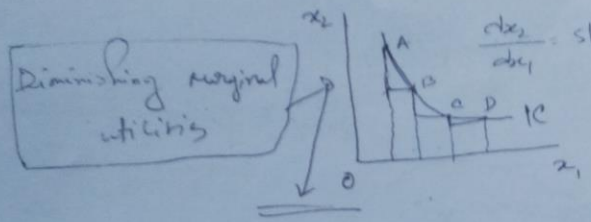
③ Indifference Curve is downward sloping

④ Convex to the origin.

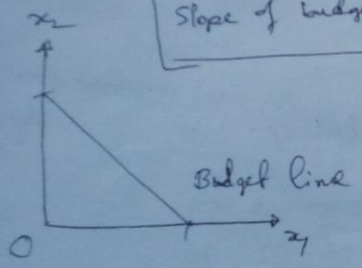


$\frac{dx_2}{dx_1}$ = slope = Marginal Rate of substitution

Budget line

Slope of budget line $\frac{dx_2}{dx_1} = -\frac{P_1}{P_2}$

$P_1x_1 + P_2x_2 = Y$



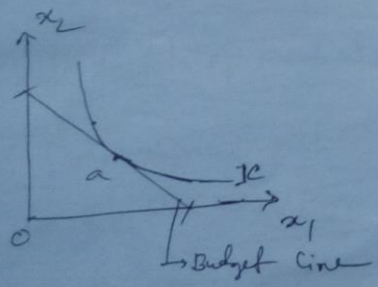
here,

Y = total Income

P_1 = price of xgood x_1

P_2 = price of good x_2

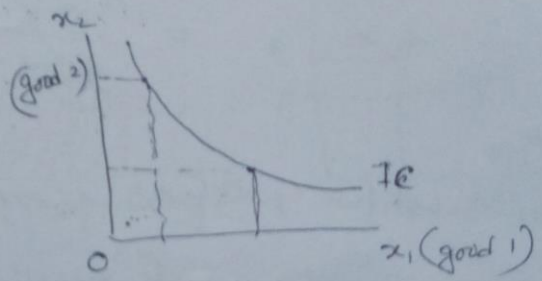
Consumer equilibrium



Date-23/12/14

Consumer preference

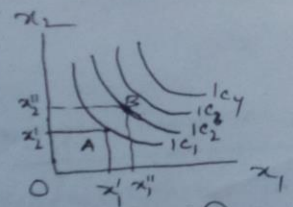
Indifference curve:



Characteristics of Indifferent Curve (IC):

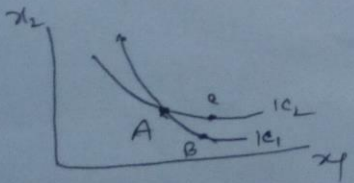
① Higher IC gives higher utility

Higher IC is prefered to low

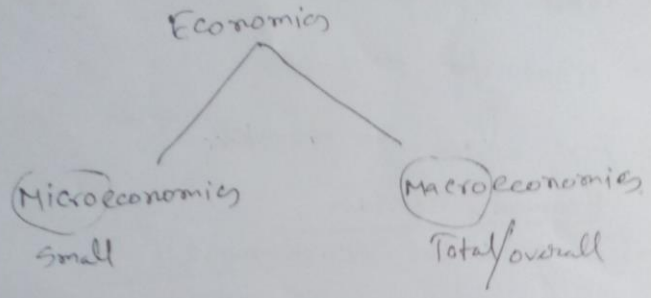


B is higher utility than A above diagram.

② IC never intersect.



Date - 28/10/14



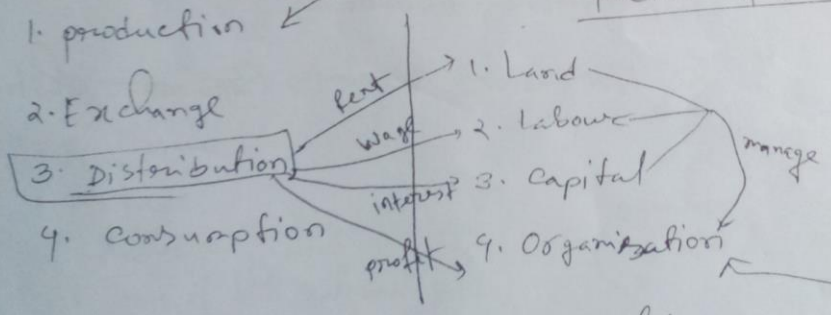
~~Microeco~~ Economic activity

* problem of double coincidence

Economic materials

1. production
2. Exchange
3. Distribution
4. Consumption

Factors of production



profit is result of work

production is a mechanism which gives output using input.

Major problems of economic

1. What to produce
2. How to produce
3. For whom to produce

Economic system

1. Capitalist / market economy
2. Command economy / State owned economy (Russia, Cuba)
3. Mixed economy (Bangladesh, India, USA etc)

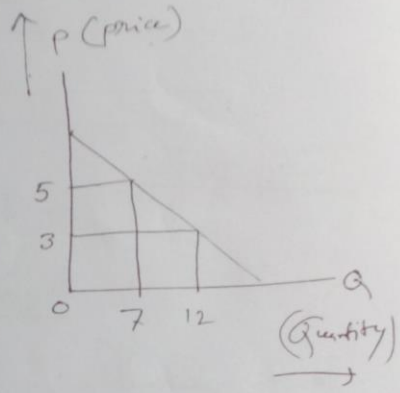
On the other hand economics can be devided into two types → 1. positivite economics
2. Normative economics (নীতিশাস্ত্র, ethitic)

1. public goods (National defence)
2. private goods

Mono poly → Antitrust law

Demand

(1) Wants
(2) Ability
(3) Willingness to pay.



Date - 11/11/14

Determinants of Demand

1. Own price
2. Income
3. Taste
4. weather
5. price of the related goods
6. Expectations

Relation

Substitutes (tea, coffee) — price increase in one good → increase in demand for the other good

Complements (paper, pen) (sugar, tea) — price ↑ of one → demand ↓ of the other good

Demand Schedule

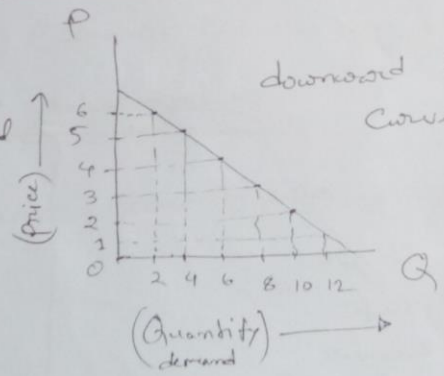
Price (P) (Taka)	Quantity demanded (Q) (unit)
1	12
2	10
3	8
4	6
5	4

Other things remaining the same

Law of Demand

Demand curve

Inverse relationship between price & demand because of downward sloping curve



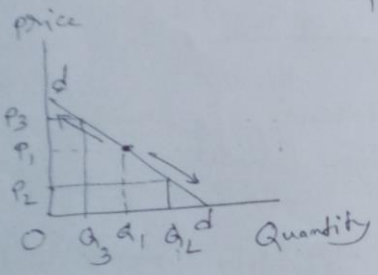
downward sloping curve

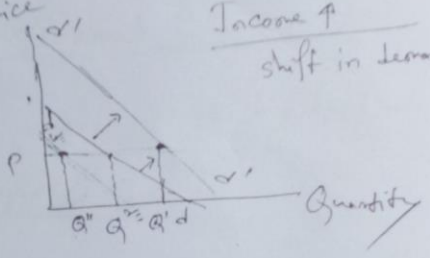
Normal goods

Inferior goods → (Income ↑ ⇒ Qd ↓)

Special case → Giffen goods

Movement along the dd curve vs Shift in dd





Movement along the demand curve

Supply

production = Supply + stock

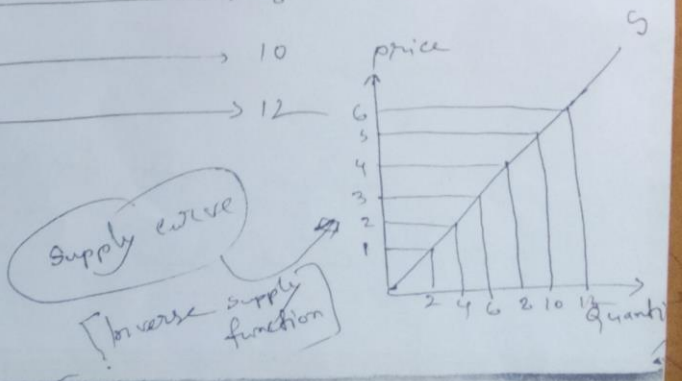
Supply → available for sale in a particular price is called Supply.

Determinants of Supply

① price
② ~~Technology~~ / costs of factors of production
③ Technology
④ Expectation
⑤ weather Condition

Supply schedule

price (P)	Quantity Supply (Q)
1	2
2	4
3	6
4	8
5	10
6	12



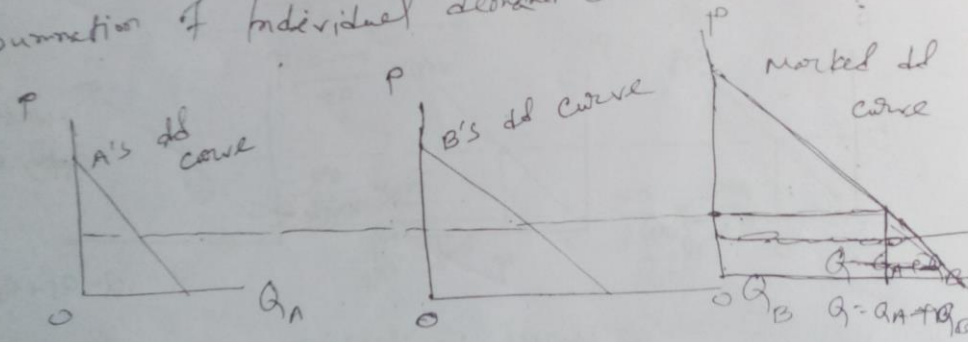
Supply curve

[Inverse supply function]

Market dd function (market demand curve)

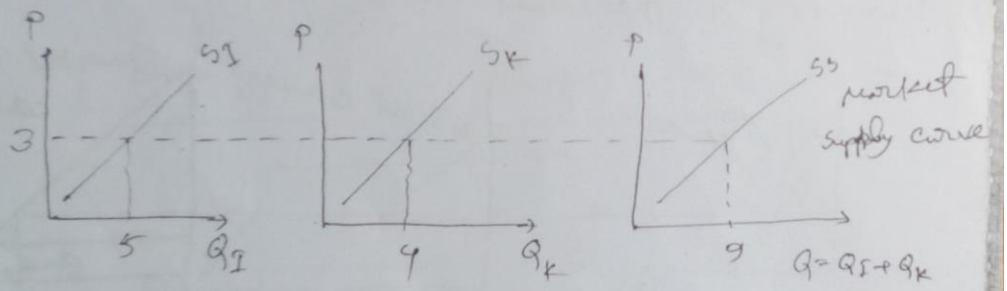
price	A's dd	B's dd	market dd
1	10	6	16
2	8	5	13
3	6	4	10
4	4	3	7

We can derive the market demand curve by horizontal summation of individual demand curve.

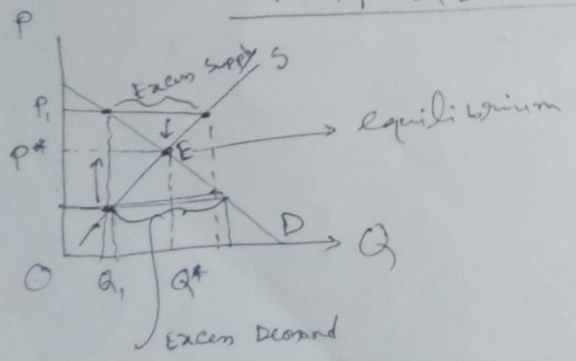


Market ss function (Market Supply curve)

price of Ice cream	Igloo's supply	Quantity's supply	Market Supply
1	2	1	3
2	3	3	6
3	5	4	9
4	7	6	13
5	9	8	17



Market Equilibrium



Date - 18/11/14

Price Elasticity of Demand

Elasticity ε_D = $\frac{\text{percentage change in demand}}{\text{percentage change in price}}$

$= \frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100}$

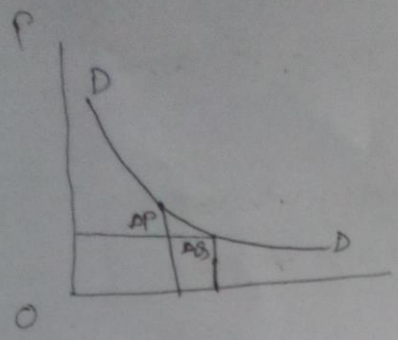
price	Quantity
90	240
110	160

$= \frac{\frac{160-240}{240} \times 100}{\frac{110-90}{90} \times 100}$

$= \frac{\frac{-80}{240} \times 100}{\frac{20}{90} \times 100} = -\frac{80}{240} \times \frac{90}{20}$

$= -\frac{3}{2}$

$\therefore |\varepsilon_D| = \frac{3}{2}$



$$E_d = \frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100}$$

$$= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

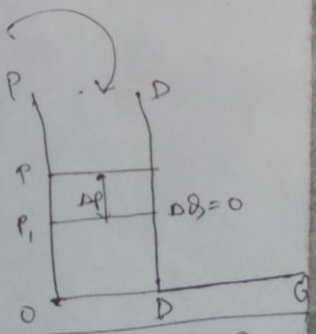
$$= \frac{dQ}{dP} \times \frac{P}{Q}$$

Determinants of price elasticity of demand

1. Availability of substitutes.
2. Necessity vs Luxury
3. Time Horizon

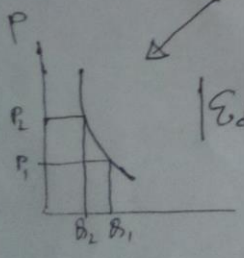
Types of price Elasticity of Demand

1. perfectly Inelastic demand



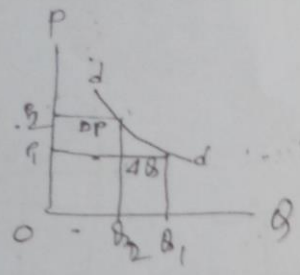
$$E_d = \frac{dQ}{dP} \times \frac{P}{Q} = \frac{0}{\Delta P} \times \frac{P}{Q} = 0$$

2. Inelastic demand: $|E_d|$ is less than 1



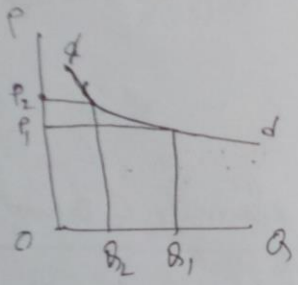
$|E_d| < 1$

3. Unit Elastic Demand : $|E_d| = 1$



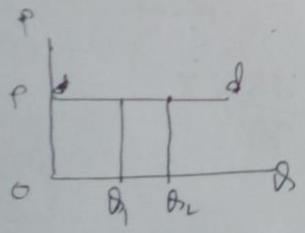
$$\therefore \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = 1$$

4. Elastic demand : $E_d > 1$



$$\frac{\Delta Q}{\Delta P} \times \frac{P}{Q} > 1$$

5. perfectly Elastic demand : Elasticity equals infinity.

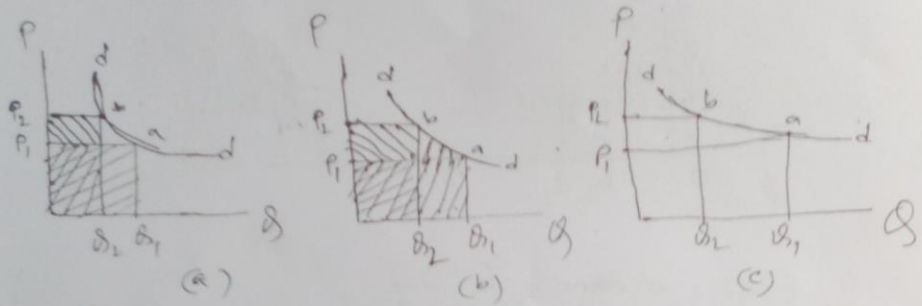


$\Delta P = 0$

$$\frac{dQ}{dP} \times \frac{P}{Q} = \frac{dQ}{0} \times \frac{P}{Q}$$

$$E_d = \infty$$

Total revenue and price elasticity of demand [Important ***]



Total revenue = $P \times Q$

Income elasticity of Demand :

$$\text{I.E of D} = \frac{\text{percentage change in quantity demand}}{\text{percentage change in Income}}$$

$$= \frac{\frac{dQ}{Q} \times 100}{\frac{dY}{Y} \times 100} = \frac{dQ}{dy} \times \frac{Y}{Q}$$

Cross elasticity demand = $\frac{\text{percentage change in quantity demand}}{\text{percentage change in price of the other goods related goods}}$

$$= \frac{\frac{dQ_{D1}}{Q_1} \times 100}{\frac{dP_2}{P_2} \times 100} = \frac{dQ_1}{dP_2} \times \frac{P_2}{Q_1}$$

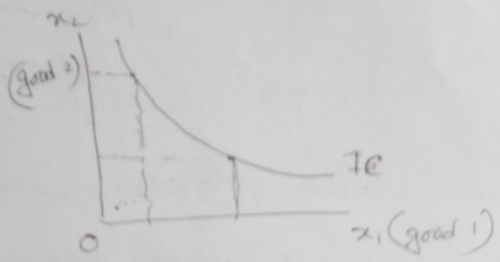
for substitute goods positive (+ve)

for complimentary goods negative (-ve)

Date-23/12/14

Consumer preference

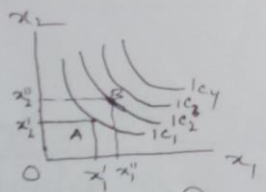
Indifference curve:



Characteristics of Indifferent Curve (IC):

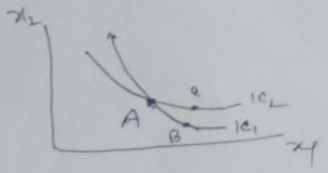
① Higher IC gives higher utility

Higher IC is preferred to low



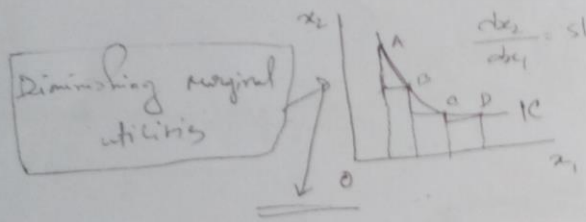
B is higher utility than A above diagram.

② IC never intersect.



③ Indifference curve is downward sloping

④ Convex to the origin.



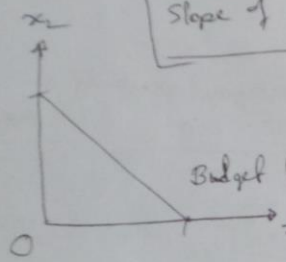
$\frac{dx_2}{dx_1}$ = slope = marginal rate of substitution

Budget line

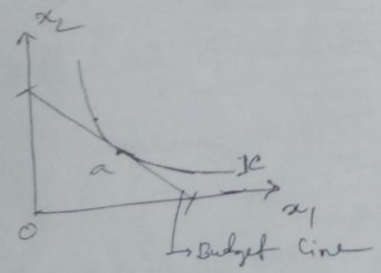
Slope of budget line $\frac{dx_2}{dx_1} = -\frac{P_1}{P_2}$

$P_1x_1 + P_2x_2 = Y$

here,
Y = total income
P_1 = price of good x_1
P_2 = price of good x_2



Consumer equilibrium



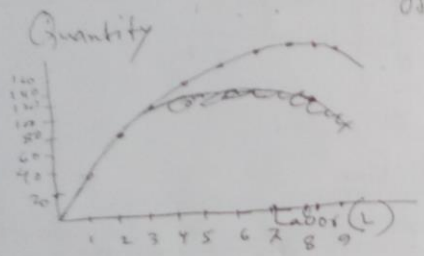
C-1-15

Production

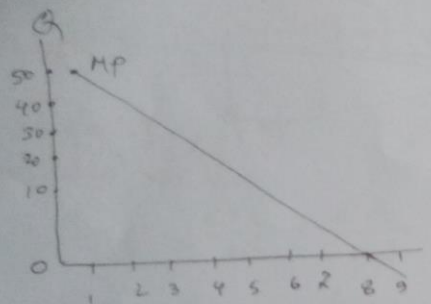
Output = f(Input)

Q = f(Labor, K, ...)

others factors of production remaining constant.



No. of worker (L)	Output Q (TP Total product) (TP)	Marginal product MP	AP ($\frac{TP}{L}$)
0	0	—	0
1	50	50	50
2	90	40	45
3	120	30	40
4	140	20	35
5	150	10	30
6	155	5	25.66
7	158	3	22
8	158	0	19
9	155	-3	17



$\frac{dTP}{dQ} = MP$

Reference [Samuelson]

Date→

Average product (AP)

$AP = \frac{TP}{\text{(labor)}}$

The law of diminishing returns: (L ↑ other const)

Returns to scale

If all factors of production are changed → (increasing)

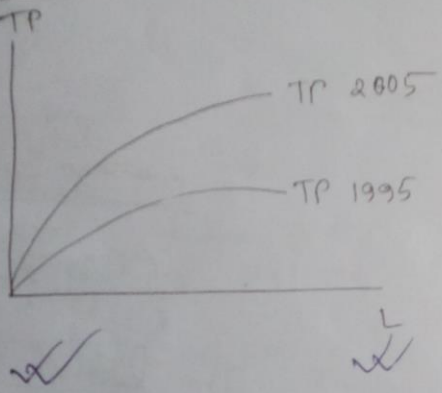
1. Increasing return to scale (all factors এক হারে production বৃদ্ধি পাবে)
2. Constant return to scale (production একই হারে)
3. Decreasing return to scale (production কম হারে)

Short run vs long run

* fixed input
* variable input

→ no fixed input
all are variable inp

Technological change



Analysis costs

Total costs (TC) = fixed costs (FC) + variable costs (VC).

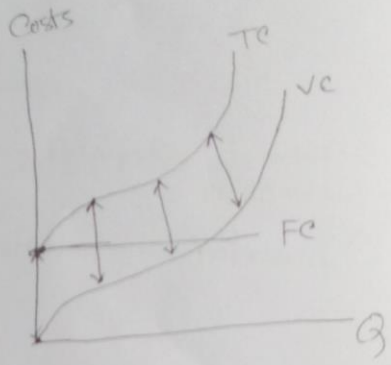
Q	FC	VC	TC	MC	AC/ATC ($\frac{TC}{Q}$)
0	55	0	55	—	—
1	55	30	85	30	85
2	55	55	110	25	27.5
3	55	75	130	20	
4	55	105	160	30	
5	55	155	210	50	
6	55	225	280	70	

$$AC = \frac{TC}{Q} \qquad \frac{dTC}{dQ} = MC$$

$$TC = FC + VC$$

$$\frac{dTC}{dQ} = \frac{dFC}{dQ} + \frac{dVC}{dQ}$$

$$\frac{dTC}{dQ} = 0 + \frac{dVC}{dQ}$$

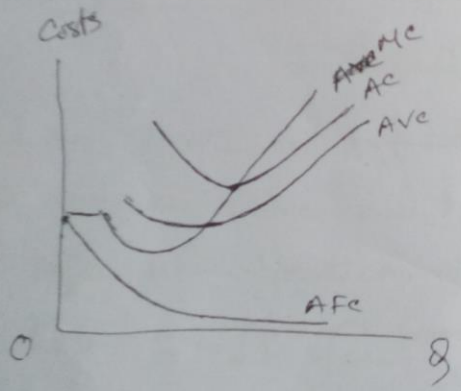


U shaped cost curve

$$ATC/AC = \frac{TC}{Q}$$

$$AVC = \frac{VC}{Q}$$

$$AFC = \frac{FC}{Q}$$



Date- 17/01/15

Market

① perfect competition

② Imperfect competition
- Monopoly
- oligopoly
- Monopolistic competition
- Monopsony

Characteristics of perfect competitive market:

i) Many buyer- many seller
ii) All are pricetaker
iii) Homogenious product
iv) All Informations are known to all.
v) Entry and ~~entry-force~~ exit free.

Characteristics of Imperfect competitive market:

Monopoly

i) only one seller — many ~~seller~~ buyer.
ii) No close-substitute
iii) Controlling on Quantity & price (seperately)

iv) No entry & exit.

Oligopoly

i) A few seller and Many buyer. (mobile operator).
Eg- BL, GP, Art Bari, TMK

ii) Rivalry (প্রতিযোগিতা)

iii) Advertisement

iv) Entry restricted

v) exit with permition

Monopolistic competition

i) Many buyer and many seller.

ii) Slightly control over price.

iii) Differentiate product.

iv) Entry & exit free.

v) Advertisement place an important role.

Monopsony

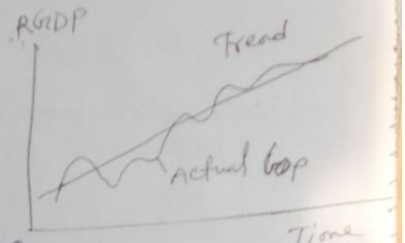
i) One buyer and many seller.

Overview of macroeconomics:

output, inflation, unemployement

Objectives / goals of macroeconomics

1. output – High level of output and rapid growth.
2. Unemployment – High level of employment with low involuntary unemployment.
3. price level stability.



GDP = Gross Domestic product

GDP is the market value of all final goods and services produced in a country during a year.

GNP = Gross National product

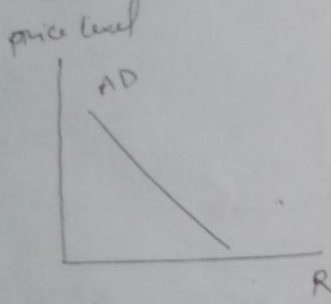
a. Nominal GDP – NGDP — measured at in actual (current) price
b. Real GDP — RGDP → is calculated in constant price.

Unemployment:

voluntary unemployment

involuntary unemployment

price level stratify



↑ price level rising
inflation

CPI
Consumer price Index
(a basket of final goods & service

$$\text{Inflation Rate} = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100.$$

Example → $IR = \frac{105 - 100}{100} \times 100$

$= 5\%$

Instruments of Macroeconomics

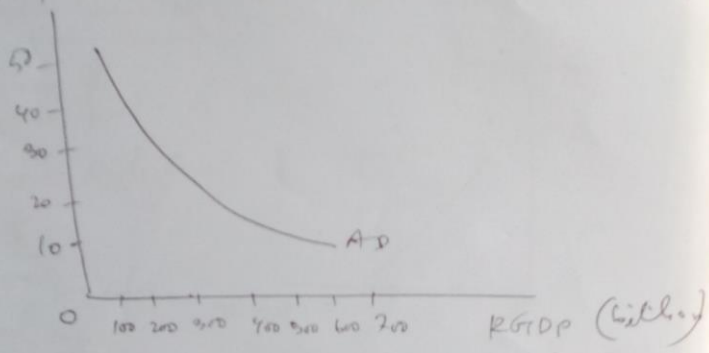
① Fiscal policy: Government expenditure, taxation. → expansionary policy

② Monetary policy: Money supply, interest rate.

AS

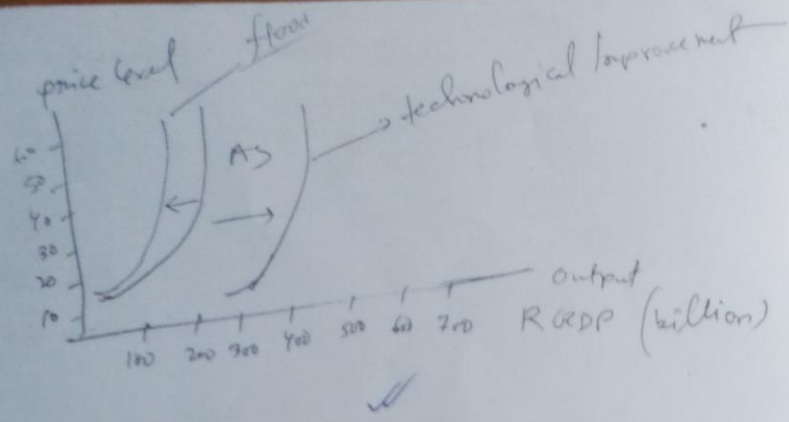
Aggregate demand Aggregate Supply and Equilibrium over...
of the economy.

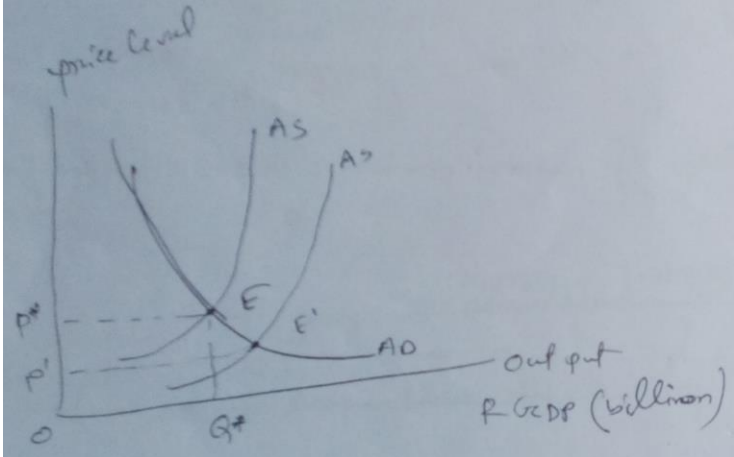
AD curve



AS refers to the total quantity of goods and servi...
that the nations business are willing to produce
in given period.

Aggregate depends upon →
1. price level
2. production capacity of the economy
3. level of cost





Tutorial - 17/02/17

Macro economics

production, cost - market

Gross Domestic product (GDP

$C + I + G + NX$

C = Consumption

I = Investment

G = Government expenditure

NX = Net export

= (X − M)

X = Export

M = Import

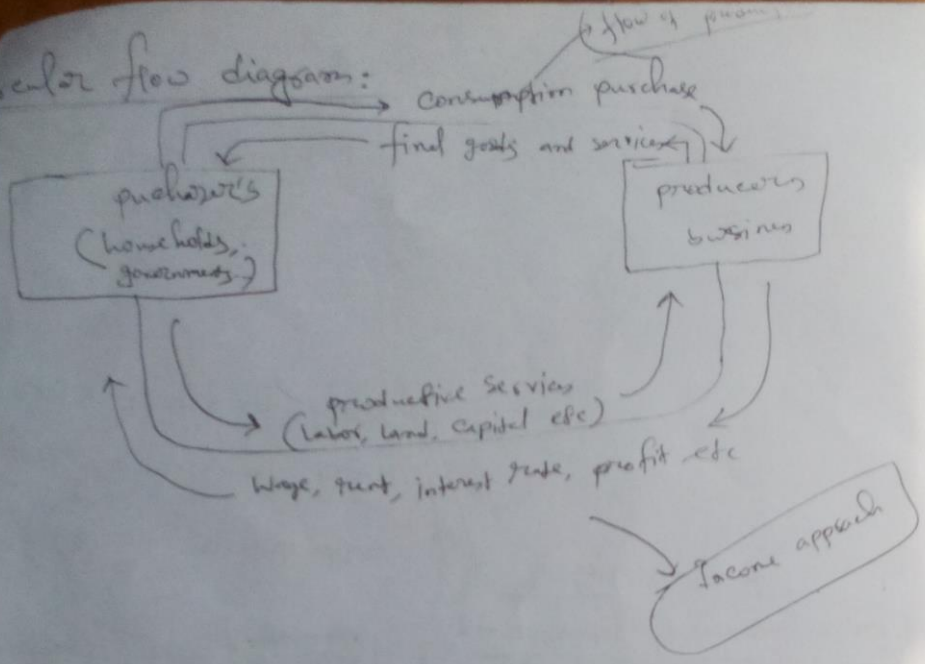
Two measures of National product: Goods flow and Earning flow

✓ Flow of product approach:

(price of blue jeans × number of blue jeans) + (price of apples × number of apples) and so forth for all over the final goods.

✓ Earnings or Income approach:

circular flow diagram:



Final goods vs intermediate goods

→ problem of double counting

Value added

Stages of production	(1) Sale receipts	(2) less cost intermediate	(3)=(1)-(2) value added wages, profit etc
wheat →	23 →	0 →	23
flour →	53 →	23 →	30
Baked dough →	110 →	53 →	57
Bread →	190 →	110 →	80
			190

Sum of value added

RGDP vs NGDP

Year 1		Year 2		
P	Q	P	Q	(bushels)
$1	1000	$2	1010	

NGDP for year 1 = $1000

NGDP for year 2 = $2020

GDP growth (102%)

Base year price

price index of 1st year − 1

GDP deflator? (Question important)

GDP deflator $= \frac{\$2}{\$1} = 2$

$RGDP = \frac{\text{Nominal GDP}}{\text{GDP deflator}} = \frac{2020}{2} = 1010$

GDP growth = 1%

$\frac{2020 - 1000}{1000} \times 100\%$ 1010

$\frac{1010}{1000} \times 100$

102%

$\frac{1010 - 1000}{1000} \times 100\%$

$= \frac{10}{10} = 1\%$

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