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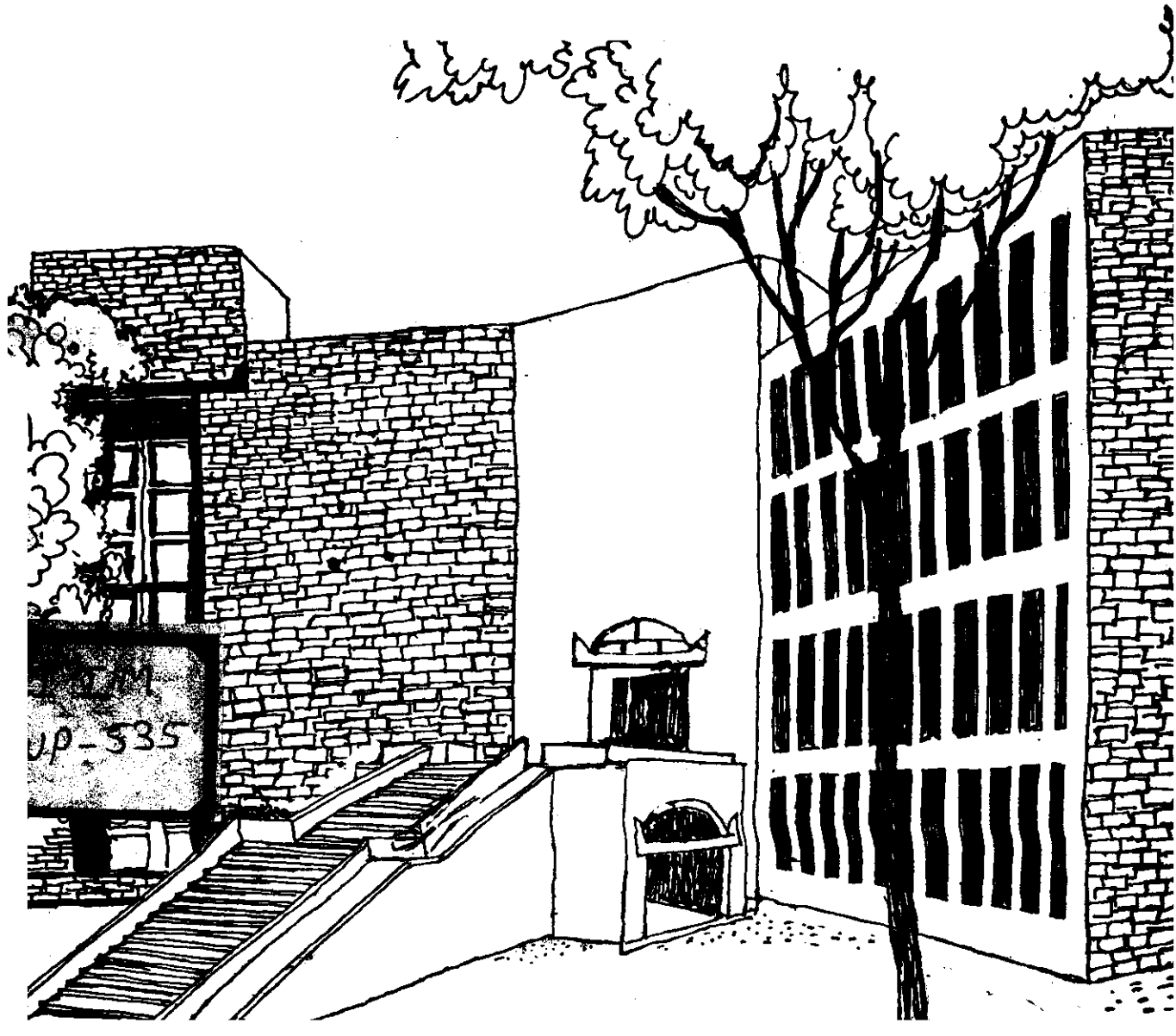

LEASE EVALUATION-YET AGAIN

By

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LEASE EVALUATION - YET AGAIN

I. INTRODUCTION

Lease evaluation has been one of the most written about subjects in the contemporary finance literature. And as is the wont in all such widely written about subjects, the literature is rife with different approaches to evaluating a lease proposal. The topic has also resulted in a vigorous debate over the years as to whether the decision is one of "lease vs buy" or "lease vs borrow", and almost every author on the subject has claimed allegiance to one or the other of the above views. Thus, purely in terms of dilemma faced, the multiplicity of the available approaches to lease evaluation seems to have left a decision maker as bewildered today as he was may be a couple of decades ago; only his problem of paucity seems to have become a problem of plenty. True, a decision maker, of necessity might have resolved his dilemma by developing his own formula for taking his leasing decisions, but unless the decision maker possesses a profound insight into the theoretical ramifications of the decision rule used, such formula may at best be a garbled version of one or several of the approaches suggested by different scholars. This paper attempts to resolve the "lease versus buy/borrow" dilemma and proceeds to develop yet another approach to lease evaluation and to that extent this paper seems to be adding its own bit to an already large stock-pile of existing approaches. And yet the addition is justified for it is genuinely felt that the treatment of the problem and the decision rule developed in this paper would help the readers considerably in critically examining the prevailing confusion and enable them to resolve their dilemma.

II. APPROACHES HITHERTO

In discussing different approaches available in the literature this paper shall primarily concern itself with a lease contract signed at present ($t = 0$) for a finite period ($t = N$). For simplicity assume that this period N covers the asset's economic life; that each contract covers the entire value of the asset leased; that the firm's earnings are large enough to absorb the depreciation on the asset if purchased; and that the cash operating expenses specific to the asset are the same under both purchase and lease options. And finally, the approaches will be discussed from lease's view point, recognizing that the treatment would be no different for the lessor either, except that the cashflows would change signs and the discount rate could be different too.

The following notations will be employed:

Y_i = Expected cash operating earnings (before lease rentals when the asset is leased) arising from the deployment of asset in question, at the end of period i,

A = Initial purchase cost of the asset,

L_i = Lease rentals at the end of period i,

Dep_i = Tax relevant depreciation charge at the end of period i,

S_N = Expected after tax salvage value of the asset at the end of period N,

K's = Appropriate discount rates (K_1, K_2, ... etc.),

r = Firm's borrowing rate,

T = Tax rate applicable to the firm,

R_i = Interest on the loan at the end of period i, if the asset were financed through borrowing, and

NAL = Net Advantage of Lease.

Bower (2) neatly presents the various approaches suggested by different authors in the following general form:

$$(1) \quad NAL = A - \sum_{i=0}^{N} \frac{L_i}{(1+K_1)^i} + \sum_{i=0}^{N} \frac{TL_i}{(1+K_2)^i} - \sum_{i=0}^{N} \frac{TR_i}{(1+K_3)^i} - \sum_{i=0}^{N} \frac{TDep_i}{(1+K_4)^i} - \frac{S_N}{(1+K_5)^N}$$

(1) (2) (3) (4) (5) (6)

While some authors have shown a preference for the summary measure NAL, others have favoured the IRR of the cashflows (and compared the IRR to interest rate)*. While some have adopted the acquisition cost and interest on equivalent loan in their cashflows, others have preferred to adopt loan equivalent of lease rentals and the corresponding interest charges instead (see Bower (2)). However the primary difference between the different approaches seem to arise from the different discount rates employed by different authors for the various components of expression 1 even when there has been no substantial disagreement between the authors on the relevant cash flows to be considered**. Even the subsequent approaches

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* Vancil (14), Bower, Herringer & Williamson (3), Johnson & Lewellen (8), Findlay (6), Gordon (7), Schall (13), Myers, Dill & Bautista (11), and Brealey and Young (4) have all used NAL, whereas Beechy (1), Wyman (15), and Roenfeldt and Osteryoung (12) have all used the IRR as the the summary measure.

** For example in expression 1, while J & L (8) discount the fifth term ($TDep_i$) at the cost of capital of the firm (K), R & O (12) discount the same term at after tax cost of debt (r(1-t)). Similarly, while both the above pairs of authors discount the second and third terms of expression 1 at r(1-T), Vancil (14) discounts them at r and K respectively.

as suggested by Gordon (7); Schall (13), and Myers, Dill and Bautista (11) fit into the above general framework (see Annexure I).

Bower dismisses the differences in these approaches as non substantial and leaves the executive to make his own judgement on the essential points of differences between various approaches. While their contention may be broadly true, in my opinion however the real life decision maker cannot be expected to exercise his own judgement on a rather involved theoretical issue. This is especially so, since a decision maker is always in the danger of associating wrong discount rates with the wrong cash flows in the absence of an unambiguous decision rule. Also, even if these approaches are similar in essence, it is perhaps possible to improve upon them to develop an unambiguous decision rule. In the process, it is also hoped that the "lease vs buy" or "lease vs borrow" debate would be laid to rest.

III. LEASE VERSUS "BUY" OR "BORROW"

When a decision maker is faced with an option of employing or not employing a productive asset in the firm, he is in effect called upon to choose between the consequential cash flows resulting from the two options and choose the one which yields a superior stream of cashflows. The superior stream of cashflows would be the one which would maximize the firm's market value. The stream maximizing the firm's market value would be the one giving higher present value when discounted at the market's expected rate of return, i.e., the firm's cost of capital. So much has been well accepted in the theory of finance. In the situation outlined above, if only the marginal cashflows are considered, the option of not employing the asset would result in status quo, i.e., nil additional cashflows, whereas the option of employing the

asset, if purchased, would typically entail a large initial cash outflow followed by subsequent cash inflows over a finite period of time. In finance theory, this comparison of different cashflow streams (or different projects) and choice of a preferred cashflow stream (or a preferred project) is recognised as belonging to the set of Investment Decisions or Capital Budgeting Decisions. At this stage, if the concept of leasing is brought in, it is apparent that the firm has an option of deploying the asset not only by purchasing it, but also by leasing the same. In other words, in addition to the choice of incurring a large initial cash outflow followed by subsequent inflows, a firm also has the option of phasing out its initial large outflow over a period of time as lease rentals. If this choice is also included, in all, the firm now would have three possible cashflow streams (including non-deployment of asset) of which to choose one form. This choice process would also logically belong to the domain of investment decisions. However, the question of "lease or buy" would arise only when both these options have been found to be superior to the third option of not deploying the asset at all. In this sense the problem of "lease or buy" belongs to the category of investment decisions. Johnson & Lewellyn (8), Chasteen (5), Gordon (7), and Schall (13) seem to hold a similar view.

However, decision makers often seem to view the problem differently. They argue that a firm first takes a decision on whether to acquire or not to acquire an asset. And, if it is decided to employ the asset, all that remains to be decided is whether the asset is to be financed through borrowing or through leasing. Hence the "lease versus borrow" argument. However, a discerning reader can easily see through this erroneous line of reasoning,

in the light of earlier discussion. But this is not the main argument which lends force to the "lease or borrow" school. It's strength comes from the fact that leasing uses up debt capacity of a firm and hence is akin to a substitute for debt. Consequentially, Vancil (14), Bower, Herringer and Williamson (3), Beechy (1), Wyman (15), Roenfeldt & Osteryoung (12), Findlay (6), and Bower (2) view the leasing decisions as Financing Decisions. The merit of these arguments will be examined in detail in Section V.

IV. EVALUATING THE LEASE

In order to help a decision maker understand the decision rule in all its theoretical implications, this paper will build up the rule from first principles. To begin with, consider the options available and the series of decisions to be made by the decision maker for acquisition of an asset in a firm:

OPTIONS:

OPTION I : Not acquiring the asset at all,

OPTION II : Acquiring the asset through purchases, and

OPTION III : Acquiring the asset through a lease.

DECISIONS:

DECISION I : To acquire the asset through purchase or not to acquire the asset at all,

DECISION II : To acquire the asset through lease or not to acquire the asset at all, and

DECISION III : To acquire the asset through purchase or acquire the asset through lease.

(Decision III would be necessitated only if both Decisions I & II are in favour of acquisition of the asset).

Each decision has been elaborated below:

DECISION I : To acquire the asset through purchase or not to acquire:

Decision Rule: The asset would be purchased if:

$$(2)^{*} \quad \sum_{i=0}^{N} \frac{(Y-I-Dep_i)(1-T) + I + Dep_i}{(1+K_o)^i} + \frac{S_N}{(1+K_o)^N} - A \geq 0 \qquad (1)$$

Where I is the interest term, explained a little later, and K_o is the overall cost of capital of the firm.

At this stage it is necessary to take serious note of some crucial factors, in explaining which we shall employ the following additional notations:

D = Market Value of Debt of the firm,

E = Market Value of Equity of the firm, and

K_e = Equity Capitalization Rate of the firm.

1. K_o is the weighted average cost of capital of the firm which is arrived at, assuming a certain constant D/E (Debt: Equity) ratio. If the firm decides to change its D/E ratio systematically, its K_o would also change (see expression 3). Thus, when K_o is used as the discount rate in expression 2 it is assumed that the firm would continue to have the same D/E ratio in future too, i.e., continue with its present capital structure.

* Note that when $N \to \infty$, Depreciation and salvage value terms disappear and component 1 of expression 2 is reduced to $\frac{(Y-I(1-T)+I}{K_o}$, which is the standard firm valuation formula of Modigliani and Miller (10).

This implies that no matter how the asset is financed, i.e., whether entirely through debt or entirely through equity, its D/E ratio is assumed to remain unchanged. In other words, it is assumed that if this asset is financed entirely through debt this time, the next asset would be financed entirely through equity next time, so that in the long run the firm's D/E ratio remains unchanged. This means that the market would value the firm as if the firm would continue with its current capital structure in future, irrespective of how a particular asset is financed. For all practical purposes then it would be the same as assuming that the firm finances each asset with both debt and equity in the proportion of its overall debt (D) and equity (E).

2. If the above view is held, the interest I shown in component (1) of expression 2 should be equal to rAD/(D+E). In other words proportion D/(D+E) of the asset's acquisition cost A is assumed to be financed through debt and the rest through equity and hence the relevant interest charge in acquiring the asset would be given as I = rAD/(D+E).

3. And finally it should be noted that K_o would be given by the weighted average cost of capital expression 3 and not by expression 4.

$$(3) \qquad K_o = K_e \frac{E}{D+E} + r \frac{D}{D+E}$$

$$(4) \qquad K_o = K_e \frac{E}{D+E} + r\,(1-T)\,\frac{D}{D+E}$$

This can be easily explained as follows*:

If X = Random variable representing earnings before interest and taxes generated by the currently held assets of a firm F,

X_t = After tax return of the firm F,

I' = Interest = rB

B = Market Value of Debt in the firm

S = Market Value of Equity in the firm.

We have:

(5) $X_t = (X-I')(1-T) + I'$

or $\frac{X_t}{(B+S)} = \frac{(X-I')(1-T)}{(B+S)} + \frac{I'}{(B+S)}$

(6) or $\frac{X_t}{(B+S)} = \frac{(X-I')(1-T)}{S} \frac{S}{(B+S)} + \frac{I'}{(B+S)}$

But $\frac{X_t}{(B+S)}$ = K_{of}, the cost of capital of firm F,

$\frac{(X-I')(1-T)}{S}$ = K_{ef}, the cost of equity capital of firm F, and

I' = rB / *

*See Modigliani & Miller (10). The explanation is being provided in the text itself rather than as a footnote since it is a rather common error committed by practitioners to use expression 4 for cost of capital, without regard to the matching cashflows. Also most authors have ignored to elaborate on this point, which in my view needs an explict reiteration.

Therefore, expression (6) becomes:

(7) $$K_{of} = K_{of} \frac{S}{(B+S)} + r \frac{B}{(B+S)}$$, which is of the same form as expression 3.

The cashflows shown in expression 5 are of the same form as those in expression 2 (except that the cashflows in expression 5 represent an infinite stream whereas cashflows in component (1) of expression 2 are finite and hence appear with the depreciation and salvage value terms). It therefore follows that K_o, the discount rate in expression 2 should be similar in form to K_{of} as given by expression 7, which in turn is similar to expression 3.

DECISION II: To acquire the asset through lease or not to acquire the asset at all.

Decision Rule: The asset should be leased if:

(8) $$\sum_{i=0}^{N} \frac{(Y_i - L_i)(1-T)}{(1+K_{ol})^i} \geq 0$$

Where $K_{ol} \simeq K_o$, the cost of capital of the firm as given by expression 3, if the total extent of leasing in the firm is relatively small - a condition largely true in India. In India, since leasing is restricted to relatively small proportion of total assets deployed, it may be assumed that leasing does not significantly alter the firm's systematic risk. Hence K_o can be considered a fair approximation to K_{ol}, the cost of capital of a firm with leasing. Treatment for estimating K_{ol} when the above condition does not

hold, i.e., when leasing by a firm is excessive, is given in section V. But a decision maker in India as of now, would find this paper of value to his purpose even if he skips reading section V.

At this stage it is important to note that almost all other authors discount the lease rental component of expression 8 at the borrowing rate, since the rental stream is considered a "riskfree" or a "certain" stream. It should however be noted that many other operating expense items such as say labour expenses might also be equally certain and yet, in valuing a firm they get discounted at the firm's cost of capital, since they are absorbed in the firm's operating earnings. Since lease rentals are also operating expenses (this view has been discussed in detail in section V), they are also absorbed in arriving at the operating earnings and hence should be discounted at the firm's cost of capital in order to arrive at the change in a firm's value owing to the acquisition of asset.

DECISION III: To acquire the asset through purchase or through lease.

From decision rules I and II it is clear that a choice between buying and leasing would arise only when each of the first two decision are in favour of acquisition of the asset. Otherwise either the purchase option or the lease option would be automatically ruled out. And if the conditions as given by expressions 2 and 8 are met, then clearly leasing would be advantageous to buying, if:

$$A = \sum_{i=0}^{N} \frac{(Y-L_i)(1-T)}{(1+K_o)^i} - \sum_{i=0}^{N} \frac{(Y-I-Dep_i)(1-T) + I + Dep_i}{(1+K_o)^i} - \frac{S_N}{(1+K_o)^N} \gtrless 0$$

[Obtained by substracting LHS of expression 2 from LHS of expression 8 and substituting K_o for K_{ol} in 8]

Simplifying this expression yields the condition:

$$A - \sum_{i=0}^{N} \frac{L_i}{(1+K_o)^i} + \sum_{i=0}^{N} \frac{TL_i}{(1+K_o)^i} - \sum_{i=0}^{N} \frac{IT}{(1+K_o)^i} - \sum_{i=0}^{N} \frac{TDep_i}{(1+K_o)^i} - \frac{S_N}{(1+K_o)^N} \geq 0$$

(9) or NAL =

$$A - \sum_{i=0}^{N} \frac{L_i}{(1+K_o)^i} + \sum_{i=0}^{N} \frac{TL_i}{(1+K_o)^i} - \sum_{i=0}^{N} \frac{IT}{(1+K_o)^i} - \sum_{i=0}^{N} \frac{TDep_i}{(1+K_o)^i} - \frac{S_N}{(1+K_o)^N} \geq 0$$

which is the same as expression 1, except that discount rates K_1, K_2, K_3...., etc. have all been substituted by a single discount rate K_o.

Another difference between the two expressions 1 and 9 pertains to the interest term. While in the former, the interest term R_i signified the interest in each period on the loan equal to the asset's acquisition cost, in the latter, as described earlier, the interest (I) is given by:

$$I = rA \frac{D}{D+E}$$

The amount I remains constant in each of the N periods, since repayment of loans are not taken cognisance of, it being assumed that any repayment of loan would be substituted by a fresh loan of the same quality, thereby keeping the D/E ratio unchanged.

The depreciation in every period would be A/N, if straight line method of depreciation is used for tax purposes. However, in India, depreciation for taxation is charged on the written down value (WDV) basis. Thus, if d be the WDV rate of depreciation, we have:

$$Dep_i = dA\,(1-d)^{i-1}, \text{ for all } i = 1 \text{ to } N, \text{ and } Dep_0 = 0$$

Further, to relax an earlier assumption, if O_i be the cash operating cost expected to be incurred in period i (assumed at the end) if the asset is purchased but not if it is leased, expression 9 may be modified as:

(10) NAL =

$$A - \sum_{i=0}^{N} \frac{L_i}{(1+K_o)^i} + \sum_{i=0}^{N} \frac{TL_i}{(1+K_o)^i} - \sum_{i=0}^{N} \frac{IT}{(1+K_o)^i} - \sum_{i=0}^{N} \frac{TDep_i}{(1+K_o)^i} - \frac{S_N}{(1+K_o)^N} + \sum_{i=0}^{N} \frac{O_i(1-T)}{(1+K_o)^i}$$

Annexure II explains each component of this expression in detail for the readers' convenience.

The decision maker should once again note that the condition that NAL >0 does not by itself imply that leasing the asset would enhance the value of the firm. It should be obvious that NAL can be positive, even when both leasing and purchasing the asset turn out to be worse alternatives than not acquiring the asset (i.e., when conditions given by expressions 2 and 8 are not met). In other words, a choice between lease or buy presupposes the superiority of each of these two options over the option of not acquiring the asset. And if both these suppositions are wrong, the firm's value will not be enhanced, even when the NAL is positive.

V. COST OF CAPITAL OF A LEVERED FIRM RESORTING TO EXCESSIVE LEASING

The question "Is leasing akin to borrowing?" can be answered more effectively by an expression derived by Long (9). According to him for an unlevered firm with leased assets*.

$$(11) \quad K_{eu} = \rho + (\rho - r) \frac{V_{LL}(1-T)}{V_S} + \frac{TV_{Dep}}{V_S}$$

When K_{eu} = Cost of equity of an unlevered firm with considerable leased assets and is given by $K_{eu} = \frac{(Y_L)(1-T)}{VS}$, where

Y_L = The operating earnings of the firm after lease rentals,

ρ = Cost of equity of an identical unlevered firm without any leased assets,

V_{LL} = Capitalised value of lease payments (capitalized at rate r),

V_{Dep} = Capitalized value of depreciation (capitalised at rate r), and

V_S = Market value of the unlevered firm with leased assets.

From the above expression it is clear that the cost of capital of the unlevered firm with leased assets increases with increase in leasing. It should be a relatively simple matter from the above to deduce that the cost of capital of a levered firm would also increase with increase in leasing. At the same time we know well that the overall cost of capital

*Young uses the term "Lease levered" firm, a term being avoided advisedly to avoid confusion. Long's perception of leasing as a "financial arrangement" is not at all necessarily to derive expression 11.

of a firm reduces with increase in borrowing. In short then, while leasing increases the cost of capital of a firm, debt reduces the same! Can leasing really be an alternative to debt then? And yet this precisely seems to be the view held by many authors on leasing.

The reasons for this seemingly paradoxical conclusion are not far to seek. The primary block to a clear understanding of the problem comes from a lack of understanding of the distinction between operating expenses and financial charges. One manifestation of this is that interest is more often than not referred to as an expense. In reality, interest is to a lender, what profits are to an owner. In other words interest may be viewed as the profit of an owner who undertakes no risk on his investment. In fact fundamentally in economics, the cost of money has been accorded a very special place and is treated different from the cost of all other physical resources like land, labour, machinery etc. Both interest and profits are costs of money which are nothing but surpluses meant to be generated through the deployment of all other physical resources and to be shared between the lenders and owners commensurate with risks undertaken by them. Thus, while the rental charges on land, building, machinery, labour etc. are regarded as operating expenses, interest is logically enough viewed as a financial charge. Clearly then, lease rentals being rentals on the use of machinery, should legitimately belong to the former category and not the latter. This fundamental difference between lease rentals and interest charges then accounts for the fact that leasing is not a substitute for borrowing.

To get further insight into the problem, consider a firm F. In CAPM, the cost of the firm's equity (K_{ef}) is estimated by the following specification:

$$(12) \qquad K_{ef} = r + \beta_f (K_m - r) = \alpha_f + \beta_f K_m$$

Where K_m = Market rate of return,

r = Borrowing rate, i.e. riskfree rate of return,

β_f = Slope of the regression line,

α_f = Constant term = $r(1-\beta)$, and

β_f indicates the systematic risk of F's equity, which is non-diversifiable by the firm's investors and hence compensated for by the market. Also, if the above firm were to increase its financial leverage, the riskiness of its equity (i.e. β_f) will increase and consequently the market would provide a higher compensation (K_{ef}) for its equity. On similar lines it can be argued that increasing the amount of leasing in the above firm would increase the firm's systematic risk level, by changing the quality of its operating earnings.

In other words, two firms with identical asset deployments and equal financial leverages differing only with respect to the amount of leased assets will have different equity capitalization rates; the one with higher leased assets having the higher rate, and consequentially a higher cost of capital.

The equity capitalization rate (K_{el}) for a levered firm with leased assets can be estimated using the CAPM approach through the following expression:

(13) $$K_{el} = r + B_l (K_m - r)$$

Where B_l = The level of systematic risk associated with the firm, and

K_m = Estimated cost of equity for the market as a whole.

The overall cost of capital (K_{ol}) for the firm would then be given by the weighted average cost of capital equation:

(14) $$K_{ol} = K_{el} \frac{E}{(D+E)} + r \frac{D}{(D+E)}$$

Thus, for a firm resorting to excessive leasing, K_{ol} would be the appropriate discount rate (substituted for K_o) in expressions 9 and 10 to arrive at the net advantage of leasing.

An alternate method of determining K_{el} could be by combining MM's approach (10) with Long's estimation of K_{eu} as given by expression 11. According to MM, the cost of equity capital of the above firm can be determined by the following relationship:

(14) $$K_{el} = \rho_t + (\rho_t - r)(1-T) \frac{D}{E}$$

ρ_t = After tax cost of capital of an unlevered firm in the same risk class as the firm under consideration.

But K_{eu} (as estimated through expression 11 represents the cost of capital of an unlevered firm in the same risk class as the firm under question, since both are assumed to have equal measure of leased assets.

Thus expression 14 becomes:

$$(15) \qquad K_{el} = K_{eu} + (K_{eu} - r)(1-T)\frac{D}{E}$$

VI. CONCLUSION

From the discussions hitherto, it should be clear that leasing cannot be regarded an alternative to borrowing, since clearly while the former increases the cost of capital of a firm, the latter reduces it. Also the fact that leasing affects the debt capacity of a firm does not make it a "financial" decision either, since leasing affects the debt capacity of a firm just as any other operating decision of the firm would affect its debt capacity. For example, the decision of a consumer product firm to enter the shipping line is bound to affect its debt capacity and this fact does not make the decision a financial one.

Also in order to arrive at the net advantage of lease, it is incorrect to discount different components of expression 2 with different rates. This is because the very process of estimating a firm's cost of capital captures the different qualities of different expense streams through the operating earnings. The correct approach for evaluating a lease proposal would therefore be given by expression 10.

ANNEXURE-I

LEASE EVALUATION FORMULAE

The basic lease evaluation approaches suggested by Gordon (7), Schall (13) and Myers, Dill and Bautista (11) have been summarised below. The authors' original expressions have been modified to suit the basic assumptions made in this paper, in order to maintain a uniformity of presentation. As far as possible the original notations have been maintained, and where that has not been possible, the new notations have been duly explained. The reader may compare these and other approaches summarised by Bower (2) with expression 10 in the paper.

1. Myron J. Gordon (7):

$$NAL = \sum_{i=0}^{N} \frac{(M_i)\ (1-T) + TN_i}{(1+r)^i} - \sum_{i=0}^{N} \frac{L_i}{(1+r)^i} + \sum_{i=0}^{N} \frac{TL_i}{(1+r)^i} - \sum_{i=0}^{N} \frac{TDep_i}{(1+r)^i} + \sum_{i=0}^{N} \frac{O_i(1-T)}{(1+r)^i} - \frac{S_N}{(1+K)^N}$$

Where M_i = Payment of interest and principal on the loan during i,

N_i = Amortization of loan's principal for tax purposes, and

K = Discount rate appropriate to the risk of cashflows before taxes and depreciation as a consequence of the deployment of the asset.

Note that Gordon clearly replaces the acquisition cost of the asset with the loan equivalent of lease rentals.

Annexure-I Contd.

2. Lawrence D. Schall (13):

NAL =

$$A = \sum_{i=0}^{N} \frac{\bar{L}_i}{(1+K_1)^i} + \sum_{i=0}^{N} \frac{\bar{TL}_i}{(1+K_2)^i} - \sum_{i=0}^{N} \frac{\bar{TR}_i}{(1+K_3)^i} - \sum_{i=0}^{N} \frac{\bar{TDep}_i}{(1+K_4)^i} + \sum_{i=0}^{N} \frac{\bar{O}_i\,(1-T)}{(1+K_5)^i}$$

Where K_1, K_2, K_3, etc. are the discount rates applied by the market in evaluating the stream of the distribution of the respective cashflows,

R_i is the interest paid at time i on any new debt issued to finance a purchase, and

The bar over a variable signifies the expected value.

3. Stewart C. Myers, David A. Dill and Alberto J. Bautista (11):

$$NAL = A - \sum_{i=0}^{N} \frac{L_i}{(1+r)^i} + \sum_{i=0}^{N} \frac{TL_i}{(1+r)^i} - \sum_{i=0}^{N} \frac{TR_i}{(1+r)^i} - \sum_{i=0}^{N} \frac{TDep_i}{(1+r)^i}$$

Where R_i is the interest on debt displaced by lease in period i.

ANNEXURE-II

EXPLANATION OF EXPRESSION 10

A	$-\sum_{i=0}^{N} \frac{L_i}{(1+K_o)^i}$	$+\sum_{i=0}^{N} \frac{TL_i}{(1+K_o)^i}$	$-\sum_{i=0}^{N} \frac{TI}{(1+K_o)^i}$	$-\sum_{i=0}^{N} \frac{TDep_i}{(1+K_o)^i}$	$+\sum_{i=0}^{N} \frac{O_i(1-T)}{(1+K_o)^i}$	$-\frac{S_N}{(1+K_o)^N}$
n	2	3	4	5	6	7

Component	Explanation of Components	Consequence: Advantage/disanvantage of leasing
1	Acquisition cost of the asset which the firm would save if the asset is leased.	Advantage
2	Present value of the lease rentals which the firm would incur if the asset is leased.	Disadvantage
3	Present value of the tax savings on lease rentals if the asset is leased.	Advantage
4	Present value of tax savings on the interest on the debt component of the acquisition cost of the asset (I = rAD/(D+E)), which is forgone by leasing the asset.	Disadvantage
5	Present value of the tax saving on depreciation forgone by leasing the asset.	Disadvantage
6	Present value of the after tax cash expenses which the firm saves by leasing the asset	Advantage
7	Present value of the after tax salvage value of the asset which is forgone by leasing the asset	Disadvantage
	Aggregate effect	Net Advantage of lease

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