

Leverage is a practice which can help a business drive up its gains / losses. In business language, if a firm has fixed expenses in P/L account or debt in [capital structure](#), the firm is said to be levered. Nowadays, almost no business is away from it but very few have struck a balance.

In finance, leverage is very closely related to fixed expenses. We can safely state that by the introduction of expenses which are fixed in nature, we are leveraging a firm. By fixed expenses, we refer to the expenses, the amount of which remains unchanged irrespective of the activity of the business. For example, an amount of investment made in [fixed assets](#) or interest paid on loans does not change with a normal change in a number of sales. Neither they decrease with a decrease in sales and nor they increase with an increase in sales.

Leverage, in business terminology, really just means debt. It's the [borrowing of funds to finance](#) the purchase of inventory, equipment, and other company assets. [Business owners](#) can use either [debt or equity](#) to finance or buy company assets. [Using debt](#) increases the company's risk of bankruptcy but can also increase the company's profits and returns; specifically its [return on equity](#). If [debt financing](#) is used rather than [equity financing](#), the owner's equity is not diluted by issuing more shares of stock.

Borrowing funds in order to expand or invest is referred to as leverage because the goal is to amplify the loan into a greater value for the firm or investors.

With debt financing, regardless of whether the interest charges are from a loan or a [line of credit](#), the interest payments are tax deductible. In addition, by making timely payments, a company will establish a positive payment history and business credit rating.

Investors prefer the business to use [debt financing](#), but only to a certain point. Investors get nervous about too much debt financing as it drives up the company's default risk.

There are three types of leverage:

Operating Leverage

[Breakeven analysis](#) states that there are essentially two types of costs in a company's structure: [fixed costs and variable costs](#). Operating leverage refers to the percentage of fixed costs that a company has. Stated another way, operating leverage is the ratio of [fixed costs](#) to variable costs; if a business firm has more fixed costs as compared to variable costs, then the firm is said to have high operating leverage.

A [capital intensive firm](#) is one that uses fixed costs, for example those within the automotive industry, as they need a huge amount of equipment to manufacture and service their products. When the economy slows down and fewer people are buying new cars, the auto companies still have to pay their fixed costs, such as overhead on factories, depreciation on equipment, and other [fixed costs](#) associated with a capital intensive business.

Compare the high operating leverage of a capital intensive firm to the operating leverage for a labor intensive one: labor intensive firms require greater human capital for the production process, and have less fixed costs. The service businesses that make up much of our economy, such as [restaurants](#) and hotels, are labor intensive. In difficult economic times,

firms that are labor intensive typically have an easier time surviving than capital intensive firms.

If a firm has high operating leverage, a small change in sales volume results in a large change in [return on invested capital](#) (ROIC). In other words, firms with high operating leverage are very sensitive to changes in sales, and this is quickly reflected by their [bottom line](#). OL directly impacts the operating profits (Profits before Interest and Taxes (PBIT)). Under good economic conditions, an increase of 1% in sales will have more than 1% change in operating profits.

Operating leverage refers to the use of fixed operating costs such as depreciation, insurance of assets, repairs and maintenance, property taxes etc. in the operations of a firm. But it does not include interest on debt capital. Higher the proportion of fixed operating cost as compared to variable cost, higher is the operating leverage, and vice versa.

Operating leverage may be defined as the “firm’s ability to use fixed operating cost to magnify effects of changes in sales on its earnings before interest and taxes.”

In practice, a firm will have three types of cost viz:

- (i) Variable cost that tends to vary in direct proportion to the change in the volume of activity,
- (ii) Fixed costs which tend to remain fixed irrespective of variations in the volume of activity within a relevant range and during a defined period of time,
- (iii) Semi-variable or Semi-fixed costs which are partly fixed and partly variable. They can be segregated into variable and fixed elements and included in the respective group of costs.

Operating leverage occurs when a firm incurs fixed costs which are to be recovered out of sales revenue irrespective of the volume of business in a period. In a firm having fixed costs in the total cost structure, a given change in sales will result in a disproportionate change in the operating profit or EBIT of the firm.

If there is no fixed cost in the total cost structure, then the firm will not have an operating leverage. In that case, the operating profit or EBIT varies in direct proportion to the changes in sales volume.

Operating leverage is associated with operating risk or business risk. The higher the fixed operating costs, the higher the firm’s operating leverage and its operating risk. Operating risk is the degree of uncertainty that the firm has faced in meeting its fixed operating cost where there is variability of EBIT.

It arises when there is volatility in earnings of a firm due to changes in demand, supply, economic environment, business conditions etc. The larger the magnitude of operating leverage, the larger is the volume of sales required to cover all fixed costs.

Illustration 1:

A firm sells its product for Rs. 5 per unit, has variable operating cost of Rs. 3 per unit and fixed operating costs of Rs. 10,000 per year. Its current level of sales is 20,000 units. What will be the impact on profit if (a) Sales increase by 25% and (b) decrease by 25%?

Solution :

Particulars	Present	Expected	
		(+ 25%)	(-25%)
Sales (in units)	20,000	25,000	15,000
	Rs.	Rs.	Rs.
Sales revenues	1,00,000	1,25,000	75,000
Less : Variable operating cost	60,000	75,000	45,000
Contribution	40,000	50,000	30,000
Less : Fixed operating cost	10,000	10,000	10,000
Operating profit (EBIT)	30,000	40,000	20,000
Changes in sales	—	(+) 25,000	(-) 25,000
Changes in operating profit		(+) 10,000	(-) 10,000
Percentage changes in operating profit		$(+) \frac{10,000}{30,000} \times 100$	$(-) \frac{10,000}{30,000} \times 100$
		$= (+) 33\frac{1}{3}\%$	$= (-) 33\frac{1}{3}\%$

(a) A 25% increase in sales (from 20,000 units to 25,000 units) results in a 33 1/3% increase in EBIT (from Rs. 30,000 to Rs. 40,000).

(b) A 25% decrease in sales (from 20,000 units to 15,000 units) results in a 33 1/3% decrease in EBIT (from Rs. 30,000 to Rs. 20,000).

The above illustration clearly shows that when a firm has fixed operating costs an increase in sales volume results in a more than proportionate increase in EBIT. Similarly, a decrease in the level of sales has an exactly opposite effect. The former operating leverage is known as favourable leverage, while the latter is known as unfavorable.

Degree of Operating Leverage:

The earnings before interest and taxes (i.e., EBIT) changes with increase or decrease in the sales volume. Operating leverage is used to measure the effect of variation in sales volume on the level of EBIT.

The formula used to compute operating leverage is:

$$\text{Operating Leverage} = \frac{\% \text{ change in EBIT}}{\% \text{ change in sales}} = \frac{\frac{\text{Increase in EBIT}}{\text{EBIT}}}{\frac{\text{Increase in sales}}{\text{Sales}}}$$

The operating leverage at any volume of sales is defined as its degree. The degree of operating leverage is computed by dividing contribution by EBIT.

$$\begin{aligned} \text{Degree of operating leverage} &= \frac{\text{Contribution}}{\text{EBIT}} \\ \text{Here, contribution} &= \text{Sales} - \text{Variable cost} \\ \text{EBIT} &= \text{Sales} - \text{Variable cost} - \text{Fixed cost} \end{aligned}$$

A high degree of operating leverage is welcome when sales are rising i.e. favourable market conditions, and it is undesirable when sales are falling. Because degree of operating leverage means a relatively high operating fixed cost for recovering which a larger volume of sales is required.

The degree of operating leverage is also obtained by using the following formula:

$$\text{DOL} = \% \text{ change in EBIT} / \% \text{ change in units sold}$$

The value of degree of operating leverage must be greater than 1. If the value is equal to 1 then there is no operating leverage.

Importance of Operating Leverage:

The importance of operating leverage:

1. It gives an idea about the impact of changes in sales on the operating income of the firm.
2. High degree of operating leverage magnifies the effect on EBIT for a small change in the sales volume.
3. High degree of operating leverage indicates increase in operating profit or EBIT.
4. High operating leverage results from the existence of a higher amount of fixed costs in the total cost structure of a firm which makes the margin of safety low.
5. High operating leverage indicates higher amount of sales required to reach break-even point.
6. Higher fixed operating cost in the total cost structure of a firm promotes higher operating leverage and its operating risk.
7. A lower operating leverage gives enough cushion to the firm by providing a high margin of safety against variation in sales.
8. Proper analysis of operating leverage of a firm is useful to the finance manager.

Financial Leverage

Financial leverage refers to the amount of debt in the accounts of the firm. If you can envision a balance sheet, financial leverage refers to the right-hand side of the balance sheet. Operating leverage refers to the left-hand side of the balance sheet, and accounts for the factory, maintenance, and equipment costs, as well as the mix of fixed assets used by the company.

The use of financial leverage in bankrolling a firm's operations has the ability to improve the returns to shareholders without diluting the firm's ownership through equity financing. Too much financial leverage, however, can lead to the risk of default and bankruptcy.

One of the financial ratios used in determining the amount of financial leverage a business has is the debt/equity ratio, which shows the proportion of debt a firm has versus the equity of its shareholders.

It is a leverage created with the help of debt component in the capital structure of a company. Higher the debt, higher would be the FL because with higher debt comes the higher amount of interest that needs to be paid. It can be both good and bad for a business depending on the situation. If a firm is able to generate a higher return on investment (ROI) than the interest rate it is paying, leverage will have its positive effect shareholder's return. The darker side is that if the said situation is opposite, higher leverage can take a business to a worst situation like bankruptcy.

Measures of Financial Leverage

There are various measures of Financial Leverage

- **Debt Ratio:** It is the ratio of debt to total assets of the firm which means what percentage of total assets is financed by debt.
- **Debt Equity Ratio:** It is the ratio of debt to equity which signifies how many dollars of debt is taken per dollar of equity.
- **Interest Coverage Ratio:** It is the ratio of profits to interest. This ratio is also represented in times. It represents how many times of the interest is the available profit to pay it off. Higher such ratio, higher is the interest paying capacity. The reciprocal of it is income gearing.

Degree of Financial Leverage

A degree of financial leverage is nothing but a measure of magnification that happens due to debt capital in the structure. The degree of financial leverage is the proportion of a percentage change in EPS due to a certain percentage change in EBIT.

$$\text{Degree of Financial Leverage (DFL)} = \frac{\% \text{ change in EPS}}{\% \text{ change in EBIT}}$$

Illustration of Financial Leverage

Let's understand the effect of leverage with the help of the following an example. The calculation below clearly shows the effect of having debt in the capital. The return on equity (ROE) and the EPS both are higher in a case of debt and equity structure.

Particulars	Only Equity	Debt – Equity
Equity Shares of Rs. 10 Each	5,00,000	2,50,000
Debt @ 12 %		2,50,000
EBIT	1,20,000	1,20,000
Interest		30,000
PBT	1,20,000	90,000
Tax – 50%	60,000	45,000
PAT	60,000	45,000
No. of Shares	50,000	25,000
EPS	1.2	1.8
ROE	12%	18%

The picture shown in the above illustration does not bring all aspects of leverage. Hence, we shall go further inside to know the reason for having higher EPS and ROE in the case of a levered firm. Let us calculate one more important ratio – ROI (Return on Investment). ROI for both the firms will be 24% ($EBIT / Total\ Investment = 120000 / 500000$).

Now, here we see that the ROI is more than the interest rate charged by lender i.e. 12%. This is the reason behind the higher EPS as well as ROE in the case of a levered firm. So, leverage would not always be profitable. The following matrix explains the behavior of leveraging a firm.

Favorable	$ROI > Interest\ rate$
Unfavorable	$ROI < Interest\ Rate$
Neutral	$ROI = Interest\ Rate$

In the current example, the first situation i.e. $ROI > Interest\ Rate$ is true and that is why the results are favorable as we can see. If the ROI is less than the interest rate, the ROE will decline and on the other hand, if ROI is the same as interest rate, it will make no difference.

Illustration 2:

One-up Ltd. has Equity Share Capital of Rs. 5,00,000 divided into shares of Rs. 100 each. It wishes to raise further Rs. 3,00,000 for expansion-cum-modernisation scheme.

The company plans the following financing alternatives:

- (i) By issuing Equity Shares only.
- (ii) Rs. 1,00,000 by issuing Equity Shares and Rs. 2,00,000 through Debentures @ 10% per annum.
- (iii) By issuing Debentures only at 10% per annum.
- (iv) Rs. 1,00,000 by issuing Equity Shares and Rs. 2,00,000 by issuing 8% Preference Shares.

You are required to suggest the best alternative giving your comment assuming that the estimated earnings before interest and taxes (EBIT) after expansion is Rs. 1,50,000 and corporate rate of tax is 35%.

Solution :

**Computation of Earnings per share
under alternative Financing Plans**

Particulars	Plan I	Plan II	Plan III	Plan IV
	Rs.	Rs.	Rs.	Rs.
Existing Equity Shares of Rs. 100 each	5,00,000	5,00,000	5,00,000	5,00,000
New Equity Shares of Rs. 100 each	3,00,000	1,00,000	—	1,00,000
8% Preference shares	—	—	—	2,00,000
10% Debentures	—	2,00,000	3,00,000	—
Capital Structure	8,00,000	8,00,000	8,00,000	8,00,000
Earnings before Interest & Taxes (EBIT)	1,50,000	1,50,000	1,50,000	1,50,000
Less : Interest on Debenture	—	20,000	30,000	—
Earning before tax (EBT)	1,50,000	1,30,000	1,20,000	1,50,000
Less : Income tax @ 35%	52,500	45,500	42,000	52,500
Earning after tax (EAT)	97,500	84,500	78,000	97,500
Less : Preference dividend @ 8%	—	—	—	16,000
Earning available to Equity Shareholders	97,500	84,500	78,000	81,500
Number of Equity Shares	8,000	6,000	5,000	6,000
Earnings per share (EPS)	$\frac{97,500}{8,000}$	$\frac{84,500}{6,000}$	$\frac{78,000}{5,000}$	$\frac{81,500}{6,000}$
	= Rs. 12.19	= Rs. 14.08	= Rs. 15.60	Rs.=13.58

In the above example, we have taken operating profit (EBIT = Rs. 1,50,000) constant for alternative financing plans. It shows that earnings per share (EPS) increases with the increase in the proportion of debt capital (debenture) to total capital employed by the firm, the firm's EBIT level taken as constant.

Financing Plan I does not use debt capital and, hence, Earning per share is low. Financing Plan III, which involves 62.5% ordinary shares and 37.5% debenture, is the most favourable

with respect to EPS (Rs. 15.60). The difference in Financing Plans II and IV is due to the fact that the interest on debt is tax-deductible while the dividend on preference shares is not.

Hence, financing alternative III should be accepted as the most profitable mix of debt and equity by One-up Ltd. Company.

Degree of Financing Leverage:

Financing leverage is a measure of changes in operating profit or EBIT on the levels of earning per share.

It is computed as:

Financial leverage = Percentage change in EPS / Percentage change in EBIT = Increase in EPS / EPS / Increase in EBIT/EBIT

The financial leverage at any level of EBIT is called its degree. It is computed as ratio of EBIT to the profit before tax (EBT).

Degree of Financial leverage (DFL) = EBIT / EBT

The value of degree of financial leverage must be greater than 1. If the value of degree of financial leverage is 1, then there will be no financial leverage. The higher the proportion of debt capital to the total capital employed by a firm, the higher is the degree of financial leverage and vice versa.

Again, the higher the degree of financial leverage, the greater is the financial risk associated, and vice versa. Under favourable market conditions (when EBIT may increase) a firm having high degree of financial leverage will be in a better position to increase the return on equity or earning per share.

Importance of Financial Leverage:

The financial leverage shows the effect of changes in EBIT on the earnings per share. So it plays a vital role in financing decision of a firm with the objective of maximising the owner's wealth.

The importance of financial leverage:

1. It helps the financial manager to design an optimum capital structure. The optimum capital structure implies that combination of debt and equity at which overall cost of capital is minimum and value of the firm is maximum.
2. It increases earning per share (EPS) as well as financial risk.
3. A high financial leverage indicates existence of high financial fixed costs and high financial risk.
4. It helps to bring balance between financial risk and return in the capital structure.

5. It shows the excess on return on investment over the fixed cost on the use of the funds.
6. It is an important tool in the hands of the finance manager while determining the amount of debt in the capital structure of the firm.

Combined Leverage

The concept of leverage is used in [breakeven analysis](#) and in the development of the capital structure of a business firm. Operating leverage influences the top half of a firm's income statement, and financial leverage influences the bottom half, as well as the earnings per share to stockholders.

Combined, or "total", leverage is the cumulative amount of risk facing a firm, including all other business risks, and is the total amount of leverage that shareholders can use to borrow on behalf of the company.

While operating leverage notes returns from fixed assets, and [financial leverage](#) notes the returns from debt financing, [combined leverage](#) is the sum of both.

Degree of Combined Leverage:

The combined leverage can be measured with the help of the following formula:

Combined Leverage = Operating leverage x Financial leverage

$$= \frac{\% \text{ Change in EBIT}}{\% \text{ Change in sales}} \times \frac{\% \text{ Change in EPS}}{\% \text{ Change in EBIT}} = \frac{\% \text{ Change in EPS}}{\% \text{ Change in sales}}$$

The degree of combined leverage is measured by using the following formula :

Degree of Combined Leverage (DCL) = DOL x DFL

$$= \frac{\% \text{ Change in EBIT}}{\% \text{ Change in sales}} \times \frac{\% \text{ Change in EPS}}{\% \text{ Change in EBIT}} = \frac{\% \text{ Change in EPS}}{\% \text{ Change in sales}}$$

Or, alternatively, at any given level

$$\begin{aligned} \text{DCL} &= \text{DOL} \times \text{DFL} \\ &= \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{Contribution}}{\text{EBT}} \end{aligned}$$

The combined leverage may be favourable or unfavorable. It will be favourable if sales increase and unfavorable when sales decrease. This is because changes in sales will result in more than proportional returns in the form of EPS. As a general rule, a firm having a high degree of operating leverage should have low financial leverage by preferring equity financing, and vice versa by preferring debt financing.

If a firm has both the leverages at a high level, it will be very risky proposition. Therefore, if a firm has a high degree of operating leverage the financial leverage should be kept low as proper balancing between the two leverages is essential in order to keep the risk profile within a reasonable limit and maximum return to shareholders.

Importance of Combined Leverage:

The importance of combined leverage is:

It indicates the effect that changes in sales will have on EPS.

2. It shows the combined effect of operating leverage and financial leverage.
3. A combination of high operating leverage and a high financial leverage is very risky situation because the combined effect of the two leverages is a multiple of these two leverages.
4. A combination of high operating leverage and a low financial leverage indicates that the management should be careful as the high risk involved in the former is balanced by the later.
5. A combination of low operating leverage and a high financial leverage gives a better situation for maximising return and minimising risk factor, because keeping the operating leverage at low rate full advantage of debt financing can be taken to maximise return. In this situation the firm reaches its BEP at a low level of sales with minimum business risk.
6. A combination of low operating leverage and low financial leverage indicates that the firm losses profitable opportunities.

Business Risk

Business risk refers to a business' likelihood of delivering future returns on the equity of its shareholders.

A component of business risk is variability in product demand. Customers must have food to survive, so even in difficult economic times, the Publix grocery store chain will have less product variability than Ford Motor Company. Customers don't have to buy new cars during an economic crash, but they must eat.

Most businesses have variability in product sales, prices, and input costs throughout the year. Companies that are slow to bring new products to the market face different business risks than those brands that offer new products in rapid succession. Both are significant risks to the financial outlook of the organization.

Advantages of Higher Leverage

- a) Take OL, the operating profits can see a sharp increase with a small change in sales as most parts of the expenses are stagnant and cannot further increase with sales.
- b) Likewise, if we consider FL, the earnings share of each shareholder will increase significantly with an increase in operating profits. Here, higher the degree of leverage, higher will be the percentage increase in operating profits and earnings per share.

Disadvantages of Higher Leverage

- a) Leverage inherits the risk of bankruptcy along with it.
- b) In the case of operating leverage, fixed expenses extend the break-even point for a business. Break even means the minimum activity (sales) required for achieving no loss / no profit situation.

- c) Financial leverage increases the minimum requirement of operating profits to meet with the expense of interest. In any case, if the required activity level not achieved, bankruptcy or cash losses become certain.

Looking at the pros and cons, it seems that a balance is required between the rewards and risks. The degree of leverage should not be too high which invites the bankruptcy and on the contrary, it should not be too low that we lose out on the benefits and the viability of a business itself comes under question.

Trading on Equity

The basic assumption relating to financial leverage is that the firm can earn more on assets acquired by the borrowed funds. Since borrowed funds require a fixed payment in the form of interest the difference between the earnings from the assets and interest on the use of the funds goes to the equity shareholders.

Hence use of fixed interest bearing funds provide increased return on equity investment without additional requirement of funds from the shareholders. Trading on equity refers to the utilization of non-equity sources of funds in the capital structure of an enterprise.

The use of borrowings for the purpose of financial advantage for residual stockholders is called trading on equity. Hence trading on equity may be based upon bonds, non-participating preferred stock and/or limited rental leases. When a corporation earns more on its borrowed capital than the interest it has to pay on bonds, trading on equity is profitable. So financial leverage is also called trading on equity. However there is the possibility of adverse result if the return is not adequate. Hence trading on equity is of double-edged. It may be defined as the increase in profit/return resulting from borrowing capital at a low rate and employing it in a business yielding a higher rate.

According to Kulkarni and Satyaprasad 'trading on equity refers to the pyramiding of corporate layers so that a successful smaller amount of stock makes it possible for a company to gain control of the subsidiaries'. The use of the fixed-charge sources of funds, such as debt and preference capital along with the owner's equity in the capital structure is described as financial leverage or gearing or trading on equity. Trading on equity is calculated by relating the rate of return on equity capital under the existing capital structure inclusive of debt capital to the rate of return on equity capital under an all-equity capital structure, i.e. the equivalent amount of equity share capital be raised in place of borrowed funds. Financial leverage explains the impact on EPS and trading on equity shows the impact of return on equity capital. The use of fixed charge or return bearing securities like debentures, bonds, preference share capital, term loan, etc., to increase the earnings available to equity shareholders is termed as trading on equity.

In other words, trading on equity is a technique by which a firm tries to maximize the return of equity shareholders by using fixed interest bearing securities in the capital structure. Trading on equity has direct impact on shareholders' wealth. This phenomenon can be illustrated with the help of the following example.

The capital structure of a company at different financial plans is given as under:

	Plan I	Plan II	Plan III
Equity Share Capital of Rs 10 each	2,50,000	2,00,000	1,50,000
10% Debentures	2,50,000	3,00,000	3,50,000

EBIT is Rs 1,00,000 and the tax rate is 50%.

Now let us calculate the EPS under different plans.

Computation of EPS under Different Plans			
	Plan I	Plan II	Plan III
EBIT	1,00,000	1,00,000	1,00,000
Less: Interest	25,000	30,000	36,000
EBT	75,000	70,000	64,000
Less: Tax	37,500	35,000	32,000
Earnings available to equity shareholders (<i>A</i>)	37,500	35,000	32,000
Number of equity shares (<i>B</i>)	25,000	20,000	15,000
EPS = A/B	Rs 1.50	Rs 1.75	Rs 2.13

Now, it is clear from the above illustration that an increase in the proportion of debt in the capital structure increases the EPS.

EBIT-EPS Analysis - EBIT-EPS analysis gives a scientific basis for comparison among various financial plans and shows ways to maximize EPS. Hence EBIT-EPS analysis may be defined as ‘a tool of financial planning that evaluates various alternatives of financing a project under varying levels of EBIT and suggests the best alternative having highest EPS and determines the most profitable level of EBIT’.

Concept of EBIT-EPS Analysis:

The EBIT-EBT analysis is the method that studies the leverage, i.e. comparing alternative methods of financing at different levels of EBIT. Simply put, EBIT-EPS analysis examines the effect of financial leverage on the EPS with varying levels of EBIT or under alternative financial plans.

It examines the effect of financial leverage on the behavior of EPS under different financing alternatives and with varying levels of EBIT. EBIT-EPS analysis is used for making the choice of the combination and of the various sources. It helps select the alternative that yields the highest EPS.

We know that a firm can finance its investment from various sources such as borrowed capital or equity capital. The proportion of various sources may also be different under various financial plans. In every financing plan the firm’s objectives lie in maximizing EPS.

Advantages of EBIT-EPS Analysis:

We have seen that EBIT-EPS analysis examines the effect of financial leverage on the behavior of EPS under various financing plans with varying levels of EBIT. It helps a firm in determining optimum financial planning having highest EPS.

Various advantages derived from EBIT-EPS analysis may be enumerated below:

Financial Planning:

Use of EBIT-EPS analysis is indispensable for determining sources of funds. In case of financial planning the objective of the firm lies in maximizing EPS. EBIT-EPS analysis evaluates the alternatives and finds the level of EBIT that maximizes EPS.

Comparative Analysis:

EBIT-EPS analysis is useful in evaluating the relative efficiency of departments, product lines and markets. It identifies the EBIT earned by these different departments, product lines and from various markets, which helps financial planners rank them according to profitability and also assess the risk associated with each.

Performance Evaluation:

This analysis is useful in comparative evaluation of performances of various sources of funds. It evaluates whether a fund obtained from a source is used in a project that produces a rate of return higher than its cost.

Determining Optimum Mix:

EBIT-EPS analysis is advantageous in selecting the optimum mix of debt and equity. By emphasizing on the relative value of EPS, this analysis determines the optimum mix of debt and equity in the capital structure. It helps determine the alternative that gives the highest value of EPS as the most profitable financing plan or the most profitable level of EBIT as the case may be.

Limitations of EBIT-EPS Analysis:

Finance managers are very much interested in knowing the sensitivity of the earnings per share with the changes in EBIT; this is clearly available with the help of EBIT-EPS analysis but this technique also suffers from certain limitations, as described below

No Consideration for Risk:

Leverage increases the level of risk, but this technique ignores the risk factor. When a corporation, on its borrowed capital, earns more than the interest it has to pay on debt, any financial planning can be accepted irrespective of risk. But in times of poor business the reverse of this situation arises—which attracts high degree of risk. This aspect is not dealt in EBIT-EPS analysis.

Contradictory Results:

It gives a contradictory result where under different alternative financing plans new equity shares are not taken into consideration. Even the comparison becomes difficult if the number of alternatives increase and sometimes it also gives erroneous result under such situation.

Over-capitalization:

This analysis cannot determine the state of over-capitalization of a firm. Beyond a certain point, additional capital cannot be employed to produce a return in excess of the payments that must be made for its use. But this aspect is ignored in EBIT-EPS analysis.

Ankim Ltd., has an EBIT of Rs 3, 20,000. Its capital structure is given as under:

	Rs
Equity Share Capital of Rs 10 each	4,00,000
13% Preference Share Capital	1,00,000
9% Debentures	2,00,000

The company is in the tax bracket of 50%.

You are required to calculate the Earning Per Share.

Solution: Computation for EPS

	Rs
EBIT	3,20,000
Less: Interest $(2,00,000 \times \frac{9}{100})$	18,000
EBT	3,02,000
Less: Tax @ 50%	1,51,000
EAT	1,51,000
Less: Preference Dividend $(1,00,000 \times \frac{13}{100})$	13,000
Earnings available to equity shareholders	1,38,000

Number of equity shares = 40,000

$$\begin{aligned} \therefore \text{Earnings per share} &= \frac{\text{Earnings available to equity shareholders}}{\text{Number of equity shares}} \\ &= \frac{\text{Rs } 1,38,000}{40,000} = \text{Rs } 3.45 \end{aligned}$$

Indifference Points:

The indifference point, often called as a breakeven point, is highly important in financial planning because; at EBIT amounts in excess of the EBIT indifference level, the more heavily levered financing plan will generate a higher EPS. On the other hand, at EBIT amounts below the EBIT indifference points the financing plan involving less leverage will generate a higher EPS.

i. Concept:

Indifference points refer to the EBIT level at which the EPS is same for two alternative financial plans. According to J. C. Van Home, 'Indifference point refers to that EBIT level at which EPS remains the same irrespective of debt equity mix'. The management is indifferent in choosing any of the alternative financial plans at this level because all the financial plans are equally desirable. The indifference point is the cut-off level of EBIT below which financial leverage is disadvantageous. Beyond the indifference point level of EBIT the benefit of financial leverage with respect to EPS starts operating.

The indifference level of EBIT is significant because the financial planner may decide to take the debt advantage if the expected EBIT crosses this level. Beyond this level of EBIT the firm will be able to magnify the effect of increase in EBIT on the EPS.

In other words, financial leverage will be favourable beyond the indifference level of EBIT and will lead to an increase in the EPS. If the expected EBIT is less than the indifference point then the financial planners will opt for equity for financing projects, because below this level, EPS will be more for less levered firm.

ii. Computation:

We have seen that indifference point refers to the level of EBIT at which EPS is the same for two different financial plans. So the level of that EBIT can easily be computed. There are two approaches to calculate indifference point: Mathematical approach and graphical approach.

Mathematical Approach:

Under the mathematical approach, the indifference point may be obtained by solving equations. Let us present the income statement given in Table 5.1 with the following symbols in Table 5.4. We are starting from EBIT only.

TABLE 5.4 Income Statement Presented with Symbols

EBIT	X
Less: Interest (I)	I
EBT	$(X - I)$
Less: Tax (at $t\%$ on EBT)	$(X - I)t$
EAT	$(X - I)(1 - t)$
Less Preference Dividend	P_d
Earnings available to Equity Shareholder	$(X - I)(1 - t) - P_d$

$$\text{EPS} = \frac{(X - I)(1 - t) - P_d}{N}$$

Where, N represents number of equity shares.

In case of financing, three types of sources may be opted: Equity, debt and preference shares. So we may have four possible combinations Equity, Equity-Debt, Equity- Preference Shares and Equity- Debt-Preference Shares.

So, EPS under various alternatives will be as follows:

$$\text{Equity-Debt: EPS} = \frac{(X - I)(1 - t)}{N}$$

$$\text{Equity-Preference Shares: EPS} = \frac{X(1 - t) - P_d}{N}$$

$$\text{Equity-Debt-Preference Shares: EPS} = \frac{(X - I)(1 - t) - P_d}{N}$$

Note:

The symbols have their usual meaning.

The indifference point between any two financial plans may be obtained by equalizing the respective equations of EPS and solving them to find the value of X.

Debarathi Co. Ltd., is planning an expansion programme. It requires Rs 20 lakhs of external financing for which it is considering two alternatives. The first alternative calls for issuing 15,000 equity shares of Rs 100 each and 5,000 10% Preference Shares of Rs 100 each; the second alternative requires 10,000 equity shares of Rs 100 each, 2,000 10% Preference Shares of Rs 100 each and Rs 8,00,000 Debentures carrying 9% interest. The company is in the tax bracket of 50%. You are required to calculate the indifference point for the plans and verify your answer by calculating the EPS.

Solution:

Solution: Capital Structure

	Plan I (Rs)	Plan II (Rs)
Equity share capital	15,00,000	10,00,000
10% Preference share capital	5,00,000	2,00,000
9% Debentures	-	8,00,000
Total	20,00,000	20,00,000
Number of equity shares	15,000	10,000

Let, at X level of EBIT, the EPS under both the plan will be same.

$$\text{EPS under 1st alternative: } \frac{X(1-t) - P_d}{N_1} = \frac{X(1-0.5) - 50,000}{15,000}$$

$$\text{Again, EPS under 2nd alternative: } \frac{(X-I)(1-t) - P_d}{N_2} = \frac{(X-72,000)(1-0.5) - 20,000}{10,000}$$

Now, equalizing both the EPS we get:

$$\Rightarrow \frac{X(1-0.5) - 50,000}{15,000} = \frac{(X-72,000)(1-0.5) - 20,000}{10,000}$$

$$\Rightarrow \frac{0.5X - 50,000}{15,000} = \frac{0.5X - 36,000 - 20,000}{10,000}$$

$$\Rightarrow \frac{0.5X - 50,000}{3} = \frac{0.5X - 56,000}{2}$$

$$\Rightarrow 1.5X - 1,68,000 = X - 1,00,000$$

$$\therefore X = \frac{68,000}{0.5} = \text{Rs } 1,36,000$$

We may verify the result by calculating EPS under both the plans.

Computation of EPS under Different Plans

	Plan I	Plan II
EBIT	1,36,000	1,36,000
Less: Interest		72,000
EBT	1,36,000	64,000
Less: Tax	68,000	32,000
EAT	68,000	32,000
Less: Preference Dividend	50,000	20,000
Earnings available to equity shareholders	18,000	12,000
No. of equity shares	15,000	10,000
∴ EPS = $\frac{\text{Earning available to equity shareholders}}{\text{Number of equity shares}}$	18,000 15,000	12,000 10,000
	= Rs 1.20	= Rs 1.20

Graphical Approach:

The indifference point may also be obtained using a graphical approach. In Figure 5.1 we have measured EBIT along the horizontal axis and EPS along the vertical axis. Suppose we have two financial plans before us: Financing by equity only and financing by equity and debt. Different combinations of EBIT and EPS may be plotted against each plan. Under Plan-I the EPS will be zero when EBIT is nil so it will start from the origin.

The curve depicting Plan I in Figure 5.1 starts from the origin. For Plan-II EBIT will have some positive figure equal to the amount of interest to make EPS zero. So the curve depicting Plan-II in Figure 5.1 will start from the positive intercept of X axis. The two lines intersect at point E where the level of EBIT and EPS both are same under both the financial plans. Point E is the indifference point. The value corresponding to X axis is EBIT and the value corresponding to Y axis is EPS.

These can be found drawing two perpendiculars from the indifference point—one on X axis and the other on Y axis. Similarly we can obtain the indifference point between any two financial plans having various financing options. The area above the indifference point is the debt advantage zone and the area below the indifference point is equity advantage zone.

Above the indifference point the Plan-II is profitable, i.e. financial leverage is advantageous. Below the indifference point Plan I is advantageous, i.e. financial leverage is not profitable. This can be found by observing Figure 5.1. Above the indifference point EPS will be higher for same level of EBIT for Plan II. Below the indifference point EPS will be higher for same level of EBIT for Plan I. The graphical approach of indifference point gives a better understanding of EBIT-EPS analysis.

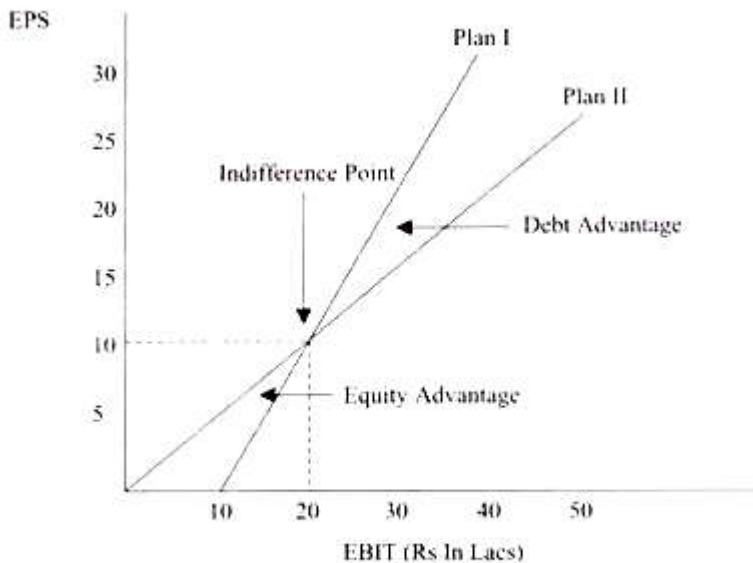


FIGURE 5.1 Graphical Presentation of Indifference Point

Financial Breakeven Point:

In general, the term Breakeven Point (BEP) refers to the point where the total cost line and sales line intersect. It indicates the level of production and sales where there is no profit and no loss because here the contribution just equals to the fixed costs. Similarly financial breakeven point is the level of EBIT at which after paying interest, tax and preference dividend, nothing remains for the equity shareholders.

In other words, financial breakeven point refers to that level of EBIT at which the firm can satisfy all fixed financial charges. EBIT less than this level will result in negative EPS. Therefore EPS is zero at this level of EBIT. Thus financial breakeven point refers to the level of EBIT at which financial profit is nil.

Financial Break Even Point (FBEP) is expressed as ratio with the following equation:

$$\text{FBEP} = \frac{(\text{EBIT} - I)(1 - t) - P_d}{N} = 0$$

Or $(\text{EBIT} - I)(1 - t) - P_d = 0$

Or $(\text{EBIT} - I) = \frac{P_d}{(1 - t)}$

Or $\text{EBIT} = I + \frac{P_d}{(1 - t)}$

where, EBIT = Earnings before Interest and Tax,

I = Interest,

t = Rate of Tax,

P_d = Preference Dividend, and

N = Number of Equity Shares.

It is to be noted here that beyond the financial breakeven point increase in EBIT will result in proportional increase in EPS.

Example 5.3:

A company has formulated the following financing plans to finance Rs 15, 00,000 which is required for financing a new project.

	Plan I (Rs)	Plan II (Rs)	Plan III (Rs)
Equity Share Capital (Rs 10 each)	15,00,000	10,00,000	7,50,000
8% Debentures	-	5,00,000	2,50,000
10% Preference Share Capital	-	-	5,00,000
	15,00,000	15,00,000	15,00,000

Compute the financial breakeven point for each alternative plan assuming tax rate at 50%.

Solution: We know that the financial breakeven point is the EBIT where EPS is 0.

$$\therefore \text{FBEP} = \frac{(\text{EBIT} - I)(1 - t) - P_d}{N} = 0$$

Financial breakeven point for Plan I:

$$\frac{(\text{EBIT} - 0)(1 - 0.5) - 0}{1,50,000} = 0$$

$$\Rightarrow 0.5 \text{ EBIT} - 0 = 0$$

$$\therefore \text{EBIT} - 0 = 0$$

Financial breakeven point is 0

Financial breakeven point for Plan II:

$$\frac{(\text{EBIT} - 40,000)(1 - 0.5) - 0}{1,00,000} = 0$$

$$\Rightarrow 0.5 \text{ EBIT} - 20,000 = 0$$

$$\therefore \text{EBIT} = 40,000$$

Financial breakeven point is 40,000

Financial breakeven point for Plan III:

$$= \frac{(\text{EBIT} - 20,000)(1 - 0.5) - 50,000}{75,000} = 0$$

$$\Rightarrow 0.5 \text{ EBIT} - 10,000 - 50,000 = 0$$

$$0.5 \text{ EBIT} = 60,000$$

$$\therefore \text{EBIT} = 1,20,000$$

Financial breakeven point is 1,20,000