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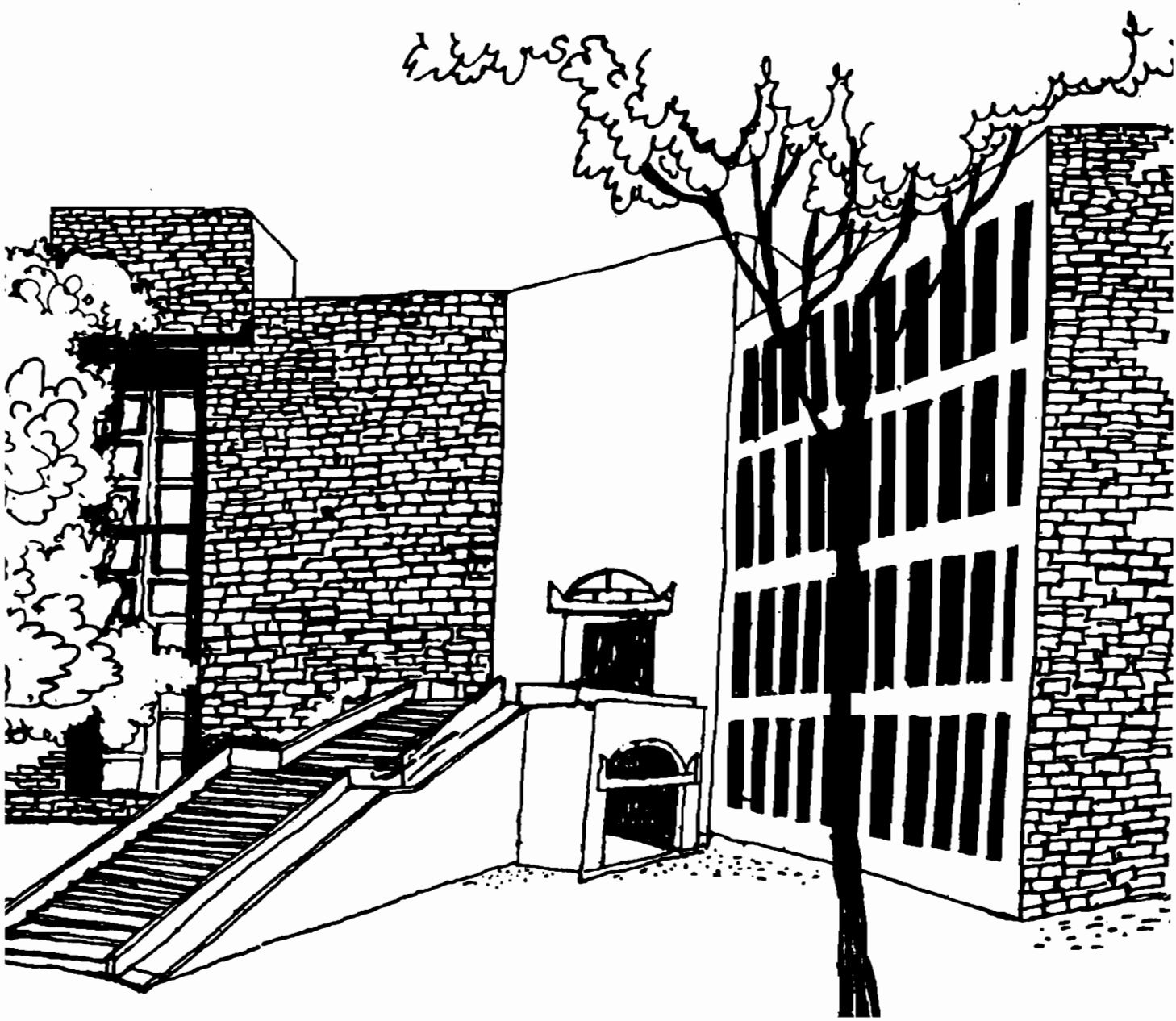

ON WACC SPECIFICATIONS AND CAPITAL STRUCTURE DECISIONS: SOME CONCEPTUAL PROPOSITIONS FOR PRACTICING MANAGERS

By

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Abstract

Recent advances in our understanding of capital structure decisions have not yet made their mark upon our capital budgeting techniques and practices. This paper attempts to bridge this gap. In doing this, it offers a surprisingly simple approach for managers to follow in making financial decisions.

The theory of corporate finance notes two alternative specifications of the weighted average cost of capital for discounting. In one, the cost of debt is specified in pre-tax terms while the tax shield on debt is accounted for in the cash flows. In another, the cost of debt is specified in after tax terms while the tax shield on interest is ignored in the cash flows. Theoretically the two alternative specifications of WACC and cash flows are considered equivalent.

In practical terms, however, what concerns a manager is which of the two specifications he should employ in financial analysis. In this paper, we take the view that the first specification above is superior to the second one on several counts: for one, it is conceptually closer to our intuitive understanding of cost. Further, it facilitates taking explicit account of a number of important considerations such as certain costs which alone can explain capital structures not tending towards 100% debt. It also allows us to explicitly consider tax shields on interest only in time periods in which they can actually be absorbed; it permits us to handle bonds, common in India, where the coupon rate of interest is different from the yield to maturity; and to incorporate the loss in value from equity issues made below market price.

This insight leads us to a resolution of the perennially vexing issue of how to value debt and leases. We go on to propose a simple two-step procedure for making financial decisions. This leads us, in conclusion, to call for a new and more meaningful distinction to replace the conventional distinction between investment decisions and financing decisions.

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I. Introduction

Two major sets of financial decisions must be faced by a practicing manager - how to discount the various cash flows in any capital budgeting decision; and how to decide the overall financing mix for the company. More often than not, the two sets of decisions are treated both by text books and by practitioners as if they are entirely independent.[1] At the academic level, this is no doubt due to the fact that capital budgeting is considered to be a 'solved' and therefore not very interesting issue. At the level of practice, the management levels at which the two decisions are made are entirely different - capital structure, dividend policy, etc. belong to the rarefied world of CEOs and CFOs, whereas capital budgeting is for the analysts in the controller's or treasurer's office.

Since the early 1970's, there have been tremendous advances in our understanding of capital structure theory, which have to some extent influenced the way capital structure decisions are actually being made today. In this paper, we point out that these advances in theory have implications for capital budgeting as well. Fortunately, however, it is possible to retain the simplicity and ease of application which are so desirable in capital budgeting procedures. In fact, we propose a relatively simple two-step solution to the overall capital structure cum capital budgeting problem which explicitly dovetails with the fact that the two kinds of decisions are to be made at different levels in the organization.

We begin the main line of our argument by looking at alternative specifications of the Weighted Average Cost of Capital (WACC). Before we begin, however, we must take note of the fact that WACC is not the only possible method of discounting cash flows.

II. RADR vs WACC

There appear to be two alternative capital budgeting procedures described in the standard finance theory : to employ a single discount rate (the weighted average cost of capital or WACC) for a single set of cash flows, or to employ risk adjusted discount rates (RADRs) for different components of cash flows. In the former scenario, the net cash flows of a project are discounted at the marginal WACC of the firm. The marginal WACC takes into account the riskiness of the project under evaluation and the targeted financial leverage of the firm as a whole. In the latter scenario, each component of cash inflows and outflows belonging to a risk category is discounted at a discount rate appropriate to that category.

For example, cash flows pertaining to a leasing decision may be discounted at a risk free rate of return, since leasing cash flows, like debt cash flows, represent a certain stream of cash flows, while the rest of the uncertain stream of cash flows may be discounted at an appropriate RADR.

It can be argued theoretically that both approaches, so long as they are applied consistently, are acceptable. While we subscribe to this view ourselves, for practical purposes we prefer the WACC

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1 There are exceptions though. Brealey and Myers (1981), for example, discuss the interaction between financing and investment decisions.

approach to the RADR approach for the flexibility and ease of usage which the former offers in comparison to the latter. Some of these considerations are:

1. The RADR approach involves estimating the discount rate for each category of cash flows separately. Thus, while in case of WACC approach, one needs to estimate only the equity capitalization rate appropriate to the project, under the RADR approach one has to estimate several such discount rates.

2. The estimation of RADRs for specific stream of cash flows presents greater problems of estimation than the marginal WACC for a project which essentially involves either using the firm's own equity capitalization rate if the project is in the same risk class as the firm or that of a comparable firm if the project is in a different risk class, and using this rate to arrive at the WACC, given the firm's target debt to equity ratio.

3. Even when CAPM is used for estimating the appropriate RADR, it cannot be applied in its usual linear form which holds only for returns. When cash flows are regressed against market returns, the CAPM relationship turns hyperbolic (see Hull), making the application of CAPM that much more confusing.

4. Given the increasing evidence of different implied utility functions applicable for cash in flows and cash out flows (for example, risk averse for in flows and risk taking for outflows as in Kahneman and Tversky), there are additional complications in estimating the RADRs for cash outflows. On the other hand, when the project net cash flows are discounted at a single rate of WACC, the exercise merely involves having to deal with in flows, so that the usual framework of risk aversion holds.

III. The WACC

However, even when WACC is used as the discount rate, one is faced with two alternative choices. One may capture the tax shield on interest rate either in the discount rate or in the cash flows. The alternative pairs of cash flow and discount rate specifications are (see Nantell & Carlson (1975), Raghunathan and Srinivasan (1987), etc.):

Alternative 1:

$$V = \frac{X(1-t) + rDt}{K} \qquad \ldots (1)$$

where:

V is the value of the firm,
X are the operating cash flows of the firm,
t is the marginal corporate tax rate,
r is the interest rate on debt,
D is the market value of debt

and K is given by:

$$K = K_e \frac{E}{D+E} + r \frac{D}{D+E} \qquad \ldots (2)$$

where:

K is the weighted average cost of capital (WACC)
K_e is the cost of equity
E is the market value of equity
D is the market value of debt
r is the interest rate on debt (as above).

Two points are worth noting here: the cash flows in the numerator include the tax shield from debt; secondly, the discounting is done at the weighted average cost of capital, which has the debt cost incorporated at r, not r (1-t). In other words, the discount rate used is not the 'after-tax cost of debt' but the 'cost of debt', plain and simple. Note also that the entire cash flow, including that part associated with debt, are discounted at the WACC.

Alternative 2:

WACC may also be given by:

$$K' = K_e \frac{E}{D+E} + r(1-t) \frac{D}{D+E} \qquad \ldots (3)$$

i.e., the debt rate used in the WACC is the 'after-tax rate'. In this case, the value of the firm is correctly given by:

$$V = \frac{X\,(1-t)}{K'} \qquad \ldots (4)$$

In other words, if the cash flow incidence of debt is ignored, the value of the firm can be arrived at by discounting the operating cash flows at the WACC given by (3).

Theoretically, according to Nantell and Carlson (1975), it is possible to say that the two specifications are equivalent. However, as Raghunathan and Srinivasan (1987) point out, in practice they yield different NPVs for non zero NPV projects because the non zero NPV of the marginal project changes the implied assumption of the target debt to equity ratio. In other words, the resulting debt to equity ratio of the firm following the acceptance of the project with a non zero NPV is no longer the debt to equity assumed in the computation of the WACC. If however, a project is financed such that the resulting Debt to equity ratio of the firm is the same as the ratio assumed in the WACC, this problem disappears.

However, this problem is more theoretical than real. The more practical (and interesting) differences between these alternative specifications lie elsewhere.

Conceptually, Fig. 1 describes the essence of our argument. We argue here that the notion of an 'after-tax cost of debt' is essentially a confusing one, which we would do better without. Conceptually, the tax shield arising from debt is a cash flow and should be reflected in the numerator, as a cash flow, not in the denominator as some kind of adjustment to the cost. The simplest and most intuitively direct way to think about cost of capital is to think of it as the rate of return demanded by the investor - this is simply r in the case of debt.

The 'equivalence' of (2) and (3) is arrived at because Nantell and Carlson's (1975) definition of WACC is:

$$WACC = \frac{X\,(1-t) + rDT}{V} \qquad \ldots (5)$$

In other words, WACC is defined as that cost of capital which would yield a firm value equal to market value. While this may be algebraically correct, it is surely an odd and roundabout way of thinking about cost. The concept of cost should logically be derived directly from demands made by those external agents who supply finance to the firm: the cost of debt and the cost of equity are best thought of as being independently determined by the marketplace.The investor who supplies debt capital, for instance, has a rate of return he demands as compensation for his capital - this should directly be specified as the cost of debt. In other words, we argue that Figure 1 is the correct way to think about costs of capital.

At the same time, we believe that the formulation (1) is essentially incomplete. If the cash flows in (1) were *all* the cash flows of the firm, then the optimal capital structure point would be achieved at *some* point where debt is extremely high. Indeed, only the existence of bankruptcy costs could yield optimal debt levels other than 100%. Even if bankruptcy costs are significant, should they not be included explicitly in the numerator of (1)? The usual reason they are not included explicitly is because they are so small! Miller (1977) derides the traditional concept of balance between the tax advantages of debt and costs associated with bankruptcy as a 'horse and rabbit stew - one horse and one rabbit'.

To understand this line of argument, we turn to a brief review of recent advances in the theory of optimal capital structure.

IV. Theories of Optimal Capital Structure

Without undertaking a detailed review of the literature on optimal capital structure, it may be safe to say that arguments against a 100% debt capital structure fall into two general categories. For the purposes of this paper, we shall typify these approaches by reference to the works of DeAngelo and Masulis (1980) and Myers (1977, 1984).

The first approach, which we shall refer to as the DM approach, short for DeAngelo and Masulis (1980), hinges on the argument that debt tax shields are not the only tax shields available to the firm. Other tax shields such as investment tax credits, depreciation, and so on, are also available to the firm. In this class of models, the firm strives to approach the point where the expected value of an additional unit of debt is balanced by the expected incremental cost of having to waste a unit of unused tax shield. The incremental cost of wasting a unit of tax shield arises from the fact that, to the investor in the market, the personal tax rate on debt earnings is generally higher than on earnings from equity. If the firm faces a significant probability of not being able to use the additional unit of tax shield from an additional unit of debt, it faces a significant probability of not being able to compensate the investor for holding its debt, in which case the return demanded by the investor will be too high for the company to pay. This, then, defines the optimal capital structure point:

E (value of incremental debt tax shield) = E (cost of foregone tax shield). ... (6)

where the operator E (.) refers to an expected value.

In practice, of course, these values and costs are not easy to work out.

The second class of models (which we shall refer to as the Myers class, in honor of Myers (1977, 1984)), argues that there are real costs to taking on debt in that the levered firm will make suboptimal investment decisions in future because of the debt burden it has to carry. This argument hinges on the

notion that a firm generally has, in addition to projects, a portfolio of options on future projects. If exercising such an option results in a cash flow which is less than the promised payment to debtholders, thereby leaving nothing for shareholders, the firm's management, which may have the interests of shareholders closest to its heart, may let even a positive NPV option go unused. Thus, the presence of debt imposes costs on the firm by reducing the value of its investment options in the future. The optimal capital structure point then may be written as the point where:

E (value of incremental debt tax shield) = E (value of investment option passed up). ... (7)

In both these formulations, an optimal capital structure at debt less than 100% would arise.

V. Completing the WACC Specification

We believe the cash flow specification in (1) is incomplete because it leaves out all the negatives of debt, as described in section IV.

A complete formulation to replace (1) would be:

$$V = \frac{X(1-t) + rDt - E(\text{loss debt})}{K} \qquad \ldots (8)$$

where the E (loss from debt) would include items such as the cost of providing debtholders with a return r which does not bring the firm any further tax shield (as in the DM approach), and the cost of passing up investment options (the Myers approach).

The optimal capital structure point would be given by:

D/(D+E) such that the value of the incremental tax shield from the next unit of debt equals the value of the loss from an additional unit of debt.

The important point to note here is that the approach embodied in WACC specification (1) and (2) allows scope for applying such corrections, since the numerator explicitly specifies all the cash flows to the firm from all possible sources and influences. The approach embodied in (3) and (4) do not allow for such adjustments.

Further Adjustments to Cash Flows

Equally important, especially in the Indian context, are a number of other cash flow considerations associated with debt and equity. Again, the first specification (in (1) and (2)) proves to be superior.

1. The first specification enables a manager to introduce the marginal tax shield on interest in the specific period in which the tax shield is expected to be absorbed. The second specification, however, imposes the rigid assumption that the firm's profitability in each period will be adequate to absorb the firm's marginal interest tax shield applicable to that period. since the first scenario is more general, the first specification is preferable.

2. In general, particularly in India, the coupon rate of interest on public debt differs from its Yield to Maturity. The first specification allows the flexibility of incorporating the tax shield on interest on the basis of the coupon rate of interest, while allowing the use of the YTM rate of interest in the discount rate. The second specification does not allow this flexibility. If the interest rate in the WACC is specified as the coupon rate, the market's expectation of return on the debt which is higher than the coupon rate is ignored and the value of debt is overstated; if the interest rate in the WACC is

specified as the YTM, it implies absorption of tax shield on the YTM rate rather than the coupon rate, so that the tax shield on interest and hence the value of debt is overstated.

3. Further the traditional approach to project evaluation and shareholders' value analysis skirts the issue of the loss in shareholders' value when a public issue of equity is made below the market value. This aspect is particularly relevant in the Indian context.

The loss in current shareholders' wealth may be calculated as follows:

Current market price per share : M

Current No. of shares O/S : N

Issue price per share : m

Amount to be raised : C

No. of shares that ought to have been issued : C/M

No. of shares actually issued : C/m

Ex-Issue price: $(M \times N + C)/(N+C/m)$ ... (9)

Loss in Wealth for each share held for the current shareholder:

$$M - (M \times N + C)/(N+C/m) \quad \ldots (10)$$

Total Loss in Current Shareholders Value

$$= \frac{C}{m}[M - (M \times N + C)/(N+C/m)] \quad \ldots (11)$$

$$= C\,[M/m - (M \times N + C)/(mN+C)] \quad \ldots (12)$$

From the point of view of existing shareholders, this amount must be deducted from their proportion of the NPV of the project, being the loss in the shareholders' value as a consequence of the firm deciding to issue a share worth Rs. M at Rs. m.

VI. Two Crucial Issues: Treating Debt and Lease Cash Flows

We now turn to two specific issues of prime importance to theorists and practitioners alike: at what rate should we discount the cash flows from debt and from leases?

So far as debt is concerned, the standard answer which the received theory of corporate finance has arrived at (see, for instance, Brealey and Myers (1981)) is that after-tax cash flows of debt should be discounted at the after-tax interest rate on the debt - and some similar mechanism should be employed for discounting leases.

Generally, one then proceeds to say that debt being a financing decision, it should be left out of the project evaluation per se and taken to have an NPV of zero. Curiously, the same argument is not always made about leases, although there appears to be a general consensus that a lease contract is very similar to a debt contract and therefore should be discounted at the after-tax cost of debt.

One possible reason for this curious distinction may be seen from Table 1, which details the cash flows from a debt contract and the NPV of its flows, both on a before-tax basis and an after-tax basis.

Table 1 shows that, if the before-tax cash flows of debt are discounted at the before-tax interest rate, the NPV of the debt cash flows is 0 - a fairly trivial result, considering that was how the annuity payments were worked out in the first place.
What is perhaps not so trivial is that when the after-tax cash flows of the debt contract are discounted at the 'after-tax interest rate on debt', the NPV of the cash flows is again found to be 0.

The 'after-tax rate on debt' is defined as

$$r(1-t) \qquad \ldots (13)$$

where

r is the interest rate on the debt, 10% in our numerical example,
t is the marginal corporate tax rate, 60% in our numerical example.

Thus, in our numerical example, r(1-t) works out to 4%.

The *mantra* which is often invoked to explain this result is:

'Discount before-tax flows at a before-tax rate and after-tax flows at an after-tax rate' - which certainly has a pleasing ring to it.

Applying this result to project evaluation, it is argued that, since debt has a zero NPV value anyway, we can afford to ignore it and proceed to do our project evaluation as if it wasn't there at all.

Unfortunately, the same argument cannot be made for the lease contract because generally the NPV of a lease works out to be something other than 0!

However, one may question how it can be said that the NPV of debt is always 0. Taking NPV of debt to mean the marginal contribution of the debt to the value of the firm, surely NPV of debt is 0 only if adroit financial management on the part of the firm's managers has brought the firm to the optimal capital structure point by managing all the costs and benefits we have described in section V above. Facile calculations such as in Table 1 and the invocation of *mantras* like 'discount after-tax cash flows at after-tax rates' cannot justify ignoring the net value of debt.

In the following paragraphs, we outline our recommended approach for treating debt, based upon the arguments we have advanced thus far in this paper.

Treating Debt

One clear implication from the theories of optimal capital structure described in section IV is that the value of debt depends very much upon the debt level of the corporation as a whole - at the project level, it is impossible to specify what the value of debt is. Interestingly enough, this theoretical finding is in consonance with the practical fact we have noted in the first section itself- that capital structure decisions tend to be made at a very high level in the organization, whereas capital budgeting decisions tend to be made lower down, since the debt level of the corporation as a whole is the province of CEOs and CFOs, whereas capital budgetfng exercises are conducted by relatively junior financial analysts and managers.

We suggest that the ideal way to deal with debt is as follows: leave it out of the cash flows of the project financed with the debt (in this we agree with the traditional approach), and value it depending upon the balance of costs and benefits of additional debt, **at the corporate level.**

We must point out that this argument is not identical with the standard call to 'separate investment decisions from financing decisions'. The reason for leaving out the debt cash flows at the project level are twofold: one, that the debt is an obligation of the firm as a whole, to outsiders who will expect to be paid whether the project does well or not; and two, that the value of debt cannot be calculated at the project level at all because the costs and benefits can only be figured out at the corporate level, with due regard to all the investments and tax shields of the firm and all the considerations we have described in the previous section. Thus, although we agree with the traditional approach insofar as the project-level decision is concerned, it is for a different reason.

Treating Leases

We shall restrict our comments here to financial leases, i.e., not short-term, cancelable, operating leases. Financial leases are, in fact, the more common variety of leases in India.

It is generally argued that a lease contract is like a debt contract, hence it should be treated just like debt. The standard argument goes on to say that since a lease is like debt, cash flows associated with it should be discounted at the 'after-tax debt rate', i.e., at r (1-t) (for example Mitchell (1970), Johnson and Lewellen (1972), Wyman (1973), etc.).

On the other hand, Raghunathan (1984, 1987) argues that a lease is more like an operating cost than like debt, so it should be discounted at WACC.

Based on our analysis so far, we answer this question here at two distinct levels: at one level, we recommend that, since formulation (1) and (2) represent the correct valuation approach, the only candidate for lease discount rate is the WACC - in fact, the only candidate for discounting anything at all is the WACC.

This would be, however, a suboptimal approach, as we explain in the next section - there is an even simpler and conceptually more appealing way of dealing with leases.

To begin with, we note that a lease is indeed like debt in the following important dimensions:

1. Its outflows are fixed over time,

2. It is an obligation to be met by the corporation as a whole whether or not the project does well, i.e., the repayment obligation is not tied to any particular project in any way, and,

3. It provides tax shields just like debt.

However, as Raghunathan (1984) points out, characteristics 1 and 3 above are not peculiar to lease alone - several operating cash flows have similar properties.

However, we argue that there is one very important dimension in which the lease contract is indeed peculiarly like debt: the optimal amount of leasing can only be calculated by reference to the corporation as a whole. Indeed, the decision whether to lease or to buy an asset is a decision best made at the corporate level, not at the project level. Even if the firm has no new projects at all, it ought to keep evaluating whether it ought to convert some purchased assets into leased assets, just as it should constantly keep evaluating whether to adjust its debt/equity ratio.

There are other similarities to debt. The risk of interest rate changes affects the lease and debt decisions alike, so that the duration management of assets and liabilities of both pose more or less identical problems. Also, the optimal lease point for a firm depends upon factors exactly like those discussed in section V in the case of debt. In some sense, indeed, the optimal capital structure point

has many solutions, not one - only reference to further constraints such as government regulations, can fix the optimal capital structure point to one mix of debt, equity, and lease.

Thus, we argue that, in the last analysis, evaluation of leases can be done without reference to projects at all, since there is a fundamental qualitative similarity between the leasing and the borrowing decisions.

VII. Deciding on Debt and Lease Levels

In practice, what does this all mean? How should the firm evaluate a debt contract or a lease contract?

In this section, we propose an alternative way of making these decisions, one which is simple in concept and corresponds with practical realities: It is not necessary to get into calculations of the value of debt and lease by discounting cash flows and so on - rather, calculate the value of the incremental tax shield from the debt or lease, and attempt to balance this benefit against the loss from taking on such contracts. The point at which these incremental costs and benefits are equal is the point *upto* which debt and lease should be taken on. Any discounting which needs to be done to weigh the costs and the benefits should be done at WACC.

Notice that we are essentially calling for an iterative procedure here: both the numerator and the denominator will generally change as the debt and lease levels vary. For small changes in debt and lease levels, especially at the margin, one may be able to ignore the effects in the denominator as second-order effects, compared to the changes in the numerator, that is, in the cash flows.

Needless to say, such an involved method is probably neither possible nor desirable in practice. In actual practice, the expected loss from one unit of debt is almost impossible to compute. Managers arrive at an optimal capital structure point essentially by a process of business intuition rather than by computation. What we have pointed out in this paper is that there are a myriad complications which must be considered in determining the optimal debt or lease level, and indeed this is a decision which can only be made at the very highest levels in the corporation's finance function.

Once the optimal debt level is fixed, how is the practicing manager to decide whether the price at *which* a given debt or lease contract is being offered is correct? The answer is again simple - attempt to determine the 'correct' rate for your company, given the risk level you have, and accept the debt or lease contract if the rate is better or equal to that 'correct' rate. One could use debt ratings, for instance, to estimate the risk of one's debt, if such ratings are available.

Thus, we prescribe a two-step process: first determine the optimal capital structure point to decide how much debt and lease you need, second, shop around to get the 'correct' or 'best' rate debt or lease you can.

The point we are making is this - the lease/purchase calculation, for instance, simply need not be done at all! The issue of 'what rate to discount lease at' is simply a non-issue: the answer is: don't discount *it*, period. Discounting individual leases and comparing them with purchase cash flows may probably be a suboptimal way to make the lease decision.

VIII. Separating the Decisions

As Raghunathan (1984) points out, simply because a lease affects the optimal capital structure of the firm, that is not enough to classify it as a financing decision. He points out that there are several investment decisions which have the same effect. In agreeing with this view, we do believe we have made a case here for a different kind of distinction.

The usual practice is to classify decisions as investment decisions or financing decisions and then attempt to keep them separate, on the assumption that they do not affect each other. This assumption, we now know, is not valid any more. 'Financing' decisions like borrowing depend crucially upon tax shields from investment decisions (as in the DM approach). Again, debt levels can distort investment decisions (as in the Myers approach).

We propose instead that we distinguish between corporate-level decisions and project-level decisions. We could think of these as 'overhead' decisions and 'project' decisions. Corporate level or 'overhead' decisions would include decisions about debt levels and lease levels, because they are to be made without reference to specific projects. As the firm's overall portfolio of projects changes, as its horizon of future investment options changes, it should adjust its debt and lease levels continuously. The decision to take on further debt or lease can then be made. At this point, it is pointless to 'evaluate' individual debt or lease contracts except in relation to each other or to other competing debt or lease opportunities.

Project-level decisions include conventional capital budgeting decisions: these should be made without reference to debt or lease arrangements.

Indeed, practicing managers should eliminate the practice of making lease/purchase decisions asset by asset, and focus instead on balancing a corporate portfolio of leased and purchased assets. The crucial factor driving the lease or buy decision is probably the risk of technological obsolescence of equipment, rather than purely financing considerations. Such risks are best managed using a portfolio approach similar to the ones used by investment managers for financial assets.

One of the authors has instituted such a system in an organization - the risk of obsolescence of a particular kind of equipment the firm used rather heavily was managed by judiciously changing the mix of leased and purchased equipment on a monthly basis. Thus, there was no project-level lease/purchase decision made at all - this was a corporate-level decision only.

There should be no assumption that project-level decisions cannot affect corporate-level decisions - if the project is big enough, it certainly will, if it changes the overall project portfolio of the firm significantly. This is what makes the optimal capital structure point a moving target. Such a view appears difficult to deal with in practice, but it corresponds with the realities faced by managers in a dynamic world. We never said it would be easy.

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Table 1

Numerical example showing amortization of debt contract and implications of discounting at before and after-tax rates.

Debt Amount Rs. 100,000	Interest Rate 10%	Term 5 yrs.	Tax Rate 60%

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Borrowing	100,000					
Payment		(26,380)	(26,380)	(26,380)	(26,380)	(26,380)
Principal Repayment		(16,380)	(18,018)	(19,819)	(21,801)	(23,982)
Interest Payment		(10,000)	(8,362)	(6,560)	(4,578)	(2,398)
Tax Shield		6,000	5,017	3,936	2,747	1,439
Before Tax Cash Flow	100,000	(26,380)	(26,380)	(26,380)	(26,380)	(26,380)
Net After Tax Cash flow	100,000	(20,380)	(21,363)	(22,444)	(23,633)	(24,941)
NPV of Net After-Tax Cash Flows discounted at 4%		0				
NPV of Before-Tax Cash Flows discounted at 10%		0				
Principal O/S	100,000	83,620	65,603	45,783	23,982	0

Figure 1: Concept of Costs of Capital