MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous Institution – UGC, Govt.of India)

MASTER OF BUSINESS ADMINISTRATION

DIGITAL NOTES (Finance Elective)

Course Name	**STRATEGIC INVESTMENT AND FINANCING DECISIONS**
SUBJECT CODE	**R20MBA25**
Programme	MBA
Semester	III
Course Coordinator/ Course Faculty	**Dr. GOWSYA SHAIK,** *MBA (FIN) M.COM (ACC) PH.D,PGDCA,ACP* **Associate Professor**

Course Aim:

- To explain the role and nature of investment and financial strategies and its Relationship to maximization of wealth/shareholders value.
- To discuss the impact of general and specific inflation on financial and investment strategy decisions.
- To evaluate the motives for financial implications of M&A and lease financing.

Learning Outcome:

- To develop an understanding of the role of financial strategy, in the investing, financing and resource allocation decisions within an organization.
- To develop an understanding of the various strategies those are in use to trade off risk and return

SYLLABUS

UNIT-I	INVESTMENT DECISIONS UNDER CONDITIONS OF RISK AND UNCERTAINTY
Concepts of risk and uncertainty: Risk analysis in investment decisions. Risk adjusted rate of return, certainty equivalents - probability distribution of cash flows- decision trees- sensitivity analysis and Monte Carlo approach to simulation. **Investment decisions under capital constraints**: capital rationing vs. portfolio. Portfolio riskand diversified projects.	
UNIT-II	**TYPES OF INVESTMENTS AND DISINVESTMENTS**
Abandonment: Project abandonment Decisions **Evidence of IRR**: Multiple IRR - modified IRR - pure, simple and mixed investments. Lorie savageparadox. **NPV:** Adjusted NPV and Impact of inflation on capital budgeting decisions.	
UNIT-III	**CRITICAL ANALYSIS OF APPRAISAL TECHNIQUES**
Discounted pay back: post pay back, surplus life and surplus payback, bail out pay back **Return on investment**: Equivalent annual cost, terminal value, single period constraints, multi period capital constraint and an unresolved problem. **NPV Mean Variance Analysis:** Hertz simulation and hillier approaches.	
UNIT-IV	**STRATEGIC ANALYSIS OF SELECTED INVESTMENT DECISIONS**
Lease financing: leasing vs. operating risk, borrowing vs. procuring. Hire purchase and installment decisions. Lease risk management, leasing as a Financing decision.	
UNIT-V	**FINANCING DECISIONS**
Mergers and acquisitions basic issues, strategy , diversification and mergers and acquisitions, types of mergers, cost of mergers, government guidelines for takeover, problems on mergers and acquisitions, Diversification Strategies for take over and cases.	
Text books	
1. Harony, J. and I. Swary, "Quarterly Dividends and Earnings Announcements", 2nd Edition, 1981. 2. Altman, E.I. and Kishore, "The Default Experience of U.S. Bonds", Working Paper, Salomon Center. 1999. 3. Jayaprakash Sugavanam, Bharathy Jayaprakash, Palanisamy Saravanan, "Strategic FinancialManagement" Oxford, 1st Edition, 2014.	

Reference books
REFERENCES: 1. Ravi M Kishore “Strategic Financial Management, Taxman. 2. Nikiforos T. Laopodis, Understanding Investments-Theories and Strategies, Routledge. 3. I. M. Pandey: Financial Management, Vikas. 4. Brigham & Ehrhardt: Financial Management, Text and Cases, Cengage. 5. G. V. Satya Sekhar, Strategic Financial Management, Himalaya Publishing House. 6. MY Khan and PK Jain: Financial Management: Text, Problems & Cases, TMH.
Web References
1. https://www.open.edu 2. https://lcsc.libguides.com 3. https://www.researchgate.net
E-Text Books
1. http://www.freebookcentre.net/Business/sfid/Books.html 2. https://bookboon.com/en/sifd-eBooks 3. https://www.amazon.in/Dictionary-sfid-Oxford-Quick-Reference/dp/0199563055

UNIT-1
INVESTMENT DECISIONS
UNDER CONDITIONS OF RISK AND UNCERTAINTY

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Concepts of risk and uncertainty. Risk analysis in investment decisions. Risk adjusted rate of return, certainty equivalents, and probability distribution of cash flows, decision trees, sensitivity analysis and Monte Carlo approach to simulation. Investment decisions under capital constraints: capital rationing vs. portfolio. Portfolio risk and diversified projects.

Concepts of risk and uncertainty

Definition of Risk

In the ordinary sense, the risk is the outcome of an action taken or not taken, in a particular situation which may result in loss or gain. It is termed as a chance or loss or exposure to danger, arising out of internal or external factors that can be minimized through preventive measures.

In the financial glossary, the meaning of risk is not much different. It implies the uncertainty regarding the expected returns on the investments made i.e. the probability of actual returns may not be equal to the expected returns. Such a risk may include the probability of losing the part or whole investment. Although the higher the risk, the higher is the expectation of returns, because investors are paid off for the additional risk they take on their investments. The major elements of risk are defined as below:

1. **Systematic Risk**: Interest Risk, Inflation Risk, Market Risk, etc.
2. **Unsystematic Risk**: Business Risk and Financial Risk.

Definition of Uncertainty

By the term uncertainty, we mean the absence of certainty or something which is not known. It refers to a situation where there are multiple alternatives resulting in a specific outcome, but the probability of the outcome is not certain. This is because of insufficient information or knowledge about the present condition. Hence, it is hard to define or predict the future outcome or events.

Uncertainty cannot be measured in quantitative terms through past models. Therefore, probabilities cannot be applied to the potential outcomes, because the probabilities are unknown.

Key Differences between Risk and Uncertainty

The difference between risk and uncertainty can be drawn clearly on the following grounds:

1. The risk is defined as the situation of winning or losing something worthy. Uncertainty is a condition where there is no knowledge about the future events.
2. Risk can be measured and quantified, through theoretical models. Conversely, it is not possible to measure uncertainty in quantitative terms, as the future events are unpredictable.
3. The potential outcomes are known in risk, whereas in the case of uncertainty, the outcomes are unknown.
4. Risk can be controlled if proper measures are taken to control it. On the other hand, uncertainty is beyond the control of the person or enterprise, as the future is uncertain.
5. Minimization of risk can be done, by taking necessary precautions. As opposed to the uncertainty that cannot be minimized.
6. In risk, probabilities are assigned to a set of circumstances which is not possible in case of uncertainty.

Risk

A risk is an unplanned event that may affect one or some of your project objectives if it occurs. The risk is positive if it affects your project positively, and it is negative if it affects the project negatively. There are separate risk response strategies for negatives and positives.

The objective of a negative risk response strategy is to minimize their impact or probability, while the objective of a positive risk response strategy is to maximize the chance or impact. You might also hear two more risk terms: known and unknown. Known risks are identified during the identify risks process and unknown risks are those you couldn't identify.

A contingency plan is made for known risks, and you will use the contingency reserve to manage them. On the other hand, unknown risks are managed through a workaround using the management reserve.

Uncertainty

Uncertainty is a lack of complete certainty. In uncertainty, the outcome of any event is entirely unknown, and it cannot be measured or guessed; you don't have any background information on the event. Uncertainty is not an unknown risk. In uncertainty, you completely lack the background

information of an event, even though it has been identified. In the case of an unknown risk, although you have the background information, you missed it during the identify risks process.

Risk analysis in investment decisions

A Real-World Example of Risk and Uncertainty

- Assume two famous teams consist of renowned players, and they are going to play a football match the next day.
- Can you tell me exactly which team is going to win?
- No, you can't; however, you can make an educated guess by reviewing and analyzing the past performances of each player, the team, and the results of matches they played against each other.
- Then you can come up with some numbers, like there is a 30% chance of Team A or Team B winning, or there is a 70% possibility of Team A or Team B losing the match.
- Now, let us put the same football match in a different scenario.
- Let us say again that two teams are going to play a game, and no players are selected for either team.
- In this situation, if somebody asked you which team is going to win, what would your response be?
- You will be clueless because you don't know which team consists of which players, and you have no idea how the teams will perform.
- Here, you don't have any information on past performance, and cannot predict the outcome of the event, even though the rules and the stadium are the same.
- This situation is called uncertainty.

Risk in Investment Decisions

The uncertainty is attached to every investment project and different projects have varying degrees of risk. A finance manager must take cognizance of risk factors while taking investment decision.

So the questions may pop up in our minds are, what is risk?, uncertainty?

Let's find out the answers to these questions in this chapter along with proper understanding of methods to measure and reduce the intensity of risk .

The aim is to arrange for additional adjustments to cover risks

Concept of Risk, Certainty & Uncertainty

The certainty is state of nature which arises when outcomes are known and determinate. e.g. investment in five years 7% tax free Government Bonds. The return on investment @ 7% can be estimated quite precisely. This is so because we assume that Government of

India is one of the most stable forces in this country and investment decision would certainly result in returns at 7% p.a. until maturity and full refund of capital thereafter. The outcome here has a probability of 1.0

Concept of Risk, Certainty & Uncertainty

Risk involves situations in which the probabilities of an event occurring are known and these probabilities are objectively or subjectively determinable. It is the inability to predict with perfect knowledge the course of future events that introduces risk.

When events become more predictable the risk is reduced and vice versa. Hence Proposal B is riskier than Proposal A in the next graph. In contrast, when an event is not repetitive and unique in character and finance manager is not sure about probabilities themselves, uncertainty is said to prevail. Uncertainty is a subjective phenomenon. Since there is no frequency distribution under uncertainty, acceptable methods cannot be evolved to handle for handling uncertainty.

Factors of Risk

After understanding the difference among risk, uncertainty and certainty, now let's look at the main factors of risks.

The first step in risk analysis is to uncover the major factors that contribute to the variability of results from investment or risk in investment. .

- Size of investment – larger the project, greater the investments and resulting risks.
- Reinvestment of Cash Flows – models assume that cash inflows in future can be used by the company to earn similar rate of return from reinvestment. This is not certain.
- Variability of Cash Flows – reliance on single estimate is risky. Range of estimates is desirable.
- Life of the Project – cannot be determined precisely and has to be determined by technical experts.

Measurement of Risk

1. **Standard Deviation**

Standard deviation measures the dispersion of data from its expected value. The standard deviation is used in making an investment decision to measure the amount of historical volatility associated with an investment relative to its annual rate of return. It indicates how much the current return is deviating from its expected historical normal returns. For example, a stock that has high standard deviation experiences higher volatility, and therefore, a higher level of risk is associated with the stock.

2. **Beta**

Beta is another common measure of risk. Beta measures the amount of systematic risk an individual security or an industrial sector has relative to the whole stock market. The market has a beta of 1, and it can be used to gauge the risk of a security. If a security's beta is equal to 1, the security's price moves in time step with the market. A security with a beta greater than 1 indicates that it is more volatile than the market.

Conversely, if a security's beta is less than 1, it indicates that the security is less volatile than the market. For example, suppose a security's beta is 1.5. In theory, the security is 50 percent more volatile than the market.

3. **Value at Risk (VaR)**

Value at Risk (VaR) is a statistical measure used to assess the level of risk associated with a portfolio or company. The VaR measures the maximum potential loss with a degree of confidence for a specified period. For example, suppose a portfolio of investments has a one-year 10 percent VaR of $5 million. Therefore, the portfolio has a 10 percent chance of losing more than $5 million over a one-year period.

4. **Conditional Value at Risk (CVaR)**

Conditional value at risk (CVaR) is another risk measure used to assess the tail risk of an investment. Used as an extension to the VaR, the CVaR assesses the likelihood, with a certain degree of confidence, that there will be a break in the VaR; it seeks to assess what happens to investment beyond its maximum loss threshold. This measure is more sensitive to events that happen in the tail end of a distribution—the tail risk. For example, suppose a risk manager believes

the average loss on an investment is $10 million for the worst one percent of possible outcomes for a portfolio. Therefore, the CVAR, or expected shortfall, is $10 million for the one percent tail.

Categories of Risk Management

Beyond the particular measures, risk management is divided into two broad categories: systematic and unsystematic risk.

1. **Systematic risk** is associated with the market. This risk affects the overall market of the security. It is unpredictable and undiversifiable; however, the risk can be mitigated through hedging. For example, political upheaval is a systematic risk that can affect multiple financial markets, such as the bond, stock, and currency markets. An investor can hedge against this sort of risk by buying put options in the market itself.
2. **Unsystematic Risk**

   The second category of risk, unsystematic risk, is associated with a company or sector. It is also known as diversifiable risk and can be mitigated through asset diversification. This risk is only inherent to a specific stock or industry. If an investor buys an oil stock, he assumes the risk associated with both the oil industry and the company itself.

   For example, suppose an investor is invested in an oil company, and he believes the falling price of oil affects the company. The investor may look to take the opposite side of, or hedge, his position by buying a put option on crude oil or on the company, or he may look to mitigate the risk through diversification by buying stock in retail or airline companies. He mitigates some of the risk if he takes these routes to protect his exposure to the oil industry. If he is not concerned with risk management, the company's stock and oil price could drop significantly, and he could lose his entire investment, severely impacting his portfolio.

Characteristics of investment decisions

Essential features of an investment programme

1. Safety of principal

Safety of funds invested is one of the essential ingredients of a good investment programme. Safety of principal signifies protection against any possible loss under the changing conditions. Safety of principal can be achieved through a careful review of economic and industrial trends before choosing the type of investment. It is clear that no one can make a forecast of future economic

conditions with utmost precision. To safeguard against certain errors that may creep in while making an investment decision, extensive diversification is suggested.

The main objective of diversification is the reduction of risk in the loss of capital and income. A diversified portfolio is less risky than holding a single portfolio.

Diversification refers to an assorted approach to investment commitments. Diversification may be of two types, namely,

1. Vertical diversification; and
2. Horizontal diversification.

Under **vertical diversification**, securities of various companies engaged in different stages of production (from raw material to finished products) are chosen for investment.

On the contrary, **horizontal diversification** means making investment in those securities of the companies that are engaged in the same stage of production.

Apart from the above classification, securities may be classified into bonds and shares which may in turn be reclassified according to their types. Further, securities can also be classified according to due date of interest, etc. However, the simplest diversification is holding different types of securities with reasonable concentration in each.

2. Liquidity and Collateral value

A liquid investment is one which can be converted into cash immediately without monetary loss. Liquid investments help investors meet emergencies. Stocks are easily marketable only when they provide adequate return through dividends and capital appreciation. Portfolio of liquid investments enables the investors to raise funds through the sale of liquid securities or borrowing by offering them as collateral security. The investor invests in high grade and readily saleable investments in order to ensure their liquidity and collateral value.

3. Stable income

Investors invest their funds in such assets that provide stable income. Regularity of income is consistent with a good investment programme. The income should not only be stable but also adequate as well.

4. Capital growth

One of the important principles of investment is capital appreciation. A company flourishes when the industry to which it belongs is sound. So, the investors, by recognizing the connection between industry growth and capital appreciation should invest in growth stocks. In short, right issue in the right industry should be bought at the right time.

5. Tax implications

While planning an investment programme, the tax implications related to it must be seriously considered. In particular, the amount of income an investment provides and the burden of income tax on that income should be given a serious thought. Investors in small income brackets intend to maximize the cash returns on their investments and hence they are hesitant to take excessive risks. On the contrary, investors who are not particular about cash income do not consider tax implications seriously.

6. Stability of Purchasing Power

Investment is the employment of funds with the objective of earning income or capital appreciation. In other words, current funds are sacrificed with the aim of receiving larger amounts of future funds. So, the investor should consider the purchasing power of future funds. In order to maintain the stability of purchasing power, the investor should analyze the expected price level inflation and the possibilities of gains and losses in the investment available to them.

The investor should invest only in such assets which are approved by law. Illegal securities will land the investor in trouble. Apart from being satisfied with the legality of investment, the investor should be free from management of securities. In case of investments in Unit Trust of India and mutual funds of Life Insurance Corporation, the management of funds is left to the care of a competent body. It will diversify the pooled funds according to the principles of safety, liquidity and stability.

Meaning of Investment Decisions:

In the terminology of financial management, the investment decision means capital budgeting. Investment decision and capital budgeting are not considered different acts in business world. In investment decision, the word 'Capital' is exclusively understood to refer to real assets which may assume any shape viz. building, plant and machinery, raw material and so on and so forth, whereas investment refers to any such real assets.

Simply, selecting the type of assets in which the funds will be invested by the firm is termed as the investment decision. These assets fall into two categories:

1. Long Term Assets
2. Short-Term Assets

The decision of investing funds in the long term assets is known as Capital Budgeting. Thus, Capital Budgeting is the process of selecting the asset or an investment proposal that will yield returns over a long period.

Step1: Involved in Capital Budgeting is to select the asset, whether existing or new on the basis of benefits that will be derived from it in the future.

Step2 : The next step is to analyze the proposal's uncertainty and risk involved in it. Since the benefits are to be accrued in the future, the uncertainty is high with respect to its returns.

Step3 : the minimum rate of return is to be set against which the performance of the long-term project can be evaluated.

The investment made in the current assets or short term assets is termed as Working Capital Management. The working capital management deals with the management of current assets that are highly liquid in nature.

The investment decision in short-term assets is crucial for an organization as a short term survival is necessary for the long-term success. Through working capital management, a firm tries to maintain a trade-off between the profitability and the liquidity.

In case a firm has an inadequate working capital i.e. less funds invested in the short term assets, then the firm may not be able to pay off its current liabilities and may result in bankruptcy. Or in case the firm has more current assets than required, it can have an adverse effect on the profitability of the firm Thus, a firm must have an optimum working capital that is necessary for the smooth functioning of its day to day operations. In other words, investment decisions are concerned with the question whether adding to capital assets today will increase the revenues of tomorrow to cover costs. Thus investment decisions are commitment of money resources at different time in expectation of economic returns in future dates.

Choice is required to be made amongst available alternative revenues for investments. As such investment decisions are concerned with the choice of acquiring real assets over the time period in a productive process.

Categories of Investment Decisions:

- **Inventory Investment:**
  - Holding of stocks of materials is unavoidable for smooth running of a business. The expenditure on stocks comes in the category of investments.
- **Strategic Investment Expenditure:**
  - In this case, the firm makes investment decisions in order to strengthen its market power. The return on such investment will not be immediate.
- **Modernization Investment Expenditure:**
  - In this case, the firm decides to adopt a new and better technology in place of the old one for the sake of cost reduction. It is also known as capital deepening process.
- **Expansion Investment on a New Business:**
  - In this case, the firm decides to start a new business or diversify into new lines of production for which a new set of machines are to be purchased.
- **Replacement Investment:**
  - In this category, the firm takes decisions about the replacement of worn out and obsolete assets by new ones.

- **Expansion Investment:**
  - In this case, the firm decides to expand the productive capacity for existing products and thus grows further in a unit-direction. This type of investment is also called capital widening.
- **Need for Investment Decisions:**
  - The need for investment decisions arrives for attaining the long term objective of the firm viz. survival or growth, preserving share of a particular market and retain leadership in a particular aspect of economic activity.

The firm may like to make investment decision to avail of the economic opportunities which may arise due to the following reasons:

- Expansion of the productive process to meet the existing excessive demand in local market to exploit the international markets and to avail the benefits of economies of scale.
- Replacement of an existing asset, plant, machinery or building may become necessary for reaping advantages of technological innovations, minimizing cost of products and increasing the efficiency of labor.
- Buy or hire on rent or lease a particular asset is another important consideration which establishes the need for making investment decisions.

Factors affecting Investment Decisions:

- Estimate of capital outlays and the future earnings of the proposed project focusing on the task of value engineering and market forecasting,
- Availability of capital and consideration of cost-focusing attention as financial analysis, and
- A correct set of standards by which to select projects for execution to maximize return-focusing attention on logic and arithmetic.

Concept of risk and uncertainty

Risk analysis in investment decisions:

Risk refers to the deviation of the financial performance of a project from the forecasted performance. One needs to forecast the cash flows and other financial aspects while selecting a project. However, the actual financial performance of a project may not in accordance to the forecasted performance. These risks can be decline in demand, uneven cash flow, and high inflation. For example, an organization is planning to install a machine that would increase the production level of the organization.

However, the demand of the product may vary with the economic environment, for example, the demand may be very high in economic boom and low if there is recession. Therefore, the organization may earn high income or incur huge loss, depending on the business environment.

Decision-making helps the decision maker in choosing the best course of action from the available courses of action. The decision-making models are classified on the basis of information about the state of nature and the decision environment are classified into three types as follows,

1. Decision-making under certainty.
2. Decision-making under risk.
3. Decision –making under uncertainty.
4. Decision-making under certainty

This is one fo the easiest from of decision-making. The outcome from the selection of a particular course of action is given with certainty. Each state of nature has one course of action which has probability. Complete and correct information and knowledge of the consequent of each choice is being provided. As such the decision holds the perfect knowledge about the future outcome, he/she chooses that course of action which pays him the maximum/optimum payoff.

Few techniques are as follows,

1. Input –output analysis
2. Break even analysis
3. Goal programming
4. Transportation and assignments methods
5. Inventory models under certainty
6. Decision-making under Risk

Decision making under risk

Decision making under risk assumes the long-run relative frequency of the states of nature occurrence to be given and besides this it also enumerates several states of nature. The state of natures information is probabilistic in nature i.e, the decision maker cannot predict which outcome will occur as a result of selecting a particular course of action. As each course of action results in more than one outcome, it is not easy to calculate the exact monetary payoffs or outcomes for the various combinations of courses of action and states of nature.

Decision-making under Uncertainty

The decision maker has to determine the expected payoff for the courses of action or strategies as the probabilities associated with the occurrence of states of nature are not given. The decision maker has number of criteria available and has to select one among them. The selection depends upon the attitude of the decision maker and the polich of an organisation.

Criterion of Optimism or Maximin: Maximin initially identifies the worst possible outcome for each course of action i.e., maximin loss or minimum outcome that would occur under each decision alternative and then choosing the best out of the worst outcome is order to select the optimal course of action or strategy.

Criterion of Optimism or Maximax : Maximax is totally reverse of maximin operations research criterion of pessimism. Maximax identifies the best possible outcome associated with each course of action and then choose the maximum of the maximum value in order to select the optimal course of action or strategy.

Minimax Regret Criterion: Minimax regret criterion is useful in identifying the regret which is associated with each states of nature if a specific course of action is undertaken.

Hurwitz Criterion or Criterion of Realism: A rational decision maker should not be either completely optimistic or pessimistic. Hurwitz introduced the idea of coefficient of optimism.

1. If a is close to 1, the decision-maker is optimistic about the future
2. If a is close to zero, the decision-maker is pessimistic about the future. According to Hurwitz, select the strategy that maximizes.
3. H=a (Maximum payoff in column)+(1-a)(Minimum payoff in column).

Criterion of Rationality or Baye's or Laplace Criterion: Laplace criterion is based on the principle of equal likelihood or insufficient reason. According to this principle, as probabilities of future states of nature is unknown, there is no reason to consider any one outcome more likely than the other i.e, all outcomes must be considered equally likely. With outcomes, each outcomes will thus have a probability of 1/n .with the help of these probabilities such a course of action must be chosen which has the highest expected loss.

Sources and perspectives of Risks:

Risk is common in every business, it is the probability of happening something wrong in future. A project involves risk which emerge from different sources. Some of the important sources are explained below,

Sources of Risk:

- Project Specific Risk
- Competitive Risk
- Industry Specific –Risk
- Market Risk
- International Risk Perspective of Risk
- Stand-alone risk
- Firm Risk
- Market Risk.

Risk and Uncertainty in Capital Budgeting

All the techniques of capital budgeting require the estimation of future cash inflows and cash outflows. But due to uncertainties about the future, the estimates if demand, production, sales cannot be exact. All these elements of uncertainty have to be taken into account in the form of forcible risk while taking a decision on investment proposals. The following two methods are suggested for accounting for risk in capital budgeting.

1. Risk adjusted cut off rate or method of varying discount rate.
2. Certainty equivalent method.

Risk adjusted cut off rate or method of varying discount rate: The simplest method for accounting for risk in capital budgeting is to increase the cut-off rate or the discount factor by certain % on account of risk. The projects which are more risky and which have greater variability in expected returns should discounted at higher rate as compared to the projects which are less risky and are expected to have lesser variability in returns. The greater drawback of this method is that it is not possible to determine the risk premium rate appropriately and moreover it is the future cash flow, which is uncertain and requires the adjustment and not the discount rate.

Certainty Equivalent Method: Another simple method of accounting foe risk n capital budgeting is to reduce the expected cash flows by certain amounts. It can be employed by multiplying the expected cash flows by certainty equivalent co-efficient as to convert the cash floe to certain cash flows.

The certainty equivalent method is conceptually superior to the risk-adjusted discount rate method because it does not assume that risk increase with time at a constant rate. Each year's certainty equivalent coefficient is based on the level or risk characterizing its cash flow. Despite its conceptual soundness it is not as popular as the risk-adjusted rate method. This is perhaps because it is inconvenient and difficult to specify a series of certainty equivalent coefficients but seemingly simple to adjust the discount rate. Notwithstanding this practical difficulty, the merits of the certainty equivalent method must not be ignored.

Simulation Approach

In considering risky investments, we can also use simulation to approximate the expected value of net present value, the expected value of internal rate of return, or the expected value of profitability index and the dispersion about the expected value. By simulation we mean testing the possible results of an investment proposal before it is accepted. The testing itself is based on a model coupled with probabilistic information. Making use of a simulation model first proposed by David Hertz, we might consider, for example, the following factors in deriving a project's cash-flow stream.

Risk analysis based on simulation approach involves the following steps:

1. List all the basic economic variables that will affect the outcome of the decision.
2. Estimate the range of variables for each of these variables that are subject to uncertainty.
3. State in equation from the economic or accounting relationships that connect the basic variables to the final outcome on which the decision will be based.
4. With the aid of computer randomly select a specific value for each basic variable according to the chances this value has of actually turning up in the future. Given these specific values, use the equation in step 3 to calculate the resulting outcome.
5. Repeat this process to define and evaluate the probability of the occurrence of each possible rate of return. Since there are literally millions of possible combinations of values, we need to test the likelihood that various specific returns on the investment will occur.

Methods that are used for taking investment decisions under risk are as follows:

1. Sensitivity Analysis
2. Scenario Analysis
3. Decision Tree Analysis
4. Break-Even Analysis
5. Risk-Adjusted Discount Rate Method
6. Certainty-Equivalent Analysis.

The risks can be assessed by using various methods that are shown in Figure-1:

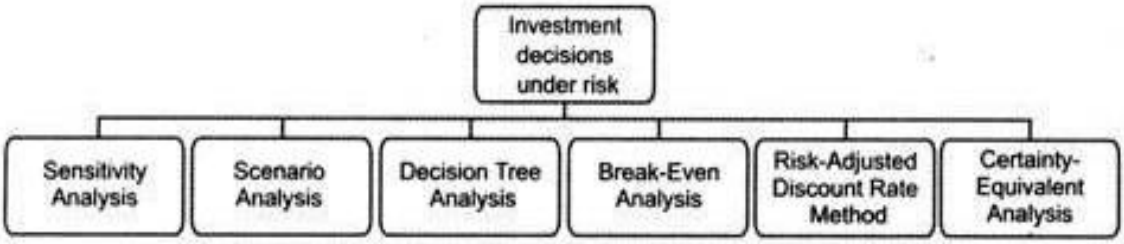


Figure-7: Methods for taking Investment Decisions under Risk

1. Sensitivity Analysis:

Forecasting plays an important role in project selection. For example, a project manager needs to forecast the total cash flow of a project. The cash flow depends on the revenue earned and cost incurred in a project.

The revenue earned from the project depends on various factors, such as sales and market share. Similarly, if we want to find out the NPV or IRR of the project, we need to make the accurate predictions of independent variables. Any change in the independent variables can change the NPV or IRR of the project.

In sensitivity analysis, we analyze the degree of responsiveness of the dependent variable (here cash flow) for a given change in any of the dependent variables (here sales and market share). In other words, sensitivity analysis is a method in which the results of a decision are forecasted, if the actual performance deviates from the expected or assumed performance.

Sensitivity analysis basically consists of three steps, which are as follows:

1. Identifying all variables that affect the NPV or IRR of the project

2. Establishing a mathematical relationship between the independent and dependent variables
3. Studying and analyzing the impact of the change in the variables

Sensitivity analysis helps in providing different cash flow estimations in three circumstances, which are as follows:

a) Worst or Pessimistic Conditions: Refers to the most unfavorable economic situation for the project
b) Normal Conditions: Refers to the most probable economic environment for the project
c) Optimistic Conditions: Indicates the most favorable economic environment for the project

Let us consider the example given in Table-1:

Table-5: Example of Sensitivity Analysis

Particulars	Project A	Project B
Initial Cash Outlays	200000	300000
Cash Inflow Estimates		
Most Optimistic	50000	80000
Expected or Most Likely	40000	60000
Most Pessimistic	20000	40000
Required Rate of Return	0.10	0.10
Economic Life	10 years	10 years

Now, the NPV of each of the projects can be calculated by using the formula of NPV.

The calculation of the NPV of project A is shown in Table-2:

Table-6: Calculation of NPV of Project A

Expected Cash Inflows	Present Value	NPV
Most Optimistic	307228	107228
Most Likely	245782	45782
Most Pessimistic	122891	-77109

Similarly, the calculation of NPV of project B is shown in Table-3:

Table-7: Calculation of NPV of project B		
Expected Cash Inflows	**Present Value**	**NPV**
Most Optimistic	491565	191565
Most Likely	368674	68674
Most Pessimistic	245782	-54218

Therefore, we can see that the extent of loss in project B is less than that of project A but the extent of profit in project B is more than that of project A. Therefore, the project manager should select project B.

2. Scenario Analysis:

Scenario analysis is another important method of estimating risks involved in a project. It involves assessing future uncertainness associated with a project and their outcomes. In this method, different probable scenarios are analyzed and the associated outcomes are also determined.

For example, you are going to undertake an important project and have forecasted your cash flows accordingly. If your forecast goes wrong substantially, the future of the whole project can be jeopardized. As discussed earlier, in sensitivity analysis, different factors of a project are interdependent.

Therefore, if any of the factors are disrupted, the whole forecast can be wrong. Scenario analysis helps a project manager in preparing a framework where he/she can explore different kinds of risks associated with a project. It is more complex as compared to sensitivity analysis.

Scenario analysis needs sophisticated computer techniques to effectively calculate a large number of probable scenarios and their respective outcomes. Scenario analysis is more useful to a project manager than the sensitivity analysis as the former is more comprehensive and gives more insight about a project.

However, there are few disadvantages of this method, which are as follows:

a. Complex Process:

Involves difficult calculations as calculating the NPV of a project is not easy by following this method. The complexity of the method makes it both costly and time consuming.

b. Difficulty in Assessing the Probability:

Implies that it is very difficult to estimate the possibility of different outcomes. Sometimes, in practical life, assessing future uncertainties is not accurate.

3. Decision Tree Analysis:

Decision tree analysis is one of the most effective methods of assessing risks associated in a project. In this method, a decision tree is drawn for analyzing the risks associated in a project. A decision tree is the representation of different probable decisions and their probable outcomes in a tree-like diagram.

This method takes into account all probable outcomes and makes the decision making process easier. Let us understand decision tree analysis with the help of an example, X&Y Manufacturers has two projects, project A and project B. The two projects need the initial investment of Rs. 25000 and Rs. 32000, respectively.

According to an estimation, 35% probability of project A to give a return is Rs. 46000 in next five years and 65% probability is that it may give a return of Rs. 42000 in the same period. Similarly, 20% probability of project B to give a return of Rs. 55000 in next five years and 80% probability is that it may give a return of Rs. 50000 in the same period.

Now, if we express the problem in a decision tree, we will get a tree-like diagram, which is shown in Figure-2:

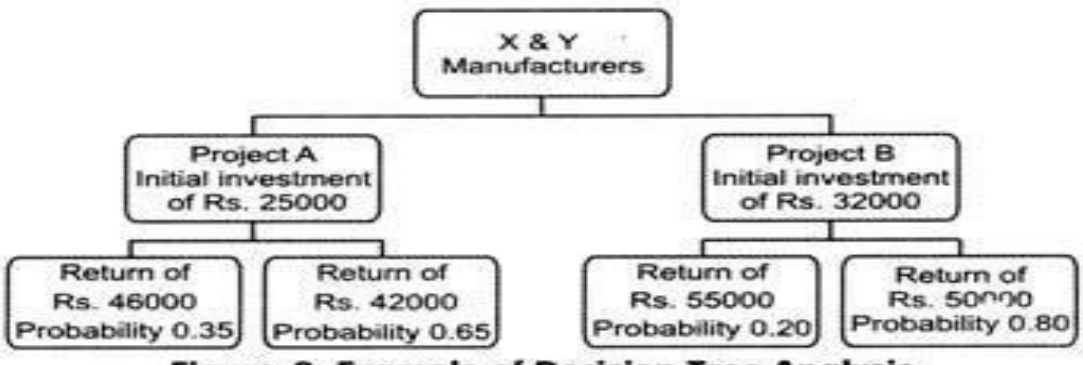


Figure-8: Example of Decision Tree Analysis

Now, the net value of each of the projects can be easily calculated. The net value of the project A would be (46000×0.35) + (42000×0.65) -25000 = (16100+27300-25000) =18400

Similarly, the net value of the project B would be (55000×.20) + (50000×.80)-32000 = 19000

Now, it is obvious that the project B is more profitable for the organization. Therefore, the organization should continue with project B.

The advantages of decision tree analysis are as follows:

1. **Detail Insight:**
   Provide a detailed view of all the probable outcomes associated with a project
2. **Objective in Nature:**
   Provides a clear evaluation of different alternative decisions

Following are the disadvantages of decision tree analysis:

- **Difficulty in Large Number of Decisions:**
  Signifies that if the expected life of the project is long and the number of outcomes are large in numbers, it is quite difficult to draw a decision tree
- **Difficulty in Interdependent Decisions:**
  Indicates that the calculation becomes very time consuming and complicated in case the alternative decisions are interdependent

4. Break-Even Analysis:

Break-even analysis is a widely used technique in project management. Break-even is a no profit and no loss situation for a project. In break-even analysis, all costs associated with a project are divided into two heads, fixed costs and variable costs.

The total fixed cost and the total variable cost are then compared with the total return or revenue of the project. In a breakeven scenario, the total of all fixed costs or variable costs in a project is equal to the total revenue or return from the project. Therefore, a project can be said to have reached its break-even when it does not have any profit or loss.

The concept of breakeven point is explained in Figure-3:

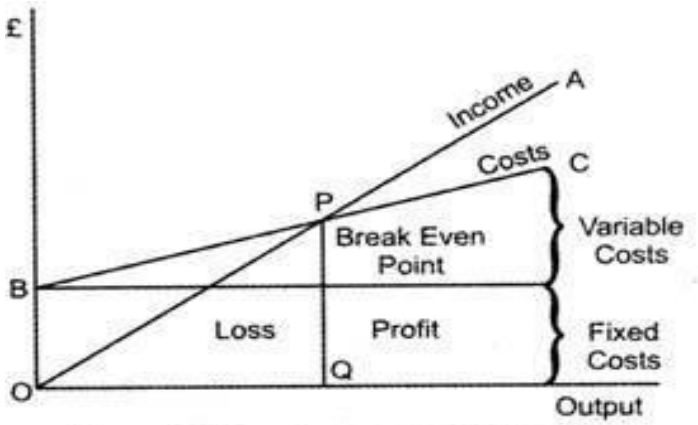


Figure-9: Break-even Point Analysis

The different costs used in break-even analysis are explained as follows:

(a) **Fixed Costs:** Refer to the costs incurred at the initial stage of the project and does not depend on the production level or operation level of the project. For example, cost of a machinery and rent.

(b) **Variable Costs:** Refer to the costs that depend on the volume of production. Wages and raw materials are the examples of variable costs.

(c) **Total Cost:** Refers to the sum total of fixed costs and variables costs.

As shown in Figure-3, at point P, the total cost is equal to the total revenue. Therefore, the project can be said to have achieved break even at point P.

5. Risk-Adjusted Discount Rate Method:

Risk-adjusted discount rate method refers to the adjustment of risk in valuation model that is NPV.Risk-adjusted discount rate can be expressed as follows:

$$d = 1/\ 1+r+\mu$$

Where, r = risk free discount rate

μ = risk probability

The preceding formula can be used for calculating risk-adjusted present value. For example, if the expected rate of return after five years is equal to R_5, then the risk-adjusted present value can be determined with the help of the following formula.

Present Value (PV) = $1/ (1+r+\mu)^5 R_5$

The calculation of risk-adjusted NPV for nth year can be done with the help of following formula:

$$NPV = \sum_{t=1}^{n} \frac{R_n}{d^n} - C_o$$

Where, R_n = return in nth year

C_o = original cost of capital

By substituting the value of d, we get the following equation:

Example 1: Let us understand the calculation of risk-adjusted discount rate with the help of an example. For example, a project, ABC cost Rs. 100 million to an organization. The project is expected to give a return of Rs. 132 million in one year. The discount rate for project 18% and probability of risk is 0.12. Find out whether the organization should accept the project ABC or not?

Solution:

The risk-adjusted NPV for project ABC can be calculated as follows:

$$NPV = \sum_{t=1}^{n} \frac{R_n}{(1+r+\mu)^n} - C_o$$

Where, R = Rs. 132 million

C_o = Rs. 100 million

r = 0.08

H = 0.12

After substituting the given values of different variables, we get the risk-adjusted NPV that is equal to:

NPV = 132/1+0.08+0.12 = 100

NPV = 10 million

Therefore, the organization is getting risk-free return of Rs. 10 million.

If we calculate NPV for the same project, it would be equal to:

$$NPV = \sum_{t=1}^{n} \frac{C_t}{(1+r)^n} - I_o$$

NPV = 132/1+0.08 = 100

NPV = 22.22 million

NPV and risk-adjusted NPV both are greater than zero. Therefore, project is profitable and should be accepted.

The advantages of risk-adjusted discount rate method are as follows:

1. Changing discount rate by changing risk factor (μ) for different time periods and amount of risk
2. Adjust the high risk of future by increasing the time duration for risk adjusted rate. For example, the risk-adjusted discounted rate for 50^{th} year is equal to:
3. Regarding as the easiest method for evaluating projects in risk conditions

However, the disadvantage of risk-adjusted discount rate method is that it fails to provide tool for measuring risk factor. Therefore, it is required to be supplemented with the method to calculate risk factor.

6. Certainty-Equivalent Analysis:

Certainty-equivalent analysis is also used for the adjustment of NPV, thus, selecting or rejecting a project. It is similar to risk- adjusted discount rate analysis. However, there is one difference between them. In risk-adjusted discount rate analysis, the discount rate is adjusted while in certainty-equivalent analysis, expected return is adjusted.

Certainty-equivalent NPV can be, calculated with the help of the following formula:

$NPV= aRn/ (1+ r)^{n}-C_0$

Where, a= certainty- equivalent coefficient

The value of a can be determined with the help of following formula:

$\alpha = R_n/R_n^*$

Where, R_n = Expected certain return

R_n^* = Expected risky return

For example, between two projects P and Q, P is risky but gives Rs. 100 million of return after one year. However, Q is risk-free but gives Rs. 90 million of return after one year. The investment for project P is Rs. 70 million and for Q it is Rs. 73 million. The risk-free discount rate is 10%. In such a case, two projects are equal for the investor. This implies that risk-free project Q is equivalent to risky project P.

Therefore, certainty-equivalent coefficient would be:

$\alpha = 90/100$

$\alpha = 0.9$

The certainty-equivalent NPV for project P would be:

$NPV = \alpha R_n / (1 + r)^n - C_0$

NPV = 0.9 * 100/ (1+0.1) -70

NPV = 12 million

The certainty-equivalent NPV for project Q would be:

$NPV = R_n / (1+r)^n - C_0$

NPV = 90/ (1+0.1) – 73

NPV = 9 million

Risk adjusted rate of return

Risk-adjusted return defines an investment's return by measuring how much risk is involved in producing that return, which is generally expressed as a number or rating. Risk-adjusted returns are applied to individual securities, investment funds, and portfolios.

Risk-Adjusted Discount Rate Definition

A risk-adjusted discount rate is the rate obtained by combining an expected risk premium with the risk-free rate during the calculation of the present value of a risky investment. A risky investment is an investment such as real estate or a business venture that entails higher levels of risk. Although it is the

usual convention to use the market rate as the discount rate in most applications, under certain circumstances, the application of a risk-adjusted discount rate becomes crucial.

A Little more on What is Risk-Adjusted Return

The risk-adjusted discount rate signifies the requisite return on investment, while correlating risk with return. This essentially means that an investment that is exposed to higher levels of risk also tends to bring in potentially higher returns, especially since the magnitude of potential losses is also greater. A risk-adjusted discount rate reflects such a correlation since discount rates are adjusted based on the magnitude of the risk involved.

Factors that Necessitate a Risk-Adjusted Discount Rate

Discount rates are mostly adjusted for unpredictability pertaining to the timing, value or time span of cash flows. In case of long-term projects, additional aspects such as future market conditions, inflation and profitability also need to be factored in. Companies adjust discount rates in keeping with risks associated with their projected liquidity, while also taking into account the risks associated with possible defaults by other parties. If the project is based in a foreign country, companies will also need to factor in other aspects such as currency risks and geographical risks. In case of investments that involve potential future lawsuits, regulatory issues or damage to the company's image, it is essential to adjust discount rates accordingly. Other factors that influence adjustments are projected competition and challenges to the competitive edge achieved by the companies.

Correlation of Discount Rate with Present Value

Adjusting the discount rate to account for risks also increases the discount rate itself, leading to a lower present value. This phenomenon can be best explained with the help of the following example.

Two different projects, P1 and P2 both have cash flows of $1 million in a year. However, P1 involves higher risk levels than P2. Naturally, P1 will be adjusted to have a higher discount rate than P2. This will result in a lower present value calculation of P1 given its potential for raking in higher profit levels. A lower present value for P1 directly translates to a lower upfront investment required to make the exact same money as P2.

Determining Risk-adjusted Discount Rate with a Capital Asset Pricing Model

A capital asset pricing model is an instrument used to determine the risk-adjusted discount rate for a particular investment. This model adjusts the risk-free interest rate by combining it with an expected risk premium that is based on the beta of the project.

Risk-adjusted discount rate = Risk-free interest rate + Expected risk premium

The risk premium is obtained by subtracting the risk-free rate of return from the market rate of return and then multiplying the result by the beta of the project.

Risk premium = (Market rate of return – Risk free rate of return) x Beta

The beta of the project is calculated as,

Beta = (Covariance) / (Variance)

where, *Covariance* is a measure of the asset's return relative to the return on the market, and V*ariance* is a measure of the market's movement relative to its mean.

Advantages and Disadvantages of Using Adjusted Rates

Employing a risk-adjusted discount rate has its own set of advantages. First, such an adjustment is easy to understand and apply. Secondly, risk-adjusted rates prepare investors to face any uncertainties. Thirdly, risk-adjusted discount rates appeal to an investor's institution, especially any investor that is averse to taking risks.

However, a risk-adjusted discount rate is not without its limitations. To begin with, the process of obtaining an adjusted rate is not a straightforward process, especially since capital asset pricing model have limited practical applications. Secondly, such an adjustment is based on the fundamental assumption that all investors are averse to taking risks, which is not true.

Monte Carlo approach to simulation

Monte Carlo simulation performs risk analysis by building models of possible results by substituting a range of values—a probability distribution—for any factor that has inherent uncertainty. It then calculates results over and over, each time using a different set of random values from the probability functions. Depending upon the number of uncertainties and the ranges specified for them, a Monte Carlo simulation could involve thousands or tens of thousands of recalculations before it is complete. Monte Carlo simulation produces distributions of possible outcome values.

By using probability distributions, variables can have different probabilities of different outcomes occurring. Probability distributions are a much more realistic way of describing uncertainty in variables of a risk analysis.

Normal

Or "bell curve." The user simply defines the mean or expected value and a standard deviation to describe the variation about the mean. Values in the middle near the mean are most likely to occur. It is symmetric and describes many natural phenomena such as people's heights. Examples of variables described by normal distributions include inflation rates and energy prices.

Lognormal

Values are positively skewed, not symmetric like a normal distribution. It is used to represent values that don't go below zero but have unlimited positive potential. Examples of variables described by lognormal distributions include real estate property values, stock prices, and oil reserves.

Uniform

All values have an equal chance of occurring, and the user simply defines the minimum and maximum. Examples of variables that could be uniformly distributed include manufacturing costs or future sales revenues for a new product.

Triangular

The user defines the minimum, most likely, and maximum values. Values around the most likely are more likely to occur. Variables that could be described by a triangular distribution include past sales history per unit of time and inventory levels.

PERT

The user defines the minimum, most likely, and maximum values, just like the triangular distribution. Values around the most likely are more likely to occur. However values between the most likely and extremes are more likely to occur than the triangular; that is, the extremes are not as emphasized. An example of the use of a PERT distribution is to describe the duration of a task in a project management model.

Discrete

The user defines specific values that may occur and the likelihood of each. An example might be the results of a lawsuit: 20% chance of positive verdict, 30% change of negative verdict, 40% chance of settlement, and 10% chance of mistrial.

During a Monte Carlo simulation, values are sampled at random from the input probability distributions. Each set of samples is called an iteration, and the resulting outcome from that sample is recorded. Monte Carlo simulation does this hundreds or thousands of times, and the result is a probability distribution of possible outcomes. In this way, Monte Carlo simulation provides a much more comprehensive view of what may happen. It tells you not only what could happen, but how likely it is to happen.

Monte Carlo simulation provides a number of advantages over deterministic, or "single-point estimate" analysis:

Probabilistic Results. Results show not only what could happen, but how likely each outcome is.

Graphical Results. Because of the data a Monte Carlo simulation generates, it's easy to create graphs of different outcomes and their chances of occurrence. This is important for communicating findings to other stakeholders.

Sensitivity Analysis. With just a few cases, deterministic analysis makes it difficult to see which variables impact the outcome the most. In Monte Carlo simulation, it's easy to see which inputs had the biggest effect on bottom-line results.

Scenario Analysis: In deterministic models, it's very difficult to model different combinations of values for different inputs to see the effects of truly different scenarios. Using Monte Carlo simulation, analysts can see exactly which inputs had which values together when certain outcomes occurred. This is invaluable for pursuing further analysis.

Correlation of Inputs. In Monte Carlo simulation, it's possible to model interdependent relationships between input variables.

CAPITAL RATIONING

Definition of capital rationing:

Capital rationing is the process of putting restrictions on the projects that can be undertaken by the company or the capital that can be invested by the company. This aims in choosing only the most profitable investments for the capital investment decision. This can be accomplished by putting restrictive limits on the budget or selecting a higher cost of capital as the hurdle rate for all the projects under consideration. Capital rationing can be either hard or soft.

Assumptions of capital rationing

The primary assumption of capital rationing is that there are restrictions on capital expenditures either by way of 'all internal financing' or 'investment budget restrictions'. Firms do not have unlimited funds available to invest in all the projects. It also assumes that capital rationing can come out with an optimal return on investment for the company whether by normal trial and error process or by implementing mathematical techniques like integer, linear or goal programming.

Why capital rationing?

Capital rationing may rise due to external factors or internal constraints imposed by the management. Thus there are two types of capital rationing.

1. External capital rationing
2. Internal capital rationing

1. **External capital rationing**

   External capital rationing mainly occurs on account of the imperfections in capital markets. Imperfections may be caused by deficiencies in market information, or by rigidities of attitude that hamper the free flow of capital. The net present value (NPV) rule will not work if shareholders do not have access to the capital markets. Imperfections in capital markets alone do not invalidate use of the net present value (NPV) rule. In reality, we will have very few situations where capital markets do not exist for shareholders.

2. **Internal capital rationing**

Internal capital rationing is caused by self imposed restrictions by the management. Various types of constraints may be imposed. For example, it may be decide not to obtain additional funds by incurring debt. This may be a part of the firm's conservative financial policy.

Management may fix an arbitrary limit to the amount of funds to be invested by the divisional managers. Sometimes management may resort to capital rationing by requiring a minimum rate of return higher than the cost of capital. Whatever, may be the type of restrictions, the implication is that some of the profitable projects will have to be forgone because of the lack of funds. However, the net present value (NPV) rule will work since shareholders can borrow or lend in the capital markets.

It is quite difficult sometimes justify the internal capital rationing. But generally it is used as a means of financial controls. In a divisional set up, the divisional managers may overstate their investment requirements. One way of forcing them to carefully assess their investment opportunities and set priorities is to put upper limits to their capital expenditures. Similarly, a company may put investment limits if it finds itself incapable of coping with the strains and organizational problems of a fast growth.

Advantages of capital rationing

Capital rationing is a very prevalent situation in companies. There are a few advantages of practicing capital rationing:

Budget

The first and important advantage is that capital rationing introduces a sense of strict budgeting of the corporate resources of a company. Whenever there is an injunction of capital in the form of more borrowings or stock issuance capital, the resources are properly handled and invested in profitable projects.

No wastage

Capital rationing prevents wastage of resources by not investing in each new project available for investment.

Fewer projects

Capital rationing ensures that less number of projects are selected by imposing capital restrictions. This helps in keeping the number of active projects to a minimum and thus manage them well.

Higher returns

Through capital rationing, companies invest only in projects where the expected return is high, thus eliminating projects with lower returns on capital.

More stability

As the company is not investing in every project, the finances are not over-extended. This helps in having adequate finances for tough times and ensures more stability and an increase in the stock price of the company.

Disadvantages of capital rationing

Capital rationing comes with its own set of disadvantages as well. Let us describe the problems that rationing can lead to:

1. **Efficient capital markets**

   Under efficient capital markets theory, all the projects that add to company's value and increase shareholders' wealth should be invested in. However, by following capital rationing and investing in only certain projects, this theory is violated.

2. **The cost of capital**

   In addition to limits on budget, capital rationing also places selective criteria on the cost of capital of shortlisted projects. However, to follow this restriction, a firm has to be very accurate in calculating the cost of capital. Any miscalculation could result in selecting a less profitable project.

3. **Un-maximizing value**

   Capital rationing does not allow for maximizing the maximum value creation as all profitable projects are not accepted and thus, the NPV is not maximized.

4. **Small projects**

   Capital rationing may lead to the selection of small projects rather than larger-scale investments.

5. **Intermediate cash flows**

   Capital rationing does not add intermediate cash flows from a project while evaluating the projects. It bases its decision only on the final returns from the project. Intermediate cash flows should be considered in keeping the time value of money in mind.

Types of Capital rationing

Soft rationing is when the firm itself limits the amount of capital that is going to be used for investment decisions in a given time period. This could happen because of a variety of reasons:
The promoters may be of the opinion that if they raise too much capital too soon, they may lose control of the firm's operations. Rather, they may want to raise capital slowly over a longer period of time and retain control. Besides if the firm is constantly demonstrating a high level of proficiency in generating returns it may get a better valuation when it raises capital in the future.

Also, the management may be worried that if too much debt is raised it may exponentially increase the risk raising the opportunity cost of capital. Most firms have written guidelines regarding the amount of debt and capital that they plan to raise to keep their liquidity and solvency ratios intact and these guidelines are usually adhered to.

Thirdly, many managers believe that they are taking decisions under imperfect market conditions i.e. they do not know about the opportunities available in the future. Maybe a project with a better rate of return can be found in the future or maybe the cost of capital may decline in the future. Either way, the firm must conserve some capital for the opportunities that may arise in the future. After all raising capital takes time and this may lead to a missed opportunity!

This type of rationing is called soft because it is the firm's internal decision. They can change or modify it in the future if they think that it is in their best interest to do so.

Also, companies usually implement this kind of rationing on a department basis. From a master investment budget, departmental investment budgets are drawn and each department is asked to choose projects on the basis of funds allocated. Only in case of an extremely attractive project are the departmental restrictions on capital investments compromised.

Hard rationing, on the other hand, is the limitation on capital that is forced by factors external to the firm. This could also be due to a variety of reasons:

For instance, a young startup firm may not be able to raise capital no matter how lucrative their project looks on paper and how high the projected returns may be.

Even medium sized companies are dependent on banks and institutional investors for their capital as many of them are not listed on the stock exchange or do not have enough credibility to sell debt to the common people.

Lastly, large sized companies may face restrictions by existing investors such as banks who place an upper limit on the amount of debt that can be issued before they make a loan. Such covenants are laid down to ensure that the company does not borrow excessively increasing risk and jeopardizing the investments of old lenders

Portfolio risk

The return on a portfolio of assets is calculated as:

$$Nrp = \sum_{i=1} w_i r_i$$

where r_i is the expected return on asset i, and w_i is the weight of asset i in the portfolio.

Portfolio risk is calculated using the risk of the individual assets (measured by the standard deviation), the weights of the assets in the portfolio, and either the correlation between or among the assets or the covariance of the assets' returns.

For a two-asset portfolio, the risk of the portfolio, σ_p, is:

$$\sigma_p = \sqrt{w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1\sigma_1 w_2\sigma_2\rho_{12}}$$

or

$$\sigma_p = \sqrt{w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1 w_2 cov_{12}}$$

$$\text{since } \rho_{12} = \frac{cov_{12}}{\sigma_1\sigma_2}$$

where σ_i is the standard deviation of asset i's returns,

ρ_{12} is the correlation between the returns of asset 1 and 2, and cov12 is the covariance between the returns of asset 1 and 2.

Problem What is the portfolio standard deviation for a two-asset portfolio comprised of the following two assets if the correlation of their returns is 0.5?

	Asset A	**Asset B**
Expected return	10%	20%
Standard deviation of expected	5%	20%

returns		
Amount invested	$40,000	$60,000

Solution S.D = 13.115%

Calculation

$$\sigma_p=\sqrt{0.4^2 0.05^2+0.6^2 0.2^2+2(0.4)(0.05)(0.6)(0.2)(0.5)}$$

$$\sigma_p=\sqrt{((0.16)(0.0025))+((0.36)(0.04))+((2)(0.0012))}$$

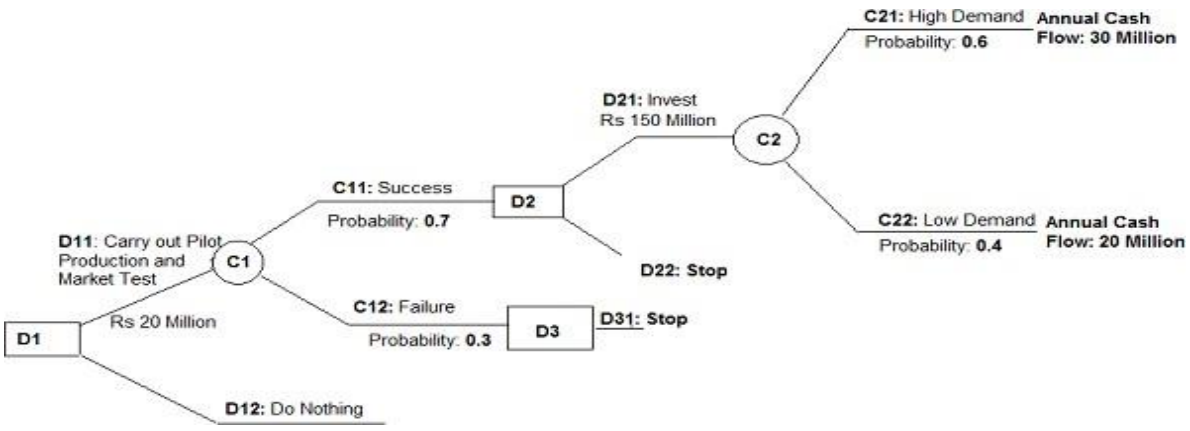
$$\sigma_p=\sqrt{0.0004+0.0144+0.0024}$$

$$\sigma_p=\sqrt{0.0172}=0.131149 \text{ or } 13.1149\%$$

Decision tree analysis

The Decision Tree Analysis is a schematic representation of several decisions followed by different chances of the occurrence. Simply, a tree-shaped graphical representation of decisions related to the investments and the chance points that help to

The decision tree shows Decision Points, represented by squares, are the alternative actions along with the investment outlays, that can be undertaken for the experimentation. These decisions are followed by the chance points, represented by circles, are the uncertain points, where the outcomes are dependent on the chance process. Thus, the probability of occurrence is assigned to each chance point. investigate the possible outcomes is called as a decision tree analysis.



Once the decision tree is described precisely, and the data about outcomes along with their probabilities is gathered, the decision alternatives can be evaluated as follows:

1. Start from the extreme right-hand end of the tree and start calculating NPV for each chance points as you proceed leftward.
2. Once the NPVs are calculated for each chance point, evaluate the alternatives at the final stage decision points in terms of their NPV.
3. Select the alternative which has the highest NPV and cut the branch of inferior decision alternative. Assign value to each decision point equivalent to the NPV of the alternative selected.
4. Again, repeat the process, proceed leftward, recalculate NPV for each chance point, select the decision alternative which has the highest NPV value and then cut the branch of the inferior decision alternative. Assign the value to each point equivalent to the NPV of selected alternative and repeat this process again and again until a final decision point is reached.

Thus, decision tree analysis helps the decision maker to take all the possible outcomes into the consideration before reaching a final investment decision.

UNIT-2

TYPES OF INVESTMENTS AND DISINVESTMENTS

UNIT-2

TYPES OF INVESTMENTS AND DISINVESTMENTS

Types of investments and disinvestments, project abandonment decisions, evidence of internal rate of return. Multiple internal rate of return, modified internal rate of return, pure, simple and mixed investments. Lorie savage paradox. Adjusted net present value and Impact of inflation on capital budgeting decisions.

Types of investments and disinvestments

Estimate of Capital Outlays and Future Earnings of the Proposed Project:

- The management of a firm is guided by various considerations in forecasting the future revenue proceeds arising out of present investment decisions. In current managerial practice if the time horizon over which benefits accrue is longer than one year, then the resources committed are called investment and the money spent is termed capital expenditures. The fixed capital outlay shows the outlay or expenditure made by the firm for creating the capacity of production.

Advance Expenditure:

- The expenditure on technical and economic feasibility reports, plant design, license fee and associated costs, expenditure on the search for finances, and other similar items would be included in this category.

Land and Site Development Expenditure:

- This includes the cost of land acquired or leasing of land, expenditures on making the land usable, laying of roads, fencing, etc.

Construction Costs:

- The expenditures on factory buildings, residential houses, roads, electricity supply lines, drainage disposal system, water supply, etc.

Machines and Tools:

- The cost of machinery should include purchase price of machines, duty, tax, freight insurance, transport charges, etc. Different types of tools will be required for operation, the value of such sets at the plant will be the cost of tools.

Erection of Equipment:

- The whole plant constituting different types of machines has to be assembled at the plant site. The payment made for installation will be accounted in this category.

Training Expenditure:

- A firm before purchasing such machines has to get its personnel trained to handle them. The cost incurred on such training will have to be accounted.

Franchise Cost:

- The cost incurred in getting the franchise from the government or any other institution is also included in this category.

Cost of Mobilizing Finance:

- The firms raise funds partly in the form of shares, bonds, debentures and fixed deposit from the public at large. A well-diversified portfolio carefully chosen from the numerous securities available in the market will help the investor in achieving his objectives.

Inventory Cost:

- The decision to hold inventories to meet demand is quite important for a firm and in certain situations the level of inventories serves as a guide to plan production. The value of such safety inventories would be included in the establishment cost.
- The above costs are concerned with the establishment of a plant. If the plant is ready for operation, it requires certain amount of money to meet the operating costs.

The broad categories of such costs are as follows:

- Labour cost,
- Repairing charges and maintenance cost,
- Rent and royalty payments,
- Insurance charges,
- Stationery cost,
- Payment of tax and duties, and
- Fuel and power costs.

• In addition to the above categories of costs, two other categories of annual costs are the depreciation provision and interest charges. The investment decisions are directly related to financing decisions. The acceptance of investment proposal shall depend upon how they are going to be financed.

Sources of Capital

Internal Capital:

- It is generated by the firm itself. It includes retained profit, depreciation provision, taxation provision and other reserves.

Short-term Capital:

- It is needed to meet day to day expenses (working capital).

Medium-term Capital:

- It may be sought for investment in plant and equipment or semi-permanent or permanent addition to current assets. It can be of any use between one to ten years.

Long-term Capital:

- It is needed to meet the requirements of fixed capital formation.

Cost of Capital:

- The cost of capital plays a very important role in appraising investment decisions. Whenever a firm mobilizes capital from different sources, it has to consider the cost of capital very carefully for making the final choice.
- Interest can be explained as an amount which is paid by a borrower for using funds belonging to some- one else. Therefore, it is a transaction between surplus and deficit units.
- The investor should know that he has to cope with the different kinds of interest rates called by different names and to be a successful investor, he should be able

to recognize the kinds of interest rates and by whom these rates are fixed. The investor should also carefully analyze the different kinds of interest rates available in the economy before he makes his investments.

Different kinds of interest rates existing in the markets are listed below:

- **Ceiling Rate of Interest:**

  It is the maximum rate of interest usually fixed by the Government of India and the RBI. It depends on the face value of a financial instrument.

- **Coupon Rate of Interest:**

  It is the rate of interest which is paid on the face value of a bond or debenture. A person who purchases a long-term bond or debenture expects an interest in the form of coupon.

- **Market Rate of Interest:**

  It indicates the present value of the future cash flows which is generated by an investment with the cost incurred on making such investment.

- **Long-term Interest:**

  It comprises of a period usually above five years or above ten years.

- **Medium-term Interest:**

  It may vary from a period of one year to five years.

- **Short-term Interest:**

  It varies per day, per week, per month, per year and the maximum number of years for which it may be considered can be of one year.

The different methods for calculating cost of capital for each source of financing investment decisions are as follows:

- **Cost of Debt:**

  The cost of debt (Cd) is the contracted rate of interest payable on the borrowed capital after adjusting tax liability of the company.

  $Cd = (1-T_R)\ R_1$

  Where Cd = Cost of debt capital

  T_R = Marginal tax rate

R_1 = Contracted rate of interest

- **Cost of Equity Capital:**

It is the minimum return which investors wish to get on their equity stocks.

$C_e = D_1 + G_R/P_0$

Where C_e = Cost of equity capital.

D_1 = Dividend paid in period 1

P_0 = Market value of the share

G_r = Growth rate of dividends

- **Cost of Preference Capital:**

Preferred stock has an investment value.

The cost of preference share may be calculated as:

$C_P = D/R$

Where C_p = Cost of preference capital

D = fixed amount of dividend obligation owned by the firm.

R = Net returns received as sale of preference stock.

- **Cost of Term Loans:**

The term loan is generally repayable in more than one year and less than ten years. The cost of the term loan is equal to the interest rate multiplied by (1-tax rate). The interest rate refers to the interest rate of the new term loan.

- **Cost of Retained Earnings:**

The cost of retained earnings is generally taken to be the same as the cost of equity.

The formula for cost of retained earnings in this case is as follows:

$C_R = D(1 – T_1)/P(1 – T_C)$

Where C_R = Cost of retained earnings

D = Dividend per share

T_1 = Marginal Income Tax

P = Market price per share

T_c = Capital gains tax

Types of investments:

Definition: Money spent on acquiring a commodity which has the potential of making future income or wealth is known as investment. In simple terms, investment is engaging money today to maximise it in the future. An investor can be anyone, an individual, a business entity or even the government.

- **Time**: The period for which the investment is made must be at least one year. More extended the term period of investment is, higher will be the return yield. Investments like government bonds depend on this factor.

- **Risk**: Every investment bears some risk. Higher the potential of the investor to take a chance, better will be the return he gets. Stock market investments are majorly influenced by this factor.

Investor: An investor can be any individual, firm or organisation who has the potential of engaging one's capital for a long-term period (usually more than a year) to earn profit or wealth in future.

Speculator: Speculators usually invest the borrowed sum in the high-risk bearing opportunities for a short-term period (not exceeding six months) to earn high returns. They rely on calculations based on market trend, psychology and technical analysis.

Trader: Traders are the ones who deal in the derivatives market or the stock market, buying and selling their holdings within a day or a week or a month. They aim to earn a profit in the form of margins derived from price fluctuation.

Gambler: Gambler is the person who put in money or valuables without any basis or calculations in a game of luck or chance. He/she invests in betting, playing cards, tosses, etc., knowing that the outcome is uncertain.

Capital investment is a sum of money provided to a company to further its business objectives. The term also can refer to a company's acquisition of long-term assets such as real estate, manufacturing plants, and machinery.

Understanding Investment

Investing is putting money to work to start or expand a project - or to purchase an asset or interest - where those funds are then put to work, with the goal to income and increased value over time. The term "investment" can refer to any mechanism used for generating future income. In the financial sense, this includes the purchase of bonds, stocks or real estate property among several others. Additionally, a constructed building or other facility used to produce goods can be seen as an investment. The production of goods required to produce other goods may also be seen as investing.

Taking an action in the hopes of raising future revenue can also be considered an investment. For example, when choosing to pursue additional education, the goal is often to increase knowledge and improve skills in the hopes of ultimately producing more income. This is also the main goal of reading articles on Investopedia. Because investing is oriented toward future growth or income, there is risk associated with the investment in the case that it does not pan out or falls short. For instance, investing in a company that ends up going bankrupt or a project that fails. This is what separates investing from saving - saving is accumulating money for future use that is not at risk, while investment is putting money to work for future gain and entails some risk.

Investment and Economic Growth

Economic growth can be encouraged through the use of sound investments at the business level. When a company constructs or acquires a new piece of production equipment in order to raise the total output of goods within the facility, the increased production can cause the nation’s gross domestic product (GDP) to rise. This allows the economy to grow through increased .

Investments and Speculation

Speculation is a separate activity from making an investment. Investing involves the purchase of assets with the intent of holding them for the long term, while speculation involves attempting to capitalize on market inefficiencies for short-term profit. Ownership is generally not a goal of speculators, while investors often look to build the number of assets in their portfolios over time.

Although speculators are often making informed decisions, speculation cannot usually be categorized as traditional investing. Speculation is generally considered higher risk than traditional investing, though this can vary depending on the type of investment involved. Some consider speculation more akin to gambling than anything else.

Capital investment

The term capital investment has two usages in business. First, capital investment refers to money used by a business to purchase fixed assets, such as land, machinery, or buildings.

Secondly, capital investment refers to money invested in a business with the understanding that the money will be used to purchase fixed assets, rather than used to cover the business's day-to-day operating expenses. For example, to purchase additional capital assets a growing business may need to seek a capital investment in the form of debt financing from a financial institution or equity financing from angel investors or venture capitalists.

Objectives of Capital Investment

- To acquire additional capital assets for expansion, enabling the business to, for example, increase unit production, create new products, or add value;
- To take advantage of new technology or advancements in equipment or machinery to increase efficiency and reduce costs
- To replace existing assets that have reached end-of-life (a high-mileage delivery vehicle or an aging laptop computer, for example)

Capital Investment and the Economy

Capital investment is considered to be a very important measure of the health of the economy. When businesses are making capital investments it means they are confident in the future and intend to grow their businesses by improving existing productive capacity. On the other hand, recessions are normally associated with reductions in capital investment by businesses.

Examples of Capital-Intensive Businesses

Types of Capital Investment

Financial Capital – Under this method, the cash/amount is handed over to a business by an individual, venture capital or angel investor. It is handed over with expectations of returns from the sum contributed by the individual

Physical Capital – Under this method, the executives may go on to make certain capital investments in the business through the purchase of long term assets that will help the company grow faster by running more efficiently

Growth-Oriented V/S Fixed-Income Investments

1. Stocks And Equities

Stocks and equities are one of the most common types of growth-oriented investment avenues that can help you grow the value of your original investment over a medium to long time interval. While you can receive higher dividends, there is always a higher level of risk. The investment returns and risks for stocks vary, as per the economy, political scene, company's performance, and other stock market indices.

2. Debt Mutual Funds

Debt mutual funds are a mix of fixed income securities, such as Treasury Bills, Government Securities, Corporate bonds, liquid or money-market funds, short-term income funds, gilt funds, and other debt securities of different time horizons. These have a fixed maturity date and pay a fixed rate of interest. The returns include interest income and capital appreciation or depreciation in the value, due to market fluctuations.

3. Fixed Deposits

Fixed Deposits are financial instruments where you can invest a lumpsum amount, to earn guaranteed returns. Your investment can be locked in for a specified period, during which your interest gets accumulated. This interest is pre-decided and unaffected by market forces, so you can get guaranteed returns.This certainty of returns can help you plan your finances in a better way. Fixed Deposit enables you to earn higher returns, with flexible tenors and options to choose periodic payouts as per your convenience.While investing in growth-oriented investment avenues can help you earn high returns, it is also important to balance your portfolio by including stable investment options like fixed deposits.Bajaj Finance Fixed Deposits offer guaranteed returns, flexible tenors, periodic payout options and you can be assured of the safety of your principal amount. Bajaj Finance FDs have the highest safety ratings by CRISIL and ICRA, which ensure that your investment amount is never at risk.

4. Bonds

When you invest in bonds, you lend your money to the issuer in exchange for periodic interest payouts, along with the returns on the investment amount. Bonds are issued by corporations, municipalities and government agencies.

5. Provident Funds

The Provident Fund is a major part of your retirement funds, which must be kept securely for your future. It is the sum of savings accrued, with contributions made by an employee, during the time he/she worked in the organization, along with an equal contribution from the employer. These savings can be withdrawn at the end of the employment or during retirement.

Understanding an Investment Company

Investment companies are business entities, both privately and publicly owned, that manage, sell and market funds to the public. The main business of an investment company is to hold and manage securities for investment purposes, but they typically offer investors a variety of funds and investment services, which include portfolio management, recordkeeping, custodial, legal, accounting and tax management services.

1. Ownership Investments

Ownership investments are what comes to mind for most people when the word "investment" is batted around. They are the most volatile and profitable class of investment. The following are examples of ownership investments:

- **Stocks:** A stock is literally a certificate that says you own a portion of a company. More broadly speaking, all traded securities, from futures to currency swaps, are ownership investments, even though all you may own is a contract. When you buy one of these investments, you have a right to a portion of a company's value or a right to carry out a certain action (as in a futures contract).
- **Business:** The money put into starting and running a business is an investment. Entrepreneurship is one of the hardest investments to make because it requires more than just money. Consequently, it is also an ownership investment with extremely large potential returns. By creating a product or service and selling it to people who want it, entrepreneurs can make huge personal fortunes. Bill Gates, founder of Microsoft and one of the world's richest men, is a prime example.

- **Real Estate:** Houses, apartments or other dwellings that you buy to rent out or repair and resell are investments. However, the house you live in is a different matter because it is filling a basic need. It fills a need for shelter and, although it may appreciate over time, shouldn't be

purchased with an expectation of profit. The mortgage meltdown of 2008 and the underwater mortgages it produced are a good illustration of the dangers in considering your primary residence an investment.

2. Lending Investments

Lending investments allow you to be the bank. They tend to be lower risk than ownership investments and return less as a result. A bond issued by a company will pay a set amount over a certain period, while during the same period the stock of a company can double or triple in value, paying far more than a bond - or it can lose heavily and go bankrupt, in which case bondholders usually still get their money and the stockholder often gets nothing.

- **Bonds:** Bond is a catch-all category for a wide variety of investments from Treasuries and international debt issues to corporate junk bonds and credit default swaps (CDS). The risks and returns vary widely between the different types of bonds, but overall, lending investments pose a lower risk and provide a lower return than ownership investments.

3. Cash Equivalents

These are investments that are "as good as cash," which means they're easy to convert back into cash.

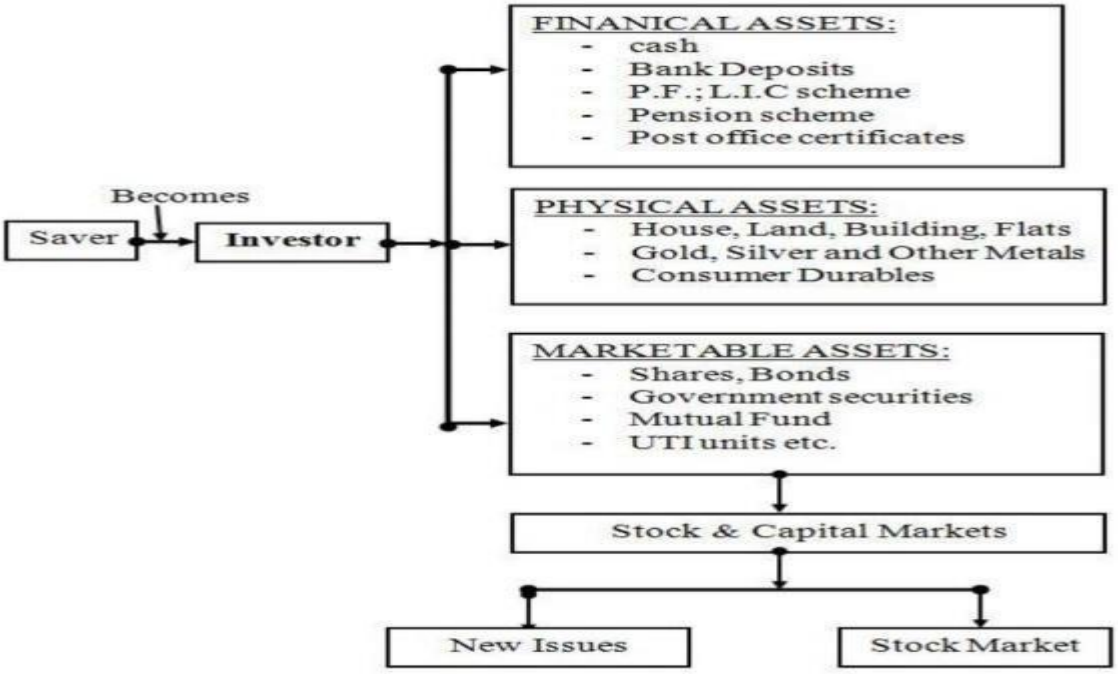
Money market funds: With money market funds, the return is very small, 1% to 2%, and the risks are also small. Although money market funds have "broken the buck" in recent memory, it is rare enough to be considered a black swan event. Money market funds are also more liquid than other investments, meaning you can write checks out of money market accounts just as you would with a checking account.

Types of investment: or various investment alternatives /avenues

Non-marketable Financial Assets:

A good portion of financial assets is represented by non-marketable financial assets. A distinguishing feature of these assets is that they represent personal transactions between the investor and the issuer. For example, when you open a savings bank account at a bank you deal with the bank personally. In contrast when you buy equity shares in the stock market you do not know who the seller is and you do not care. These can be classified into the following broad categories:

- Post office deposits
- Company deposits
- Provident fund deposits
- Bank deposits



Equity Shares:

Equities are a type of security that represents the ownership in a company. Equities are traded (bought and sold) in stock markets. Alternatively, they can be purchased via the Initial Public Offering (IPO) route, i.e. directly from the company. Investing in equities is a good long-term investment option as the returns on equities over a long time horizon are generally higher than most other investment avenues. However, along with the possibility of greater returns comes greater risk. Equity shares are classified into the following broad categories by stock market analysts:

1. Blue chip shares
2. Growth shares
3. Income shares
4. Cyclical shares
5. Speculative shares

Bonds:

Bond is a debt instrument issued for a period of more than one year with the purpose of raising capital by borrowing.It is certificates acknowledging the money lend by a bondholder to the company. It states it maturity date, interest rate, and par value.

The Federal government, states, cities, corporations, and many other types of institutions sell bonds. When an investor buys a bond, he/she becomes a creditor of the issuer. However, the buyer does not gain any kind of ownership rights to the issuer, unlike in the case of equities. On the hand, a bond holder has a greater claim on an issuer's income than a shareholder in the case of financial distress (this is true for all creditors). The yield from a bond is made up of three components: coupon interest, capital gains and interest on interest (if a bond pays no coupon interest, the only yield will be capital gains). A bond might be sold at above or below par (the amount paid out at maturity), but the market price will approach par value as the bond approaches maturity. A riskier bond has to provide a higher payout to compensate for that additional risk. Some bonds are tax-exempt, and these are typically issued by municipal, county or state governments, whose interest payments are not subject to federal income tax, and sometimes also state or local income tax.

Bonds may be classified into the following categories:

- Government securities
- Government of India relief bonds
- Government agency securities
- PSU bonds
- Debentures of private sector companies
- Preference shares

Money Market Instruments:

Debt instruments which have a maturity of less than one year at the time of issue are called money market instruments. The important money market instruments are:

- Treasury bills
- Commercial paper
- Certificates of deposits

Mutual Funds:

Instead of directly buying equity shares and/or fixed income instruments, you can participate in various schemes floated by mutual funds which, in turn, invest in equity shares and fixed income securities.A mutual fund is made up of money that is pooled together by a large number of investors who give their money to a fund manager to invest in a large portfolio of stocks and / or bonds Mutual fund is a kind of trust that manages the pool of money collected from various investors and it is managed by a team of professional fund managers (usually called an Asset Management Company) for a small fee.

The investments by the Mutual Funds are made in equities, bonds, debentures, call money etc., depending on the terms of each scheme floated by the Fund. The current value of such investments is now a day is calculated almost on daily basis and the same is reflected in the Net Asset Value (NAV) declared by the funds from time to time. This NAV keeps on changing with the changes in the equity and bond market. Therefore, the investments in Mutual Funds is not risk free, but a good managed Fund can give you regular and higher returns than when you can get from fixed deposits of a bank etc. There are three broad types of mutual fund schemes:

- Equity schemes
- Debt schemes
- Balanced scheme

Life Insurance:

In a broad sense, life insurance may be viewed as an investment. Life insurance is a contract between the policy holder and the insurer, where the insurer promises to pay a designated beneficiary a sum of money (the "benefits") upon the death of the insured person. Depending on the contract, other events such as terminal illness or critical illness may also trigger payment. In return, the policy holder agrees to pay a stipulated amount (the "premium") at regular intervals or in lump sums. The important types of insurance policies in India are:

- Endowment assurance policy
- Money back policy
- Whole life policy
- Term assurance policy

Real Estate:

For the bulk of the investors the most important asset in their portfolio is a residential house. In addition to a residential house, the more affluent investors are likely to be interested in the following types of real estate:

- Agricultural land
- Semi-urban land
- Time share in a holiday resort

Precious Objects:

Precious objects are items that are generally small in size but highly valuable in monetary terms. Some important precious objects are:

Gold and silver Precious stones Art objects

Financial Derivative:

A financial derivative is an instrument whose value is derived from the value of an underlying asset. It may be viewed as a side bet on the asset. The most important financial derivatives from the point of view of investors are:

- Options
- Futures

Non-financial Instruments

Real estate

With the ever-increasing cost of land, real estate has come up as a profitable investment proposition.

Gold

The 'yellow metal' is a preferred investment option, particularly when markets are volatile. Today, beyond physical gold, a number of products which derive their value from the price of gold are available for investment. These include gold futures and gold exchange traded funds.

Involved in Investment Process

When we speak of investment, I am sure most of you would think of investing in some fixed deposit or a property or some of you would even buy gold. But there is much more to investing. An investment is the purchase of an asset with an expectation to receive return or some other income on that asset in future. The process of investment involves careful study and analysis of the various classes of assets and the risk-return ratio attached to it.

There are basically 5 investment process steps that help you in selecting and investing in the best asset class according to your needs and preferences.

Step 1- Understanding the client

The first and the foremost step of investment process is to understand the client or the investor his/her needs, his risk taking capacity and his tax status. After getting an insight of the goals and restraints of the client, it is important to set a benchmark for the client's portfolio management process which will help in evaluating the performance and check whether the client's objectives are achieved.

Step 2- Asset allocation decision

This step involves decision on how to allocate the investment across different asset classes, i.e. fixed income securities, equity, real estate etc. It also involves decision of whether to invest in domestic assets or in foreign assets. The investor will make this decision after considering the macroeconomic conditions and overall market status.

Step 3- Portfolio strategy selection

Third step in the investment process is to select the proper strategy of portfolio creation. Choosing the right strategy for portfolio creation is very important as it forms the basis of selecting the assets that will be added in the portfolio management process. The strategy that conforms to the investment policies and investment objectives should be selected.

There are two types of portfolio strategy-

1. Active Management
2. Passive Management

Step 4- Asset selection decision

The investor needs to select the assets to be placed in the portfolio management process in the fourth step. Within each asset class, there are different sub asset-classes. For example, in equity, which stocks should be chosen? Within the fixed income securities class, which bonds should be chosen?

Also, the investment objectives should conform to the investment policies because otherwise the main purpose of investment management process would become meaningless.

Step 5- Evaluating portfolio performance

This is the final step in the investment process which evaluates the portfolio management performance. This is an important step as it measures the performance of the investment with respect to a benchmark, in both absolute and relative terms. The investor would determine whether his objectives are being achieved or not.

Definition of Disinvestment

At the very basic level, disinvestment can be explained as follows:

"Investment refers to the conversion of money or cash into securities, debentures, bonds or any other claims on money. As follows, disinvestment involves the conversion of money claims or securities into money or cash."Disinvestment can also be defined as the action of an organisation (or government) selling or liquidating an asset or subsidiary. It is also referred to as 'divestment' or 'divestiture. 'In most contexts, disinvestment typically refers to sale from the government, partly or fully, of a government-owned enterprise.

A company or a government organisation will typically disinvest an asset either as a strategic move for the company, or for raising resources to meet general/specific needs.

Objectives of Disinvestment

The new economic policy initiated in July 1991 clearly indicated that PSUs had shown a very negative rate of return on capital employed. Inefficient PSUs had become and were continuing to be a drag on the Government's resources turning to be more of liabilities to the Government than being assets. Many undertakings traditionally established as pillars of growth had become a burden on the economy. The national gross domestic product and gross national savings were also getting adversely affected by low returns from PSUs. About 10 to 15 % of the total gross domestic savings were getting reduced on account of low savings from PSUs. In relation to the capital employed, the levels of profits were too low. Of the various factors responsible for low profits in the PSUs, the following were identified as particularly important:

- Price policy of public sector undertakings
- Under–utilisation of capacity
- Problems related to planning and construction of projects
- Problems of labour, personnel and management
- Lack of autonomy

Hence, the need for the Government to get rid of these units and to concentrate on core activities was identified. The Government also took a view that it should move out of non-core businesses, especially the ones where the private sector had now entered in a significant way. Finally, disinvestment was also seen by the Government to raise funds for meeting general/specific needs.

In this direction, the Government adopted the 'Disinvestment Policy'. This was identified as an active tool to reduce the burden of financing the PSUs. The following main objectives of disinvestment were outlined:

- To reduce the financial burden on the Government
- To improve public finances
- To introduce, competition and market discipline
- To fund growth
- To encourage wider share of ownership
- To depoliticise non-essential services

Importance of Disinvestment

Presently, the Government has about Rs. 2 lakh crore locked up in PSUs. Disinvestment of the Government stake is, thus, far too significant. The importance of disinvestment lies in utilisation of funds for:

- Financing the increasing fiscal deficit
- Financing large-scale infrastructure development
- For investing in the economy to encourage spending
- For retiring Government debt- Almost 40-45% of the Centre’s revenue receipts go towards repaying public debt/interest
- For social programs like health and education
- Disinvestment also assumes significance due to the prevalence of an increasingly competitive environment, which makes it difficult for many PSUs to operate profitably. This leads to a rapid erosion of value of the public assets making it critical to disinvest early to realize a high value.

Process of disinvestment

Prior to the setting up of a separate Department of Disinvestment (DOD) in 1999, the disinvestment of Government equity in selected PSUs was carried out by the Department of Public Enterprises (DPE) in

association with the concerned PSUs and their Administrative Ministries/ Department, the Ministry of Finance and the Cabinet Secretariat. Other Central Government Ministries/ Departments were co-opted on the basis of the requirement of a particular transaction

1. The entire public enterprise can be sold to a private sector firm which is the highest bidder or otherwise. In this case both the ownership and control or management is transferred to the private firm. This happened when 'Modem Food', a public company, was sold to Hindustan Lever and Centaur Hotel in Bombay was sold to a private company.
2. The second way in which disinvestment in a public enterprise can be made is selling a part of the Government stake to a strategic private company. A strategic company is one which has a strategic interest in the public enterprise and has a capability to run it efficiently. The strategic buyer can be chosen by inviting tenders from the private companies.
3. Thirdly, the Government can offer for sale its shares of a public enterprise to the general public through the stock-market intermediaries.
4. Finally, sale of a certain number of Government shares in a public enterprise can be made through auction of shares among a selected number of private firms. The reserve price of shares of a company for auction can be determined with the help of merchant bankers.

Methods of Disinvestment

In order to achieve the various objectives and goals of disinvestment many methods have been formulated and implemented. These include:

(a) Public Offer:

Offering shares of public sector enterprises at a fixed price through a genera prospectus.

The offer is made to the general public through the medium of recognised market intermediaries. Initially equity was offered to retail investors through domestic public issues. This was followed by issuance of the Global Depository Receipts (GDRs) to tap the overseas market.

(b) Sale of Equity:

Sale of equity through auction of share amongst pre-determined clientele, whose number can be large. The reserve price for the PSE's equity can be determined with the assistance of merchant bankers.

(c) Offer for Sale:

Offer for sale, determining the fixed price for sale of a public enterprise, inviting open bidders and accepting highest bidder's quotation for sale.

(d) Cross Holding:

In the case of cross holdings, the government would simply sell part of its shares of one PSU to one or more PSUs.

(e) Golden Share:

In this model, the government retains a 26 percent share in the PSU. This 26 percent share will continue to give the Government the status of majority shareholder.

(f) Warehousing:

Under this model, the government owned financial institutions were expected to buy the government's share in select PSUs and holding them until third buyer emerged.

(g) Strategic Sale:

Of late, Government is pursuing the strategic sale method. Under this method, the government sells a major portion (51 percent and above) of its stake to a strategic buyer and also gives over the management control. Disinvestment price will be market based and not prefixed and PSUs shares will be under the department of Disinvestment.

'Abandonment Value'

Definition: Abandonment value is the equivalent cash value of a project if it is liquidated immediately after reducing all debts which need to be repaid.

Description:

Abandonment value is also known as liquidation value of an asset. The general rule for deciding to discontinue the product is that if the product's salvage value is greater than the net present value (NPV) of its expected cash flows, the project is abandoned.

It is important for companies to know the profitability of a project and if it is not profitable it is better to discontinue the same. It is an important factor in bankruptcy filings where assets are generally sold at a discount.Theoretically, the optimal economic life of an asset is 4 years, but the project's expected

cash flows may change over the life of the asset. The company should also estimate the future abandonment values in the initial investment phase. It would help the manager to effectively gauge the optimal economic life of an asset.

INTERNAL RATE OF RETURN

The internal rate of return, or IRR, is the interest rate where the net present value of all cash flows from a project or an investment equal zero. IRR involves positive and negative cash flows. It is used to evaluate how attractive a specific investment or project happens to be.

If the IRR falls below a required return rate, then investors know that the idea should be avoided or rejected. On the other hand, if it falls above the required return rate, then the risks of losing the investment are much lower and should be considered or accepted.

Every project can be evaluated using IRR calculations. Projects can even be compared to one another to determine which options are the best for investors.

List of the Advantages of the Internal Rate of Return Method

1. It incorporates the time value of money into the calculation.

   IRR is measured when you calculate the interest rate where the present value of a future cash flow equates to the required capital investment. That means all cash flows in the future are considered as part of the IRR calculation. That allows every cash flow to be assigned an equal weight when looking at the value of money from a time perspective.

2. It is a simple calculation.

   IRR is an easy measurement to calculate. The information it provides makes it simple to compare the value or worth of various projects that may be under consideration at any given time. When calculated correctly, business owners are able to quickly see which projects would generate the most potential cash flows in the future. It is also possible to use IRR as a way to find cost-savings opportunities with future purchases or investments.

3. It offers a method to rank projects for profitability.

   The goal of the internal rate of return is to maximize overall profitability. It is able to do this by allowing you to compare the positive or negative outcomes of all projects under consideration. You can then rank the results in order, from high to low, to evaluate which projects create the best possible chances to achieve cash flows that will lead to profitability. Because the calculation

produces a percentage routine, the ranking process is very fast when compared to other forms of project evaluation.

4. It works well with other evaluation factors.

   One of the biggest mistakes that is made with the internal rate of return method is that it is the only calculation used to evaluate the viability of a project. That action leads to a number of potential disadvantages. The IRR method is better used with multiple evaluation factors. That way, you're able to compare the positive or negative percentages from this calculation to other business factors. That provides you with a better picture of the financial health of a specific project.

5. It is not linked with the required rate of return.

   When using the IRR method, you're able to compare it to the rough estimates generated by the required rate of return. This rough estimate is not used with the internal rate of return method which means the two common calculations are not linked to one another. That makes it easier to make a decision with fewer risks because there is more information available.

List of the Disadvantages of the internal Rate of Return Method

1. **It can provide an incomplete picture of the future.**

   When using the IRR calculation, the cost of capital is not required to be part of the equation. Sometimes referred to as the "hurdle rate," this figure is the required rate of return which would be needed to fund the project. Although this can be an advantage as the hurdle rate is sometimes a subjective figure, it can also sometimes be a confirmed figure. In that situation, the IRR may not provide an accurate estimated cost.

2. **It ignores the overall size and scope of the project.**

   When using the internal rate of return method to compare projects, it is important to remember that this method does not look at the size or scope of the project for comparison. It will only compare the cash flows to the amount of capital being spent to generate those cash flows. If there are two different projects requiring very different levels of capital, larger projects tend to be under-valued compared to smaller projects when using IRR calculations. If this is the only tool being used, a business may find itself avoiding long-term projects which may offer much better cash flows over time.

3. **It ignores future costs within the calculation.**

   The goal of the internal rate of return method is to determine a projected cash flow from an injection of capital. It does not account for the potential costs that may affect profits in the future.

Many costs, such as fuel and maintenance, are variable for businesses over time. By ignore these future costs, the cash flows being projected may not be as accurate when evaluating the full scope of the project.

4. **It does not account for reinvestments.**

   Perhaps the biggest weakness of the IRR calculation is that it makes assumptions that future cash flows can be invested as the same rate as the internal rate of return. In reality, the number generated by the IRR can be quite high. The number of opportunities which are available that would yield such a return are usually minimal at best, creating an unrealistic picture for some companies looking to maximize future cash flows.

5. **It struggles to keep up with multiple cash flows.**

   The IRR calculation is a good evaluation of potential risk because it produces a simple positive or negative result when the equation is completed. If there are multiple cash flows involved with the calculation, then sometimes the internal rate of return method can be misleading. Although this issue can be somewhat tempered by creating an assumed reinvestment rate that is specifically added into the calculation (see Con #3) and by bringing in interim or intermittent cash flows, this is all based on assumption. If you add more variables into the calculation, you are reducing the overall accuracy of the IRR.

6. **It requires calculations that are quite tedious for the average person.**

   To calculate the IRR for a project, you must use the same formula as the net present value to determine an outcome. That means you must be able to take the number of time periods by the net cash inflow during the time period over the discount rate. You must then subtract the total initial investment costs from the calculation, based on the idea that the net present value is equal to solve. There are several resources which take you through this calculation, but you will need to have the specific figures available to begin the calculation process.

7. **It places the top priority of the calculation on profitability.**

   If your primary need is to determine future profitability, then the IRR method is a good calculation to consider. If you're looking to see how fast you'll be able to recoup your capital expenditure, then the IRR is not going to provide you with the information that is needed. It can be easy to think that you can recoup expenses faster on smaller projects when, in reality, some projects may not be able to fully recoup the capital expenditure since the future tends to be unpredictable.

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Dual Rate of Return. When measuring the **rate of return** on a transaction, we are trying to relate the profit made to the amount lent over time. For transactions which are not loans, it is convenient to express the **rate of return** as an equivalent loan **rate**.

Dual Rate of Return

When measuring the rate of return on a transaction, we are trying to relate the profit made to the amount lent over time.For transactions which are not loans, it is convenient to express the rate of return as an equivalent loan rate.

Example:

Consider a tax system with a rate of 40% and a single tax instalment paid one year after the balance date.

The leased item costs: $10,000.00 provided in July 2012

Residual: $3,000.00 two years hence

Rentals: 2 × $5,000.00 annually in arrears

Depreciation: 24% prime cost

Fees: 2% of cost up front

Balance Date: 31 July

Cashflows to the lessor arising before tax are:

Lessor's Cashflows					
Month	**Advance**	**Rentals**	**Residual**	**Fees**	**Total**
July 2012	(10,000)	–	–	(200)	(10,200)
July 2013	–	5,000	–	–	5,000
July 2014	–	5,000	3,000	–	8,000
Total	(10,000)	(10,000)	3,000	(200)	2,800

Assessable income in each year is:

Assessable Income					
Year Ended	**Depreciation**	**Rentals**	**Residual**	**Fees**	**Total**
July 2012	–	–	–	(200)	(200)
July 2013	(2,400)	5,000	–	–	2,600
July 2014	(7,600)	5,000	3,000	–	400

Assessable Income					
Year Ended	**Depreciation**	**Rentals**	**Residual**	**Fees**	**Total**
Total	(10,000)	(10,000)	3,000	(200)	2,800

After-tax cashflows arising from the transaction are thus:

Cashflows			
Month	**Pre-tax Cashflow**	**Tax Cashflow**	**After-tax Cashflow**
July 2012	(10,200)	0	(10,200)
July 2013	5,000	80	5,080
July 2014	8,000	(1,040)	6,960
July 2015	0	(160)	(160)
Total	2,800	(1,120)	1,680

Multiple IRR

Multiple IRRs occur when a project has more than one internal rate of return. The problem arises where a project has non-normal cash flow (non-conventional cash flow pattern). Internal rate of return (**IRR**) is one of the most commonly used capital budgeting tools

Definition

The multiple internal rates of return problem occur when at least one future cash inflow of a project is followed by cash outflow. In other words, there is at least one negative value after a positive one, or the signs of cash flows change more than once. In this case, we say that the project has non-normal cash flows. In contrast, normal cash flows have one or more consecutive cash outflows followed by cash inflows as in the table below.

	Initial Cost, CF_0	Cash flows at the end of relevant year, CF_t				
		1	2	3	4	5
Normal cash flows	-$10,000	$4,000	$6,000	$8,000	$7,000	$4,000
Normal cash flows	-$10,000	$5,000	$7,000	$8,000	$11,000	$9,000
Non-normal cash flows	-$10,000	$2,000	$5,000	$8,000	$7,000	-$6,000
Non-normal cash flows	-$10,000	$5,000	$4,000	-$2,000	$11,000	-$4,000

If a project has a non-normal cash flow, it can have more the one IRR. To better sort out the problem, let's look at the example below.

Example

To illustrate the multiple IRR problem, let's assume that Project Z has non-normal cash flows. The detailed information about its cash inflows and outflows is presented in the table below.

	Initial Cost, CF_0	Cash flows at the end of relevant year, CF_t				
		1	2	3	4	5
Project Z	$1,000,000	$1,000,000	$1,100,000	$1,300,000	$1,000,000	$3,700,000

To find the IRR, we have to solve the following equation:

$$NPV = \$1{,}000{,}000 + \frac{\$1{,}000{,}000}{(1+IRR)^1} + \frac{\$1{,}100{,}000}{(1+IRR)^2} + \frac{\$1{,}300{,}000}{(1+IRR)^3} + \frac{\$1{,}000{,}000}{(1+IRR)^4} + \frac{\$3{,}700{,}000}{(1+IRR)^5} = 0$$

The NPV of Project Z is equal to zero at an IRR of 5.0699% and 82.4254%. Now we have a dilemma regarding which one is better. To illustrate the issue, let's look at the NPV profile in the figure below.

Modified internal rate of return

Modified internal rate of return (MIRR) is a capital budgeting tool which allows a project cash flows to grow at a rate different than the **internal rate of return**. **Internal rate of return** is the rate of return at which a project's net present value (NPV) is zero

What Is a MIRR?

The modified internal rate of return (MIRR) assumes that positive cash flows are reinvested at the firm's cost of capital and that the initial outlays are financed at the firm's financing cost. By contrast, the traditional internal rate of return (IRR) assumes the cash flows from a project are reinvested at the IRR itself. The MIRR, therefore, more accurately reflects the cost and profitability of a project.

$$\mathbf{MIRR = (FV_{CI}/PV_{CO})^{(1/n)} - 1}$$

Where **MIRR** is the modified internal rate of return, $\mathbf{FV_{CI}}$ is the sum of future values of all net cash flows at the end of the project, $\mathbf{PV_{CO}}$ is the initial investment, and **n** is the number of periods.

Advantages and disadvantages of MIRR:

- **Advantage:** MIRR is a better and improved method for project evaluation as it obviates all the shortcomings of normal IRR and NPV methods. It takes into consideration the practically possible reinvestment rate. The calculation is also not a rocket science.

- **Disadvantage:** The disadvantage of MIRR is that it asks for two additional decisions i.e. determination of financing rate and cost of capital. These can be estimates again and the managers in real life may hesitate in involving these two additional estimates.

Advantages. **MIRR** overcomes 2 major **drawbacks** of **IRR** including the elimination of multiple IRRs in case of investments with unusual timing of cash flows and secondly the re-investment problem discussed earlier. Helps in the measurement of sensitivity of an investment towards variation in the cost of capital

Basis for comparison	**IRR**	**MIRR**
Meaning	IRR is a method of computing the rate of return considering internal factors, i.e. Excluding cost of capital and inflation.	MIRR is a capital budgeting technique, that calculate rate of return using cost of capital and is used to rank various investments of equal size.
What is it?	It is the rate at which NPV is equal to zero.	It is the rate at which NPV of terminal inflows is equal to the outflow, i.e. Investment.
Assumption	Project cash flows are reinvested at the project's own IRR.	Project cash flows are reinvested at the cost of capital.
Accuracy	Low	Comparatively high

Types of Investments

Ownership Investments

The investment made to acquire the possession of any tangible or intangible asset is known as ownership investment. Some of the types of ownership investments are:

- **Fixed Assets**: It includes the acquisition of fixed assets (machinery, land, building, etc.) to generate some value in the future.
- **Stocks**: Holding shares of a public company provides the right to stake the future profits of the company.

- **Valuables like antiques and collectables**: Investment on some antique objects or collectables with the idea of selling them in future can be profitable.
- **Business Capital**: It is investing in one's own business to earn a profit by selling goods or services.
- **License and Trademark**: A license or trademark gives recognition to the company by giving it a brand name which brings in more business to the company.

Lending Investments

Lending investments can be understood as buying of repayable debts to earn interest in future.

- **Debentures**: Debentures are non-secured debt instrument purchased by investor depending on the creditworthiness and goodwill of the issuer. The interest rate is pre-decided and may be fixed or floating.
- **Government Bonds**: Government bonds are debentures issued by the government like, treasury bills are another risk-free investment option where the rate of interest is nominal and fixed.
- **Certificate of Deposits (CDs)**: A certificate of deposit is a promissory note which a bank issues in exchange for keeping your money in a saving account for a specific period.

Cash Equivalents

These investments can be treated as cash equivalents. Some of them are:

1. **Money Market Funds**: Money Market Funds are investments which can be conveniently encashed, whenever required. They bear a low risk and give low returns in the short run.

2. **Savings Account**: A savings account opened with a bank is an easily assessed investment, but it gives meagre returns.

3. Funds

Funds are another option where the sum accumulated is quite high, and investment is well planned and systematic. Some of the well-known funds are:

4. **Mutual Funds**: Mutual Fund is the accrued fund pooled in by many investors and is invested by money manager in shares, bonds and other financial instruments. It generates a reasonably high income in the long run.

5. **Hedge Funds**: These funds majorly aim at minimising the investment risk but are used as an investment option itself. Though similar to mutual funds, they involve high-risk strategies and invests in any potential opportunity.

6. **Index Funds**: An index fund is the mutual fund portfolio comprising of various shares or stocks. A shareholding in an index fund means owning a percentage of the whole collection. It provides better returns due to investment in a diversified portfolio.

7. **Exchange-Traded Funds (ETFs)**: These are similar to the index fund. But, unlike index fund, these are not mutual fund investment. Instead, ETFs can be seen as active trading investments in the share market, where buying and selling can be done throughout the day while share markets are open.

Alternatives

The other kind of investments which are way different from the traditional investments can be termed under alternatives. These are:

1. **Precious Metals**: Buying of gold, silver and other precious metal in their actual form or as ornament and jewellery to sell it at a higher price in future.

2. **Venture Capital**: A venture capitalist leverages a start-up or a small business by becoming a partner in the company and derives a return in the form of profit. This can also be a form of ownership investments.

3. **Real Estate Investment Trusts (REITs)**: Real estate investing entitles the investor for partial ownership and thus relish property gain or rent earned from the property.

4. **Commodities**: Investment in commodities are future contracts to buy and sell specific resources at the pre-decided price. It includes sugar, coffee, wheat, cocoa, cotton, natural gas, crude oil, cattle, et

Disinvestment means to sell off certain assets such as a manufacturing plant, a division or subsidiary, or product line. Disinvestment is sometimes described as the opposite of capital expenditures. Some people use the term *divestiture,* or *to divest* when discussing disinvestment.

Evidence of IRR

IRR is a discounted cash flow (DCF) technique which means that it incorporate the time value of money. The initial outlay/investment in any project must be compensated by net cash flows which far exceed the initial investment. The higher those cash flows when compared to the initial outlay, the higher will be the IRR and the project is a promising investment.

Decision Rule

A project should only be accepted if its IRR is NOT less than the hurdle rate, the minimum required rate of return. The minimum required rate of return is based on the company's cost of capital (i.e. WACC) and is adjusted to properly reflect the risk of the project.

When comparing two or more mutually exclusive projects, the project having highest value of IRR should be accepted.

IRR Calculation

There is no direct algebraic expression in which we might plug some numbers and get the IRR.

IRR is most commonly calculated using the hit-and-trial method, linear-interpolation formula or spreadsheets and financial calculators.

Since IRR is defined as the discount rate at which NPV = 0, we can write that:

NPV = 0; or; PV of future cash flows − Initial Investment = 0; or

$$\left| \frac{F_1}{1+r)^1} \quad \frac{F_2}{1+r)^2} \quad \frac{F_3}{1+r)^3} \quad \ldots \right| \text{ Initial Investment} = 0$$

Where,

r is the internal rate of return;

CF_1 is the period one net cash inflow;

CF_2 is the period two net cash inflow,

CF_3 is the period three net cash inflow, and so on ...

But the problem is, we cannot isolate the variable **r** (=internal rate of return) on one side of the above equation. Even though we can use the linear-interpolation formula, the simplest method is to use hit and trial as described below:

Step 1: Guess the value of r and calculate the NPV of the project at that value.

Step 2: If NPV is close to zero then IRR is equal to r.

Step 3: If NPV is greater than 0 then increase r and jump to step 5.

Step 4: If NPV is smaller than 0 then decrease r and jump to step 5.

Step 5: Recalculate NPV using the new value of r and go back to step 2

MIRR vs. IRR

Even though the internal rate of return (IRR) metric is popular among business managers, it tends to overstate the profitability of a project and can lead to capital budgeting mistakes based on an overly optimistic estimate. The modified internal rate of return (MIRR) compensates for this flaw and gives managers more control over the assumed reinvestment rate from future cash flow.

An IRR calculation acts like an inverted compounding growth rate. It has to discount the growth from the initial investment in addition to reinvested cash flows. However, the IRR does not paint a realistic picture of how cash flows are actually pumped back into future projects.

Cash flows are often reinvested at the cost of capital, not at the same rate at which they were generated in the first place. IRR assumes that the growth rate remains constant from project to project. It is very easy to overstate potential future value with basic IRR figures.

Another major issue with IRR occurs when a project has different periods of positive and negative cash flows. In these cases, the IRR produces more than one number, causing uncertainty and confusion. MIRR solves this issue as well.

MIRR vs. FMRR

The financial management rate of return (FMRR) is a metric most often used to evaluate the performance of a real estate investment and pertains to a real estate investment trust (REIT). The modified internal rate of return (MIRR) improves on the standard internal rate of return (IRR) value by adjusting for differences in the assumed reinvestment rates of initial cash outlays and subsequent cash inflows. FMRR takes things a step further by specifying cash outflows and cash inflows at two different rates known as the "safe rate" and the "reinvestment rate."

Safe rate assumes that funds required to cover negative cash flows are earning interest at a rate easily attainable and can be withdrawn when needed at a moment's notice (i.e., within a day of account deposit). In this instance, a rate is "safe" because the funds are highly liquid and safely available with minimal risk when needed.

The reinvestment rate includes a rate to be received when positive cash flows are reinvested in a similar intermediate or long-term investment with comparable risk. The reinvestment rate is higher than the safe rate because it is not liquid (i.e., it pertains to another investment) and thus requires a higher-risk discount rate.

Limitations of MIRR

The first limitation of MIRR is that it requires you to compute an estimate of the cost of capital in order to make a decision, a calculation that can be subjective and vary depending on the assumptions made.

As with IRR, the MIRR can provide information that leads to sub-optimal decisions that do not maximize value when several investment options are being considered at once. MIRR does not actually quantify the various impacts of different investments in absolute terms; NPV often provides a

more effective theoretical basis for selecting investments that are mutually exclusive. It may also fail to produce optimal results in the case of capital rationing.

MIRR can also be difficult to understand for people who do not have a financial background.
Moreover, the theoretical basis for MIRR is also disputed among academics

Pure Investment

Definition: An investment in which a firm never borrows money from the project.
How to Determine: If theproject passes the net investment test, it is a pure investment. Relationship: A simple investment is always a pure investment.

Mixed Investment

Definition: An investment in which a firm borrows money from the project during the investment period.
How to Determine: If a project fails the net investment test, it is a mixed investment.
Relationship: If a project is a mixed investment, it is a non simple investment.

The modified internal rate of return (MIRR)

MIRR is that rate of return which, when the initial outlay is compared with the terminal value of the project's net cash flows reinvested at the cost of capital, gives an NPV of zero.
This involves a two-stage process:

1. Calculate the terminal value of the project by compounding forward all interim cash flows at the cost of capital to the end of the project.
2. Find the rate of interest that equates the terminal value with the initial cost.

Adjusting the NPV formula for risk

Two approaches are commonly used to incorporate risk within the NPV formula.

i. Certainty equivalent method

This conceptually appealing approach permits adjustment for risk by incorporating the decision-maker's risk attitude into the capital investment decision. The certainty equivalent method adjusts the numerator in the net present value calculation by multiplying the expected annual cash flows by a certainty equivalent coefficient. The revised formula becomes: where: is the expected net present

value; is the certainty equivalent coefficient, which reflect's management's risk attitude; is the expected cash flow in period *t*; *i* is the riskless rate of interest; *n* is the project's life; and is the initial cash outlay. The numerator represents the figure that management would be willing to receive as a certain sum each year in place of the uncertain annual cash flow offered by the project. The greater is management's aversion to risk, the nearer the certainty
equivalent coefficient is to zero. Where projects are of normal risk for the business, and
the cost of capital and risk-free rate of interest are known, it is possible to determine
the certainty equivalent coefficient.

The word "investment" has become muddled with overuse. Referring to a stock or a bond as an investment is still in regular use, but now people make "investments" in their education, their cars and even their flat screen TVs.

In this article, we will look at the three basic types of investment as well as some of the things that are definitely not investments – no matter what the commercial says.

Investment, as the dictionary defines it, is something that is purchased with money that is expected to produce income or profit. Investments can be broken into three basic groups: ownership, lending and cash equivalents.

Token Disinvestment

Disinvestment started in India with a high political caution—in a symbolic way known as the **'token' disinvestment**. The general policy was to sell the shares of the PSUs maximum upto the 49 per cent (i.e. maintaining government ownership of the companies). But in practice, shares were sold to the tune of 5–10 per cent only. This phase of disinvestment though brought some extra funds to the government (which was used to fill up the fiscal deficit considering the proceeds as the 'capital receipts') it could not initiate any new element to the PSUs which could enhance their efficiency. It remained the major criticism of this type of disinvestment, and the experts around the world started suggesting the Government to go for it in the way the ownership could be transferred from the government to the private sector. The other hot issue raised by the experts was related to the question of using the *proceeds* of disinvestment.

i. Strategic Disinvestment

In order to make disinvestment a process by which efficiency of the PSUs could be enhanced and the government could de-burden itself of the activities in which the private sector has developed better efficiency (so that the government could concentrate on the areas which have no attraction for the private sector such as the social sector support for the poor masses), the government initiated the process of strategic disinvestment. The Government classifying the PSUs into ***'strategic'*** and ***'non strategic'***announced in March 1999 that it will generally reduce its stake (share holding) in the ***'non-strategic'*** public sector enterprises (PSEs) to 26 per cent or below if necessary and in the ***'strategic'*** PSEs (i.e. arms and ammunition; atomic energy and related activities; and railways) it will retain its majority holding. There was a major shift in the disinvestment policy from selling small lots of share in the profit-making PSUs (i.e. token disinvestment) to the strategic sale with change in management control both in profit and loss-making enterprises.

(a) The minimum shares to be divested will be 51 per cent, and

(b) the wholesale sale of shares will be done to a '***strategic partner***' having international class experience and expertise in the sector.

MODIFIED IRR

The **modified internal rate of return** (**MIRR**) is a financial measure of an investment's attractiveness.[1][2] It is used in capital budgeting to rank alternative investments of equal size. As the name implies, MIRR is a modification of the internal rate of return (IRR) and as such aims to resolve some problems with the IRR.

where *n* is the number of equal periods at the end of which the cash flows occur (not the number of cash flows), *PV* is present value (at the beginning of the first period), *FV* is future value (at the end of the last period).

The formula adds up the negative cash flows after discounting them to time zero using the external cost of capital, adds up the positive cash flows including the proceeds of reinvestment at the external reinvestment rate to the final period, and then works out what rate of return would cause the magnitude of the discounted negative cash flows at time zero to be equivalent to the future value of the positive cash flows at the final time period.

Example

If an investment project is described by the sequence of cash flows:

Second, we calculate the future value of the positive cash flows (reinvested at the reinvestment rate):

Third, we find the MIRR:

The calculated MIRR (17.91%) is significantly different from the IRR (25.48%).

Like the internal rate of return, the modified internal rate of return is not valid for ranking projects of different sizes, because a larger project with a smaller modified internal rate of return may have a higher net present value. However, there exist variants of the modified internal rate of return which can be used for such comparisons.[4][5]

Modified Internal Rate Of Return - MIRR

The modified internal rate of return (MIRR) assumes that positive cash flows are reinvested at the firm's cost of capital, and that the initial outlays are financed at the firm's financing cost. By contrast, the traditional internal rate of return (IRR)assumes the cash flows from a project are reinvested at the IRR itself. The MIRR therefore more accurately reflects the cost and profitability of a project.

The Formula For MIRR is

$$MIRR = \sqrt[n]{\frac{FV(PositiveCashFlows, cost of capital)}{PV\ (InitialOutlays, Financing Cost)}} - 1$$

Calculating the Modified Internal Rate of Return

The formula for the MIRR takes into account three variables. They are:

FVCF(c) = the future value of positive cash flows at the cost of capital for the company

PVCF(fc) = the present value of negative cash flows at the financing cost of the company

n = number of periods

Given the variables, the formula for MIRR is expressed as the one above.

Meanwhile, internal rate of return (IRR) is a discount rate that makes the net present value (NPV) of all cash flows from a particular project equal to zero. Both MIRR and IRR calculations rely on the formula for NPV.

What the Modified Internal Rate Of Return Tells You

The MIRR is used to rank investments or projects of unequal size. The calculation is a solution to two major problems that exist with the popular IRR calculation. The first main problem with IRR is that multiple solutions can be found for the same project. The second problem is that the assumption that positive cash flows are reinvested at the IRR is considered impractical in practice. With the MIRR, only a single solution exists for a given project, and reinvestment rate of positive cash flows is much more valid in practice.

The MIRR allows project managers to change the assumed rate of reinvested growth from stage to stage in a project. The most common method is to input the average estimated cost of capital, but there is flexibility to add any specific anticipated reinvestment rate.

Limitations of MIRR

The first limitation of MIRR is that it requires you to compute an estimate of the cost of capital in order to make a decision, a calculation that can be subjective and vary depending on the assumptions made.

As with IRR, the MIRR can provide information that leads to sub-optimal decisions that do not maximize value when several investment options are being considered at once. MIRR does not actually quantify the various impacts of different investments in absolute terms, NPV often provides a more effective theoretical basis for selecting investments that are mutually exclusive. It may also fail to produce optimal results in the case of capital rationing.

MIRR can also be difficult to understand for people who do not have a financial background. Moreover, the theoretical basis for MIRR is also disputed among academics.

Impact of inflation on capital budgeting:

- Inflation has ramifications for the realized value of a capital project.
- When evaluating capital projects, companies can evaluate capital projects in nominal or real (i.e. inflation adjusted) terms.
- Real cash flows are based on purchasing power at the time the decision to invest would is made.

- Under a real cash flow approach, the discount rate would remove the expected inflation rate, as the cash flows will already reflect the effects of inflation.

- Commonly, capital projects are analyzed in nominal terms, so the discount rate applied is inclusive of expected inflation; however actual inflation may veer from expectations and inflation may impact the different project variables in different ways.

Capital budgeting Techniques:

The capital budgeting appraisal methods are techniques of evaluation of investment proposal will help the company to decide upon the desirability of an investment proposal depending upon their; relative income generating capacity and rank them in order of their desirability. These methods provide the company a set of norms on the basis of which either it has to accept or reject the investment proposal. The most widely accepted techniques used in estimating the cost-returns of investment projects can be grouped under two categories.

1. Traditional methods
2. Discounted Cash flow methods

1. Traditional methods

These methods are based on the principles to determine the desirability of an investment project on the basis of its useful life and expected returns. These methods depend upon the accounting information available from the books of accounts of the company. These will not take into account the concept of 'time value of money', which is a significant factor to determine the desirability of a project in terms of present value.

A. Pay-back period method: It is the most popular and widely recognized traditional method of evaluating the investment proposals. It can be defined, as 'the number of years required to recover the original cash out lay invested in a project'.

According to Weston & Brigham, "The pay back period is the number of years it takes the firm to recover its original investment by net returns before depreciation, but after taxes".

According to James. C. Vanhorne, "The payback period is the number of years required to recover initial cash investment.

The pay back period is also called payout or payoff period. This period is calculated by dividing the cost of the project by the annual earnings after tax but before depreciation under this method the projects are ranked on the basis of the length of the payback period. A project with the shortest payback period will be given the highest rank and taken as the best investment. The shorter the payback period, the less risky the investment is the formula for payback period is

$$\text{Pay-back period} = \frac{\text{Cash outlay (or) original cost of project}}{\text{Annual cash inflow}}$$

Merits:

1. It is one of the earliest methods of evaluating the investment projects.
2. It is simple to understand and to compute.
3. It dose not involve any cost for computation of the payback period
4. It is one of the widely used methods in small scale industry sector
5. It can be computed on the basis of accounting information available from the books.

Demerits:

1. This method fails to take into account the cash flows received by the company after the pay back period.
2. It doesn't take into account the interest factor involved in an investment outlay.
3. It doesn't take into account the interest factor involved in an investment outlay.
4. It is not consistent with the objective of maximizing the market value of the company's share.

5. It fails to consider the pattern of cash inflows i. e., the magnitude and timing of cash in flows.

B. Accounting (or) Average rate of return method (ARR):

It is an accounting method, which uses the accounting information repeated by the financial statements to measure the probability of an investment proposal. It can be determine by dividing the average income after taxes by the average investment i.e., the average book value after depreciation.

According to 'Soloman', accounting rate of return on an investment can be calculated as the ratio of accounting net income to the initial investment, i.e.,

$$ARR = \frac{\text{Average net income after taxes}}{\text{Average Investment}} \times 100$$

$$\text{Average net income after taxes} = \frac{\text{Total Income after Taxes}}{\text{No. Of Years}}$$

$$\text{Average investment} = \frac{\text{Total Investment}}{2}$$

On the basis of this method, the company can select all those projects who's ARR is higher than the minimum rate established by the company. It can reject the projects with an ARR lower than the expected rate of return. This method can also help the management to rank the proposal on the basis of ARR. A highest rank will be given to a project with highest ARR, where as a lowest rank to a project with lowest ARR.

Merits:

It is very simple to understand and calculate.

1. It can be readily computed with the help of the available accounting data.
2. It uses the entire stream of earning to calculate the ARR.

Demerits:

1. It is not based on cash flows generated by a project.
2. This method does not consider the objective of wealth maximization
3. IT ignores the length of the projects useful life.
4. It does not take into account the fact that the profits can be re-invested.

II: Discounted cash flow methods:

The traditional method does not take into consideration the time value of money. They give equal weight age to the present and future flow of incomes. The DCF methods are based on the concept that a rupee earned today is more worth than a rupee earned tomorrow. These methods take into consideration the profitability and also time value of money.

A. Net present value method (NPV)

The NPV takes into consideration the time value of money. The cash flows of different years and valued differently and made comparable in terms of present values for this the net cash inflows of various period are discounted using required rate of return which is predetermined.

According to Ezra Solomon, "It is a present value of future returns, discounted at the required rate of return minus the present value of the cost of the investment."

NPV is the difference between the present value of cash inflows of a project and the initial cost of the project.

According the NPV technique, only one project will be selected whose NPV is positive or above zero. If a project(s) NPV is less than 'Zero'. It gives negative NPV hence. It must be rejected. If there are more than one project with positive NPV's the project is selected whose NPV is the highest.

The formula for NPV is

NPV= Present value of cash inflows – investment.

$$NPV = \frac{C1}{(1+K)} + \frac{C2}{} + \frac{C3}{} + \frac{Cn}{}$$

Co- investment

C1, C2, C3… Cn= cash inflows in different years.

K= Cost of the Capital (or) Discounting rate

D= Years.

Merits:

1. It recognizes the time value of money.
2. It is based on the entire cash flows generated during the useful life of the asset.
3. It is consistent with the objective of maximization of wealth of the owners.
4. The ranking of projects is independent of the discount rate used for determining the present value.

Demerits:

1. It is different to understand and use.
2. The NPV is calculated by using the cost of capital as a discount rate. But the concept of cost of capital. If self is difficult to understood and determine.
3. It does not give solutions when the comparable projects are involved in different amounts of investment.
4. It does not give correct answer to a question whether alternative projects or limited funds are available with unequal lines.

B. Internal Rate of Return Method (IRR)

The IRR for an investment proposal is that discount rate which equates the present value of cash inflows with the present value of cash out flows of an investment. The IRR is also known as cutoff or handle rate. It is usually the concern's cost of capital.

According to Weston and Brigham "The internal rate is the interest rate that equates the present value of the expected future receipts to the cost of the investment outlay.

When compared the IRR with the required rate of return (RRR), if the IRR is more than RRR then the project is accepted else rejected. In case of more than one project with IRR more than RRR, the one, which gives the highest IRR, is selected.

The IRR is not a predetermine rate, rather it is to be trial and error method. It implies that one has to start with a discounting rate to calculate the present value of cash inflows. If the obtained present value is higher than the initial cost of the project one has to try with a higher rate. Like wise if the present value of expected cash inflows obtained is lower than the present value of cash flow. Lower rate is to be taken up. The process is continued till the net present value becomes Zero. As this discount rate is determined internally, this method is called internal rate of return method.

$$IRR = L + \frac{P1 - Q}{P1 - P2} \times D$$

L- Lower discount rate

P1 - Present value of cash inflows at lower rate.

P2 - Present value of cash inflows at higher rate.

Q- Actual investment

D- Difference in Discount rates.

Merits:

1. It consider the time value of money
2. It takes into account the cash flows over the entire useful life of the asset.
3. It has a psychological appear to the user because when the highest rate of return projects are selected, it satisfies the investors in terms of the rate of return an capital
4. It always suggests accepting to projects with maximum rate of return.
5. It is inconformity with the firm's objective of maximum owner's welfare.

Demerits:

1. It is very difficult to understand and use.
2. It involves a very complicated computational work.
3. It may not give unique answer in all situations.

C. Probability Index Method (PI)

The method is also called benefit cost ration. This method is obtained cloth a slight modification of the NPV method. In case of NPV the present value of cash out flows are profitability index (PI), the present value of cash inflows are divide by the present value of cash out flows, while NPV is a absolute measure, the PI is a relative measure.

It the PI is more than one (>1), the proposal is accepted else rejected. If there are more than one investment proposal with the more than one PI the one with the highest PI will be selected. This

method is more useful incase of projects with different cash outlays cash outlays and hence is superior to the NPV method.

The formula for PI is

$$\text{Probability index} = \frac{\text{Present Value of Future Cash Inflow}}{\text{Investment}}$$

Merits:

1. It requires less computational work then IRR method
2. It helps to accept / reject investment proposal on the basis of value of the index.
3. It is useful to rank the proposals on the basis of the highest/lowest value of the index.
4. It is useful to tank the proposals on the basis of the highest/lowest value of the index.
5. It takes into consideration the entire stream of cash flows generated during the useful life of the asset.

Demerits:

1. It is some what difficult to understand
2. Some people may feel no limitation for index number due to several limitation involved in their competitions
3. It is very difficult to understand the analytical part of the decision on the basis of probability index.

UNIT-3

CRITICAL ANALYSIS OF APPRAISAL TECHNIQUES

UNIT-3

CRITICAL ANALYSIS OF APPRAISAL TECHNIQUES

Discounted pay back, post pay back, surplus life and surplus payback, bail out pay back, return on investment, equivalent annual cost, terminal value, single period constraints, multi period capital constraint and an unresolved problem.Net present value mean variance analysis, hertz simulation and hillier approaches. Significance of information and data bank in project selections.

Discounted Payback Period

The discounted payback period is a modified version of the payback period that accounts for the time value of money. Both metrics are used to calculate the amount of time that it will take for a project to "break even", or to get the point where the net cash flows generated cover the initial cost of the project. Both the payback period and the discounted payback period can be used to evaluate the profitability and feasibility of a specific project.

Other metrics, such as the internal rate of return (IRR), profitability index (PI), net present value (NPV), and effective annual annuity (EAA) can be used to quantify the profitability of a given project. To make the best decision about whether to pursue a project or not, a company's management needs to decide which metrics to prioritize. Management then looks at a variety of metrics in order to obtain complete information. Usually, companies are deciding between multiple possible projects. Comparing various profitability metrics for all projects is key to making a well-informed decision.

Discounted Payback Period Formula

There are two steps involved in calculating the discounted payback period. First, we must discount (i.e., bring to the present value) the net cash flows that will occur during each year of the project.

Second, we must subtract the discounted cash flows from the initial cost figure in order to obtain the discounted payback period. Once we've calculated the discounted cash flows for each period of the project, we can subtract them from the initial cost figure until we arrive at zero.

Discounted Payback Period Example

Assume a business that is considering a given project. Below are some selected data from the discounted cash flow model created by the company's financial analysts:

Data					
Year	1	2	3	4	5
Discounted Cash Flow	$ 1,000	$ 1,500	$ 2,000	$ 3,000	$ 3,000
Intial Cost	$ 7,500				

As we can see here, the project returns a positive discounted cash flow in its first year and sees its yearly discounted cash flow grow to $3,000 in later years. We also learn that the project cost is $7,500. Using the given information, we can calculate the discounted payback period as follows:

Discounted Payback Period Example			
Year	Discounted Cash Flow	Initial Cost Left to Reduce	Time Elapsed (Years)
0	0	$ 7,500.00	0
1	$ 1,000	$ 6,500	1
2	$ 1,500	$ 5,000	2
3	$ 2,000	$ 3,000	3
4	$ 3,000	$ -	4
5	$ 3,000	N/A	N/A

In this case, we see that the project's payback period is 4 years. Since the project's life is calculated at 5 years, we can infer that the project returns a positive NPV. Thus, the project will likely add value to the business if pursued.

Payback Periods

One observation to make from the example above is that the discounted payback period of the project is reached exactly at the end of a year. Obviously, that may not always be the case. In other circumstances, we may see projects where the payback occurs during, rather than at the end of, a given year.

In such situations, we will first take the difference between the year-end cash flow and the initial cost left to reduce. Next, we divide the number by the year-end cash flow in order to get the percentage of the time period left over after the project has been paid back.

The next step is to subtract the number from 1 to obtain the percent of the year at which the project is paid back. Finally, we proceed to convert the percentage in months (e.g., 25% would be 3 months, etc.), and add the figure to the last year in order to arrive at the final discounted payback period number

Investment appraisal

Definition:Investment appraisal is a collection of techniques used to identify the attractiveness of an investment.

The purpose of investment appraisal is to assess the viability of project, programme or portfolio decisions and the value they generate. In the context of a business case, the primary objective of investment appraisal is to place a value on benefits so that the costs are justified.

There are many factors that can form part of an appraisal. These include:

- financial – this is the most commonly assessed factor;
- legal – the value of an investment may be in it enabling an organisation to meet current or future legislation;
- environmental – the impact of the work on the environment is increasingly a factor when considering an investment;
- social – for charitable organisations, return on investment could be measured in terms of 'quality of life' or even 'lives saved';
- operational – benefits may be expressed in terms of 'increased customer satisfaction', 'higher staff morale' or 'competitive advantage';
- risk – all organisations are subject to business and operational risk. An investment decision may be justified because it reduces risk.

A financial appraisal is the most easily quantifiable approach but it can only be applied to benefits that produce financial returns.

The simplest financial appraisal technique is the payback method. The payback period is the time it takes for net cash inflow to equal the cash investment. This is a relatively crude assessment and is often used simply as an initial screening process.

A better way of comparing alternative investments is the accounting rate of return (ARR) which expresses the 'profit' as a percentage of the costs. However, this has the disadvantage of not taking into account the timing of income and expenditure. This makes a significant difference on all but the shortest and most capital-intensive of projects.

In most cases, discounted cash flow techniques such as net present value (NPV) or internal rate of return (IRR) are appropriate to evaluate the value of benefits and alternative ways of delivering them. NPV calculates the present value of cash flows associated with an investment; the higher the NPV the better. This calculation uses a discount rate to show how the value of money decreases with time. The discount rate that gives an investment a NPV value of zero is called the IRR. NPV and IRR can be

compared for a number of options.

Appraisal of capital-intensive projects and programmes should take into account the whole-life costs across the complete product life cycle as there may be significant termination costs. In the case of the public sector, where income is usually zero, it is common practice to identify the option with the lowest whole-life cost as the option that offers the best value for money.

The appraisal on less tangible and non-financial factors is more subjective. In some cases, a financial value may be calculated by applying a series of assumptions. For example, work that improved staff morale may lead to lower staff turnover and reduce recruitment costs. A financial appraisal of this benefit would have to include assumptions about the numerical impact of increased morale on staff turnover and the estimated costs of recruitment.

Where benefits cannot be quantified then scoring methods may be used to compare the subjective value of benefits.

Project

Stand-alone projects will use investment appraisal to compare alternative approaches to achieving the required benefits. Wherever possible, the project should use techniques that are the organisational, programme or portfolio standard approach.

Where a project is part of a programme, the initial investment appraisal may be performed by the programme management team. That does not exempt the project management team from being familiar with the content of the appraisal or the techniques used to perform it. It will still be responsible for keeping the business case up to date and this will involve repeating the investment calculations to account for changing circumstances.

Where a project is undertaken by a contracting organisation, the financial appraisal is relatively straightforward as it will simply be a comparison of costs with the fee paid by the client, probably using a discounted cash flow technique.

Programme

Programmes are usually defined to bring about organisational change. This inevitably gives rise to a higher proportion of intangible and non-financial benefits being included in the business case. Commercial programmes must be careful not to be overly dependent on non-financial benefits, as anything can be justified through subjective views of value.

The programme management team must set out standards for the appraisal of the component projects

and their associated benefits. Consistent and compatible techniques must be used across the programme so that individual project business cases can be aggregated and summarised in the overall programme business case.

Portfolio

In the definition phase of a portfolio there may be many ideas and suggestions for projects and programmes to meet the strategic objectives. The portfolio management team must establish a system for capturing and screening these ideas.

This is where broad-brush techniques such as payback may be used. A criterion may be set that requires payback within the financial planning cycle. Any projects or programmes that do not provide payback in that period are discarded. As the higher-potential ideas are captured, they will be subject to more detailed, analytical techniques.

The prioritisation and balancing phases of the portfolio will rely heavily on how investment appraisal has built the business cases of the component projects and programmes. It is essential that the portfolio management team establishes standard methods and consistent approaches across the portfolio to ensure reliable decision-making. The team should also provide specialist advice and guidance on the use of appraisal techniques to all project and programme teams.

The portfolio management team must also ensure that investment appraisals consider potential investments in the context of the existing and planned projects and programmes. For example, to identify opportunities for reuse of components and avoid double counting of benefits.

Discounted Pay Back

One of the major disadvantages of simple payback period is that it ignores the time value of money. To counter this limitation, an alternative procedure called discounted payback period may be followed, which accounts for time value of money by discounting the cash inflows of the project.

Formulas and Calculation Procedure

In discounted payback period we have to calculate the present value of each cash inflow taking the start of the first period as zero point. For this purpose the management has to set a suitable discount rate. The discounted cash inflow for each period is to be calculated using the formula:

$$\text{Discounted Cash Inflow} = \frac{\text{Actual Cash Inflow}}{(1(K + i)^n}$$

Where,

I is the discount rate; n is the period to which the cash inflow relates.

Usually the above formula is split into two components which are actual cash inflow and present value factor (i.e. 1 / (1 + i)^n). Thus discounted cash flow is the product of actual cash flow and present value factor.

The rest of the procedure is similar to the calculation of simple payback period except that we have to use the discounted cash flows as calculated above instead of actual cash flows. The cumulative cash flow will be replaced by cumulative discounted cash flow.

Where,

A = Last period with a negative discounted cumulative cash flow;

B = Absolute value of discounted cumulative cash flow at the end of the period A;

C = Discounted cash flow during the period after A.

Advantages and Disadvantages

- **Advantage:** Discounted payback period is more reliable than simple payback period since it accounts for time value of money. It is interesting to note that if a project has negative net present value it won't pay back the initial investment.

- **Disadvantage:** It ignores the cash inflows from project after the payback period.

  Bailout Payback Method Definition

In accounting, bailout payback method shows the length of time required to repay the total initial investment through investment cash flows combined with salvage value. The shorter the payback period, the more attractive a company is.

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Bailout Payback Calculation

For example, a company invested $20,000 for a project and expected $5,000 cash flow annually.

1. Payback period = 20,000 / 5,000 = 4

2. Bailout payback

At the end of year	Cash flow	Salvage Value	Cumulative payback
1	5000	12000	17000
2	10000	10000	20000
3	15000	8000	23000
4	20000	6000	26000

Bailout payback = 2, at the end of year 2, the cumulative payback of $20,000 is equal to the initial investment of $20,000.

Bailout Payback vs Payback Period

The second type of payback, bailout payback method, is similar like payback period method. The difference between these two is that bailout payback model incorporates the salvage value of the asset into the calculation and measures the length of the payback period when the periodic cash inflows are combined with the salvage value.

Sources of Long Term Finance

1. **Issue of Shares**: The amount of capital decided to be raised from members of the public is divided into units of equal value. These units are known as share and the aggregate values of shares are known as share capital of the company. Those who subscribe to the share capital become members of the company and are called shareholders. They are the owners of the company. Hence shares are also described as ownership securities.

2. **Issue of Preference Shares**: Preference share have three distinct characteristics. Preference shareholders have the right to claim dividend at a fixed rate, which is decided according to the terms of issue of shares. Moreover, the preference dividend is to be paid first out of the net profit. The balance, it any, can be distributed among other shareholders that is, equity shareholders. However, payment of dividend is not legally compulsory. Only when dividend is declared, preference shareholders have a prior claim over equity shareholders.

Preference shareholders also have the preferential right of claiming repayment of capital in the event of winding up of the company. Preference capital has to be repaid out of assets after meeting the loan obligations and claims of creditors but before any amount is repaid to equity shareholders.

Holders of preference shares enjoy certain privileges, which cannot be claimed by the equity shareholders. That is why; they cannot directly take part in matters, which may be discussed at the general meeting of shareholders, or in the election of directors.

Depending upon the terms of conditions of issue, different types of preference shares may be issued by a company to raises funds. Preference shares may be issued as:

1. Cumulative or Non-cumulative
2. Participating or Non-participating
3. Redeemable or Non-redeemable, or as
4. Convertible or non-convertible preference shares.

In the case of cumulative preference shares, the dividend unpaid if any in previous years gets accumulated until that is paid. No cumulative preference shares have any such provision.

Participatory shareholders are entitled to a further share in the surplus profits after a reasonable divided has been paid to equity shareholders. Non-participating preference shares do not enjoy such right. Redeemable preference shares are those, which are repaid after a specified period, where as the irredeemable preference shares are not repaid. However, the company can also redeem these shares after a specified period by giving notice as per the terms of issue. Convertible preference shows are those, which are entitled to be converted into equity shares after a specified period.

Merits:

Many companies due to the following reasons prefer issue of preference shares as a source of finance.

1. It helps to enlarge the sources of funds.
2. Some financial institutions and individuals prefer to invest in preference shares due to the assurance of a fixed return.
3. Dividend is payable only when there are profits.
4. If does not affect the equity shareholders' control over management

Limitations:

The limitations of preference shares relates to some of its main features:

1. Dividend paid cannot be charged to the company's income as an expense; hence there is no tax saving as in the case of interest on loans.
2. Even through payment of dividend is not legally compulsory, if it is not paid or arrears accumulate there is an adverse effect on the company's credit.
3. Issue of preference share does not attract many investors, as the return is generally limited and not exceed the rates of interest on loan. On the other than, there is a risk of no dividend being paid in the event of falling income.

1. Issue of Equity Shares: The most important source of raising long-term capital for a company is the issue of equity shares. In the case of equity shares there is no promise to shareholders a fixed dividend. But if the company is successful and the level profits are high, equity shareholders enjoy very high returns on their investment. This feature is very attractive to many investors even through they run the risk of having no return if the profits are inadequate or there is loss. They have the right of control over the management of the company and their liability is limited to the value of shares held by them.

From the above it can be said that equity shares have three distinct characteristics:

1. The holders of equity shares are the primary risk bearers. It is the issue of equity shares that mainly provides 'risk capital', unlike borrowed capital. Even compared with preference capital, equity shareholders are to bear ultimate risk.
2. Equity shares enable much higher return sot be earned by shareholders during prosperity because after meeting the preference dividend and interest on borrowed capital at a fixed rate, the entire surplus of profit goes to equity shareholders only.
3. Holders of equity shares have the right of control over the company. Directors are elected on the vote of equity shareholders.

Merits:

From the company' point of view; there are several merits of issuing equity shares to raise long-term finance.

1. It is a source of permanent capital without any commitment of a fixed return to the shareholders. The return on capital depends ultimately on the profitability of business.
2. It facilities a higher rate of return to be earned with the help borrowed funds. This is possible due to two reasons. Loans carry a relatively lower rate of interest than the average rate of return on total capital. Secondly, there is tax saving as interest paid can be charged to income as a expense before tax calculation.
3. Assets are not required to give as security for raising equity capital. Thus additional funds can be raised as loan against the security of assets.

Limitations:

Although there are several advantages of issuing equity shares to raise long-term capital.

1. The risks of fluctuating returns due to changes in the level of earnings of the company do not attract many people to subscribe to equity capital.
2. The value of shares in the market also fluctuate with changes in business conditions, this is another risk, which many investors want to avoid.

2. Issue of Debentures:

When a company decides to raise loans from the public, the amount of loan is dividend into units of equal. These units are known as debentures. A debenture is the instrument or certificate issued by a company to acknowledge its debt. Those who invest money in debentures are known as 'debenture holders'. They are creditors of the company. Debentures are therefore called 'creditor ship' securities. The value of each debentures is generally fixed in multiplies of 10 like Rs. 100 or Rs. 500, or Rs. 1000.

Debentures carry a fixed rate of interest, and generally are repayable after a certain period, which is specified at the time of issue. Depending upon the terms and conditions of issue there are different types of debentures. There are:

a. Secured or unsecured Debentures and
b. Convertible of Non convertible Debentures.

It debentures are issued on the security of all or some specific assets of the company, they are known as secured debentures. The assets are mortgaged in favor of the debenture holders. Debentures, which are not secured by a charge or mortgage of any assets, are called unsecured debentures. The holders of these debentures are treated as ordinary creditors.

Sometimes under the terms of issue debenture holders are given an option to covert their debentures into equity shares after a specified period. Or the terms of issue may lay down that the whole or part of the debentures will be automatically converted into equity shares of a specified price after a certain period. Such debentures are known as convertible debentures. If there is no mention of conversion at the time of issue, the debentures are regarded as non-convertible debentures.

Merits:

Debentures issue is a widely used method of raising long-term finance by companies, due to the following reasons.

1. Interest payable on Debentures can be fixed at low rates than rate of return on equity shares. Thus Debentures issue is a cheaper source of finance.
2. Interest paid can be deducted from income tax purpose; there by the amount of tax payable is reduced.
3. Funds raised for the issue of debentures may be used in business to earn a much higher rate of return then the rate of interest. As a result the equity shareholders earn more.
4. Another advantage of debenture issue is that funds are available from investors who are not entitled to have any control over the management of the company.
5. Companies often find it convenient to raise debenture capital from financial institutions, which prefer to invest in debentures rather than in shares. This is due to the assurance of a fixed return and repayment after a specified period.

Limitations:

Debenture issue as a source of finance has certain limitations too.

1. It involves a fixed commitment to pay interest regularly even when the company has low earnings or incurring losses.

2. Debentures issue may not be possible beyond a certain limit due to the inadequacy of assets to be offered as security.

Methods of Issuing Securities: The firm after deciding the amount to be raised and the type of securities to be issued, must adopt suitable methods to offer the securities to potential investors. There are for common methods followed by companies for the purpose.

When securities are offered to the general public a document known as Prospectus, or a notice, circular or advertisement is issued inviting the public to subscribe to the securities offered thereby all particulars about the company and the securities offered are made to the public. Brokers are appointed and one or more banks are authorized to collect subscription.

Some times the entire issue is subscribed by an organization known as Issue House, which in turn sells the securities to the public at a suitable time.

The company may negotiate with large investors of financial institutions who agree to take over the securities. This is known as 'Private Placement' of securities.

When an exiting company decides to raise funds by issue of equity shares, it is required under law to offer the new shares to the existing shareholders. This is described as right issue of equity shares. But if the existing shareholders decline, the new shares can be offered to the public.

3. Loans from financial Institutions:

Government with the main object of promoting industrial development has set up a number of financial institutions. These institutions play an important role as sources of company finance. Besides they also assist companies to raise funds from other sources.

These institutions provide medium and long-term finance to industrial enterprises at a reason able rate of interest. Thus companies may obtain direct loan from the financial institutions for expansion or modernization of existing manufacturing units or for starting a new unit.

Often, the financial institutions subscribe to the industrial debenture issue of companies some of the institutions (ICICI) and (IDBI) also subscribe to the share issued by companies.

All such institutions also underwrite the public issue of shares and debentures by companies. Underwriting is an agreement to take over the securities to the extent there is no public response to the issue. They may guarantee loans, which may be raised by companies from other sources.

Loans in foreign currency may also be granted for the import of machinery and equipment wherever necessary from these institutions, which stand guarantee for re-payments. Apart from the national level institutions mentioned above, there are a number of similar institutions set up in different states of India. The state-level financial institutions are known as State Financial Corporation, State Industrial Development Corporations, State Industrial Investment Corporation and the like. The objectives of these institutions are similar to those of the national-level institutions. But they are mainly concerned with the development of medium and small-scale industrial units. Thus, smaller companies depend on state level institutions as a source of medium and long-term finance for the expansion and modernization of their enterprise.

4. Retained Profits:

Successful companies do not distribute the whole of their profits as dividend to shareholders but reinvest a part of the profits. The amount of profit reinvested in the business of a company is known as retained profit. It is shown as reserve in the accounts. The surplus profits retained and reinvested may be regarded as an internal source of finance. Hence, this method of financing is known as self-financing. It is also called sloughing back of profits.

Since profits belong to the shareholders, the amount of retained profit is treated as ownership fund. It serves the purpose of medium and long-term finance. The total amount of ownership capital of a company can be determined by adding the share capital and accumulated reserves.

Merits:

This source of finance is considered to be better than other sources for the following reasons.

1. As an internal source, it is more dependable than external sources. It is not necessary to consider investor's preference.
2. Use of retained profit does not involve any cost to be incurred for raising the funds. Expenses on prospectus, advertising, etc, can be avoided.

3. There is no fixed commitment to pay dividend on the profits reinvested. It is a part of risk capital like equity share capital.
4. Control over the management of the company remains unaffected, as there is no addition to the number of shareholder.
5. It does not require the security of assets, which can be used for raising additional funds in the form of loan.

Limitations:

However, there are certain limitations on the part of retained profit.

1. Only well established companies can be avail of this sources of finance. Even for such companies retained profits cannot be used to an unlimited extent.
2. Accumulation of reserves often attract competition in the market,
3. With the increased earnings, shareholders expect a high rate of dividend to be paid.
4. Growth of companies through internal financing may attract government restrictions as it leads to concentration of economic power.

5. Public Deposits:

An important source of medium – term finance which companies make use of is public deposits. This requires advertisement to be issued inviting the general public of deposits. This requires advertisement to be issued inviting the general public to deposit their savings with the company. The period of deposit may extend up to three yeas. The rate of interest offered is generally higher than the interest on bank deposits. Against the deposit, the company mentioning the amount, rate of interest, time of repayment and such other information issues a receipt.

Since the public deposits are unsecured loans, profitable companies enjoying public confidence only can be able to attract public deposits. Even for such companies there are rules prescribed by government limited its use.

Sources of Short Term Finance

The major sources of short-term finance are discussed below:

1. **Trade credit**: Trade credit is a common source of short-term finance available to all companies. It refers to the amount payable to the suppliers of raw materials, goods etc. after

an agreed period, which is generally less than a year. It is customary for all business firms to allow credit facility to their customers in trade business. Thus, it is an automatic source of finance. With the increase in production and corresponding purchases, the amount due to the creditors also increases. Thereby part of the funds required for increased production is financed by the creditors. The more important advantages of trade credit as a source of short-term finance are the following:

It is readily available according to the prevailing customs. There are no special efforts to be made to avail of it. Trade credit is a flexible source of finance. It can be easily adjusted to the changing needs for purchases.

Where there is an open account for any creditor failure to pay the amounts on time due to temporary difficulties does not involve any serious consequence Creditors often adjust the time of payment in view of continued dealings. It is an economical source of finance.

However, the liability on account of trade credit cannot be neglected. Payment has to be made regularly. If the company is required to accept a bill of exchange or to issue a promissory note against the credit, payment must be made on the maturity of the bill or note. It is a legal commitment and must be honored; otherwise legal action will follow to recover the dues.

2. **Bank loans and advances**: Money advanced or granted as loan by commercial banks is known as bank credit. Companies generally secure bank credit to meet their current operating expenses. The most common forms are cash credit and overdraft facilities. Under the cash credit arrangement the maximum limit of credit is fixed in advance on the security of goods and materials in stock or against the personal security of directors. The total amount drawn is not to exceed the limit fixed. Interest is charged on the amount actually drawn and outstanding. During the period of credit, the company can draw, repay and again draw amounts with in the maximum limit. In the case of overdraft, the company is allowed to overdraw its current account up to the sanctioned limit. This facility is also allowed either against personal security or the security of assets. Interest is charged on the amount actually overdrawn, not on the sanctioned limit.

The advantage of bank credit as a source of short-term finance is that the amount can be adjusted according to the changing needs of finance. The rate of interest on bank credit is fairly high. But the burden is no excessive because it is used for short periods and is compensated by profitable use of the funds.

Commercial banks also advance money by discounting bills of exchange. A company having sold goods on credit may draw bills of exchange on the customers for their acceptance. A bill is an order in writing requiring the customer to pay the specified amount after a certain period (say 60 days or 90 days). After acceptance of the bill, the company can drawn the amount as an advance from many commercial banks on payment of a discount. The amount of discount, which is equal to the interest for the period of the bill, and the balance, is available to the company. Bill discounting is thus another source of short-term finance available from the commercial banks.

3. **Short term loans from finance companies**: Short-term funds may be available from finance companies on the security of assets. Some finance companies also provide funds according to the value of bills receivable or amount due from the customers of the borrowing company, which they take over.

UNIT-4
STRATEGIC ANALYSIS OF SELECTED INVESTMENT DECISIONS

UNIT-4

STRATEGIC ANALYSIS OF SELECTED INVESTMENT DECISIONS

Lease Financing

Leasing is a method of acquiring the right to use equipment for a consideration. Leasing is a contract between the owner (lessor) and the user (lessee) for a fixed term for the use on hire of a specific asset selected by the lessee; the lessor retain ownership of the asset and the lessees has possession and use of the asset on payment of a specified rental over a period. It is a sort of contractual arrangement between the lessor and lessee and is regulated by the terms, conditions and covenants of such a contract. In other words, leasing arrangements provide an enterprise with the use of and control over assets without receiving title to them.

Terms in the Lease Agreement

In a lease contract, the lessor agrees to lease to the lessee and the lessee agrees to take on lease from the lessor subject to terms of the lease contract. The various terms involved in the formation of a lease contract are as follows:

1. **Lessor**: The party who is the owner of the equipment and who gives it for lease to the other party for payment of a periodical amount.
2. **Lessee**: The party who obtains the equipment for use for which he pays periodical rentals.
3. **Lease Property**: The subject of the lease, the asset, article or equipment that is on lease.
4. **Term of lease**: The lease period for which the agreement will be in operation.
5. **Lease rentals**: This refers to the consideration for lease. This may be connected with interest on lessor investment, maintenance cost of the equipment by the lessor, depreciation of the asset, and servicing charges or packaging charges for providing the above services.
6. **Warranties**: The lessee makes the selection of equipment based upon its own judgement. The lessor makes no express or implied warranties including those or merchant ability or fitness for particular use of the equipment and hereby disclaims the same. The lessor shall not be responsible for any repairs, service or defects in the equipment or the operation thereof.
7. **Manufacturer Warranties:** The lessor agrees that the Lessee shall be entitled to the benefits of the warranties provided the manufacturers/ suppliers of the equipment. Any performance guarantee provided by the supplier shall be in the joint names of the lessor and the lessee and shall be enforceable by the lessor or the lessee or both of them.

Title, identification, ownership of equipment: Lease contract provides that the equipment shall at all time remain the property of the lessor. The lessee also agrees and undertake not to sell, assign, sublet, pledge, hypothecate or otherwise suffer a lien upon, or against the equipment or remove the equipment from the factory or office or site where originally put to use or located, without the prior consent of the lessor in writing which consent the lessor agrees will not be unreasonably withheld. Conditioned upon the lessee's compliance with and fulfillment of the terms and conditions of this agreement, the lessee shall have the right to have exclusive peaceful possession, operation and use of the equipment for the full terms of the lease and any renewals thereof.

Equipment in transit: The equipment leased, will be delivered by the manufacturers/suppliers to the location specified by the lessee. The lessor shall not be responsible for any damage incurred to the equipment prior to or during deliver. Prior to the dispatch of the equipment, the lessee shall ensure that transit insurance on the equipment being dispatched is provided by the supplier naming the lessor as loss payee.

Indemnity: The lessee agrees to comply with all laws and regulations relating to the transportation, possession, operating and use of the equipment and assumes all liabilities including injuries to or of persons arising from or pertaining to the transportation, possession, operation or use of the equipment. The Lessee agrees to and keep indemnified and hold safe and harmless the lessor against all such liabilities and also against loss of equipment by seizure by any person. Any fees, taxes or other charges legally payable by the lessee in relation to the possession and use of the equipment and which is paid by the lessor in the event of the lessee's failure to pay shall at the lessor's option become immediately due from the lessee to the lessor.

Inspection: The lessor or a representative shall have the right from time to time during the normal hours on any working day with prior notice in writing to the lessee to enter upon the lessee's premises for the purpose of the existence, condition and proper maintenance of the equipment.

Repairs, loss and damage: The lessor shall not be called upon to keep the equipment in good repair, condition and working order and the lessee at its own cost and expense will keep the in good repair, condition and working order. All parts, mechanisms and devices or any replacements made by the lessee to the equipment shall immediately be deemed part of the equipment for all purpose thereof and

shall become the property of the lessor, any payment for such parts, mechanisms and devices from the lessor. In the event, any item of equipment is lost, stolen or destroyed or damaged beyond repair for any reason, the lessee shall pay to the lessor the amount of lease rentals then remaining unpaid, including any renewal options entered into pursuant to this agreement.

Insurance: The lessee for the benefit of and on behalf of the lessor obtain and maintain for the entire term of this agreement at its own expense insurance against normal risks and such other risks of loss as are customarily insured against on the type of equipment leased hereunder and by businesses in which the lessee is engaged in for such amount, provided however, that the amount of insurance against loss or damage to the equipment shall not be less than the original cost of the equipment. Alternatively the lessor may insure the equipment as aforesaid and the lessee shall reimburse the insurance premium and other costs and expenses to the lessor.

Steps in Leasing Transactions

The important steps involved in a leasing transaction can be summarized as follows:

Firstly, the lessee has to take a decision about the asset required and determine the manufacturer or the supplier. He also decides about his other requirements, viz., the design specification, the price, warranties, terms of delivery, installation and servicing.

The lessee then enters into a lease agreement with the lessor. He specifies to him his requirements as determined above. The lease agreement contains the obligations of the lessor and the lessee as:

I. The basic lease period during which the lease is irrevocable;
II. The timing and amount of periodical rental payments during the basic lease period;
III. Details of any option to renew the lease or to purchase the asset at the end of the basic lease period. In the case of absence of any such option to the lessee, the lessor takes possession of the asset and is entitled to any residual value associated with it; and
IV. Details regarding the responsibility for payment of cost of maintenance and repairs, taxes, insurance and other expenses. In case of a “Net lease agreement”, the lessee pays all these costs. However, in case of a “Maintenance lease agreement”, the lessor maintains the asset and also pays for the insurance.

After the lease agreement is signed, the lessor contacts, the manufacturer or supplier to supply the asset to the lessee. The lessor makes payment to the manufacturer or the supplier after the asset has been delivered, tested and accepted by the lessee.

Types of Leasing

A lease financing transaction can be differently classified on the basis of differences in the terms and conditions such as, number of parties to the transaction; extent to which risks and rewards of ownership are transferred; and domiciles of the equipment manufacturer, the lessor and the lessee. Considering the differences in the above criteria the lease agreements can broadly be put into following categories.

Financial Lease

A financial lease is a long-term arrangement which is irrevocable during its primary lease period. The financial lease is one which satisfies one or more of the following conditions:

a.The lessor transfer title to the lessee at the end of the lease period.

b.The lease contains an option to purchase the asset at a bargain price.

c.The lease period is equal to or greater than 75% of the estimated economic life of the asset.

At the beginning of the lease, the present value of the minimum lease payments equals or exceeds 90% of the fair value of the leased property to the lessor (less any investment, tax credits, realized by the lessor).

In case of a financial lease, practically all the risks incidental to the ownership of the asset and the benefits arising there from are transferred to the lessee, except the legal title which may or may not be eventually transferred. The lessee has also to bear costs of insurance, repairs and maintenance of the asset and other related expenses. The financial lease is also termed as 'Close-end lease" since the lease agreement, more or less is irrevocable and the rental payments are so fixed that they ensure return of the total investment at a pre-determined rate of return.

Operating Lease

a. The International Accounting Standard committee defines an operating lease as any lease other than a finance lease. An operating lease has the following characteristics
b. The lease term is significantly less than the economic life of the equipment.

c. The lessee enjoys the right to terminate the lease at short notice without any significant penalty.
d. The lessor usually provides the operating know-how, supplies the related services and undertakes the responsibility of insuring and maintaining the equipment, in which case the operating lease is called a 'Wet lease'.

An operating lease where the lessee bears the cost of insuring and maintaining the leased equipment is called a 'Dry lease'. The operating lease does not shift the equipment-related, business and technological risks from the lessor to lessee.

The lessor structuring an operating lease transaction has to depend upon multiple leases or on the realization of substantial resale value (on the expiry of first lease), to recover the investment cost plus reasonable rate of return thereon. Hence, to deal in operating leasing one requires an in-depth knowledge of the equipment and the resale market for such equipment. In our country, as the resale market for most of the used capital equipments is not active, operating leases are not very popular. Nevertheless, this form of lease is ideal for firms engaged in industries with a high degree of technological risk.

a. **Sale and Lease Back**

In case of a sale and lease back arrangement, a firm sells an asset to another person who in turn leases it back to the firm. The asset is generally sold at its market value. The firm receives the sale price in cash and gets the right to use the asset during the basic lease period. The firm makes periodic rental payments to the lessor. The title to the asset now vests with the lessor who is naturally also entitled to any residual value the asset might have at the end of the lease period.

The sale and lease backs arrangement is beneficial both for the lessor and the lessee. The lessee gets immediate cash which results in improvement in his cash flow position. The lessor gets the benefits in terms of tax credit due to depreciation. The sale and lease back arrangements are popular with the companies which are facing short-term crisis.

b.**Leveraged Leasing**

This form of leasing has become very popular in recent years. This type of lease agreement is used for financing those assets which require large capital outlays. Such a type of lease arrangement

involves three parties - the lessee, the lessor, and the lender. Under this arrangement, the lessor borrows funds from the lender and himself acts as an equity participant. Normally, the amount borrowed is substantial Vis-à-vis the funds provided by the lessor himself. The lessor services the debt out of lease rents received. The position of the lessee under a leveraged leasing agreement is the same as on case of any other type of lease. The position of the lessor, however, undergoes a change. The loan is generally secured by a mortgage on the asset besides assignment of the leased asset's rental payments.

c.**Primary and Secondary Lease**

The lease contract is sometimes divided into two parts, namely, primary lease and secondary lease. The primary lease provides for the recovery of the cost of the asset and profit through lease rentals during the initial years (say 4 to 5 years) of lease contract followed by the secondary/ perpetual lease at nominal lease rents. In other words, more lease rents are charged in the primary and less in the secondary period of the contract. These forms of lease contracts are also referred to as front-ended lease and back ended lease respectively

1. **Domestic Lease**

   If all parties to the lease transaction – the equipment supplier, lessor and lessee – are domiciled in the same country, it is a domestic lease.

2. **International Lease**

   If the parties to the lease agreement are living in different countries, the lease is an international lease. The term 'International leasing' covers three separate types of activities: Cross border leasing, overseas subsidiaries, and Import leasing.

3. **Cross Border Leasing**

   Leasing across national frontiers is cross border leasing. The cross border leasing exists where the lessee and lessor are domiciled in different countries. It includes export leasing.

4. **Overseas Subsidiaries**

   When a financial institution sets up leasing subsidiaries overseas, each conducting purely domestic business involving lessees in the same country they are called overseas subsidiaries.

5. **Import Leasing**

   It is an arrangement by which a leasing company, a manufacturing company or the government enters into an agreement with a foreign company to acquire sophisticated equipments on lease basis. In fact, this activity requires a lot of government support and suitable changes in the import regulations.

6. **In-House Leasing**

   When an industrial house promotes a leasing company for the benefit of companies in the same group, that company is known as 'In-house Company'. These companies are normally floated to take advantage of tax benefits and creating an additional source of finance through public issues by them. The in-house leasing companies enable the industrial house to claim greater amount of expenses as tax deductible charge than what it can claim otherwise. If the industrial house floats leasing company, it can charge depreciation on the leased assets in the books of the leasing company and lease rentals in the books of lessee as tax deductible charges. As such from the point of view of the industrial house as a whole the lease rentals as well as depreciation on the leased assets are claimed as tax deductible charges reducing the amount of taxable income.

7. **Hire Purchase vs Lease Financing**

   In case of a hire purchase transaction, the goods are delivered by the owner to another person on the agreement that such person pays the agreed amount in periodical installments. The property in the goods passes to such person only on the payment of the last installment. In a hire purchase transaction, therefore, theoretically the seller continues to retain the title to the asset. The ownership has, however, to ultimately pass to the buyer unless the buyer exercises the option not to buy the asset by stopping payments of future installments. The buyer can claim depreciation on the cost of the asset and interest as expense for tax purposes. On the other hand, in case of lease financing, the lease rent is deducted as an expense for tax purposes. Depreciation on the leased asset is claimed by the lessor.

In case of a hire purchase on completion of the contract, the residual value of the asset goes to the buyer. While in case of a lease financing, the residual value goes to the lessor, in case where the lessee has a right to cancel the arrangement as in the case of vehicles or air craft leases.

However, in case of a finance lease where the financing is made for purchase of equipment useful only to the lessee, there is no provision for cancellation of the lease agreement. In such a case, the residual value devolves on the lessee. The residual value in such a case is zero or if positive it will be treated as miscellaneous income and be subject to taxation.

Lease Evaluation

A leasing transaction has to beneficial both for the lessor and the lessee. Each one evaluates the transaction from his angle. In the following pages, we are explaining the techniques adopted by the concerned parties for evaluating a lease transaction.

Evaluation by Lessor

The Internal Rate of Return (IRR) is the most commonly adopted technique by the lessor evaluating lease transaction. Internal Rate of Return is that rate of return at which the sum of the discounted cash inflows equals the sum of discounted cash outflows. In other words, it is the rate which discounts the cash flows to 'zero'.

In case of a leasing transaction, the cash inflows are in the form of rentals received from the lessee, while the cash outflows are in the from of payments made by the lessor to the manufacturer or supplier of the leased asset. The internal rate of return is computed on the basis of these cash flows. It is then compared with the weighted average cost of capital of the lessor. In case the IRR is more than the weighted average cost of capital, the investment should be made.

The sources of long-term funds are mainly debt and equity. Dept capital consists of loans from banks/financial institutions, issue of debentures, etc. The equity capital represents the amount brought in by the shareholders and the earnings retained in the business. It may also be mentioned here that interest on debt is allowed as expenditure for tax purpose, while dividend on shares is not allowed as expenditure for tax purposes. The computation of cost of shareholders' funds is most cumbersome. Generally, it is calculated according to "Dividend plus growth approach".

Advantages of Leasing

Acquisition of capital assets generally needs substantial cash outlay. This is sometimes quite beyond the financial capacity of the actual user. Leasing serves as a source of long-term funds that can be used for acquisition of capital assets.

The basic advantages from leasing can be summarized as follows:

1. **Protects against obsolescence**: In case of ownership the firm bears the risk of the obsolescent of the asset. This dimension of potential risk is too important to be ignored and particularly in the present era of rapidly changing technologies. Leasing provides a cushion against all such hazards by shifting the risk of obsolescence of equipment of the lessor. This is particularly true of operating leases which are of short duration and cancelable at the option of the lessee.

2. **Faster and cheaper credit:** It has generally been found that acquisition of assets under a leasing arrangement is cheaper and faster as compared to acquisition of assets through any other source. Leasing companies are more accommodating than banks and financial institutions in respect of terms of financing. The rental payments are fixed keeping in view the expected profits and cash generation of individual lessees, which is generally not possible in the case of lending by banks and other similar institutions.

3. **Enhance liquidity:** Leasing arrangements enable the lessee to utilize more of his funds for working capital purposes in place of low yielding fixed assets. Moreover, acquisition of assets under lease arrangements does not alter the debt-equity ratio of the lessee. Hence, the lessee can resort to further borrowings in case the need arises.

4. **Boon for small firms:** Acquisition of assets by means of a leasing arrangement is particularly beneficial to small firms which cannot afford to raise their capacity on account of paucity of financial resources. It serves as a boon for technocrats who are unable to arrange funds even for promoters contribution or margin money as required by financial institutions.

5. **Absence of restrictive covenants:** The financial institutions while lending money usually attach several restrictions on the borrower as regards management, debt-equity norms, declaration of dividend, etc. Such restrictions are absolutely absent in the case of financing through a lease agreement.

Convenience and flexibility: If an asset is needed for a short period only, it does not seem to make much sense on the part of the firm first to spend time in selecting an asset, negotiating its purchase, arranging insurance, registration, etc. and then to repeat all these steps to resell the asset. Leasing obviates the need of this exercise and thus emerges out to be a very convenient and an inexpensive form of acquiring the use of services of the equipment.

Whole financing: Lease financing enables a firm to acquire the use of an asset without having to make a down payment for initial equity investment.

Tax benefits: Leasing finance provides enough opportunity for both lessor and lessee to gain in both income tax and sale tax. A lease payment is tax deductible. If an asset is purchased, it must be capitalized, and the annual depreciation charge is deducted as a tax-deductible item. Sales tax will be paid by the lessor as the equipment is bought by him. But later on, under financial lease he can claim a part of the sales tax from the lessee, when the equipment is transferred to the lessee. The lessee will be paying the sales tax on lesser amount. This is so because by the time the property or equipment is sold to him, its value gets reduced.

Disadvantages of Leasing

Acquisition of assets through leasing arrangements also results in certain disadvantages, as listed below.

1. **Deprived of ownership**: The lessee has only the right to use the asset as the ownership lies with the lessor. If the lessor's financial condition deteriorates or if the leasing company is wound up, the lessee may be deprived of the use of equipment interrupting its normal manufacturing operations.
2. **No scope for modernization:** Under the lease, the lessee is generally prohibited from making alterations/improvements on the leased asset without the prior approval of the lessor. It may cause problems to the lessee if the lesser disapproves of his plan the lesser may impose certain restrictive conditions, sometimes, regarding the use of the asset, say, number of hours the equipment may be put to use and so on.
    - **In case of default:** In case the lessee makes a default in rental payments, the lessor is entitled, at his will, to take over the asset and the lessee has no right to prevent him

from doing so. In case of a financial lease arrangement, the lessor may also file a suit against the lessee for damages.

- **Costly:** Compared to term loans by banks, lease finance is costlier. If there is no investment allowance, the lease transactions bring tax loss. At the termination of the lease agreement, the asset is taken by the lessor and the lessee will lose the residual value.

UNIT-V
FINANCING DECISIONS

UNIT-V

FINANCING DECISIONS

A merger/amalgamation refers to a combination of two or more companies into one company. One or more companies may merge with an existing company or they may merge to form a new company. Laws in India use the term amalgamation for merger for example, Section 2 (IA) of the Income Tax Act, 1961 defines amalgamation as the merger of one or more companies (called amalgamating company or companies) with another company (called amalgamated company) or the merger of two or more companies to form a new company in such a way that all assets and liabilities of the amalgamating company or companies become assets and liabilities of the amalgamated company and shareholders holding not less than nine-tenths in value of the shares in the amalgamating company or companies become shareholders of the amalgamated company. After this, the term merger and acquisition will be used interchangeably. Merger or amalgamation may take two forms: merger through absorption, merger through consolidation. Absorption is a combination of two or more companies into an existing company. All companies except one lose their identity in a merger through absorption. For example, absorption of Tata Fertilisers Ltd. (TFL) by Tata Chemical Limited (TCL). Consolidation is a combination of two or more companies into a new company. In this form of merger, all companies are legally dissolved and new company is created for example Hindustan Computers Ltd., Hindustan Instruments Limited, Indian Software Company Limited and Indian Reprographics Ltd. Lost their existence and creates a new entity HCL Limited.

Types of Mergers

Mergers may be classified into the following three types- (i) horizontal, (ii) vertical and (iii) conglomerate.

Horizontal Merger

Horizontal merger takes place when two or more corporate firms dealing in similar lines of activities combine together. For example, merger of two publishers or two luggage manufacturing companies. Elimination or reduction in competition, putting an end to price cutting, economies of scale in production, research and development, marketing and management are the often cited motives underlying such mergers.

Vertical Merger

Vertical merger is a combination of two or more firms involved in different stages of production or distribution. For example, joining of a spinning company and weaving company. Vertical merger may be forward or backward merger. When a company combines with the supplier of material, it is called backward merger and when it combines with the customer, it is known as forward merger. The main advantages of such mergers are lower buying cost of materials, lower distribution costs, assured supplies and market, increasing or creating barriers to entry for competitors etc

Conglomerate merger

Conglomerate merger is a combination in which a firm in one industry combines with a firm from an unrelated industry. A typical example is merging of different businesses like manufacturing of cement products, fertilisers products, electronic products, insurance investment and advertising agencies. Voltas Ltd. is an example of a conglomerate company. Diversification of risk constitutes the rationale for such mergers.

Advantages of merger and acquisition

The major advantages of merger/acquisitions are mentioned below:

Economies of Scale: The operating cost advantage in terms of economies of scale is considered to be the primary objective of mergers. These economies arise because of more intensive utilisation of production capacities, distribution networks, engineering services, research and development facilities, data processing system etc. Economies of scale are the most prominent in the case of horizontal mergers. In vertical merger, the principal sources of benefits are improved coordination of activities, lower inventory levels.

Synergy: It results from complementary activities. For examples, one firm may have financial resources while the other has profitable investment opportunities. In the same manner, one firm may have a strong research and development facilities. The merged concern in all these cases will be more effective than the individual firms combined value of merged firms is likely to be greater than the sum of the individual entities.

Strategic benefits: If a company has decided to enter or expand in a particular industry through acquisition of a firm engaged in that industry, rather than dependence on internal expansion, may offer

several strategic advantages: (i) it can prevent a competitor from establishing a similar position in that industry; (ii) it offers a special timing advantages, (iii) it may entail less risk and even less cost.

Tax benefits: Under certain conditions, tax benefits may turn out to be the underlying motive for a merger. Suppose when a firm with accumulated losses and unabsorbed depreciation mergers with a profit-making firm, tax benefits are utilised better. Because its accumulated losses/unabsorbed depreciation can be set off against the profits of the profit-making firm.

Utilisation of surplus funds: A firm in a mature industry may generate a lot of cash but may not have opportunities for profitable investment. In such a situation, a merger with another firm involving cash compensation often represent a more effective utilisation of surplus funds.

Diversification: Diversification is yet another major advantage especially in conglomerate merger. The merger between two unrelated firms would tend to reduce business risk, which, in turn reduces the cost of capital (K_0) of the firm's earnings which enhances the market value of the firm.

Financing techniques in merger/acquisition

After the value of a firm has been determined on the basis of the preceding analysis, the next step is the choice of the method of payment to the acquired firm. The choice of financial instruments and techniques in acquiring a firm usually has an effect on the purchasing agreement. The payment may take the form of either cash or securities, i.e., ordinary shares, convertible securities, deferred payment plans and tender offers.

Ordinary shares financing: When a company is considering to use ordinary shares to finance a merger, the Relative Price-Earnings (P/E) ratios of two firms are an important consideration. For instance, for a firm having a high P/E ratio, ordinary shares represent an ideal method for financing mergers and acquisitions. Similarly, the ordinary shares are more advantageous for both companies when the firm to be acquired has low P/E ratio.

Debt and Preference Shares Financing: From the foregoing it is clear that financing of mergers and acquisitions with equity shares is advantageous both to the acquiring firm and the acquired firm when the P/E ratio is high. Since, however, some firms may have a relatively lower P/E ratio as also the

requirement of some investors might be different, the other types of securities, in conjunction with/in lieu of equity shares, may be used for the purpose.

Deferred Payment Plan: Under this method, the acquiring firm, besides making initial payment, also undertakes to make additional payment in future years to the target firm in the event of the former being able to increase earnings consequent also known as earn-out plan.

Tender Offer: An alternative approach to acquire another firm is the tender offer. A tender offer, as a method of acquiring firms, involves a bid by the acquiring firm for controlling interest in the acquired firm.

Regulations of mergers and takeovers in India

Mergers and acquisitions may degenerate into the exploitation of shareholders, particularly minority shareholders. They may also stifle competition and encourage monopoly and monopolistic corporate behaviour. Therefore, most countries have legal framework to regulate the merger and acquisition activities. In India, mergers and acquisitions are regulated through the provision of the Companies Act, 1956, the Monopolies and Restrictive Trade Practice (MRTP) Act, 1969, the Foreign Exchange Regulation Act (FERA), 1973, the Income Tax Act, 1961, and the Securities and Controls (Regulations) Act, 1956. The Securities and Exchange Board of India (SEBI) has issued guidelines to regulate mergers, acquisitions and takeovers.

Legal measures against takeovers

The Companies Act restricts an individual or a company or a group of individuals from acquiring shares, together with the shares held earlier, in a public company to 25 per cent of the total paid-up capital. Also, the Central Government needs to be intimated whenever such holding exceeds 10 per cent of the subscribed capital. The Companies Act also provides for the approval of shareholders and the Central Government when a company, by itself or in association of an individual or individuals purchases shares of another company in excess of its specified limit. The approval of the Central Government is necessary if such investment exceeds 10 per cent of the subscribed capital of another company. These are precautionary measures against the takeover of public limited companies.

Refusal to register the transfer of shares

In order to defuse situation of hostile takeover attempts, companies have been given power to refuse to register the transfer of shares. If this is done, a company must inform the transferee and the transferor within 60 days. A refusal to register transfer is permitted if:

- A legal requirement relating to the transfer of shares have not be complied with; or
- The transfer is in contravention of the law; or
- The transfer is prohibited by a court order; or
- The transfer is not in the interests of the company and the public.

Protection of minority shareholders' interests

In a takeover bid, the interests of all shareholders should be protected without a prejudice to genuine takeovers. It would be unfair if the same high price is not offered to all the shareholders of prospective acquired company. The large shareholders (including financial institutions, banks and individuals) may get most of the benefits because of their accessibility to the brokers and the takeover dealmakers. Before the small shareholders know about the proposal, it may be too late for them. The Companies Act provides that a purchaser can force the minority shareholder to sell their shares if:

The offer has been made to the shareholders of the company;

The offer has been approved by at least 90 per cent of the shareholders of the company whose transfer is involved, within 4 months of making the offer; and The minority shareholders have been intimated within 2 months from the expiry of 4 months referred above.

The purchaser is already in possession of more than 90 per cent of the aggregate value of all the shares of the company, the transfer of the shares of minority shareholders is possible if:

- The purchaser offers the same terms to all shareholders and
- The tenders who approve the transfer, besides holding at least 90 per cent of the value of shares, should also form at least 75 per cent of the total holders of shares.

SEBI guidelines for takeovers

The salient features of some of the important guidelines as follows:

Disclosure of share acquisition/holding: Any person who acquires 5% or 10% or 14% shares or voting rights of the target company, should disclose of his holdings at every stage to the target company and the Stock Exchanges within 2 days of acquisition or receipt of intimation of allotment of shares.

Any person who holds more than]5% but less than 75% shares or voting rights of target company, and who purchases or sells shares aggregating to 2% or more shall within 2 days disclose such purchase or sale along with the aggregate of his shareholding to the target company and the Stock Exchanges.

Any person who holds more than 15% shares or voting rights of target company and a promoter and person having control over the target company, shall within 21 days from the financial year ending March 31 as well as the record date fixed for the purpose of dividend declaration, disclose every year his aggregate shareholding to the target company.

Public announcement and open offer: An acquirer who intends to acquire shares which along with his existing shareholding would entitle him to exercise] 5% or more voting rights, can acquire such additional shares only after making a public announcement to acquire at least additional 20% of the voting capita] of target company from the shareholders through an open offer.

An acquirer who holds 15% or more but less than 75% of shares or voting rights of a target company, can acquire such additional shares as would entitle him to exercise more than 5% of the voting rights in any financial year ending March 31 only after making a public announcement to acquire at least additional 20% shares of target company from the shareholders through an open offer.

An acquirer, who holds 75% shares or voting rights of a target company, can acquire further shares or voting rights only after making a public announcement to acquire at least additional 20% shares of Target Company from the shareholders through an open offer.

Offer price: The acquirer is required to ensure that all the relevant parameters are taken into consideration while determining the offer price and that justification for the same is disclosed in the letter of offer. The relevant parameters are:

- Negotiated price under the agreement which triggered the open offer.
- Price paid by the acquirer for acquisition, if any, including by way of allotment in a public or rights or preferential issue during the twenty six week period prior to the date of public announcement, whichever is higher.
- The average of the weekly high and low of the closing prices of the shares of the target company as quoted on the stock exchange where the shares of the company are most frequently traded during the twenty six weeks or the average of the daily high and low prices of the shares as quoted on the stock exchange where the shares of the company are most frequently traded during the two weeks preceding the date of public announcement, whichever is higher.

In case the shares of Target Company are not frequently traded then parameters based on the fundamentals of the company such as return on net worth of the company, book value per share, EPS etc. are required to be considered and disclosed.

Disclosure: The offer should disclose the detailed terms of the offer, identity of the offerer, details of the officer's existing holdings in the offered company etc. and the information should be made available to all the shareholders at the same time and in the same manner.

Offer document: The offer document should contain the offer's financial information, its intention to continue the offered company's business and to make major change and long-term commercial justification for the offer.

The objectives of the Companies Act and the guidelines for takeover are to ensure full disclosure about the mergers and takeovers and to protect the interests of the shareholders, particularly the small shareholders. The main thrust is that public authorities should be notified within two days.

In a nutshell, an individual or company can continue to purchase the shares without making an offer to other shareholders until the shareholding exceeds 10 per cent. Once the offer is made to other shareholders, the offer price should not be less than the weekly average price in the past 6 months or the negotiated price.

Financial problems after merger and acquisition

After merger and consolidation the companies face a number of financial problems. The liquidity of the companies has to be established afresh. The merging and consolidating companies pursue their own financial policies when they are working independently. A number of adjustments are required to be made in financial planning and policies so that consolidated efforts may enable to improve short-term and long-term finances of the companies. Some of the financial problems of merging and consolidating companies are discussed as follows:

Cash Management: The liquidity problem is the usual problem faced by acquiring companies. Before merger and consolidation, the companies had their own methods of payments, cash behavior patterns and arrangements with financial institutions. The cash pattern will have to be adjusted according to the present needs of the business.

Credit Policy: The credit policies of the companies are unified so that same terms and conditions may be applied to the customers. If the market areas of the companies are different, then same old policies may be followed. The problem will arise only when operating areas of the companies are the same and same credit policy will have to be pursued.

Financial Planning: The companies may be following different financial plans before merger and consolidation. The methods of budgeting and financial controls may also be different. After merger and consolidation, a unified financial planning is followed. The divergent financial controls will be unified to suit the needs of the acquiring concerns.

Dividend Policy: The companies may be following different policies for paying dividend. The stockholders will be expecting higher rates of dividend after merger and consolidation on the belief that financial position and earning capacity has increased after combining the resources of the companies. This is a ticklish problem and management will have to devise an acceptable pay-out policy. In the earlier stages of merger and consolidation it may be difficult to maintain even the old rates of dividend.

Depreciation Policy: The companies follow different depreciation policies. The methods of depreciation, the rates of depreciation, and the amounts to be taken to revenue accounts will be different. After merger and consolidation the first thing to be decided will be about the depreciable and non-depreciable assets. The second will be about the rates of depreciation. Different assets will be in different stages of use and appropriate amounts of depreciation should be decided.