. And yet, the law treats the two mechanisms differently: "We should expect doctrinal regimes of equivalent rigor covering each of the three methods of extracting private benefits ... In fact, however, the legal rules that govern the three methods are quite different" [Gilson and Gordon 2003, p. 787].[27]

Consider again our example. Suppose the raider—as a director of the target firm—improves the firm's value by $v = 100$. At the same time, however, he also borrows $D = 80$ against the firm's assets and takes the proceeds home, for personal consumption. Even though minority shareholders are overall better off, the borrowing transaction is unlawful. The same is true for other forms of dilution, such as selling assets to another company owned by the raider at below the market price, or issuing additional shares exclusively to the raider.[28]

Simply speaking, as long as the minority shareholders are shareholders of the target firm, they have a right to a pro-rata share of the value created by the raider (here: v). What a freezeout merger does is to deprive minority shareholders of exactly this privilege, namely, to be a shareholder of the target firm. Minority shareholders then no longer have a right to the value created subsequent to the merger, but only to a fair price in return for surrendering their shares, which includes the premerger share value plus potentially a share of the merger gains, as discussed at length in Section IV.C.

[27] The first two methods are those discussed here: dilution and freezeout mergers. The third method is the sale of a controlling block at a premium.

[28] Such transactions violate the raider's duty of loyalty as a director and/or his fiduciary duty as a controlling shareholder under Del. Gen. Corp. L. §144, *Sinclair* [*Sinclair Oil Corp. v. Levien,* 280 A.2d 717 (Del. 1971)]) and *Weinberger* [supra]. See Siegel [1999] for details.

There are sound economic reasons why the law might want to permit freezeout mergers, e.g., if the acquirer wants to use target assets to improve his own debt capacity, as in *Tanzer*.[29] As argued above, if there are any remaining minority shareholders, this transaction would violate the acquirer's fiduciary duty as a controlling shareholder. Prima facie, there is thus nothing inherently wrong about a freezeout merger—it is a useful instrument to facilitate (potentially efficient) business transactions that might otherwise be legally problematic.

With the ascent of the going-private transaction in the mid 1970s, however, freezeout mergers have been increasingly used to eliminate minority shareholders even if there was no valid business purpose; the sole purpose was generally to exclude the minority from sharing in future value improvements.[30] From its start, this practice received strong criticism, and the Delaware Supreme Court would soon join in.[31] In a series of decisions beginning in 1977, it ruled that a "merger, made for the sole purpose of freezing out minority stockholders, is an abuse of the corporate process" [*Singer*, p. 980], and "the fiduciary duty is violated when those in control of a corporation's voting machinery use that power to 'cash out' minority shareholders ... for no reason other than to eliminate them" [*Roland*, p. 1034].[32] As a consequence, the Supreme Court

[29] *Tanzer v. International General Industries* [379 A.2d 1121 (Del. 1977)]. Dean Meadors, spokesman for Mary Kay Cosmetics, once argued that being a private company gives "the freedom to make long-term strategic decisions" (quoted in Schwartz [1986, p. 491]).

[30] Prior to 1974, Delaware law allowed minority cashouts only in short-form mergers. By contrast, in long-form mergers—i.e., mergers in which the raider holds less than 90 percent of the shares—minority shareholders had to be offered shares in the surviving corporation. This evidently made going-private transactions difficult.

[31] In 1974, A.A. Sommer Jr., then a commissioner with the SEC, called the going-private transaction "unfair, and sometimes disgraceful, a perversion of the whole process of public financing" (Schwartz [1986, p. 489]).

[32] *Singer v. Magnavox Co.* [380 A.2d 969 (Del. 1977)], and *Roland International Corp. v. Najjar* [407 A.2d 1032 (Del. 1979)].

promulgated its famous *business purpose rule*, which required that freezeout mergers must have a valid business purpose, or else they are unlawful.

As Burgman and Cox [1984, p. 614] observe, "the business purpose rule increased the burdens of the courts and the corporations. In a state that supposedly encouraged mergers, corporate planning became fraught with uncertainty ... Where once there had been a simple choice between appraisal and equitable relief, there was now a potential for burdensome complex litigation". A few years later, in 1983, the *Weinberger* [supra] Court consequently abandoned the business purpose rule. Hence, for a short period of time, "pure" cashout mergers (i.e., mergers whose only purpose is to eliminate the minority) and dilution à la Grossman-Hart had indeed been treated similarly. With the abandonment of the business purpose rule, however, the former became prima facie legitimate—they merely had to pass the remaining test of satisfiying the "entire fairness" criterion mentioned earlier.

It is not uncommon that the law would validate a certain transaction under one section but invalidate the economic equivalent of that transaction under another section. This is part of a general principle known as *doctrine of independent legal significance* (or *equal dignity doctrine*): "Under this rule, a transaction effectuated under one statutory section and providing one set of powers and rights is evaluated solely under that section, regardless of the fact that the transaction may be the economic equivalent of one that could have been accomplished under another section with a different set of powers and rights" [Mitchell 1992, p. 612]. This inherent statutory conflict between different sections of the law is not viewed as a problem, though. Rather, it is viewed as way to let "corporate participants choose among different statutory alternatives for dealing with precisely the same functional activity" [Gilson 2001, p. 509].

V. General Model

V.A. Extending the Basic Model

The basic structure and timing of events is the same as in Section III. Instead of assuming that the raider's value improvement is deterministic, however, we now assume that v is randomly distributed over $[0, \overline{v}]$ with density $f(v)$ and cumulative density $F(v)$. For analytical convenience, we assume that $f(v)/[1 - F(v)]$ is nondecreasing in v.[33]

For the most part of this section, the target's existing assets play no special role. They become important only when we consider defensive leveraged recapitalizations and asset sales in Section V.D. Until then, we set $A = 0$ for analytical convenience. The value of v is realized at $t = 2$. If $v \geq D$ debtholders obtain the promised repayment D. Conversely, if $v < D$ debtholders obtain $(1 - k)\, v$, where $k \in (0, 1)$ indicates that a fixed fraction of the asset value is lost in bankruptcy. Our qualitative results remain the same with fixed bankruptcy costs.

In our numerical example in Section III, we assumed that there are 100 target shareholders holding one share each. In this section, we directly follow Grossman and Hart [1980] by assuming that target shareholders are nonatomic, which automatically implies that no single shareholder is pivotal. This requires a slight change in notation. The relevant unit of measurement is now not an individual share, but the total equity of the target firm. If we denote the tender offer bid price by b and the merger consideration by p, this implies that the raider pays a total of βb for the tendered shares and $(1 - \beta)p$ for the remaining minority shares.

Given that $A = 0$, our "fair-price" constraint (1) takes the simple form

$$p \geq \alpha \int_D^{\overline{v}} (v - D) f(v) dv. \tag{4}$$

[33] This is known as Monotone Hazard Rate Property. It is implied by, and hence weaker than, the Monotone Likelihood Ratio Property, which is satisfied by many standard distributions [Milgrom 1981].

As in Section III, we set $\alpha = 1$ for expositional convenience.

The remainder of this section is organized as follows. Section V.B. discusses bankruptcy costs. Section V.C. considers toeholds. Finally, Section V.D. discusses leveraged recapitalizations and asset sales by the target management as a way to ward off hostile takeovers.

V.B. Bankruptcy Costs

This section examines the role of bankruptcy costs for the welfare of target shareholders and the efficiency of the market for corporate control. Analogous to (2), we can express the raider's profit as

$$\Pi = (1-k)\int_0^D vf(v)dv + D\int_D^{\overline{v}} f(v)dv - \beta b - (1-\beta)\,p + \int_D^{\overline{v}}(v-D)f(v)dv - c. \tag{5}$$

The first two terms represent the proceeds from the debt issue under the assumption that debtholders make zero expected profits. The third and fourth terms denote the payments to tendering shareholders and minority shareholders in the cashout merger, respectively. The fifth term denotes the value of the surviving firm's equity, which is 100 percent owned by the raider. The last term denotes the raider's administrative expenses.

By optimality, we have that

$$b = p = \int_D^{\overline{v}}(v-D)f(v)dv, \tag{6}$$

which implies that (5) simplifies to

$$\Pi = \underbrace{\int_0^{\overline{v}} vf(v)dv - c}_{\text{Takeover Gains}} - \underbrace{\int_D^{\overline{v}}(v-D)\,f(v)dv}_{\text{Takeover Premium}} - \underbrace{k\int_0^D vf(v)dv}_{\text{Bankruptcy Costs}}. \tag{7}$$

Hence, the raider faces a simple tradeoff. On the one hand, an increase in D reduces the takeover premium. On the other, it increases expected bankruptcy costs: since the debt is sold at a fair price, the increase in bankruptcy costs is fully borne by the raider.

Maximizing (7) with respect to D, we obtain

$$1 - F(D^*) = kD^* f(D^*), \tag{8}$$

where the optimal debt level is unique and satisfies $D^* \in (0, \overline{v})$.[34] The first-order condition has a natural interpretation: the left-hand side depicts the marginal reduction in the takeover premium if D is increased by one unit, while the right-hand side depicts the marginal increase in expected bankruptcy costs.

We proceed with an interpretation of the optimal solution.

(i) It already follows from (7) that there exists a critical value $\overline{c} \in (0, \int_0^{\overline{v}} vf(v)dv)$ such that $\Pi_{D=D^*} \geq 0$ if and only if $c \leq \overline{c}$, with strict inequality if $c < \overline{c}$. The takeover consequently takes place if and only if the takeover gains are sufficiently large.

(ii) In Section III, we defined the socially optimal debt level D_s as the smallest value of D at which the raider's profit is zero. On the other hand, we just showed that—conditional on the takeover taking place—the raider's profit is strictly positive (except if $c = \overline{c}$, in which case $\Pi_{D=D^*} = 0$). By continuity of Π_D and $\Pi_{D=0} < 0$, this in turn implies that—*if* the takeover takes place—it generically holds that $D^* > D_s$, i.e., the raider's privately optimal debt level exceeds the socially optimal level. The intuition is straightforward. In (7), the raider minimizes the sum of the takeover premium and expected bankruptcy costs. He will consequently take on additional debt as long as the marginal reduction in the takeover premium exceeds the marginal increase in expected bankruptcy costs. As the takeover premium is merely a wealth transfer between the raider and target shareholders, however, the raider's privately optimal debt level lies above the social optimum.

[34] The fact that $D^* \in (0, \overline{v})$ is obvious. Uniqueness follows from continuity and the fact that $f(D)/[1 - F(D)]$ is nondecreasing while $1/kD$ is strictly decreasing in D.

Points (i) and (ii) are summarized in the following proposition.

Proposition 1. The takeover takes place if and only if the takeover gains are sufficiently large. As the takeover premium is a pure wealth transfer between the raider and target shareholders, the raider takes on too much debt relative to the social optimum.

(iii) Differentiating (6) with respect to k, we obtain

$$\frac{db^*}{dk} = -\frac{dD^*}{dk}\left[1 - F\left(D^*\right)\right] = \frac{D^*\left[1 - F\left(D^*\right)\right]}{f\left(D^*\right) + k\left[f'\left(D^*\right)D^* + f\left(D^*\right)\right]} > 0,$$

where $-f\left(D^*\right) - k\left[f'\left(D^*\right)D^* + f\left(D^*\right)\right] < 0$ is the second order condition for a maximum. Provided that the takeover takes place, target shareholders are thus better off in regimes with high bankruptcy costs: if bankruptcy costs are high the raider takes on less debt, which results in a higher takeover premium.

(iv) By (7) and the envelope theorem, $\Pi_{D=D^*}$ is decreasing in k. Hence, if bankruptcy costs are excessive, the takeover will not take place. Precisely, there exists a critical value $\overline{k} = \overline{k}(c)$ given by

$$\Pi = (1 - \overline{k}) \int_0^{D^*(\overline{k})} v f(v) dv + D^*(\overline{k}) \int_{D^*(\overline{k})}^{\overline{v}} f(v) dv - c = 0, \tag{9}$$

such that the takeover takes place if and only if $k \leq \overline{k}(c)$. If c is small (precisely: if $c \leq D^*(1) \int_{D^*(1)}^{\overline{v}} f(v) dv$), we have $\overline{k}(c) = 1$. For other values of c, we have $\overline{k}(c) < 1$, where $d\overline{k}/dc < 0$ follows straightforwardly from differentiating (9) with respect to c.

Points (iii) and (iv) are summarized in the following proposition

Proposition 2. If the takeover gains are sufficiently large, target shareholders unambiguously benefit from an increase in bankruptcy costs: it raises the takeover premium without jeopardizing the takeover. Otherwise, target shareholders benefit from an increase in

bankruptcy costs only if these remain below a critical threshold, which is increasing in the size of the takeover gains.

V.C. Toeholds

This sections considers the interplay between toeholds and leverage. Shleifer and Vishny [1986] argue that a toehold increases the raider's profit, as he faces no free-rider problem on those shares he already owns. Like Shleifer and Vishny, we take the raider's toehold as given.

Denote the raider's initial toehold by $\omega < 1/2$ and the fraction of shares held by the raider if the tender offer is successful by β, which includes his toehold. The total amount paid to tendering shareholders is then $(\beta - \omega)b$. Going through the same steps as previously, we can write the raider's profit as

$$\Pi = \underbrace{\int_0^{\overline{v}} v f(v) dv - c}_{\text{Takeover Gains}} - (1-\omega) \underbrace{\int_D^{\overline{v}} (v - D) f(v) dv}_{\text{Takeover Premium}} - \underbrace{k \int_0^D v f(v) dv}_{\text{Bankruptcy Costs}}. \tag{10}$$

A reduction in the takeover premium by one dollar increases the raider's profit now by only $1 - \omega$ dollars. Hence, a toehold reduces the benefits of leverage. The costs of leverage, on the other hand, remain the same, since the toehold has no effect on bankruptcy costs. As a result, the raider issues less debt relative to the case with no toehold.

We can easily formalize this intuition. Maximizing (10) with respect to D, we obtain

$$(1-\omega)[1 - F(D^*)] = kD^* f(D^*), \tag{11}$$

where $D^* \in (0, \overline{v})$ is again unique. Implicitly differentiating (11) with respect to ω gives

$$\frac{dD^*}{d\omega} = \frac{1 - F(D^*)}{-f(D^*)(1-\omega) - k\left[f(D^*) + D^* f'(D^*)\right]} < 0,$$

where $-f(D^*)(1-\omega) - k[f(D^*) + D^* f'(D^*)] < 0$ is the second-order condition for a maximum.

Since the equilibrium bid price in the tender offer is decreasing in the raider's debt, this implies that a toehold raises the equilibrium bid price, and thus the takeover premium.

Proposition 3**.** A toehold reduces the amount of debt taken on by the raider and raises the takeover premium.

Proposition 3 stands in contrast to Shleifer and Vishny [1986] and Hirshleifer and Titman [1990], who both find that the takeover premium is decreasing in the raider's toehold. In Burkart, Gromb, and Panunzi [1998], on the other hand, the takeover premium is independent of the raider's toehold. Finally, in Burkart's [1995] model, like here, the takeover premium is increasing in the toehold. Incidentally, while the existence of a toehold raises the takeover premium, it also implies that there are fewer shares on which this premium must be paid. Indeed, by (10) and the envelope theorem, the raider's profit at $D = D^*$ is increasing in his toehold. The overall effect of a toehold on the raider's profit is thus unambiguously positive.[35]

V.D. Defensive Leveraged Recapitalizations and Asset Sales

This section examines the connection between the target's existing net worth and the raider's borrowing capacity. As the target management can manipulate the net worth (e.g., by selling assets or undertaking a leveraged recapitalization), the analysis also sheds light on the target management's ability to ward off a hostile takeover.

For the purpose of our analysis, we now reintroduce $A > 0$. Precisely, we assume that A is randomly distributed over $[0, \overline{A}]$ with density $h(A)$ and cumulative density $H(A)$. This provides

[35] Recall that we have assumed that the raider already owns his toehold. The statement remains true, however, as long as the raider can acquire the toehold for less than the equilibrium bid price in the tender offer.

us with a general framework in which not only the raider's acquisition debt, but also the target's existing debt is risky.

We model the raider's value improvement as a first-order stochastic dominance (FOSD) shift in the distribution of the target's assets. The new density and cumulative density functions if the raider implements his business plan are $g(A)$ and $G(A)$, respectively, where $G(A)$ dominates $H(A)$ in the sense of FOSD. Among other things, this implies that the expected value of the assets in place improves under the raider's business plan. Analogous to our previous assumption, we assume that $g(A)/[1-G(A)]$ is nondecreasing in A.

Let us denote the target's existing debt by D_t and the raider's acquisition debt by D_r. To bias our model as much as possible against the possibility that the takeover takes place, we assume that D_t is senior with respect to D_r. If the raider could additionally dilute the target's existing debt, this alone might ensure that he can make a profit.[36]

The takeover gains are

$$
\begin{aligned}
& \underbrace{\int_0^{\overline{A}} A\left[g(A)-h\left(A\right)\right]dA + k\int_0^{D_t} A\left[h\left(A\right)-g(A)\right]dA - c}_{\text{Total Takeover Gains}} \\
(12) \qquad = \; & \underbrace{(1-k)\int_0^{D_t} A\left[g(A)-h\left(A\right)\right]dA + D_t\int_{D_t}^{\overline{A}}\left[g(A)-h\left(A\right)\right]dA}_{\text{Change in Value of Target's Existing Debt}} \\
& + \underbrace{\int_{D_t}^{\overline{A}}\left(A-D_t\right)\left[g(A)-h\left(A\right)\right]dA - c}_{\text{Appropriable Takeover Gains}}
\end{aligned}
$$

The first row decomposes the takeover gains into three parts: (i) the change in expected value

[36] Empirically, it appears that the expropriation of target debtholders is a second-order effect. Wealth losses incurred by target debtholders are either statistically insignificant or negligible (e.g., Asquith and Wizman [1990], Warga and Welch [1993]). One reason is that target debtholders are usually protected via covenants. Warga and Welch consequently conclude that "the primary impetus for LBOs in our period was not the exploitation of holders of public debt" [p. 979].

of the target's assets, (ii) the change in bankruptcy costs incurred by the target's existing debtholders, and (iii) the raider's administrative expenses. Since the target's existing debt is senior, target debtholders automatically appropriate a fraction of the takeover gains due to the coinsurance effect caused by the FOSD shift. This windfall profit is depicted in the second row.[37] The third row depicts the remaining takeover gains that can be potentially split between the raider and the target shareholders.

If we again set $\alpha = 1$, the "fair-price" constraint (1) takes the form

$$p \geq \max\left\{\int_{D_t}^{\overline{A}} (A - D_t)\, h\,(A)\, dA, \int_{D_t+D_r}^{\overline{A}} (A - D_t - D_r)\, g\,(A)\, dA\right\}.$$

As previously, target shareholders receive the maximum between the pre- and postmerger share value in the cashout merger. Since the raider must pay at least the premerger share value, he has no reason to overleverage: adding on additional debt only increases bankruptcy costs, but does not reduce the takeover premium. By optimality, he therefore chooses

$$b = p = \int_{D_t+D_r}^{\overline{A}} (A - D_t - D_r)\, g\,(A)\, dA \geq \int_{D_t}^{\overline{A}} (A - D_t)\, h\,(A)\, dA. \tag{13}$$

Going through the same steps as previously, we can write the raider's profit as

$$\begin{aligned}\Pi \;=\; & \underbrace{\int_{D_t}^{\overline{A}} (A - D_t)\,[g(A) - h\,(A)]\, dA - c}_{\text{Appropriable Takeover Gains}} - \underbrace{k\int_{D_t}^{D_r+D_t} (V - D_t)\, g(A) dA}_{\text{Additional Bankruptcy Costs}} \\ & - \underbrace{\left[\int_{D_t+D_r}^{\overline{A}} (A - D_t - D_r)\, g\,(A)\, dA - \int_{D_t}^{\overline{A}} (A - D_t)\, h\,(A)\, dA\right]}_{\text{Takeover Premium}}.\end{aligned} \tag{14}$$

[37] We can rewrite the second row in (12) as

$$(1-k)\int_0^{D_t} [H(A) - G\,(A)]\, dA + D_t k\,[H(D_t) - G\,(D_t)] > 0,$$

where the sign follows from FOSD.

While issuing debt allows the raider to capture a fraction of the appropriable takeover gains (subject to the "fair-price" constraint (13), of course), it also causes additional bankruptcy costs. As a consequence, an additional fraction of the "appropriable takeover gains" is wasted.

By inspection, the appropriable takeover gains are decreasing in D_t. This is the windfall profit accruing to debtholders mentioned earlier. What is not immediately obvious is whether the sum of the three terms in (14)—and hence the raider's overall profit—is decreasing in D_t. In the Appendix, we show that this is indeed true. The intuition is straightforward: an increase in the target's existing debt limits the raider's ability to pledge target assets as collateral and therefore his ability to borrow. This is summarized in the following proposition.

Proposition 4**.** An increase in the target's outstanding debt reduces the raider's profit, and thus the likelihood that the takeover takes place.

Proposition 4 is consistent with empirical evidence provided by Palepu [1986], Billet [1996], and Safieddine and Titman [1999], who all find a significant negative relation between target leverage and takeover likelihood.

The argument that high leverage acts as a takeover deterrent is not new. It has been made previously by, e.g., Israel [1991], Stulz [1988], Harris and Raviv [1988], and Zwiebel [1996]. All these papers, however, *assume* that the takeover is financed with cash out of the raider's pocket. The postulated link between target leverage and takeover likelihood is consequently different from ours. Our argument, on the other hand, appears to have long been a part of the Wall Street folklore: "The assumption of additional debt reduces the target company's debt capacity, posing an impediment to using the target's surplus debt capacity to fund the acquisition of control" [Wasserstein 2000, p. 831].

An alternative way to impair the raider's borrowing capacity is to sell off existing assets.[38] Suppose the remaining assets have value $\max\{0, A - S\}$, where $S = \overline{A}$ if all assets have been sold and $S = 0$ if none have been sold. For simplicity, let us assume that the density and cumulative density functions are still $h(A)$, $g(A)$, $H(A)$, and $G(A)$, respectively, with support $[0, \overline{A}]$. Evidently, if we set $S = D_t$, the model is isomorphic to the one above. In particular, the raider can only improve those assets that have not been sold, which implies the appropriable takeover gain shrinks to $\int_S^{\overline{A}} (A - S)\,[g(A) - h\,(A)]dA - c$, just like before.

Proposition 5**.** A sale of target assets has the same effect as a leveraged recapitalization.

There exist numerous examples where firms disposed of cash or assets when facing a hostile takeover threat. For instance, in the 1982 takeover fight for Marathon Oil, Marathon granted U.S. Steel the right to buy Marathon's interest in the Yates oil field—arguably one of Marathon's "crown jewels"—at a bargain price of $2.8 billion if a third party acquires more than 50 percent of Marathon's stock. Likewise, oil companies such as Phillips or Unocal undertook substantial defensive restructurings involving increases in cash dividends and share repurchases in the range of 25 to 53 percent [Wasserstein 2000].

VI. Concluding Remarks

Leveraged buyouts (LBOs) of publicly held companies typically consist of two steps: a front-end tender offer and a back-end merger between the target and the raider's acquisition subsidiary, a special purpose vehicle founded for the purpose of purchasing the target's shares and issuing the debt. The fact that the acquisition subsidiary is highly indebted dampens the increase in net

[38] This includes, as a special case, share repurchases (e.g., Bagwell [1991]).

worth that would otherwise result from the raider's value improvement, and thus the incentives for target shareholders to become minority shareholders in the raider-controlled firm. The raider can consequently offer a lower bid price in the tender offer and make a profit. LBOs thus play a role similar to the dilution mechanism envisioned by Grossman and Hart [1980]. In fact, they may be the best known legal form of dilution. By contrast, "classic" forms of dilution such as, e.g., the transfer of target assets or output to a company owned by the raider at below the market price, or the use of target assets to back a private loan by the raider, either violate the raider's duty of loyalty or his fiduciary duty as a controlling shareholder.

The focus of this paper is on the efficiency of the market for corporate control. Precisely, we ask if and under what circumstances efficient takeovers take place. Consistent with the empirical evidence (see Introduction), our model suggests that the returns to target shareholders should be decreasing—and the raider's profit increasing—in the raider's leverage. Hence, LBOs are a way to *redistribute* wealth from target shareholders to the raider. In doing so, however, they also *create* wealth as the appropriation of takeover gains is a necessary condition for the raider to undertake the acquisition in the first place. Other arguments for LBOs, by contrast, such as taxes [Kaplan 1989] or managerial incentives [Jensen 1986], are primarily concerned with the creation of wealth. Besides, to improve managerial incentives, it is not crucial that the takeover itself is leveraged; increasing leverage shortly after the deal has closed would be sufficient. For our argument, by contrast, it is crucial that the transaction itself is leveraged.[39]

Since our main concern is whether efficient takeovers take place, we have—for the most part of our analysis—confined ourselves to the simpler monopoly case. As our numerical example shows, however, it is relatively easy to reconcile our model with the empirical fact that takeover premia

[39]The tax argument is somewhat more complicated, as the deal itself may create taxable gains and losses.

were high even in LBOs.[40] If there is bidding competition—or if the first bidder wants to preempt entry by other bidders—takeover premia in our model are high and bidder profits are low, while at the same time our comparative statics results are preserved. This implies that the *level* of profits—or the *size* of the takeover premium—naturally depends on the bidding environment. Whether the takeover takes place at all, however, will depend on how it is structured and financed. On the other hand, our model cannot by itself explain the often astronomical debt-equity ratios found in LBOs, which were frequently in the range of 5:1 or higher. It merely argues that debt financing allows the raider to appropriate takeover gains. The amount of debt needed to accomplish this goal is naturally limited by the size of these gains. To square our model with the evidence concerning the *level* of debt in LBOs, one would have to introduce additional benefits of debt, such as taxes or incentive effects.[41]

An interesting alternative hypothesis for the widespread use of LBOs in the 1980s is that there was a bubble in the junk bond market, so that raiders could finance their acquisitions by issuing overvalued debt.[42] However, studies by Altman [1989] and Blume and Keim [1987] on the risk and return characteristics of junk bonds suggest that, if anything, junk bonds were slightly *under*valued in the 1980s. Moreover, there appears to be little substantial difference between the 1980s and the 1990s in terms of junk-bond market efficiency [Altman 2002], while the difference in LBO activity was substantial.

Why then did we see relatively many hostile LBOs in the 1980s but only few in the 1990s

[40] The empirical evidence is surveyed in, e.g., Gaughan [1999] and Weston, Chung, and Hoag [1990].

[41] Take our numerical solution $D^* \in [100, 150]$ in Section III.G. While this solution allows for high debt-equity ratios of, say, 9:1 (corresponding to $D^* = 135$), such ratios become strictly suboptimal once we introduce bankruptcy costs. As a counterweight, one would then also have to introduce additional benefits.

[42] For a model of takeovers based on securities misvaluation, see Shleifer and Vishny [2003].

[Holmström and Kaplan 2001]? The collapse of the junk bond market following Drexel's bankruptcy in 1990 can hardly provide the answer: already three years later in 1993, both the number and volume of new junk bond issues were higher than ever before in the 1980s, a trend that continued throughout the 1990s [Altman 1998].

Rather, the decline in hostile LBO activity appears to be related to the adoption of sophisticated antitakeover devices by firms and corresponding changes in state takeover legislation on the one hand, and improved corporate governance and pursuance of shareholder value maximization on the other [Kaplan 1997; Holmström and Kaplan 2001]. The first line of reasoning suggests that hostile takeovers have become increasingly difficult, the second line of reasoning suggests that their necessity has decreased. Indeed, if there is no use—or no need—in making a tender offer directly to the target firm's shareholders, our model attributes no beneficial role to LBOs, which is consistent with the notion that they have become less important in the 1990s.

Appendix: Proof of Proposition 4

The proof proceeds in two steps. We first derive the raider's optimal debt level D_r^*. We then show that the raider's profit is decreasing in the target's existing debt level D_t.

Since the left-hand side of the inequality in (13) continuous and decreasing in D_r, there exists a unique value $\overline{D}_r$ defined by

$$\int_{D_t+\overline{D}_r}^{\overline{A}} \left(A - D_t - \overline{D}_r\right) g\left(A\right) dA = \int_{D_t}^{\overline{A}} \left(A - D_t\right) h\left(A\right) dA \tag{15}$$

such that (13) is satisfied if and only if $D_r \leq \overline{D}_r$.

By the argument in the main text, we can consider a relaxed problem in which the raider maximizes (14) subject to (13)—or equivalently—subject to $D_r \leq \overline{D}_r$. Differentiating (14) with

respect to D_r yields

$$\frac{\partial \Pi}{\partial D_r} = 1 - G(D_t + D_r) - kD_r g(D_t + D_r).$$

Since the right-hand side is strictly positive at $D_r = 0$, there are two potential solution candidates: a corner solution $D_r^* = \overline{D}_r$—in which case the post- and pre-merger share values coincide—and an interior solution $D_r^* \in (0, \overline{D}_r)$ defined by $\partial \Pi / \partial D_r = 0$.

Let us compute the effect of D_t on the raider's profit. The total derivative of (14) with respect to D_t at the optimal solution D_r^* is

$$\frac{d\Pi}{dD_t}\Big|_{D_r = D_r^*} = \frac{\partial \Pi}{\partial D_t}\Big|_{D_r = D_r^*} + \frac{\partial \Pi}{\partial D_r}\Big|_{D_r = D_r^*} \frac{\partial D_r^*}{\partial D_t}, \tag{16}$$

where

$$\frac{\partial \Pi}{\partial D_t} = -kD_r^* g(D_t + D_r^*) - \int_{D_t + D_r^*}^{\overline{A}} g(A) dA < 0.$$

Consider first the corner solution candidate $D_r^* = \overline{D}_r$. For $\overline{D}_r$ to be a solution to the raider's maximization problem, it must be true that

$$\frac{\partial \Pi}{\partial D_r}\Big|_{D_r = \overline{D}_r} = 1 - G(D_t + \overline{D}_r) - k\overline{D}_r g(D_t + \overline{D}_r) \geq 0.$$

Moreover, implicit differentiation of (15) using Leibniz's rule yields

$$\frac{\partial \overline{D}_r}{\partial D_t} = \frac{G(D_t + \overline{D}_r) - H(D_t)}{1 - G(D_t + \overline{D}_r)} < 0,$$

where the sign follows from FOSD. Inserting these results in (16) yields $d\Pi/dD_t|_{D_r = D_r^*} < 0$.

Consider next the interior solution candidate $D_r^* \in (0, \overline{D}_r)$. By the envelope theorem, we have that $d\Pi/dD_t|_{D_r = D_r^*} = \partial \Pi / \partial D_t|_{D_r = D_r^*} < 0$, which completes the proof.

New York University and Centre for Economic Policy Research

Università di Bologna and Centre for Economic Policy Research

References

Altman, Edward I., "Measuring Corporate Bond Mortality and Performance," Journal of Finance, XLIV (1989), 909-922.

——, "The Anatomy of the High Yield Bond Market," mimeo, New York University, 1998.

Altman, Edward I., and Pablo Arman, "Defaults and Returns on High Yield Bonds: Analysis Through 2001," Journal of Applied Finance, XII (2002), 98-112.

Amihud, Yakov, Marcel Kahan, and Rangarajan Sundaram, "The Efficiency and Welfare Foundations of Freezeout Laws in Takeovers," Journal of Finance, forthcoming.

Asquith, Paul, and Thierry A. Wizman, "Event Risk, Covenants, and Bondholder Returns in Leveraged Buyouts," Journal of Financial Economics, XXVII (1990), 195-213.

Bagwell, Laurie S., "Share Repurchase and Takeover Deterrence," Rand Journal of Economics, XXII (1991), 72-88.

Bebchuk, Lucian A., and Oliver D. Hart, "Takeover Bids vs. Proxy Fights in Contests for Corporate Control," NBER Working Paper No. 8633, 2001.

Bebchuk, Lucian A., and Marcel Kahan, "Adverse Selection and Gains to Controllers in Corporate Freezeouts," in Randall Morck, ed., Concentrated Corporate Ownership (Chicago, IL: University of Chicago Press, 2000).

Billet, Matthew T., "Targeting Capital Structure: The Relationship Between Risky Debt and the Firm's Likelihood of Being Acquired," Journal of Business, LXIX (1996), 173-192.

Blume, Marshall E., and Donald B. Keim, "Lower-Grade Bonds: Their Risks and Returns," Financial Analysts Journal, XLIII (1987), 26-33.

Bronars, Stephen G., and Donald R. Deere, "The Threat of Unionization, the Use of Debt, and the Preservation of Shareholder Wealth," Quarterly Journal of Economics, CVI (1991), 231-254.

Brudney, Victor, "Equal Treatment of Shareholders in Corporate Distributions and Reorganizations," California Law Review, LXXI (1983), 1072-1133.

Burgman, Dierdre A., and Paul N. Cox, "Reappraising the Role of the Shareholder in the Modern Corporation: Weinberger's Procedural Approach to Fairness in Freezeouts," Wisconsin Law Review, MCMLXXXIV (1984), 593-665.

Burkart, Mike, "Initial Shareholdings and Overbidding in Takeover Contests," Journal of Finance, L (1995), 1491-1515.

Burkart, Mike, Denis Gromb, and Fausto Panunzi, "Why Higher Takeover Premia Protect Minority Shareholders," Journal of Political Economy, CVI (1998), 172-204.

Bruck, Connie, The Predators' Ball (New York, NY: Simon and Schuster, 1988).

Burrough, Brian, and John Helyar, Barbarians at the Gate (New York, NY: Harper & Row, 1990).

Campbell, Rutheford B., Jr., "Fair Value and Fair Price in Corporate Acquisitions," North Carolina Law Review, LXXVIII (1999), 101-152.

Carney, William J., and Mark Heimendinger, "Appraising the Non-Existent: The Delaware Courts' Struggle with Control Premiums," University of Pennsylvania Law Review, CLII (2003), 845-880.

Chowdhry, Bhagwan, and Vikram Nanda, "The Strategic Role of Debt in Takeover Contests," Journal of Finance, XLVIII (1993), 731-745.

Crawford, Edward K., A Management Guide to Leveraged Buyouts (New York, NY: John Wiley & Sons, 1987).

Dasgupta, Sudipto, and Kunal Sengupta, "Sunk Investment, Bargaining, and Choice of Capital Structure," International Economic Review, XXXIV (1993), 203-220.

Fishman, Michael J., "Preemptive Bidding and the Role of the Medium of Exchange in Acquisitions," Journal of Finance, XLIV (1989), 41-57.

Frome, Robert L., and Alan M. Getzoff, "Structuring the Buyout," in Steven J. Lee, and Robert D. Colman, eds., Handbook of Mergers, Acquisitions and Buyouts (Englewood Cliffs, NJ: Prentice Hall, 1981).

Garfinkel, Neil M., "No Way Out: Section 546(e) Is No Escape for the Public Shareholder of a Failed LBO," Columbia Business Law Review, MCMXCI (1991), 51-69.

Gaughan, Patrick A., Mergers, Acquisitions, and Corporate Restructurings (New York, NY: John Wiley & Sons, 1999).

Gilson, Ronald J., "Unocal Fifteen Years Later (and What We Can Do about It)," Delaware Journal of Corporate Law, XXVI (2001), 491-513.

Gilson, Ronald J., and Jeffrey N. Gordon, "Controlling Controlling Shareholders," University of Pennsylvania Law Review, CLII (2003), 785-843.

Gomes, Armando, "Takeovers, Freezeouts, and Risk Arbitrage," mimeo, University of Pennsylvania, 2001.

Grossman, Sanford J., and Oliver D. Hart, "Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation," Bell Journal of Economics, XI (1980), 42-64.

——, "One Share-One Vote and the Market for Corporate Control," Journal of Financial Economics, XX (1988), 175-202.

Hansen, Robert G., "A Theory for the Choice of the Medium of Exchange in Acquisitions," Journal of Business, LX (1987), 75-95.

Harris, Milton, and Arthur Raviv, "Corporate Control Contests and Capital Structure," Journal of Financial Economics, XX (1988), 55-86.

Hirshleifer, David, "Mergers and Acquisitions: Strategic and Informational Issues," in Robert Jarrow, Vojislav Maksimovic, and William T. Ziemba, eds., Handbooks in Operations Research and Management Science, Vol 9 (Amsterdam: North-Holland, 1995).

Hirshleifer, David, and Sheridan Titman, "Share Tendering Strategies and the Success of Hostile Takeover Bids," Journal of Political Economy, XCVIII (1990), 295-324.

Holmström, Bengt R., and Steven N. Kaplan, "Corporate Governance and Merger Activity in the United States: Making Sense of the 1980s and 1990s," Journal of Economic Perspectives, XV (2001), 121-144.

Israel, Ronen, "Capital Structure and the Market for Corporate Control: The Defensive Role of Debt Financing," Journal of Finance, 46 (1991), 1391-1409.

Jensen, Michael C., "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," American Economic Review Papers and Proceedings, LXXVI (1986), 323-329.

——, "Takeovers: Their Causes and Consequences," Journal of Economic Perspectives, II (1988), 21-48.

Kaplan, Steven N., "Management Buyouts: Evidence on Taxes as a Source of Value," Journal of Finance, XLIV (1989), 611-632.

——, "The Evolution of U.S. Corporate Governance: We Are All Henry Kravis Now," Journal of Private Equity, I (1997), 7-14.

Kaplan, Steven N., and Jeremy C. Stein, "The Evolution of Buyout Pricing and Financial Structure in the 1980s," Quarterly Journal of Economics, CVIII (1993), 313-357.

Lang, Larry H.P., René M. Stulz, and Ralph A. Walkling, "A Test of the Free Cash Flow Hypothesis: The Case of Bidder Returns," Journal of Financial Economics, XXIX (1991), 315-335.

Mahoney, Paul G., and Mark Weinstein, "The Appraisal Remedy and Merger Premiums," American Law and Economics Review, I (1999), 239-275.

Maloney, Michael T., Robert E. McCormick, and Mark L. Mitchell, "Managerial Decision Making and Capital Structure, Journal of Business, LXVI (1993), 189-217.

Milgrom, Paul R., "Good News and Bad News: Representation Theorems and Applications," Bell Journal of Economics, XII (1981), 380-391.

Mitchell, Lawrence E., "A Theoretical and Practical Framework for Enforcing Corporate Constituency Statutes," Texas Law Review, LXX (1992), 579-643.

Müller, Holger M., and Fausto Panunzi, "Tender Offers and Leverage," CEPR Discussion Paper No. 3964, 2003.

Palepu, Krishna G., "Predicting Takeover Targets: A Methodological and Empirical Analysis," Journal of Accounting and Economics, VIII (1986), 3-37.

Perotti, Enrico C., and Kathryn E. Spier, "Capital Structure as a Bargaining Tool: The Role of Leverage in Contract Renegotiation," American Economic Review, LXXXIII (1993), 1131-1141.

Prentice, Robert A., "Front-End Loaded, Two-Tiered Tender Offers: An Examination of the Counterproductive Effects of a Mighty Offensive Weapon," Case Western Reserve Law Review, XIX (1989), 389-453.

Reisman, Albert F., "Leveraged Business Acquisitions," in Steven J. Lee, and Robert D. Colman, eds., Handbook of Mergers, Acquisitions and Buyouts (Englewood Cliffs, NJ: Prentice Hall, 1981).

Resnick, Brian M., "Note: Recent Delaware Decisions May Prove to Be "Entirely Unfair" to Minority Shareholders in Parent Merger with Partially Owned Subsidiary," Columbia Business Law Review, MMIII (2003), 253-283.

Safieddine, Assem, and Sheridan Titman, "Leverage and Corporate Performance: Evidence from Unsuccessful Takeovers," Journal of Finance, LIV (1999), 547-580.

Scharf, Charles A., Edward E. Shea, and George C. Beck, Acquisitions, Mergers, Sales, Buyouts and Takeovers: A Handbook with Forms (Englewood Cliffs, NJ: Prentice Hall, 1991).

Scherer, Frederic M., "Corporate Takeovers: The Efficiency Arguments," Journal of Economic Perspectives, II (1988), 69-82.

Seligman, Joel, "Reappraising the Appraisal Remedy," George Washington Law Review, LII (1984), 829-871.

Shleifer, Andrei, and Robert W. Vishny, "Large Shareholders and Corporate Control," Journal of Political Economy, XCIV (1986), 461-488.

——, "Stock Market Driven Acquisitions," Journal of Financial Economics, LXX (2003), 295-311.

Siegel, Mary, "The Erosion of the Law of Controlling Shareholders," Delaware Journal of Corporate Law, XXIV (1999), 27-81.

Silverman, Jesse N., "In Re Munford and the Trustee in Bankruptcy: Should Georgia's Distribution Statute Apply to Leveraged Buyouts?" Bankruptcy Developments Journal, XV (1999), 519-553.

Stulz, René M., "Managerial Control of Voting Rights: Financing Policies and the Market for Corporate Control," Journal of Financial Economics, XX (1988), 25-54.

Schwartz, Gregory J., "Regulation of Leveraged Buyouts to Protect the Public Shareholder and Enhance the Corporate Image," Catholic University Law Review, XXXV (1986), 489-544.

Warga, Arthur, and Ivo Welch, "Bondholder Losses in Leveraged Buyouts," Review of Financial Studies, VI (1993), 959-972.

Weston, J. Fred, Kwang S. Chung, and Susan E. Hoag, Mergers, Restructuring, and Corporate Control (Englewood Cliffs, NJ: Prentice Hall, 1990).

Wasserstein, Bruce, Big Deal: 2000 and Beyond (New York, NY: Warner Books, 2000).

Wertheimer, Barry M., "The Shareholders' Appraisal Remedy and How Courts Determine Fair Value," Duke Law Journal, XLVII (1998), 613-715.

Wruck, Karen H., "Revco D.S., Inc. (A)," Teaching Note, Harvard Business School Case 5-897-166, 1997.

Yarrow, George K., "Shareholder Protection, Compulsory Acquisition and the Efficiency of the Takeover Process," Journal of Industrial Economics, XXXIV (1985), 3-16.

Zwiebel, Jeffrey, "Dynamic Capital Structure under Managerial Entrenchment," American Economic Review, LXXXVI (1996), 1197-1215.