

Financial system:-

Financial system consist of the institution that help to match one person's saving with another person's investment.

- Who does the group of institution manage the financial system.
- The relationship between Financial system & many economic variable like saving & investment.
- A model is developed to determine supply & demand for fund in the financial market.

Financial system depends on two institution.

- (a) Financial market
- (b) Financial intermediaries

(a) Financial market :-

The financial market are financial institution through which a person wants to save can directly supply fund to the person who wants to borrow.

D) Financial market is of two type.

- (i) Bond market
- (ii) Stock market

D) Financial Intermediaries of two type.

- (a) Bank
- (b) mutual fund

Bond:-

- Bond is a certificate of indebtedness.
- It is the obligation of the borrower to the holder of the bond, that loan is repaid after the date of maturity.
- The rate of interest paid periodically until the loan mature.

The buyer can hold the bond until maturity or can sell the bond at earlier date to someone else.

NSC : National Saving Certificate (One type of bond)

Characteristics of Bond :-

(i) Bond's term or time period

(a) short term Bond (Issued within few months or within a year)

(b) Long term Bond (Issued upto 30 years or more than that)

(c) Perpetuity (Issued upto 50 years or more than that)

Perpetuity :-

→ The British Government have even issued of Bond that never matures called perpetuity.

→ This Bond pays interest for ever but the principal is never repay.

→ Rate

□ Rate of Interest decided on the basis of time period.

long term Bond pays higher rate of interest because it is riskier than the short term bond. Holder of the long term bond has to wait for longer period for repayment of principal.

→ If holder needs money before the date of maturity, he has to sell the bond to someone else perhaps at a reduced price.

(ii) It has credit Risk :-

- If the borrow fails to pay some of the interest & principle such failure to pay is called Default.
- Borrow can sometime default on their loan by declaring bank to bankruptcy.
- If the probability of default is high then the demand higher interest rate to compensate their risk.

Bankruptcy :-

It means it is the legal status of a person that can't be repay the debt it owes to its creditors. It is imposed by Courts.

(iii) It has tax-treatment :-

Interest income is taxable.

The bond which are issued by local government, state Govt. federal government or municipality charges lower rate of interest.

□ Junk bond :-

It is a highyielding, highrisk security typically issued by a company to seeking to raise capital quickly in order to finance take over.

STOCK :-

Stock is a partial ownership in a firm.

Difference between Bond & Stock :-

- (a) (i) The sale of stock to raise money is called equity finance.
(ii) The sale of bond to raise money is called debt finance.
- (b) (i) The owner of shares of intel stock is a part owner of intel.
(ii) The owner of an Intel bond is a creditor of the corporation.
- (c) (i) If intel is very profitable the stock holder enjoy the benefit of these profit / progress.
(ii) The bond holder only get interest of their bond.
- (d) (i) In case of stock offer the holder both higher risk & higher return.
(ii) If Intel bond runs into financial difficulty the bond holders are paid what they are due before the stock holders receive anything at all.

Determination of Stock Price :-

- Corporation issues stock by selling its shares to the public & these share trade among stock holders on organise stock exchange.

The price at which shares straight in stock exchanges are determine by supply of & demand by these companies. Demand for stock reflects people perception of the corporation future profitable.

when people become optimistic about the companies future then they raise their demand for the stock, so the price of the stock increases.

when people expect companies to have little profit or even losses the price of share falls.

Financial Intermediaries :-

(i) Bank

(ii) mutual fund

→ funds are supplied indirectly from savers to investors.

→ Bank & mutual fund act as mediators.

functions of Bank :-

primary functions :-

(i) It accept's deposit from public

(ii) It advances loan to public.

for deposit:-

(a) fixed or time deposit

(b) current or demand deposit

(c) savings account deposit

for loan:-

(a) direct loan

(b) cash credit

(c) overdraft system

Secondary Function :-

- (i) Secondary function include factor of credit
- (ii) undertaking safe custody of valuables (locus system)
- (iii) providing consumer finance using check system
- (iv) Educational loan

Mutual Fund :-

- An institution that sell shares to the public & uses the proceeds to buy of portfolio of stock & bond.
- The share holder of mutual fund accepts all the risk & return associated with the portfolio.
- If the value of portfolio rises, the shareholder benefits.
- If the value of portfolio falls, then the shareholder suffers the loss.

Advantages of mutual fund :-

- (i) It allows the people with small amount of money to diversify their holdings. because holding of single kind of bond or stock is very risky, people who hold the diverse portfolio of stock & bonds less risk because they have only a small stock in each company. Mutual fund makes these diversification easy.
- (ii) Mutual fund gives an ordinary people access to the skills of professional money manager. These manager gives firm's attention to company prospect in which buy the stock. They buy the stock of the companies having profitable future & sell the stock of companies with less promising prospect.

→ Mutual fund is also called Index fund.

Saving, Investment & National Income account :-

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mutual fund is also called index-fund.

National Income Account :-

1. closed Economy
2. opened Economy

1. Closed Economy :-

Absence of international trade, international borrowing & lending.

2. Open Economy :- presence of international trade, international borrowing & lending.

$$Y = C + I + G + NX$$

according to GDP,

open Economy, $Y = C + I + G + NX$

Closed Economy, $Y = C + I + G$ (here $NX = 0$)

If we subtract C & G from both side, then we derive

$$Y - C - G = (C + I + G) - (C + G)$$

$$S = I$$

$\therefore S \Rightarrow$ national saving

$I \Rightarrow$ Investment

$S = \text{private saving} + \text{public}$

$\therefore S = \text{private saving} + \text{public}$

let $T = \text{tax}$ indicates government collects tax from household — the amount it is pays back to the household in form of transfer payment. (in the form of social security benefit)

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$$S = (Y - T - C) + (T - G)$$

↓ ↓

Total saving (private saving) (public saving)

When $T > G$ = Budget surplus

$T < G$ = Budget deficit

Private saving :-

The income that household have left after paying taxes & consumption.

Public saving :-

The tax revenue that the Government has left after paying for it's spending.

Q. Suppose GDP is 8 dollar trillion. Taxes are 1.5 dollar trillion. Private saving is 0.5 dollar trillion. Public saving is 0.2 dollar trillion. Assuming this economy is closed. calculate

- (i) Consumption
- (ii) government purchase
- (iii) national saving
- (iv) nation saving ~~&~~ investment.

$$Y = C + I + G$$

$$8 = Y = 8 \text{ dollar trillion.}$$

$$Y - T - C = 0.5$$

$$T - G_1 = 0.2$$

$$T = 1.5$$

$$T - G_1 = 0.2$$

$$1.5 - G_1 = 0.2$$

$$(ii) G_1 = -0.2 + 1.5 = 1.3 \text{ dollar trillion.}$$

$$Y - 1.5 - C = 0.5$$

$$\rightarrow 8 - 1.5 - C = 0.5$$

$$(ii) \rightarrow C = 6.5 - 0.5 = 6 \text{ dollar trillion.}$$

$$Y = C + I + G$$

$$8 = 6 + I + 1.3$$

$$\rightarrow 8 = 7.3 + I$$

$$(iv) I = 8 - 7.3 = 0.7 \text{ dollar trillion.}$$

$$S = (Y - T - C) + (T + G_1)$$

$$= (8 - 1.5 - 6) + (1.5 - 1.3)$$

$$= 2 + 8 - 2.1 + 0.2$$

$$= 5.9 + 0.2$$

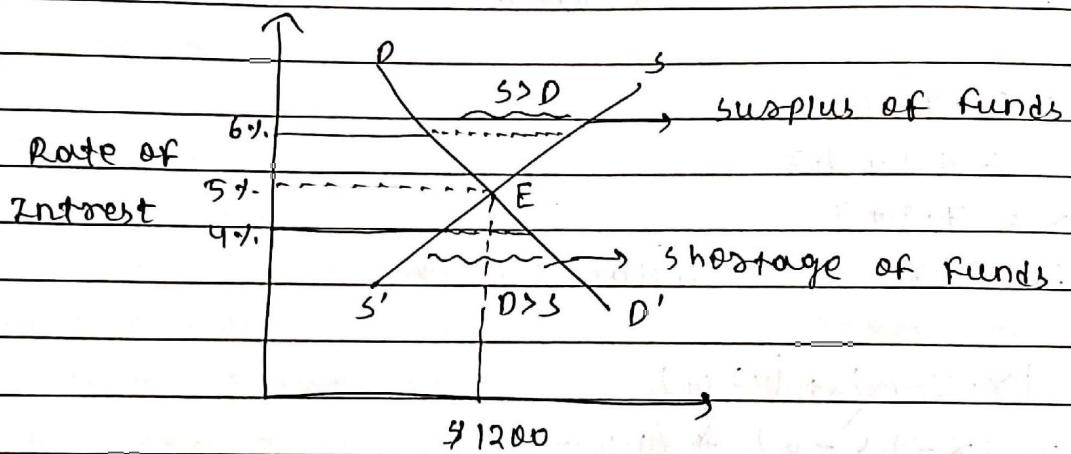
$$= 6.1 \text{ dollar trillion.}$$

$$(v) I = S = 0.7 \text{ dollar trillion.}$$

Market for loanable fund : (financial market)

- (i) savers
- (ii) investors

- market in which those who wants to save supply funds & those who want to borrow demand borrow.
- Saving is the source of supply for loanable funds.
- Investment is the source of demand for loanable funds.
- There is one investment rate which may be treated as return to saving & cost of borrowing.



Government Policy implemented on the market for loanable fund:-

Policy 1:-

Saving incentive (tax incentive)

Policy 2:-

Investment incentive

Policy 3:-

Budgetary surplus & Budgetary deficit.

This policies are explained through three steps:-

Step 1:-

what is the impact of these policies on the market for loanable fund.

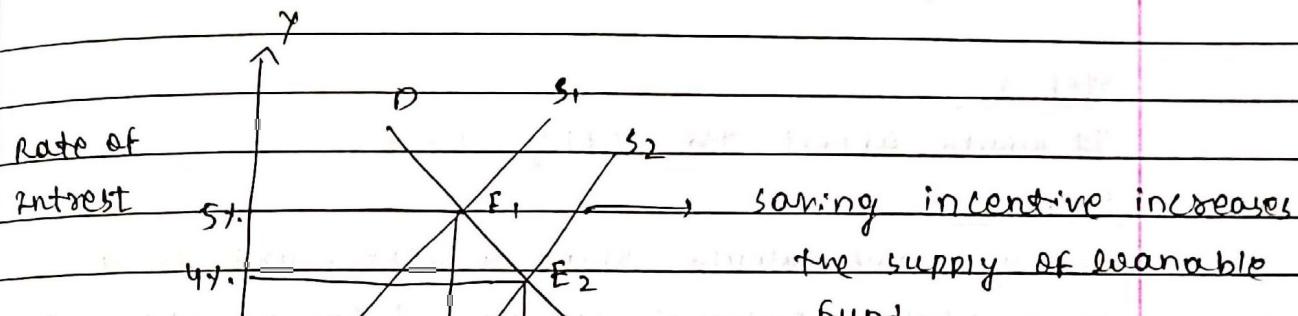
It would affect supply or demand curve.

Step 2:-

In which direction the curve would shift.

Step 3:-

We can compare the old & new equilibrium.



(Quantity demand & supply)

D saving incentive increases the supply of loanable fund. Change in tax laws to encourage firms & household to save more would shift the supply curve of loanable fund from S_1 to S_2 . A equilibrium quantity of loanable funds save & invested rises from 1200 to 1600.

D If a reform of a tax law encourage greater saving, the result would be lower interest rate & greater investment.

→ If income is equal to expenditure, the government will run balance budget.

→ If income is more than expenditure then government runs surplus budget.

→ If income is less than the expenditure then government will run the deficit budget.

Government finance deficit budget like by borrowing in the bond market & the accumulation of past govt. borrowing is called government debt.

Step-1:

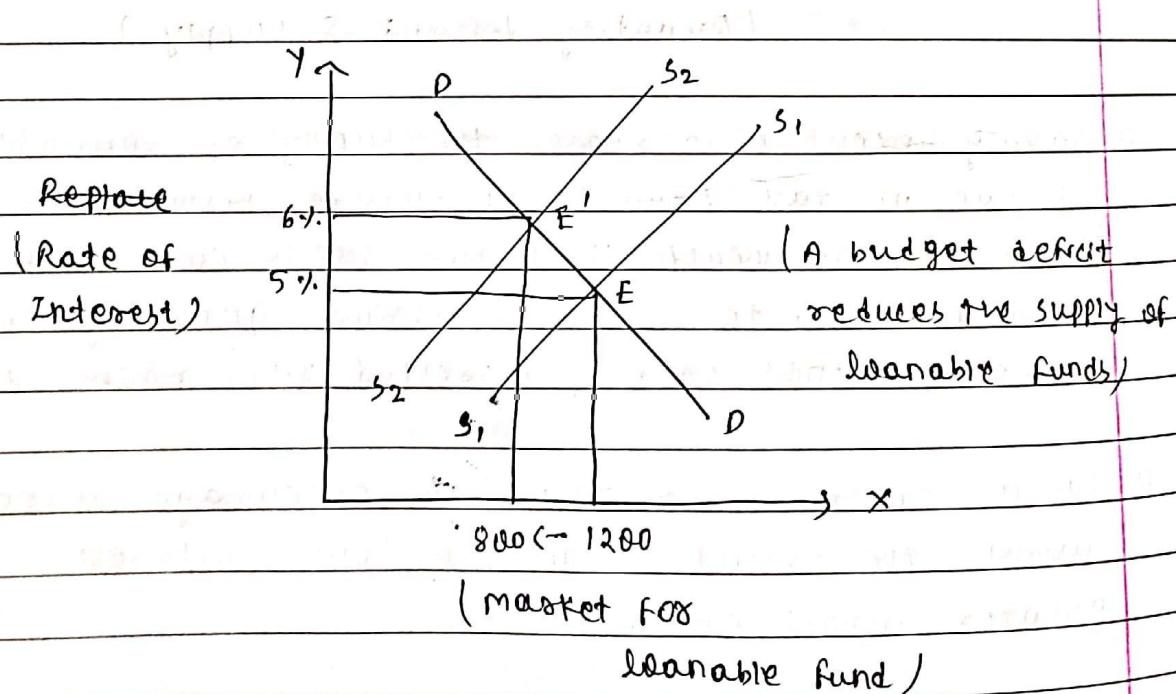
It would affect the supply curve.

Step-2:

Supply curve would shift to leftward as a result of decreasing national saving. [Due to tax cut & increase in expenditure]

Step-3:

Compare old & new equilibrium.



when the government spends more than it receives in tax revenue, the resulting budget deficit lowers national saving. The supply of loanable fund decreases & equilibrium interest rate rises. So the government borrows to finance its budget deficit it crowds out household & firms that otherwise ^{would borrow} finance investment.

when the supply curve shifts 's₁ to s₂, the equilibrium rises interest rate rises from 5% to 6%, & equilibrium quantity of loanable funds saved & invested falls from \$1200 to 4800.

D Crowd Out :-

It means decrease in investment that result from government borrowing.

Conclusion:-

when government reduces national saving by running a budget deficit, the interest rate rises & investment falls.

D SO the budget surplus increases the supply of loanable funds & reduces the rate of interest & stimulate investment.

(Ch-3 Q.1)

Suppose a worker in Germany can produce 50 computers or 5 tons of grain per month. Similarly worker in Poland can produce 4 computers or 4 tons of grain per month. Each country has 10 workers. Calculate what is the opportunity cost of computer & grains in Germany. Similarly what is the opportunity cost of computer & grains in Poland, which country has an absolute advantages in producing computer & grain. Similarly which country has comparative advantages in producing computer & grain.

- (iii) Each country should tend towards specialization in production of which field & why.

Soln

For Germany,

$$50 \text{ computers} \rightarrow 5 \text{ tons grain}$$

$$1 \text{ " } = \frac{5}{50} = 0.1 \text{ ton grain.}$$

Opportunity cost of computer is 0.1 tons of grain.

5 tons of grain \rightarrow 50 computers.

$$1 \text{ " } = \frac{50}{5} = 10 \text{ computers.}$$

Opportunity cost of grain is 10 computer.

For Poland:

$$4 \text{ computers} \rightarrow 4 \text{ tons grain}$$

$$1 \text{ " } \rightarrow \frac{4}{4} = 1 \text{ ton of grain.}$$

Opportunity cost of computer is 1 tons of grain.

$$4 \text{ tons grain} \rightarrow 1 \text{ computer}$$

$$1 \text{ " } \rightarrow 1 \text{ tons of grain.}$$

Below some data are given for land of milk & honey -

Year	Price of Milk	Quantity (Milk)	Price (honey)	Quantity
2016	₹2	100	₹5	200
2017	₹3	150	₹6	250
2018	₹4	200	₹7	300

- i) Compute N GDP, R GDP, & V GDP deflators for each year using 2016 as base year.
- ii) Compute percentage change in N GDP, R GDP & G DP deflators in 2017, 2018?
- iii) Did economic well being rise more in 2017 or 2018?

Ans

Nominal GDP

for 2016

$$(2 \times 100) + (5 \times 200) = 200 + 1000 = 1200$$

for 2017

$$3 \times 150 + 6 \times 250 = 450 + 1500 = 1950$$

for 2018

$$(4 \times 200) + (7 \times 300) = 800 + 2100 = 2900$$

Real GDP

for 2016

$$(2 \times 100) + (5 \times 200) = 1200$$

for 2017

$$(2 \times 150) + (5 \times 250) = 300 + 1250 = 1550$$

for 2018

$$(2 \times 200) + (5 \times 300) = 400 + 1500 = 1900$$

GDP deflation

For 2016, 100

$$\text{For 2017, } = \frac{1950}{1550} \times 100 = 126$$

$$\text{For 2018, } = \frac{2900}{1900} \times 100 = 153$$

(ii)

i. Change for NUIDP in (2017) = $\frac{1950 - 1200}{1200} \times 100$
 $= 62.5\%$.

ii. RUIDP in (2017) = $\frac{1550 - 1200}{1200} \times 100$
 $= 29.1\%$.

iii. GDP deflator in (2017) = $\frac{126 - 100}{100} \times 100$
 $= 26\%$.

In 2018

i. Change for NUIDP = $\frac{2900 - 1950}{1950} \times 100$
 $= 48.71\% \approx 49\%$.

ii. RUIDP = $\frac{1900 - 1550}{1550} \times 100$
 $= 23\%$.

iii. GDP deflator = $\frac{153 - 126}{126} \times 100$
 $= 21.4\%$.

(iv) 2017, well being rise.

Basis tools of finance

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year price of milk

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Time value of money :-

Value of money at a particular time period is called time value of money.

It is also refers to purchasing power of money & also earning power of money.

For example, a rupee today is more valuable than rupee tomorrow during non inflationary period.

$$P = 1000/-$$

$$i = 10\%$$

$$n = 2$$

$$F = P(1+i)^n$$
$$1000 (1+10)^2$$

P = present value

F = Future value

i = Interest in percentage

n : Number of time period

A : Annuity

(Annuity means a series of equal payment and equal time interval)

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

$$= \frac{(1 - (1 + 0.1)^{-2})}{0.1}$$

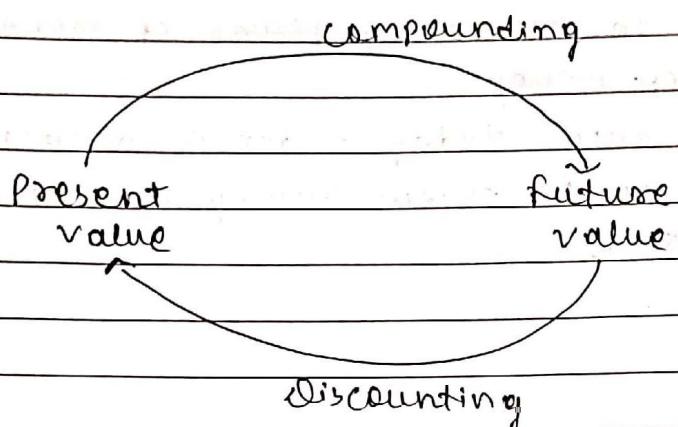
$$= \frac{(1 - 0.8264)}{0.1}$$

$$= \frac{0.1736}{0.1}$$

$$= 1.736$$

Compounding :- & Discounting :-

The concept of compounding & discounting is similar.
 Discounting brings a future sum of money to the present time using discount rate.
 and compound brings a present sum of money to the future time.



Compound Interest factors :-

(i) Compound amount factor (single payment)

F is to be determined

P, i, n are given

$$F = P(1+i)^n$$

Q. A person deposits sum of rupees 20 thousand at the interest rate of 18%. Compound rate Annually for 10 years. find the maturity value after 10 years.

$$\text{A: } P = 20000$$

$$i = 18$$

$$n = 10$$

$$\begin{aligned}
 F &= 20000(1+1.8)^{10} \\
 &= 20000 \times (1.8)^{10} (1.18)^{10} \\
 &= 104676
 \end{aligned}$$

(ii) present worth factor (single payment)

F, i, n are given

$$P = ?$$

$$P = \frac{F}{(1+i)^n}$$

Q: A person wishes to have future sum of rupees 110k for his child education after 10 years from now. What is the single payment that he should deposit now so that he desire the amount after 10 years? The bank gives 15% interest rate.

$$F = 100000$$

$$n = 10$$

$$i = 15$$

$$P = \frac{100000}{(1+15)^{10}} = 24718.4$$

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(iii) Series compound amount factor (series of payment)

$$F = A \left[\frac{(1+i)^n - 1}{i} \right]$$

Q: A person who is now 35 years old is planning for his retired life. He plans to invest equal sum of rupees 10 thousand at the end of every year for the next 25 years starting from the end of next year.

The bank gives 20% interest rate compounded annually. Find the maturity value for the account when he is 60 years old?

A.M

$$A = 10000$$

$$i = 20\%$$

$$n = 25$$

$$F = 10000 \frac{(1 + 20\%)^{25} - 1}{20\%}$$

$$= 10000 \frac{\left(1 + \frac{20}{100}\right)^{25} - 1}{\frac{20}{100}}$$

$$= 10000 \frac{(1.2)^{25} - 1}{0.2}$$

$$= 4719810 \quad (\text{Ans})$$

(iv) Sinking fund factor :-

A is to determine from F.

$$A = F \left[\frac{i}{(1+i)^n - 1} \right]$$

- Q. A company has to replace its present facility after 15 years at an outlet of 5 lakh rupees. It plans to deposit an equal amount at the end of every year for next 15 years, with the interest rate of 18% annually. Find the equivalent amount must be deposit at the end of the year?

$$n = 15$$

$$i = 18\%$$

$$F = 5000000$$

$$A = 500000 \left[\frac{1}{1 + \frac{18}{100}} \right] \left[\frac{(1 + \frac{18}{100})^{15} - 1}{(1 + \frac{18}{100})^{15} - 1} \right]$$

$$= 500000 \left[\frac{0.18}{(1 + 0.18)^{15} - 1} \right] = 8201$$

(v) series present worth factor :-

P is to be determined from A.

$$P = A \left[\frac{(1+i)^n - 1}{i(1+i)^n} \right]$$

- Q: A company wants to setup or reserve which will help the company to have at an annual equivalent amount of 10 lakh rupees for the next 20 years towards its employee welfare measures. The reserve is assumed to grow at the rate of 15% annually. Find the single payment that must be made now as a reserve amount.

A

$$n = 20$$

$$i = 15$$

$$A = 1000000$$

$$P = 1000000 \left[\frac{(1+0.15)^{20} - 1}{0.15(1+0.15)^{20}} \right]$$

$$= 1000000 \left[\frac{(1.15)^{20} - 1}{0.15 \times (1.15)^{20}} \right]$$

$$= 6259331$$

(vi) Capital recovery factor :-

A is to determine from P.

$$A = \frac{P \left[i(1+i)^n \right]}{\left[(1+i)^n - 1 \right]}$$

Q: A bank gives loan to the company to purchase an equipment worth 10 lakhs rupees with the interest rate 18% compound rate annually. This amount should be repaid in 15 yearly installment. Find the installment amount that the company has to pay to bank.

$$P = 1000000$$

$$A = 1000000 \times \left[\frac{0.18 (1+0.18)^{15}}{(1+0.18)^{15} - 1} \right]$$

$$= 196403$$

- Q: A financial institution introduce a plan to pay sum of rupees 15 lakh after 10 years at the rate of 18% compound rate annually. Find the annual equivalent amount that the person should invest at the end of every year for the next 10 years to receive 15 lakh after 10 years from the institution.

Ans

$$F = 15000000$$

$$i = 18\%$$

$$n = 10 \text{ year}$$

$$A = 15000000 \left[\frac{18}{100} \right] \left[\frac{(1+18)^{10} - 1}{100} \right]$$

$$\therefore A = 63772. \text{ Hence annual investment required}$$

- Q: A company takes a loan of 20 lakh to modernise its biler section. The loan is to be repaid in 20 equal installment at the 12% interest rate compound rate annually. Find the annual equivalent amount that should be paid for next 20 years?

Ans

$$P = 2000000$$

$$A = 2000000 \times \left[\frac{0.12 (1 + 0.12)}{(1 + 0.12)^{20} - 1} \right]$$

$$\therefore A = 267757$$

functions of central bank or open bank :-

RBI, Federal Reserve System

Bank of England, Bank of Japan.

function of central Bank :-

- The role of central bank which is oversee the banking system & regulate the quantity of money in the economy.
- Federal reserve system is created in 1913. It is run by board of governors which has seven members. The members are appointed by the USA president of USA & also the confirmation of SELET. The time period of the governor is 14 years.
- Among the seven members from the board of governors, the most important is chairman below, chairman directs the federal staff, presides over the board meeting and testifies about federal policies in front of congressional committee. Its time period is 4 years.
- Federal Reserve System regulates the function of bank and facilitates the transaction by issuing checks. It is also called open bank or bankers bank.
It is also called lender of last resort.
- Generally Federal Reserve System advances the loan to the commercial banks. If there is shortage of cash, then the Federal Reserve System provide funds to the commercial Banks, so why it is called lender of last-resort.

Another important function of the Federal Reserve system is to control the money supply in the economy. At the Federal Reserve maintains policy which is made by the Federal Open Market Committee (FOMC).

As the Federal Reserve monetary policy is made by the FOMC. FOMC meets about every 6 weeks in Washington DC. We discuss the condition of economy and considers the changes in monetary policy.

→ FOMC is made of seven members of Board of Governors & 5 members from 12 regional Bank's President. All the 12 regional president attend the FOMC meetings.

→ Federal Reserve System can regulate the supply of money through the technique which is called open market operation.

* Open market operation means the purchase & sell of the government bond by the Federal Reserve System.

The purchase of bond by Reserve system increases money supply.

The purchase of the sell of bond by federal system decreases money supply.

To see how the bank influence money supply, let us first imagine a world without a bank. Suppose total amount of currency in the economy is 100 dollars. So the supply money is also same with 100 dollars.

Now suppose someone opens a bank called 1st national bank. This is only called depository institution. that is it is accept deposit but can't give loan.

Suppose a person deposit some money, the bank keeps the money in his vault until the depositor withdrawing it. Deposites that bank has received but has not loaned out are called reserve. If all deposits are held as reserve so this system is called 100% reserve banking.

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i) open market operation:-

Purchase & sale of government bond. To expand the money supply, federal bank purchase the government bond. To contract the money supply, federal bank sale the government bond.

ii) cash reserve ratio (CRR) :-

To expand the money supply, the bank has to reduce to CRR. similarly & to contract the money supply, bank has to increase the CRR.

iii) discount rate :-

→ The rate of interest which is charged by the central bank to the commercial bank if advancing loan.

→ To expand the money supply, central bank has to reduce the discount rate, and contract the money supply, central bank has to increase the interest rate.

we can explain financial position of First National bank with a T account.

First National Bank

<u>Assets</u>	<u>Liabilities</u>
Reserves \$100.00	Deposits \$100.00

Each depositor in the bank reduces currency & raises the demand deposit by exactly the same amount leaving the money supply unchanged.

Reserve Ratio :-

The fraction of deposits that bank holds as reserve.

Reserve Requirement :-

Federal sets of minimum amount of reserve that bank must hold called Reserve requirement.

Excess Reserve :-

Bank may hold reserve above the legal minimum is called excess reserve.

Money creation with Fractional reserve Banking :

Suppose the first National bank reserve ratio is 10%. It means that it keeps 10% of its deposits in reserve and lends out the rest amount.

first National Bank

Assets	Liabilities
Reserves \$10.00	Deposites \$100.00
Loans \$90.00	

Now the bank has two kinds of assets. One is reserves & another is loans.

When the 1st National bank made these loans, the money supply increases. The money supply = \$100 (Demand deposite) + \$90 (As currency which is held by borrowers).

→ The creation of money does not stop with first National Bank.

Suppose the borrowers of 1st National bank uses \$90 to buy something from someone who they deposite the currency in 2nd National bank.

2nd National Bank

Assets	Liabilities
Reserves \$9.00	Deposite \$90
Loans \$81.00	

$$\begin{aligned}
 & 10\% \text{ of } 90. \\
 & \rightarrow 9.00 \\
 & \text{then } 90 - 9.00 \\
 & = \text{loan } \$81.00
 \end{aligned}$$

3rd National Bank

Assets	liabilities
Reserve \$ 8.10	Deposite \$ 81.00
Loan 72.90	

These process on & on each time the money deposited,
bank loan is made & more money is created.

Q. how much money is created?

original deposite \$ 100

1st national bank \$ 90.00

lending :

2nd national bank \$ 81.00

lending :

3rd national bank \$ 72.00

lending :

;

Total money supply = \$ 1000 (100×10)
money multiplier:-

Money multiplier is the reciprocal of reserve ratio.

$$\text{Here } R = \frac{1}{10} \quad [\text{reserve ratio}]$$

∴ Money multiplier = 10

$$\therefore \text{Total money supply} = 100 \text{ (initial demand deposite)} \times 10 \\ = 1000$$

Higher the reserve ratio, the less of each deposit
bank lend out & smaller the money multiplier.