

## Business Finance

### Unit 2

#### Capital Budgeting

Capital budgeting may be defined as the decision-making process by which firms evaluate the purchase of major fixed assets such as machinery, equipment, buildings, acquisition of other firms either through the purchase of equity shares or group of assets to conduct an on-going business. Capital budgeting describes the firm's formal planning process for the acquisition and investment of capital and results in a capital budget i.e., the firm's formal plan outlay for purchase of fixed assets.

#### **Importance**

Preparation of the firm's formal capital budget is necessary for a number of reasons:

1. ***It affects profitability:*** Capital budgeting decisions affect the profitability of the firm. They also have a bearing on the competitive position of the firm. They determine the future destiny of the company. An opportune investment decision can yield spectacular returns. On the other hand, an ill-advised and incorrect investment decision can endanger the very survival even of the large sized firms.
2. ***Effects are felt over long time periods:*** The effects of capital spending decisions will be felt by the firm over extended periods of time, e.g., construction of a factory affects the company's future cost structure.
3. ***It involves substantial expenditures:*** Capital expenditure may range from a single piece equipment costing thousands of rupees to complete. Profit and other physical facilities costing crores of rupees.
4. ***Not easily reversible:*** Capital investment decisions once made, are not easily reversible without much financial loss to the firm, since there may be no market for second hand plant and equipment, or conversion to other uses may not be financially feasible.
5. ***Based on long-term policy decisions:*** Capital budgeting decisions should be based on long term policy decisions and should rest firmly on organisation policies on growth, marketing, industry share, social responsibility and other matters and not taken on ad hoc basis.
6. ***Scarce capital resources:*** Capital investment involves cost and the majority of the firm's resources are limited. This underlines the need for thoughtful and correct investment decisions.
7. ***Difficulties in evaluation:*** Evaluation of capital investment proposals is difficult since the benefits from investment are received in some future period. Hence there is a substantial risk involved in estimation of the future benefits. Added to this, the possibility of shifts in consumer preferences, the actions of competitors, technological developments, and changes in the economic and political environment. Even to quantify the future benefits in rupees is not an easy task.

#### **Kinds of Proposals**

One can identify five types of proposals:

1. ***Replacement:*** As fixed assets are used they wear out or become outdated by new technology. Money may be budgeted to replace worn out or obsolete equipment.

2. 2. **Expansion:** A firm has to grow, and therefore production facilities are to be added by way of single machinery or group of machines either for the same products or new products in the same area.
3. 3. **Diversification:** A business can reduce the risk by operating in several markets rather than a single market. Firms seeking the facilities to enter new markets will consider proposals for the purchase of new machinery and facilities to handle the new products.
4. 4. **Research and development:** Firms in industries where technology is rapidly changing will expend large sums of money for research and development of new products. If large sums of money are needed for equipment these proposals will normally be included in the capital budget.
5. 5. **Miscellaneous:** A firm will frequently have proposals that do not directly help achieve profit-oriented goals, e.g., installation of pollution control equipment. Safety items, such as automatic sprinkling systems to protect against fire, may involve considerable expenditures.

### **Payback Period**

Sometimes called the payout method i.e., a computationally simple project evaluation approach that has been used for many years. The procedure is to determine how long it takes a project to return the cost of the original investment.

The project with a lower payback period will be preferred. Sometimes, the management lays down policy guidelines regarding payback period.

#### ***Merits***

1. This method is quite simple and easy to understand; it has the advantage of making it clear that there is no profit of any project unless the payback is over. When funds are limited it is always better to select projects having shorter payback periods. This method is suitable to industries where the risks of obsolescence are very high.
2. The payback period can be compared to a break-even point, the point at which costs are fully recovered, but profits are yet to commence.
3. The risk associated with a project arises due to uncertainty associated with the cash inflows. A shorter payback period means less uncertainty towards risk.

#### ***Limitations***

1. The method does not give any considerations to time value of money. Cash flows occurring at all points of time are simply added.
2. This method becomes a very inadequate measure of evaluating two projects where cash inflows are uneven.
3. It stresses capital recovery rather than profitability. It does not take into account the returns from a project after its payback period. Therefore, this method may not be a good measure to evaluate where the comparison is between two projects one involving a long gestation period and other yielding quick results only for a short period.

### **Accounting Rate of Return (ARR)**

The accounting rate of return (ARR) method of evaluating capital budgeting projects is so named because it parallels traditional accounting concepts of income and investment. A project

is evaluated by computing a rate of return on the investment, using accounting measures of net income. The formula for the accounting rate of return is:

$$ARR = \frac{\text{Annual revenue from project} - \text{Annual expenditure of project}}{\text{Project investment}} \times 100$$

This rate is compared with the rate expected on other projects, had the same funds been invested alternatively in those projects. Sometimes, the management compares this rate with the minimum rate (called cut of rate) they may have in mind.

**Merits:** This method is quite simple and popular because it is easy to understand and includes income from the project throughout its life.

**Limitations:**

1. This method ignores the timing of cash flows, the duration of cash flows and the time value of money.
2. It is based upon a crude average of profits of the future years. It ignores the effect of fluctuations in profits from year to year.

### **Net Present Value (NPV)**

Under this method, all cash inflows and outflow are discounted at a minimum acceptable rate of return, usually the firm's cost of capital. If the present value of the cash inflows is greater than the present value of the cash outflows, the project is acceptable i.e.,  $NPV > 0$ , accept and  $NPV < 0$ , reject. In other words, a positive NPV means the project earns a rate of return higher than the firm's cost of capital.

The net present value relies on the time value of money and the timings of cash flows in evaluating projects. All cash flows are discounted at the cost of capital and NPV assumes that all cash inflows from projects are re-invested at the cost of capital.

As a decision criterion, this method can be used to make a choice between mutually exclusive projects. The project with the highest NPV would be assigned the first rank, followed by others in the descending order.

**Merits:**

1. It recognises the time value of money.
2. The whole stream of cash flows throughout the project life is considered.
3. A changing discount rate can be built into the NPV calculations by altering the denominator.
4. NPV can be seen as the addition to the wealth of shareholders. The criterion of NPV is, thus, in conformity with basic financial objectives.
5. This method is useful for selection of mutually exclusive projects.
6. An NPV uses the discounted cash flows i.e., expresses cash flows in terms of current rupees. The NPV's of different projects, therefore, can be added/compared. This is called the value additive principle, implying that NPV's of separate projects can be added. It implies that each project can be evaluated independent of others on its own merit.

### ***Limitations:***

1. It is difficult to calculate as well as understand and use in comparison with the payback method or even the ARR method.
2. The calculation of discount rate presents serious problems. In fact, there is difference of opinion even regarding the exact method of calculating it.
3. PV method is an absolute measure. *Prima facie* between the two projects, this method will favour the project, which has Higher Present Value (or NPV). But it is likely that this project may also involve a larger initial outlay. Thus, in case of projects involving different outlays, the present value method may not give dependable results.
4. This method may not give satisfactory results in case of projects having different effective lives.

### **Internal Rate of Return (IRR)**

Internal rate of return is the interest rate that discounts an investment's future cash flows to the present so that the present value of cash inflows exactly equals the present value of the cash outflows i.e., at that interest rate the net present value equals zero.

The discount rate i.e., cost of capital is considered in determination of the net present value while in the internal rate of return calculation, the net present value is set equal to zero and the discount rate which satisfies this condition is determined and is called Internal Rate of Return.

Any investment that yields a rate of return greater than the cost of capital should be accepted because the project will increase the value of the firm.

### ***Advantages***

1. It possesses the advantages, which are offered by the NPV criterion such as it considers time value of money and takes into account the total cash inflows and outflows.
2. IRR is easier to understand. Business executives and non-technical people understand the concept of IRR much more readily than they understand the concepts of NPV.
3. It does not use the concept of the required cost of return (or the cost of capital). It itself provides a rate of return which is indicative of the profitability of the proposal. The cost of capital enters the calculation, later on.
4. It is consistent with the overall objective of maximizing shareholders wealth since the acceptance or otherwise of a project is based on comparison of the IRR with the required rate of return.

### ***Limitations***

1. It involves tedious calculations.
2. It produces multiple rates, which can be confusing.
3. In evaluating mutually exclusive proposals, the project with the highest IRR would be picked up to the exclusion of all others. However, in practice, it may not turn out to be one that is the most profitable and consistent with the objectives of the firm i.e., maximization of the wealth of the shareholders.
4. Under IRR method, it is assumed that, all intermediate cash flows are reinvested at the IRR rate. It is not logical to think that the same firm has the ability to re-invest, the cash flows at different rates. In order to have correct and reliable results it is obvious,

therefore, that they should be based on realistic estimates of the interest rate at which the income will be re-invested.

5. The IRR rule requires comparing the projects IRR with the opportunity cost of capital. But, sometimes, there is an opportunity cost of capital for 1 year cash flows, a different cost of capital for 2-year cash flows and so on. In these cases, there is no simple yardstick for evaluating the IRR of a project.

## **Financing Decision:**

### **Meaning of Capital Structure**

The basic objective of financial management is to maximize the shareholders wealth. Therefore, all financial decisions in any firm should be taken in the light of this objective.

Whenever a company is required to raise long-term funds the finance manager is required to select such a mix of sources of finance that overall cost of capital is minimum (i.e., value of the firm/wealth of shareholders is maximum). Mix of long-term sources of finance is referred as “capital structure”.

### **Optimum Capital Structure**

The capital structure is said to be optimum when the firm has selected such a combination of equity and debt so that the wealth of firm (shareholder) is maximum. At this capital structure, the cost of capital is minimum and market price per share is maximum.

It is very difficult to find out optimum debt and equity mix where capital structure would be optimum because it is difficult to measure a fall in the market value of an equity shares on account of Increase in risk due to high debt content in capital structure. Hence, in practice, the expression “appropriate capital structure” is more realistic expression than ‘optimum capital structure’.

### ***Features of an Appropriate Capital Structure***

1. ***Profitability:*** The most profitable capital structure is one that tends to minimize cost of financing and maximize earning per equity share.
2. ***Flexibility:*** The capital structure should be such that company can raise funds whenever needed.
3. ***Conservation:*** The debt content in the capital structure should not exceed the limit, which the company can bear.
4. ***Solvency:*** The capital structure should be such that firm does not run the risk of becoming insolvent.
5. ***Control:*** The capital structure should be so devised that it involves minimum risk of loss of control of the company.

### **Capital Structure Theories**

These approaches analyse the relationship between the leverage, the cost of capital and the value of the firm in different ways. However, the following assumptions are made to understand these relationships.

1. There are only two sources of funds viz., debt and equity.
2. The total assets of firm are given. The degree of leverage can be changed by selling debt to repurchase shares or selling shares to retire debt.
3. There are no retained earnings. It implies that entire profits are distributed among shareholders.
4. The operating profit of firm is given and expected to grow.
5. The business risk is assumed to be constant and is not affected by the financing mix decision.
6. There are no corporate or personal taxes.
7. The investors have the same subjective probability distribution of expected earnings.

### **Net Income (NI) Approach**

The Net Income (NI) approach is the relationship between leverage and cost of capital and value of the firm. This theory states that there is a relationship between capital structure and the value of the firm and therefore, the firm can affect its value by increasing or decreasing the debt proportion in the overall financing mix. The NI approach makes the following additional assumptions:

1. That the total capital requirement of the firm is given and remains constant.
2. That cost of debt is less than cost of equity capitalization rate.
3. There are no corporate taxes.
4. The use of debt content does not change the risk reception of the investors as a result; both the debt capitalization rate and the equity capitalization rate remain constant.

*NI (Net Income) Approach is suggested by Durand.*

The NI approach starts from the argument that change in financing mix of a firm will lead to change in Weighted Average Cost of Capital (WACC) of the firm, resulting in the change in value of the firm. As debt capitalization is less than equity, the increasing use of cheaper debt (and simultaneous decrease in equity proportion) in the overall capital structure will result in magnified returns to the shareholders.

### **Net Operating Income (NOI) Approach**

The Net Operating Income (NOI) approach is the opposite of the NI approach. According to the NOI approach, the market value of the firm depends upon the net operating profit or EBIT and the overall cost of capital, WACC. The financing mix or the capital structure is irrelevant and does not affect the value of the firm. The NOI approach makes the following assumptions:

1. Investors see the firm as a whole and thus capitalize the total earnings of the firm to find the value of the firm as a whole.
2. The overall cost of capital of the firm is constant and depends upon the business risk, which also is assumed to be unchanged.
3. The cost of debt is also taken as constant.
4. The use of more and more debt in the capital structure increases the risk of shareholders and thus results in the increase in the cost of equity capital i.e., the increase in cost of equity is such, as to completely offset the benefits of employing cheaper debt, and
5. There is no tax.

## **Modigliani–Miller’s Approach (Extension of NOI Approach)**

*The Modigliani–Millers (MM) model* is considered to be one of the most influential papers ever written in corporate finance.

*The Modigliani–Miller approach* is similar to the Net Operating Income (NOI) approach. In other words, according to this approach, the value of a firm is independent of its capital structure. However, there is a basic difference between the two. The NOI approach is purely conceptual. It does not provide operational justification for irrelevance of the capital structure in the valuation of the firm. While MM approach supports the NOI approach providing behavioural justification for the independence of the total valuation and the cost of capital of the firm from its capital structure. In other words, MM approach maintains that the weighted average cost of capital does not change in the debt equity mix or capital structure of the firm.

*Modigliani–Miller (MM) was represented in 1958.*

### **Basic Proportions**

The following are the three basic proportions of the MM approach.

1. The overall cost of capital (K) and the value of the firm (V) are independent of the capital structure. In other words, K and V are constant for all levels of debt-equity mix. The total market value of the firm is given by capitalizing the expected Net Operating Income (NOI) by the rate appropriate for that risk class.
2. The cost of equity ( $K_e$ ) is equal to capitalization rate of a pure equity stream plus a premium for the financial risk. The financial risk increases with more debt content in the capital structure. As a result,  $K_e$  increases in a manner to offset exactly the use of a less expensive source of funds represented by debt.
3. The cut-off rate for investment purposes is completely independent of the way in which an investment is financed.

### **Assumptions**

The MM approach is subject to the following assumptions:

1. **Capital markets are perfect:** This means that investors are free to buy and sell securities.
2. The firm can be classified into homogenous risk classes. All the forms within the same class will have the same degree of business risks.
3. All investors have the same expectations of a firm’s net operating income (EBIT) with which to evaluate the value of any firm.
4. The dividend payout ratio is 100%. In other words, there are no retained earnings.
5. There are no corporate taxes. However, this assumption has been removed later.

In brief, the MM hypothesis can be put in the following words:

“MM hypothesis is based on the idea that no matter how you bifurcate the capital structure of a firm among debt, equity and other claims, there is a conservation of investment value. That is because the total investment value of a corporation depends upon its underlying profitability and risk”.

It is invariant with respect to relative changes in the firm's financial capitalization. Thus, the total pie does not change as it is divided into debt, equity and other securities. The sum of the parts must equal the whole; so regardless of financing mix; the total value of the firm stays the same.

## **Leverage**

Leverage results from the use of fixed costs assets or funds to magnify returns to the firm's owners. Generally, increases in leverage results in increased returns and risk; and decreases in leverage results in decrease in returns and risk. The amount of leverage in the firm's capital structure (the mix of long-term debt and equity) can significantly affect its value by affecting returns and risks.

The term 'leverage' in general refers to a relationship between two inter-related variable. In financial analysis, it represents the influence of one financial variable over some other related financial variable.

The three basic types of leverage can be defined with reference to firm's income statement as follows:

1. Operating leverage is concerned with the relationship between the firm's sales revenue and its earnings before interest and taxes, or EBIT (EBIT is descriptive label for operating profits).
2. Financial leverage is concerned with the relationship between the firms EBIT and its common share earnings per share (EPS earnings per share). It is defined as the firm's ability to use fixed financial charges to magnify the effects of charge in EBIT/operating profit on firm's earnings per share.
3. Total leverage is concerned with the relationship between the firm's sales revenue and EPS.

## **Operating Leverage**

Operating leverage results from the existence of the fixed operating expenses in the firm's income stream. The operating costs of a firm fall into three categories:

1. Fixed costs, which may be defined as those do not vary with sales volume, are a function of time and are typically contractual; they must be paid regardless of the amount of revenue available with sales volume.
2. Variable costs, which vary directly.
3. Semi-variable or semi-fixed costs are those, which are partly fixed and partly variable. They are fixed over a certain higher sales volume. Since the last category of cost can be broken down into fixed and variable components, the cost of a firm in operational terms can be divided into fixed and variables. The operating leverage occurs anytime a firm has fixed costs that must be met regardless of the volume. With fixed costs, the percentage change in profit accompanying a change in volume is greater than the percentage change in volume.

$$\text{Operating Leverage} = \frac{\text{Percentage change in EBIT}}{\text{Percentage Change in Sales}}$$



Operating leverage is defined as the firm's ability to use fixed operating costs to magnify effects of changes in sales or its earnings before interest on tax.

## **Financial Leverage**

Financial leverage is defined as the ability of a firm to use fixed financial charges to magnify the effects in EBIT/operating profits, on the firm's earning per share, the two fixed financial cost that may be found in the firms' income statement are:

1. Interest on debt and
2. Dividends on preferred shares.

These charges must be paid regardless of the amount of EBIT available to pay them. The financial leverage is favourable when the firm earns more on the investments/ assets financed by the sources having fixed charges. It is obvious that shareholders gain in a situation where a company earns a higher rate of return and pays a low rate to the supplier of long term funds. Financial leverage in such cases is also called "trading in equity."

The degree of financial leverage is the measure of the firms' financial leverage and is calculated as:

$$\text{Financial leverage} = \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}}$$

### **Significance of Financial Leverage**

Financial leverage is a double-edged sword. On the one hand, it increases earnings per share, and on the other hand it increases financial risk. A high financial leverage means high fixed financial cost and high financial risks, i.e., as the debt component in capital structure increases, the financial leverage increased and at the time of the financial risk also increases. i.e., risk of insolvency increases.

## **Combined Leverage**

Combined leverage or total leverage can be defined as potential use of fixed costs, both operating and financial, to magnify the effect of changes in sales on the firms, earnings per share. Total leverage or combined leverage can therefore be viewed as the total impact of the fixed cost in the firms operating and financial structure.

$$\begin{aligned}\text{Combined Leverage} &= \text{Operating Leverage} \times \text{Financial Leverage} \\ &= \frac{\% \text{ change in EBIT}}{\% \text{ change in Sales}} \times \frac{\% \text{ change in EPS}}{\% \text{ change in EBIT}} \\ &= \frac{\% \text{ change in EPS}}{\% \text{ Change in Sales}}\end{aligned}$$

### **Significance of Combined Leverage**

A high operating leverage and a high financial leverage combination is very risky. If the company is producing and selling at a high level it will make extremely high profit for its shareholders. But even a small fall in the level of operations would result in tremendous fall in

earnings per share. A company must, therefore, maintain a proper balance between these two leverages.

A combination of high operating level and a low financial leverage indicates that the management is careful since the higher amount of risk involved in high operating leverage has been sought to be balanced by low financial leverage. However, a more preferable option would be to have a low operating leverage and a high financial leverage. A low operating leverage implies that the company reaches its breakeven point at a low level of sales. Therefore, risk is diminished. A highly cautious and conservative manager will keep both its operating and financial leverage at a very low level, but the approach may, however, mean that the company is losing profitable opportunities.

### **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’.

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 behaviour 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.

### **Advantages of EBIT-EPS Analysis:**

**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:**

**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.