



2.6 Financial Services

This Section includes :

- **Leasing**
- **Hire Purchase**
- **Forfaiting**
- **Bill Discounting**
- **Factoring**
- **Asset Securitization**

INTRODUCTION :

With the sea change in the complex business environment, financial services play a pivotal role in facilitating the smooth flow of the entire financial system.

Financial services include :

- (a) Leasing
- (b) Hire-Purchase
- (c) Forfaiting
- (d) Bill Discounting
- (e) Factoring
- (f) Asset Securitization

LEASING :

A lease is an agreement whereby the lessor conveys to the lessee in return for a payment or series of payments the right to use an asset for an agreed period of time. It may be defined as:

- (a) A contractual agreement between the lessor (owner of an asset/equipment) and the lessee (the user of such asset / equipment);
- (b) Which provides a right to the user of the asset, over a certain agreed period of time;
- (c) Against a consideration, lease rentals.

HIRE PURCHASE :

A hire purchase is a contractual agreement under which the owner lets his goods on hire to the hirer and offers an option to the hirer for purchasing the goods in accordance with the terms of the agreement. It has two aspects:

- (a) Bailment of goods subject to the hire purchase agreement;
- (b) There is an element to sale when the option to purchase the goods is exercised by the hirer (i.e., the user).

Features of Hire Purchase Agreement :

- (a) Hiree (lessor) provides his assets to the hirer(lessee) for use
- (b) Hirer pays regular hire purchase instalments-including interest and principal.
- (c) That the ownership is transferred to the hirer (user) only after the payment of the last installment.

FORFAITING :

The term “a forfait” in French means, “**relinquish a right**”. It refers to the exporter relinquishing his right to a receivable due at a future date in exchange for immediate cash payment, at an agreed discount, passing all risks and responsibilities for collecting the debt to the forfeiter.

It is the discounting of international trade receivable on a 100% “Without recourse” basis. “Without recourse ” means the client gets full credit protection and all the components of service, i.e., short-term finance, administration of sales ledger are available to the client.

Forfeiting transforms the supplier’s credit granted to the importer into cash transaction for the exporter protecting him completely from all the risks associated with selling overseas on credit. It effectively transforms a credit sale into a cash sale.

Procedure

- (a) The exporter sells the goods to the importer on a deferred payment basis spread over 3-5 years.
- (b) The importer draws a series of promissory notes in favour of the exporter for the payments to be made inclusive of interest charges.
- (c) Such promissory notes are availed or guaranteed by a reputed international bank which can also be the importer’s banker. (it is endorsement on the promissory note by the guaranteeing bank that it covers any default of payment of the buyer).
- (d) The exporter now sells the availed notes to a forfeiter (which may be the exporter’s banker) at a discount without a recourse.
- (e) The forfeiter may hold these notes till maturity or sell them to group of investors interested in taking up such high-yielding unsecured paper.

Graphical representation of forfaiting

1 = Promissory notes sent for availing to the importer’s banker

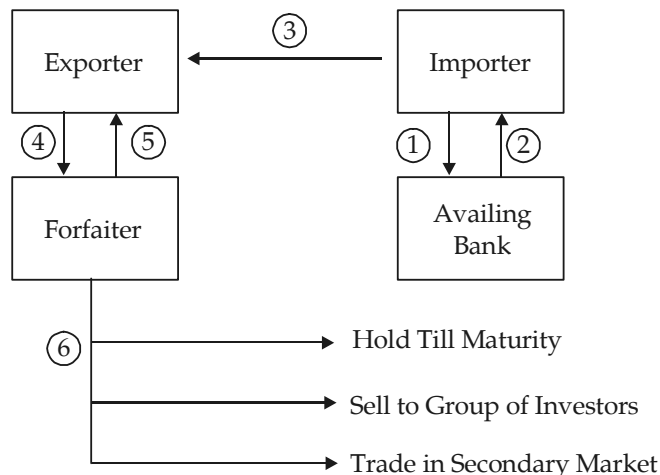
2 = Availed notes returned to the importer

3 = Availed notes sent to exporter

4 = availed notes sold at a discount to a forfeiter on a non - recourse basis

5 = exporter obtains finance

6 = forfeiter holds the notes till maturity or securities these notes and sells the short-term paper either to a group of investors or to investors in the secondary market.



BILL DISCOUNTING :

It is the process of discounting the trade finance bills by the drawer or the holder of the bill.

There are four types of trade finance bills:

- (a) **Trader' bill** - (i) a seller supplies goods and raises the bill for the value of goods sold; (ii) the buyer accepts the bill (iii) the seller receives the accepted bill and discounts it with the seller's banker (iv) the buyer honours the bill on due date.
- (b) **Bills with co-acceptance** - (i) a seller supplies goods and raises the bill for the value of goods sold; (ii) the buyer accepts the bill (iii) the buyer's bank also co-accepts the bill, (iv) the seller receives the accepted bill and discounts it with the seller's banker.
- (c) **Bills accompanied with Letter of Credit (LC)** - (i) a seller supplies goods and raises the bill for the value of goods sold; (ii) the buyer accepts the bill (iii) the buyer's bank opens the LC in favour of the seller and discounts the same with seller's bank.
- (d) **Drawee Bills** - (i) a seller supplies goods and raises the bill for the value of goods sold; (ii) the buyer accepts the bill (iii) the buyer's bank discounts the bill for the account of the buyer.

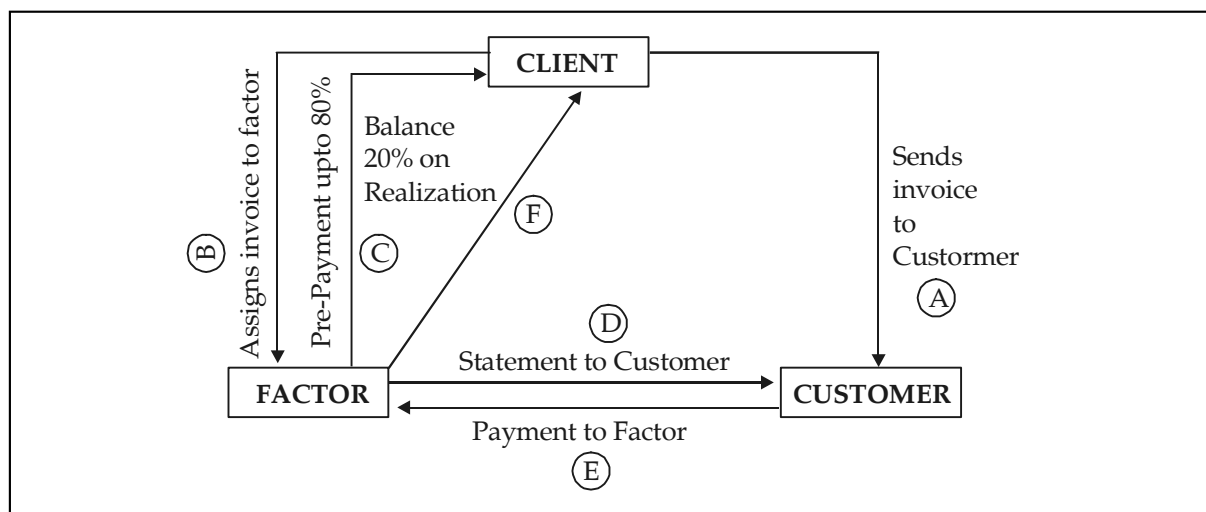
FACTORING :

Factoring is an arrangement in which a financial intermediary called "factor" collects the accounts receivables on behalf of the goods and services. The factor charges a fee that is usually expressed as a percentage of the total value of the receivables factored.

Factors, are usually subsidiaries of banks or private financial companies, generally, renders the following services:

- (a) purchasing the accounts receivable of the seller for immediate cash;
- (b) administering the sales ledger of the seller;
- (c) collects the accounts receivable;
- (d) forecasts the losses which may arise due to bad debts;
- (e) advisory services to the seller.

Factoring is an alternative to in-house management of receivables.





How Factoring works

- (a) seller raises the bill on the customer and issues a notification that the invoice is assigned to and must be paid to the factor.
- (b) Copies of invoice sent to the factor
- (c) Factor will provide pre-payment of upto a maximum of 80% of the total invoice value
- (d) Follow up procedure with the customers for realization of payments due
- (e) Balance payment is made on realization of dues
- (f) Seller will be informed of factor invoices through monthly statement of account sent by the factor.

Types of Factoring

- (a) Recourse factoring: the factor purchases the receivables on the condition that any loss arising out of irrecoverable debts will be borne by the seller/client.
- (b) Non-recourse or full factoring: the client gets full protection and all the components of service.
- (c) Advance factoring or maturity factoring: no advance or prepayment is made by the factor. The payment is made to the client either on a guaranteed payment date or on the date of collection from the customer.
- (d) Invoice discounting: the factor provides a prepayment to the client against the purchase of account receivables and collects interest (Service charges) For the period extending from the date of prepayment to the date of collection. The administration and collection charges shall be borne by the client.
- (e) Undisclosed factoring: companies of a very high repute and sound financial base can opt for this type of factoring. Here, the client's customers are not notified of the factoring agreement and they continue to make to the client. The client bears the responsibility of making payment to the Factor on the due date, irrespective of realizations from the customers.

Factoring is not advisable in the following situations

- (a) Where sales are made for cash;
- (b) In case of speculative business;
- (c) For highly specialized capital equipments or goods made-to-order;
- (d) If the credit period is more than 180 days;
- (e) In case of "consignment sale" or "sale or return arrangements";
- (f) Sales to associated companies;
- (g) Sales are made to public at large.



Factoring Vs. Forfeiting

Factoring	Forfeiting
1. 80% of the invoice value is considered for advance	1. 100% financing
2. Factor does the credit rating of the counterpartly in case of non-recourse factoring	2. The forfeiting bank relies on the credibility of the availing bank
3. Day to day administration of sales and other allied services are provided	3. No additional services are provided
4. Advances are generally short-term in nature	4. Advances are generally medium-term in nature.

ASSET SECURITIZATION :

Asset Securitization is the process by which non-tradable assets are converted into tradable securities. Assets like mortgage loans receivables, cash credit receivables, etc. on the balance sheet of use originator (say, Housing Finance companies, financial industries, etc) are packaged, underwritten and sold in the form of securities to investors through a carefully structured process. These securities may be in the form of commercial paper, Certificate of Deposits, Notes or any other form of security permissible under the legal framework in the country.

Benefits to the Investor :

The investor gets a security, which is backed by adequate collateral security and has credit enhancement. Those securities are rated by the credit rating agencies.

Asset Securitization process :

- The originator, owing the assets, identifies a pool of homogeneous assets, which is held for securitization.
- The pool of assets is then transferred to a different entity, known as Special Purpose Vehicles (SPV).
- The SPV issues the securities backed by the pool of assets. They also indicates the liability for the cash consideration received from the investors.
- The consideration is remitted by the SPV to the originator, which then replaces the securitized assets from its balance with the consideration received.

Factoring Vs Securitization

Factoring	Securitization
1. One party involved	1. Generally a wide range of investors are involved
2. May be done with or without recourse	2. Done without recourse
3. Payment from the factor is received after a time lag	3. Cash is generally received as soon as the issue is placed
4. Additional services like credit checking, ledger maintenance are offered	4. No such additional services are offered.
5. Short term receivables are factored	5. Long term receivables are securitized
6. Credit rating is not compulsory	6. Credit rating is compulsory
7. Existing receivables can be factored	7. Along with existing receivables, future receivables can also be securitized.

Illustration 1 :

DLP Pvt .Ltd . is considering the possibility of purchasing a multipurpose machine which cost Rs. 10.00 Lakhs. The machine has an expected life of 5 years. The machine generates Rs. 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 Rs.1.00lakh. 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 Rs. 28 per thousand per month. The company wants you to evaluate the proposal with purchase option. The cost of capital of the Company is 12% and for Lease option it wants you to consider a discount rate of 16%.

	0	1	2	3	4	5
PV 12%	1.000	0.893	0.797	0.712	0.636	0.567
PV 16%	1.000	0.862	0.743	0.641	0.552	0.476

I Purchase : (Rs. Lacs)

Particulars	0	1	2	3	4	5
Initial outlay Op.		6.00	6.00	6.00	6.00	6.00
Profit	(10)	2.50	1.88	1.40	1.06	0.79
Less : Depreciation						
Profit before tax		3.50	4.12	4.60	4.94	5.21
Less:Tax @ 50%		1.75	2.06	2.30	2.47	2.60
Profit after tax		1.75	2.06	2.30	2.47	2.61
Add:Depreciation		2.50	1.88	1.40	1.06	0.79
Salvage value of machine						1.00
Net cash Inflow		4.25	3.94	3.70	3.53	4.40
Present value factor @ 12%	1.00	.893	.797	.712	.636	.567
Present values	(10)	3.80	3.14	2.63	2.25	2.49

NPV of purchase option is Rs. 4,31,000

II Lease : (Rs. lacs)

Particulars	1	2	3	4	5
Operating profit					
Less:lease Rent					
Profit before tax	6.003.36	6.003.36	6.003.36	6.003.36	6.003.36
Tax @ 50%	2.641.32	2.641.32	2.641.32	2.641.32	2.641.32
Profit after tax	1.32	1.32	1.32	1.32	1.32
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 Rs. 4,33,000.

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

Illustration 2 :

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 of Rs. 8 lakhs. The full purchase value of machine can be financed by 20% loan repayable in five equal installments falling due at the end of each year. Alternatively, the machine can be produced on a 5 year lease, year end lease rentals being Rs. 12,00,000 per

annum. The company follows the WDV method of depreciation at the rate of 25%. Company's tax rate is 35% and the cost of capital is 16%.

- (i) Advise the company which option is should be —lease or borrow
- (ii) Assess the proposal from the lessor's point of view examining whether leasing the machine is financially viable at 14% cost of capital.

(Detailed working notes to be given. Calculations can be rounded off to lakhs).

Solution :

Evaluation from the point of view of Lessee:

Lease option:

Lease Rental after tax $12,00,000 \times (1 - 0.35)$ Rs. 7,80,000

PVIFA (13%, 5) 3.517

PV of Lease Rentals $(7,80,000 \times 3.517)$ Rs 27,43,260

Borrowing Option:

in this case, the loan is repayable in 5 equal installments. This includes interest also. So, the payment to be made every year is Rs. $40,00,000 \div 2,991 =$ Rs. 13,37,345. Now, the borrowing option can be evaluated as follows : (Disc Rate = $20 \times (1.0.35) = 13\%$]

Year	Payment	Tax benefit		Net Cash Outflow	PVF _(13,n)	Total
		On Int.	On Dep.			
1	13,37,345	2,80,000	3,50,000	7,07,345	0.885	6,26,000
2	13,37,345	2,48,386	2,62,500	8,25459	0.783	6,47,117
3	13,37,345	1,97,249	1,96,875	9,43,221	0.693	6,53,652
4	13,37,345	1,43,085	1,47,656	10,46604	0.613	6,41,568
5	13,37,345	78,087	1,10,742	11,48,516	0.543	6,23644
	Total PV of Outflows					31,91,981
	Less : PV of Salvage value $(8,00,000 \times 0.543)$					4,34,400
	PV of tax benefit on m/c sold at loss (WN 2) $(149219 \times 0.35 = 52.227 \times 0.543)$					28,359
	Net present value of cash outflows					27,29,222

As the PV of cash outflows of lease option is greater than of borrowing option, the borrowing option is recommended.



Working Notes:

1. Debt and Interest Payments

Year	Loan Installments	Loan in the beginning of the year	Interest	Principal	Balance at the end of year
1	13,37,345	40,00,000	8,00,000	5,37,345	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	2,23,106	11,14,239	

2. Loss on Sale of Machine

BV at the end of 5 years	9,49,219
SP of machine	8,00,000
Loss	1,49,219

From the View Point of Lessor:

From point of view of lessor, it is a capital buddgeting problem and can be analyzed as follows:

	Year 1	Year 2	Year 3	Year 4	Year 5
	Rs.	Rs.	Rs.	Rs.	Rs.
Lease Rentals <i>Less</i> : Dep.	12,00,000 10,00,000	12,00,000 7,50,000	12,00,000 5,62,500	12,00,000 4,21,875	12,00,000 3,16,406
Profit Befor Tax <i>Less</i> : Tax @ 35%	2,00,000 70,000	4,50,000 1,57,500	6,37,500 2,23,125	7,78,125 2,72,344	3,16,406 3,09,258
Profit After Tax + Depreciation	1,30,000 10,00,000	2,92,500 7,50,000	4,14,375 5,62,500	5,05,781 4,21,875	5,74,336 3,16,406
Cash flows PVIFA (14%, 0)	11,30,000 0.877 9,91,010	10,42,500 0.760 7,92,300	9,76,875 0.675 6,59,391	9,27,656 0.592 5,49,172	8,90,742 0.519 4,62,295
Total P.V. / <i>Add</i> : PV of Tax saving on sale of asset	[149219×0.35×0.519 = 27106]				34,54,168 27,106
Total PV of cash inflow Coat of Machine					34,81,168 40,00,000
NPV					(5,18,726)

Advice: Lease is not financially viable and is not recommended.

Illustration 3 :

ABC Ltd. is considering to buy a machine costing Rs. 110000 Payable Rs. 10000 down payment and balance in 10 installments inclusive of interest chargeable at 15%. Another option before it is to acquire the assets on a lease rental of RS. 15000 per annum for 10 years. As a financial managers, decide between these two options so that :

- i. scrap value of RS. 20000 is realizable if the asset is purchased.
- ii. The firm provides 10% depreciation on SLM on the original cost
- iii. The tax rate is 50% and the after tax cost of capital is 15%.

Solution:

Option I—BUY.

In this option the firm has to pay RS 10,000 down and the balance RS. 1,00,000 together with interest @ 15% is payable in 10 annual equal installments. The annuity amount may be calculated for 10 years at 15%, as i.e.,

Annual repayment = $RS. 1,00,000 / 5.019 = RS. 19,925$.

The cash flows of the interest in the purchase option may be calculated as follows:

Year	Installment Rs.	Interest Rs.	Repayment Rs.	Balance Rs.
1	19,925	15,000	4,925	95,075
2	19,925	14,261	5,664	89,411
3	19,925	13,412	6,513	82,898
4	19,925	12,435	7,490	75,408
5	19,925	11,311	8,614	66,894
6	19,925	10,019	9,906	56,888
7	19,925	8,533	11,392	45,496
8	19,925	6,824	13,101	32,395
9	19,925	4,859	15,066	17,329
10	19,925	2,596	17,329	—



The PV Cash outflows may now be found as follows:

Year	Payment	Interest	Dep.	Tax	Net CF	PVF	PV
				Shield 50%	(1-4)		
	Rs.	Rs.	Rs.	Rs.		Rs.	
0	10,000	—	—	—	—	—	10,000
1	19,925	15,000	11,000	13,000	6,925	.870	6,025
2	19,925	14,261	11,000	12,631	7,294	.756	5,514
3	19,925	13,412	11,000	12,206	7,719	.658	5,079
4	19,925	12,435	11,000	11,718	8,207	.572	4,694
5	19,925	11,311	11,000	11,156	8,769	.497	4,358
6	19,925	10,019	11,000	10,510	9,415	.432	4,067
7	19,925	8,533	11,000	8,767	10,158	.376	3,819
8	19,925	6,824	11,000	8,912	11,013	.327	3,601
9	19,925	4,859	11,000	7,930	11,995	.284	3,407
10	19,925	2,596	11,000	6,798	13,127	.247	3,242
	Present value of total outflows						-53,806
	Salvage value (after tax)				10,000	.247	+2,470
	Net present value of outflows						-51,336

(i) Depreciation of 10% i.e.RS. 11,000 has been provided for all the years.

(ii) The asset is fully depreciated during its life of 10 years, therefore, the book value at the end of 10th year would be zero. As the asset is having a salvage value of RS. 20,000, this would be capital gain, and presuming it to be taxable at the normal rate of 50%, the net cash inflow on account of salvage value would be RS. 10,000 only. This is further discounted to find out the present value of this inflow.

Option II - Evalution of Lease Option. In case, the asset is acquired on lease, there is an annual lease rent of RS. 15,000 payable at the end of next 10 years. This lease rental is tax deductible, therefore, the net cash outflow would be only RS. 7,500 (after tax).

The PVAF for 10 years @ 15% is 5.019. So the present value of annuity of is. RS. $7,500 \times 5.019$ = RS. 37,643 .

Advice: The PV of outflows in case of a lease is lower. Therefore it is advisable to go for Leasing.



LESSOR'S PERSPECTIVE

Illustration 4 :

A request has been received by Lotus Finance Ltd. who are engaged in leasing business, for structuring a lease of a machine costing Rs. 30 lakhs. The average post-tax cost of funds to Lotus Finance (effective tax rate 50%) is 10%, but they wish to mark up this by 2% to cover the effects of inflation.

Calculate the annual lease rent to be charged assuming that

- (a) the lease period is to be 5 years;
- (b) the rents will be payable on the first day of each year ;and
- (c) the machine will be fully depreciated in 5 years.

Solution:

Calculation of Depreciation Tax Shield :

Annual Depreciation = $30.00/5$	= RS.6.00 lakhs
Annuity factor @ 12%for 5 years	= 3.61
PV of depreciation tax shelter	= $(6.00 \times 0.5) \times 3.61 = \text{RS. } 10.83 \text{ lakhs}$
Calculation of amount placed under finance.[Minium PV to be recovered from lessee]	
Cost of machine (Rs. in lakhs)	= 30.00
Less: PV of depreciation tax shelter	= 10.83
Total	= 19.17

Calculation of Annual Lease Rent :

The Annuity factor @ 12%(for amount receivable at the beginning of the year)

= $1 + 0.82 + 0.80 + 0.71 + 0.64 = 3.97$ [Note: We begin with the first PV for year zero =1] Let the Annual rent be L,

If RS. 19.17 lakhs is to be recovered, then using the same steps as given in the earlier problem
 $L \times 3.97 = 19.17$

or $L = 4.83$

Therefore Annual Lease rent (payable at the beginning of the year) is RS. 4.83 lakhs.

Illustration 5 :

A lessor has an equipment for RS. 1,00,000. It has a five-year life and lease will be for 5 years. The projected salvage value is RS.10,000 to be discounted at 25% owing to higher rate of uncertainty connected to the estimate. The company is earning 10% (after tax) on its marginal investments. Hence, a 10% discount rate is to be used in computing present value of debaiancing and lease financing.



Determine the annual lease payments if made

- (i) at the start of each year, and
- (ii) at the end of each year.

Solution :

The salvage value will remain same under both options:i.e. RS.10,000.

This is to be discounted at 25%. So the present value of the salvage value is

$$\begin{aligned} &= \text{RS. } 10,000 \times \text{PVF}_{(25\%, 5\text{y})} \\ &= \text{RS. } 10,000 \times 0.328 \\ &= \text{RS. } 3280 \end{aligned}$$

Calculation of Lease rental:

Lease rentals have to be decided in such a way that net of purchase cost and salvage value receipt is recovered. Amount of recovery for the purpose of calculation of lease rental:

$$\text{RS. } 1,00,000 - \text{RS. } 3280 = \text{RS. } 96,720.$$

- (i) **If lease rental is payable in the beginning:**

Let the lease rentals payable be RS.L.

$$\text{RS. } 96,720 = L \times 1.00 + L \times \text{PVIFA } (10\%, 4)$$

$$\text{RS. } 96,720 = L = 3.170L$$

$$\text{RS. } 96,720 = 4.170L$$

$$\text{Therefore } L = \text{RS. } 23194$$

- (ii) **If lease rental is payable at the end of the year:**

Let the lease rentals payable be RS. L.

$$\text{RS. } 96,720 = L \times \text{PVIFA } (10\%, 5)$$

$$\text{RS. } 96,720 = 3.791L$$

$$\text{Therefore } L = \text{RS. } 25513$$

Illustration 6 :

Kuber Leasing Ltd. is the process of making out a proposal to lease certain equipment to a user - manufacturer. the cost of the equipment is expected to be RS. 10 lakhs and the primary period of lease to be 10 years. Kuber Leasing is able to give you the following additional information.

(a) The machine can be depreciated fully over the 10 years on straight line basis (assume this to be acceptable for IT purposes) (b) The current effective tax rate for Kuber Leasing is 40% and they expect to go down to 30% from the beginning of the 6th year of the lease (c) It is the normal objective of Kuber to make a 10% post - tax return in its lease pricing (d) Lease



management fee of 1% of the value of the asset is usually collected from the lessees upon signing of the contract of lease, to cover the overhead costs related to processing of the signing of the contract of lease, to cover the overhead costs related to processing of the proposal (e) Annual lease rents are collected at the beginning of every year.

You are required to determine the equated annual rent to be charged for the proposal.

Solution :

Calculation of Depreciation Tax Shelter:

Annual Depreciation = $10.00/10$	= RS. 1.00 Lakh
Annuity factor @ 10% for 1-5 years	= 3.79
Annuity factor @ 10% for 6-10 years	= 2.35
PV of depreciation tax shelter:	
$(1.00 \times 0.4) \times 3.79 + (1.00 \times 0.3) \times 2.35$	= Rs. 2.22 lakhs
Calculation of amount placed under finance:	
Cost of machine (RS. in lakhs)	= 10.00
Less: PV of depreciation tax shelter	= 2.22
Total	= 7.78

Note: Lease management fee of 1% is collected to cover the overhead costs related to processing of the signing of the contract of lease. this amount would not be taken into account for recovering from lessee.

Calculation of Annual Lease Rent:

Let the Annual rent be L,

The annuity factor @ 10% for 0-5 years = 4.79

The annuity factor @ 10% for 6-9 years = 1.96

If RS. 7.78 lakhs is to be recovered, then

$$(L \times 0.6) \times 4.79 + (L \times 0.7) \times 1.96 = 7.78 \text{ or } L = 1.83$$

Therefore, equated Annual rent (payable at the beginning of thr year) is RS. 1.83 lakhs.

Illustration 7 :

Fair Finance Ltd. is a hire purchase and leasing company who have been approached by a local small scale business interested in acquisition of a machine through leasing. The price quoeted by the manufacturer of the machine is Rs. 3,00,000. 10% Sales tax is extra. The proposed lessee desires to have a primary lease period of 5 years.

Fair Finance's target rate of return on the transaction is 8% post-tax on the outlay. They wish to fix annual lease rents which are to be payable in arrears at the end of each year. Their effective Income - tax rate is 50%. The Income - tax rate of depreciation on the machine is 25%.

Calculate the annual lease rent to be charged by Fair Finance Ltd.



Solution:

Calculation of amount placed under Finance:

Calculation of Depreciation Tax Shelter					
1	2	3	4	5	6
Year	Cost/WDV	Depreciation @ 25% on WDV	Tax Shield (3) × 50%	Discount factor @ 8%	Discounted cash flow
1	330000	82500	41250	0.93	38363
2	247500	61875	30938	0.86	26606
3	185625	46406	23203	0.79	18330
4	139219	34805	17403	0.74	12878
5	104414	26104	13052	0.68	8875
					105052

Cost of machine including Sales Tax Rs. 330000
 Less: Depreciation Tax Shelter (PV) Rs. 105052
Rs. 224958

Calculation of Annual Lease Rent:

Let Annual Lease Rent charged be x
 Annual Post tax recovery $0.5x$
 If RS.224948 is to be recovered, then the value of 'x' will be $= 4 \times 0.5x = 224948$
 Or $x = 112474$

Therefore, Annual Lease Rent has to be Rs. 112474.

Illustration 8 :

Ugly finance a leasing company has been approached by a perspective customer intending to acquire a machine where cash down payment is Rs. 3 crores. The customer in order to leverage his tax position has requested a quote for three year lease with rentals payable at the end of each year but in a diminishing manner such that are in the ratio of 3:2:1.

Depreciation can be assumed to be on straight line basis and Fair Finance's marginal tax rate is 35%. The target rate of return for Fair Finance on the transaction is 10%. Calculate lease rental to be quoted for lease of three years.

Solution:

Calculation of Depreciation Tax Shelter:

Annual Depreciation = 3 crores/3 = Rs. 1 crore
 Annuity factor @ 10% for 3 years = 2.487
 PV of depreciation tax shelter = $(1 \text{ crore} \times 0.35) \times 2.487 = \text{RS.87 lakhs approx.}$
 Calculation of amount placed under finance: [Minimum PV to be recovered from Lessee]
 Cost of machine (Rs. in lakhs) = 300.00
 Less: PV of depreciation tax shelter = 87.00
 Total = 213.00



Calculation of Annual Lease Rent :

Let the Lease Rental payable in the last year be L. With rentals payable at the end of each year in a diminishing manner in the ratio of 3:2:1, we have three lease rentals as 3L, 2L & L respectively.

If RS. 213 lakhs is to be recovered, then effecting the tax we have,

$$3L (1-T) \times PVIF (10\%,1) + 2L (1-T) \times PVIF (10\%,2) + L (1-T) \times PVIF(10\%,3) = \text{RS.213 lakhs}$$

Solving we get L = RS. 63.86 lacs

Therefore Annual Lease rents are payable in the ratio of RS. 1.91.58 lacs, RS. 127.72 lacs, and RS.63.86 lacs in the year 1,2 and 3 respectively.

Bower- Herringer-Wiliamson Method (BHW)

This model aims at segregating cash flow streams into separate parts, one relating financing, and the other relating to tax-shields and salvage value.

Financial Advantage(FA)	Operational Advantage (OA)
PV of loan payments	PV of tax shield on Leasing
Less PV of lease payments	Less PV of tax shield on borrowings

Note: If either of the answer is negative, it called disadvantage.

If FA + OA, >0, then go for Leasing

IF FA + OA < 0, then go for borrowing.

Illustration 9 :

A leasing company's cost of capital is 10%. It proposes to lease a machine costing RS. 5,00,000 for ten years. Lease payments will be paid in advance. However, there exists a borrowing option too at 16% rate of interest, with installments payable in advance. Depreciation is allowable on straight line basis. Applicable tax rate is 50%. Find the operating advantage of lease using the Bower-Herringer-Williamson Method, if the appropriate discount rate for evaluation is 15%.

Solution :

Calculation of Financial Advantage

PV of loan payments	500000
Less: Pv of lease rentals = $7396^* \times 5.61^{**}$	415005
Financial Advantage	84995

* Each equated lease payment = $500000 / PVIFA (10\%,10) = 73976$

Advance Lease Payments Hence, PV factors for year 0 to 9 = 6.759

** Total of PV factors for 16% for 10 years

Calculation of operational advantage

$$\text{Equated Loan Installment} = 500000 / PVIFA (16\%,10) = 500000 / 5.61 = 89127$$

Falcon Finance offers a Hire Purchase proposal for an equipment costing Rs. 10 lakhs on the following terms :

- Flat rate of interest of 14%



- b. A hire purchase period of 36 months.
- c. Post tax cost of debt of the company is 8%
- d. Tax rate of the firm is 50%
- e. Depreciation rate of equipment is 33.33% as per WDV Method and realizable value of asset at the end of 3 years is NIL

Find the PV of Hire Purchase :

Solution :

Step I Find Total Interest burden

$$= \text{Rs. } 1000000 \times 0.14 \times 3 = \text{Rs. } 420000$$

Step II Find Hire Purchase Installment

$$= [\text{Rs. } 1000000 + 420000] \times 36 = \text{Rs. } 39444 \text{ per months.}$$

$$= [\text{Rs. } 1000000 + 420000] \times 3 = \text{Rs. } 473333 \text{ per year.}$$

Step III Adopt SOYD method for 36 months for each year as follows :

Find SOYD factors for three years***

$$\text{1st Year : } (36+35+34+\dots+25)/(36+35+34+\dots+2+1) = 366/666$$

$$\text{2nd Year : } (24+25+23+\dots+13)/(36+35+34+\dots+2+1) = 222/666$$

$$\text{3rd Year : } (12+11+10+\dots+1)/(36+35+34+\dots+2+1) = 78/666$$

Step IV Based on these find interest rate allocations

$$\text{1st Year : } \text{Rs. } 420000 \times 366/666 = \text{Rs. } 230811$$

$$\text{2nd Year : } \text{Rs. } 420000 \times 222/666 = \text{Rs. } 140000$$

$$\text{3rd Year : } \text{Rs. } 420000 \times 78/666 = \text{Rs. } 49189$$

Step V Prepare the Interest Allocation table

Year	Hire Purchase Instalment	Interest	Principal Rapayment
1	473333	230811	242522
2	473333	140000	333333
3	473333	49189	424144

Step VI Find Post Tax Interest & Depreciation Tax Shield

Year	Interest (1-T)	Principal	Depreciation ×	1(1-T)+P-DT
1	230811*0.5	2425322	333333*0.5	191261
2	140000*0.5	333333	222222*0.5	292222
3	49189*0.5	424144	148148*0.5	374665

Step VII Find the PV at the post tax rae

$$= 191261/(1.08) + 292222/(1.8)^2 + 374665/(1.08)^3$$

$$= 725047.90$$

***** Note :** Had the tenure been given as 3 years then the SOYD factors would be

$$\frac{3}{1+2+3}, \frac{2}{1+2+3} \text{ \& } \frac{1}{1+2+3}$$



Illustration 10 :

A small firm has a total sales of Rs. 100 lakhs, of which 80% is on credit. It is offering a discount credit terms of "2/40 Net 30". Of the total, 50% of customers avail of discount and the balance pay in 120 days. The past experience indicates that bad debt losses are around 1% of credit sales. The firm spends about Rs. 1,20,000 per annum to administer its credit sales. These are avoidable as a factor is prepared to buy the firm's receivables. He will charge 2% commission. He will also pay advance against receivables to the firm at an interest rate of 18% after withholding 10% as reserve. Answer the following :

- What is the total credit sales?
- What is the average collection period?
- What is the average receivables?
- What is the factoring commission payable per annum?
- What is the disburseable amount to the firm by the factor?
- What is the total interest chargeable by the factor?
- What is the cost of factoring?
- Should the firm avail factoring services?

Solution :

- Total Credit sales = 80% of Total Sales = Rs. 80 lakhs.
- Average Collection period = $0.5 \times 40 + 0.5 \times 120 = 80$ days
- Average Receivables =

$$\frac{\text{Total Credit Sales} \times \text{Av. Collect}}{360}$$

$$\frac{80,00,000 \times 80}{360}$$

$$= \text{Rs. } 17,77,778$$

- Factoring Commission = 2% of Average Receivables = 2% of 17,77,778 = Rs. 35,556
- Reserve @ 10% of Receivables = 10% of 17,77,778 = Rs. 1,77,778

$$\text{Disburseable Amount} = \text{Payable by Factor} = 17,77,778 - 35,556 - 1,77,778 = \text{Rs. } 15,64,444$$

- Interest Chargeable @ 18% = $15,64,444 \times 18\% \left(\frac{80}{360} \right) = \text{Rs. } 62,578$

g. Cost of Factoring :

$$\text{Commission} = \text{Rs. } 35,556$$

$$\text{Interest} = \frac{\text{Rs. } 62,578}{\text{Rs. } 98,134}$$

$$\text{Annualized Cost} = \frac{98,134 \times 360}{80}$$

$$= \text{Rs. } 4,41,603$$



Less : Savings of Bad Debts	=	Rs. 80,000
Administrative Cost	=	<u>1,20,000</u>
Net Cost	=	<u>2,41,603</u>

Effective Rate of Cost = $241603/1564444 = 15.44\%$

So, the Net Cost of Factoring is 15.44%. If the firm can obtain funds at a lesser cost, the factoring need not be considered.

Illustration 11 :

A Ltd. has a total sales of Rs. 3.2 Crores and its average collection period is 90 days. The past experience indicates that bad debt losses are 1.5% on sales. The expenditure incurred by the firm in administering its receivable collection efforts are Rs. 500000. A factor is prepared to buy the firm's receivables by charging 2% commissions. The factor will pay advance on receivables to the firm at an interest rate of 18% p.a. after withholding 10% as reserve. Calculate the effective cost of factoring to the firm.

Solution :

Average level of Receivables = $3,20,00,000 \times 90/30$	80,00,000
Factoring commission = $80,00,000 \times 2/100$	1,60,000
Factoring reserve = $80,00,000 \times 10/100$	8,00,000
Amount available for advance = Rs. 80,00,000	70,40,000

(1,60,000 + 8,00,000)

Factor will deduct his interest @ 18%

$$\text{Interest} = \frac{\text{Rs. } 70,40,000 \times 18 \times 90}{100 \times 360} \quad \text{Rs. } 3,16,800$$

∴ Advance to be paid = Rs. 70,40,000 – Rs. 3,16,800 = Rs. 67,23,200

Amount Cost of Factoring to the Firm : Rs.

Cost of credit administration saved	5,00,000
Cost of Bad Debts (Rs. 3,20,00,000 × 1.5/100) avoided	4,80,000
Total	9,80,000
Net cost of the Firm (Rs. 19,07,200 – Rs. 9,80,000)	9,27,200

$$\text{Effective rate of interest to the firm} = \frac{\text{Rs. } 9,27,200 \times 100}{67,23,200} \quad 13.79\%*$$

Note : The number of days in a year have been assumed to be 360 days.

Illustration 12 :

Under an advance factoring arrangement Bharat Factors Ltd. (BFL) has advanced a sum of Rs. 14 lakhs against the receivable purchased from ABC Ltd. The factoring agreement provides for an advance payment of 80% (maintaining 'factor reserve' of 20% to provide for disputes and deductions relating to the bills assigned) of the value of factored receivable and for guaranteed payment after three months from the date of purchasing the receivables. The advance carries a rate of interest of 20% per annum compounded quarterly and the factoring commission is 1.5% of the value of factored receivables. Both the interest and commissions are collected up-front.

Financial Management Decisions

- (i) Compute the amount of advance payable to ABC Ltd.
- (ii) Calculate per annum the effective cost of funds made available to ABC Ltd.
- (iii) Calculate the effective cost of funds made available to ABC Ltd. assuming the interest is collected in arrear and commission is collected in advance.

Solution :

- (i) **Computation of Advance Payable to ABC Ltd. :** (Rs. in lakhs)

Value of factored receivable (<i>i.e.</i> , 14/0.8)	17.50
Maximum Permissible advance	14.00
Less : Commission @ 1.5 per cent (<i>i.e.</i> , 17.50×0.015)	0.26
Less : Discount charge (14×0.2×90/360)	<u>0.70</u>
Funds made available to ABC Ltd.	13.04

- (ii) **Effective Cost :**

Total charge	= 7+26 = Rs. 96 lakhs
Total charge expressed as a percentage of funds made available to ABC Ltd. (<i>i.e.</i> , 0.96/13.04)	= 7.36% per quarter
The annualized rate of interest	= $[1+0.0736]^4 - 1 = 32.85$
Hence cost of funds	= 32.85%

- (iii) **Effective cost when interest in arrears and commission in advance :**

(Rs. in lakhs)

Maximum permissible advance	14.00
Less : Commission payable up-front (17.50×0.015)	0.26
Funds made available to ABC Ltd.	13.74
Interest charges collected in arrears (<i>i.e.</i> , 14×0.20×90/360)	0.70
Total charge expressed as a percentage of funds made available (0.96/13.74)×100 = 6.99% per quarter	
Annualized interest cost = $[(1+0.0699)^4 - 1] \times 100 = 31.03\%$	

Recourse Vs Non-Recourse Factoring

Illustration 13 :

BP Factors, offers recourse factoring on the following terms :

	Facility	Recourse Factoring
I.	Discount charge (payable up-front)	18% p.a.
II.	Reserve	21%
III.	Commission	2.5%

The Finance Manager of Fame Furnishings Ltd. a dealer in home furnishings has approached BP Factor to factor its receivables. After intricate analysis of the sales documents of Fame Furnishings Ltd. BP Factors offered a guaranteed payment of 45 days.



The following information about the credit policy and trends of Fame Furnishing Ltd is available :

Fame Furnishings sells on terms "2/10 net 45". On an average 50% of the customers pay on the 10th day and avail the discount. Again, on an average the remaining customers pay 80 days after the invoice date. The bad debts and losses amount to 1% of the sales invoices. The sales personnel are responsible for following up collections and by and large the Fame Furnishings can increase its annual sale by Rs. 25 lakhs if the sales people are relieved from collection jobs. The gross margin on sales is 28% and the estimated sales turnover for the following year without considering the increase in sales is Rs. 300 lakhs. By offloading sales ledger administration and credit monitoring, Fame Furnishings can save overheads to the extent of Rs. 1.50 lakhs per annum. Currently, Fame Furnishings is financing its investments through a mix of bank finance and long-term funds in the ratio of 3:2. The effective rate on bank finance is 17% and the pre-tax cost of long-term funds is 21%.

You are required to :

- Perform cost-benefit analysis of recourse factoring and advise Fame Furnishings whether to accept the factoring proposal or not.
- Find out the maximum rate of factoring commission Fame Furnishings can pay if it wishes to relieve the cost of bad debts and be indifferent between recourse and non-recourse factoring.

Solution :

- The relevant costs associated with in-house management of receivables and recourse factoring are listed below :

Relevant costs of In-house management of receivables

- | | |
|--|---|
| A. Cash discount | = $300 \times 0.02 \times 0.50$ = Rs. 3.0000 Lakhs |
| Average collection period | = $(10 \times 0.50) + (80 \times 0.50)$ = 45 days |
| Cost of bank finance | = $(300 \times 3/5) \times (45/360) \times 0.17$ = Rs. 3.8250 lakhs |
| Cost of long-term funds | = $(300 \times 2/5) \times (45/360) \times 0.21$ = Rs. 3.1500 lakhs |
| B. Cost of funds in receivables | = rs. 6.9750 lakhs |
| C. Bad debt losses | = 300×0.01 = Rs. 3 lakhs |
| D. Contribution lost on foregone sales | = 25×0.28 = Rs. 7.0000 lakhs |
| E. Avoided cost of sales ledger administration & credit monitoring | = Rs. 1.50000 lakhs |

Relevant costs of recourse factoring

- | | |
|-------------------------|--|
| F. Factoring commission | = 325×0.025 = Rs. 8.1250 lakhs |
| G. Discount charge | = $325 \times 0.79 \times 0.18 \times (45/360)$ = Rs. 5.7916 lakhs |

Cost-benefit analysis of recourse factoring

- | | |
|---|---------------------------------|
| I. Benefit associated with recourse factoring | = $A+B+D+E$ = Rs. 18.4750 lakhs |
| J. Cost associated with recourse factoring | = $F+G+H$ = Rs. 15.6935 lakhs |
| K. Net benefit | = $I - J$ = Rs. 2.7816 lakhs |

As the net benefit associated with recourse factoring is positive Fame Furnishings is advised to opt for recourse factoring.



- b. should be same and as benefit of non-recourse factoring is increased by the amount for bad debt losses i.e. Rs. 3 lakhs, non-recourse factoring commission can be higher than recourse factoring by Rs. 3 lakhs.

$\therefore$ Non-recourse factoring commission = $8.125 + 3$ = Rs. 11.125 lakhs.

Maximum factoring commission, BP Factoring can pay = $11.125 / 325$ i.e. Rate 3.42%

Factoring Vs Bills Discounting :

Illustration 14 :

The turnover of Rs. Ltd. is Rs. 60 lakhs of which 80% is on credit. Debtors are allowed on month to clear off the des. A factor is willing to advance 90% of the bills raised on credit for a fee of 2% a month plus a commission of 4% on the total amount of debts. Rs Ltd. as a result of this arrangement is likely to save Rs. 21,600 annually in management costs and avoid bad debts at 1% on the credit sales.

A scheduled bank has come forward to make an advance equal to 90% of the debts at an interest rate of 18% p.a. However its processing fee will be at 2% on the **debts**. Would you accept factoring or the offer from the bank?

Solution :

Factoring arrangement :

Assuming the turnover given in the problem is annual turnover, the calculations are as follows :

Cost of factoring : Rs.

Fee of 2% on 90% of Rs. 4,00,000	=	7,200
(80% of 60 lakhs = 48 lakhs / 12 = 4 lakhs is the monthly credit sales)		
Commission at 4% on Rs. 4,00,000	=	<u>16,000</u>
		23,200

Less : Savings in cost

Savings in annual management cost is Rs. 21,600

Hence for a month : $21600 / 12$ = Rs. 1,800

1% savings of Bad debts on Rs. 4,00,000 = Rs. 4,000
5,800

Net cost in factoring 17,400

Cost of Bank Advance :

Interest at 18% p.a. for one month on

90% of Rs. 4,00,000 5,400

Processing fee at 2% on Rs. 4,00,000 8,000

Add : Bad debts loss that cannot be avoided 4,000

Since costs of both alternatives are equal, it is immaterial whether R. Ltd. goes in for factoring or bank loan.

Note : Alternatively the same problem can be solved on a annual basis leading to the same total cost of Rs. 2,00,800.