

CHAPTER 25

Solved Problems

P.25.16 The following data are furnished by the Hypothetical Leasing Ltd (HLL):

Investment cost	Rs 500 lakh
Primary lease term	5 years
Estimated residual value after the primary period	Nil
Pre-tax required rate of return	24 per cent

The HLL seeks your help in determining the annual lease rentals under the following rental structures:

(a) Equated, (b) Stepped (an annual increase of 15 per cent), (c) Ballooned (annual rental of Rs 80 lakh for years 1–4) and (d) Deferred (2 years deferment period).

You are required to compute the relevant annual rentals.

Solution

(a) Equated annual lease rentals, Y:

$$Y = \text{Investment cost} / \text{PVIFA}(24, 5 \text{ years}) = \text{Rs } 500 \text{ lakh} / 2.745 = \text{Rs } 182.15 \text{ lakh}$$

(b) Stepped lease rental (assuming annual increase of 15 per cent annually), Y:

$$Y \times \text{PVIF}(24, 1) + (1.15)Y \times \text{PVIF}(24, 2) + (1.15)^2 Y \times \text{PVIF}(24, 3) + (1.15)^3 Y \times \text{PVIF}(24, 4) + (1.15)^4 Y \times \text{PVIF}(24, 5) = \text{Rs } 500 \text{ lakh.}$$

$$\text{Or } 0.806Y + 0.7475Y + 0.693Y + 0.6433Y + 0.5894Y = \text{Rs } 500 \text{ lakh}$$

$$\text{Or } 3.4792Y = \text{Rs } 500 \text{ lakh or } Y = \text{Rs } 500 \text{ lakh} / 3.4792 = \text{Rs } 143.71 \text{ lakh}$$

Lease rentals (year-wise) (in lakh of rupees)					
Year	1	2	3	4	5
Lease rent	143.71	165.26	190.05	218.56	251.34

(c) Ballooned lease rental (Rs 80 lakh for years, 1 – 4)

$$\text{Rs } 80 \text{ lakh} \times \text{PVIFA}(24, 4) + Y \times \text{PVIF}(24, 5) = \text{Rs } 500 \text{ lakh}$$

$$\text{Rs } 80 \text{ lakh} \times 2.404 + 0.341Y = \text{Rs } 500 \text{ lakh}$$

$$0.341Y = \text{Rs } 500 \text{ lakh} - \text{Rs } 192.32 \text{ lakh} = \text{Rs } 307.68 \text{ lakh}$$

$$\text{or } Y = \text{Rs } 307.68 / 0.341 = \text{Rs } 902.29 \text{ lakh (ballooned payment)}$$

(d) Deferred lease rental (deferment of 2 years)

Denoting Y as the equated annual rental to be charged between years 3–5,

$$Y \times \text{PVIF}(24, 3) + Y \times \text{PVIF}(24, 4) + Y \times \text{PVIF}(24, 5) = \text{Rs } 500 \text{ lakh}$$

$$0.524Y + 0.423Y + 0.341Y = \text{Rs } 500 \text{ lakh}$$

$$Y = \text{Rs } 500 \text{ lakh} / 1.288 = \text{Rs } 388.20 \text{ lakh.}$$

P.25.17 Mr X, the Finance Manager of ABC Ltd, had almost decided to finance the purchase of Rs 20 lakh in new computer equipment with 16 % long-term debt when he was contacted by First Leasing Company Ltd. The manager of the leasing company tried to convince Mr X that leasing the equipment would be more beneficial to ABC Ltd.

If ABC borrowed, the firm would be required to pay 16 per cent interest on the borrowed funds plus an annual sinking fund payment of Rs 2,00,000. The equipment has an expected life of 10 years, with an anticipated salvage value of Rs 4,00,000. The firm uses the straight line method of depreciation, and is in the 50 per cent tax bracket.

The leasing company is willing to lease the equipment for Rs 3,80,000 per year. Further, it was stressed that the lease payments were fully tax deductible, while debt repayment was not.

Mr X seeks your advice before committing to lease the computer equipment. What advise would you, as a financial consultant, give to the finance manager of ABC Ltd?

Solution

PV of cash outflows under leasing alternative			
Year end	Lease payment after taxes (L) (1 – 0.5)	PV factor (0.08)	Total PV
1–10	Rs 1,90,000	6.710	Rs 12,74,900

PV of cash outflows under buying alternative

Year-end	Total payment		Tax advantage on			Cash outflows after taxes (Col 4 – Col 7)	PV factor (0.08)	Total PV	
	Principal	Interest (0.16)*	Total	Interest (I × 0.50)	Depreciation (D × 0.50)*				
1	2	3	4	5	6	7	8	9	10
1	Rs 2,00,000	Rs 3,20,000	Rs 5,20,000	Rs 1,60,000	Rs 80,000	Rs 2,40,000	Rs 2,80,000	0.926	Rs 2,59,280
2	2,00,000	2,88,000	4,88,000	1,44,000	80,000	2,24,000	2,64,000	0.857	2,26,248
3	2,00,000	2,56,000	4,56,000	1,28,000	80,000	2,08,000	2,48,000	0.794	1,96,912
4	2,00,000	2,24,000	4,24,000	1,12,000	80,000	1,92,000	2,32,000	0.735	1,70,520
5	2,00,000	1,92,000	3,92,000	96,000	80,000	1,76,000	2,16,000	0.681	1,47,096
6	2,00,000	1,60,000	3,60,000	80,000	80,000	1,60,000	2,00,000	0.630	1,26,000
7	2,00,000	1,28,000	3,28,000	64,000	80,000	1,44,000	1,84,000	0.583	1,07,272
8	2,00,000	96,000	2,96,000	48,000	80,000	1,28,000	1,68,000	0.540	90,720
9	2,00,000	64,000	2,64,000	32,000	80,000	1,12,000	1,52,000	0.500	76,000
10	2,00,000	32,000	2,32,000	16,000	80,000	96,000	1,36,000	0.463	62,968
11	Salvage value	—	—	—	—	—	(4,00,000)	0.463	(1,85,200)
									12,77,816

* Interest is charged on the principal sum outstanding at the beginning of the year.

* Depreciation = (Rs 20 lakh – Rs 4 lakh) ÷ 10 years = Rs 1,60,000 × 0.50

Recommendation Lease alternative is better.

P.25.18 Hypothetical Limited is contemplating having an access to a machine for a period of 5 years. Discussions with various financial institutions have shown that the company can have the use of machine for the stipulated period through leasing arrangement, or the requisite amount can be borrowed at 14 per cent to buy the machine. The firm is in the 50 per cent tax bracket. In case of leasing, the firm would be required to pay an annual end-of-year rent of Rs 1,20,000 for 5 years. All maintenance, insurance and other costs are to be borne by the lessee.

In the case of purchase of the machine (which costs Rs 3,43,300), the firm would have a 14 %, 5-year loan, to be paid in 5 equal instalments, each instalment becoming due at the end of each year. The machine would be depreciated on a straight line basis for tax purposes, with no salvage value.

Advise the company regarding the option it should go for, assuming lease rentals are paid (a) at the end of the year (b) in advance.

Solution

(a) PV of cash outflows under leasing alternative (year-end payment of lease rentals)

Year-end	Lease payment (L) after tax	PV factor at after tax cost of debt (0.07)	Total PV of lease payments Col (2) × Col (3)
1	2	3	4
1–5	Rs 60,000	4.100	Rs 2,46,000

Determination of the interest and principal components of loan instalment

Year-end	Loan instalment	Loan at the beginning of the year	Payment Interest on loan (Col 3 × 0.14)	Principal re-payment (Col 2 – Col 4)	Principal out- standing at the end of the year (Col 3 – Col 5)
1	2	3	4	5	6
1	Rs 1,00,000*	Rs 3,43,300	Rs 48,062	Rs 51,938	Rs 2,91,362
2	1,00,000	2,91,362	40,791	59,209	2,32,153
3	1,00,000	2,32,153	32,501	67,499	1,64,654
4	1,00,000	1,64,654	23,052	76,948	87,706
5	1,00,000	87,706	12,294	87,706	—

*Determination of loan instalment: Amount of loan/PVIFA(14,5) = Rs 3,43,300/3.433 = Rs 1,00,000

PV of cash outflows after tax under buying (borrowing) alternative

Year-end	Loan instalment	Tax advantage	Tax advantage on	Net cash outflows	PV factor at after-	PV of buying
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		<i>on interest payment</i>	<i>depreciation</i>	<i>(Col 2 – (Col 3 + 4)</i>	<i>tax cost of debt (0.07)</i>	<i>alternative</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
1	Rs 1,00,000	Rs 24,031	Rs 34,330	Rs 41,639	0.935	Rs 38,932
2	1,00,000	20,395	34,330	45,275	0.873	39,525
3	1,00,000	16,250	34,330	49,420	0.816	40,327
4	1,00,000	11,526	34,330	54,144	0.763	41,312
5	1,00,000	6,147	34,330	59,523	0.713	42,440
		m			Total	2,02,536

Recommendation Since the PV of cash outflows for buying/borrowing (Rs 2,02,536) is lower than that of leasing (Rs 2,46,000), the buying alternative is preferred.

(b) PV of cash outflows under leasing alternative, when lease rental is paid in advance

<i>Year-end</i>	<i>Lease payment</i>	<i>Tax shield</i>	<i>Cash outflows after taxes</i>	<i>PV factor (0.07)</i>	<i>Total PV</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
0	Rs 1,20,000	—	Rs 1,20,000	1.000	Rs 1,20,000
1–4	1,20,000	Rs 60,000	60,000	3.387	2,03,220
5	—	60,000	(60,000)	0.713	(42,780)
					2,80,440

Recommendation Buying alternative is better.

P.25.19 For the Hypothetical Ltd in **P.25.3** assume, (i) The company follows written down value method of depreciation, the depreciation rate being 25 per cent. There is no other asset in this asset block; (ii) The corporate tax rate is 35 per cent; (iii) Post-tax marginal cost of capital is 10 per cent; (iv) Salvage value, Rs 40,000 at the end of 5th year.

Compute the NAL to the lessee if lease rentals are paid (a) at the end of the year (b) in advance.

Solution

(a) Computation of NAL (lease rentals are paid in arrear, that is, at the year-end)

Benefits from leasing:	
Cost of the machine	Rs 3,43,300
PV of tax shield on lease rentals (working note 2)	1,59,222
Total	5,02,522
Cost of leasing:	
PV of lease rentals (1)	4,11,960
PV of tax shield foregone on depreciation (3)	67,259
PV of interest tax shield foregone on debt (4)	43,810
PV of salvage proceeds (Rs 40,0000 × 0.621)	24,840
PV of tax shield on short-term capital loss (5)	24,018
Total	5,71,887
NAL	(69,365)

Recommendation Leasing is not financially viable.

Working Notes

(1) PV of lease rentals: Lease rentals × PVIFA (14,5) = Rs 1,20,000 × 3.433 = Rs 4,11,960

(2) PV of tax shield on lease rentals: Rs 1,20,000 × 0.35 × 3.791 = Rs 1,59,222

(3) PV of shield foregone on depreciation

<i>Year</i>	<i>Depreciation*</i>	<i>Tax shield</i>	<i>PV factor (at 0.10)</i>	<i>Total PV</i>
1	Rs 85,825	Rs 30,039	0.909	Rs 27,305
2	64,369	22,529	0.826	18,609
3	48,277	16,897	0.751	12,690
4	36,207	12,672	0.683	8,655
				67,259

*No depreciation is to be charged in 5th year as the block of assets ceases to exist.

(4)**PV of interest tax shield**

Year	Interest	Tax shield	PV factor (at 0.10)	Total PV
1	Rs 48,062	Rs 16,822	0.909	Rs 15,291
2	40,791	14,277	0.826	11,793
3	32,501	11,375	0.751	8,543
4	23,052	8,068	0.683	5,511
5	12,294	4,303	0.621	2,672
				43,810

(5) PV of tax shield on short-term capital loss: (Cost of machine – Accumulated depreciation – Salvage value) $\times t = (Rs\ 3,43,000 - Rs\ 2,34,678 - Rs\ 40,000) = Rs\ 68,622 \times 0.35 = Rs\ 24,018$.

(b) Computation of NAL (lease rentals are paid in advance)

Benefits from leasing:		
Cost of the machine		Rs 3,43,300
PV of tax shield on lease rentals		1,59,222
Total		5,02,522
<i>(Contd.)</i>		
Cost of leasing:		
PV of lease rentals (1)		4,69,680
PV of tax shield foregone on depreciation		67,259
PV of interest tax shield foregone on debt		43,810
PV of salvage proceeds		24,840
PV of tax shield on short-term capital loss		24,018
Total		6,29,607
NAL		(1,27,085)

Recommendation Leasing is not financially viable.

Working Notes**(1)****PV of lease rentals**

Year	Lease payment	PV factor (at 0.14)	Total PV
0	Rs 1,20,000	1.000	Rs 1,20,000
1–4	1,20,000	2.914	3,49,680
			4,69,680

P.25.20 For the facts in **P.25.19**, determine the break even lease rental (BELR) for the lessee in both the situations.

Solution**(a) Computation of BELR (lease rents are paid at the end of the year)**

Benefits from leasing:		
Cost of the machine		Rs 3,43,300
PV of tax shield on lease rentals (2)		1.20155L
Cost of leasing:		
PV of lease rentals (1)		3.433L
PV of tax shield foregone on depreciation	Rs 67,259	
PV of interest tax shield foregone on debt	43,810	
PV of salvage proceeds	24,840	
PV of tax shield on short-term capital loss	24,018	1,59,927
BELR (L) = Rs 3,43,300 + 1.20155L = 3.433L + Rs 1,59,927		
2.23145L = Rs 1,83,373		
L = Rs 82,177		

Working Notes

(1) PV of lease rentals: $L \times PVIFA(14,5) = 3.433 \times L = 3.433L$

(2) PV of tax shield on lease rentals: $3.433L \times \text{tax rate} = 3.433L \times 0.35 = 1.20155L$

(b) BELR (lease rents paid in advance)

Benefits from leasing

Cost of the machine	Rs 3,43,300
PV of tax shield on lease rentals (2)	1.3699L
Cost of leasing	
PV of lease rentals (1)	3.914L
Other costs (already computed)	1,59,927
BELR(L) = Rs 3,43,300 + 1.3699L = 3.914L + Rs 1,59,927	
2.5441L = Rs 1,83,373	
L = Rs 1,83,373/2.5441 = Rs 72,078	

Working Notes

- (1) PV of lease rentals = $3.914 \times L = 3.914L$, PVIFA = 2.914 (years, 1–4) + 1 (year 0) = 3.914
(2) PV of tax shield on lease rentals: $3.914L \times 0.35 = 1.3699L$

P.25.21 Agrani Ltd. is in the business of manufacturing bearings. Some more product lines are being planned to be added to the existing system. The machinery required may be bought or may be taken on lease. The cost of machine is Rs 40,00,000 having a useful life of 5 years with the salvage value of Rs 8,00,000. The full purchase value of machine can be financed by 20 per cent loan repayable in five equal instalments falling due at the end of each year. Alternatively, the machine can be procured on a 5 years lease, year-end lease rentals being Rs 12,00,000 per annum. The Company follows the written down value method of depreciation at the rate of 25 per cent. Company's tax rate is 35 per cent and cost of capital is 16 per cent.

- (i) Advise the company which option it should choose lease or borrow.
(ii) Assess the proposal from the lessor's point of view examining whether leasing the machine is financially viable at 14 per cent cost of capital (Detailed working notes should be given).

Solution

(i) **PV of cash outflows under leasing alternative**

Year-end	Lease rent after taxes [LR (1-t)] [Rs 12,00,000 (1 - 0.35)]	PVIFA at 13 per cent [20% (1 - 0.35)]	Total PV
1 - 5	Rs 7,80,000	3.517	Rs 27,43,260

(ii) **Borrowing/Buying option**

Equivalent annual loan instalment = Rs 40,00,000/2.991 (PVIFA for 5 years at 20 per cent) = Rs 13,37,345.

PV of cash outflows under buying alternative

Year-end	Loan instalment	Tax advantage on Net cash outflows on Interest (I × 0.35)	Depreciation (D × 0.35)	PVIF (Col. 2 - Col. 3 + 4)	Total PV at 13%	
1	2	3	4	5	6	
1	Rs 13,37,345	Rs 2,80,000	Rs 3,50,000	Rs 7,07,345	0.885	Rs 6,26,000
2	13,37,345	2,42,386	2,62,500	8,32,459	0.783	6,51,815
3	13,37,345	1,97,249	1,96,875	9,43,221	0.693	6,53,652
4	13,37,345	1,43,084	1,47,656	10,46,605	0.613	6,41,569
5	13,37,345	77,635	1,10,742	11,48,968	0.543	6,23,890
Total PV of cash outflows						31,96,926
Less: PV of salvage value (Rs 8,00,000 × 0.543)					4,34,400	
Less: PV of tax savings on short-term capital loss (9,49,279 - 8,00,000) × 0.35 = (52,226 × 0.543)						28,358
NPV of cash outflows						27,34,168

Working Notes

Schedule of debt payment

Year-end	Loan instalment	Loan at the beginning of the year	Interest (Col. 3 × 20%)	Payments Principal repayment	Loan outstanding at the year (Col. 3 - Col. 5)
1	2	3	4	5	6
1	Rs 13,37,345	Rs 40,00,000	Rs 8,00,000	Rs 5,37,345	Rs 34,62,655
2	13,37,345	34,62,655	6,92,531	6,44,814	28,17,841
3	13,37,345	28,17,841	5,63,568	7,73,777	20,44,064

4	13,37,345	20,44,064	4,08,813	9,28,532	11,15,532
5	13,37,345	11,15,532	2,21,813*	11,15,532	—

*Difference between loan instalment and loan outstanding.

Schedule of Depreciation

Year	Depreciation	Balance at the end of the year
1	Rs 40,00,000 × 0.25 = Rs10,00,000	Rs 30,00,000
2	30,00,000 × 0.25 = 7,50,000	22,50,000
3	22,50,000 × 0.25 = 5,62,500	16,87,500
4	16,87,500 × 0.25 = 4,21,875	12,65,625
5	12,65,625 × 0.25 = 3,16,406	9,49,219

Recommendation The Company is advised to go for borrowing as the PV of cash outflows under borrowing option is lower than under leasing alternative.

Assumption The machine is sold after the expiry of its useful of 5 years; for this reason, the depreciation is charged in 5th year and there is no other asset in this block.

(ii) Determination of NPV of cash inflows

Particulars	Years				
	1	2	3	4	5
Lease rent	Rs 12,00,000	Rs 12,00,000	Rs 12,00,000	Rs 12,00,000	Rs 12,00,000
Less: Depreciation	10,00,000	7,50,000	5,62,500	4,21,875	3,16,406
Earnings before taxes	2,00,000	4,50,000	6,37,500	7,78,125	8,83,594
Less: Taxes (0.35)	70,000	1,57,500	2,23,125	2,72,344	3,09,258
Earnings after taxes	1,30,000	2,92,500	4,14,375	5,05,781	5,74,336
Cash inflows after taxes	11,30,000	10,42,500	9,76,875	9,27,656	8,90,742
(x) PV factor at (0.14)	0.877	0.769	0.675	0.592	0.519
Present value	9,91,010	8,01,682	6,59,391	5,49,172	4,62,295
Total PV of operating CFAT					34,63,550
Add: PV of salvage value of machine (8,00,000 × 0.519)				4,15,200	
Add: PV of tax savings on short-term capital loss (52,226 × 0.519)					27,105
Gross PV					39,05,855
Less: Cost of machine					40,00,000
NPV					(94,145)

Recommendation It is not financially profitable to let out the machine on lease by the leasing Company, as NPV is negative.

Assumption The machine is to be sold after the expiry of 5 years. There is no other asset in the block of 25 per cent of the lessee.

P.25.22 The Hypothetical Equipments Ltd (HEL) has recently leased assets worth Rs 2,500 lakh from the Hypothetical Leasing Ltd (HLL). The following facts are available:

- (1) Lease period, 9 years, of which the first 6 years constitute the lease term;
- (2) Annual lease rates: First 6 years, Rs 360/Rs 1,000; Next 3 years, Rs 15/Rs 1,000;
- (3) Incremental borrowing rates for HEL, 22 per cent.
 - (a) Assuming 14 years as the average economic life of the equipment, is the lease a finance lease or an operating lease?
 - (b) Assuming further (i) physical life of 14 years, (ii) technological life of 9 years and (iii) product-market life of 11 years, how will you classify the lease?

Solution A lease is finance lease if one of the following two conditions is satisfied:

- (i) The lease term exceeds 75 per cent of the useful life of the equipment (the minimum of physical useful life, technological life and product market life).
- (ii) The PV of lease payments exceeds 90 per cent of the fair market value of the equipment (cost of equipment), the discount rate being incremental borrowing rate in the case of lessee and cost of capital in the case of lessor.

(a) (i) Term of lease is 9/14 years = 64 per cent.

(ii) Determination of PV of lease payment (Rs in lakh)			
Year	Lease payment	Discount factor (0.22)	Total PV
1 – 6	900	3.167	Rs 2,850
7 – 9	37.5	0.62*	23
			2,873

*(0.249 + 0.204 + 0.167)

The lease is finance lease as the PV of lease payment exceeds the cost of asset.

(b) Finance lease as term of lease is 9/9 = 100 per cent.

P.25.23 From the given facts relating to the Hypothetical Leasing Ltd, calculate the annual rentals under the following rental structure for the 6-year period;

- Equated,
- Stepped (annual increase of 12 per cent),
- Ballooned (annual rental of Rs 15 lakh for year 1 and 2)
- Deferred (deferment period of 1 year).

Investment cost	Rs 96 lakh
Primary lease term	3 years
Residual value	Nil
Pre-tax required rate of annual return	22 per cent

Assume that the lease can be renewed for an additional period of 3 years (secondary lease period). The lease rental for the secondary period will be 5 per cent of the rental charged during the primary period.

Solution

(a) Equated annual lease rentals, Y

$$Y \times PVIFA(22, 3) + 0.05Y \times PVIFA(22, 4-6) = \text{Rs } 96 \text{ lakh}$$

$$2.042Y + 0.05625Y = \text{Rs } 96 \text{ lakh}$$

$$Y = \text{Rs } 96 \text{ lakh} / 2.09825 = \text{Rs } 45.75 \text{ lakh (primary lease period); Rs } 2.29 \text{ lakh (secondary lease period).}$$

(b) Stepped lease rentals (annual increase of 12 per cent)

$$Y \times PVIF(22, 1) + 1.12Y \times PVIF(22, 2) + (1.12)^2Y \times PVIF(22, 3) + (1.12)^3Y \times PVIF(22, 4) + (1.12)^4Y \times PVIF(22, 5) + (1.12)^5Y \times PVIF(22, 6) = \text{Rs } 96 \text{ lakh}$$

$$\text{Or } 0.820Y + 0.7526Y + 0.6912Y + 0.6336Y + 0.5822Y + 0.534Y = \text{Rs } 96 \text{ lakh}$$

$$\text{Or } Y = \text{Rs } 96 \text{ lakh} / 4.0136 = \text{Rs } 23.92 \text{ lakh}$$

(c) Ballooned lease rentals (Rs 15 lakh for years 1–2)

$$\text{Rs } 15 \text{ lakh} \times PVIFA(22, 2) + Y \times PVIF(22, 3) + 0.05Y \times PVIFA(22, 4-6) = \text{Rs } 96 \text{ lakh}$$

$$\text{Rs } 22.38 \text{ lakh} + 0.658Y + 0.05625Y = \text{Rs } 96 \text{ lakh}$$

$$Y = \text{Rs } 96 \text{ lakh} - \text{Rs } 22.38 \text{ lakh} / 0.71425 = \text{Rs } 103.07 \text{ lakh}$$

(d) Deferred lease rentals (deferment of 1 year), Y

$$Y \times PVIF(22, 2) + Y \times PVIF(22, 3) + 0.05Y \times PVIFA(22, 4-6) = \text{Rs } 96 \text{ lakh}$$

$$0.672Y + 0.551Y + 0.05625Y = \text{Rs } 96 \text{ lakh}$$

$$Y = \text{Rs } 96 \text{ lakh} / 1.2795 = \text{Rs } 75.04 \text{ lakh}$$

P.25.24 Hypothetical Ltd is expanding its facilities. In the coming year, the company will either purchase or lease equipment which it plans to use for 4 years and then replace it with a new one. Its current tax bracket is 50 per cent. The other data are as follows:

Purchase: (i) The purchase price of the equipment is Rs 40,00,000, (ii) The expected salvage value after 4 years is Rs 10,00,000, (iii) The equipment is subject to the straight line method of depreciation, (iv) Funds to finance the equipment can be obtained at 16 per cent, (v) The loan is to be repaid in four equal annual instalments due at the end of each year, (vi) The equipment will increase the annual revenues by Rs 30,00,000, and increase annual cash operating costs by Rs 20,00,000.

Leasing: (i) The annual lease is Rs 10,00,000, (ii) The lease rent is payable at the end of each year for 4 years, (iii) The equipment will increase annual revenues by Rs 30,00,000 and increase annual non-depreciation operating costs by Rs 19,00,000, as the lessor will pay Rs 1,00,000 for the maintenance costs associated with the equipment.

Determine whether the company should purchase or lease the equipment.

Solution

PV of cash outflows under leasing alternative

Year-end	Gross	Effective lease payment			PV factor Cash outflows after taxes	Total (0.08)	PV
		Savings in main- tenance costs	Net (Col 2 – Col 3)	Tax shield (Col 4 × 0.50)			
1	2	3	4	5	6	7	8
1–4	Rs 10,00,000	Rs 1,00,000	Rs 9,00,000	Rs 4,50,000	Rs 4,50,000	3.312	Rs 14,90,400

Determination of interest and principal components of loan instalment

Year-end	Loan instalment	Loan at the beginning	Payment of		Principal out-standing at the end of the year
			Interest (Col 3 × 0.16)	Principal (Col 2 – Col 4)	
1	2	3	4	5	6
1	Rs 14,29,593*	Rs 40,00,000	Rs 6,40,000	Rs 7,89,593	Rs 32,10,407
2	14,29,593	32,10,407	5,13,665	9,15,928	22,94,497
3	14,29,593	22,94,479	3,67,117	10,62,476	12,32,003
4	14,29,593	12,32,003	1,97,590	12,32,003	—

*Rs 40,00,000 ÷ 2.798 that is, PV annuity factor of 4 years at 16 per cent.

PV of cash outflows under buying alternative

Year	Loan instalment	Interest (I × t)	Depreciation (D × t)	Cash outflows after taxes [Col 2 – (Col 3 + Col 4)]	PV factor (0.08)	Total PV
1	2	3	4	5	6	7
1	Rs 14,29,593	Rs 3,20,000	Rs 3,75,000	Rs 7,34,593	0.926	Rs 6,80,233
2	14,29,593	2,56,832	3,75,000	7,97,761	0.857	6,83,681
3	14,29,593	1,83,558	3,75,000	8,71,035	0.794	6,91,602
4	14,29,593	98,795	3,75,000	9,55,798	0.735	7,02,512
4	Salvage value	—	—	(10,00,000)	0.735	(7,35,000)
						20,23,028

Recommendation The lease alternative is better, as it is a cheaper source of finance than debt in terms of the NPV of the cash outflows.

Review Questions

25.24 Beta Limited is considering the acquisition of a personal computer costing Rs 50,000. The effective life of the computer is expected to be 5 years. The company plans to acquire the same either by borrowing Rs 50,000 from its banker at 15 per cent interest per annum or by lease. The company wishes to know the lease rentals to be paid annually which will match the loan option. The following further information is provided to you.

- The principal amount of the loan will be paid in 5 annual equal instalments.
- Interest, lease rentals, principal repayments are to be paid on the last day of each year.
- The full cost of the computer will be written off over the effective life of computer on a straight-line basis and the same will be allowed for tax purposes.
- The company's effective tax rate is 40 per cent and the after-tax cost of capital is 9 per cent.
- The computer will be sold for Rs 1,700 at the end of the fifth year. The commission on such sales is 9 per cent on the sale value and the same will be paid.

You are required to compute the annual lease rentals payable by Beta Ltd. which will result in indifference to the loan option.

25.25 Welsh Limited is faced with a decision to purchase or acquire on lease a mini car. The cost of the mini car is Rs 1,26,965. It has a life of 5 years. The mini car can be obtained on lease by paying in advance equal lease rentals annually. The leasing company desires a return of 10 per cent on the gross value of the asset.

Welsh Limited can also obtain 100 per cent finance from its regular banking channel. The annual

rate of interest will be 15 per cent and the loan will be paid in 5 annual equal instalments, inclusive of interest, each instalment becoming due at the beginning of the year. The effective tax rate of the company is 40 per cent. For the purpose of taxation, it is to be assumed that the asset will be written off over a period of 5 years on a straight line basis.

- (a) Advise Welsh Limited about the method of acquiring the car.
- (b) What should be the annual lease rental to be charged by the leasing company to match the loan option?

25.26 Computeronics Ltd sells computer services to its clients. The company has recently completed a feasibility study and decided to acquire an additional computer the details of which are as follows:

1. The purchase price of the computer is Rs 2,30,000; maintenance, property taxes and insurance will be Rs 20,000 per year. The additional annual expenses to operate the computer are estimated at Rs 80,000. If the computer is rented, the annual rent will be Rs 85,000, *plus* 5 per cent of annual billings. The rent is due on the last day of each year. Maintenance expenses are to be borne by the lessor.
2. Due to competitive conditions, the company feels it will be necessary to replace the computer at the end of 3 years with a more advanced model. The resale value is estimated at Rs 1,10,000.
3. The appropriate income tax rate is 50 per cent, and the straight-line method of depreciation is used.
4. The estimated annual billing for the services of the new computer will be Rs 2,20,000 during the first year, and Rs 2,60,000 during the subsequent two years.
5. If the computer is purchased, the company will borrow to finance the purchase from a bank with interest at 16 per cent. The interest will be paid regularly, and the principal will be returned in one lumpsum at the end of year 3.

Assuming cost of capital at 12 per cent, you are required to analyse the financial viability of the proposal from the viewpoint of the leasing company as well as the Lessor.

Answers

25.24 Rs 14,495.

25.25 (a) Leasing option is better; PV of cash outflows under lease is Rs 81,719; PV of cash outflows under borrowing and buy option is Rs 87,442, (b) Rs 34,949.

25.26 (a) Computeronics should buy the computer (PV of cash outflows under leasing alternative is Rs 1.25 lakh and under buying alternative is Rs 1.17 lakh) (b) Proposal is financially unsound from the point of leasing company (–NPV of Rs 0.11 lakh).