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ASSET LEASING IN COMPETITIVE CAPITAL MARKETS

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OVER THE SPAN of the last several years, there has been substantial interest evidenced in the finance literature in asset leasing as a corporate decision problem. Indeed, given the sheer volume of published papers on the topic,[1] the casual reader might be tempted to conclude that leasing is at least one of the two or three most inportant issues in the theory of the firm. Some portion of this activity would appear to be attributable to a widespread feeling that certain outrages were perpetrated in an early paper in the area [8]. A more neutral view, however, suggests that the intriguing characteristic of the leasing problem is the fact that it forces one to confront along the way most of the difficult and subtle issues of asset-and-liability valuation under uncertainty which have veen the general concern of the finance theorist in recent times. For this reason, it holds particular fascination as an analytical challenge. We hope in the present paper to shed additional light on the relevant issues by approaching the analysis from a somewhat different perspective than has thus far been attempted. Our debt to various writers, notably Gordon [5] and Schall [21], will be evident in that undertaking.

I.

We begin, as an expositional strategy, with the situation of an unlevered enterprise having a specified set of production and investment plans, all of which have been announced to investors. Those plans embody a policy of relying solely on internally-generated funds to support future years' additions to the firm's real-asset base, and the distribution of all residual cash flows to shareholders as dividends. If we let $\bar{R}_t$ denote pre-tax net cash operating revenues expected by investors to occur in year t—given the announced corporate plan—let $\bar{D}_t$ be year t's anticipated asset depreciation charges, $\bar{I}_t$ be the expected size of cash reinvestments in additional assets for the year, and $\bar{S}_t$ be the cash salvage value of assets to be disposed of during the year, the cash dividend expectation visualized by shareholders for the year will be

$$\bar{X}_t = \bar{R}_t - \tau\left(\bar{R}_t - \bar{D}_t\right) - \bar{I}_t + \bar{S}_t \tag{1}$$

$$\bar{X}_t = \bar{R}_t(1-\tau) + \tau\bar{D}_t - \bar{I}_t + \bar{S}_t \tag{2}$$

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1. See, for example: Beechy [1], Bierman [2], Bower [3], Clark, Jantorni, and Gann [4], Gordon [5], Johnson and Lewellen [8] [9], Lev and Orgler [10], Lusztig [13], Mitchell [14], Nantell [17], Roenfeldt and Osteryoung [18], Sartoris and Paul [19], Schall [21], and Wyman [22].

where τ is the applicable corporate income tax rate, and $\bar{S}_t$ is defined for convenience to be net of whatever tax levies are associated with asset retirement. Clearly, a more concise notational scheme would be feasible, but the intent is to identify explicitly the several cash flow elements that may individually be affected (transferred) if a leasing arrangement is entered into by the firm for certain of the relevant assets.

The market value of the shares of such a firm will thereupon depend on investors' reactions to the constituents of the indicated dividend stream. As Schall [20] has demonstrated in his "value additivity principle," the value of the total stream must, in a transaction-costless competitive capital market, be equal to the sum of the respective values of its individual components. That is,

$$V_U = \sum_{t=0}^{\infty} \bar{R}_t(1-\tau)/(1+k_1)^t + \sum_{t=0}^{\infty} \tau \bar{D}_t/(1+k_2)^t$$

$$- \sum_{t=0}^{\infty} \bar{I}_t/(1+k_3)^t + \sum_{t=0}^{\infty} \bar{S}_t/(1+k_4)^t \tag{3}$$

in which $k_1, \ldots, k_4$ are capitalization rates commensurate with the risk features of the separate elements, in the light of investor opportunities to trade in similar such streams elsewhere in the market.

Consider then the consequences should the firm elect to obtain a portion of the assets it requires by arranging to lease them from another enterprise rather than purchasing them directly, but in the context of an unchanged over-all production and asset-employment strategy. If those assets would have cost an amount $\bar{I}_t^L$ in year t if purchased, and would have given rise to depreciation deductions $\bar{D}_t^L$ and salvage recoveries $\bar{S}_t^L$, and will necessitate lease payments of size $\bar{L}_t$, the revised cash dividend expectations of shareholders become:

$$\bar{X}_t' = \left(\bar{R}_t - \bar{L}_t\right) - \tau\left[\bar{R}_t - \bar{L}_t - \left(\bar{D}_t - \bar{D}_t^L\right)\right] - \left(\bar{I}_t - \bar{I}_t^L\right) + \left(\bar{S}_t - \bar{S}_t^L\right) \tag{4}$$

$$\bar{X}_t' = \bar{X}_t - \bar{L}_t(1-\tau) - \tau\bar{D}_t^L + \bar{I}_t^L - \bar{S}_t^L. \tag{5}$$

To this point, the analysis has the normal form. What has been omitted in prior treatments, however, is a consideration of the other side of the transaction—and its market implications. Thus, the cash dividend prospects of the owners of the *lessor* firm pursuant to the arrangement are

$$\bar{X}_t^L = \bar{L}_t - \tau\left(\bar{L}_t - \bar{D}_t^L\right) + \bar{S}_t^L - \bar{I}_t^L \tag{6}$$

$$\bar{X}_t^L = \bar{L}_t(1-\tau) + \tau\bar{D}_t^L + \bar{S}_t^L - \bar{I}_t^L \tag{7}$$

since they must bear the burden of the outlays $\bar{I}_t^L$ to purchase the assets which now are leased, but, in return, are entitled to claim the depreciation tax savings and any available salvage opportunities.

Inevitably, therefore, the *total* dividend flows to be generated for the owners of the two firms come to

$$\bar{X}_t' + \bar{X}_t^L = \bar{X}_t \tag{8}$$

and the net result is a combined income prospect exactly like that which was available to investors before the lease was written. If we then invoke the value additivity principle—or even simple intuition—we must conclude that the total market value of the shares of the lessee firm, V_S, and the shares of the lessor firm, V_L, together can only match the original pre-lease V_U, and, thereupon, that the leasing contract will have no impact on aggregate share valuation—so long as the tax rate on corporate income is the same for lessee and lessor enterprises. Note also that this conclusion holds, whether the lease identified is the *only* activity of the lessor or is just one of many such lease contracts it has outstanding, since the value additivity principle would assert that the addition of one more set of income flows to an existing base would have a market value impact precisely like that of the same set of flows valued in isolation.

What, therefore, would be expected to occur under the press of competition in the leasing market? No firm will be willing to become a lessee at the sacrifice of any of its shareholders' market wealth positions, i.e., will not be amenable to lease payment obligations whose present value exceeds the benefit derived from avoiding the direct expenditures on the assets involved, net of the attendant depreciation tax savings and salvage values. Accordingly, its decision rule will be

$$\sum_{t=0}^{\infty} \bar{L}_t(1-\tau)/(1+k_L)^t \leqslant \sum_{t=0}^{\infty} \bar{I}_t^L/(1+k_5)^t - \sum_{t=0}^{\infty} \tau \bar{D}_t^L/(1+k_6)^t - \sum_{t=0}^{\infty} \bar{S}_t^L/(1+k_7)^t \tag{9}$$

where the capitalization rates at issue are left in their most general notational form to allow for the possibility that the mode of the market's valuation of the $\bar{D}_t^L$, $\bar{S}_t^L$, and $\bar{I}_t^L$ may differ from that of the counterpart flows associated with the remaining, non-leased assets of the firm.[2]

By the same token, of course, investors in the lessor firm will be unwilling to provide the $\bar{I}_t^L$ cash inputs to permit the purchase-and-subsequent-lease of the relevant assets unless the value of the lease payment prospects generated is at least as great as that of the asset expenditures, also net of depreciation and salvage. In short, the decision rule from the lessor firm's standpoint is exactly as in equation (9), with the inequality condition reversed. But, since $V_S + V_L = V_U$, and V_U is

2. And, obviously, the various $\bar{L}_t$, $\bar{I}_t^L$, and $\bar{S}_t^L$ will be zero for values of t beyond the termination date of the lease.

unaffected by the division of the income streams between the two firms because $\overline{X}_t$ is unaffected, any increment in value realized by *either* firm's shareholders requires a corresponding sacrifice on the part of the *other* firm's owners, whatever may be the applicable k_L, k_5, k_6, k_7. Hence, only one set of leasing terms can satisfy both entities' acceptance criteria—that array of $\overline{L}_t$ for which the left and right hand sides of equation (9) are equal. Such terms will leave shareholders, in the aggregate, just as well off as if leasing were not undertaken. Therefore, in a competitive capital market comprised of completely equity-financed firms, an enterprise can expect to confront leasing opportunities which are fully as expensive as outright asset purchases;[3] the lease-or-buy choice will be a matter of indifference.

This conclusion, it may be noted, applies as well to the situation where the assets involved are new ones under consideration as *additions* to the firm's existing capital stock. The capital-budgeting hurdle criterion $dV_U \geqslant dI$ for purchase must be imposed in precisely the same form on potential leased-asset expansions, given that leasing terms of a size just sufficient to induce the lessor firm to commit its funds to assume the burden dI will inevitably be quoted.

II.

However, the more intriguing circumstance, is that in which it is possible for both lessor and lessee enterprises to lever themselves and exploit the tax-deductibility features of interest obligations, to the benefit of shareholders. Let us suppose that our hypothetical corporation had, as part of its original financing-and-investment scenario, arranged for total borrowings in the amount $\overline{B}_t$ to be outstanding during year t and that the rate of interest charged for those loans was set at r by the pertinent lenders. In such a case, stockholder dividend prospects would be:

$$\overline{X}_t^S = \left(\overline{R}_t - r\overline{B}_t\right) - \tau\left(\overline{R}_t - r\overline{B}_t - \overline{D}_t\right) - \overline{I}_t + \overline{S}_t - \overline{M}_t \tag{10}$$

where the term $\overline{M}_t$ denotes the loans which are scheduled to mature at the end of the year. These repayment obligations, of course, diminish the cash available for dividend distributions to shareholders, dollar for dollar, and are equal simply to $\overline{B}_t - \overline{B}_{t+1}$. Thus

$$\overline{X}_t^S = \overline{R}_t(1-\tau) - r\overline{B}_t(1-\tau) + \tau\overline{D}_t - \overline{I}_t + \overline{S}_t - \overline{M}_t \tag{11}$$

$$\overline{X}_t^S = \overline{X}_t - r\overline{B}_t(1-\tau) - \overline{M}_t \tag{12}$$

where the $\overline{X}_t$ is that of equation (2) above. Correspondingly, the lenders involved can look forward to cash flows of size

$$\overline{X}_t^B = r\overline{B}_t + \overline{M}_t \tag{13}$$

and the resulting combined income prospect for both classes of securityholders is

$$\overline{X}_t^* = \overline{X}_t^S + \overline{X}_t^B = \overline{X}_t + \tau r\overline{B}_t. \tag{14}$$

3. We shall examine the effect of certain market peculiarities and tax differences below.

This stream must sell in the market for a present price of

$$V^* = V_U + \sum_{t=1}^{\infty} \tau r \bar{B}_t/(1+r)^t \tag{15}$$

pursuant to the value additivity principle,[4] given that r is unambiguously the capitalization rate appropriate to flows of the risk character of the borrowings in question, since it is the observable yield demanded by the relevant market participants—the lenders—in return for providing the funds.[5] Accordingly, the market value of the common shares of the firm will be

$$V_S^* = V^* - \sum_{t=1}^{\infty} r\bar{B}_t/(1+r)^t + \sum_{t=1}^{\infty} \bar{M}_t/(1+r)^t \tag{16}$$

$$V_S^* = V^* - B_0, \tag{17}$$

the difference between the total value of the enterprise and the value of lender claims to it, B_0.

If equipment leasing possibilities are introduced in such a context, then, we must recognize not only the direct cash flow impact of the lease contract but also any potential indirect consequences on borrowing capacities. Certainly, the amount that lenders would be willing to advance to the firm *at the interest rate r* cannot help but be diminished by commitments made to lessors, so long as the operating cash flow stream available to meet the company's total senior obligations remains unchanged. Whatever the perceived contingencies which caused the yield r to be required on the loans, those contingencies can only be exacerbated by the firm's assumption of competing concurrent lease obligations. While we might consider how *much* of a loss in (rate r) borrowing capacity would be entailed, it will suffice for the moment simply to denote the ensuing reductions in available loan balances by the generalized sequence $\bar{B}_t^L$ and the accompanying lower principal repayments $\bar{M}_t^L$.

On that basis, and continuing our prior notation, the dividend expectations of the shareholders of the leveraged lessee firm become

$$\bar{X}_t^{SL} = \left[\bar{R}_t - \bar{L}_t - r\left(\bar{B}_t - \bar{B}_t^L\right)\right] - \tau\left[\bar{R}_L - \bar{L}_t - r\left(\bar{B}_t - \bar{B}_t^L\right) - \left(\bar{D}_t - \bar{D}_t^L\right)\right]$$

$$-\left(\bar{I}_t - \bar{I}_t^L\right) + \left(\bar{S}_t - \bar{S}_t^L\right) - \left(\bar{M}_t - \bar{M}_t^L\right) \tag{18}$$

$$\bar{X}_t^{SL} = \bar{X}_t^S - \bar{L}_t(1-\tau) + r\bar{B}_t^L(1-\tau) - \tau\bar{D}_t^L + \bar{I}_t^L - \bar{S}_t^L + \bar{M}_t^L. \tag{19}$$

4. The $t=0$ interval for the summation in the second term of (15) is dropped, on the conventional assumption of end-of-period interest-and-principal payment schedules.

5. On the assumption that the bonds carry a coupon rate sufficient to permit them to sell at par. Such an assumption simplifies the algebra of the expressions, although it is by no means essential. Whatever the coupon, the bonds need not be riskless for the arguments to hold; a required market yield r above the riskless rate preserves the form of equation (15), as demonstrated in [7], [15], [20].

For the same reason that borrowing opportunities are somewhat diminished for the lessee, of course, they are correspondingly—and equivalently—enhanced for the lessor, given that the incremental net cash inflow of the latter enterprise is the mirror image of the outflow of the former. The lessor therefore can avail itself of those opportunities and create for shareholders the dividend prospect

$$\bar{X}_t^{LL} = \left(\bar{L}_t - r\bar{B}_t^L\right) - \tau\left(\bar{L}_t - r\bar{B}_t^L - \bar{D}_t^L\right) - \bar{I}_t^L + \bar{S}_t^L - \bar{M}_t^L \tag{20}$$

$$\bar{X}_t^{LL} = \bar{L}_t(1-\tau) - r\bar{B}_t^L(1-\tau) + \tau\bar{D}_t^L - \bar{I}_t^L + \bar{S}_t^L - \bar{M}_t^L \tag{21}$$

which maintains for lenders in the aggregate a cash flow expectation of

$$\bar{X}_t^{BL} = r\left(\bar{B}_t - \bar{B}_t^L\right) + \left(\bar{M}_t - \bar{M}_t^L\right) + r\bar{B}_t^L + \bar{M}_t^L = \bar{X}_t^B \tag{22}$$

and thereby a total set of flows to the three groups of securityholders amounting to

$$\bar{X}_t^{SL} + \bar{X}_t^{LL} + \bar{X}_t^{BL} = \bar{X}_t^S + \bar{X}_t^B = \bar{X}_t + \tau r\bar{B}_t \tag{23}$$

matching that generated in the absence of the lease arrangement. Hence, total market value must remain at its pre-lease level V^*. Leasing, in short, will not alter the price which investors will pay for the underlying productive income stream even when leverage possibilities are present, since any loss in debt capacity on the part of lessee firms will necessarily be offset by commensurate increases in the capacity of lessors.

The competitive-market equilibrium implications of such a circumstance are obvious. As in the unlevered-firm case, if total security values are invariant to leasing, any future-period commitments made under leasing contracts will occasion a transfer of market worth to the lessor matching that relinquished by the lessee. Only if the lessee obtains asset expenditure savings of at least equal value for its owners, will it concur in the arrangement. Similarly, the lessor cannot offer terms which provide a net gain to the lessee without harming its own shareholders—put differently, cannot induce them to supply the capital to purchase and then rent the assets unless the resulting cash income prospects are as attractive as those they could obtain by investing directly in the potential lessee enterprise. Therefore, there is only one lease price that can satisfy both constraints—the price which will render leasing and buying equally worthwhile.

III.

The profile of the associated managerial decision rule, however, is of interest, both because it has been a subject of contention in the literature and because it permits us to pinpoint the conditions under which certain market peculiarities could interfer with the indicated competitive equivalent-price outcome. From equations (19) and (22), it is clear that the total cash flows to the stockholders *and* creditors of the *lessee* firm will differ in year t by the amount

$$\bar{L}_t(1-\tau) + \tau r\bar{B}_t^L + \tau\bar{D}_t^L + \bar{S}_t^L - \bar{I}_t^L$$

from those that would be in prospect for securityholders of a similar firm in the absence of leasing. Its aggregate market value therefore will be

$$V^{*L} = V^* - \sum_{t=0}^{\infty} \bar{L}_t(1-\tau)/(1+k_L)^t + \sum_{t=0}^{\infty} \bar{I}_t^L/(1+k_5)^t$$

$$- \sum_{t=0}^{\infty} \tau \bar{D}_t^L/(1+k_6)^t - \sum_{t=0}^{\infty} \bar{S}_t^L/(1+k_7)^t$$

$$- \sum_{t=1}^{\infty} \tau r \bar{B}_t^L/(1+r)^t \tag{24}$$

relying once more on the value additivity prescription. The resulting equity market value is

$$V_S^{*L} = V^{*L} - (B_0 - B_0^L) \tag{25}$$

since loans smaller by B_0^L will be outstanding due to the reduction in borrowing power, where B_0^L is the present worth of the $r\bar{B}_t^L$ and $\bar{M}_t^L$, capitalized at r. That foregone immediate loan inflow, of course, must be made up for directly by shareholders out of what would otherwise have been larger cash dividend receipts at $t=0$. Accordingly, in order for shareholders to be well-served by a leasing arrangement, management must require that V_S^{*L} be greater than the original V_S^* by at least enough to compensate for the immediate dividend reduction. Thus, the acceptance criterion is

$$V_S^{*L} \geqslant V_S^* + B_0^L \tag{26}$$

which, upon substitution from (17), (24), and (25), resolves to

$$\sum_{t=0}^{\infty} \bar{L}_t(1-\tau)/(1+k_L)^t \leqslant \sum_{t=0}^{\infty} \bar{I}_t^L/(1+k_5)^t - \sum_{t=0}^{\infty} \tau \bar{D}_t^L/(1+k_6)^t$$

$$- \sum_{t=0}^{\infty} \bar{S}_t^L/(1+k_7)^t$$

$$- \sum_{t=1}^{\infty} \tau r \bar{B}_t^L/(1+r)^t. \tag{27}$$

In words, the market value of the lease promises made cannot exceed that of the asset expenditure flow saved, net of salvage and depreciation tax recoupments and the valuation consequences of the lessee firm's reduced borrowing power—the latter being purely a tax phenomenon.[6]

The cash flow impact of the arrangement from the lessor firm's standpoint is exactly symmetrical. It receives the indicated $\bar{L}_t$, bears the outlays $\bar{I}_t^L$, and claims the $\tau\bar{D}_t^L$ and $\bar{S}_t^L$. Similarly, it can borrow B_0^L to help finance the activity but, in so

6. In effect, equation (27) is Schall's [21] criterion cast in standard expected-return-discounting form.

doing, incures repayment obligations having the same present value, leaving it with only the incremental tax-benefit stream $\tau r\bar{B}_t^L$ as a net valuation gain. Only, therefore, if the lease contract receipts plus these other inflows equal or exceed the $\bar{I}_t^L$ will the contract be attractive. Further, since the capitalization rates applicable to the various streams involved are not firm-specific in a rational securities market, the appropriate decision criterion for the lessor *is* simply equation (27) in reverse. Once more, then, only one figure for the present value of the $\overline{L}_t$ can meet both parties' conditions for a willingness to transact, and price competition in the leasing market must yield that outcome.

At such a price, of course, the cost of leasing is the same as that of direct asset acquisition, and the same discounted-cash-flow test for new investment project acceptability should be imposed by the lessee firm *regardless* of the manner of acquisition. The acceptance test for asset purchase—that is, $dV^* \geqslant dI$, where the V^* is that of equation (15) above—will have imbedded in it the valuation effect of the accompanying increase in corporate borrowing power.[7] The competitive equilibrium implication of equation (27), however, is an alteration in that borrowing power, when leasing is undertaken, the valuation consequence of which will be just offset by the present worth of the other cash flows involved. The lessee's decision problem in such an environment, therefore, is the normal one of "expand or not," examined in the light of the normal debt financing policy the firm has established.[8]

IV.

On the other hand, there may occasionally be some differences in the *cirsumstances* of lessor and lessee enterprises which, even in a competitive market framework, could lead to differentially attractive asset acquisition opportunities. While none of these are especially startling, their role in the present valuation portrayal merits attention since it is only through that mechanism that their impact can be rigorously defined.

The basic question is easily posed: under what conditions can the market value of two firms, combined—a lessor and lessee—exceed that of a single enterprise, given a fixed array of underlying production and investment activities? Only if such an enhancement of total value is possible can leasing bargains be struck that will offer an advantage to one of the parties without harming the other—and an acquiescence to harm is inconsistent both with rationality and market competition.

In that regard, certain assumptions were implicit in the derivations above: (1) that the tax rates of lessor and lessee were equal, (2) that the assets involved would cost the lessor the same amount to purchase as they would the lessee, (3) that depreciation deductions were realizable on the same terms by both, (4) that the

7. As formally delineated in Haley and Schall [7], Lewellen and Racette [11], Lewellen [12], Myers [16], and Schall [20].

8. And the decision is definitely lease-or-buy rather than lease-or-borrow. The so-called "effective interest rate" on the obligations $\overline{L}_t$ in (27) which equates their present value to that of the purchase costs $\bar{I}_t^L$ is a meaningless concept for decision purposes, because the $\bar{I}_t^L$ are not the only cash flows affected by the lease contract and thereby the debt capacity change involved is nowhere automatically tied just to the $\bar{I}_t^L$ alone.

salvage potential of the assets would be unaffected by the arrangement, and (5) that borrowing *policies*—as distinct from *capacities*—were identical in the two companies. We may therefore examine the implications of any departures from these stipulations.

In order to do so in a way that permits a convenient paraellel with the leasing treatments of the recent literature, let us cast the decision criterion of equation (27) in the mold of the "standard" lease contract typically assayed: one in which the lease payments occur at year's end, where the contract has a specified term T, where the assets acquired would have necessitated expenditures entirely out of the current year's ($t=0$) capital budget, where the term of the lease coincides with the period over which the lessee firm planned to employ the assets if it purchased them,[9] and where the borrowing affected would have had a finite balloon maturity N.[10] Under that scenario, consider the case wherein the lease arrangement is *just* acceptable from the standpoint of the lessee. That is, the firm finds that

$$(1-\tau)\sum_{t=1}^{T}\bar{L}_t/(1+k_L)^t - I_0^L + \tau\sum_{t=1}^{T}\bar{D}_t^L/(1+k_6)^t$$

$$+\bar{S}_T^L/(1+k_7)^T + \tau r B_0^L A_{N:r} = 0 \tag{28}$$

where $A_{N:r}$ denotes the present value of a one-dollar annuity of N years' duration, discounted at r. If, then, this same contract is *more* valuable to the lessor—in the one relevant sense that the external securities market puts a price higher than zero on that firm's counterpart cash flows—total market values *will* rise as a result of the transaction and some viable contract bargaining room on lease terms, under which both enterprises can gain, will exist.

The requisite conditions are obvious. The $\bar{L}_t$ and the applicable capitalization rates—whatever they may be—are the same as in (28) for the lessor's side of the contract, but the other elements may not be. In particular, if the lessor (a) can acquire the assets at a price below I_0^L, (b) can realize salvage proceeds greater than $\bar{S}_T^L$, (c) can depreciate the assets more rapidly or more reliably than the lessee, or (d) levers the transaction to a greater extent than B_0^L, the market price associated with the lessor's equivalent of (28) will indeed be positive.[11] The tax effect, interestingly, can go either way. Thus, if some $\tau^* > \tau$ applied to the lessor, the first term in (28) would fall, but the third and fifth would increase, and the net change would depend on the specific asset life (lease period), depreciation schedule, capitalization rates, and leverage possibilities involved.[12] Therefore, the standard

9. Indeed, this is a necessary condition, if we are to remain in the context of a particular set of production-and-investment plans for the firm.

10. There is, of course, in principle no requirement that the lease and these borrowings have the same maturity ($T=N$), as there is no requirement in general that a particular asset be financed with loans having a maturity matched to the asset's economic life.

11. Note that, while the tax savings on the $\bar{D}_t^L$ decline when I_0^L falls, the present-value impact of the former is always less than that of the latter, as long as $\tau<1$ and $k_6>0$.

12. In particular, the shorter the lease term and the greater the alteration in debt capacity, the more likely is the lessor's higher tax rate to generate valuation gains.

wisdom that high-tax-rate lessors are a rich potential source of lucrative leasing deals, is not necessarily borne out. The reverse may easily be true; a high tax rate may actually induce a firm to be a lessee rather than a lessor. In any case, we see that differences in the two parties' circumstances *could* at times generate market valuation benefits that would make leasing attractive, and the framework encompassed in (28) identifies those dimensions. One could readily insert representative numerical values therein and quantify the possible scope of the relevant opportunities.

Some commentary on the likelihood—and the origin—of such differences in a competitive market economy, on the other hand, seems warranted. It is conceivable that a lessor firm which buys assets in volume from their manufacturers could negotiate for lower average prices than would be quoted for single purchases by lessees. Savings of this sort, however, can only be attributable to reduced transactions costs since the underlying manufacturing economics are not affected, i.e., no change in total *supplier* output is occasioned by a mere re-routing of the assets through intermediaries to their ultimate users. We therefore suspect that the savings are apt to be rather modest, if they exist at all. The same goes for resale/salvage values. The lessor may be more active or more skillful in dealing in the associated second-hand asset market; his specialized knowledge may give him an edge. But if that market is itself reasonably competitive, lowered transactions costs (from information acquisition perhaps) again are the one legitimate source of potential savings. To the extent that many leasing arrangements involve assets manufactured for quire specific purposes, of course, few of these transaction efficiencies are likely to emerge—indeed, they may be more than offset by the extra transactions costs of the intervening lease contract. Only in the case of leases of very standard, high-volume asset items do any benefits appear to be realizable.

Whether the depreciation tax savings stream offers any corresponding opportunities is equally problematical. These could arise in principle from more *rapid* write-off patterns by lessors, but it stretches credulity to believe that the IRS would sanction differences of this sort on any systematic large scale, given the demonstrated sensitivity of the tax authorities to the obvious adverse revenue consequences. Alternatively, the lessor's depreciation deductions may be more "attainable" in the sense that the lessee may not as consistently have taxable income against which to claim the deductions. This argument is often made particularly in connection with accelerated depreciation schedules that could exceed lessee income in the early years of asset life. We do not rule out such possible differences—in effect, they connote more rapid *de facto* lessor write-off profiles—but the carry-forward and backward corporate income averaging provisions of the tax law should substantially diminish their impact for all but the most marginal lessee enterprises. Note that the realization of these tax benefits by the lessor depends on the existence of additional taxable income from other sources on his part; if his only business is leasing the one asset, the lease payments he receives are his only taxable earnings as well, and he confronts precisely the same deduction limits as would the lessee. For that matter, many lessees may be in a *better* position to take the deductions—against other income—than would be the lessors, depending upon the specific earnings time patterns of the respective enterprises. In any

case, the less effective in practice are the income-smoothing provisions of the revenue code, the more likely are the tax deduction transfers associated with lease contracts to provide some occasional opportunities for net valuation gains.

Finally, there is the issue of differences in borrowing policies between lessor and lessee firms. As was discussed earlier, it is inevitable that any debt *capacity* increments generated for lessors will be matched by reductions for lessees, given that the (debt-supporting) cash flow receipts of the former are the mirror image of the cash flow losses of the latter. So long as both enterprises exploit such borrowing capacities to the fullest—as they should be led to do by competitive conditions—the valuation effects cancel out. Nonetheless, it could occur that the lessee firm may not be so diligent and thereupon that the B_0^L of equation (28) which that firm actually relinquishes, according to its policies, is below the figure the enlightened lessor takes advantage of in the transaction. To the degree, then, that leasing results in improved aggregate capital structures in the community, some lease-price bargaining room becomes available. It should be stressed, however, that the lease does not *create* this effect; its origin is simply the ineptitude of the lessee, and that ineptitude can be remedied without entering into a rental arrangement.

We therefore are led to conclude that environmental factors which can bring about significant differences in the costs of asset purchase and asset leasing will seldom prevail, especially since the tax *rate* effect on the transaction can go either way. Perturbations from equilibrium cannot be ruled out, certainly, but market pressures can be expected to eliminate most of these fairly quickly. The corporate decision rule for testing those possibilities has been portrayed above, and the securities market context of such decisions identified. The implication of that framework is that subsequent investigations of the leasing phenomenon might most profitably focus on the role of market imperfections as qualifying influences, and on the *empirical* prevalence of the factors discussed which could lead to exploitable profit opportunities. It appears to us that, in an idealized competitive milieu, a reliable rationale for leasing attractiveness cannot reasonably be maintained.

REFERENCES

1. T. Beechy. "Quasi-Debt Analysis of Financial Leases," *Accounting Review*, April 1969, pp. 375–381.
2. H. Bierman. "Analysis of the Lease-or-Buy Decision: Comment," *Journal of Finance*, September 1973, pp. 1019–1021.
3. R. Bower. "Issues in Lease Financing," *Financial Management*, Winter 1973, pp. 25–34.
4. R. Clark, J. Jantorni, and R. Gann. "Analysis of the Lease-or-Buy Decision: Comment," *Journal of Finance*, September 1973, pp. 1015–1016.
5. M. Gordon. "A General Solution to the Buy or Lease Decision," *Journal of Finance*, March 1974, pp. 245–250.
6. ——— and P. Halpern. "Cost of Capital for a Division of a Firm," *Journal of Finance*, September 1974, pp. 1153–1163.
7. C. Haley and L. Schall. *The Theory of Financial Decisions*, New York, McGraw-Hill, 1973.
8. R. Johnson and W. Lewellen. "Analysis of the Lease-or-Buy Decision," *Journal of Finance*, September 1972, pp. 815–823.
9. ——— and ———. "Reply," *Journal of Finance*, September 1973, pp. 1024–1028.
10. B. Lev and Y. Orgler. "Analysis of the Lease-or-Buy Decision: Comment," *Journal of Finance*, September 1973, pp. 1022–1023.

11. W. Lewellen and G. Racette. "Convertible Debt Financing," *Journal of Financial and Quantitative Analysis*, December 1973, pp. 777–792.
12. ———. "A Conceptual Reappraisal of Cost of Capital," *Financial Management*, Winter 1974.
13. P. Lusztig. "Analysis of the Lease-or-Buy Decision: Comment," *Journal of Finance*, September 1973, pp. 1017–1018.
14. G. Mitchell. "After-Tax Cost of Leasing," *Accounting Review*, April 1970, pp. 308–314.
15. J. Mossin. *Theory of Financial Markets*, Englewood Cliffs, N. J., Prentice-Hall, 1973.
16. S. Myers. "Interactions of Corporate Investment and Financing Decisions—Implications for Capital Budgeting," *Journal of Finance*, March 1974, pp. 1–25.
17. T. Nantell. "Equivalence of Lease vs. Buy Analyses," *Financial Management*, Autumn 1973, pp. 61–65.
18. R. Roenfeldt and J. Osteryoung. "Analysis of Financial Leases," *Financial Management*, Spring 1973, pp. 74–87.
19. W. Sartoris and R. Paul. "Lease Evaluation—Another Capital Budgeting Decision," *Financial Management*, Summer 1973, pp. 46–52.
20. L. Schall. "Asset Valuation, Firm Investment, and Firm Diversification," *Journal of Business*, January 1972, pp. 11–28.
21. ———. "The Lease-or-Buy and Asset Acquisition Decisions," *Journal of Finance*, September 1974, pp. 1203–1214.
22. H. Wyman. "Financial Lease Evaluation Under Conditions of Uncertainty," *Accounting Review*, July 1973, pp. 489–493.