

MB202: FINANCIAL MANAGEMENT

UNIT 2

PROF.G.SUDHAKAR

INVESTMENT DEFINITION:

The term "investment" can be used to refer to any mechanism used for the purpose of generating future income. In the financial sense, this includes the purchase of bonds, stocks or real estate property. Additionally, the constructed building or other facility used to produce goods can be seen as an investment.

CAPITAL DEFINITION:

The word Capital refers to be the total investment of a company money in , tangible and intangible assets Investment decision is the process of making investment decisions in capital expenditure.

A capital expenditure may be defined as an expenditure the benefits of which are expected to be received over period of time exceeding one year. The main characteristic of a capital expenditure is that the expenditure is incurred at one point of time whereas benefits of the expenditure are realized at different points of time in future.

CAPITAL BUDGETING

Capital budgeting is the art of deciding how to spend company's money wisely. Basically, it is the process of evaluating potential long-term investment opportunities to determine which ones will generate the most profit for a business. It involves analyzing future cash flows, considering the time value of money, and assessing risks. Ultimately, the goal is to choose investments that will help the business grow and thrive.

The process through which different projects are evaluated is known as capital budgeting. Capital budgeting is defined as the firm's formal process for the acquisition and investment of capital. It involves firm's decisions to invest its current funds for addition, disposition, modification and replacement of fixed assets.

DEFINITION Capital budgeting (investment decision) as, "Capital budgeting is long term Planning for making and financing proposed capital outlays." Charles T.Horngreen

NEED AND IMPORTANCE OF CAPITAL BUDGETING

1. Huge investments: Capital budgeting requires huge investments of funds, but the available funds are limited, therefore the firm before investing projects, plan are control its capital expenditure.

2. Long-term: Capital expenditure is long-term in nature or permanent in nature. Therefore financial risks involved in the investment decision are more. If higher risks are involved, it needs careful planning of capital budgeting.

3. Irreversible: The capital investment decisions are irreversible, are not changed back. Once the decision is taken for purchasing a permanent asset, it is very difficult to dispose of those assets without involving huge losses.

4. Long-term effect: Capital budgeting not only reduces the cost but also increases the revenue in long-term and will bring significant changes in the profit of the company by avoiding over or more investment or under investment. Over investments leads to be unable to utilize assets or over utilization of fixed assets. Therefore before making the investment, it is required carefully planning and analysis of the project thoroughly.

FEATURES OF CAPITAL BUDGETING

- **Long-term:** It involves making long-term investment decisions that will affect your company's financial health.
- **Time-sensitive:** It takes into account the time value of money, which means that a dollar today is worth more than a dollar in the future. It's like trying to decide whether to eat a cookie now or wait for two cookies later you have to consider the value of delayed gratification.
- **Risk-conscious:** Another feature is risk assessment. Businesses must carefully evaluate the potential risks and rewards of each investment opportunity to make informed decisions.
- **Predictive:** Capital budgeting requires accurate financial forecasting, which involves predicting future cash flows and expenses.
- **Needs collaboration:** Finally, capital budgeting requires collaboration and communication among different departments and stakeholders within a company.

FACTORS AFFECTING CAPITAL BUDGETING DECISIONS

- 1. Risk and Uncertainty:** Companies need to consider the risks associated with the investment and the uncertainties involved in estimating the future cash flows. Higher risk investments require higher return expectations to justify the investment, while lower risk investments may be acceptable at a lower rate of return.
- 2. Capital Constraints:** Capital constraints refer to the limitations on the amount of available capital for investment. Companies must balance their capital needs with their available resources, including equity, debt, and retained earnings. Capital constraints may affect a company's ability to pursue all of its desirable investment opportunities and may require the company to prioritize investments based on their profitability.
- 3. Business Environment:** Companies must assess the potential impact of changes in the business environment on their investment opportunities and factor in the effects of these changes in their capital budgeting decisions.
- 4. Government Policies:** Changes in tax laws, environmental regulations, and other government policies can significantly affect the profitability of investment opportunities.
- 5. Social and Environmental Factors:** Companies need to consider the social and environmental impact of their investments and factor in potential reputational risks associated with their investment decisions.

Advantages of capital budgeting

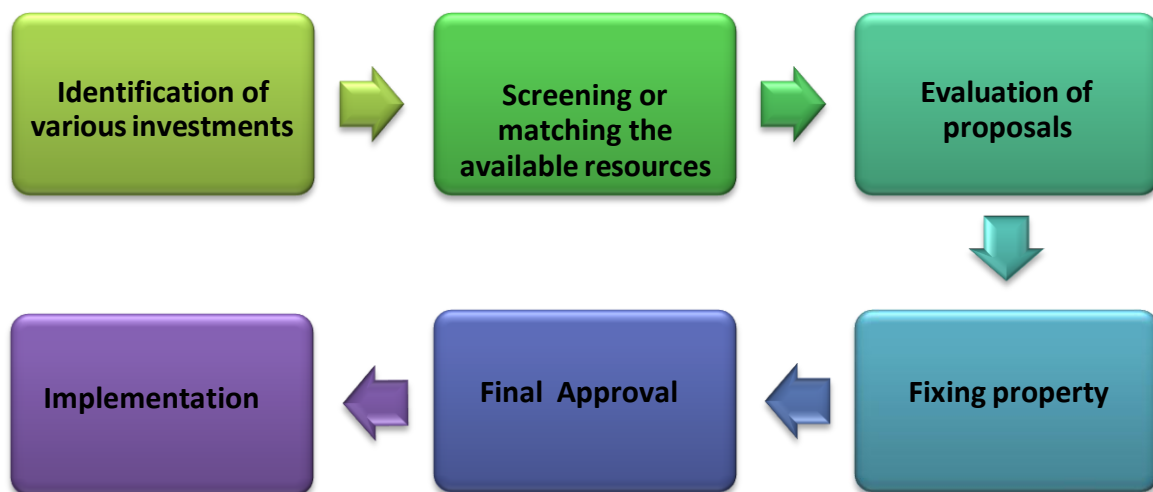
- **Helps in maximizing returns:** It helps in identifying profitable investment opportunities and maximizing returns on investments.
- **Ensures effective utilization of resources:** It helps in the effective allocation and utilization of resources by identifying the most profitable investment opportunities.
- **Provides a long-term perspective:** it enables companies to take a long-term perspective while making investment decisions, which helps in achieving the long-term goals of the company.
- **Reduces risk:** By considering factors such as risk, uncertainty, and the time value of money, capital budgeting helps in reducing the risk associated with investment decisions.
- **Facilitates decision-making:** It provides a structured and systematic approach for evaluating investment proposals, which facilitates decision-making.

Limitations of capital budgeting

- **Inaccurate estimates:** It relies heavily on estimates of future cash flows and discount rates, which may be inaccurate, leading to incorrect investment decisions.
- **Ignores qualitative factors:** Capital budgeting does not consider qualitative factors such as social responsibility or environmental impact, which may be important in certain cases.
- **High degree of complexity:** Budgeting techniques can be complex and time-consuming to implement, especially for large and complex investment projects.
- **Limited scope:** Some techniques are limited in scope as they only consider financial factors and do not take into account non-financial factors such as reputation or brand value.

CAPITAL BUDGETING PROCESS

Capital budgeting is a complex process as it involves decisions relating to the investment of current funds for the benefit to be achieved in future and the future is always uncertain. However the following procedure may be adopted in the process of capital budgeting:



PROJECT GENERATION

1. Identification of Investment Proposals: The proposal or the idea about potential investment opportunities may originate from the top management or may come from the rank and file worker of any department or from any officer of the organization.

2. Screening the Proposals: The expenditure planning committee screens the various proposals received from different departments. The committee views these proposals from various angles to ensure that these are in accordance with the corporate strategies or a selection criterion's of the firm and also do not lead to departmental imbalances.

PROJECT EVALUATION

3. Evaluation of Various Proposals: The next step in the capital budgeting process is to evaluate the profitability of various proposals. There are many methods which may be used for this purpose such as payback period method, rate of return method, net present value method, internal rate of return method etc.

PROJECT SELECTION

4. Fixing Priorities: After evaluating various proposals, the unprofitable or uneconomic proposals may be rejected straight ways. But it may not be possible for the firm to invest immediately in all the acceptable proposals due to limitation of funds. Hence, it is very essential to rank the various proposals and to establish priorities after considering urgency, risk and profitability involved therein.

5. Final Approval and Preparation of Capital Expenditure Budget: Proposals meeting the evaluation and other criteria are finally approved to be included in the Capital expenditure budget.

PROJECT EXECUTION

6. Implementing Proposal: Preparation of a capital expenditure budgeting and incorporation of a particular proposal in the budget does not itself authorize to go ahead with the implementation of the project. A request for authority to spend the amount should further be made to the Capital Expenditure Committee. Further, while implementing the project, it is better to assign responsibilities for completing the project within the given time frame and cost limit so as to avoid unnecessary delays and cost over runs by applying Network techniques PERT and CPM.

7. Performance Review: The last stage in the process of capital budgeting is the evaluation of the performance of the project. The evaluation is made through post completion audit by way of comparison of actual expenditure of the project with the budgeted one, and also by comparing the actual return from the investment with the anticipated return. The unfavourable

variances, if any should be looked into and the causes of the same are identified so that corrective action may be taken in future.

DEVELOPING CAH FLOW DATA (cash inflow and cash outflow)

The process of cash flow estimation is problematic because it is difficult to accurately forecast the costs and revenues associated with large, complex projects that are expected to affect operations for long periods of time. Forecasting project cash inflows involves numerous variables and many participants in this exercise.

Capital outlays are estimated by engineering and product development departments, revenue projections are provided by marketing group and operational cost are estimated by production people, cost accountants, purchase managers, personalexecutives, and tax experts and so on.

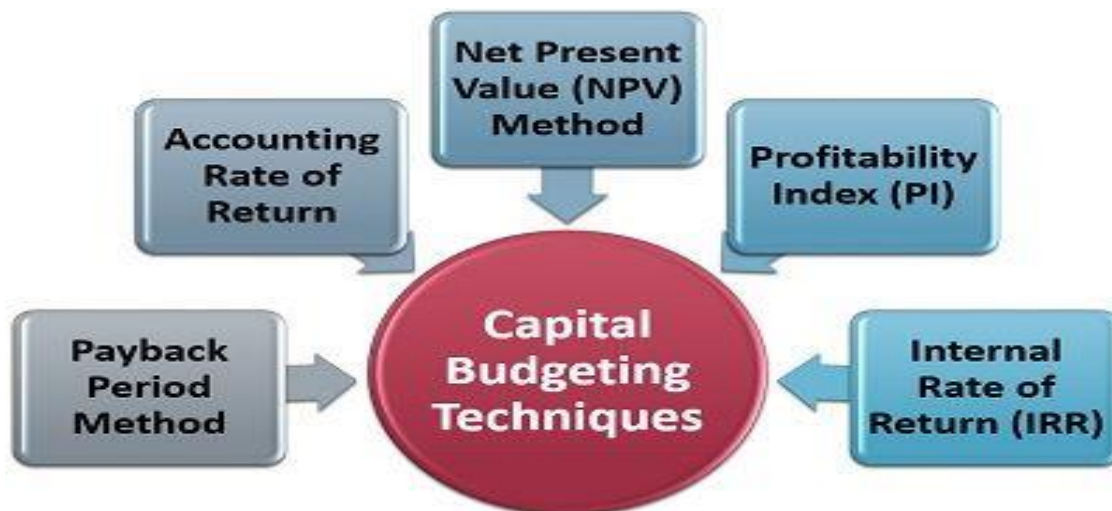
Calculation of cash inflow

Sales	xxxx
Less: Cash expenses	xxxx
PBDT	xxxx
Less: Depreciation	xxxx
PBT	xxxx
less: Tax	xxxx
PAT	xxxx
Add: Depreciation	xxxx
Cash inflow p.a	xxxx

Calculation of cash outflow

Cost of project/asset	xxxx
Transportation/installation charges	xxxx
Working capital	xxxx
Cash outflow	xxxx

CAPITAL BUDGETING TECHNIQUES AND METHODS



A. TRADITIONAL TECHNIQUES

1. PAYBACK PERIOD (PBP)

The payback period is a capital budgeting technique used to determine the amount of time required for a project to generate enough cash flow to recover the initial investment. To calculate the payback period, you need to divide the initial investment by the expected annual cash inflows until the investment is fully recovered.

Formula

$$\text{Payback Period} = \text{Initial Investment} / \text{Expected Annual Cash Inflows}$$

Advantages

- Simple and easy to understand
- Useful for evaluating short-term projects
- Provides a quick assessment of the project's risk and liquidity
- Can help avoid investments that take too long to recoup their costs
- Does not require estimating future cash flows or discount rates

Limitations

- Ignores the time value of money
- Does not consider cash flows beyond the payback period
- Ignores profits earned after the payback period

- Ignores the risk associated with future cash flows
- Cannot be used to compare projects with different lifespans

ACCEPT /REJECT CRITERIA

Under this method, various investments are ranked according to the length of their payback period in such a manner that the investment within a shorter payback period is preferred to the one which has longer payback period.

2. AVERAGE RATE OF RETURN METHOD (ARR)

In this method, by dividing average income after taxes by average investment, the revenue of an investment proposal can be determined. This forms the average book value after depreciation.

Formula

$$\text{ARR} = \frac{\text{Average Net Income after Taxes} \times 100}{\text{Average Investment}}$$

Where,

Average Income after Taxes = Total Income after Taxes/Total Number of Years

Average Investment = Total Investment/2

ACCEPT /REJECT CRITERIA

In this method, a company can choose projects that possess an Accounting Rate of Return (ARR) exceeding the company's predefined minimum rate. Further, the company can reject projects with low ARR.

B. DISCOUNTING CASHFLOW TECHNIQUES (DCF)

3. NET PRESENT VALUE (NPV)

The Net Present Value (NPV) method is a capital budgeting technique used to determine the value of an investment by comparing the present value of its expected cash inflows to the initial investment cost.

Formula

$$\text{NPV} = \text{Total of PV of Expected Cash Inflows} - \text{Initial Investment}$$

Where:

PV = Present Value

Initial Investment = Total cost of the investment

Expected Cash Inflows = Future cash inflows discounted to their present value

Advantages

- Considers the time value of money
- Accounts for all expected cash inflows and outflows
- Provides a measure of the investment's profitability
- Can be used to compare multiple investment opportunities

Limitations

- Requires accurate estimates of future cash flows and discount rates
- Can be complex and time-consuming to calculate
- Does not consider non-financial factors such as environmental impact or social responsibility.

ACCEPT /REJECT CRITERIA

If the present value of cash inflows is more than the present value of cash outflows, it would be accepted. If not, it would be rejected.

4. INTERNAL RATE OF RETURN (IRR)

The Internal Rate of Return (IRR) method is a capital budgeting technique that determines the expected rate of return of an investment. It is the discount rate that makes the net present value of the project's expected cash inflows equal to the initial investment cost.

Formula

IRR is calculated by finding the discount rate that makes the present value of cash inflows equal to the initial investment.

Advantages

- Considers the time value of money
- Accounts for all expected cash inflows and outflows
- Provides a measure of the investment's profitability
- Can be used to compare multiple investment opportunities

Limitations

- Requires accurate estimates of future cash flows and discount rates

- May lead to incorrect decisions when evaluating mutually exclusive projects
- May result in multiple IRR values for some projects

ACCEPT /REJECT CRITERIA

If the present value of the sum total of the compounded reinvested cash flows is greater than the present value of the outflows, the proposed project is accepted. If not it would be rejected.

5. PROFITABILITY INDEX (PI)

The Profitability Index (PI) method technique is used to evaluate investment opportunities by calculating the ratio of the present value of cash inflows to the initial investment cost.

Formula

$$\text{PI} = \text{PV of Expected Cash Inflows} / \text{Initial Investment}$$

Where:

PV = Present Value

Initial Investment = Total cost of the investment

Expected Cash Inflows = Future cash inflows discounted to their present value

Advantages

- Considers the time value of money
- Accounts for all expected cash inflows and outflows
- Provides a measure of the investment's profitability
- Can be used to compare multiple investment opportunities

Limitations

- May lead to incorrect decisions when evaluating mutually exclusive projects
- May not always lead to the best investment decisions when budgets are limited.

ACCEPT /REJECT CRITERIA

The greater PI of the proposed project is accepted. If not it would be rejected.

NPV VS. IRR DEBATE

Key differences between the most popular methods, the NPV (Net Present Value) Method and IRR (Internal Rate of Return) Method, include:

- NPV is calculated in terms of currency while IRR is expressed in terms of the percentage return a firm expects the capital project to return;
- Academic evidence suggests that the NPV Method is preferred over other methods since it calculates additional wealth and the IRR Method does not;
- The IRR Method cannot be used to evaluate projects where there are changing cash flows (e.g., an initial outflow followed by in-flows and a later out-flow, such as may be required in the case of land reclamation by a mining firm);
- However, the IRR Method does have one significant advantage -- managers tend to better understand the concept of returns stated in percentages and find it easy to compare to the required cost of capital; and, finally,
- While both the NPV Method and the IRR Method are both DCF models and can even reach similar conclusions about a single project, the use of the IRR Method can lead to the belief that a smaller project with a shorter life and earlier cash inflows, is preferable to a larger project that will generate more cash.
- Applying NPV using different discount rates will result in different recommendations. The IRR method always gives the same recommendation.

APPROACHES FOR RECONCILIATION

The conflicts in project rankings may arise due to size disparity, time disparity and life disparity.

1. Time Disparity: Usually, the differences between NPV and IRR methods is found due to differences in timing of cash flows. When large cash inflows are made in initial stage of project, it leads to higher rate of return and if large cash inflows are made in final stage of project, it results in higher NPV but rate of return will be less. In order to maximize the shareholder's wealth firm must select the project with higher NPV.

2. Size Disparity: The conflicts between NPV and IRR methods may arise due to unequal amount of cash outflows. As NPV method give clear results and focus on objective of shareholder's wealth maximization, the project which gives higher NPV must be accepted.

3. Life Disparity: When two mutually exclusive projects have different life spans they result in conflict between NPV and IRR rules. Let us assume two projects A and B are mutually exclusive and both have same amount of initial outcome. But project A generate cash inflows at the end of first year, whereas project B provide cash inflows

at the end of fifth year. When NPV method is used project is more profitable and in terms of IRR, project A is best. Firm must select the project with higher NPV because it emphasis on wealth maximizations principle.

RISK ANALYSIS AND UNCERTAINTY IN CAPITAL BUDGETING

It is possible to predict the outcome of some decisions with complete certainty because only one outcome can arise. However, there are many occasions when decisions can lead to more than one possible outcome, such situations are surrounded with uncertainty. The traditional difference between risk and uncertainty is that the uncertainty cannot be quantified while risk can be quantified. Risk is concerned with the use of quantification of the likelihood of future outcomes. The word uncertainty is to cover all future outcomes, which cannot be predicted with accuracy.

People have different attitudes towards the future. Some welcome the opportunity to take risk they may be called risk takers or risk seekers and others are risk averse. An organisation's performance is influenced by the elements contained within its environment. In turn the organisation also has an impact on its environment. The very survival of an organisation depends critically upon the willingness of its environment to sustain it. It is the role of the management to predict events that are likely to occur to meet the challenges and to take advantage of any new opportunity.

NATURE OF RISK

Risk analysis should be incorporated in capital budgeting exercise. The capital budgeting decisions are based on the benefits derived from the project. These benefits measured in terms of cash flows are estimates. The estimation of future returns is done on the basis of various assumptions. The actual return in terms of cash inflows depends on a variety of factors such as price, sales volume, effectiveness of advertising, competition, cost of raw materials, manufacturing cost and so on. Each of these in turn, depends on other variables like state of the economy, rate of inflation, etc.

The accuracy of the estimates of future returns and the reliability of the investment decision would largely depend upon the accuracy with which these factors are forecasted. The actual return will vary from the estimated return, which is technically referred to as risk. Thus risk with reference to investment decision is defined as "the variability in actual returns arise from

a project in future over its working life in relation to the estimated return as forecast at the time of the initial capital budgeting decisions".

Types of Risk:

The risk can be broken up into three types

- 1. Certainty:** It is a situation where the returns are assured and no variability likely to occur in future returns. For example investment in Government bonds, fixed deposits in a nationalized bank.
- 2. Uncertainty:** It is a situation where infinite number of outcomes are possible and probabilities cannot be assigned. ',
- 3. Risk:** Risk is the variability that is likely to occur in future returns from the investment. In other words, risk is a situation in which the probabilities of future cash flows occurring are known.

Source of Risk:

As explained above, risk is associated with the variability of future returns of a project. The factors which will influence the future returns of the projects may be explained as follows:

- (a) Size of the investment:** The size of the investment in terms of the amount required will determine the risk. Large scale projects are more risky than small scale projects example, a project involves for Rs. 1 crore investment involves more risk than a project with Rs. 1 lakh investment.
- (b) Life of the Project:** The life of the project will determine the risk involved. Longer the life of projects more is the risk, shorter the life of the projects less is the risk.
- (c) Economic conditions:** There are certain conditions which will influence the general level of business activity. For example, economic and political situation in the country, Government monetary and fiscal policies, etc.
- (d) Industry Factors:** These factors affect all the companies of the industry in the same way. For example: industrial relations in the industry, innovation, material cost, etc.
- (e) Company Factors:** These are internal to the company which will effect a particular company only. For example, change in the management, strike in the company, fire accident in the company etc.

TECHNIQUES FOR MEASUREMENT OF RISK

A. CONVENTIONAL TECHNIQUES

1. Risk Adjusted Discount Rate (RAD)

This method is based on the presumption that investors expect more rate of return on risky projects as compared to less risky projects. The required rate of return will be equal to risk free rate plus risk premium. This method is similar to the net present value method, except adding some percentage of risk premium to risk free rate of return. The risk adjusted discount rate accounts for risk, by varying the discount rate, depending on the degree of risk of investment projects. A higher rate will be used for with high risk project and .lower rate for less risky project. The net present value will decrease with increasing k , indicating that ' the risky project is perceived, the less likely it will be accepted.

Advantages

- (a) It is easy to understand and simple to calculate
- (b) It recognise the risk involved in projects. ;.

Disadvantages

- (a) There is no easy way to determine risk-adjusted discount rate:
- (b) If does not make any adjustment in the numerator for the cash flows that are forecast over the future years.
- (c) It is based on the assumption that investors are risk averse.

2. Certainty Equivalent Factor Method (CEF)

According to this method, the estimated cash flows are reduced to conservative level by applying a correction factor referred as .a certainty equivalent coefficient. The correction factor is ' the ratio of riskless cash flow to risky cash flow. The certainty equivalent method recognises the risk in capital budgeting by adjusting estimated cash flows and employ risk free rate to discount adjusted cash flows.

3. Sensitivity Analysis

It is a technique, which indicates exactly how much the NPV or IRR will change in response to a given change in an input variable other things held constant. It indicates how sensitive a

project NPV or IRR is to changes in particular variables, (Sales volume, price, variable cost, fixed cost, investment, project life etc.). The more sensitive the NPV, the more critical the variable. The following three steps are involved in the use of sensitivity analysis. ,

- (a) Identification of all the variables which have an influence on the projects NPV or IRR.
- (b) Establish the relationship between the variables.
- (c) Analyse the impact of change in each of the variables on the projects NPV or IRR

Advantages

- 1) It compels the decision maker to identify the variables which will influence projects NPV or IRR. This helps him in understanding the project in totality.
- 2) It indicates the critical variables which have negative impact on the project NPV or IRR.
- 3) It helps to expose in appropriate forecast and thus guides the decision maker to concentrate on relevant variables.

Limitations:

- 1) It does not provide clear cut results.
- 2) It fails to focus on the inter-relationship between variables, for example sales volume may be related to price, cost and expenditure over advertisement.

B. STATISTICAL TECHNIQUES

1. Probability Assignment

The concept of probability is one of the statistical techniques to handle risk in capital budgeting projects. It may be described as a "measure of someone's opinion about the likelihood that an event will occur. If an event is certain to occur, we can say that it has 100% probability of occurrence one. If an event is certain not to occur, we can say that its probability of occurring is zero. Thus the probability of occur all events' lies between 0 and 1.

2. Standard Deviation and Coefficient of Variation

The probability assignment approach to risk analysis in capital budgeting does not provide decision maker, about the variability of cash flows and therefore the risk. To overcome this 'limitation, standard deviation technique is used. Which is an absolute measure of risk. In case

of capital budgeting this measure is used to compare the variability of possible cash flows of different projects from their respective mean. A project having larger standard deviation will be more risky as compared to a project having smaller standard deviation.

3. Decision Tree Analysis

Decision tree analysis is another technique of analysing the risk involved in capital budgeting proposals, Decision tree is a "graphic display of relationship between a present decision and possible future events, future decisions and their consequences. The sequence of event is mapped out over time in a format similar to the branches of tree". In other words, it is a pictorial representation in tree form which indicates the magnitude.

1) Define investment: The first step in constructing decision tree is to define the proposal. For example, entering a new market or introducing new product line.

2) Identify decision alternatives: The decision alternatives should be clearly identified. For example, a firm may be considering the purchase of new plant for manufacturing a new product. It may have three alternatives

- (a) Purchases a small plant
- (b) Purchases a large plant
- (c) Purchase a medium size plant.

3) Draw a decision tree: The decision tree is then laid down showing decision point and decision branches.

4) Analyse data: The results should be analysed and the best alternative should be selected.

Usefulness of Decision Tree Approach:

The decision tree approach useful in handling the sequential investments the working backwards from future to present, we are able to eliminate unprofitable branches and determine optimum decision at various decision points. ! The merits of decision tree are:

- i) It clearly brings out the implicit assumptions and calculations for all to see, question and revise.
- ii) It allows decision maker to visualise assumptions and alternatives in graphic form, which is easier to understand than abstract form.