

**SUBJECT-Engineering Economics**

**SEM-3<sup>rd</sup>**

**BRANCH-Mechanical,Civil**

**MODULE-III & IV**

**Prepared By-Mr.Sumanta Kumar Das**

## Inflation

Inflation refers to the rise in the prices of most goods and services of daily or common use, such as food, clothing, housing, recreation, transport, consumer staples, etc. Inflation measures the average price change in a basket of commodities and services over time. The opposite and rare fall in the price index of this basket of items is called 'deflation'. Inflation is indicative of the decrease in the purchasing power of a unit of a country's currency. This is measured in percentage.

### Types of Inflation

- (a) Demand Pull Inflation      (b) Cost-Push Inflation      (c) Open Inflation      (d) Repressed Inflation  
(e) Hyper-Inflation      (f) Creeping and Moderate Inflation      (g) True Inflation      (h) Semi-Inflation

### Demand Pull Inflation

This is when the aggregate demand in an economy exceeds the aggregate supply. This increase in the aggregate demand might occur due to an increase in the money supply or income or the level of public expenditure.

This concept is associated with full employment when altering the supply is not possible. Take a look at the graph below:

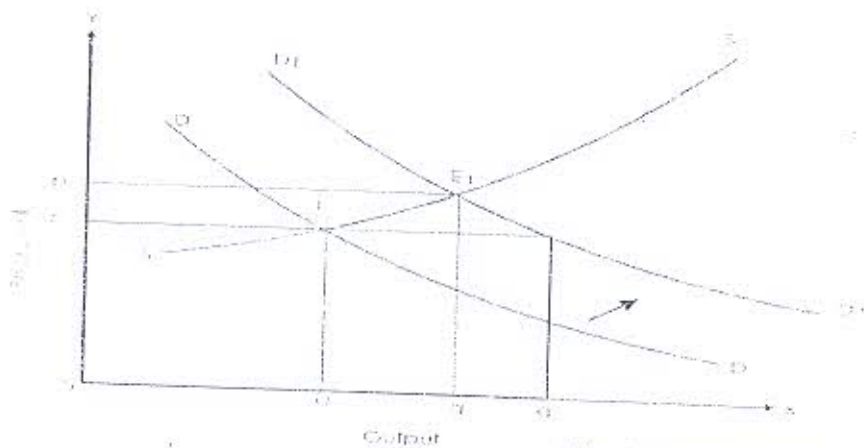


Fig. 1 - Demand Pull Inflation

In the graph above, SS is the aggregate supply curve and DD is the aggregate demand curve. Further,

- $O_p$  is the equilibrium price
- $O_q$  is the equilibrium output

Exogenous causes shift the demand curve to the right to  $D_1D_1$ . Therefore, at the current price ( $O_p$ ), the demand increases by  $qq_2$ . However, the supply is  $O_q$ .

Hence, the excess demand for  $qq_2$  puts pressure on the price, increasing it to  $O_{p1}$ . Therefore, there is a new equilibrium at this price, where demand equals supply. As you can see, the excess demand is eliminated as follows:

- The price rises which leads to a fall in demand and a rise in supply.

### Favourable Impacts of Inflation

The favourable impacts of inflation are as follows:

### **(i) Higher Profits**

Inflation, usually, benefits the producers of products. They experience better profits since they can sell their products at higher prices.

### **(ii) Better Investment Returns**

During inflation, investors and entrepreneurs receive added incentives for investing in productive activities. Therefore, they receive better returns.

### **(iii) Increase in Production**

Once the producers receive the right investment, they create more goods and services. Hence, inflation leads to an increase in production of products/services.

### **(iv) More Employment and Better Income**

Since production increases, there is an increased demand for the various factors of production, including manpower. Therefore, employment and income increases during inflation.

### **(v) Shareholders can earn a good income**

If a company earns higher profits, which is possible during inflation, it can declare dividends to its shareholders. Thus, the shareholders can experience a rise in their dividend income during inflationary periods.

### **(vi) Benefits to Borrowers**

During inflation, the purchasing power of money decreases. Therefore, if the borrower is paying a rate of interest which is less than the inflation rate, then he gains in the process. This is because the real value of the money that the borrower returns is actually less than that of the money borrowed.

## **Unfavourable Impacts of Inflation**

The unfavourable impacts of inflation are as follows:

### **(i) Fixed-Income Groups experience a fall in income**

The true income of an individual is the purchasing power of his money income

For people belonging to the fixed-income group like salaried individuals, pensioners, etc. this means that they will experience a fall in real income. In other words, their purchasing power will reduce.

### **(ii) Inequality in Income Distribution Increases**

During inflation, businessmen and entrepreneurs experience an increase in profits. On the other hand, people belonging to the fixed-income groups experience a decline in their real income. Hence, the inequality in income distribution becomes acute during this period.

### **(iii) Upsets the Planning Process**

During inflation, the prices of goods, raw materials, and factor services increase. Therefore, the Government has to spend more money to complete any investment project taken up during the planning period.

If the Government fails to raise more financial resources through savings or taxation, then it upsets the entire planning process.

#### (iv) Speculative Investment Increases

Let's say that the price levels are rising at a very fast rate. People are unsure about how much the prices will rise in the next few weeks or months. In such cases, many people start speculative investments.

For example, they might start purchasing shares, gems, land, etc. just for speculative purposes. This is done with the objective of earning quick profits. Such investments do not help in creating productive capital in the economy.

#### (v) Harmful Effects on Capital Accumulation

Let's say that rising prices become chronic in an economy. During such periods, people start preferring goods to money since the real value of money will fall in the future. Also, people start preferring immediate consumption to consumption in the future.

Therefore, the general desire to save starts reducing. As the willingness and ability to save reduces, the amount of funds available for further investment reduces too. Therefore, the overall impact on the capital accumulation of the economy is negative since capital accumulation in an economy depends on the growth of investment.

#### (vi) Lenders face Losses

Under favourable impacts of inflation, we mentioned that borrowers benefit from inflation. Therefore, lenders stand a chance of losing during such periods. This is because they receive an amount having lower purchasing power than the amount loaned.

#### (vii) Negative Impact on Export Income

Since the prices of raw materials and factors of production increase, the prices of export items also increase during inflation. Hence, their demand in the foreign markets might fall which leads to a fall in the export income of the country.

### Cost-Push Inflation

Supply can also cause inflationary pressure. If the aggregate demand remains unchanged but the aggregate supply falls due to exogenous causes, then the price level increases. Take a look at the graph below:

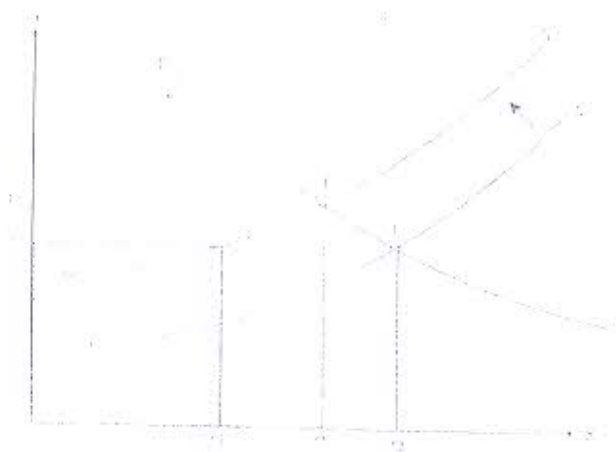


Fig. 2 - Cost-Push Inflation

In the graph above, the equilibrium price is  $O_p$  and the equilibrium output is  $O_q$ . If the aggregate supply falls, the supply curve  $SS$  shifts left to reach  $S1S1$ .

Now, at the price  $O_p$ , the demand is  $O_q$  but the supply is  $O_{q2}$  which is lesser than  $O_q$ . Therefore, the prices are pushed high till a new equilibrium is reached at  $O_{p1}$ .

#### At What are the main causes of Demand-Pull Inflation?

1. A **depreciation of the exchange rate** increases the price of imports and reduces the foreign price of a country's exports. If consumers buy fewer imports, while exports grow,  $AD$  will rise – and there may be a multiplier effect on the level of demand and output
2. **Higher demand from a fiscal stimulus** e.g. lower direct or indirect taxes or higher government spending. If direct taxes are reduced, consumers have more disposable income causing demand to rise. Higher government spending and increased borrowing creates extra demand in the circular flow
3. **Monetary stimulus to the economy:** A fall in interest rates may stimulate too much demand – for example in raising demand for loans or in leading to house price inflation. Monetarist economists believe that inflation is caused by “too much money chasing too few goods” and that governments can lose control of inflation if they allow the financial system to expand the money supply too quickly.
4. **Fast growth in other countries** – providing a boost to UK exports overseas. Export sales provide an extra flow of income and spending into the UK circular flow – so what is happening to the economic cycles of other countries definitely affects the UK

#### Cost-push inflation

Cost-push inflation occurs when firms respond to **rising costs** by increasing prices in order to **protect their profit margins**.

There are many reasons why costs might rise:

1. **Component costs:** e.g. an increase in the prices of raw materials and other components. This might be because of a rise in commodity prices such as oil, copper and agricultural products used in food processing. A recent example has been a surge in the world price of wheat.
2. **Rising labour costs** - caused by wage increases, which are greater than improvements in productivity. Wage costs often rise when unemployment is low because skilled workers become scarce and this can drive pay levels higher. Wages might increase when people **expect higher inflation** so they ask for more pay in order to protect their real incomes. Trade unions may use their bargaining power to bid for and achieve increasing wages, this could be a cause of cost-push inflation
3. **Expectations of inflation** are important in shaping what actually happens to inflation. When people see prices are rising for everyday items they get concerned about the effects of inflation on their real standard of living. One of the dangers of a pick-up in inflation is what the Bank of England calls “**second-round effects**” i.e. an initial rise in prices triggers a burst of higher pay claims as workers look to protect their way of life. This is also known as a “wage-price effect”

## Methods of Measuring National Income:

There are four methods of measuring national income. Which method is to be used depends on the availability of data in a country and the purpose in hand.

### (1) Product Method:

According to this method, the total value of final goods and services produced in a country during a year is calculated at market prices. To find out the GNP, the data of all productive activities, such as agricultural products, wood received from forests, minerals received from mines, commodities produced by industries, the contributions to production made by transport, communications, insurance companies, lawyers, doctors, teachers, etc. are collected and assessed at market prices. Only the final goods and services are included and the intermediary goods and services are left out.

### (2) Income Method:

According to this method, the net income payments received by all citizens of a country in a particular year are added up, i.e. net incomes that accrue to all factors of production by way of net rents, net wages, net interest and net profits are added together but incomes received in the form of transfer payments are not included in it. The data pertaining to income are obtained from different sources, for instance, from income tax department in respect of high income groups and in case of workers from their wage bills.

### (3) Expenditure Method:

According to this method, the total expenditure incurred by the society in a particular year is added together and includes personal consumption expenditure, net domestic investment, government expenditure on goods and services, and net foreign investment. This concept is based on the assumption that national income equals national expenditure.

### (4) Value Added Method:

Another method of measuring national income is the value added by industries. The difference between the value of material outputs and inputs at each stage of production is the value added. If all such differences are added up for all industries in the economy, we arrive at the gross domestic product.

## Banking

A **bank** is a financial institution that accepts deposits from the public and creates credit.<sup>[1]</sup> Lending activities can be performed either directly or indirectly through capital markets. Due to their importance in the financial system and influence on national economies, banks are highly regulated in most countries. Most nations have institutionalized a system known as fractional reserve banking under which banks hold liquid assets equal to only a portion of their current liabilities. In addition to other regulations intended to ensure liquidity, banks are generally subject to minimum capital requirements based on an international set of capital standards, known as the Basel Accords.

The word *bank* was borrowed in Middle English from Middle French *banque*, from Old Italian *banca*, meaning "table from Old High German *bank*, *bank* "bench, counter". Benches were used as makeshift desks or exchange counters during the Renaissance by Jewish<sup>[10]</sup> Florentine bankers, who used to make their transactions atop desks covered by green tablecloths.

### Types of Banks:

Banks are of various types which are explained as under

#### 1. Commercial Banks:

Commercial banks are those banks which perform all kinds of banking functions such as accepting deposits, advancing loans, credit creation, and agency functions. They are also called joint stock banks because they are organised in the same manner as joint stock companies.

They usually advance short-term loans to customers. Of late, they have started giving medium term and long-term loans also. In India 20 major commercial banks have been nationalised, whereas in developed countries they are run like joint stock companies in the private sector. Some of the commercial banks in India are Andhra Bank, Canara Bank, Indian Bank, Punjab National Bank, etc.

#### 2. Exchange Banks:

Exchange banks are those banks which deal in foreign exchange and specialise in financing foreign trade. They are called foreign exchange banks. In India, these exchange banks have their head offices located outside India. The Chartered Bank and the Brindlays Bank have their head offices in England, whereas the American Express Bank, and Citi Bank have their head offices in the USA. These banks also render other services such as collecting and supplying information about the foreign customers, providing remittance facilities etc.

#### 3. Industrial Banks:

Industrial banks are those banks which provide medium term and long-term finance to industries for the purchase of land, machinery etc. They underwrite the debentures and shares of industries and also subscribe to them. In India, there are a number of financial institutions which perform the functions of industrial banks such as Industrial Development Bank of India, Industrial Finance Corporation of India, Industrial Credit and Investment Corporation of India, etc. Each State in India has its own State Financial Corporation. These institutions are also known as Development Banks.

#### 4. Agricultural Banks:

Agricultural banks are those banks which provide credit to farmers for short-term, medium-term and long-term needs. In India, commercial banks, regional rural banks and Agricultural Cooperative Banks provide short-term loans to farmers. Land Development Bank give medium-term and long-term loans to farmers on the mortgage of their land. The National Bank for Agriculture and Rural Development (NABARD) provides refinance facilities to all types of banks which give loans to agriculturists.

#### 5. Cooperative Banks:

Cooperative banks are those financial institutions which are organised on the principle of cooperation. They provide short-term and medium-term loans to their members. In rural areas, there are agricultural cooperative banks which accept deposits and give loans to agriculturists, rural artisans, etc.

In urban areas, there are also cooperative banks which perform the functions of ordinary commercial banks but give loans to their members only. There is a State Cooperative Bank in every state of India with its branches at the district level known as the Central Cooperative Bank. The Central Cooperative Bank, in turn, has its branches both in urban and rural areas.

Every State Cooperative bank is an apex bank which provides credit facilities to the Central Cooperative Banks. It mobilises financial resources from the richer sections of the urban population by accepting deposits and creating credit like commercial banks and borrowing from the money market. It also gets funds from the Reserve Bank of India.

#### 6. Savings Banks:

Savings banks help promote small savings, and mobilise them. They have been very successful in Japan and Germany. In India, post offices act as savings bank.

#### 7. Central Bank:

The central bank is the apex bank in a country which controls its monetary and banking structure. It is owned by the government of the country and operates in national interest. It regulates and issues currency, performs banking and agency services for the state, keeps cash reserves of commercial banks, keeps and manages international currency, acts as the lender of the last resort, acts as a clearing house, and controls the flow of credit. The Reserve Bank of India is the Central bank in India.

#### Meaning of Commercial Banks:

A commercial bank is a financial institution which performs the functions of accepting deposits from the general public and giving loans for investment with the aim of earning profit.

#### (A) Primary Functions:

##### 1. It accepts deposits:

A commercial bank accepts deposits in the form of current, savings and fixed deposits. It collects the surplus balances of the individuals, firms and finances the temporary needs of commercial transactions. The first task is, therefore, the collection of the savings of the public. The bank does this by accepting deposits from its customers. Deposits are the lifeline of banks.

#### Deposits are of three types as under:

##### (i) Current account deposits:

Such deposits are payable on demand and are, therefore, called demand deposits. These can be withdrawn by the depositors any number of times depending upon the balance in the account. The bank does not pay any interest on these deposits but provides cheque facilities. These accounts are generally maintained by businessmen and industrialists who receive and make business payments of large amounts through cheques.

##### (ii) Fixed deposits (Time deposits):

Fixed deposits have a fixed period of maturity and are referred to as time deposits. These are deposits for a fixed term, i.e., period of time ranging from a few days to a few years. These are neither payable on demand nor they enjoy cheque facilities.

They can be withdrawn only after the maturity of the specified fixed period. They carry higher rate of interest. They are not created as a part of money supply. Recurring deposit in which a regular deposit of an agreed sum is made is also a variant of fixed deposits.

### (ii) Savings account deposits:

These are deposits whose main objective is to save. Savings account is most suitable for individual households. They combine the features of both current account and fixed deposits. They are payable on demand and also withdrawable by cheque. But bank gives this facility with some restrictions, e.g., a bank may allow four or five cheques in a month. Interest paid on savings account deposits is lesser than that of fixed deposit.

## 2. It gives loans and advances:

The second major function of a commercial bank is to give loans and advances particularly to businessmen and entrepreneurs and thereby earn interest. This is, in fact, the main source of income of the bank. A bank keeps a certain portion of the deposits with itself as reserve and gives (lends) the balance to the borrowers as loans and advances in the form of cash credit, demand loans, short-run loans, overdraft as explained under.

### (i) Cash Credit:

An eligible borrower is first sanctioned a credit limit and within that limit he is allowed to withdraw a certain amount on a given security. The withdrawing power depends upon the borrower's current assets, the stock statement of which is submitted by him to the bank as the basis of security. Interest is charged by the bank on the drawn or utilised portion of credit (loan).

### (ii) Demand Loans:

A loan which can be recalled on demand is called demand loan. There is no stated maturity. The entire loan amount is repaid in lump sum by crediting it to the loan account of the borrower. Those like security brokers whose credit needs fluctuate generally, take such loans on personal security and financial assets.

### (iii) Short-term Loans:

Short-term loans are given against some security as personal loans to finance working capital or as priority sector advances. The entire amount is repaid either in one instalment or in a number of instalments over the period of loan.

### Investment:

Commercial banks invest their surplus fund in 3 types of securities:

(i) Government securities, (ii) Other approved securities and (iii) Other securities. Banks earn interest on these securities.

## (B) Secondary Functions:

Apart from the above-mentioned two primary (major) functions, commercial banks perform the following secondary functions also.

### 3. Discounting bills of exchange or hundies:

A bill of exchange represents a promise to pay a fixed amount of money at a specific point of time in future. It can also be encashed earlier through discounting process of a commercial bank. Alternatively, a bill of exchange is a document acknowledging an amount of money owed in consideration of goods received. It is a paper asset signed by the debtor and creditor for a fixed amount payable on a fixed date. It works like this.

Suppose, A buys goods from B, he may not pay B immediately but instead give B a bill of exchange stating the amount of money owed and the time when A will settle the debt. Suppose, B wants the money immediately, he will present the bill of exchange (Hundi) to the bank for discounting. The bank will deduct the commission and pay to B the present value of the bill. When the bill matures after specified period, the bank will get payment from A.

### 4. Overdraft facility:

An overdraft is an advance given by allowing a customer keeping current account to overdraw his current account up to an agreed limit. It is a facility to a depositor for overdrawing the amount than the balance amount in his account.

In other words, depositors of current account make arrangement with the banks that in case a cheque has been drawn by them which are not covered by the deposit, then the bank should grant overdraft and honour the cheque. The security for overdraft is generally financial assets like shares, debentures, life insurance policies of the account holder, etc.

## 5. Agency functions of the bank:

The bank acts as an agent of its customers and gets commission for performing agency functions as under:

### (i) Transfer of funds:

It provides facility for cheap and easy remittance of funds from place-to-place through demand drafts, mail transfers, telegraphic transfers, etc.

### (ii) Collection of funds:

It collects funds through cheques, bills, hundies and demand drafts on behalf of its customers.

**(iii) Payments of various items:**

It makes payment of taxes, insurance premium, bills, etc. as per the directions of its customers.

**(iv) Purchase and sale of shares and securities:**

It buys sells and keeps in safe custody securities and shares on behalf of its customers.

(v) Collection of dividends, interest on shares and debentures is made on behalf of its customers.

(vi) Acts as Trustee and Executor of property of its customers on advice of its customers.

**(vii) Letters of References:**

It gives information about economic position of its customers to traders and provides similar information about other traders to its customers.

**6. Performing general utility services:**

The banks provide many general utility services, some of which are as under:

(i) Traveller's cheques .The banks issue traveler's cheques and gift cheques.

(ii) Locker facility. The customers can keep their ornaments and important documents in lockers for safe custody.

(iii) Underwriting securities issued by government, public or private bodies.

(iv) Purchase and sale of foreign exchange (currency).

**Central Bank:-**

**Definition:** A central bank is an independent national authority that conducts monetary policy, regulates banks, and provides financial services including economic research. Its goals are to stabilize the nation's currency, keep unemployment low, and prevent inflation.

Most central banks are governed by a board consisting of its member banks. The country's chief elected official appoints the director.

According to Kent, "Central Bank may be defined as an institution which is charged with the responsibility of managing the expansion and contraction of the volume of money in the interest of general public welfare."

According to Bank of International Settlement, "A Central Bank is the bank in any country to which has been entrusted the duty of regulating the volume of currency and credit in that country."

**Functions of Central Bank**



Figure-2: Different Functions of a Central Bank

**(a) Traditional Functions:**

Refer to functions that are common to all central banks in the world.

The traditional functions of the central bank include the following:

**(i) Bank of issue:**

possesses an exclusive right to issue notes (currency) in every country of the world. In the initial years of banking, every bank enjoyed the right of issuing notes. However, this led to a number of problems, such as notes were over-issued and the currency system became disorganized. Therefore, the governments of different countries authorized central banks to issue notes. The issue of notes by one bank has led to uniformity in note circulation and balance in money supply.

**(ii) Government's banker, agent, and advisor:**

Implies that a central bank performs different functions for the government. As a banker, the central bank performs banking functions for the government as commercial banks performs for the public by accepting the government deposits and

granting loans to the government. As an agent, the central bank manages the public debt, undertakes the payment of interest on this debt, and provides all other services related to the debt.

As an advisor, the central bank gives advice to the government regarding economic policy matters, money market, capital market, and government loans. Apart from this, the central bank formulates and implements fiscal and monetary policies, regulate the supply of money in the market and control inflation.

**(iii) Custodian of cash reserves of commercial banks:**

Implies that the central bank takes care of the cash reserves of commercial banks. Commercial banks are required to keep certain amount of public deposits as cash reserve, with the central bank, and other part is kept with commercial banks themselves.

The percentage of cash reserves is decided by the central bank! A certain part of these reserves is kept with the central bank for the purpose of granting loans to commercial banks. Therefore, the central bank is also called banker's bank.

**(iv) Custodian of international currency:** Implies that the central bank maintains a minimum reserve of international currency. The main aim of this reserve is to meet emergency requirements of foreign exchange and overcome adverse requirements of deficit in balance of payments.

**(v) Bank of rediscount:** Serve the cash requirements of individuals and businesses by rediscounting the bills of exchange through commercial banks. This is an indirect way of lending money to commercial banks by the central bank. Discounting a bill of exchange implies acquiring the bill by purchasing it for the sum less than its face value.

Rediscounting implies discounting a bill of exchange that was previously discounted. When owners of bill of exchange are in need of cash they approach the commercial bank to discount these bills. If commercial banks are themselves in need of cash they approach the central bank to rediscount the bills.

**(vi) Lender of last resort:** Refer to the most crucial function of the central bank. The central bank also lends money to commercial banks. Instead of rediscounting of bills, the central bank provides loans against treasury bills, government securities, and bills of exchange.

**(vii) Bank of central clearance, settlement, and transfer:**

Implies that the central bank helps in settling mutual indebtedness between commercial banks. Depositors of banks give checks and demand drafts drawn on other banks. In such a case, it is not possible for banks to approach each other for clearance, settlement, or transfer of deposits.

The central bank makes this process easy by setting a clearing house under it. The clearing house acts as an institution where mutual indebtedness between banks is settled. The representatives of different banks meet in the clearing house to settle inter-bank payments. This helps the central bank to know the liquidity state of the commercial banks.

**(viii) Controller of Credit:**

Implies that the central bank has power to regulate the credit creation by commercial banks. The credit creation depends upon the amount of deposits, cash reserves, and rate of interest given by commercial banks. All these are directly or indirectly controlled by the central bank. For instance, the central bank can influence the deposits of commercial banks by performing open market operations and making changes in CRR to control various economic conditions.

**(b) Developmental Functions:** Refer to the functions that are related to the promotion of banking system and economic development of the country. These are not compulsory functions of the central bank.

**These are discussed as follows:**

**(i) Developing specialized financial institutions:** Refer to the primary functions of the central bank for the economic development of a country. The central bank establishes institutions that serve credit requirements of the agriculture sector and other rural businesses.

Some of these financial institutions include Industrial Development Bank of India (IDBI) and National Bank for Agriculture and Rural Development (NABARD). These are called specialized institutions as they serve the specific sectors of the economy.

**(ii) Influencing money market and capital market:** Implies that central bank helps in controlling the financial market. Money market deals in short term credit and capital market deals in long term credit. The central bank maintains the country's economic growth by controlling the activities of these markets.

**(iii) Collecting statistical data:**

Gathers and analyzes data related to banking, currency, and foreign exchange position of a country. The data is quite helpful for researchers, policymakers, and economists. For instance, the Reserve Bank of India publishes a magazine called Reserve Bank of India Bulletin, whose data is useful for formulating different policies and making macro-level decisions.

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① what is Bank Rate?

Ans: - Bank Rate is the re-discount rate at which the advances loans to the Commercial Bank against approved securities.

② what is open market operation?

The direct purchase & sale of bonds & securities from the Commercial banks by the RBI is called as open market operation.

③ what is Treasury bill?

Ans: - Treasury bill is a short term liability of the central govt. which are of 91 days to 364 days duration. It is used to meet temporary revenue deficit of the govt.

④ what is Money market?

Ans: - Money market refers to institutional arrangements which deal with short term funds. They are of two kinds: -

(i) Organised (RBI, Commercial Bank)

(ii) Un-organised (Non-bank companies)

⑤ what is call money market?

Ans: - The call money market is the most sensitive segment of the financial system where all scheduled commercial & cooperative banks etc, operate in this market.

⑥ Write two shortcomings of Indian money market.

→ Lack of adequate integration in the Indian money market

→ It is shortage of funds.

⑦ what is mutual fund?

Ans: - As per the central govt. order in April, 1972, mutual fund was set up with the main objective to bring the money market instruments within the reach of individuals.

⑧ Define Marginal Cost.

Ans: - The net addition to the total cost incurred by the firm by producing additional unit of production.

$$MC = \frac{\Delta C}{\Delta Q} \text{ or } MC_n = TC_n - TC_{n-1}$$

### (9) Contribution :-

It is the difference between sales & marginal or variable costs. It contributes toward fixed cost & profit.

$$\text{Contribution} = \text{Selling Price per unit} - \text{Variable cost per unit}$$
$$= \text{Fixed cost} + \text{Profit}$$

### (10) Profit-volume Ratio :-

The profit-volume ratios show the relationship between the contribution & value of sales.

$$\text{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

(11) Give a brief discussion about Indian Money market.

Ans: Financial markets are classified into two categories:

- (i) Money market
- (ii) Capital market

Money market refers to financial institutions which deal with short term bonds, securities & other funds. It is a short term credit market that deals with relatively liquid & quickly marketable.

In India, we get two kinds of money market: -

- (i) Organised (Nationalised & other scheduled & non-scheduled commercial banks)
- (ii) Un-organised (Non-bank financial institutions, etc., etc)

Organised money market consists all nationalised, scheduled & non-scheduled commercial banks like RBI, SBI, BOI, Co-op Bank, Dena Bank etc. The main constituents of the organised money market are called money market, treasury bill market, commercial bill market, certificate of deposit market, commercial paper market & mutual fund market.

On the other hand un-organised money market includes insurance, investment etc.

Indian money markets are suffering from following short coming: -

- The Indian money market fails to provide an adequate & continuous supply of short term assets.
- This market is lacking the highly organized bank system.
- The sub-market such as acceptance market & the

Indian money market.

→ it fails to attract foreign bonds & securities.

Q Explain the Linear-Break even analysis with limit.

Ans:- Break even analysis established a relationship between cost, revenue & profit. It is directed to the point at which operations merely break even, neither making nor losing money, changes in operations are evaluated according to their effect on this point. It is also known as cost volume profit analysis, is widely used for financial studies because it is simple extracts useful.

In BE analysis, cost & revenue are expressed as a function of production. The selling price per unit of output compares profit, variable cost & fixed costs. Costs can be divided into two major parts i.e. fixed cost & variable cost. Fixed costs are independent of change in output but variable cost is directly influenced by output produced. Revenue is the money receipt received by the firm by selling units of output where profit is the difference between Revenue & cost.

Break-even analysis can be expressed in two ways:-

(i) Linear BE Analysis

(ii) Non-Linear BE A.

In Linear BEA, revenue & variable cost are directly related & Proportional also. There are 3 primary conditions for BEA.

(i) Income is only from operations under consideration.

(ii) Per unit sales price, fixed cost, variable cost should be constant.

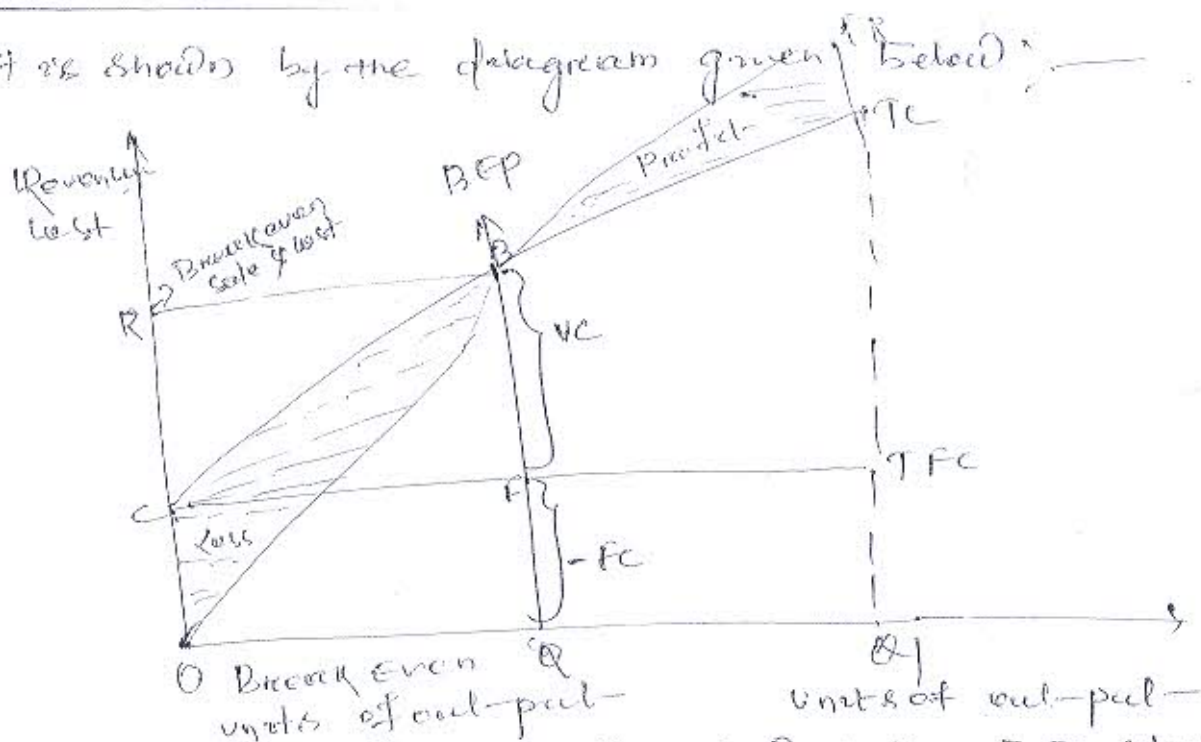
(iii) All units produced are sold.

BEP means profit is zero, TR & TC are equal in operation. The Break Even chart presents two curves i.e.

TR & TC Table

Units	Price	TR	TC	Situation
1	10	10	12	TR < TC
2	10	20	22	TR < TC
3	10	30	35	TR < TC
4	10	40	40	BEP
5	10	50	45	TR > TC
6	10	60	52	TR > TC

It is shown by the diagram given below:



In the above diagram point B is the BEP, where two lines intersect each other ( $TR = TC$ ) BQ vs TR & TC for OQ level of price or is BEP.

$$TR(Q) = TFC + TVC(Q)$$

$$BQ = FQ + BF$$

BQ - BF known as margin of safety because  $\pi$  is compensated by that level of output.

Algebraic Expression:

Suppose,  $n$  = no. of units produced.

$P$  = selling price per unit -

$c$  = total cost

$F$  = fixed cost,  $v$  = variable cost,  $\pi$  = Gross Profit -

$\pi$  = Net profit,  $R$  = Revenue

Def. of  $\pi$ :

$$\pi = R - C$$

$$R \text{ or } C = TFC + TVC$$

TVC is a direct f<sup>n</sup> of output -

$$\text{hence } C = nv + F$$

$$\pi = R - C$$

$$= np - (nv + F)$$

$$= np - nv - F$$

$$= n(p - v) - F$$

At the point of Break even  $\pi = 0$

$$\text{So } \pi = n(p - v) - F = 0$$

$$\Rightarrow n(p - v) = F \Rightarrow n = \frac{F}{p - v}$$

Now multiply by  $p$  in both sides  $\Rightarrow np = \frac{F \times p}{p - v}$

$\pi = n(p - v) - F$

where  $(p-v)$  is known as Contribution/Unit.

$$B.E.S = \frac{F}{P/V \text{ Ratio}}$$

In case, the volume of output is required to be compared to a target (desired profit) this amount need be added to cost in the numerator.

$$\text{Target volume (out put)} = \frac{F+Z}{p-v}$$

$$= \frac{\text{Fixed cost} + \text{Profit}}{\text{Contribution Per unit}}$$

$$\text{Target volume (Revenue)} = \left[ \frac{F+Z}{p-v} \right] P$$

$$= \left[ \frac{\text{Fixed cost} + \text{Desired Profit}}{p-v} \right] \text{ Selling Price}$$

P/V Ratio :-

The profit-volume ratio shows the relationship between the contribution & value of sales, it is also known as contribution to sales ratio, it gives the impact of change in output level on operating income. It is usually expressed as a percentage & is a valuable guide to the profitability.

$$P/V \text{ Ratio} = \frac{\text{Contribution}}{\text{Sales}} = \frac{\text{Change in Contribution}}{\text{Change in sales}}$$

$$= \frac{\text{Change in Profit}}{\text{Change in Sales}}$$

$$B.E.S = \frac{\text{Fixed cost}}{P/V \text{ Ratio}}$$

Margin of Safety

The margin of safety is the difference between the total sales & B.E.S.

$$MS \text{ (in unit)} = \frac{Z}{p-v} \text{ or } \frac{\text{Profit}}{\text{Contribution Per unit}}$$

$$MS \text{ (in Percentage)} = \frac{\text{Actual Sales} - B.E. \text{ Sales}}{\text{Actual Sales}} \times 100$$

$$MS = \frac{\text{Profit}}{P/V \text{ Ratio}}$$

Limitations :-

It is found that often there is a change in price of a product over a period of time which is not reflected in the B.E.S.

- It is a static in nature
- Semi-variable cost, imputed cost etc. are not taken into consideration.
- Profits also depend on other factors like technological debt, managerial effectiveness etc. but they are not considered.
- It ignores selling cost & advertisement.

Q Explain the Conditions of Present-worth.

Ans: The basic problem for engineering economic is that to select a project among different alternatives. Every engineer also want how to utilize the resources optimally in choice of projects. For the selection of projects points of view several methods in economics are to be considered such as PWC, PW, etc. In order to compare all available alternatives heterogeneous units like cash flows, rate of interest, life period etc. of the projects should be expressed into a common base.

Many economists prefer the present worth method because it reveals the sum in today's rupee that is equivalent to a future cash flow stream.

In the present worth method, the present-worth of all cash flow is compared with the present-worth of all (all) out-flow associated with investment project. In this method, the cash flow of each alternative are discounted to time zero or present-time by assuming a rate of interest.

The project selection decision depends upon the Net present value analysis.

$$NPV = PW \text{ of revenue} - \text{Present-worth cost in case of single project.}$$

- If  $NPV > 0$  → Project makes profit & it will be selected.
- If  $NPV = 0$  → Project is either selected or rejected.
- $NPV < 0$  → The project will be rejected due to loss.

The present worth comparison method is based on several assumption or conditions.

(1) Cash flows are known. →

The accuracy of Cash flow estimator is always difficult because future progress cannot be anticipated completely. But Present-worth method

is known and fixed.

(a) Cash flows are in constant-value

The purchasing power of money is constant during the study period in terms of rupees or dollar etc. It should be free from price fluctuations like inflation or deflation.

(b) The rate of interest is known

The rate of interest should be fixed for this purpose of comparison. Though different rate of interest has different effects on cash flow on magnitude of the calculated present worth but it should be known & same during comparison.

(c) Comparison are made before tax  $\Rightarrow$

Inclusion of income taxes greatly expands the burden of calculation to avoid extra burden & for quick extension taxes are excluded.

(d) It should exclude intangible considerations  $\Rightarrow$

It is difficult to quantify the qualitative concept like sacrifice, effort, impregnation etc. So PWC should avoid it.

Q Explain the present-worth comparison method for project evaluation of private sector. Give example.

Ans - In all engineering problems engineers encounter one i.e. selection of projects, to select the best alternatives various methods have been evolved. Present-worth comparison method is one of important method of comparison. In this method the present-worth of all cash in the project is compared against the present-worth of cash outflows associated with an investment project. In this method cash flows are discounted to time zero by assuming a specific rate of interest.

The present-worth method is based on following assumptions

$\rightarrow$  The cash flow should be known

$\rightarrow$  purchasing power of money is assumed to be constant

$\rightarrow$  The interest rate should be known.

→ Comparison should be made before start  
 → Comparison should not include incompatible to each other

If there is a single project, then decision whether a project will be selected or rejected can be made according to NPV. If NPV  $> 0$  the proposal will be selected, else it means the present value of receipts is greater than present value of disbursement. So the difference between PV of receipt & PV of cost is called as net present worth.

If NPV  $> 0 \Rightarrow$  Project will be selected.

NPV = 0  $\Rightarrow$  Project will be indifferent in decision.

NPV  $< 0 \Rightarrow$  Project will be rejected.

In case there are multiple exclusive alternatives, then present worth cash flow can be calculated by two primary methods: -

(i) Revenue dominated cash flow.

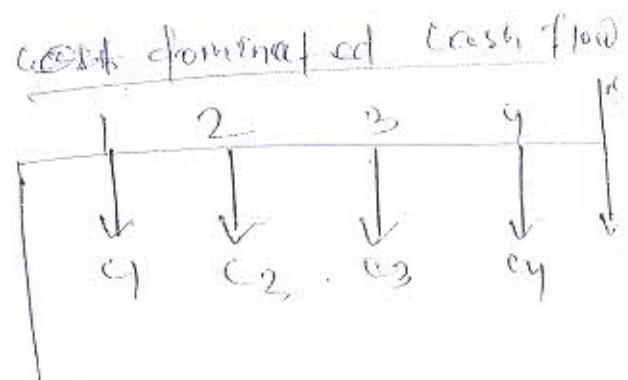
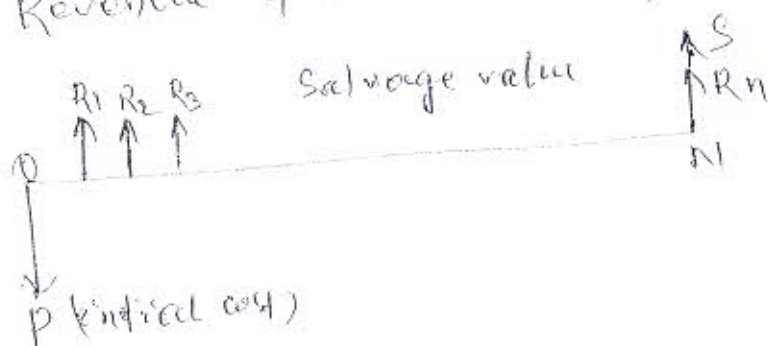
(ii) Cost dominated cash flow.

In revenue dominated cash flow the profit, revenue & salvage value will be assigned as +ve sign & interest cost, operating & maintenance charge are -ve sign.

On the other hand cost dominated cash flow indicates cost or outflows are +ve & profit, revenue & salvage value are -ve sign.

In the revenue dominated, the decision is to select the alternative with the maximum profit. If we have cash flow if  $PW(A) > PW(B) \Rightarrow A$  will be selected. For cost dominated cash flow if  $PW(A) < PW(B) \Rightarrow A$  will be selected.

Revenue dominated cash flow: -



To find present worth of the cash flow we can flow + formula given below! —

$$PW(i) = -P + \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2} + \dots + \frac{R_n}{(1+i)^n} + \frac{S}{(1+i)^n}$$

$$\text{or } PW(i) = -P + R_1(P/F, i, 1) + R_2(P/F, i, 2) + \dots + R_n(P/F, i, N) + S(P/F, i, N)$$

If it is an equal payment series

$$PW(i) = -P + R(P/A, i, N) + S(P/F, i, N)$$

For cost dominated cash flow  $P$  is the initial cost,  $S$  is the salvage value,  $R$  = Revenue,  $C$  = cost series, So the formula is  $PW(i)$

$$= P + \frac{C_1}{(1+i)} + \frac{C_2}{(1+i)^2} + \dots + \frac{C_n}{(1+i)^n} - \frac{S}{(1+i)^n}$$

$$\text{or } PW(i) = P + C(P/F, i, 1) + C_2(P/F, i, 2) + \dots + C_n(P/F, i, n) - S(P/F, i, N)$$

In case of uniform series

$$PW(i) = P + C(P/A, i, N) - S(P/F, i, N)$$

Example The Bajaj co. Ltd. is planning to expand its production operation by using two technologies given

Technology	Initial cost	Annual Revenue	Life period
A	12,00,000	4,00,000	10
B	18,00,000	5,00,000	10

which should be adopted at 20% rate of interest

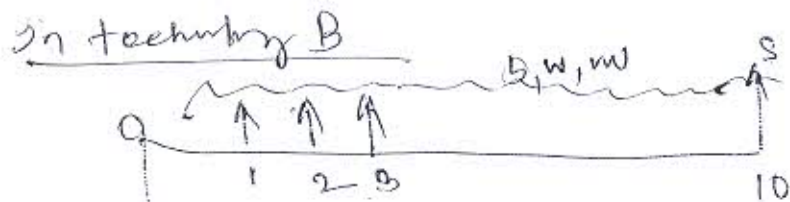
Sol Technology - A

$$P = Rs. 12,00,000, A = Rs. 4,00,000, i = 20, N = 10$$

The cash flow diagram is given below without salvage value



$$PW_A(20) = -P + A(P/A, i, N) = -12,00,000 + 4,00,000(P/A, 20, 10) = -12,00,000 + 16,77,000 = 4,77,000$$



$18, w, w$

$$PW_{(B)} = -18, w, w + 5, w, w (PIA, 20, 10)$$

$$= -18, w, w + 5, w, w (4.1925)$$

$$= -18, w, w + 20, 9, 6250 = Rs. 2, 96, 250$$

Here  $PW_{(A)} > PW_{(B)}$  though it is revenue dominated project.  
is better.

Q. Explain the functions of commercial bank.

The commercial banks serve as the king pin of the financial system of the country. They render many valuable services. The important functions of the Commercial banks can be explained with the help of the following chart. A **commercial bank** is a type of bank that provides services, such as accepting deposits, giving business loans and basic investment products.

Commercial bank can also refer to a bank or a division of a bank that mostly deals with deposits and loans from corporations or large businesses, as opposed to individual members of the public

### Primary Functions

The primary functions of the commercial banks include the following:

#### A. Acceptance of Deposits

**1. Time Deposits:**-These are deposits repayable after a certain fixed period. These deposits are not withdrawn able by cheque, draft or by other means. It includes the following.

**(a) Fixed Deposits:**-The deposits can be withdrawn only after expiry of certain period say 3 years, 5 years or 10 years. The banker allows a higher rate of interest depending upon the amount and period of time. Previously the rates of interest payable on fixed deposits were determined by Reserve Bank.

**(b) Recurring Deposits:**-In recurring deposit, the customer opens an account and deposit a certain sum of money every month. After a certain period, say 1 year or 3 years or 5 years, the accumulated amount along with interest is paid to the customer. It is very helpful to the middle and poor sections of the people. The interest paid on such deposits is generally on cumulative basis. This deposit system is a useful mechanism for regular savers of money.

**(c) Cash Certificates:**-Cash certificates are issued to the public for a longer period of time. It attracts the people because its maturity value is in multiples of the sum invested. It is an attractive and high yielding investment for those who can keep the funds for a long time.

**2. Demand Deposits:**-These are the deposits which may be withdrawn by the depositor at any time without previous notice. It is withdraw able by cheque/draft. It includes the following:

**(a) Savings Deposits:**-The savings deposit promotes thrift among people. The savings deposits can only be held by individuals and non-profit institutions. The rate of interest paid on savings deposits is lower than that of time deposits. The savings account holder gets the advantage of liquidity and small income in the form of interests.

**(b) Current Account Deposits:**-These accounts are maintained by the people who need to have a liquid balance. Current account offers high liquidity. No interest is paid on current deposits and there are no restrictions on withdrawals from the current account.

These accounts are generally in the case of business firms, institutions and co-operative bodies. Nowadays, banks are designing and offering various investment schemes for deposit of money. These schemes vary from bank to bank.

**B. Advancing of Loans:**-The commercial banks provide loans and advances in various forms. They are given below:

**1. Overdraft:**-This facility is given to holders of current accounts only. This is an arrangement with the bankers whereby the customer is allowed to draw money over and above the balance in his/her account. This facility of overdrawing his account is generally pre-arranged with the bank up to a certain limit.

**2. Cash Credit:**-Cash credit is a form of working capital credit given to the business firms. Under this arrangement, the customer opens an account and the sanctioned amount is credited with that account. The customer can operate that account within the sanctioned limit as and when required.

**3. Discounting of Bills:** Discounting of Bills may be another form of bank credit. The bank may purchase inland and foreign bills before these are due for payment by the drawer debtors, at discounted values, i.e., values a little lower than the face values.

The Banker's discount is generally the interest on the full amount for the unexpired period of the bill. The banks reserve the right of debiting the accounts of the customers in case the bills are ultimately not paid, i.e., dishonored.

**4. Loans and Advances:** It includes both demand and term loans, direct loans and advances given to all type of customers mainly to businessmen and investors against personal security or goods of movable or immovable in nature. The loan amount is paid in cash or by credit to customer account which the customer can draw at any time.

**Classification of Loans and Advances:**-Loans and advances given by bankers can be classified broadly into the following categories:

- (i) Advances which are given on the personal security of the debtor, and for which no tangible or collateral security is taken; this type of advance is given either when the amount of the advance is very small.
- (ii) Advances which are covered by tangible or collateral security. In this section of the study we are concerned with this type of advance and with different types of securities which a Banker may accept for such advances

(iii) Advances which are given against the personal security of the debtor but for which the Banker also holds in addition the guarantee of one or more sureties. This type of advance is often given by Banker to persons who are not known to them but whose surety is known to the Banker. Bankers also often take the personal guarantee of the Directors of a company to whom they agree to advance a clean or unsecured loan.

(iv) Loans are also given against the security of Fixed Deposit receipts.

## 5. Housing Finance:

Nowadays the commercial banks are competing among themselves in providing housing finance facilities to their customers. It is mainly to increase the housing facilities in the country. State Bank of India, Indian Bank, Canara Bank, Punjab National Bank, has formed housing subsidiaries to provide housing finance.



**6. Educational Loan Scheme:**-The Reserve Bank of India, from August, 1999 introduced a new Educational Loan Scheme for students of full time graduate/post-graduate professional courses in private professional colleges.

Under the scheme all public sector banks have been directed to provide educational loan up to Rs. 15,000 for free seat and Rs. 50,000 for payment seat student at interest not more than 12 per cent per annum. This loan is on clean basis i.e., without calling for security.

This loan is available only for students whose annual family income does not exceed Rs. 1,00,000. The loan has to be repaid together with interest within five years from the date of completion of the course. Studies in respect of the following subjects/areas are covered under the scheme.

- (a) Medical and dental course.
- (b) Engineering course.
- (c) Chemical Technology.
- (d) Management courses like MBA.
- (e) Law studies.

**7. Loans against Shares/Securities:**-Commercial banks provide loans against the security of shares/debentures of reputed companies. Loans are usually given only up to 50% value of the shares subject to a maximum amount permissible as per RBI directives. Presently one can obtain a loan up to Rs.10 lakhs against the physical shares and up to Rs. 20 lakhs against dematerialized shares.

**8. Loans against Savings Certificates:**-Banks are also providing loans up to certain value of savings certificates like National Savings Certificate, Fixed Deposit Receipt, Indira Vikas Patra, etc. The loan may be obtained for personal or business purposes.

**9. Consumer Loans and Advances:**-One of the important areas for bank financing in recent years is towards purchase of consumer durables like TV sets, Washing Machines, Micro Oven, etc. Banks also provide liberal Car finance.

**10. Securitization of Loans:**-Banks are recently trying to securitize a part of their part of loan portfolio and sell it to another investor. Under this method, banks will convert their business loans into a security or a document and sell it to some Investment or Fund Manager for cash to enhance their liquidity position.

**11. Others:**-Commercial banks provide other types of advances such as venture capital advances, jewel loans, etc.

**C. Credit Creation:**-Credit creation is one of the primary functions of commercial banks. When a bank sanctions a loan to the customer, it does not give cash to him. But, a deposit account is opened in his name and the amount is credited to his account. He can withdraw the money whenever he needs.

**Secondary Functions:**-The secondary functions of the banks consist of agency functions and general utility functions.

**A. Agency Functions:**-Agency functions include the following:

**(i) Collection of cheques, dividends, and interests:**-As an agent the bank collects cheques, drafts, promissory notes, interest, dividends etc., on behalf of its customers and credit the amounts to their accounts.

**(ii) Payment of rent, insurance premiums:**-The bank makes the payments such as rent, insurance premiums, subscriptions, on standing instructions until further notice. Till the order is revoked, the bank will continue to make such payments regularly by debiting the customer's account.

**(iii) Dealing in foreign exchange:**-As an agent the commercial banks purchase and sell foreign exchange as well for customers as per RBI Exchange Control Regulations.

**(iv) Purchase and sale of securities:**-Commercial banks undertake the purchase and sale of different securities such as shares, debentures, bonds etc., on behalf of their customers. They run a separate 'Portfolio Management Scheme' for their big customers.

**(v) Act as trustee, executor, attorney, etc:**-The banks act as executors of Will, trustees and attorneys. It is safe to appoint a bank as a trustee than to appoint an individual. Acting as attorneys of their customers, they receive payments and sign transfer deeds of the properties of their customers.

**(vi) Act as correspondent:**-The commercial banks act as a correspondent of their customers. Small banks even get travel tickets, book vehicles; receive letters etc. on behalf of the customers.

**(vii) Preparations of Income-Tax returns:**-They prepare income-tax returns and provide advices on tax matters for their customers. For this purpose, they employ tax experts and make their services, available to their customers.

**B. General Utility Services:**-The General utility services include the following:

**(i) Safety Locker facility:**-Safekeeping of important documents, valuables like jewels are one of the oldest services provided by commercial banks. 'Lockers' are small receptacles which are fitted in steel racks and kept inside strong rooms known as vaults. These lockers are available on half-yearly or annual rental basis.

**(ii) Payment Mechanism or Money Transfer:**-Transfer of funds is one of the important functions performed by commercial banks. Cheques and credit cards are two important payment mechanisms through banks. Despite an increase in financial transactions, banks are managing the transfer of funds process very efficiently.

Cheques are also cleared through the banking system. Correspondent banking is another method of transferring funds over long distance, usually from one country to another. Banks, these days employ computers to speed up money transfer and to reduce cost of transferring funds.

**(iii) Travelers' cheques:**-Travelers Cheques are used by domestic travelers as well as by international travelers. However the use of traveler's cheques is more common by international travelers because of their safety and convenience. These can be also termed as a modified form of traveler's letter of credit

**(iv) Circular Notes or Circular Letters of Credit:**

Under Circular Letters of Credit, the customer/traveller negotiates the drafts with any of the various branches to which they are addressed. Thus the traveller can obtain funds from many of the branches of banks instead only from a particular branch. Circular Letters of Credit are therefore a more useful method for obtaining funds while travelling to many countries.

**(v) Issue "Travellers Cheques":**-Banks issue travellers cheques to help carry money safely while travelling within India or abroad. Thus, the customers can travel without fear, theft or loss of money.

**(vi) Letters of Credit:-**Letter of Credit is a payment document provided by the buyer's banker in favour of seller. This document guarantees payment to the seller upon production of document mentioned in the Letter of Credit evidencing dispatch of goods to the buyer.

The Letter of Credit is an assurance of payment upon fulfilling conditions mentioned in the Letter of Credit. The letter of credit is an important method of payment in international trade. There are primarily 4 parties to a letter of credit.

**(vii) Acting as Referees:-**The banks act as referees and supply information about the business transactions and financial standing of their customers on enquiries made by third parties. This is done on the acceptance of the customers and help to increase the business activity in general.

**(viii) Provides Trade Information:-**The commercial banks collect information on business and financial conditions etc., and make it available to their customers to help plan their strategy. Trade information service is very useful for those customers going for cross-border business. It will help traders to know the exact business conditions, payment rules and buyers' financial status in other countries.

**(ix) ATM facilities:-**The banks today have ATM facilities. Under this system the customers can withdraw their money easily and quickly and 24 hours a day. This is also known as 'Any Time Money'. Customers under this system can withdraw funds i.e., currency notes with a help of certain magnetic card issued by the bank and similarly deposit cash/cheque for credit to account.

**(x) Credit cards:-**Banks have introduced credit card system. Credit cards enable a customer to purchase goods and services from certain specified retail and service establishments up to a limit without making immediate payment. In other words, purchases can be made on credit basis on the strength of the credit card.

**(xi) Gift Cheques:-**The commercial banks offer Gift cheque facilities to the general public. These cheques received a wider acceptance in India. Under this system by paying equivalent amount one can buy gift cheque for presentation on occasions like Wedding, Birthday.

**(xii) Accepting Bills:-**On behalf of their customers, the banks accept bills drawn by third parties on its customers. This resembles the letter of credit. While banks accept bills, they provide a better security for payment to seller of goods or drawer of bills.

**(xiii) Merchant Banking:-**The commercial banks provide valuable services through their merchant banking divisions or through their subsidiaries to the traders. This is the function of underwriting of securities. They underwrite a portion of the Public issue of shares, Debentures and Bonds of Joint Stock Companies.

**(xiv) Advice on Financial Matters:-**The commercial banks also give advice to their customers on financial matters particularly on investment decisions such as expansion, diversification, new ventures, rising of funds etc.

**(xv) Factoring Service:-**Today the commercial banks provide factoring service to their customers. It is very much helpful in the development of trade and industry as immediate cash flow and administration of debtors' accounts are taken care of by factors. This service is again provided only by a separate subsidiary as per RBI regulations.

A customer has to carefully study these statements to choose his banks. The combined balance sheet of all banks in the country reveals certain economic trends. A specimen of a Bank's Balance Sheet is

## Q. Difference between money market & capital market

### 1. Maturity Period:

The money market deals in the lending and borrowing of short-term finance (i.e., for one year or less), while the capital market deals in the lending and borrowing of long-term finance (i.e., for more than one year).

### 2. Credit Instruments:

The main credit instruments of the money market are call money, collateral loans, acceptances, bills of exchange. On the other hand, the main instruments used in the capital market are stocks, shares, debentures, bonds, securities of the government.

### 3. Nature of Credit Instruments:

The credit instruments dealt with in the capital market are more heterogeneous than those in money market. Some homogeneity of credit instruments is needed for the operation of financial markets. Too much diversity creates problems for the investors.

### 4. Institutions:

Important institutions operating in the money market are central banks, commercial banks, acceptance houses, nonbank financial institutions, bill brokers, etc. Important institutions of the capital market are stock exchanges, commercial banks and nonbank institutions, such as insurance companies, mortgage banks, building societies, etc.

### 5. Purpose of Loan:

The money market meets the short-term credit needs of business; it provides working capital to the industrialists. The capital market, on the other hand, caters the long-term credit needs of the industrialists and provides fixed capital to buy land, machinery, etc.

### 6. Risk:

The degree of risk is small in the money market. The risk is much greater in capital market. The maturity of one year or less gives little time for a default to occur, so the risk is minimised. Risk varies both in degree and nature throughout the capital market.

### 7. Basic Role:

The basic role of money market is that of liquidity adjustment. The basic role of capital market is that of putting capital to work, preferably to long-term, secure and productive employment.

### 8. Relation with Central Bank:



The money market is closely and directly linked with central bank of the country. The capital market feels central bank's influence, but mainly indirectly and through the money market. **9. Market Regulation:** In the money market, commercial banks are closely regulated. In the capital market, the institutions are not much regular given at the end of this chapter.

## Q. Explain the functions of reserve bank of India.

**Reserve Bank of India (RBI)** is India's central banking institution, which controls the monetary policy of the Indian rupee. It was established on 1 April 1935 during the British Raj in accordance with the provisions of the Reserve Bank of India Act. The share capital was divided into shares of 100 each fully paid, which was entirely owned by private shareholders in the beginning. The RBI was nationalised in the year 1949.

The RBI plays an important part in the development strategy of the Government of India. It is a member bank of the Asian Clearing Union. The general superintendence and direction of the RBI is entrusted with the 21-member-strong Central Board of Directors—the Governor, four Deputy Governors, two Finance Ministry representative, ten government-nominated directors to represent important elements from India's economy, and four directors to represent local boards headquartered at Mumbai, Kolkata, Chennai and New Delhi. The bank is also active in promoting financial inclusion policy and is a leading member of the Alliance for Financial Inclusion (AFI).

**Functions of Reserve Bank of India:**—The Reserve Bank of India Act of 1934 entrust all the important functions of a central bank the Reserve Bank of India.

**Bank of Issue:**—Under Section 22 of the Reserve Bank of India Act, the Bank has the sole right to issue bank notes of all denominations. The distribution of one rupee notes and coins and small coins all over the country is undertaken by the Reserve Bank as agent of the Government. The Reserve Bank has a separate Issue Department which is entrusted with the issue of currency notes. The assets and liabilities of the Issue Department are kept separate from those of the Banking Department.

**Banker to Government:**—The second important function of the Reserve Bank of India is to act as Government banker, agent and adviser. The Reserve Bank is agent of Central Government and of all State Governments in India excepting that of Jammu and Kashmir. The Reserve Bank has the obligation to transact Government business, viz. to keep the cash balances as deposits free of interest, to receive and to make payments on behalf of the Government and to carry out their exchange remittances and other banking operations. The Reserve Bank of India helps the Government - both the Union and the States to float new loans and to manage public debt.

### Bankers' Bank and Lender of the Last Resort:-

The Reserve Bank of India acts as the bankers' bank. According to the provisions of the Banking Companies Act of 1949, every scheduled bank was required to maintain with the Reserve Bank a cash balance equivalent to 5% of its demand liabilities and 2 per cent of its time liabilities in India. By an amendment of 1962, the distinction between demand and time liabilities was abolished and banks have been asked to keep cash reserves equal to 3 per cent of their aggregate deposit liabilities. The minimum cash requirements can be changed by the Reserve Bank of India.

**Controller of Credit:**—The Reserve Bank of India is the controller of credit i.e. it has the power to influence the volume of credit created by banks in India. It can do so through changing the Bank rate or through open market operations. According to the Banking Regulation Act of 1949, the Reserve Bank of India can ask any particular bank or the whole banking system not to lend to particular groups or persons on the basis of certain types of securities. Since 1956, selective controls of credit are increasingly being used by the Reserve Bank.

As supreme banking authority in the country, the Reserve Bank of India, therefore, has the following powers:-

- (a) It holds the cash reserves of all the scheduled banks.
- (b) It controls the credit operations of banks through quantitative and qualitative controls.
- (c) It controls the banking system through the system of licensing, inspection and calling for information.
- (d) It acts as the lender of the last resort by providing rediscount facilities to scheduled banks.

**Custodian of Foreign Reserves:**-The Reserve Bank of India has the responsibility to maintain the official rate of exchange. According to the Reserve Bank of India Act of 1934, the Bank was required to buy and sell at fixed rates any amount of sterling in lots of not less than Rs. 10,000. The rate of exchange fixed was Re. 1 = sh. 6d. Since 1935 the Bank was able to maintain the exchange rate fixed at 1sh.6d, though there were periods of extreme pressure in favour of or against the rupee. After India became a member of the International Monetary Fund in 1946, the Reserve Bank has the responsibility of maintaining fixed exchange rates with all other member countries of the I.M.F.

**Supervisory functions:**-In addition to its traditional central banking functions, the Reserve bank has certain non-monetary functions of the nature of supervision of banks and promotion of sound banking in India. The Reserve Bank Act, 1934, and the Banking Regulation Act, 1949 have given the RBI wide powers of supervision and control over commercial and co-operative banks, relating to licensing and establishments, branch expansion, liquidity of their assets, management and methods of working, amalgamation, reconstruction, and liquidation. The RBI is authorised to carry out periodical inspections of the banks and to call for returns and necessary information from them. The nationalisation of 14 major Indian scheduled banks in July 1969 has imposed new responsibilities on the RBI for directing the growth of banking and credit policies towards more rapid development of the economy and realisation of certain desired social objectives. The supervisory functions of the RBI have helped a great deal in improving the standard of banking in India to develop on sound lines and to improve the methods of their operation.

**Promotional functions:**-With economic growth assuming a new urgency since Independence, the range of the Reserve Bank's functions has steadily widened. The Bank now performs a variety of developmental and promotional functions, which, at one time, were regarded as outside the normal scope of central banking. The Reserve Bank was asked to promote banking habit, extend banking facilities to rural and semi-urban areas, and establish and promote new specialised financing agencies. Accordingly, the Reserve Bank has helped in the setting up of the IFCI and the SFC; it set up the Deposit Insurance Corporation in 1962, the Unit Trust of India in 1964, the Industrial Development Bank of India also in 1964, the Agricultural Refinance Corporation of India in 1963 and the Industrial Reconstruction Corporation of India in 1972.

The monetary functions also known as the central banking functions of the RBI are related to control and regulation of money and credit, i.e., issue of currency, control of bank credit, control of foreign exchange operations, banker to the Government and to the money market. Monetary functions of the RBI are significant as they control and regulate the volume of money and credit in the country.

# Evaluation of Engineering Projects

## Introduction:

⇒ A comparison of alternative investments is required for decision of whether to accept or reject the any investment  
⇒ It is required to know how to compare alternatives on an equal basis for selecting the wisest alternative from an economic standpoint.

⇒ The most common bases of comparison of alternatives are:—

- Present worth method
- Annual equivalent—
- Future worth
- IRR (Internal Rate of Return)

## Present-worth Method

⇒ Present worth of an investment is the net equivalent-amount-at present time

⇒ It represents the difference between the net receipts and net disbursements made at present time for a specified interest rate

⇒ It is also known as net present worth and expressed as  $PW(i)$

Then, the NPW of the project is

$$\begin{aligned} \text{PW}(15\%) &= \text{PW}(15\%)_{\text{inflow}} - \text{PW}(15\%)_{\text{outflow}} \\ &= \text{Rs. } 7,92,190 - \text{Rs. } 6,50,000 \\ &= \text{Rs. } 79,190 \end{aligned}$$

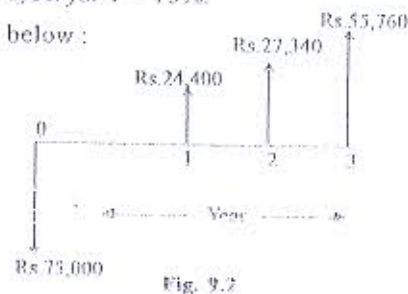
Since,  $\text{PW}(15\%) > 0$ , the project would be acceptable.

**Example - 9.2** The Project cash flows of an investment proposal is given below.

End of year	Net cash flow (Rs)
0	-75,000
1	24,400
2	27,340
3	55,760

Evaluate the economic desirability of this project for  $i = 15\%$ .

**Solu.** The cash flow diagram for the given project is shown below:



The present worth of this cash flow is

$$\begin{aligned} \text{PW}(15\%) &= -75,000 + 24,400 (\text{P/F}, 15\%, 1) \\ &\quad + 27,340 (\text{P/F}, 15\%, 2) \\ &\quad + 55,760 (\text{P/F}, 15\%, 3) \\ &= -75,000 + 24,400 (1 + 0.15)^{-1} + 27,340 (1 + 0.15)^{-2} + 55,760 (1 + 0.15)^{-3} \\ &= \text{Rs. } 3,551 \end{aligned}$$

Since,  $\text{PW}(15\%) > 0$ , the project is acceptable.

#### 9.2.1 Features of NPW Method :

1. The NPW method is based on the assumption that the intermediate cash inflows of the project are re-invested at a rate of return equal to the cost of capital of the firm.
2. The NPW of a project is inversely related to discount rate ( $i$ ).

#### 9.2.2 Merits of NPW Method :

1. It takes into account the time value of money.
2. It considers the cash flow stream in its entirety.
3. The NPW of various projects measured in terms of money can be added.

$$\text{i.e., NPW}(A+B) = \text{NPW}(A) + \text{NPW}(B),$$

where, A & B are two independent projects.

### 9.2.3 Limitations of NPW Method :

1. The ranking of projects on the NPW criterion is influenced by the discount rate.
2. The NPW method does not appear very meaningful to businessmen who think in terms of rate of return measures.

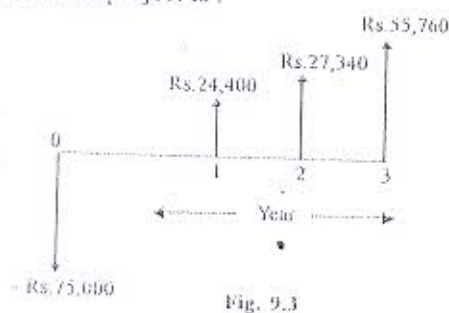
## 9.3 FUTURE WORTH METHOD

Future worth method is particularly useful in an investment situation where we need to compute the equivalent worth of a project at the end of its investment period, rather than at its beginning. The followings are the steps of this method.

- (1) Determine the interest rate that the firm wishes to earn on its investment.
- (2) Estimate the service life of the project.
- (3) Estimate the cash inflows for each period over the service life.
- (4) Estimate the cash outflows over each service period.
- (5) Determine the net cash flows, i.e., net cash flows = cash inflow minus cash outflows.
- (6) Find the future worth of each net cash flow. add up these future worth figures; their sum is defined as project's Net Future Worth (NFW).
- (7) For a single project evaluation,
  - if  $\text{FW}(i) > 0$ , accept the investment.
  - if  $\text{FW}(i) = 0$ , remain indifferent to the investment.
  - if  $\text{FW}(i) < 0$ , reject the investment.

**Example - 9.3** For the project cash flows in example - 2, compute the Net Future Worth at the end of year three at  $i = 15\%$ . Is this project acceptable?

**Soln.** The cash flow diagram for the project is :



valuation of a?

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Example - 9.4

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Q.2

A Company must decide whether to buy Machine - A or Machine - B

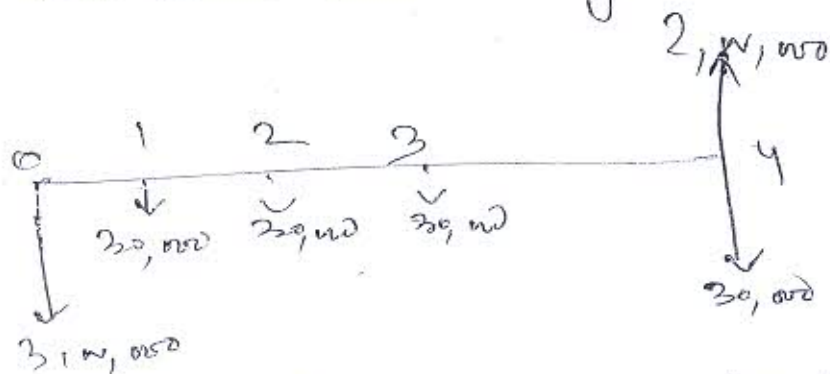
	Machine - A	Machine - B
Initial cost (Rs)	3,00,000	6,00,000
Useful life (years)	4	4
Salvage value at the end of the Machine life	2,00,000	3,00,000
Annual Maintenance	30,000	-

At 15% interest rate, which Machine should be purchased?

Solution

Machine - A

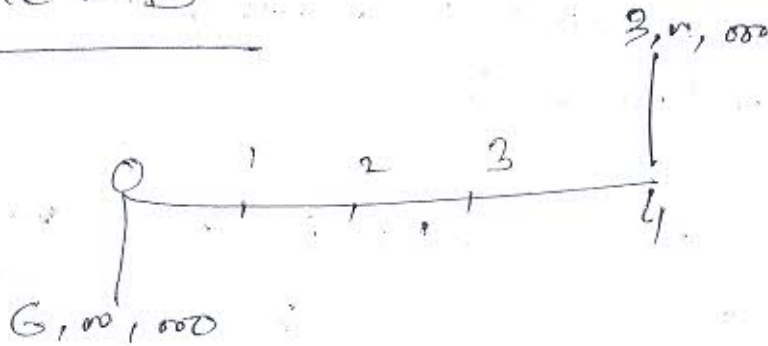
The cash flow diagram of Machine - A



The annual equivalent cost expression of the above cash flow diagram is

$$\begin{aligned}
 A E (15\%) &= 3,00,000 (A/P, 15\%, 4) + 30,000 - 2,00,000 \\
 &= 3,00,000 \times 0.3503 + 30,000 - 2,00,000 \times 0.2 \\
 &= 95,030
 \end{aligned}$$

Machine - B



$$\begin{aligned} AE(15\%) &= 6,00,000 (A/P, 15, 4) - 3,00,000 (A/F, 15, 4) \\ &= 6,00,000 \times 0.2503 - 3,00,000 \times 0.2400 \\ &= \cancel{1,50,090} \\ &= \underline{1,50,090} \checkmark \end{aligned}$$

## Annual Equivalent - Worth Method

- $\Rightarrow$  Annual equivalent-worth Criterion provides a basis of measuring worth of investment by finding equal payments on annual basis.
- $\Rightarrow$  Annual equivalent-worth is the net sum of annual receipts and annual disbursements.
- $\Rightarrow$  Depending upon the value of AE decision on any investment - can be accept it, be indifferent - or reject it.
- $\Rightarrow$  Annual equivalent basis of comparison is preferred in case of repeating type of cash flows.

### Formulae

(i) Savings Fund Annual Factor

$$A/F = \frac{i}{(1+i)^n - 1}$$

(ii) Capital Recovery Factor

$$A/P = \frac{i(1+i)^n}{(1+i)^n - 1}$$

$$(ii) CR = -P(A/P, i, n) + SV(A/F, i, n)$$

SV = Salvage value

CR = Capital Recovery

$p = \text{Initial Investment} -$

~~A~~  $CR = A$

$A = \text{Equivalent Annual Amount} -$

Q A Printing Press owner purchased a printing machine for 1,00,000. His operating cost ~~is~~ to be expected 20,000 p.a. He expects to sell the machine for 50,000 from 5 years now. Calculate the equivalent annual worth of the printing machine if the interest rate is 10%.

Sol  
given data

Initial Investment,  $p = 1,00,000$

Equivalent Annual Amount,  $A = 20,000$

Salvage value  $S_v = 50,000$

$i = 10\%$

year  $= n = 5 \text{ years}$

$$CR = -P \left( \frac{A}{P}, i, n \right) + S_v \left( \frac{A}{S}, i, n \right)$$

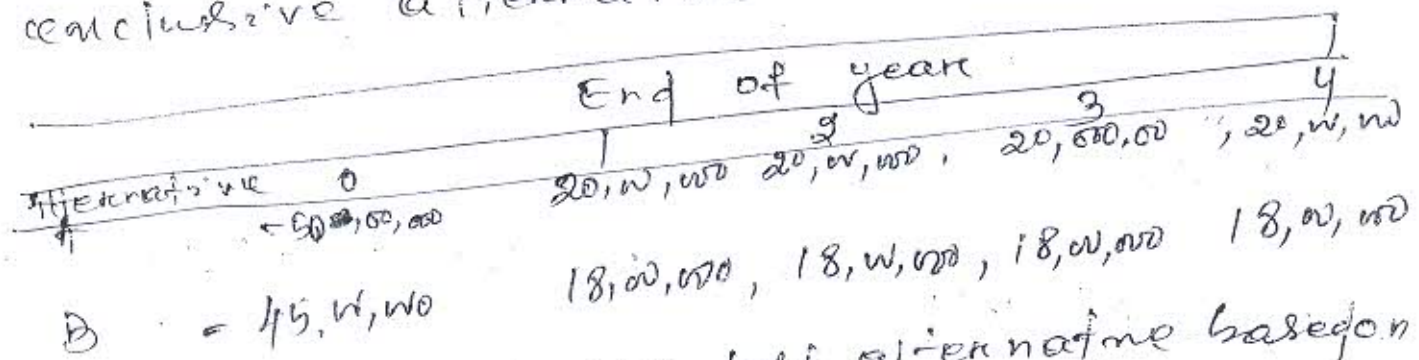
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# Future Worth Method

⇒ Future Worth of an investment is the difference between equivalent-receipt and disbursements of some point of time in future.

⇒ It can be founded by converting the present worth of the investment at some future time.

Ex Consider the following two mutually exclusive alternative.

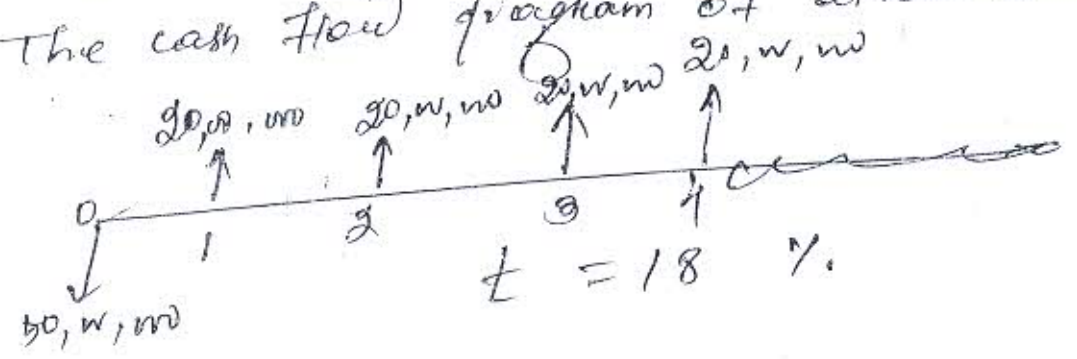


At = 18% interest. the best alternative based on future worth method of comparison.

Calculation Alternative A

- Initial investment, P = 50,00,000
- Annual equivalent-revenue, A = 20,00,000
- Interest rate, i = 18% compounded annually.
- Life of Alt: A = 4 years

The cash flow diagram of alternative A.



$$FW_A(18\%) = -50,000,000 (F/P, 18\%, 4) + 20,000,000 (F/A, 18\%, 4)$$

$$= -50,000,000 (1.939) + 20,000,000 (5.215)$$

$$= 2,350,000$$

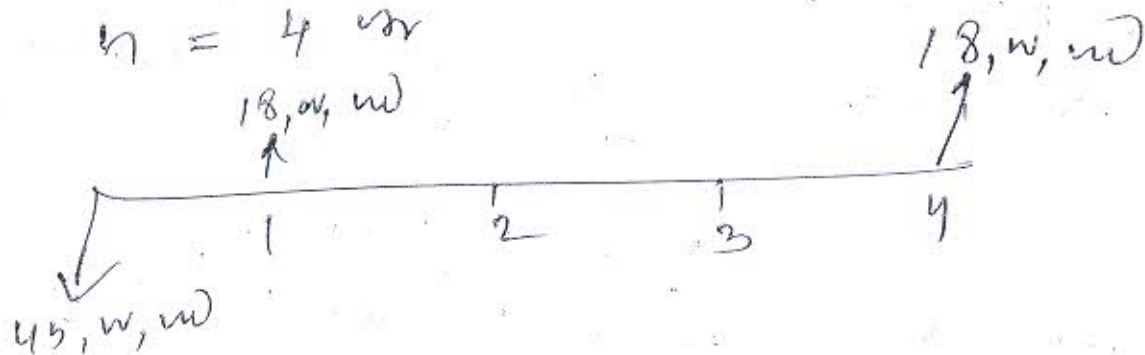
Answer - B

Initial investment = 45,000,000

Annual equivalent = A = 18,000,000

$$i = 18\%$$

$$n = 4 \text{ yr}$$



$$FW_B(18\%) = -45,000,000 (F/P, 18\%, 4) + 18,000,000 (F/A, 18\%, 4)$$

$$= -45,000,000 (1.939) + 18,000,000 (5.215)$$

$$= 6,615,000$$

## IRR - Internal Rate of Return

It is a discount-rate at which NPV becomes zero. In other words, IRR is the opportunity cost at which the NPV becomes zero. IRR, as the name suggests, it tells how much rate of return are we getting from the project.

### Importance of Calculating IRR $\Rightarrow$

- $\rightarrow$  It is used to rank different-projects
- $\rightarrow$  The higher a project's internal rate of return, the more desirable it is to undertake the project.
- $\rightarrow$  If all the other factors are same for different projects then the project with the higher IRR should be considered.

Formula :

$$0 = \frac{CF_0}{(1+r)^0} + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_n}{(1+r)^n}$$

# IRR Internal Rate of Return Method

The rate of return is another method of discounted cash flow into present-value for the comparison of the projects. It refers to a percentage that indicates the relative yield on different uses of capital. There are 3 rate of return appear frequently in engineering economic studies i.e:

(I) MARR (Minimum acceptable Rate of Return)

(II) IRR

(III) ERR (External Rate of Return)

The IRR is the best known and most widely used rate of return method. It is also known as discounted cash flow method. The IRR can be calculated by equating the annual present or future worth of cash flow to zero. IRR is the rate of interest at which the present-worth of the cash flow of a project is zero or ~~ERR~~

~~is to~~ IRR refers to the rate of which the present-worth of receipts is equal to present-worth of cost.

$$\text{Means, } C + \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2} + \dots + \frac{R_n}{(1+i)^n} = 0$$

$C$  = Initial cost

$i$  = Rate of return

$R$  = Expected Return.

IRR indicates a rate at which  $NPV = 0$

$$\text{So, } PW(R) - PW(i) = 0$$

IRR is discounted rate

$$R - C + \frac{R_1 - C_1}{(1+i)} + \frac{R_2 - C_2}{(1+i)^2} + \dots + \frac{R_n - C_n}{(1+i)^n} = 0$$

Calculation of IRR (in Single Project)

- (i)  $IRR > MARR \rightarrow$  Accept the project
- (ii)  $IRR = MARR \rightarrow$  Either select or reject
- (iii)  $IRR < MARR =$  Reject

Calculation of IRR when two projects

- (i)  $IRR_A > IRR_B = A$  will be selected
- (ii)  $IRR_A = IRR_B =$  Indifferent decision
- (iii)  $IRR_A < IRR_B = B$  will be selected.

## Comparison between NPV & IRR

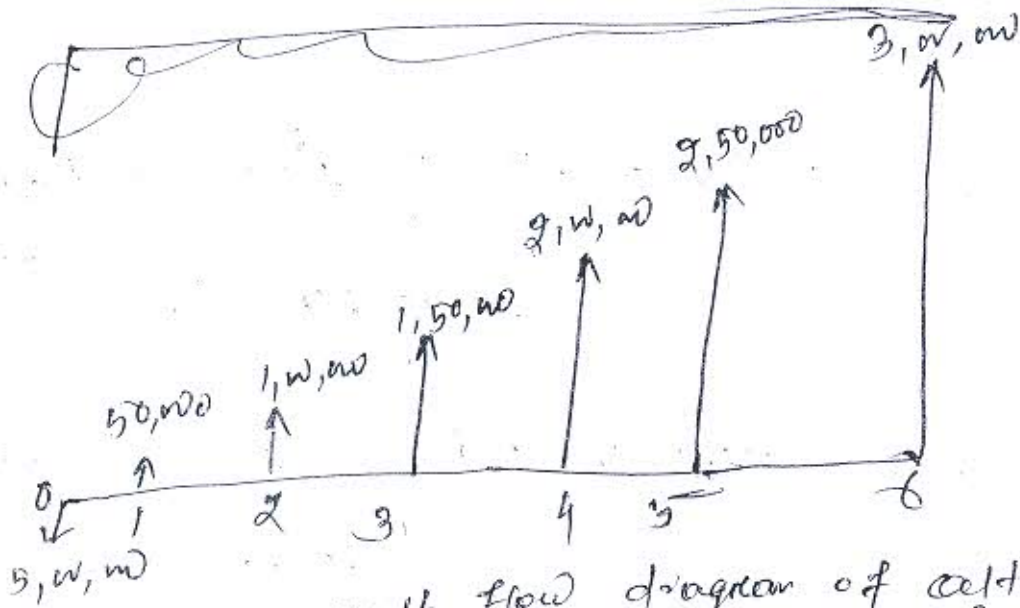
### Similarities :-> ✓

- (i) Both methods are modern techniques of capital ~~budgeting~~.
- (ii) Both take account the time value of money in to consideration.
- (iii) Both are also discounted cash flow techniques.
- (iv) Both the techniques assume independence among the cash flow generated by cash project under consideration.

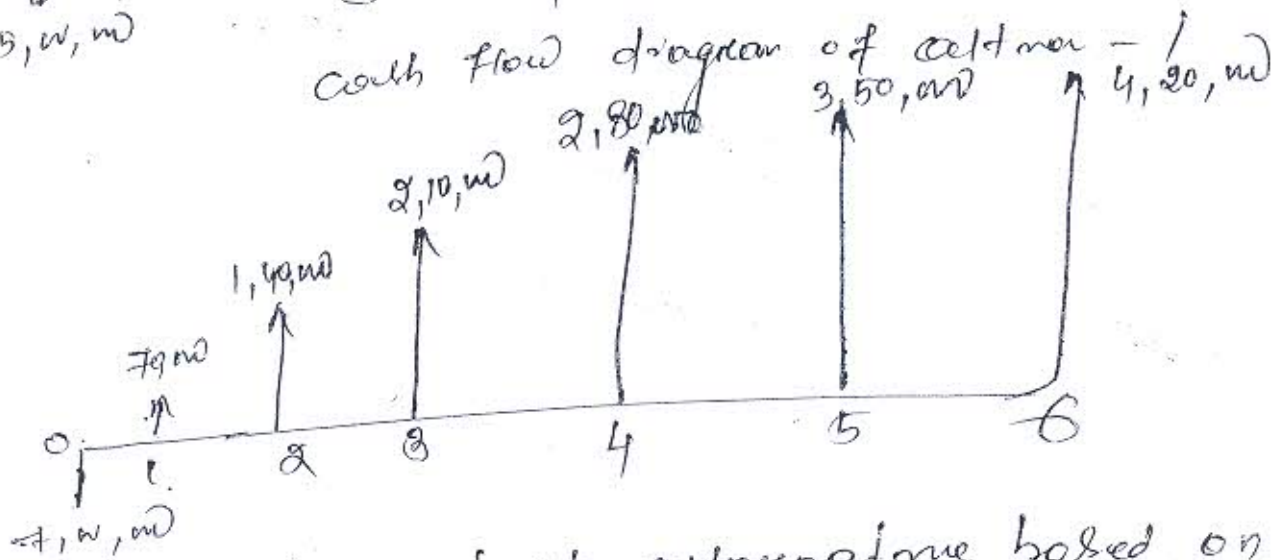
### Differences :-

- (i) In NPV method, present value is determined by discounting the future cash flow of a project at a pre-determined or specified rate called cut off rate.
- (ii) In IRR method cash flows are discounted at a suitable rate by hit and trial method. Here discount rate is not pre-determined.
- (iii) NPV method gives the importance of market interest rate but IRR method does not consider.

③ The cash flow diagram of two mutually exclusive alternatives are given: —



Cash flow diagram of alt no 1



(a) Select the best alternative based on future worth method at  $i = 8\%$ .

(b) Redo part (a) with  $i = 9\%$  &  $20\%$ .

Alternative - 1

$$AI = 50,000$$

$$P = 5,000, n = 6, i = 8\%, n = 6 \text{ yrs}$$

$$FW(8\%) = -P(F/P, 8\%, 6) + [AI] + G(F/G, 8\%, 6) \times [F/A, 8\%, 6]$$

$$= -5,000(1.587) + [50,000 + 50,000(2.2764) \times 7.337]$$

$$= ₹ 4,08,283.52$$

Alt. 2

$$P = 7, w, w$$

$$AL = 70, w$$

$$G = 70, w$$

$$i = 8\%$$

$$n = 2$$

$$PW_2(8\%) = -P(F/P, 8\%, 6) + [A_1 + G(A/G, 8\%, 6) \\ \oplus \times F/A, 8\%, 6)]$$

$$= -7, w, w \times 1.1587 + [70, w + 70, w \times 2.764 \\ \times 7.336]$$

$$= 5, 71, 596.93$$

Alt. 2 re Selectin.

Market Structure:

Meaning:

Market structure refers to the nature and degree of competition in the market for goods and services. The structures of market both for goods market and service (factor) market are determined by the nature of competition prevailing in a particular market.

Forms of Market Structure:

On the basis of competition, a market can be classified in the following ways:

1. Perfect Competition    2. Monopoly    3. Duopoly    4. Oligopoly    5. Monopolistic Competition

1. Perfect Competition Market:

A perfectly competitive market is one in which the number of buyers and sellers is very large, <sup>(2)</sup> all engaged in buying and selling a homogeneous product without any artificial restrictions and possessing perfect knowledge of market at a time. In the words of A. Koutsoyiannis, "Perfect competition is a market structure characterised by a complete absence of rivalry among the individual firms." According to R.G. Lipsey, "Perfect competition is a market structure in which all firms in an industry are price-takers and in which there is freedom of entry into, and exit from, industry."

Characteristics of Perfect Competition:

The following are the conditions for the existence of perfect competition:

(1) Large Number of Buyers and Sellers:

The first condition is that the number of buyers and sellers must be so large that none of them individually is in a position to influence the price and output of the industry as a whole. The demand of individual buyer relative to the total demand is so small that he cannot influence the price of the product by his individual action.

Similarly, the supply of an individual seller is so small a fraction of the total output that he cannot influence the price of the product by his action alone. In other words, the individual seller is unable to influence the price of the product by increasing or decreasing its supply.

Rather, he adjusts his supply to the price of the product. He is "output adjuster". Thus no buyer or seller can alter the price by his individual action. He has to accept the price for the product as fixed for the whole industry. He is a "price taker".

(2) Freedom of Entry or Exit of Firms:

The next condition is that the firms should be free to enter or leave the industry. It implies that whenever the industry is earning excess profits, attracted by these profits some new firms enter the industry. In case of loss being sustained by the industry, some firms leave it.

(3) Homogeneous Product:

Each firm produces and sells a homogeneous product so that no buyer has any preference for the product of any individual seller over others. This is only possible if units of the same product produced by different sellers are perfect substitutes. In other words, the cross elasticity of the products of sellers is infinite.

No seller has an independent price policy. Commodities like salt, wheat, cotton and coal are homogeneous in nature. He cannot raise the price of his product. If he does so, his customers would leave him and buy the product from other sellers at the ruling lower price.

The above two conditions between themselves make the average revenue curve of the individual seller or firm perfectly elastic, horizontal to the X-axis. It means that a firm can sell more or less at the ruling market price but cannot influence the price as the product is homogeneous and the number of sellers very large.

#### (4) Absence of Artificial Restrictions:

The next condition is that there is complete openness in buying and selling of goods. Sellers are free to sell their goods to any buyers and the buyers are free to buy from any sellers. In other words, there is no discrimination on the part of buyers or sellers.

Moreover, prices are liable to change freely in response to demand-supply conditions. There are no efforts on the part of the producers, the government and other agencies to control the supply, demand or price of the products. The movement of prices is unfettered.

#### (5) Profit Maximisation Goal:

Every firm has only one goal of maximising its profits.

#### (6) Perfect Mobility of Goods and Factors:

Another requirement of perfect competition is the perfect mobility of goods and factors between industries. Goods are free to move to those places where they can fetch the highest price. Factors can also move from a low-paid to a high-paid industry.

#### (7) Perfect Knowledge of Market Conditions:

This condition implies a close contact between buyers and sellers. Buyers and sellers possess complete knowledge about the prices at which goods are being bought and sold, and of the prices at which others are prepared to buy and sell. They have also perfect knowledge of the place where the transactions are being carried on. Such perfect knowledge of market conditions forces the sellers to sell their product at the prevailing market price and the buyers to buy at that price.

#### (8) Absence of Transport Costs:

Another condition is that there are no transport costs in carrying of product from one place to another. This condition is essential for the existence of perfect competition which requires that a commodity must have the same price everywhere at any time. If transport costs are added to the price of the product, even a homogeneous commodity will have different prices depending upon transport costs from the place of supply.

#### (9) Absence of Selling Costs:

