

# Leverage Analysis

By:

Dr. Vijay Shankar Pandey

Assistant Professor

IMS-New Campus

University of Lucknow, Lucknow

# Leverage Analysis: An Introduction

Leverage have different meaning in different subjects such as;

- In Mechanics leverage means a instrument that helps us in lifting heavy objects, which may not be otherwise possible.
- In financial management, the firm's ability to use fixed cost funds to magnify the return of its owners.
- The term leverage, in general, refers to a relationship between two interrelated variables. With reference to a business firm, these variables may be costs, output, sales revenue, EBIT, Earnings Per share (EPS) etc.
- The leverage may be defined as the % change in one variable divided by the % change in some other variable or variables.
- The leverage analysis thus, reflects as to how responsiveness is the dependent variable to a change in the independent variables.

## Types of Leverage

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graph TD; A[Types of Leverage] --> B[Operating Leverage:]; A --> C[Financial Leverage]; A --> D[Combined Leverage];
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Operating  
Leverage:

Financial  
Leverage

Combined  
Leverage

## Operating Leverage :

The operating leverage measures the relationship between the sales revenue and the EBIT. It measures the effect of change in sales revenue on the level of EBIT.

Hence, the operating leverage is calculated by dividing the % change in EBIT by the % change in sales revenue.

The operating costs are categorized into **three**  
:

1. Variable Cost- Change proportion to production
2. Semi-Variable: Change along with production but not in proportion.
3. Fixed Cos: No change incur.

Sales	}	Operating
Less : Variable Cost		
= Contribution		
Less : Fixed Cost	}	Financing
= Earning before Interest & Tax		
Less : Interest on Debt		
= Profit before Tax		
Less : Tax		
= Profit after Tax		
Less : Preference Dividend		
= Equity Earnings		

The operating leverage can be calculated by the following formula.

$$\text{Operating Leverage (OL)} = \frac{\text{Contribution (C)}}{\text{Operating Profit (EBIT or OP)}}$$

where, Contribution = Sales – Variable Cost

Operating Profit = Contribution – Fixed Cost

Operating leverage may be favourable or unfavourable . In case the contribution exceeds the fixed cost, there is favourable operating leverage and in vice versa it will be unfavourable .

The operating leverage indicates the impact of change in sale on operating income (EBIT). If a firm has a high degree of operating leverage even small changes in sales will have large effects on its operating income (EBIT).

**Degree of Operating Leverage :** The degree of operating leverage may be defined as the change in the percentage of operating income (EBIT), for the change in percentage of sales revenue.

**Degree of Operating Leverage (DOL) =**

Percentage Change in EBIT / Percentage Change in Sales

Or

Degree of Operating Leverage (OL) = % change in contribution ( $\Delta C$ ) / % change in operating Profit ( $\Delta$  EBIT or OP)

**Illustration:** The installed capacity of a factory is 800 units. Actual capacity used is 500 units. Selling price per unit is Rs.12. Variable cost is Rs.7 per unit Calculate the operating leverage in each of the following three situations when fixed costs are Rs.500

When fixed costs are Rs.1,200

When fixed costs are Rs.1,400

Particulars	Situation 1	Situation 2	Situation 3
Sales (S)	6000	6000	6000
Less: Variable cost (V)	4000	4000	4000
Contribution (C = S-V)	2000	2000	2000
Less: Fixed cost (F)	500	1200	1500
Operating profit (OP= C-F)	1500	800	500
Operating leverage (C/OP)	1.33	2.50	4.00

We conclude that the degree of operating leverage increases with every increase in share of fixed cost in the total cost structure of the firm. It shows for e.g., in situation 3 that if sales increase by one percent, the profit would increase by 4%. This can be verified by placing suitable figure in situation 3 suppose sales is Rs.12,000 i.e., 100% increase than the operating profit will be Rs.2,500 which is increased by 400%.



**Financial Leverage** : Using various component of capital in composite called capital structure. The use of fixed charges, sources of funds such as debt and preference share capital along with the equity share capital in capital structure is called financial leverage. It is also known as trading on equity. **According to Lawrence**, financial leverage is the ability of the firm to use fixed financial charges to magnify the effects of changes in EBIT on the firm's earnings per share. The fixed charges do not vary with firm's EBIT. They must be paid regardless of the amount of EBIT.

The Financial leverage can be calculated by the following formula.

**Financial Leverage =**

**EBIT or Operating Profit / EBT or taxable income**

**Degree of Financial Leverage (DFL) =**

**Percentage Change in EPS / Percentage Change in EBIT**

A financial leverage may be favourable or unfavourable.

Favourable leverage occurs when the firm earns more on the assets purchased with the funds, than the fixed cost of their use and vice versa. High degree of financial leverage leads to high financial risk. The financial risk refers to the risk of the firm not being able to cover its fixed financial charges.

# Computation of Financial Leverage

**Case 1: Where capital structure consists of equity shares and debt :** In such a case the formula is :-

$$\text{Financial Leverage} = \text{EBIT} / (\text{EBIT} - \text{Interest})$$

**Or**

$$= (\text{EBIT or OP}) / (\text{EBT or PBT})$$

**Case 2: Where capital structure consists of Preference share and equity shares :** The amount of preference dividends will have to be grossed up (as per the tax rate applicable to the company) and then deducted from the earnings before interest and tax in such a case the formula is :-

$$FL = EBIT / \{EBIT - [PD/(1-t)]\}$$

**Case 3: Where capital structure consists of Equity Shares, Preference share and Debts :**  
In such a case the financial leverage is calculated after deducting from operating profit both interest and preference dividend on a before-tax basis. The formula is as follows :

$$FL = EBIT / \{EBIT - \text{Interest} - [PD/(1-t)]\}$$



**Combined Leverage :** The operating leverage has its effects on operating risk and is measured by the percentage change in EBIT due to the percentage change in sales. The financing leverage has its effects on financial risk and is measured by the percentage change in EPS due to the percentage change in EBIT. Since, both these leverages are closely related with the ascertainment of the firm's ability to cover fixed charges (fixed operating costs and fixed financial costs), the sum of both, gives us the total leverage or combined leverage and the risk associated with combined leverage is known as total risk.

Combined leverage can be calculated by combining operating leverage and financial leverage which will reflect the total risk or sensitivity due to change in sales over change in earning per share. This is called the degree of combined leverage as follows:

$$DOC = \frac{\Delta EBIT}{\Delta Sales} \times \frac{\Delta EPS}{\Delta EBIT} \text{ or called } \frac{\Delta EPS}{\Delta Sales}$$

Degree of operating leverage= Degree of operating leverage X Degree of financial leverage

$$\text{combined leverage} = \frac{\text{Contribution}}{EBIT} \times \frac{EBIT}{EBT} \text{ OR } \frac{\text{Contribution}}{EBT}$$

# EBIT- EPS Analysis

EBIT – EPS analysis is an important tool used to optimize the capital structure for highest earnings for shareholders

It helps in understanding the sensitivity of EPS at given level of Earning before Interest & Tax under different sources of financing

It helps in analyzing how capital structure decision is important to raise the value of firm

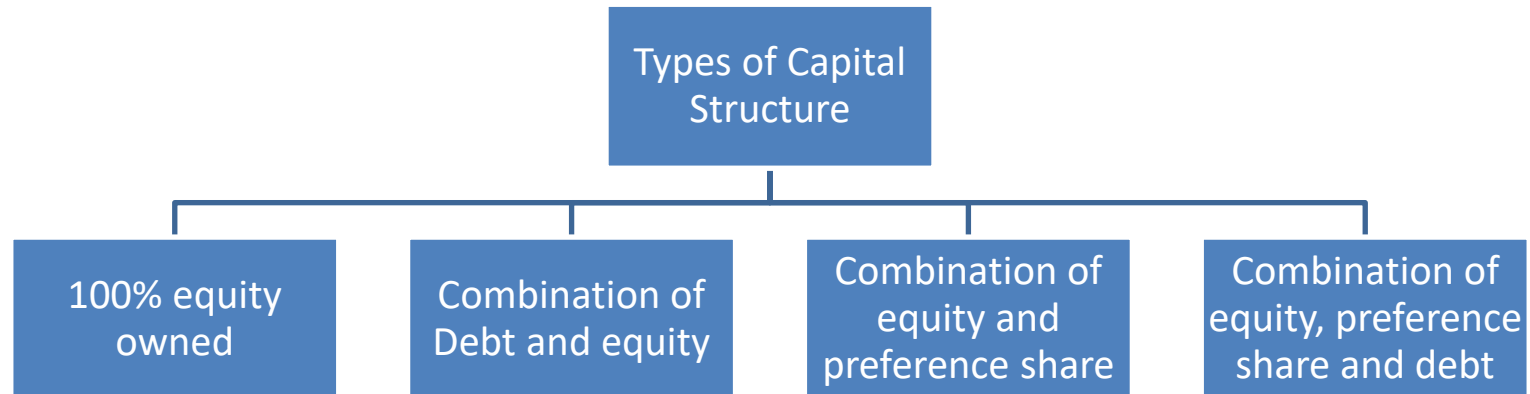
An optimal financing structure minimizes the cost of capital and maximizes the earnings



# Pro forma of Income Statement

Particular	Amount	Type of Activity
Sales (S)	****	Operating Activity
Variable cost (V)	****	
Contribution (C )(C= S -V)	****	
Fixed cost (F)	****	
Operating profit or EBIT (EBIT=C-F)	****	Financial Activity
Interst on debt (INT)	****	
Profit before tax or EBT (EBIT- EBT)	****	
Tax (T)	****	
Profit after tax (PAT) (PAT= EBT-T)	****	

# Capital Structure



Note: Equity share = Equity share + Retained earnings

# Earning Per Share

- **Plan 1 (Only Equity Shares)**

$$\text{EPS} = \frac{\text{EBIT} (1 - \text{Tax rate})}{\text{No. of Outstanding Shares}}$$

- **Plan 2 (Equity Shares & Debt)**

$$\text{EPS} = \frac{(\text{EBIT} - \text{Interest}) (1 - \text{Tax rate})}{\text{No. of Outstanding Shares}}$$

- **Plan 3 (Equity, Debt & Preference Shares)**

$$\text{EPS} = \frac{(\text{EBIT} - \text{Interest}) (1 - \text{Tax rate}) - \text{Pref. Dividend}}{\text{No. of Outstanding Shares}}$$

- **Plan 4 (Equity shares & Preference Shares)**

$$\text{EPS} = \frac{(\text{EBIT} (1 - \text{Tax rate}) - \text{Pref. Dividend})}{\text{No. of Outstanding Shares}}$$

# Problem

ABC Ltd. has existing equity share capital of Rs. 4,00,000 (face value 100 each). It has decided to expand its business for which there is an additional capital requirement of Rs. 2,00,000. Now, it has following four alternatives sources to raise capital :-

Plan 1 – To raise full 2,00,000 through equity financing

Plan 2 – To raise 100,000 (face value of 100) through equity and 100,000 through debt at int. rate of 10%p.a.

Plan 3 – To raise full 2,00,000 through debt financing @ interest rate of 10% p.a.

Plan 4 – To raise 100,000 through equity and 100,000 through 5% preference shares

Plan 5 – To raise 100,000 through equity and 50,000 through 5% preference share and 50,000 through debt at the rate of 10%.

The expected level of EBIT is 100,000 . Tax rate is 30%. Which plan do you think it

- should go for considering the one which would provide maximum EPS?

## Solution for EPS under various plans

Particular	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5
EBIT	100000	100000	100000	100000	100000
Interest	0	10000	20000	0	5000
EBT	100000	90000	80000	100000	95000
Tax at the rate of 30%	30000	27000	24000	30000	28500
PAT	70000	63000	56000	70000	66500
Preference Dividend at 5%	0	0	0	5000	2500
Earnings available to equity share holders	70000	63000	56000	65000	64000
Earning per share	11.67	12.6	14	13	12.8

Plan 3 have maximum EPS so than plan 3 is better

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