NOTES ON LEVERAGE

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Section – 6A, 6B & 6E

Subject – Financial Management

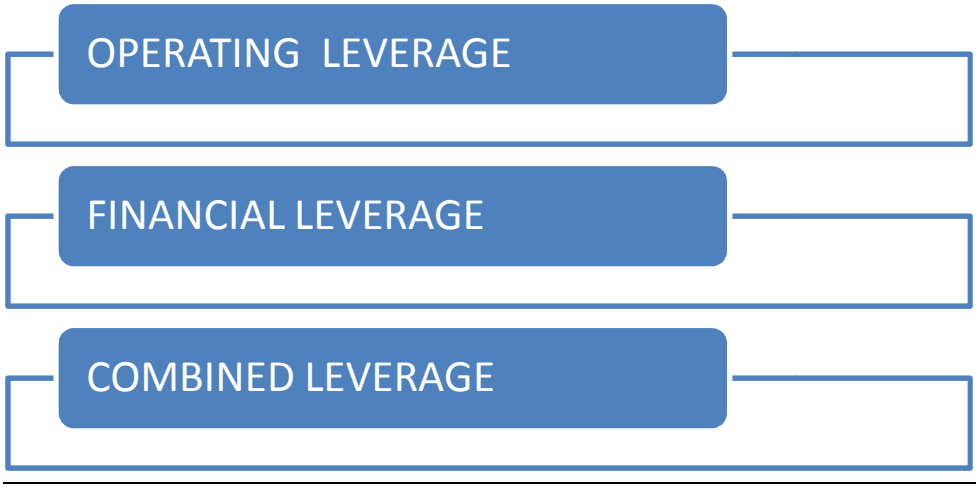
LEVERAGE

In Financial Management, Leverage means the influence of one financial variable over some other related financial variable

It is used to explain firm's ability to use fixed cost to magnify the returns to its owner. Leverage exist s whenever a firm has fixed costs. If there is fixed costs & if there is uncertainty to generate revenue to meet those fixed costs, there arises risk. There are two types of risk & these are –

1. Operating Risk / Business Risk
2. Financial Risk

TYPES OF LEVERAGE



❖ OPERATING LEVERAGE:-

It is the ability of the firm to use fixed operating costs to magnify the effects of changes in sales on its EBIT (Earnings before interest & tax).The firm can measure its operating Risk through operating leverage.

- Measurement of Operating Leverage:-

$$DOL = \frac{\%\ \text{Change in EBIT}}{\%\ \text{Change in Sales}}$$

Or

$$\frac{\text{Contribution}}{\text{EBIT}}$$

❖ FINANCIAL LEVERAGE:-

It is the ability of the firm to use fixed financial charges (e.g Interest) to magnify the effects of changes in EBIT on the Firm's EPS.(Earning per Share). The firm can measure its Financial Risk through financial leverage

- Measurement of Financial Leverage:-

$$DFL = \frac{\%\ \text{Change in EPS}}{}$$

% Change in EBIT

Or

DFL = EBIT / EBT

❖ COMBINED LEVERAGE:-

It is the ability of the firm to use fixed costs both fixed & financial which magnifies the effect of change in sales volume on the EPS of the firm. The firm can measure its total Risk through combined leverage

- Measurement of Combined Leverage:-

DCL = = % Change in EPS / % Change in Sales

Or

Contribution / EBT

INCOME STATEMENT / PROFITABILITY STATEMENT

	Particulars	Rs.
	Sales	***
Less:	Variable cost	****
	Contribution	*****
Less:-	Fixed operating costs	***
	EBIT(Earning before Interest & Tax)	*****
Less:-	Interest(Financial Charges)	***
	EBT(Earning before tax)	*****
Less:-	Tax	***
	EAT(Earning after tax)	*****
Less:-	Preference Dividend	***
	Earnings available to equity shareholder(A)	*****
	No. Of equity Shares**(B)**	***
	EPS (Earning per Share) = A/B	*****

SUMS ON LEVERAGE:-

1. **From the following information compute sales:-**
   DOL – 2; DFL – 3; Interest – Rs. 3,00,000 & contribution is 40% of sales.

SOLUTION -

Degree of Financial Leverage (DFL) = EBIT / EBT

Or, we can say 3 = EBIT / EBIT – Rs. 3,00,000 .

Or, 3EBIT – 9, 00,000 = EBIT

OR, EBIT = Rs. 4, 50,000

Again we have,

Degree of Operating Leverage (DOL) = $\frac{\text{Contribution}}{\text{EBIT}}$

Or, $2 = \frac{\text{Contribution}}{4,50,000}$

Or, Contribution = Rs. 9, 00,000

Now, Contribution = 40% of Sales (given)

Or, Sales = $\frac{\text{Contribution}}{40\%}$

$= \frac{9,00,000}{40\%}$

= Rs. 22, 50,000.(ANS.)

2. The following information have been taken from the Income Statement of X ltd.

Fixed operating expenses Rs. 1,200

Fixed Financial Charges Rs. 600

Earning before tax Rs. 400

Calculate % of change in EPS , if Sales increase by 10%.

SOLUTION -

Calculation of EBIT & Contribution

EBT	Rs. 400
Add:- Fixed Financial Charges	Rs. 600
EBIT	Rs. 1,000
Add: - Fixed operating expenses	Rs. 1,200
Contribution	Rs. 2,200

Degree of Operating Leverage (DOL) = $\frac{\text{Contribution}}{\text{EBIT}}$

$= \frac{\text{Rs. 2,200}}{\text{Rs. 1,000}}$

= 2.20

Degree of Financial Leverage (DFL) = $\frac{\text{EBIT}}{\text{EBT}}$

$= \frac{\text{Rs. 1,000}}{\text{Rs. 400}}$

= 2.50

Degree of Combined Leverage (DCL) = Contribution / EBT

= Rs. 2,200 / Rs. 400

= 5.50

Again, DCL = % Change in EPS / % Change in Sales

Or, 5.50 = % Change in EPS / 10

So , % change in EPS = 5.50*10 = 55%

Hence, if Sales increase by 10% , EPS will increase by 55%.

3. **If the combined leverage & operating leverage of a company re 2.5 & 1.25 respectively , find Financial Leverage & P/v ratio, given that the equity dividend per share is Rs. 2 , interest per year is Rs. 2 lakhs, total fixed cost Rs. 1 lakh & sales Rs. 20 lakhs.**

SOLUTION -

combined leverage = operating leverage* Financial Leverage

or, 2.5 = 1.25 * Financial Leverage

or, Financial Leverage = 2.5 / 1.25

Again Financial Leverage = EBIT / EBT

Or, 2 = EBIT / EBIT - I

Or, 2 = EBIT / EBIT – 2

Or 2 EBIT – 4 = EBIT

Or 2EBIT – EBIT = 4

Or EBIT = Rs. 4 Lakhs

We know that ---

operating leverage = Contribution / EBIT

1.25 = Contribution / 4

Or. Contribution = 1.25 * 4 lakhs

Or, Contribution = Rs. 5 lakhs

Now P/v ratio = Contribution/sales = 5 lakhs / 20 lakhs = 0.25 = 25%

So, P/v ratio = 25%

EBIT – EPS ANALYSIS

The basic objective of financial management is to design an appropriate capital structure which can provide the highest Earnings per share (EPS) over the Company's expected range of EBIT.

EPS measures a company's performance for the shareholders. The level of EBIT varies from year to year & represents the success of a Co's operation. EBIT – EPS analysis is a vital tool for designing the optimal capital structure of a company. So, the analysis which aims at determining that component – combination by which the EPS will be maximised with respect to a given amount of EBIT in order to form the capital structure is called EBIT – EPS analysis.

Suppose a firm requires capital of Rs. 10 lakhs. The firm can procure the sum of Rs. 10 lakhs from different sources. Again suppose the firm has 4 alternatives financial plan from where it can procure Rs. 10 lakhs. The alternatives are :---

a) Equity Shares of Rs. 10, 00,000.
b) Equity Shares of Rs. 5,00,000 & 10% Preference Shares of Rs. 5,00,000
c) Equity Shares of Rs. 5,00,000 & 10% Debenture of Rs. 5,00,000
d) Equity Shares of Rs. 5,00,000 & 10% Preference Shares of Rs. 2,50,000 & 10% Debenture of Rs. 2,50,000.

In this case the above mentioned plans are the different alternatives component – combination of capital structure of Rs. 10,00,000. A firm can form its capital structure of Rs. 10, 00,000 by taking any one of these component – combination. So, in order to find out the maximum EPS under these 4 alternatives the firm need to make an comparison among these alternatives & choose the best one.

So, we can say that the analysis which aims t determining that component – combination by which the EPS will be maximised with respect to given mount of EBIT in order to form the Capital Structure is called EBIT – EPS analysis.

4. G Company has currently an ordinary share capital of Rs. 25 lakhs , Consisting of 25,000 equity shares of Rs. 100 each. The management is planning to rise another Rs. 20 lakhs to finance major programme of expansion through one of four possible financing plans. The options are:
   I. Entirely through equity / ordinary shares.
   II. Rs. 10 lakhs through equity shares & Rs. 10 lakhs through Long term borrowings at 8% interest p.a.
   III. Rs. 5 lakhs through equity shares & Rs. 15 lakhs through Long term borrowings at 9% interest p.a.
   IV. Rs. 10 lakhs through equity shares & Rs. 10 lakhs through preference shares with 5% dividend.

The Company's expected EBIT will be Rs. 8 Lakhs. Assuming a corporate tax rate of 50%, determining the EPS in each alternative.

SOLUTION:--

Statement showing Total capital after expansion & EPS under four alternatives.

Particulars	**Financing Plans.**			
	I	**II**	**III**	**IV**
Total capital after expansion Existing Equity share capital (@ Rs. 100 each)	25,00,000	25,00,000	25,00,000	25,00,000
[A]----------→	25,00,000	25,00,000	25,00,000	25,00,000
On Expansion Equity share capital	20,00,000 (100%)	10,00,000 (50%)	5,00,000 (25%)	10,00,000 (50%)
8% Long term Borrowing	----------	10,00,000 (50%)	----------	----------

9% Long term Borrowing 5% Preference Share capital	---------- ----------	---------- ----------	15,00,000 (75%) ----------	---------- 10,00,000 (50%)
[B]----------→	20,00,000	20,00,000	20,00,000	20,00,000
TOTAL CAPITAL [A+B]	45,00,000	45,00,000	45,00,000	45,00,000
(1) EBIT (2) Less – Interest	8,00,000 ------	8,00,000 80,000	8,00,000 1,35,000	8,00,000 ----
(3) EBT [1-2]	8,00,000	7,20,000	6,65,000	8,00,000
(4) Less- Tax	4,00,000	3,60,000	3,32,500	4,00,000
(5) EAT [3-4]	4,00,000	3,60,000	3,32,500	4,00,000
(6) Less- Preference Dividend	------	--------	---------	50,000
(7) Earnings available to Equity shareholders [5-6]	4,00,000	3,60,000	3,32,500	3,50,000
(8) No. of Equity shares[Existing + New]	45,000	35,000	30,000	35,000
(9) Earnings per Share [7/8]	8.89	10.29	11.08	10.00

Comment- It is clear from the above that when EBIT is Rs. 8,00,000 the Financing Plan III involving total capitalisation of 25% equity & 75& debt would be the most favourable with respect to EPS.

INDIFFERENCE POINT

When two alternative financing plans produce level of EBIT where EPS is the same irrespective of Debt – Equity mixture , the situation is referred to as " Indifference Point."In other words, it is the level of EBIT where EPS will be equal under alternative financing plans.
The point of Indifference can be calculated by using the following equation:--

$$\frac{[(EBIT - I1)(1 - T)] - P}{N1} = \frac{[(EBIT - I2)(1 - T)] - P}{N2}$$

i.e EPS for Alternative 1 = EPS for Alternative 2
where,
EBIT = Earning before Interest & Tax
I1 = Interest under Alternative 1
I2 = Interest under Alternative 2
T = Tax Rate
P = Preference Dividend
N1 = Number of Equity share under Alternative 1
N2 = Number of Equity share under Alternative 2

5. **XY Ltd. Is setting up a project with capital outlay of Rs. 15,00,000. It has the following two alternatives in financing the project cost.**
Alternative 1 :- 100% Equity Finance @ Rs. 100 per Share
Alternative 2 :- Debt – Equity ratio 2 : 1
The rate of interest payable on the debt is 12% p.a. The Corporate rate of tax is 50%. Calculate Indifference Point two alternatives methods of Financing.

SOLUTION:--

XY LTD.
Capital Structure of the Projects

Particulars	Alternative 1	Alternative 2
Equity Share Capital @ Rs. 100 per Share	15,00,000	5,00,000
12% Debt Capital	----------	10,00,000

Now, the point of Indifference is given by

$$\frac{[(EBIT - I1)(1-T)] - P}{N1} = \frac{[(EBIT - I2)(1-T)] - P}{N2}$$

Or, $$\frac{[(EBIT - 0)(1-0.50)] - 0}{15{,}000} = \frac{[(EBIT - Rs.\,1{,}20{,}000)(1-0.50)] - 0}{5{,}000}$$

Or, $$\frac{0.50\text{EBIT}}{15{,}000} = \frac{0.50EBIT - Rs.\,60{,}000}{5{,}000}$$

Or, 0.50EBIT = 1.50 EBIT - Rs. 1,80,000
Or, EBIT = Rs. 1, 80,000

The EBIT at indifference point is therefore Rs. 1,80,000 which explains that the EPS for two alternatives of Financing is Equal. We can confirm this with the help of the following table.

Confirmation Table

Particulars	Alternative 1 (Equity)	Alternative 2 (Debt + Equity)
(1) EBIT	1,80,000	1,80,000
(2) Less – Interest	-----	1,20,000
(3) EBT [1-2]	1,80,000	60,000
(4) Less- Tax	90,000	30,000
(5) EAT [3-4]	90,000	30,000
(6) No. of Equity shares	15,000	5,000
(7) EPS [5/6]	6	6

FINANCIL BREAK EVEN POINT

Financial Break even point is the level of EBIT at which the EPS would be zero. Zero EPS is possible only when earnings available to equity shareholder would be zero. It is the minimum level of EBIT needed to satisfy all fixed financial charges i.e. interest & preference Dividend.

Financial Break even point = Interest + $\frac{\text{Preference Dividend}}{(1\text{-}T)}$

6. Z Ltd. hs total paid share capital of Rs. 70,00,000 , comprises of Rs. 4,00,000 equity shares of Rs. 10 each & 30,000, 14% preference shares of Rs. 100 each. The company has also 8% Debenture of Rs. 50,00,000 in its capital structure . The Corporate tax rate is 30% . Financial Break Even point of z ltd.

SOLUTION :-

Financial Break even point = Interest + $\frac{\text{Preference Dividend}}{(1\text{-}T)}$

$$= (8\% \text{ of Rs. } 50,00,000) + \frac{(14\% \text{ of Rs. } 30,00,000)}{(1\text{-}0.30)}$$

$$= 4,00,000 + \frac{4,20,000}{0.70}$$

= 4, 00,000 + 6, 00,000 = Rs. 10, 00,000 (ans.)

It is the level of EBIT (i. e Rs. 10,00,000) at which EPS is zero. This may be verified as follows –

Particulars	Rs.
(1) EBIT	10,00,000
(2) Less – Interest	4,00,000
(3) EBT [1-2]	6,00,000
(4) Less- Tax	1,80,000
(5) EAT [3-4]	4,20,000
(6) Less- Preference Dividend	4,20,000
(7) Earnings available to Equity shareholders [5-6]	0
(8) No. of Equity shares[Existing + New]	4,00,000
(9) Earnings per Share [7/8]	0