Macroeconomics

→ Study of the structure and performance of national economies and of the policies that governments use to try to affect economic performances.

Issues of Macroeconomics

- Long-run Economic Growth
- Economic Activities to Fluctuate
- Unemployment
- Inflation
- Government Policies

Circular Flow of Income

Income → Sum total of all the individuals

GDP → Total monetary or market value of all the finished goods and services produced within a country in a specific time period.

→ Two Sector Model
→ Three sector Model
→ Four sector Model

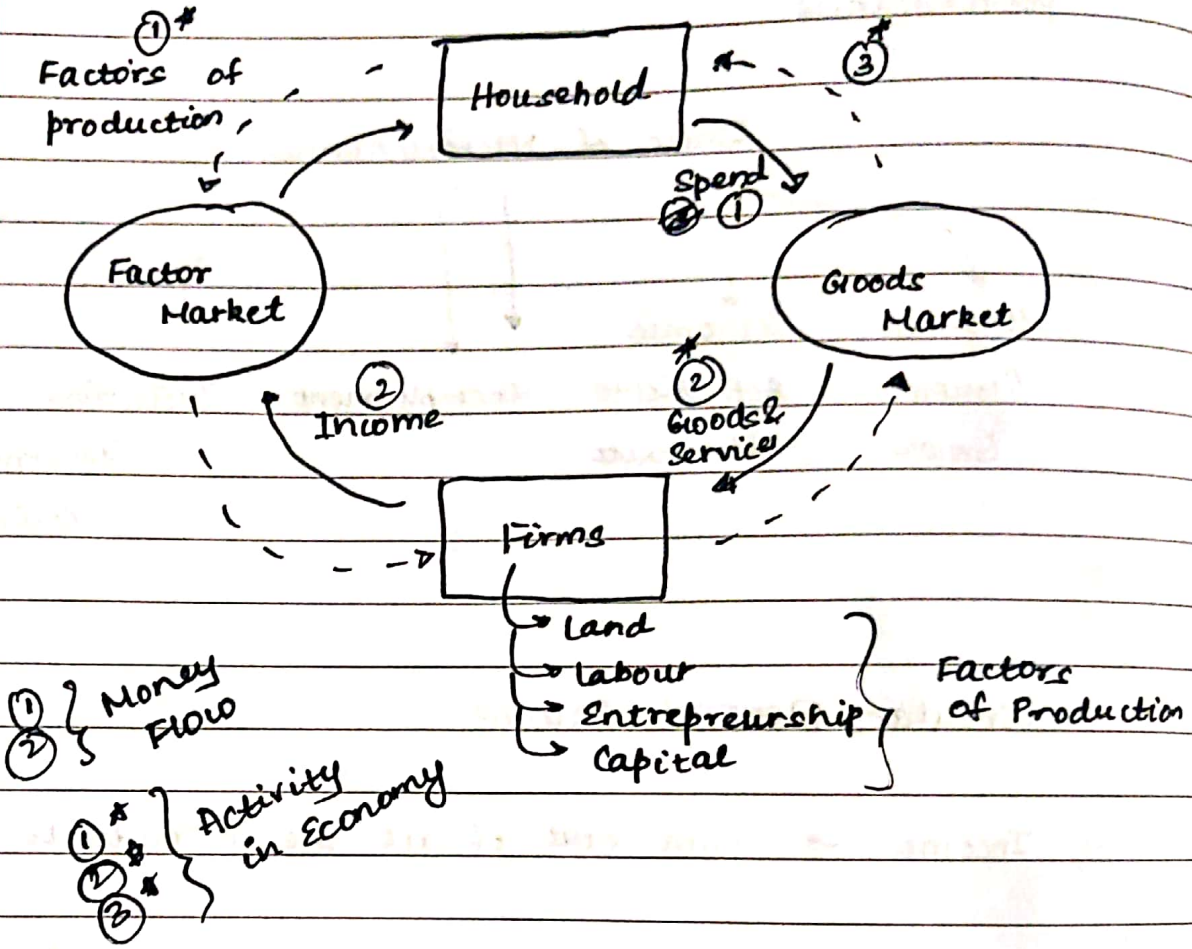
consumer good
↳ Final good
Capital good
↳ Used in further process of production

Two Sector Model:

→ Firms (Producer): The firm sector includes businesses that take on the risk of combining scare resources to produce goods and services. This sector buys capital goods with investment and pays for

Household : Responsible for consumption expenditure

Two Sector Mode

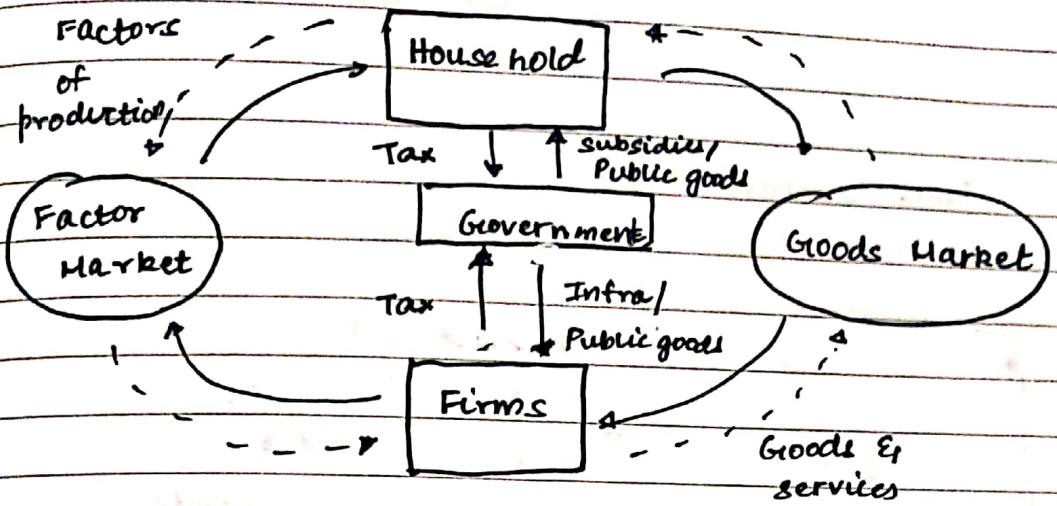


In factor market, firms buy factors, households sell them

In goods market, firms sell, household buy

→ Thereby achieving macroeconomic balance

Three Sector Model



of household

A part of income is paid to the government as tax (Income tax).

The income left after paying to the government is called disposable personal income with household

Household can spend only the disposable income, but the goods available in the market add up to their Income

Consider

Income → ₹1000 cr

Tax → 10%

Disposable Income → ₹900 cr → can be used

Households cant spend this.

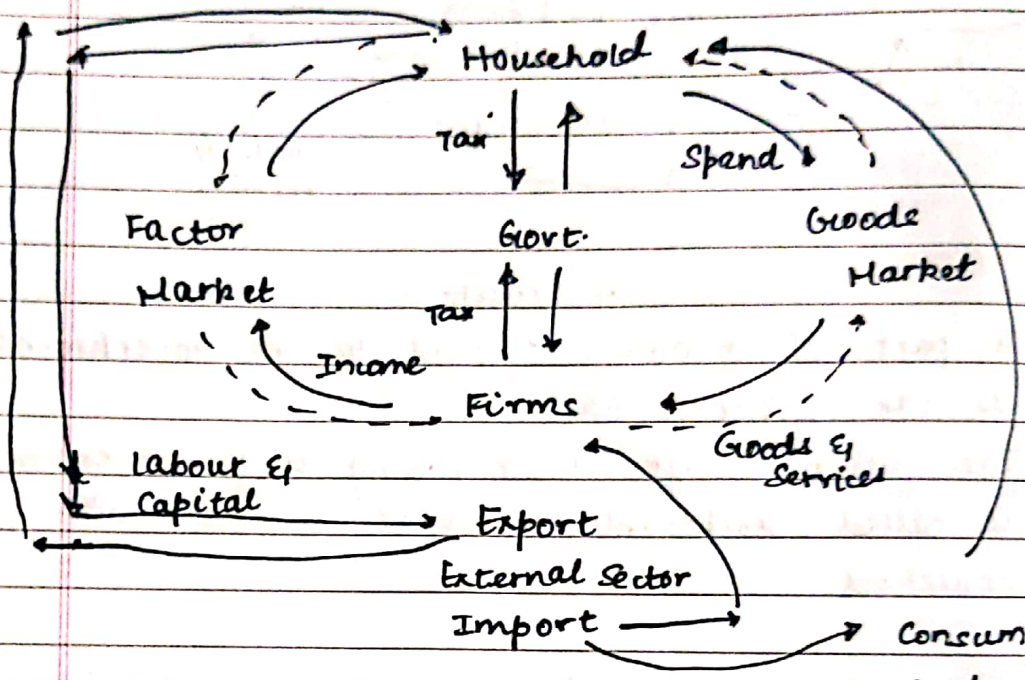
Tax → ₹100 cr (Leakage)

Available in goods market → ₹1000 cr

Government spends this ₹100 cr for various goods & services (Injection)

Leakage = Injection.
(For the 3-sector Mode

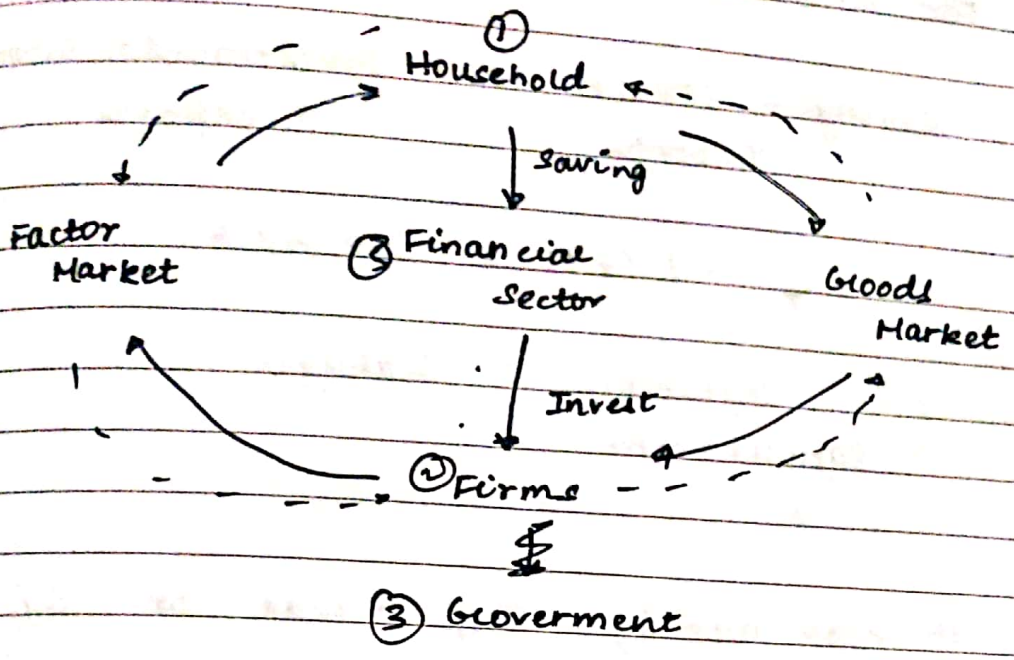
Four sector Mode



Export = Import → This is a leakage in this model
↳ Injection

Consider ₹100 cr of export, so we don't use from the domestic market, so these ₹100 cr from domestic is imported.

Five sector Model



So, ₹100 cr is tax
₹150 cr for export

Now, household is left with ₹800 cr, this where financial sector comes in,

Out of this ₹800 cr, household can save a part of it (savings)

In all the models, we see

Agg supply = Agg. demand

For 5- sector model

Savings + Taxes + Imports = Investment + Govt. spend + Exports

$S + T + M = I + G + X$

Injection = Leakages

Equilibrium

In real world, Inj > Leak or Inj < Leak

Inj > Leak ⇒ Expenditure and employment will rise

Economic Boom

Inj < Leak ⇒ Recession.

Keysian Economics

- Developed after Great Depression
- Came up as repudiation to the aggregate supply focused Classical Economics → price of labour is feasible
  - ↳ Applicable in long run. Disturbances in short run
  - ↳ no. govt. involvement
- Output is strongly influenced by aggregate demand
- Aggregate demand doesn't necessarily equal the productive capacity of economy.
- Influenced by a lot of factors

Consumption Demand fn.

- Talking abt. aggregate consumption
- Consumption depends on psychology of the household
- Agg. consumption is a ~~linear~~ increasing fn. of absolute disposable income
- Current consumption is a fn. of current income.
- Keynes talks about current absolute disposable income
- "As income increases, cons. consumption increases but not by as much as increase in income.

Disposable Income → $Y = C + S$ ← Saving.

Keynsian cons. fn.: Cons. is a stable fn. of current dis. income.

$C = a + bY$ $\quad a > 0, \quad 0 < b < 1$

Rate of Interest ↓

Save more, RI ↑, consumption ↓

Consumption is a dec. fn. of RI

a → Autonomous consumption
↳ consumption at zero income
(They consume by past savings or borrowing)

Marginal propensity to consume (b)

$$0 < MPC = \frac{\Delta C}{\Delta Y} < 1$$

(slope of consumption fn.)

If MPC = 0 → Entire income is saved
MPC = 1 → Entire income is consumed
↑
Not possible situations

Average propensity to consume

→ Falls as income rises.

$$APC = \frac{C}{Y} = \frac{a}{Y} + b$$

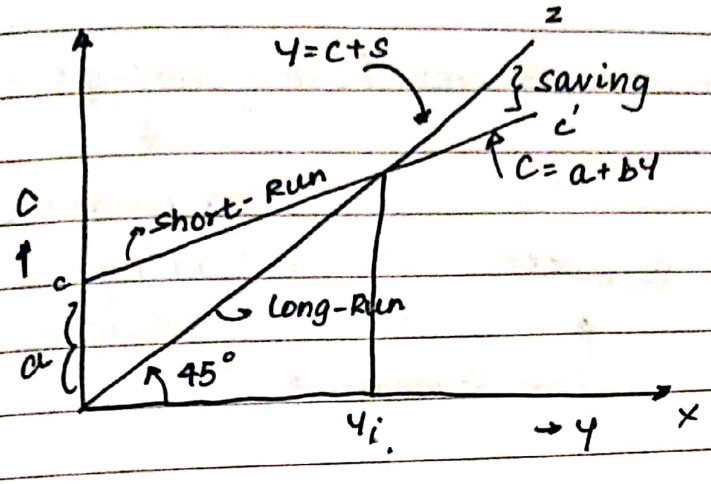
$\frac{C}{Y}$ = Total cons. / Total inc.

APC > MPC

Income is primary derminant of consumption and the interest rate doesn't have imp. role to play.

MPC = $\frac{1}{2}$ ← From income, consumption data

$C = 10 + 0.5Y$ (From data, for a particular data)



$S = Y - C$

$= Y - a - bY$

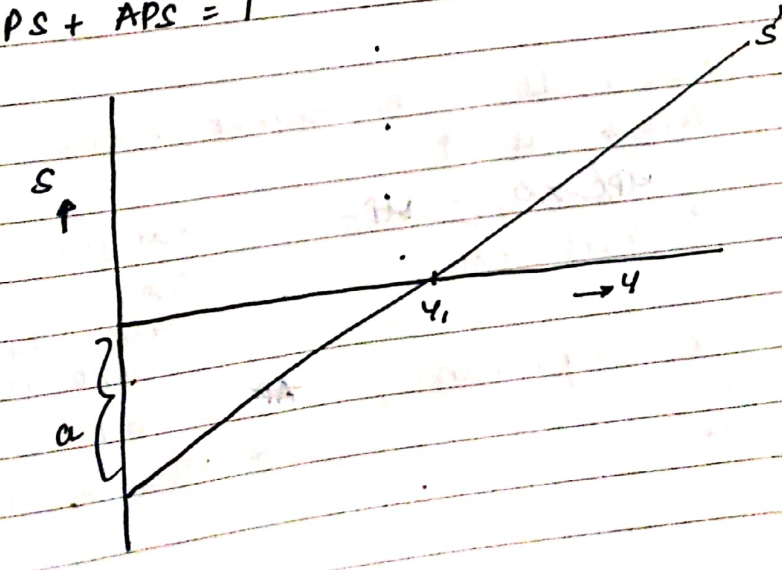
$S = -a + (1-b)Y$

$MPS = 1-b$

$APS = -\frac{a}{Y} + (1-b)$ (MPS)

$\therefore$ MPS > APS

$MPS + APS = 1$ $\quad APC + APS = 1$



As economy prospers, income goes up and so does saving rate (APS). Thus, prosperity leads to stagnation, leading to recession

Income ↑ ⇒ Saving ↑

⇓

Agg demand ≠ Agg supply

↳ leading to lesser consumption

Recession ← Stagnation

→ Savings don't lead to investment as Oppurtunities for investment may not be favorable.

→ Y↑, APC ↓, APS ↑. Consumption exp. ↓

This leads to increase in inventory, fall in production and the stagnation.
(Secular stagnation Hypothesis)

Early Emperical Successes (Results from Early studies)

→ House holds with higher incomes:
APC ↓ as Y↑

↳ Short-run

Kanye's says
Fck long run,
Talk only about
short run

For long-run, $C = bY$

↳ MPC is const.

↳

Keynesian Investment Function

→ flow variable

- Investment is defined as addition to capital stock
- Related to capital

capital is ~~net~~ cumulative net investment.

$$K_t = \sum_{i=1}^{t} I_t$$

K_t ← Capital stock in time t

I_t ← Net investment in time t

$$I_t = K_t - K_{t-1}$$

$$I_{n,t} = I_{g,t} - D$$

$I_{n,t}$ ← net Investment

$I_{g,t}$ ← Gross Investmen

D ← Depreciation (wear & Tear)

Types of Investment

- Business Fixed (Non-residential) investment
- Residential Investment
- Inventory Investment

- Guiding principle behind investment is profit.

Decision to Invest

→ New investment is determined by marginal efficiency of capital (MEC) in conjuction with rate of intrest (r)

→ MEC is highest rate of return over cost expected from producing an additional unit of capital.

→ MEC refers to the rate of discount which makes the present value of expected net returns from a capital asset just equal to it's supply price.

MEC depends on
- Supply price / Replacement cost
- Prospective yields or expected returns from an income yielding assets

$$C_0 = \sum \frac{R_t}{(1+e)^t}$$

(C_0: supply price; R_t: prospective yield)

MEC $\geq$ Ri
↳ profit

e → MEC

If $e > r$, new investment is profitable
$e < r$, new investment is non-profitable
$e = r$, investers are neutral.

Supply Price : Sum of prospective yields discounted at MEC

Demand Price : Sum of propective yields discounted at current rate of intrests

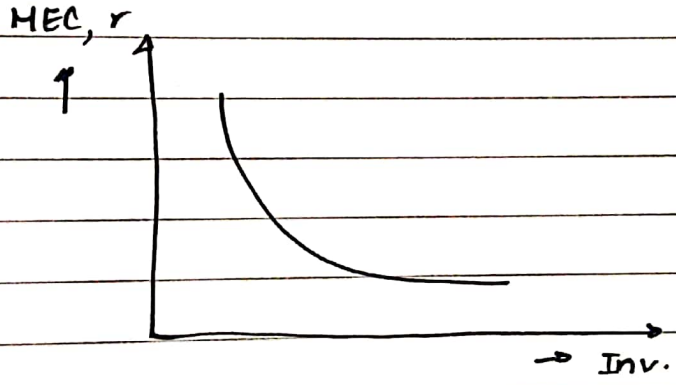
→ Demand price ↑, the lower r & I at which it is discontinued.

→ RI↓, More investment (Classical eco.)

→ Kayne's says for more investment MEC must exceed rate of intrest

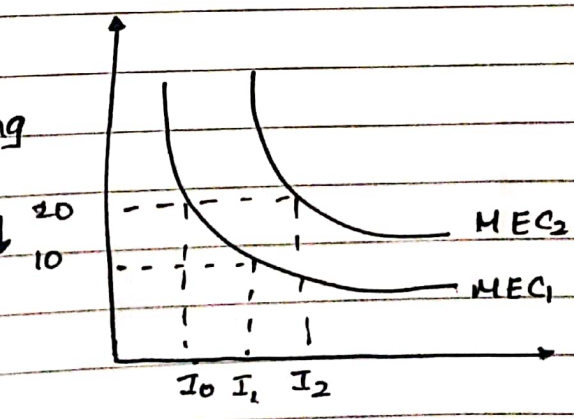
→ MEC and r are determined ind. of each other

→ MEC isn't same as marginal pdt. of capital which is concerned with immediate effect of additional capital.



→ Company keeps investing till MEC = r

→ As r↓, I↑



Case : r ↓ by 0.5%
I ↑ by 8%
↳ More sensitive
Steeper
↳ More elastic w.r.t r

r↓ by 5%
I↑ by 2%

Factors Influencing MEC

- Infrastructure (Most. imp) → Production method
- Governance → Govt. policy
- Capital equipment supply → Nature of Demand
- Change in income → Business cycle

Introduction to Income Determination

$$Y \text{ (Income)} = C + S + T + (X - M)$$

(Net Export; C: consumption)

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

(G: Govt. Expenditure; I: Investment; C: Consumption)

Assuming closed economy,

$$C + I + G = GDP = Y = C + S + T$$

∴ National Income, $C + I + G = GDP = C + S + T$

$$y - c = i + g \qquad y - c = s + t$$

$$\Rightarrow \quad i + g = s + t$$

$$\therefore i = s + (t - g)$$

(g: unforseen changes)

$$i = \bar{I} + \Delta inv = s + t - g.$$

($\bar{I}$: Planned Invest.; Δinv: unplanned invest)

$$C + \bar{I} + \Delta i + g = y = C + S + t$$

Tax

Tax revenue is a fn. of income (y)

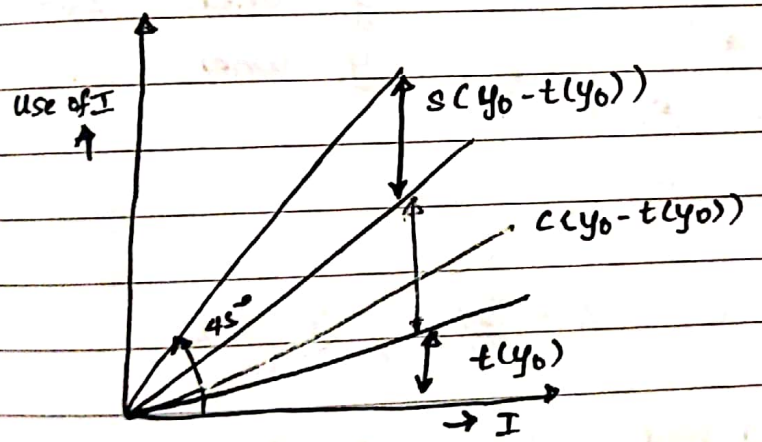
$$t = t(y) : \quad t' > 0 \qquad \frac{dt}{dy} > 0$$

Disposable income $= y - t(y)$

$$C = C(y - t(y)) \qquad C' > 0 \quad \text{MPC}$$

$$S = S(y - t(y)) \qquad S' > 0 \quad \text{MPS}$$

$$\text{MPC} + \text{MPS} = 1$$



Area under $t(y_0)$ is tax.

$\bar{I} + \Delta i + g = S + t$ ← zero for eq.

$\bar{I} + \Delta i + g = S(y - t(y)) + t(y)$

$\bar{I} + g = S(y - t(y)) + t(y)$ (Eq. cond.)

If income increases,

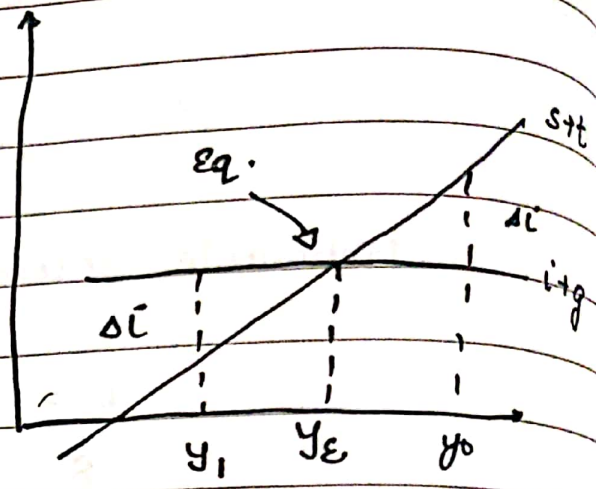
$S + t > i + g$

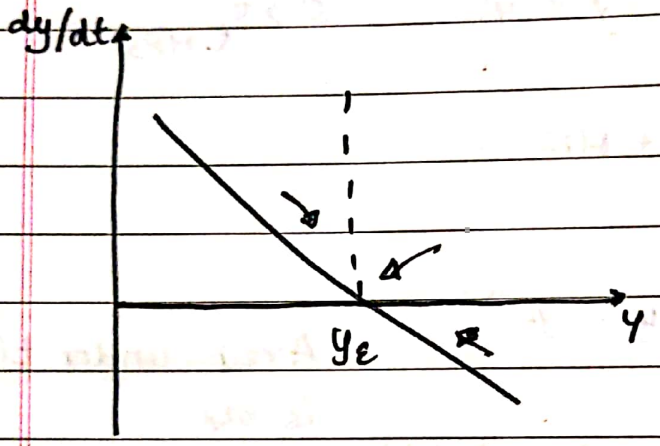
$(S + t) - (i + g) = \Delta i > 0$

$\Delta i > 0 \Rightarrow$ extra inventory. So producers will call back orders until $\Delta i = 0$

Determination of Eq. Income

(S+t) +vely slope, as both are fn of y.





$y_\varepsilon \rightarrow$ Eq. income

y_0 when $(s+t) > (i+g)$

y_1 when $(s+t) < (i+g)$

Consider $C = 20 + \frac{3Y}{4}$, $I = 20$

Eq. is reached when $S = I$

$$-20 + \frac{3Y}{4} = 20$$

$$\Rightarrow Y = 160$$

(OR) $Y = C + I \Rightarrow Y = 160$

Expenditure Multiplier

Following Keynesian model -

→ Vol: of investment expenditure
→ Consumption is a fn: of income and is linear
→ MPC is positive but less than unity
→ Economy is closed one.

$C = a + bY$ $\qquad I = I_0$

$$Y = C + I = a + bY + I_0$$
$$Y(1-b) = a + I_0$$
$$Y = \frac{a + I_0}{(1-b)}$$

Suppose investment changes to $I = I_0 + \Delta I$

$$\Rightarrow \Delta Y = \frac{\Delta I}{1-b}$$

$$\therefore \Delta Y = k(\Delta I)$$ ← Multiplier

Multiplier is amt: by which eq: output changes when autonomous investment increases by 1 unit.

→ Larger the MPC, larger is multiplier.

Consider ΔI increase in R-I,

Due to increase in income, demand increase so production increase, which further gives rise to an increase in income.

$$\Delta D = \frac{1}{1-c} \Delta I = \Delta Y_0$$

↑ MPC

For $b < 1$, the successive terms in the series become progressively smaller.