

Economics

How do we operate in scarce environments?

- Less resources
- Unlimited demand

- Not only money-based, but also applicable in sustainable environment.
- Deals with resource allocation.

(def) Meeting unlimited needs with limited means.

Economics

Microeconomics

- Deals with problems at individual level
eg. Price setting of single market.
- Deals with individual economic agents (firms / customers / markets)

Macroeconomics

- Deals with problems at all levels, from a birds-eye view.
- Understanding interplay of economic agents from an aggregate perspective.
eg) GDP, Unemployment

Macroeconomics

- Has crucial impact on a country.

As a policymaker,

- we first evaluate the existing resources
- first aim would be to increase employment, i.e. earning capability (income) of citizens.

[When the nominal income goes up, it would lead to inflation & price escalation]

To evaluate a policy at the end of a period of time, the amount of income would be compared to that at start.

Income is the variable of interest, which is the metric of the efficacy of a policy.

Chapter 1 National Income Accounting

Production of goods and services helps in the rise of income.

Income & Production are often used interchangeably, and are interdependent.

country
A)

Let an economy produces 'N' no. of goods.
10 units of apples &
20 units of computers

country
B)

20 units of oranges
5 units of aeroplanes

which country is doing better?

- Look at the market prices of each goods. Find the aggregate.

$$P_a = ₹ 10 \leftarrow \text{price of apples (market value)}$$

$$P_c = ₹ 50 \quad q_a, q_c \rightarrow \text{quantities}$$

Country A

$$P_a q_a + P_c q_c$$

$$= 10 \times 10 + 50 \times 20$$

$$= ₹ 1100/-$$

$$P_o = ₹ 20$$

$$P_a = ₹ 100$$

$$\text{market value} = P_o \times q_o + P_a \times q_{ac}$$

$$= 20 \times 20 + 100 \times 5$$

$$= 400 + 500$$

$$= ₹ 900/-$$

Through market prices we standardise the production.

GDP is calculated in a similar fashion through aggregate.

Let $N \rightarrow$ no. of goods produced in a country

$$GDP = P_1 q_1 + P_2 q_2 + P_3 q_3 + \dots + P_n q_n.$$

$$\Rightarrow GDP = \sum_{i=1}^N P_i q_i$$

(Nominal)

takes into account current year price

Increase in production leads to increase in GDP.

Ways to increase GDP

- Increase P (price)
- Increase q (quantity)
- Increase N

Increase in P results in inflation, it leads to rise in GDP.

Eg: Country A (2020).

10 units of apples (q_a)

20 units of computers (q_c)

$$P_a = 10/- \quad P_c = 50/-$$

Nominal GDP

1100/-

Country A (2023)

$$q_a = 15 \quad P_a = 20$$

$$q_c = 30 \quad P_c = 100$$

$$\begin{aligned} \text{Nominal GDP} &= 20 \times 15 + 100 \times 30 \\ &= 30 + 3000 \\ &= 3300/- \end{aligned}$$

Calculate real GDP with base year 2020.

Take prices of 2020

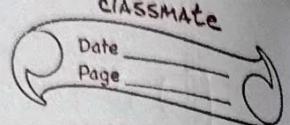
Take qty of 2023.

$$\begin{aligned} \text{Real GDP} &= 10 \times 15 + 50 \times 30 \\ &= 150 + 1500 \\ &= 1650/- \end{aligned}$$

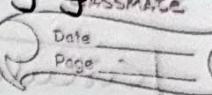
Value of GDP has increased by 550/- only accounting for the quantities.

Increase in real GDP is through increase in production.

by RBI
base year 2011/12



GNP → income generating capacity of citizens of a country



Real GDP → GDP at constant prices
Nominal GDP → GDP at current price.

Problems faced in setting base year:

- products in both years may not be the same, i.e. the newer goods may be introduced later.
- Hence, every 5 years, base year revision is performed.

Definition of GDP

Gross Domestic Product (GDP) is the market value of all final goods and services ~~being~~ produced within the geographical/political boundaries of an economy/country within a specified period of time.

Goods are physically perceptible while services are not.

Goods (pen, book)

Services (teller, bank, doctor, legal, haircut)

GDP is the total market value of all

the goods and services produced in the confinement of the region. It does not take into account the raw materials; only final goods, i.e. it should not be included in the production of another material in the country.

14/08/2024

Gross National Product (GNP)

$GNP = GDP + \text{factor income from abroad} - \text{factor payments to abroad.}$

$\Rightarrow GDP + \text{Net factor income from abroad}$

$$\Rightarrow GNP = GDP + NFIA$$

We assume a simplified economy:-

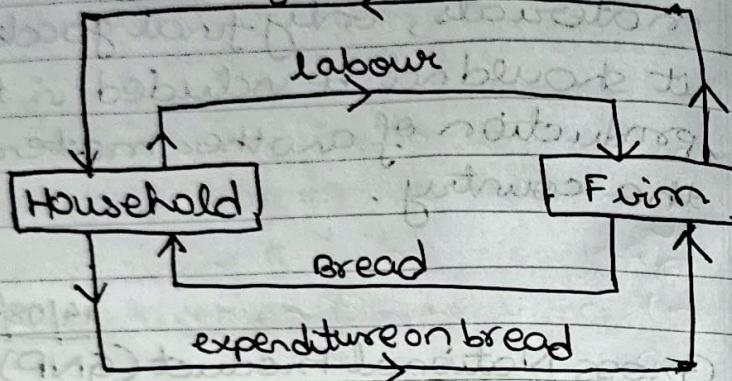
→ 2 types: household (labour) and (sectors) firms (producers)

→ 1 product: Bread (good produced)

→ 1 raw material for Bread:

Circular flow of economic model

1 good product \rightarrow Bread
 factor of production \rightarrow Labour
 wages/factor payments



There are no leakages in the economy, i.e. the households spend all of their income on bread.
 (Expenditure & Salary are equal)

There are 2 loops:

- \rightarrow Inner loop (clockwise): Real flow
- \rightarrow Outer loop (anticlockwise):

Money flow corresponding to real loop inside.

\rightarrow There are no leakages in the form of investments. There are no injections in the income through borrowing from outside.

National Income Identity

National Income \equiv National Expenditure
 \equiv National Production

National Income Calculation:-

- \rightarrow Income method
- \rightarrow Expenditure method,
- \rightarrow Product method.

based on tracking of respective paths.

All forms of expenditure can be classified into four heads:-

- \rightarrow Consumption Expenditure
- \rightarrow Investment Expenditure
- \rightarrow Government Expenditure.
- \rightarrow Net Exports

- \rightarrow Consumption Expenditure
- \rightarrow Durable goods
- \rightarrow Non-durable goods
- \rightarrow services

largest contribution to expenditure.

Durable goods last for a longer service span (fridge, AC) as compared to non-durable goods (food, clothes) which are perishable.

- Investment Expenditure**
- Business fixed investment (building, machinery, tools, land)
 - Inventory investment
 - Residential investment

Investment refers to increase in capital stock of an economy. Capital implies the goods and services which can be used to produce further. It is a produced means of production.

Eg: Capital stock (K_t) at time t .
 if $K_t = \$500$
 $K_{t+1} = \$700$
 $\therefore I_{t+1} = K_{t+1} - K_t (\Delta K)$
 $= \$200$

when ΔK is negative, it leads to disinvestment. A positive ΔK implies investment.

Inventory: finished goods kept at buffer stock in warehouse. It is done to meet the unforeseen

demands for that good. It can be immediately supplied to the market.

Residential: spending to buy residences for our own consumption

- **Government expenditure**
 It includes infrastructure, defence. Government is the referee of economy
- **Net exports**
 $\text{Exports} - \text{Imports}$

Adding expenditure of foreigners on local goods and subtracting expenditure of local people on foreign goods.

Consider

No trade; Net exports = \$0

$$C = \$200$$

$$I = \$100$$

$$G = \$200$$

$$\begin{aligned} GDP &= C + I + G \\ &= \$500 \end{aligned}$$

If $NPIA = \$500$
 $GNP = \$1000 [C + I + G + NPIA]$

#2] $C = \$200$
 $I = \$100$
 $G = \$200$

Income from abroad = \$800
 factor payments to abroad = \$500
 $NPIA = \$300 - \500
 $= -\$200$

$GNP = C + I + G + NPIA$
 $= 500 - 200$
 $= \$300$

If $GNP > GDP$, citizens of country are earning more from abroad.

If $GNP < GDP$, outside people are exploiting local economy more.
 (e.g. Congo, Sudan)

Depreciation \rightarrow Consumption of fixed capital
 (e.g. price of goods falls every year)

Net Domestic Product (NDP),
 $NDP = GDP - \text{depreciation}$

Similarly,

$NNP = GNP - \text{depreciation}$

$GDP, GNP, NDP \& NNP$ are based on market prices.

When we go to sell a product in the market in the presence of a government, we need to increase the price to include taxes (indirect taxes). However, if the government provides subsidies, the price is decreased.

Subtracting net indirect cost from any of the statistics results in factor cost.

$GDP_{mp} - \text{net indirect taxes} = GDP_{fc}$

mp
market price.
fc
factor cost.

NNP_{fc} is the official measure of National Income

#3) If depreciation $\rightarrow \$50$ million
 Net Indirect tax = $\$10$

$$C = \$200$$

$$I = \$100$$

$$G = \$200$$

$$NFI = -\$200.$$

$$GDP = C + I + G.$$

$$GNP = GDP_{mp} + NFI$$

$$NNP_{mp} = GNP_{mp} - \text{depreciation}$$

$$NNP_{fc} = NNP_{mp} - \text{Net indirect tax}$$

National Income (NI) score.

21/08/2024

Classical Tradition

All economies if left to themselves will consume resources at their own rate, i.e. unemployment ceases to exist.

After a certain period, there are booms and busts in the economy. Busts involve fall in production level & recession.

An amplified form of recession is depression.

The General Theory of Employment, Interest & Money (1936) - J.M. Keynes

In order to save the economy from depression, we need to increase the demand. All expenditure translates into demand.

Simple Keynesian Model of Income Determination

what influences consumption in a company?

- Income

$$\text{consumption} = f(\text{Income})$$

$$\Rightarrow C = f(Y)$$

$$C = a + bY$$

$a, b \rightarrow \text{constants}$
 $a, Y \rightarrow \text{variables}$

b determines consumption

$$0 \leq b \leq 1$$

$b \rightarrow \text{slope};$

Increase in consumption, due to unit increase in income

Psychological parameter
(behavioral)

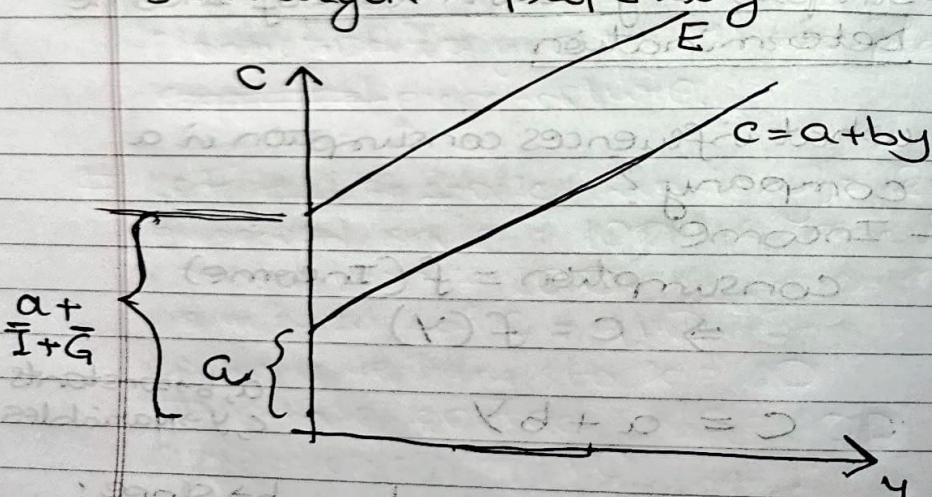
$b \rightarrow$ determines how much income is translated to consumption.

$a \rightarrow$ Subsistence level of consumption.

Basic needs \rightarrow The amount of consumption which is not independent of income.

Terminology

a \rightarrow subsistence level of consumption
b \rightarrow marginal propensity to consume.



Expenditure

$$E = C + I + G$$

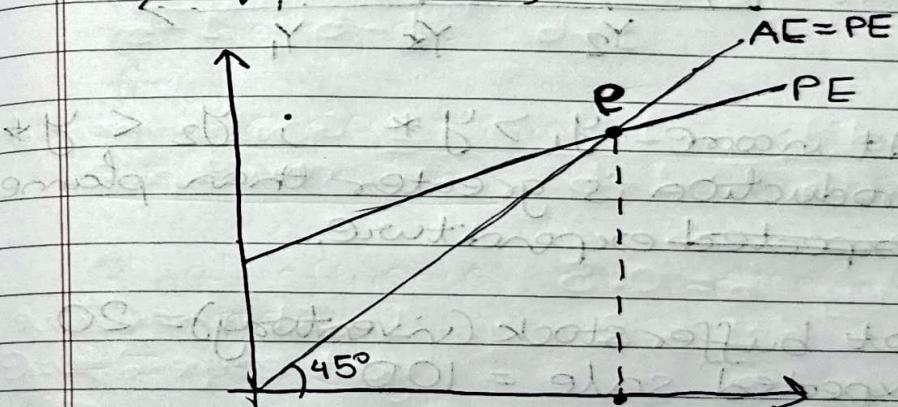
$$= (a + by) + \bar{I} + \bar{G}$$

; assume I & G to be constant.

Expenditure

- Planned (PE) ~~Expenditure~~ $\rightarrow E$ in the graph
- Actual (AE) \rightarrow GDP

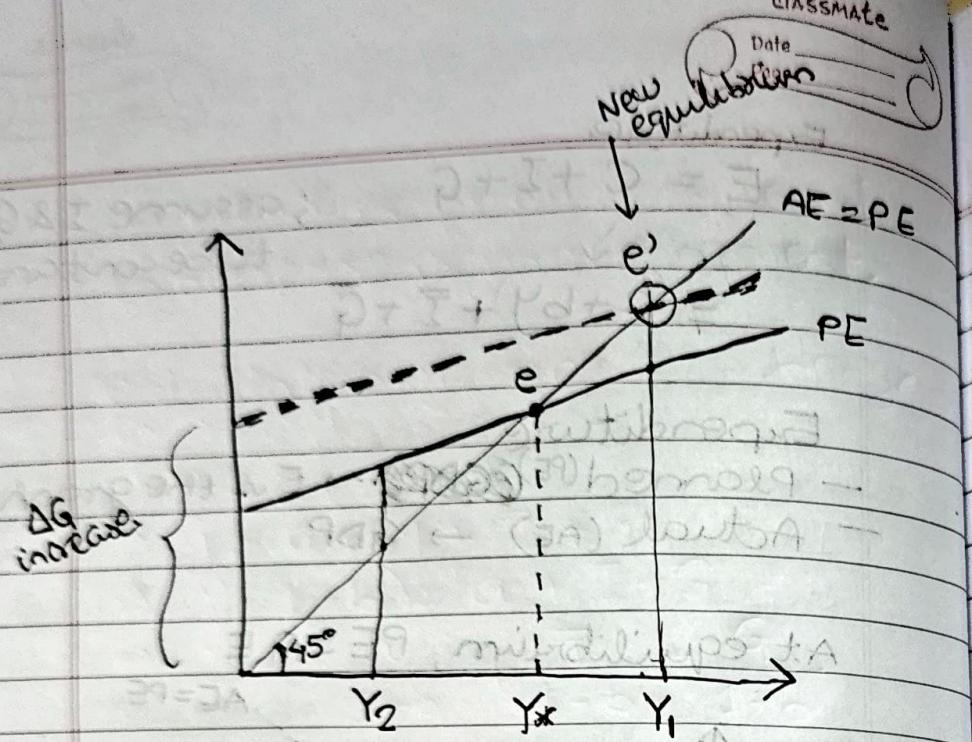
At equilibrium, $PE = AE$



Y^* \rightarrow equilibrium level of income.
 e \rightarrow Keynesian cross

$OII =$ output

The 45° line indicates AE / GDP .



At income $y_1 > y^*$; $y_2 < y^*$.
Production is greater than planned expected expenditure.

let buffer stock (inventory) = 20
expected sale = 100
production = 100.

actual sale = 110

new inventory stock = 10 * γ

again expected sale = 100,

production = 110

//to keep buffer stock constant.

When production $>$ planned expenditure, then inventory stocks increases. Due to unanticipated accumulation of inventory, the firm decreases level of production from ~~y_1~~ to y^* .

In the opposite scenario, the depletion/deaccumulation of inventories, causes a rise in level of production from y_2 to y^* .

Hence, e is the point of equilibrium.

G can be influenced by the govt.
 $(Y = C + I + G)$.

Suppose govt expenditure (G) is increased by

$$G + \Delta G = G'$$

which leads to increase in ~~constant~~ y-intercept.

Govt intervention thereby influences production level.

Increase in production leads to decrease in unemployment.

calculation of impact of change in G or Y

$$\begin{aligned}Y &= C + \bar{I} + G \\ \Rightarrow Y &= a + bY + \bar{I} + G \\ \Rightarrow Y(1-b) &= a + \bar{I} + G \\ \Rightarrow Y &= \frac{a}{1-b} + \frac{\bar{I}}{1-b} + \frac{G}{1-b}\end{aligned}$$

$$\frac{dY}{dG} = \frac{1}{1-b} = \text{Govt. expenditure multiplier}$$

iff $b = 0.5$,

$$\frac{dY}{dG} = 2 ; \text{ 1 unit increase in gvt expenditure}$$

increases income twice.

The higher the value of b , then increase in Y is higher.

A poor family has higher ' b ' value.

If govt. expenditure decreases, then equilibrium point shifts towards left in the graph.

total currency in circulation ←
currency & coins

CLASSMATE

Date _____
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Total Money Stock in the Economy:

- $M_1 \leftarrow$ currency and coins + demand deposits

Two types of deposits

→ Demand deposits

~~Time~~ Deposits

from where we can
readily withdraw
on demand

(savings account)

→ Time deposits

Deposits from
where we cannot
readily withdraw.
(Eg: - fixed deposits)

- low liquidity →
can't be converted
to cash readily.

~~$M_2 \leftarrow M_1 +$ deposits with post office
savings bank account~~

- $M_2 \leftarrow M_1 +$ all time deposits
- $M_3 \leftarrow M_1 +$ deposits in the post
office savings bank
- $M_4 \leftarrow M_3 +$ all deposits with the
post offices.

$M_1 \leftarrow$ most liquid

$M_4 \leftarrow$ least liquid.

$M_1, M_2 \leftarrow$ Narrow measures of money supply
 $M_3, M_4 \leftarrow$ Broader measures of money supply.

How to increase M_1 for an economy?

- $M_1 \leftarrow$ currency & coins + demand deposits
- $M_1 \leftarrow (cc) + (dd)$
- increase cc : print new currency
- increase dd

Fractional Reserve Banking

- Corporate Banks work under this,
worldwide.

- Certain fraction of deposit must be
kept in bank vaults, for emergency.

Reserve requirement (rr): fraction of
deposits that the commercial banks
has to maintain in its vaults.

Calculating money multiplier

- Assume Bank-A.

- A person deposits = ₹ 1000
- $rr = 20\% = 0.2$

- Bank A keeps ₹ 200 in vault.

max. amt of money that Bank-A
can loan out = ₹ 800

- Another person borrows ₹ 800 from Bank-A and deposits in Bank-B.
- ~~Bank B~~ Bank B moves to vault = ₹ 160
= 20% of ₹ 800.
- Available amt to loan = ₹ 640.
- Another person borrows ₹ 640 & deposits in Bank C.
- Bank C puts 20% of 640 = ₹ 128 in ~~loan~~ vault & so on.

The total sum of deposits at banks are total money.

$$= 1000 + 800 + 640 + 512 + \dots$$

~~$$= 1000 \times \frac{1}{1-r}$$~~

$$+ 1000 (1-r)$$

$$+ 1000 (1-r)^2$$

$$+ 1000 (1-r)^3$$

+ ...

$$= 1000 \left[1 + (1-r) + (1-r)^2 + (1-r)^3 + \dots \right]$$

$$= 1000 \times \frac{1}{1-(1-r)} \quad \leftarrow \text{infinite GP}$$

$$= 1000 \times \frac{1}{r}$$

if $r = 0.2$,
total deposit = $\frac{1000}{0.2} = ₹ 5000$

$\frac{1}{r}$ ← Money multiplier / deposit multiplier

It tells how To increase the value of money multiplier, decrease the r .

For Indian economy, $r = 4\% = 0.04$
Value of money multiplier = $\frac{1}{0.04} = 25$

Inflation & Unemployment.

Inflation: sustained rise in overall price level in an economy

Rate of inflation:

If P_t ← Price at time period t;

$$\text{Rate of inflation} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Cost of production & demand determines the price of a product in the economy.

~~Topic~~ What is demand?

~~Willingness~~ Desire backed by purchasing capability.

Price affects the demand of a product.

Let q_x ← quantity demanded of commodity X.

$$q_x = f(P_x, M, S)$$

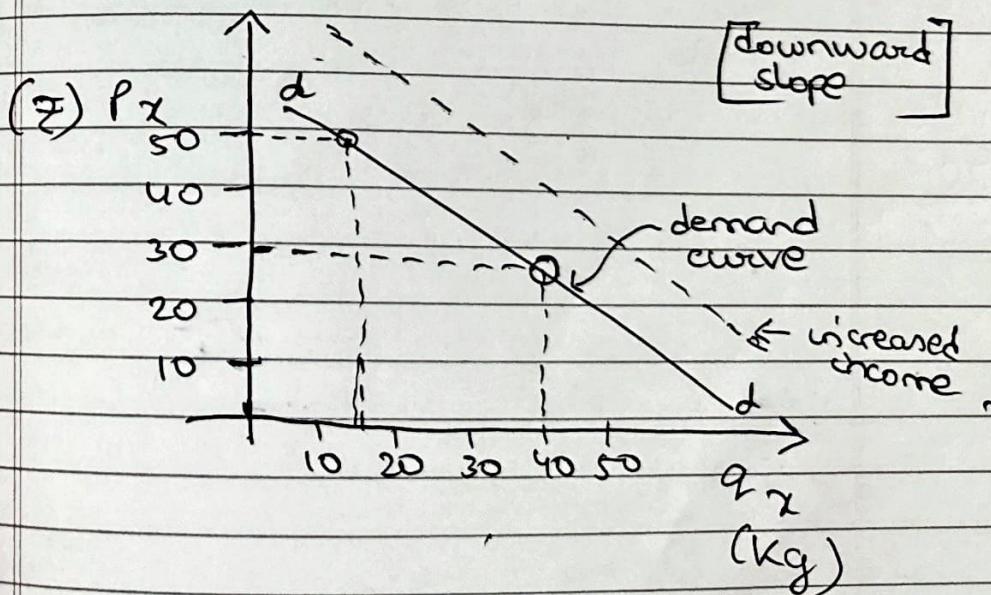
price:

- If price is higher, quantity of purchase is lower.
- Income (M) ← influences demands
- S ← other factors such as competitors, ~~taste~~, taste & preferences, etc.

Law of demand

The quantity demanded of a good ~~commodity~~ is inversely related to its price, ceteris paribus.

ceteris paribus ← all other things which influences demands remains constant.



- At £50 price demand is 15 kg
when price falls from £50 to £30, then demand increases to 40 kg.

If income increases, then at each price, we can buy more quantity, ie. there is increase in demand. The graph shifts right, same slope.

Taste & preferences can shift the curve accordingly.

