3
Leasing Decisions

Learning Objectives
After going through the chapter student shall be able to understand.

- Terms, types, advantages and disadvantages of Leasing.
- Financial evaluation of lease proposal
- Break Even Lease Rental (BELR) from Lessee’s and Lessor’s point of view
- Cross Border Leasing

1. Leasing

1.1 What is lease: Lease can be defined as a right to use an equipment or capital goods on payment of periodical amount. This may broadly be equated to an instalment credit being extended to the person using the asset by the owner of capital goods with small variation.

1.2 Parties to a Lease Agreement: There are two principal parties to any lease transaction as under:

   Lessor: Who is actual owner of equipment permitting use to the other party on payment of periodical amount.

   Lessee: Who acquires the right to use the equipment on payment of periodical amount.

1.3 Lease vis-à-vis Hire Purchase: Hire-purchase transaction is also almost similar to a lease transaction with the basic difference that the person using the asset on hire-purchase basis is the owner of the asset and full title is transferred to him after he has paid the agreed instalments. The asset will be shown in his balance sheet and he can claim depreciation and other allowances on the asset for computation of tax during the currency of hire-purchase agreement and thereafter.

   In a lease transaction, however, the ownership of the equipment always vests with the lessor and lessee only gets the right to use the asset. Depreciation and other allowances on the asset will be claimed by the lessor and the asset will also be shown in the balance sheet of the lessor. The lease money paid by the lessee can be charged to his Profit and Loss Account. However, the asset as such will not appear in the balance sheet of the lessee. Such asset for the lessee is, therefore, called off the balance sheet asset.
2. Types of Leasing

A lease transaction has many variants relating to the type and nature of leased equipment, amortisation period, residual value of equipment, period of leasing, option for termination of lease etc. Various types of leasing transactions are, therefore, operating in the market on the basis of these variants. The different leasing options may however, be grouped in two broad categories as under:

(a) **Operating Lease** : In this type of lease transaction, the primary lease period is short and the lessor would not be able to realize the full cost of the equipment and other incidental charges thereon during the initial lease period. Besides the cost of machinery, the lessor also bears insurance, maintenance and repair costs etc. The lessee acquires the right to use the asset for a short duration. Agreements of operating lease generally provide for an option to the lessee/lessor to terminate the lease after due notice. These agreements may generally be preferred by the lessee in the following circumstances:

- When the long-term suitability of asset is uncertain.
- When the asset is subject to rapid obsolescence.
- When the asset is required for immediate use to tide over a temporary problem.

Computers and other office equipments are the very common assets which form subject matter of many operating lease agreements.

(b) **Financial Lease**: As against the temporary nature of an operating lease agreement, financial lease agreement is a long-term arrangement, which is irrevocable during the primary lease period which is generally the full economic life of the leased asset. Under this arrangement lessor is assured to realize the cost of purchasing the leased asset, cost of financing it and other administrative expenses as well as his profit by way of lease rent during the initial (primary) period of leasing itself. Financial lease involves transferring almost all the risks incidental to ownership and benefits arising therefrom except the legal title to the lessee against his irrevocable undertaking to make unconditional payments to the lessor as per agreed schedule. This is a closed end arrangement with no option to lessee to terminate the lease agreement subsequently. In such lease, the lessee has to bear insurance, maintenance and other related costs. The choice of asset and its supplier is generally left to the lessee in such transactions. The variants under financial lease are as under:

- Lease with purchase option-where the lessee has the right to purchase the leased assets after the expiry of initial lease period at an agreed price.
- Lease with lessee having residual benefits-where the lessee has the right to share the sale proceeds of the asset after expiry of initial lease period and/or to renew the lease agreement at a lower rental.

In a few cases of financial lease, the lessor may not be a single individual but a group of equity participants and the group borrows a large amount from financial institutions to purchase the leased asset. Such transaction is called ‘Leveraged lease’.
Sales and Lease Back Leasing: Under this arrangement an asset which already exists and is used by the lessee is first sold to the lessor for consideration in cash. The same asset is then acquired for use under financial lease agreement from the lessor. This is a method of raising funds immediately required by lessee for working capital or other purposes. The lessee continues to make economic use of assets against payment of lease rentals while ownership vests with the lessor.

Sales-Aid-Lease: When the leasing company (lessor) enters into an arrangement with the seller, usually manufacturer of equipment, to market the latter’s product through its own leasing operations, it is called a ‘sales-aid-lease’. The leasing company usually gets a commission on such sales from the manufacturers and increases its profit.

Apart from term loan and other facilities available from financial institutions including banks to a promoter to acquire equipment and other capital goods, the promoter now has an alternative option to acquire economic use of capital assets through leasing. The ultimate decision to either approach a financial institution or a leasing company will, however, depend on the nature of each such transaction.

3. Advantages

- The first and foremost advantage of a lease agreement is its flexibility. The leasing company in most of the cases would be prepared to modify the arrangement to suit the specific requirements of the lessee. The ownership of the leased equipment gives them added confidence to enable them to be more accommodative than the banks and other financial institutions.

- The leasing company may finance 100% cost of the equipment without insisting for any initial disbursement by the lessee, whereas 100% finance is generally never allowed by banks/financial institutions.

- Banks/financial institutions may involve lengthy appraisal and impose stringent terms and conditions to the sanctioned loan. The process is time consuming. In contrast leasing companies may arrange for immediate purchase of equipment on mutually agreeable terms.

- Lengthy and time consuming documentation procedure is involved for term loans by banks/institutions. The lease agreement is very simple in comparison.

- In short-term lease (operating lease) the lessee is safeguarded against the risk of obsolescence. It is also an ideal method to acquire use of an asset required for a temporary period.

- The use of leased assets does not affect the borrowing capacity of the lessee as lease payment may not require normal lines of credit and are payable from income during the operating period. This neither affects the debt equity ratio or the current ratio of the lessee.

- Leased equipment is an ‘off the balance sheet’ asset being economically used by the lessee and does not affect the debt position of lessee.
By employing ‘sale and lease back’ arrangement, the lessee may overcome a financial crisis by immediately arranging cash resources for some emergent application or for working capital.

Piecemeal financing of small equipments is conveniently possible through lease arrangement only as debt financing for such items is impracticable.

Tax benefits may also sometimes accrue to the lessee depending upon his tax status.

4. Disadvantages

- The lease rentals become payable soon after the acquisition of assets and no moratorium period is permissible as in case of term loans from financial institutions. The lease arrangement may, therefore, not be suitable for setting up of the new projects as it would entail cash outflows even before the project comes into operation.
- The leased assets are purchased by the lessor who is the owner of equipment. The seller's warranties for satisfactory operation of the leased assets may sometimes not be available to lessee.
- Lessor generally obtain credit facilities from banks etc. to purchase the leased equipment which are subject to hypothecation charge in favour of the bank. Default in payment by the lessor may sometimes result in seizure of assets by banks causing loss to the lessee.
- Lease financing has a very high cost of interest as compared to interest charged on term loans by financial institutions/banks.

Despite all these disadvantages, the flexibility and simplicity offered by lease finance is bound to make it popular. Lease operations will find increasing use in the near future.

5. Financial Evaluation

Steps in financial evaluation of a financial lease:

(a) evaluation of client in terms of financial strength and credit worthiness.
(b) evaluation of security / collateral security offered
(c) financial evaluation of the proposal

The most important part in lease financing is its financial evaluation both from the point of view of lessor and lessee.

5.1 Lessee Perspective: A lease can be evaluated either as an investment decision or as a financing means. If an investment decision has already been made, a firm (lessee) has to evaluate whether it will purchase the asset equipment or acquire it on lease basis. The lease rentals can be taken as interest on debt. Thus leasing in essence is alternating source of financing to borrowing. The lease evaluation thus is debt financing versus lease financing. The decision criterion used is Net Present Value of leasing NPV (L) / Net Advantage of Leasing (NAL). The discount rate used is the marginal cost of capital (Ke) for all cash flows other than lease payments and the pretax cost of long term debt for lease payment (Kd). The value of the interest tax shield is included as forgone cash flow in the computation of NPV (L) / NAL.
3.5 Strategic Financial Management

Calculation of NPV (L) / NAL:

Cost of Asset
Less PV of Lease rentals (LR) (Discounted at \( K_d \))
Add PV of tax shield on LR (Discounted at \( K_e \))
Less PV of interest on debt tax shield. (Discounted at \( K_e \))
Less PV of tax shield on depreciation (Discounted at \( K_e \))
Less PV of salvage value (Discounted at \( K_e \))

If NAL / NPV(L) is +, the leasing alternative to be used, otherwise borrowing alternative would be preferable.

Method I (Normal method): Discount lease rentals at pre tax rates and discount rest of cash flows at post tax rates.

Method II (Alternatively): Discount all cash flows at post tax rates ignoring the cash flow on account of interest tax shield on displaced debt.

Illustration 1

XYZ Co is planning to install a machine which becomes scrap in 3 years. It requires an investment of ₹ 180 lakhs and scrap realizes ₹ 18 lakhs. The company has following options:

1. to take a loan @ 18% and buy that machine, the loan being repayable in 3 equal year end installments.
2. take it on lease @ 444/1000 payable annually for 3 years.

Depreciation is 40% (WDV). Tax rate is 35%. Determine which option is better.

Solution

Pre tax rate is 18%.
Post tax rate is 18%(1-0.35) = 11.7 %.

(a) P.V. of lease rentals
Lease rental for ₹ 180 lakhs × 444/1000 = ₹ 79.92 lakhs p.a.
P.V. of LR = PVIFA (11.7%,3) × ₹ 79.92 lakhs
= 2.414 × ₹ 79.92 lakhs
= ₹ 192.93 lakhs

(b) P.V. of tax shield
Taxes to be paid are = tax rate × amount
= 0.35 × ₹ 79.92 lakhs
= ₹ 27.97 lakhs per year

Present value of tax shield is PVIFA (11.7%,3) × 27.97 i.e., 2.414 × ₹ 27.97
= ₹ 67.52 lakhs
(c) The loan amount is repayable together with the interest at the rate of 18% on loan amount and is repayable in 3 equal installments at the end of each year. The PVAF at the rate of 18% for 5 years is 2.174, the amount payable will be

Annual Payment = \( \frac{\text{₹} 180}{2.174} \) = ₹82.79 lakhs

(d) P.V. of Depreciation

Depreciation for 1st year is 40% of ₹180 lakhs = ₹72 lakhs.
Depreciation for 2nd year is 40% of ₹108 lakhs = ₹43.20 lakhs
Depreciation for 3rd year is 40% of ₹64.80 lakhs = ₹25.92 lakhs
Depreciation tax shield = ₹72.0 lakhs \times 0.35 = ₹25.20 lakhs
= ₹43.20 lakhs \times 0.35 = ₹15.12 lakhs
= ₹25.92 lakhs \times 0.35 = ₹9.07 lakhs

P.V. of Depreciation tax shield = 25.20 PVIF (11.7%,1) + 15.12 PVIF (11.7%,2) + 9.07 PVIF (11.7%,3) = ₹41.18 lakhs

(e) P.V. of interest tax shield in displaced debt:

Assuming purchaser has taken a loan instead of a lease and loan investment as lease investment than.

<table>
<thead>
<tr>
<th>Loan O/S</th>
<th>Interest @ 18%</th>
<th>Instalment</th>
<th>Capital (balancing figure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>180.00</td>
<td>32.40</td>
<td>82.79</td>
<td>50.39</td>
</tr>
<tr>
<td>129.61</td>
<td>23.33</td>
<td>82.79</td>
<td>59.46</td>
</tr>
<tr>
<td>70.15</td>
<td>12.64*</td>
<td>82.79</td>
<td>70.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>180.00</td>
</tr>
</tbody>
</table>

* Balancing figure

Interest tax shield

\[ \text{Interest} \times \text{tax rate} = \text{Interest tax shield} \]

\[ \text{₹}32.40 \text{ lakhs} \times 0.35 = \text{₹}11.34 \text{ lakhs} \]

\[ \text{₹}23.33 \text{ lakhs} \times 0.35 = \text{₹}8.16 \text{ lakhs} \]

\[ \text{₹}12.64 \text{ lakhs} \times 0.35 = \text{₹}4.42 \text{ lakhs} \]

P.V. of tax shield

\[ \text{₹}11.34 \text{ lakhs} \times \text{PVIF} (11.7\%, 1) + \text{₹}8.16 \text{ lakhs} \times \text{PVIF} (11.7\%, 2) + \text{₹}4.42 \text{ lakhs} \times \text{PVIF} (11.7\%, 3) = \text{₹}19.86 \text{ lakhs} \]
(f) PV of Salvage:

Salvage value is 18 lakhs after 3 years. So P.V. of salvage in 3rd year is $18 \times PVIF(11.7\%,3) = 12.92$ lakhs.

**Analysis**:

\[
\text{NPV (L) / NAL} = 180 - 79.92 \times 2.174 + 67.52 - 41.18 - 12.92
\]

\[
= 180 - 173.75 + 67.52 - 19.86 - 41.18 - 12.92 = -0.19
\]

Since NPV of leasing is negative so we prefer borrowing and buying.

### 5.2 Structure of Lease Rentals (LR.):

Lease Rentals are tailor made to enable the lessee to pay from the funds generated from its operations. Example: If profits from the leased plant start from the third year and go on increasing, then lessee will structure the installments of the plant in such a way that he will pay more amount in 4th year and onwards i.e. ballooned lease rentals.

Lease Rentals can be of three types:

1. Deferred Lease Rentals
2. Stepped up Lease Rentals.

**Illustration 2**

**Assuming lease amortised in 5 years, calculate alternate rental structure from the following :**

<table>
<thead>
<tr>
<th>Investment Outlay</th>
<th>₹ 100 Lakh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Tax Rate</td>
<td>20%</td>
</tr>
<tr>
<td>Scrap Value</td>
<td>Nil</td>
</tr>
</tbody>
</table>

**Schemes**

(a) Equal Annual Plan
(b) Stepped Up Plan (15% increase per annum)
(c) Balloon Plan (he pays ₹ 400,000 in the fourth year)
(d) Deferred plan (deferment of 2 years)

**Calculate Lease Rentals.**

**Solution**

(₹ in lakhs)

<table>
<thead>
<tr>
<th>Scheme (a)</th>
<th>100</th>
<th>LR × PVIF (20,1) + LR × PVIF (20,2) + LR × PVIF (20,3) + LR × PVIF (20,4) + LR × PVIF (20,5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>100</td>
<td>LR × PVIFA (20,5)</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>LR × 2.991</td>
</tr>
<tr>
<td>LR</td>
<td></td>
<td>33.434 lakhs per year.</td>
</tr>
</tbody>
</table>
Leasing Decisions

Scheme (b)\[ 100 = LR \times PVIF(20,1) + (1.15) LR \times PVIF(20,2) + (1.15)^2 LR \times PVIF(20,3) + (1.15)^3 LR \times PVIF(20,4) + (1.15)^4 LR \times PVIF(20,5) \]

\( LR = 26.09 \) lakhs per year.

Scheme (c)\[ 100 = LR \times PVIF(20,4) + LR \times PVIF(20,5) \]
\[= 4 \times 0.482 + LR \times 0.402\]
\[= 1.928 + LR \times 0.402\]
\[98.072 = 0.402 \times LR\]
\[LR = 243.96 \) lakhs in first year.

Scheme (d)\[ 100 = LR \times PVIF(20,3) + LR \times (20,4) + LR \times PVIF(20,5) \]
\[= LR \times (0.579 + 0.482 + 0.402)\]
\[= LR \times 1.463\]
\[LR = 68.35 \) lakhs per year.

Example

A leasing company expects a minimum yield of 10% on its investment in the leasing business. It proposes to lease a machine costing `5,00,000 for ten years. Lease payments will be received in advance.

The lease rental can be determined from the following equation:

\[ `5,00,000 = x \times \frac{x}{(1 + 0.1)} + \frac{x}{(1 + 0.1)^2} + \ldots + \frac{x}{(1 + 0.1)^9}\]

where \( x \) = lease rental per annum

\[ `5,00,000 = x + 5.759x\]

\[x = \frac{`5,00,000}{6.759} = `73,976\]

The above solution gives us the present value of one lease rental payment at time 0, plus the present value of nine lease rental payments at the end of each of the next nine years. We can find the present value discount factor for an even stream of cash flows for nine years to the capital recovery factor in D.C.F. analysis, where we recover principal and interest in equal installment during the specified period.

5.3 Evaluation of Lease Methods: There are three methods of evaluating a leasing proposal viz. Present Value analysis, Internal Rate of Return analysis, and the Bower Herringer Williamson method. These are explained below. The principal assumptions made are (a) the borrowing rate is 16% (b) the income tax rate 50% (c) the operating costs are the...
same under lease and 'buy' alternatives (d) depreciation is allowable on straight line basis (e) residual value is 'nil'.

(a) Present Value Analysis: In this method, the present value of the annual lease payments (tax adjusted) is compared with that of the annual loan repayments adjusted for tax shield on depreciation and interest, and the alternative which has the lesser cash outflow will be chosen. The discounting rate is the after tax cost of borrowing i.e. 8% in our example.

Table 1 : Schedule of cash outflows : Leasing alternative

<table>
<thead>
<tr>
<th>End of year</th>
<th>Lease payment ₹</th>
<th>Tax shield cash outflows ₹</th>
<th>After tax of cash outflows ₹</th>
<th>Present value at 8% ₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>73,976</td>
<td>73,976</td>
<td>73,976</td>
<td>73,976</td>
</tr>
<tr>
<td>1-9</td>
<td>73,976</td>
<td>36,988</td>
<td>36,988</td>
<td>2,31,064</td>
</tr>
<tr>
<td>10</td>
<td>–</td>
<td>36,988</td>
<td>(36,988)</td>
<td>(17,125)</td>
</tr>
</tbody>
</table>

Table 2 : Schedule of debt repayments

<table>
<thead>
<tr>
<th>End of year</th>
<th>Interest plus principal payment ₹</th>
<th>Principal amount owing at the end of year ₹</th>
<th>Annual Interest @16% ₹</th>
<th>Principal component ₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>89,127</td>
<td>4,10,873</td>
<td>–</td>
<td>89,127</td>
</tr>
<tr>
<td>1</td>
<td>89,127</td>
<td>3,87,486</td>
<td>65,740</td>
<td>23,387</td>
</tr>
<tr>
<td>2</td>
<td>89,127</td>
<td>3,60,357</td>
<td>61,998</td>
<td>27,129</td>
</tr>
<tr>
<td>3</td>
<td>89,127</td>
<td>3,28,887</td>
<td>57,657</td>
<td>31,470</td>
</tr>
<tr>
<td>4</td>
<td>89,127</td>
<td>2,92,382</td>
<td>52,622</td>
<td>36,505</td>
</tr>
<tr>
<td>5</td>
<td>89,127</td>
<td>2,50,036</td>
<td>46,781</td>
<td>42,346</td>
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<tr>
<td>6</td>
<td>89,127</td>
<td>2,00,915</td>
<td>40,006</td>
<td>49,121</td>
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<tr>
<td>7</td>
<td>89,127</td>
<td>1,43,934</td>
<td>32,146</td>
<td>56,981</td>
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<tr>
<td>8</td>
<td>89,127</td>
<td>77,836</td>
<td>23,029</td>
<td>66,098</td>
</tr>
<tr>
<td>9</td>
<td>90,290*</td>
<td>–</td>
<td>12,454</td>
<td>77,836</td>
</tr>
</tbody>
</table>

*Difference in the last installment is due to rounding off of annuity factor to two decimal points.

Note: In case of buying the asset, the firm will have to borrow ₹ 5,00,000 at 16 per cent p.a. interest. It is assumed that this loan will be repaid with interest in the same period as the term of the lease. This assumption places the loan on an equivalent basis with the lease.
Table 3: Schedule of cash outflows in debt financing

<table>
<thead>
<tr>
<th>End of year</th>
<th>Annual loan repayment at 8%</th>
<th>Interest @16%</th>
<th>Depreciation</th>
<th>Tax shield</th>
<th>Net cash outflows</th>
<th>Present value of cash flows</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td></td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
</tr>
<tr>
<td>0</td>
<td>89,127</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>89,127</td>
<td>89,127</td>
</tr>
<tr>
<td>1</td>
<td>89,127</td>
<td>65,740</td>
<td>50,000</td>
<td>57,870</td>
<td>31,257</td>
<td>28,944</td>
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<td>61,998</td>
<td>50,000</td>
<td>55,999</td>
<td>33,128</td>
<td>28,391</td>
</tr>
<tr>
<td>3</td>
<td>89,127</td>
<td>57,657</td>
<td>50,000</td>
<td>53,829</td>
<td>35,298</td>
<td>28,027</td>
</tr>
<tr>
<td>4</td>
<td>89,127</td>
<td>52,622</td>
<td>50,000</td>
<td>51,311</td>
<td>37,816</td>
<td>27,795</td>
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<tr>
<td>5</td>
<td>89,127</td>
<td>46,781</td>
<td>50,000</td>
<td>48,391</td>
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<td>27,741</td>
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<td>6</td>
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<td>40,006</td>
<td>50,000</td>
<td>45,003</td>
<td>44,124</td>
<td>27,798</td>
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<tr>
<td>7</td>
<td>89,127</td>
<td>32,146</td>
<td>50,000</td>
<td>41,073</td>
<td>48,054</td>
<td>28,015</td>
</tr>
<tr>
<td>8</td>
<td>89,127</td>
<td>23,029</td>
<td>50,000</td>
<td>36,515</td>
<td>52,612</td>
<td>28,410</td>
</tr>
<tr>
<td>9</td>
<td>90,290</td>
<td>12,454</td>
<td>50,000</td>
<td>31,227</td>
<td>59,063</td>
<td>29,532</td>
</tr>
<tr>
<td>10</td>
<td>–</td>
<td>–</td>
<td>50,000</td>
<td>25,000</td>
<td>(25,000)</td>
<td>(11,575)</td>
</tr>
<tr>
<td>(t = tax rate)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,32,205</td>
</tr>
</tbody>
</table>

The present value of cash outflows under lease financing is ₹ 2,87,915 while that of debt financing (i.e., owning this asset) is ₹ 3,32,205. Thus leasing has an advantage over ownership in this case. It has been assumed that the lessor does not pass on tax benefits like additional depreciation to the lessee. Similarly the impact of additional depreciation in the case of buying has been ignored.

(b) Internal rate of return analysis: Under this method there is no need to assume any rate of discount. To this extent, this is different from the former method where the after-tax cost of borrowed capital was used as the rate of discount. The result of this analysis is the after tax cost of capital explicit in the lease which can be compared with that of the other available sources of finance such as a fresh issue of equity capital, retained earnings or debt. Simply stated, this method seeks to establish the rate at which the lease rentals, net of tax shield on depreciation are equal to the cost of leasing. For the above example, the calculation of this rate i.e. cost of leasing is shown below:
### Table 4: Computation of cash flows for internal rate of return

<table>
<thead>
<tr>
<th>End of year</th>
<th>Cost of asset</th>
<th>Lease rental</th>
<th>Depreciation</th>
<th>Additional tax shield on lease rental</th>
<th>Net cash outflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>₹ 5,00,000</td>
<td>₹ 73,976</td>
<td>₹ –</td>
<td>₹ –</td>
<td>₹ 4,26,024</td>
</tr>
<tr>
<td>1</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>2</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>3</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>4</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>5</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>6</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>7</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>8</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>9</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ (61,988)</td>
</tr>
<tr>
<td>10</td>
<td>₹ –</td>
<td>₹ 73,976</td>
<td>₹ 50,000</td>
<td>₹ 11,988</td>
<td>₹ 11,988</td>
</tr>
</tbody>
</table>

**t** = tax rate at 50%

**[(3) - (4)] × t**

In the above table, the last column shows the cash flow stream. When we compute the rate of discount that equates the negative cash flows with the positive cash flows, we get, 5.4% (As shown below). This should be compared with the after tax cost of debt finance i.e. 8%. Since the cost of lease is lower than after tax cost of debt finance, the former should be preferred.

Let us discount cash flows at 5%, then NPV is

\[
4,26,024 + (\₹ 61,988) \times PVIFA(5\%, 9) + \₹ 11,988 \times PVF(5\%, 10)
\]

\[
= 4,26,024 + (\₹ 61,988) \times 7.108 + \₹ 11,988 \times 0.614
\]

\[
= 4,26,024 + (\₹ 4,40,611) + \₹ 7,361 = -\₹ 7,226
\]

Since the value is negative now we shall discount at higher rate say at 6%.

\[
= 4,26,024 + (\₹ 61,988) \times 6.802 + \₹ 11,988 \times 0.558
\]

\[
= 4,26,024 + (\₹ 4,21,642) + \₹ 6,689 = \₹ 11,071
\]

Using interpolation formula

\[
= 5\% + \frac{-7226}{7226 - 11071} \times (6\% - 5\%) = 5\% + \frac{7226}{18297} = 5\% + 0.395\% = 5.395\%\ say\ 5.4\%
\]

It will be noticed that there is no need to assume any cost of capital for discounting purposes in the IRR method unlike the Present value method. The management understands the IRR
better than it does the Present Value. It is, therefore, considered that the IRR method may be preferred to the other methods.

(c) **Bower-Herringer-Williamson Method:** This method segregates the financial and tax aspects of lease financing. If the operating advantage of a lease is more than its financial disadvantage or vice-versa lease will be preferred.

The procedure of evaluation is briefly as follows:

1. Compare the present value of debt with the discounted value of lease payments (gross), the rate of discount being the gross cost of debt capital. The net present value is the financial advantage (or disadvantage).
2. Work out the comparative tax benefit during the period and discount it at an appropriate cost of capital. The present value is the operating advantage (or disadvantage) of leasing.
3. If the net result is an advantage, select leasing.

For the given example:

| Present value of loan payments | 5,00,000 |
| Present value of lease payments discounted at 16% | 4,15,005 |
| i.e. ₹ 73,976 × 5.61 (1+4.61) | |
| Financial advantage | 84,995 |

The present value of comparative tax-benefits i.e., the operating advantage (disadvantage) is calculated below:

**Table 5: Operating advantage (disadvantage) of lease**

<table>
<thead>
<tr>
<th>End of year</th>
<th>Tax shield on leasing</th>
<th>Tax shield on borrowings</th>
<th>Incremental saving in tax due to leasing</th>
<th>Present value factor at 15%</th>
<th>Present value at 15%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4) = (2)–(3)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td>₹</td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
<td>₹</td>
</tr>
<tr>
<td>1</td>
<td>36,988</td>
<td>57,870</td>
<td>(20,882)</td>
<td>0.87</td>
<td>(18,167)</td>
</tr>
<tr>
<td>2</td>
<td>36,988</td>
<td>55,999</td>
<td>(19,011)</td>
<td>0.76</td>
<td>(14,448)</td>
</tr>
<tr>
<td>3</td>
<td>36,988</td>
<td>53,829</td>
<td>(16,841)</td>
<td>0.66</td>
<td>(11,115)</td>
</tr>
<tr>
<td>4</td>
<td>36,988</td>
<td>51,311</td>
<td>(14,323)</td>
<td>0.57</td>
<td>(8,164)</td>
</tr>
<tr>
<td>5</td>
<td>36,988</td>
<td>48,391</td>
<td>(11,403)</td>
<td>0.50</td>
<td>(5,702)</td>
</tr>
<tr>
<td>6</td>
<td>36,988</td>
<td>45,003</td>
<td>(8,015)</td>
<td>0.43</td>
<td>(3,446)</td>
</tr>
<tr>
<td>7</td>
<td>36,988</td>
<td>41,073</td>
<td>(4,085)</td>
<td>0.38</td>
<td>(1,552)</td>
</tr>
<tr>
<td>8</td>
<td>36,988</td>
<td>36,515</td>
<td>473</td>
<td>0.33</td>
<td>156</td>
</tr>
<tr>
<td>9</td>
<td>36,988</td>
<td>31,227</td>
<td>5,761</td>
<td>0.28</td>
<td>1,613</td>
</tr>
<tr>
<td>10</td>
<td>36,988</td>
<td>25,000</td>
<td>11,988</td>
<td>0.25</td>
<td>2,997</td>
</tr>
<tr>
<td><strong>Operating disadvantage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(57,828)</td>
</tr>
</tbody>
</table>

*Note:* The rate of 15% is considered to be the appropriate cost of capital.
3.13 Strategic Financial Management

Since the financial advantage exceeds the operating disadvantage in lease, it is advantageous to go for leasing.

Illustration 3

Evergreen Pvt. Ltd. is considering the possibility of purchasing a multipurpose machine which cost ₹ 10.00 lakhs. The machine has an expected life of 5 years. The machine generates ₹ 6.00 lakhs per year before Depreciation and Tax, and the Management wishes to dispose the machine at the end of 5 years which will fetch ₹ 1.00 lakh. The Depreciation allowable for the machine is 25% on written down value and the Company’s Tax rate is 50%. The company approached a NBFC for a five year Lease for financing the asset which quoted a rate of ₹ 28 per thousand per month. The Company wants you to evaluate the proposal with purchase option. The cost of capital is 12% and for lease option it wants you to consider a discount rate of 16%.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV @ 12%</td>
<td>1.00</td>
<td>0.893</td>
<td>0.797</td>
<td>0.712</td>
<td>0.636</td>
<td>0.567</td>
</tr>
<tr>
<td>PV @ 16%</td>
<td>1.00</td>
<td>0.862</td>
<td>0.743</td>
<td>0.641</td>
<td>0.552</td>
<td>0.476</td>
</tr>
</tbody>
</table>

Solution

Evaluation of Purchase Option

<table>
<thead>
<tr>
<th>Particulars</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial outlay</td>
<td>(10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating profit</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Less : Depreciation</td>
<td>2.50</td>
<td>1.88</td>
<td>1.40</td>
<td>1.06</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>Profit before tax</td>
<td>3.50</td>
<td>4.12</td>
<td>4.60</td>
<td>4.94</td>
<td>5.21</td>
<td></td>
</tr>
<tr>
<td>Less : Tax @ 50%</td>
<td>1.75</td>
<td>2.06</td>
<td>2.30</td>
<td>2.47</td>
<td>2.60</td>
<td></td>
</tr>
<tr>
<td>Profit after tax</td>
<td>1.75</td>
<td>2.06</td>
<td>2.30</td>
<td>2.47</td>
<td>2.60</td>
<td></td>
</tr>
<tr>
<td>Add : Depreciation</td>
<td>2.50</td>
<td>1.88</td>
<td>1.40</td>
<td>1.06</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>Salvage value of machine</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Net cash inflow</td>
<td>4.25</td>
<td>3.94</td>
<td>3.70</td>
<td>3.53</td>
<td>4.40</td>
<td></td>
</tr>
<tr>
<td>Present value factor @ 12%</td>
<td>1.00</td>
<td>0.893</td>
<td>0.797</td>
<td>0.712</td>
<td>0.636</td>
<td>0.567</td>
</tr>
<tr>
<td>Present Values</td>
<td>(10)</td>
<td>3.80</td>
<td>3.14</td>
<td>2.63</td>
<td>2.25</td>
<td>2.49</td>
</tr>
</tbody>
</table>

Net present value of the purchase option is ₹ 4,31,000

Evaluation of Lease Option

<table>
<thead>
<tr>
<th>Particulars</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Profit</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Less : Lease Rent</td>
<td>3.36</td>
<td>3.36</td>
<td>3.36</td>
<td>3.36</td>
<td>3.36</td>
</tr>
<tr>
<td>Profit before tax</td>
<td>2.64</td>
<td>2.64</td>
<td>2.64</td>
<td>2.64</td>
<td>2.64</td>
</tr>
<tr>
<td>Tax @ 50%</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
</tr>
<tr>
<td>Profit after tax</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
</tr>
</tbody>
</table>
Discount factor @ 16% | 0.862 | 0.743 | 0.641 | 0.552 | 0.476
---|---|---|---|---|---
Present values | 1.14 | 0.98 | 0.85 | 0.73 | 0.63

The net present value of lease option is ₹ 4,33,000.
Alternatively it can also be calculated as follows:
(₹ 6.00 lakhs – ₹ 3.36 lakhs)(0.5)X3.274 = ₹ 4,32,168

**Decision** : From the above analysis we observe that NPV of lease option is more than that of purchase option. Hence, lease of machine is recommended.

**Illustration 4**
Bright Limited is considering to acquire an additional sophisticated computer to augment its time-share computer services to its clients. Its has two options:

Either,

(a) to purchase the computer at a cost of ₹ 44,00,000

Or,

(b) to take the computer on lease for 3 years from a leasing company at an annual lease rental of ₹ 10 lacs plus 10% of the gross time-share service revenue. The agreement also requires an additional payment of ₹ 12 lacs at the end of the third year. Lease rentals are payable at the year end and the computer reverts back to lessor after period of contract.

The company estimates that the computer will be worth ₹ 20 lacs at the end of the third year.

The Gross revenue to be earned are as follows :

<table>
<thead>
<tr>
<th>Year</th>
<th>₹ in lacs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
</tr>
</tbody>
</table>

Annual operating cost (excluding depreciation/lease rental) are estimated at ₹ 18 lacs with an additional cost of ₹ 2 lacs for start up and training at the beginning of the first year. These costs are to be borne by the lessee in case of lease arrangement also. The company proposes to borrow @ 16% interest to finance the purchase of the computer and the repayments are to be made as per the following schedule :

<table>
<thead>
<tr>
<th>Year end</th>
<th>Repayment of principal ₹</th>
<th>Interest of year ₹</th>
<th>Total ₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10,00,000</td>
<td>7,04,000</td>
<td>17,04,000</td>
</tr>
<tr>
<td>2</td>
<td>17,00,000</td>
<td>5,44,000</td>
<td>22,44,000</td>
</tr>
<tr>
<td>3</td>
<td>17,00,000</td>
<td>2,72,000</td>
<td>19,72,000</td>
</tr>
</tbody>
</table>

For the purpose of this computation assume that the company uses the straight line method of depreciation on assets and pays 50% tax on its income.
3.15 Strategic Financial Management

You are required to analyse and recommend to the company which of the two options is better. [PV factor @ 8% for year 1 (0.926), year 2 (0.857), year 3 (0.794) and @ 16% for year 1 (0.862), year 2 (0.743) and year 3 (0.641)]

Solution

Working notes:
Depreciation p.a. = (₹ 44 Lakhs – ₹ 20 Lakhs)/3 years = ₹ 8 Lakhs p.a.
Tax advantage on depreciation p.a. = ₹ 8 Lakhs × 0.50 = ₹ 4 Lakhs p.a.
Tax advantage on interest paid = 16% (1 – 0.50) = 8%

Present Value of cash outflow under Leasing Alternative

<table>
<thead>
<tr>
<th>Year</th>
<th>Lease Rent ₹</th>
<th>10% of gross Revenue</th>
<th>Total payment ₹</th>
<th>Tax shield @ 50%</th>
<th>Net cash outflow (₹)</th>
<th>PV factor @ 8%</th>
<th>Total PV ₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10,00,000</td>
<td>4,50,000</td>
<td>14,50,000</td>
<td>7,25,000</td>
<td>7,25,000</td>
<td>0.926</td>
<td>6,71,350</td>
</tr>
<tr>
<td>2</td>
<td>10,00,000</td>
<td>5,00,000</td>
<td>15,00,000</td>
<td>7,50,000</td>
<td>7,50,000</td>
<td>0.857</td>
<td>6,42,750</td>
</tr>
<tr>
<td>3</td>
<td>10,00,000</td>
<td>5,50,000</td>
<td>27,50,000</td>
<td>13,75,000</td>
<td>13,75,000</td>
<td>0.794</td>
<td>10,91,750</td>
</tr>
<tr>
<td>Lump sum payment</td>
<td>12,00,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Present Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24,05,850</td>
</tr>
</tbody>
</table>

Present value of Cash outflow if Computer is bought

<table>
<thead>
<tr>
<th>Year</th>
<th>Initial payment ₹</th>
<th>Interest @ 16% ₹</th>
<th>Total ₹</th>
<th>Tax advantage on interest paid ₹</th>
<th>Tax advantage on Depreciation ₹</th>
<th>Net cash Outflow ₹</th>
<th>PV factor @ 8%</th>
<th>Total PV ₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10,00,000</td>
<td>17,04,000</td>
<td>27,04,000</td>
<td>3,52,000</td>
<td>4,00,000</td>
<td>9,52,000</td>
<td>0.926</td>
<td>8,81,552</td>
</tr>
<tr>
<td>2</td>
<td>17,00,000</td>
<td>22,44,000</td>
<td>39,44,000</td>
<td>2,72,000</td>
<td>4,00,000</td>
<td>15,72,000</td>
<td>0.857</td>
<td>13,47,204</td>
</tr>
<tr>
<td>3</td>
<td>17,00,000</td>
<td>19,72,000</td>
<td>36,72,000</td>
<td>1,36,000</td>
<td>4,00,000</td>
<td>14,36,000 (20,00,000 Salvage)</td>
<td>0.794</td>
<td>11,40,184</td>
</tr>
<tr>
<td>Total Present Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17,80,940</td>
</tr>
</tbody>
</table>

Decision: The present value cash-out flow is less by ₹ 6,24,910 (i.e., 24,05,850 – 17,80,940) if the computer is bought. Therefore, purchase of computer is suggested.

Illustration 5

Outlook Ltd., a small manufacturing firm, is considering the acquisition and the use of a machine. After evaluating equipments offered by seven different manufacturers, it has come to the conclusion that “Z” was the most suitable machine for its needs. Consequently, it has asked the manufacturer’s sales personnel to provide information on alternative financing plans available through their financing subsidiary. The subsidiary presented the two alternatives.
Alternative I was to lease the “Z” equipment for 7 years, which was the machine’s expected useful life. The annual lease payments would be ₹14,700 and would include service and maintenance. Lease payments would be due at the beginning of the year. Lease payments would be fully tax-deductible.

Alternative II would be to purchase the “Z” equipment through 100 per cent loan from the financing subsidiary. The cost of the machine is ₹50,000. It would make seven annual payments of ₹9,935 each to repay the loan of ₹50,000. Payments would be, at the end of each year.

The company’s marginal tax rate in 44%. It has estimated that the equipment has an expected salvage value of ₹1,000. The company plans to depreciate the equipment by using straight-line method. The service and maintenance would cost ₹3,700 annually.

You are required to advise the company on the desirability of the alternative plans, assuming that the rate of interest is 9 per cent p.a.

Note: The relevant PV factors are:

<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVF</td>
<td>1.00</td>
<td>.952</td>
<td>.907</td>
<td>.864</td>
<td>.823</td>
<td>.784</td>
<td>.746</td>
<td>.711</td>
</tr>
</tbody>
</table>

PVF for salvage value: 0.452.

Solution

Alternative I: Leasing decision

<table>
<thead>
<tr>
<th>Year</th>
<th>Lease Rent</th>
<th>Tax on lease rent</th>
<th>Net Payment</th>
<th>P.V. Factor @ 9% (1-0.44)</th>
<th>Present values</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>14,700</td>
<td>-----</td>
<td>14,700</td>
<td>1.000</td>
<td>14,700</td>
</tr>
<tr>
<td>1</td>
<td>14,700</td>
<td>6,468</td>
<td>8,232</td>
<td>0.952</td>
<td>7,837</td>
</tr>
<tr>
<td>2</td>
<td>14,700</td>
<td>6,468</td>
<td>8,232</td>
<td>0.906</td>
<td>7,458</td>
</tr>
<tr>
<td>3</td>
<td>14,700</td>
<td>6,468</td>
<td>8,232</td>
<td>0.863</td>
<td>7,104</td>
</tr>
<tr>
<td>4</td>
<td>14,700</td>
<td>6,468</td>
<td>8,232</td>
<td>0.821</td>
<td>6,758</td>
</tr>
<tr>
<td>5</td>
<td>14,700</td>
<td>6,468</td>
<td>8,232</td>
<td>0.782</td>
<td>6,437</td>
</tr>
<tr>
<td>6</td>
<td>14,700</td>
<td>6,468</td>
<td>8,232</td>
<td>0.745</td>
<td>6,133</td>
</tr>
<tr>
<td>7</td>
<td>---</td>
<td>6,468</td>
<td>(6,468)</td>
<td>0.709</td>
<td>(4,586)</td>
</tr>
</tbody>
</table>

Present value of cash outflow: 51,841

Alternative II: Buying decision

<table>
<thead>
<tr>
<th>Year (1)</th>
<th>Loan Payment (2) ₹</th>
<th>Interest (3) ₹</th>
<th>Balance (4) ₹</th>
<th>Repayment (5) = (2) - (3) ₹</th>
<th>Maintenance (6) ₹</th>
<th>Depreciation (7) (7) x 0.44 ₹</th>
<th>Tax shield (8) (6)+(3)+(7)x 0.44 ₹</th>
<th>Outflow (9)=(2)+(6)-(8) ₹</th>
<th>P.V. Factor @ 9% (1-0.44)</th>
<th>Present values ₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9,935</td>
<td>4,500</td>
<td>50,000</td>
<td>5,435</td>
<td>3,700</td>
<td>7,000</td>
<td>6,688</td>
<td>6,947</td>
<td>0.952</td>
<td>6,614</td>
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<td>2</td>
<td>9,935</td>
<td>4,011</td>
<td>44,565</td>
<td>5,924</td>
<td>3,700</td>
<td>7,000</td>
<td>6,473</td>
<td>7,162</td>
<td>0.906</td>
<td>6,489</td>
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<td>3</td>
<td>9,935</td>
<td>3,478</td>
<td>38,641</td>
<td>6,457</td>
<td>3,700</td>
<td>7,000</td>
<td>6,238</td>
<td>7,397</td>
<td>0.863</td>
<td>6,384</td>
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</table>
3.17 Strategic Financial Management

<table>
<thead>
<tr>
<th></th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>9,935</td>
<td>2,897</td>
<td>32,184</td>
<td>7,038</td>
<td>3,700</td>
<td>7,000</td>
<td>5,983</td>
</tr>
<tr>
<td>5</td>
<td>9,935</td>
<td>2,263</td>
<td>25,146</td>
<td>7,672</td>
<td>3,700</td>
<td>7,000</td>
<td>5,704</td>
</tr>
<tr>
<td>6</td>
<td>9,935</td>
<td>1,573</td>
<td>17,474</td>
<td>8,362</td>
<td>3,700</td>
<td>7,000</td>
<td>5,400</td>
</tr>
<tr>
<td>7</td>
<td>9,935</td>
<td>823</td>
<td>9,112</td>
<td>9,112</td>
<td>3,700</td>
<td>7,000</td>
<td>5,070</td>
</tr>
<tr>
<td>7</td>
<td>Salvage</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>(1,000)</td>
</tr>
</tbody>
</table>

**Present value of cash out flows** 43,470

**Decision**: Since the present value of cashflow is lowest for Alternative II, it is suggested to purchase the machine.

6. **Break Even Lease Rental (BELR)**

Break-Even Lease Rental can be from both point of views i.e. from lessee’s view as well as lessor’s point of view.

**6.1 Break Even Lease Rental (BELR) from Lessee’s point of view**: From the point of view of lessee the BELR is the rental at which the lessee is indifferent between borrowing and buying option and lease financing option. In other words he can opt for any one option. At this rental the Net Advantage of leasing (NAL) will be zero. In other words it can also be defined as maximum lease rental the lessee would be willing to pay. In case if BELR is less than the actual rent payable, the lease option would not be viable.

**Illustration 6**

The following investment proposal is available to XYZ Ltd.

- **Initial Investments** 18 crores
- **Life of Machine** 3 years
- **Net Salvage value of machine after 3 year** 180 lakh
- **Depreciation (WDV Method)** 40%

From above data compute the BELR, if other option of borrowing at a rate of interest of 17% per annum is available. Further, you may also assume that the cost of capital to the company is 12% and applicable tax rate is 35%.

**Solution**

Let BELR be L. Since at BELR the NAL will be zero, we shall first compute NAL and will be put it equal to zero to compute BELR.

**NAL**

\[
\begin{align*}
\text{Initial Outlay} & = 1800 \text{ lakh} \\
\text{Less: - Present Value of Lease Rent (W1)} & = 2.210 \text{ L} \\
\text{Add: - Tax shield on Lease Rent. (W2)} & = 0.7735 \text{ L} \\
\text{Less: - PV of Tax Benefit on Dep. (W3)} & = 410.135 \text{ Lakhs} \\
\text{Less: - PV of Tax benefit on interest (W4)} & = 186.27 \\
\text{Less: - PV of Net Salvage Value (W5)} & = 128.16 \\
\end{align*}
\]

\[
\text{NAL} = 1075.435 \text{ lakh} - 1.4365 \text{ L}
\]

Since NAL should be equal to zero.
Then ₹ 1075.435 lakh – 1.4365 L = 0
Accordingly, L = 748.65 Lakh i.e. Break Even Lease Rental = ₹ 748.65 lakh or ₹ 7.4865 crore

Working Notes:

**W1**

L X PVIFA (17%, 3) = 2.210 L

**W2**

L X PVIFA (17%, 3) X 0.35 = 0.7735L

**W3**

Calculation of Present Value of Tax Benefits on Depreciation

<table>
<thead>
<tr>
<th>Year</th>
<th>WDV (₹ Lakhs)</th>
<th>Depreciate (₹ Lakhs)</th>
<th>Tax Benefit (₹ Lakhs)</th>
<th>PVF@12%</th>
<th>PV (₹ Lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1800</td>
<td>720</td>
<td>252</td>
<td>0.893</td>
<td>225,036</td>
</tr>
<tr>
<td>2</td>
<td>1080</td>
<td>432</td>
<td>151.20</td>
<td>0.797</td>
<td>120,506</td>
</tr>
<tr>
<td>3</td>
<td>648</td>
<td>259.20</td>
<td>90.72</td>
<td>0.712</td>
<td>64,593</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>410.135</td>
</tr>
</tbody>
</table>

**W4**

Calculation of PV of Tax Benefit on Interest

First of all we shall calculate annual installment

\[
\text{Installment} = \frac{1800 \text{ Lakh}}{2.210} = 814.48 \text{ Lakh}
\]

Now we shall calculate interest element included in installment amount

<table>
<thead>
<tr>
<th>Year</th>
<th>Installment (₹ Lakhs)</th>
<th>Opening Value (₹ Lakhs)</th>
<th>Interest (₹ Lakhs)</th>
<th>Principal Repayment (₹ Lakhs)</th>
<th>Closing Value (₹ Lakhs)</th>
<th>Tax Benefit (₹ Lakhs)</th>
<th>PVF@12%</th>
<th>PV (₹ Lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>814.48</td>
<td>1800</td>
<td>306</td>
<td>508.48</td>
<td>1291.52</td>
<td>107.10</td>
<td>0.893</td>
<td>95.64</td>
</tr>
<tr>
<td>2</td>
<td>814.48</td>
<td>1291.52</td>
<td>219.56</td>
<td>594.92</td>
<td>696.60</td>
<td>76.85</td>
<td>0.797</td>
<td>61.25</td>
</tr>
<tr>
<td>3</td>
<td>814.48</td>
<td>696.60</td>
<td>117.88*</td>
<td>696.60</td>
<td>-</td>
<td>41.26</td>
<td>0.712</td>
<td>29.38</td>
</tr>
</tbody>
</table>

* Balancing Figure

**W5**

Salvage Value at the end of 3 year = ₹ 180 Lakh

PVF @ 12% = 0.712

PV of salvage Value = ₹ 180 lakh x 0.712 = ₹ 128.16 Lakhs.
3.19 Strategic Financial Management

6.2 Break Even Lease Rental (BELR) from Lessor’s point of View

From the lessor’s viewpoint, BELR is the minimum (floor) lease rental, which he should accept. In this case also NAL should be zero. Any lease rent below BELR should not be accepted. It is to be noted that while computing NAL, the over all cost of capital of the firm should be used. The computation of BELR from lessor’s point of view can be understood with the help of following illustration.

Illustration 7

With the following data available compute the BELR that ABC Ltd. should charge from lessee.

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Machine</td>
<td>₹ 150 Lakh</td>
</tr>
<tr>
<td>Expected Useful Life</td>
<td>5 year</td>
</tr>
<tr>
<td>Salvage Value of Machine at the end of 5 years</td>
<td>₹ 10 lakh</td>
</tr>
<tr>
<td>Rate of Depreciation (WDV)</td>
<td>25%</td>
</tr>
<tr>
<td>Ko</td>
<td>14%</td>
</tr>
<tr>
<td>Applicable Tax Rate</td>
<td>35%</td>
</tr>
</tbody>
</table>

Machine will constitute a separate block for depreciation purpose.

Solution

Cost of Machine ₹ 150,00,000
Less: - PV of Salvage Value (W1) ₹ 5,19,400
Less: PV of Tax benefit on Depreciation (W2) ₹ 27,34,184
Less: PV of Tax Saving on STCL at the end of 5 year (W3) ₹ 6,80,478
 ₹ 110,65,938
PVIFA for 5 years @14% 3.433
After tax Break Even Lease Rental = \( \frac{110,65,938}{3.433} \) = ₹ 32,23,400

Before Tax BELR = \( \frac{32,23,400}{1-0.35} \) = ₹ 49,59,100

Working Notes

W1
Salvage Value = ₹ 10,00,000
PVF @14% = 0.5194
PV of Salvage Value = ₹ 5,19,400

W2
Table showing calculation of PV of Tax Benefit on Depreciation
### Leasing Decisions

<table>
<thead>
<tr>
<th>Year</th>
<th>Opening WDV</th>
<th>Depreciation @ 25%</th>
<th>Closing WDV</th>
<th>FVF @14%</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>₹150,00,000</td>
<td>₹37,50,000</td>
<td>₹11,250,000</td>
<td>0.877</td>
<td>₹32,88,750</td>
</tr>
<tr>
<td>2</td>
<td>₹112,50,000</td>
<td>₹28,12,500</td>
<td>₹84,37,500</td>
<td>0.769</td>
<td>₹21,62,813</td>
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<tr>
<td>3</td>
<td>₹84,37,500</td>
<td>₹21,09,375</td>
<td>₹63,28,125</td>
<td>0.675</td>
<td>₹14,23,828</td>
</tr>
<tr>
<td>4</td>
<td>₹63,28,125</td>
<td>₹15,82,031</td>
<td>₹47,46,094</td>
<td>0.592</td>
<td>₹9,36,562</td>
</tr>
</tbody>
</table>

Tax Benefit on Depreciation = ₹78,11,953 X 0.35 = ₹27,34,184

**W3**

PV of Tax benefit on Short Term Capital Loss (STCL)

- WDV at beginning of 5 year as per above table: ₹47,46,094
- Less: Salvage Value: ₹10,00,000
- STCL: ₹37,46,094
- Tax Benefit: ₹13,11,133
- PVF at 14%: 0.519
- PV of Tax Benefit on STCL: ₹6,80,478

### 7. Cross-Border Leasing

Cross-border leasing can be considered as an alternative to equipment loans in some emerging foreign market, where finance leases are treated as conditional sales agreements. The only difference between international leasing and loans will be the documentation, with down payments, payment streams, and lease-end options the same as offered under **Equipment Loans to Foreign Buyers**. The various kinds of leasing arrangements available in the U.S. market are not yet feasible in most cases for cross-border leasing transactions. There are however, attempts to develop more flexible international leasing structures for export financing. Operating leases may be feasible for exports of large equipment with a long economic life relative to the lease term.

Cross-border leasing is a leasing arrangement where lessor and lessee are situated in two different countries. This raises significant additional issues relating to tax avoidance and tax shelters.

Cross-border leasing has been widely used in some European countries, to arbitrage the difference in the tax laws of different countries. Typically, this rests on the premise that, for tax purposes, some assign ownership and the attendant depreciation allowances to the entity that has legal title to an asset, while others assign it to the entity that has the most of the use (legal title being only one of several factors taken into account). In these cases, with sufficiently long leases (often 99 years), an asset can end up with two effective owners, one each in different countries, this is often referred to as a double-dip lease.
Often the original owner of an asset is not subject to taxation in any country and therefore not able to claim depreciation. The transaction often involves an entity selling an asset (such as sewerage system or power plant) to an investor (who can claim depreciation), and long-term leasing it right back (often referred to as a sale leaseback).

Leasing techniques had been used for financing purposes for several decades throughout the world. The practice was developed as a method of financing aircraft. Several airlines entities in the early 1970s were unprofitable and very capital intensive. These airlines had no need for the depreciation deductions generated by their aircraft and were significantly more interested in reducing their operating expenses. A very prominent bank purchased aircraft and leased them to the airlines and because the bank was able to claim depreciation deductions for those aircraft, the bank was able to offer lease rates that were significantly lower than the interest payments that airlines would have to pay on an aircraft purchase loan (and most commercial aircraft flying today are operated under a lease). In the United States, this spread into leasing the assets of U.S. entities and governmental entities and eventually evolved into cross-border leasing.

One significant evolution of the leasing industry involved the collateralization of lease obligations in sale leaseback transactions. For example, an entity would sell an asset to a bank, the bank would require lease payment and give an entity an option to repurchase the asset, the lease obligations were low enough (due to the depreciation deductions the banks were now claiming) so that the entity could pay for the lease obligations and fund the repurchase of the asset by depositing most but not all of the sale proceeds in an interest bearing account. This resulted in the entity having pre-funded all of its lease obligations as well as its option to repurchase the asset from the bank for less than the amount received in the initial sale of the asset so the entity would be left with additional cash after having pre-funded all of its lease obligations.

This gave the appearance of entities entering into leasing transactions with banks for a fee. By the late 1990s many of such leasing transactions were with entities in Europe. However, in 1999 cross border leasing in the United States was “stopped” by the effective shutdown of LILOs (lease-in/lease outs). LILOs were significantly more complicated than the typical lease where an owner (for example) would lease an asset to a bank and then lease it back from the bank for a shorter period of time.

Cross-border leasing has been in practice as a means of financing infrastructure development in emerging nations. Cross-border leasing may have significant applications in financing infrastructure development in emerging nations – such as rail and air transport equipment, telephone and telecommunications equipment and assets incorporated into power generation and distribution systems and other projects that have predictable revenue streams.

A major objective of cross-border leases is to reduce the overall cost of financing through utilization by the lessor of tax depreciation allowances to reduce its taxable income. The tax savings are passed through to the lessee as a lower cost of finance. The basic prerequisites are relatively high tax rates in the lessor’s country liberal depreciation rules and either very flexible or very formalistic rules governing tax ownership.
Other important objectives of cross border leasing include the following:

- The lessor is often able to utilize nonrecourse debt to finance a substantial portion of the equipment cost. The debt is secured by among other things, a mortgage on the equipment and by an assignment of the right to receive payments under the lease.
- Also, depending on the structure, in some countries the lessor can utilize very favourable “leveraged lease” financial accounting treatment for the overall transaction.
- In some countries, it is easier for a lessor to repossess the leased equipment following a lessee default because the lessor is an owner and not a mere secured lender.
- Leasing provides the lessee with 100% financing.

While details may differ from one transaction to another, most leasing structures are essentially similar and follow the “sale-leaseback” pattern. The principal players are (i) one or more equity investors; (ii) a special purpose vehicle formed to acquire and own the equipment and act as the lessor; (iii) one or more lenders, and (iv) the lessee. The lease itself is a “triple-net lease” under which the lessee is responsible for all costs of operation, maintenance and insurance.

In many transactions, the lessee’s fixed payment obligations are prefunded or “defeased” through an up-front payment (in an amount equal to the present value of the fixed payment obligations) to a financial entity that assumes such obligations. The benefits of defeasance include (i) the lessee can lock in its financial savings by making the defeasance payment; (ii) by routing the lease payments through the defeasance entity’s jurisdiction, withholding taxes applicable to lease payments in the lessee’s jurisdiction may possibly be avoided; (iii) defeasance serves to some extent as a credit enhancement technique for the lessor, and (iv) defeasance may eliminate or reduce currency risk exposure.

In order for the lessor to obtain the tax benefits associated with equipment leasing, most countries require that the lease be treated as a “true lease” for tax purposes, as opposed to a conditional sale or other secured financing arrangement. This objective generally can be satisfied if the lessor has “tax ownership” of the leased equipment.

Each country applies differing rules for determining whether the party acting as lessor under a cross-border lease is the “owner” of the leased asset for tax purposes and is thereby entitled to claim tax allowances. In the United States and some other countries, the principal focus is on whether the lessor possesses substantially all attributes of economic ownership of the leased asset. Other countries such as the United Kingdom and Germany apply more formalistic property law concepts and focus primarily on the location of legal title, although these countries usually also require that the lessor have some attributes of economic ownership or, at least, that the lessee have only a minimal economic interest in the equipment. In Japan, ownership of legal title is essential, but the lessor is only required under current law to obtain nominal incidents of economic ownership (all that is required is that the lease will provide a return of the equity investment plus a pre-tax profit of 1% of equipment cost). While Japan does have detailed tax lease guidelines, these guidelines are designed primarily to circumscribe the tax benefits available to the lessor in a cross-border lease to prevent undue
tax deferral; they do not require the lessor to have a significant economic interest in the leased equipment.

The non-tax issues associated with cross-border leasing can best be described by reference to the various structural risks that may arise in a given transaction and must be addressed in the documentation.

**Summary**

1. **Leasing**
   1.1 **What is lease?**
   Lease can be defined as a right to use an equipment or capital goods on payment of periodical amount.

1.2 **Parties to a lease agreement**
   There are two principal parties to any lease transaction as under:

   **Lessor:** Actual owner of equipment

   **Lessee:** Acquirer of right to use the equipment on payment of periodic amount.

1.3 **Lease vis-à-vis Hire Purchase**
   Basic difference is that the person using the asset on hire-purchase basis is the owner of the asset and full title is transferred to him after he has paid the agreed instalments.

2. **Types of Leasing**
   (a) **Operating Lease**
      - Primary lease period is short so, the full cost of the equipment may not be realized.
      - The lessor also bears insurance, maintenance and repair etc apart from equipment cost.

   (b) **Financial Lease**
      - Financial lease is a long-term arrangement, generally comprising the full economic life of the leased asset.
      - Lessor is assured to realize the cost of purchasing, associated expenses plus some profit by way of lease rents.
      - In a few cases of financial lease, the lessor may not be a single individual but a group of equity participants which borrows a large amount from financial institutions to purchase the leased asset. Such transaction is called ‘Leveraged lease’.

**Sales and Lease Back Leasing**

This is a method of raising funds immediately required by lessee by transferring its asset’s ownership to lessor and continues to make its economic use against payment of lease rentals.
Sales-Aid-Lease

- Lessor enters into an arrangement with the seller, usually manufacturer of equipment, to market the latter’s product through its own leasing operations.
- Lessor usually gets a commission on such sales from the manufactures and doubles its profit.

3. Advantages of Leasing

- Flexibility.
- The leasing company may finance 100% cost of the equipment.
- Leasing is time saving and involves quick documentation.
- Operating lease safeguards lessee against obsolescence.
- Leasing does not affect the borrowing capacity of the lessee.
- Leased equipment is an ‘off the balance sheet’ asset being economically used by the lessee and does not affect the debt position of lessee.
- ‘Sale and lease back’ arrangement helps lessee overcomes a financial crisis immediately.
- Leasing is convenient for small equipments where debt financing is impracticable.
- Tax benefits may also sometimes accrue to the lessee depending upon his tax status.

4. Disadvantages of Leasing

- May not be suitable for setting up of the new projects.
- The seller’s warranties for satisfactory operation of the leased assets may sometimes not be available to lessee.
- Default in payment by the lessor may sometimes result in seizure of assets by banks causing loss to the lessee.
- Involves high interest cost as compared to financial institutions/banks financing.

5. Financial Evaluation

Steps in financial evaluation:

(a) Evaluation of client in terms of financial strength and credit worthiness.
(b) Evaluation of security / collateral security offered
(c) Financial evaluation of the proposal

The most important part in lease financing is its financial evaluation both from the point of view of lessor and lessee.
5.1 Lessee Perspective

Calculation of NPV (L) / NAL (Net Advantage of Leasing):

Cost of Asset

Less: PV of Lease rentals (LR) (Discounted at \(K_d\))

Add: PV of tax shield on LR (Discounted at \(K_e\))

Less: PV of interest on debt tax shield (Discounted at \(K_e\))

Less: PV of tax shield on depreciation (Discounted at \(K_e\))

Less: PV of salvage value (Discounted at \(K_e\))

If NAL / NPV(L) is +, the leasing alternative to be used, otherwise borrowing alternative would be preferable.

Method I (Normal method): Discount lease rentals at pre-tax rates and discount rest of cash flows at post tax rates.

Method II (Alternatively): Discount all cash flows at post tax rates ignoring the cash flow on account of interest tax shield on displaced debt.

5.2 Structure of Lease Rentals (L.R.): Lease Rentals are tailor made to enable the lessee to pay from the funds generated from its operations.

5.3 Evaluation of Lease Methods: There are three methods of evaluating a leasing proposal viz. Present Value analysis, Internal Rate of Return analysis, and the Bower Herringer Williamson method.

(a) Present Value Analysis: In this method, the present value of the annual lease payments (tax adjusted) is compared with that of the annual loan repayments adjusted for tax shield on depreciation and interest, and the favourable alternative will be chosen.

(b) Internal rate of return analysis: This method seeks to establish the rate at which the lease rentals, net of tax shield on depreciation are equal to the cost of leasing.

(c) Bower-Herringer-Williamson Method: This method segregates the financial and tax aspects of lease financing. If the operating advantage of a lease is more than its financial disadvantage or vice-versa lease will be preferred.

6. Break Even Lease Rental (BELR)

Break-Even Lease Rental can be from both point of views i.e. from lessee’s view as well as lessor’s point of view.

6.1 Break Even Lease Rental (BELR) from Lessee’s point of view

The rental at which the lessee is indifferent between borrowing and buying option and lease financing option. At this rental the Net Advantage of leasing (NAL) will be zero.

6.2 Break Even Lease Rental (BELR) from Lessor’s point of View

BELR is the minimum (floor) lease rental, which he should accept. In this case also NAL should be zero.
7. **Cross-Border Leasing**

- Cross-border leasing is a leasing arrangement where lessor and lessee are situated in two different countries.
- Cross-border leasing can be considered as an alternative to equipment loans in some emerging foreign market, where finance leases are treated as conditional sales agreements.
- The only difference between international leasing and loans will be the documentation, with down payments, payment streams, and lease-end options.
- A major objective of cross-border leasing is to reduce the overall financing cost of lessee as tax savings on depreciation allowances are passed by lessor to the lessee.