

Economics

Reading 14: Topics in Demand & Supply

* Demand Concepts

• Law of demand

↳ As the price of good (own price) ↑, buyers will choose to buy less of it & as price falls, they buy more

• Demand function for Good A : $Q^D = f(P_A, I, P_r, \dots)$

Lets consider demand for chair,

$$Q^D = 10 - 0.5P + 0.06I - 0.01P_r$$

where if

$$I \text{ (Income)} = 1633.33$$

$$P_r \text{ (Price of table)} = 800$$

Q then

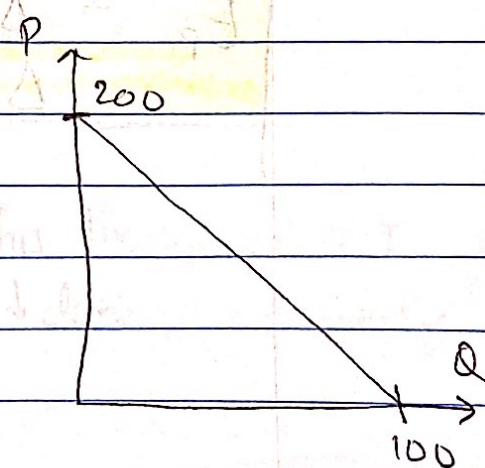
$$Q^D = 100 - 0.5P$$

• Inverse demand function : $P = 200 - 2Q$

• Demand curve :- graph of

• If there is change in I or P_r , shift in curve

• If Q or P , movement along the curve



Basic Mathematical Rule

$$\text{If } A = 10 + 5B - 6C + 8D$$

then

$$\frac{\Delta A}{\Delta B} = \text{coeff of } B = 5$$

$$\frac{\Delta A}{\Delta C} = -6$$

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Own-Price Elasticity of Demand

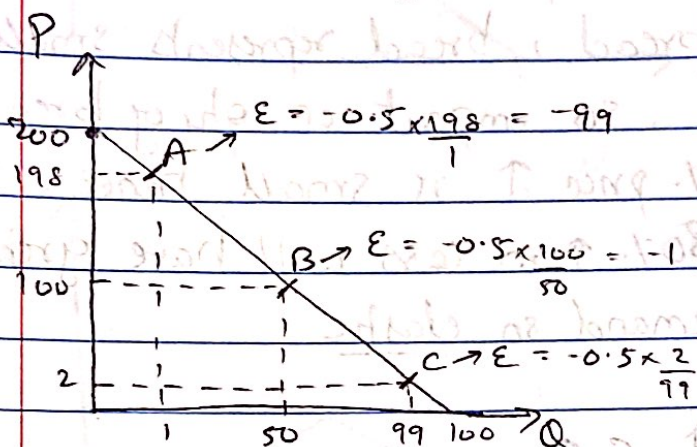
- We know that as price \uparrow , demand \downarrow
But by how much? We use this.

$$E_p^{Q^D} = \frac{\% \Delta Q^D}{\% \Delta P} = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

$$E_p^{Q^D} = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

- For all -vely sloped, linear demand curves, elasticity varies depending on where it is calculated

Let's consider $Q = -0.5P + 100$

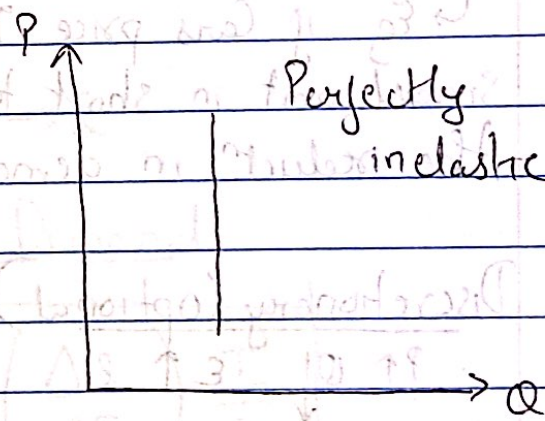
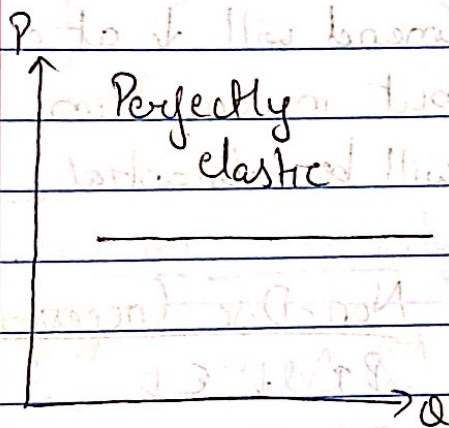


Here A = Elastic

B = Unit elastic

C = Inelastic

ie 1% ΔP causes 1% ΔQ



Factors that Affect Demand & Supply

- Substitutes $\uparrow E \uparrow$
 ↳ Consider Toyota Corolla, for this the competⁿ \uparrow
 so even a little \uparrow in price of TC will \downarrow demand substantially
 hence $\uparrow E$

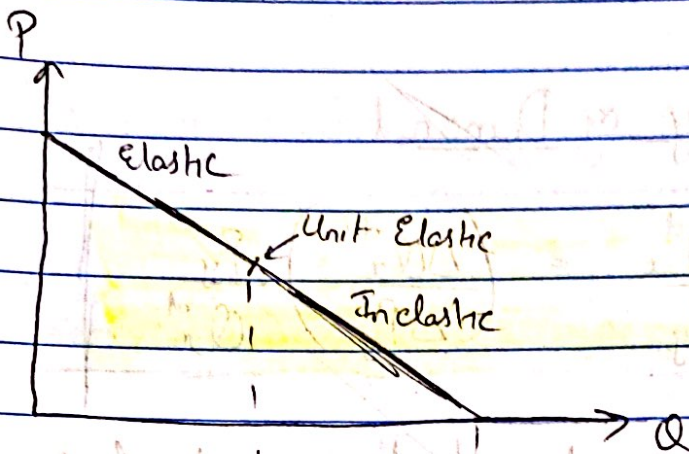
- Portion of budget \uparrow $E \uparrow$
 - \hookrightarrow Product that has greater part of consumers budget income will be more elastic
 - \hookrightarrow Eg. When you compare 30% increase in Car & 30% in bread, bread represents small % of household inc, so impact on qty of bread demanded if 30% price \uparrow is small hence inelastic but 30% \uparrow in cars will have greater impact on its demand so elastic

- Time Horizon \uparrow $E \uparrow$
 - \hookrightarrow Eg. if Cars price \uparrow , demand will \downarrow at a small amt in short term but in long term the reduct in demand will be substantial

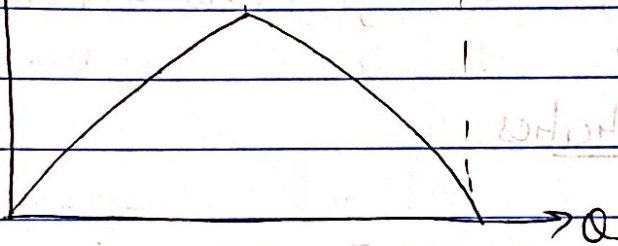
- Discretionary (Optional) vs Non-Disc. (necessary)
 - $P \uparrow Q \downarrow E \uparrow$
 - $P \uparrow Q \downarrow E \downarrow$

Elasticity & Total Expenditure

- Total Exp = Price x Quantity
 - \hookrightarrow Total amt a consumer spends on a product



Total Exp
P x Q



TE ↑ in elastic region &
↓ in inelastic

CONSUMER PERSPECTIVE

Income Elasticity of Demand

$$E_I^d = \frac{\% \Delta Q^d}{\% \Delta I} = \left(\frac{\Delta Q}{\Delta I} \right) \frac{I}{Q}$$

As Inc ↑, Q ↑

- For normal good, inc. elasticity +ve ↑
- inferior good, -ve (Eg. bicycles)

Cross Elasticity of Demand

$$E_{Py}^d = \frac{\% \Delta Q_x^d}{\% \Delta P_y} = \left(\frac{\Delta Q_x^d}{\Delta P_y} \right) \frac{P_y}{Q_x^d}$$

- It tells us about what impact does change in price of Y has on X 's qty.
- For substitute, +ve (Eg. Chairs & Stools)
complement, -ve (Eg. Tables & Chairs)

• Calculating Elasticities

$$Q_A = 60 - 12P_A + 0.015I + 3P_B - 4.5P_C$$

where

$$P_A = 10 \quad I = 2,000$$

$$P_B = 55$$

$$P_C = 10$$

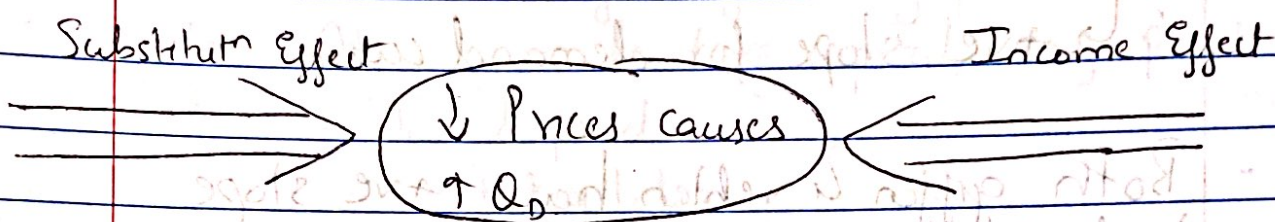
$$\therefore Q_A = 90$$

$$\text{Own price } \epsilon = \frac{-12 \times 10}{90} = -1.33$$

$$\text{Inc } \epsilon = \frac{0.015 \times 2000}{90} = 0.33 \quad [\text{Normal good}]$$

$$\text{Cross } \epsilon_{A,B} = 3 \times \frac{55}{90} = 1.83 \quad [\text{Substitute}]$$

Substitutⁿ & Inc Effects



	<u>Substitutⁿ Effect</u>	<u>Income Effect</u>
<u>Normal good</u>	P ↓ Q ↑	P ↓ Real Inc ↑ Q ↑

<u>Inferior good</u>	P ↓ Q ↑	P ↓ Real Inc ↑ Q ↓
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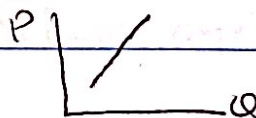
Exceptⁿ to Law of Demand

• Giffen goods P ↓ Q ↓

↳ Eg. in rural China, for poor peasants, rice is the staple food. So acc to subst. effect, if price of rice ↓, its qty of demand ↑. But acc to income effect, if P ↓ their real inc ↑ so they can now buy meat, vegs from that extra saved money so Q ↓.

↳ For inferior goods, inc effects dominates substⁿ

↳ Demand curve is +ve



- $P \uparrow \Rightarrow Q \uparrow$
- Veblen goods
↳ goods that ppl buy to show off money, status
↳ Eg. more exp. macbook gets, more ppl want it
↳ +ve slope for demand curve
 - Both giffen & veblen have +ve slope but for diff. reasons

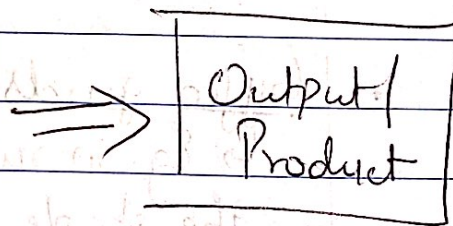
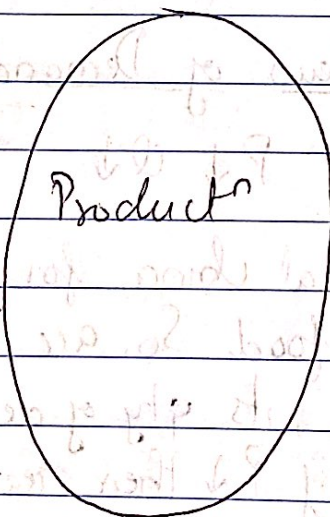
* Supply Analysis: The Firm

Factors of prodⁿ
or i/p.

Labor (L) →

Capital (K) →

Other →



- Total product
↳ Total o/p produced.

- Avg. product
↳ It is w.r.t a given factor of prod.
↳ ∴ At a given level of capital, avg. prod. of labor = $\frac{\text{Total prod.}}{\text{Amt of labor}}$

- Marginal prod.
↳ Marg. prod. of labor is the additional amt of o/p or product produced by using one more unit for labor. Same for capital.

Labor (L)	Total Prod (Q _L)	Avg. Prod.	Marg. Prod.
0	0	0	0
1	250	250 $[\frac{250}{1}]$	250 $[250-0]$
2	525	263 $[\frac{525}{2}]$	275 $[525-250]$
3	750	250	225 $[750-525]$
4	900	225	150 $[900-750]$
5	1000	200	100 $[1000-900]$
6	1050	175	50 $[1050-1000]$
7	875	125 $[\frac{875}{7}]$	-175 $[875-1050]$

Increasing marg return

Decreasing marg return

- Input productivity i.e. Average Product } marg returns are directly related

Total Rev = Total Cost

When profit ≤ 0

BreakEven & Shutdown Analysis

Consider you have a business & you invested 100mil & expect 10% profit \therefore 10mil is the opportunity cost. Revenue = 200mil & Acc Cost = 190mil.

→ Let's say 200 mil \rightarrow revenue
- 190 mil \rightarrow Accounting cost
10 mil \rightarrow Accounting profit
- 10 mil \rightarrow Opp. Cost
0 \rightarrow Economic profit

• Economic profit = Total Rev - Total eco. cost
(EP) $= 200 - 190 - 10 = 0$ \hookrightarrow Includes Opp. Cost

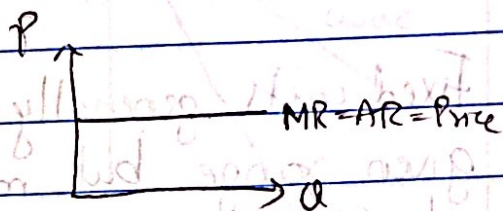
• Accounting profit = TR - Total acc cost.
(AP) $= 200 - 190 = 10$

• Normal profit = AP, when EP = 0

Normal profit = Opp. Cost, otherwise

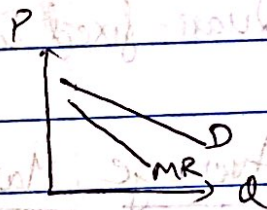
- Marginal revenue is the additional revenue from increasing output by one unit per time period

$$\text{Marg. Rev} = \frac{\Delta TR}{\Delta Q}$$

↳ Perfect competition: 

$$\text{MR} = \text{Avg. Rev} = \text{Price}$$

↳ Imperfect competition



$$\text{MR} = P + Q \frac{\Delta P}{\Delta Q}$$

$$\text{MR} = \frac{\Delta TR}{\Delta Q} = \frac{P\Delta Q + Q\Delta P}{\Delta Q}$$

- Marginal cost is the \uparrow in total cost from increasing o/p by one unit per time period.

↳ Short-run MC

↳ Cost of \uparrow o/p by 1 unit keeping all factors constant except labor

↳ w (Labor rate)

MP_L (Marg. prod)

↳ Long Run MC

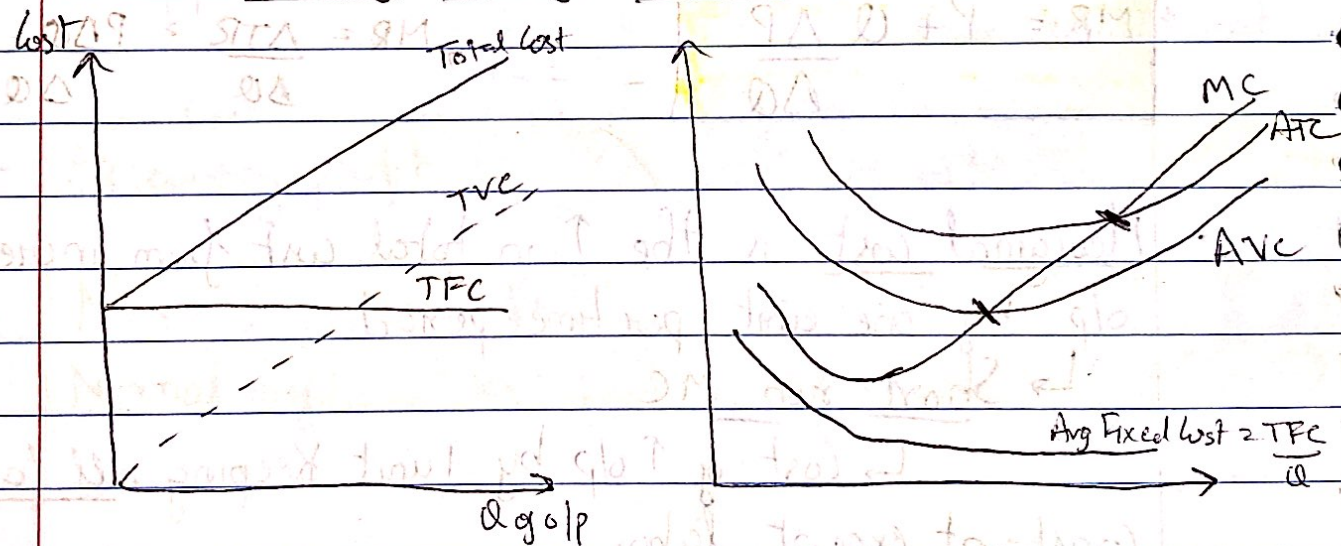
↳ cost of ↑ in o/p by one unit where all factors are variable

$$\text{Average variable cost (AVC)} = \frac{\text{Total var. cost}}{Q} = \frac{w}{\text{Avg. Prod.}}$$

- Fixed costs generally stay the same over a given range but move to another const. level when product ↑

↳ Quasi-fixed cost & normal text

• Total, Average, Marginal, Fixed & Variable Cost



↳ MC will always intersect ATC & AVC at its minimum.

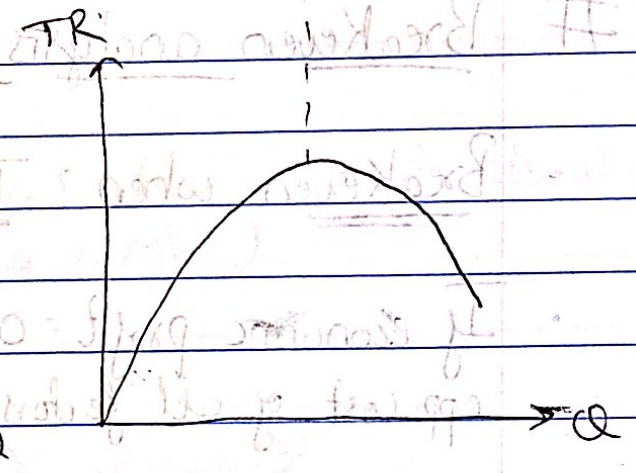
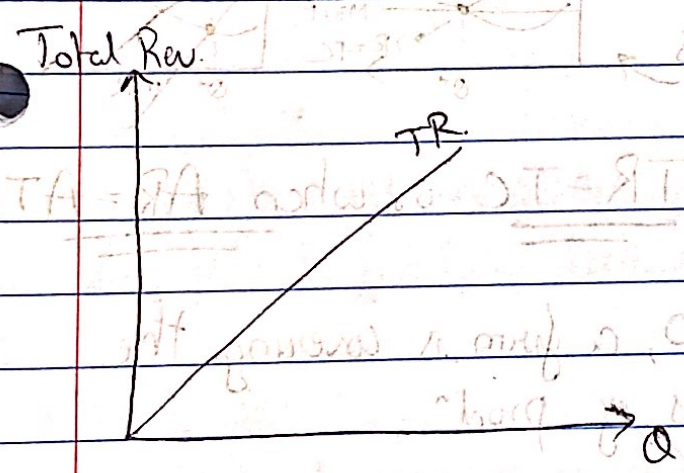
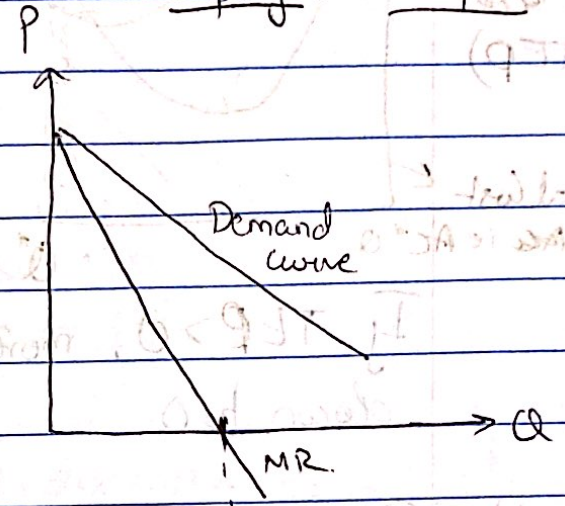
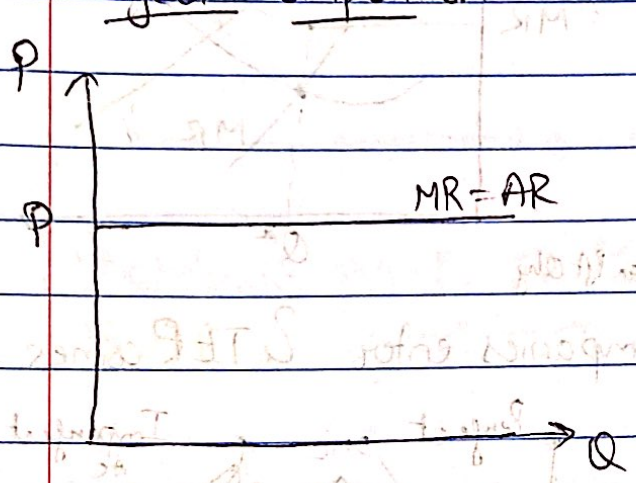
④ Short-run MC under long-run equilibrium

Demand & Total Revenue Function

FIRM PERSPECTIVE

Perfect Competition

Imperfect Competition



Profit Maximization

Profit Max condition:

Alternatively

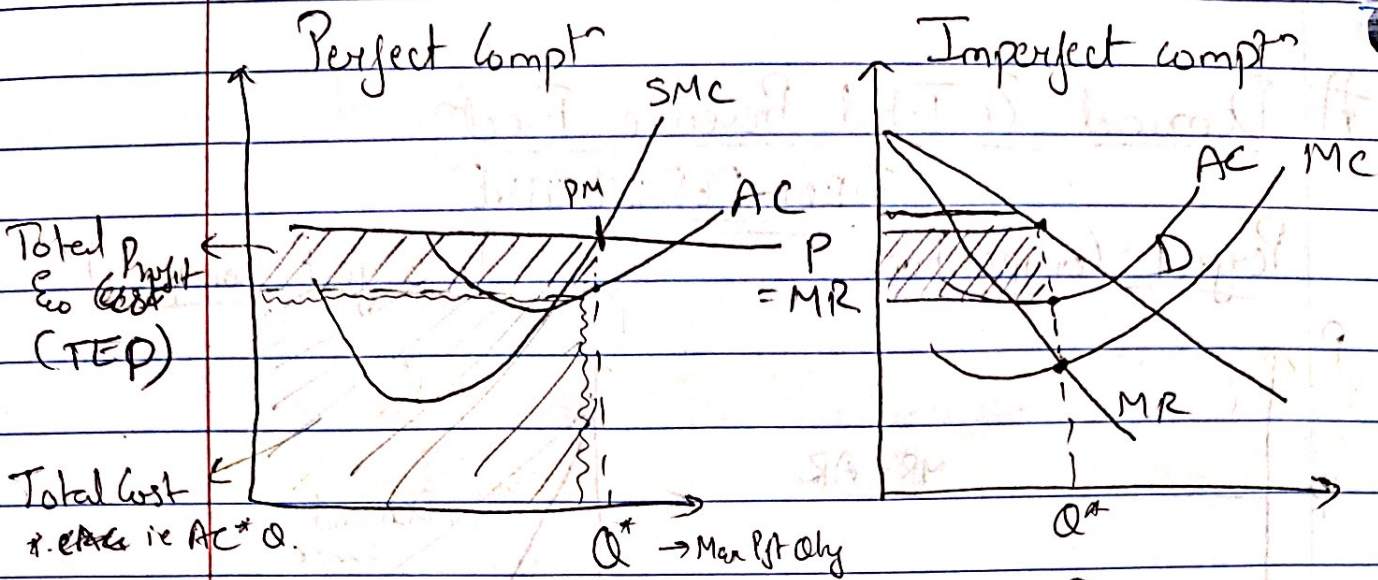
Short term $MC = MR$
(SMC) &

$TR > TC$ & $TR - TC$ is

SMC is rising

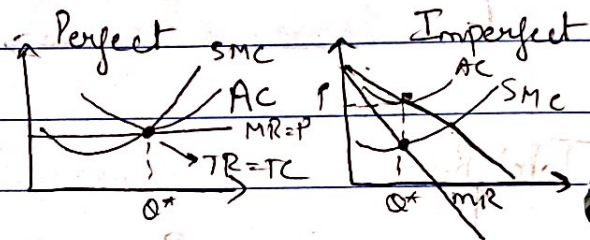
maximized

• Is profit maximised when ATC minimized? (No)



If $TEP > 0$, more companies enter & TEP comes down to 0

Break-even analysis

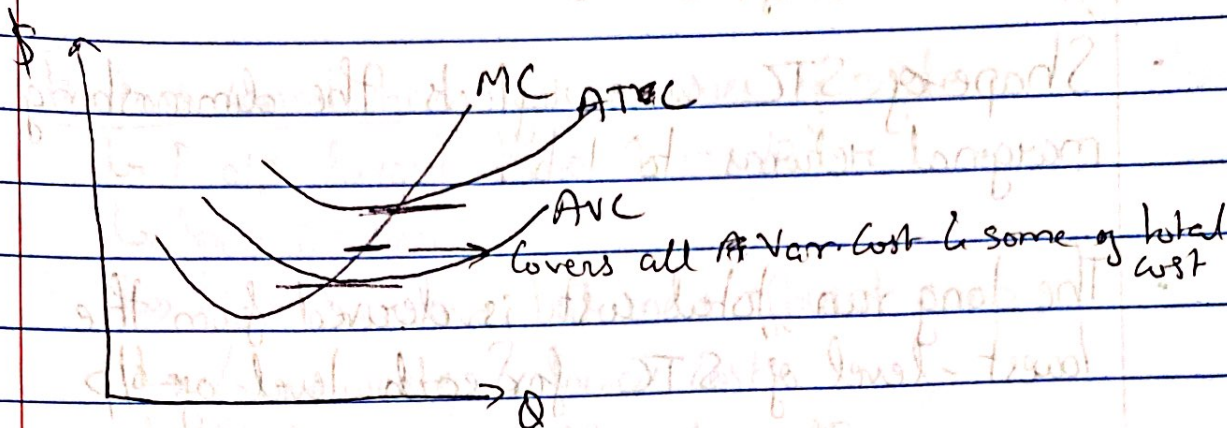


• Break-even when: TR = TC or when AR = ATC

• If economic profit = 0, a firm is covering the opp. cost of all factors of prodⁿ

Shutdown Decision

	Short-run dec	Long-run decision
$TR \geq TC$	Continue	Continue
$TR \geq TVC$ but $TR < TC$	Continue	Exit
$TR < TVC$	Shutdown	Exit



- Shutdown point \rightarrow Minimum AVC
- Breakeven point \rightarrow Minimum ATC

Understanding Economies & Diseconomies of Scale

Short run

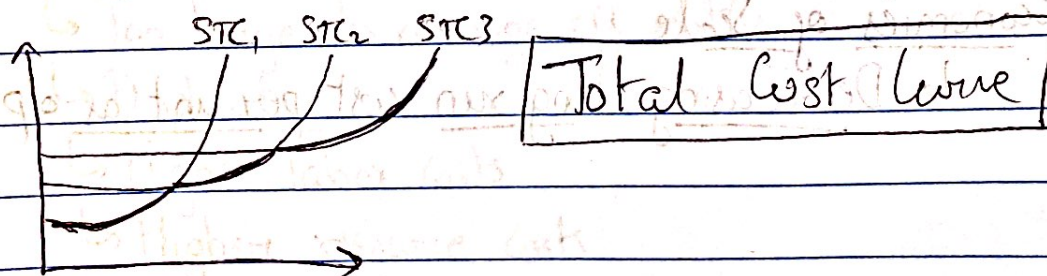
\rightarrow At least one factor of productⁿ is fixed (Usually Capital is fixed & labor is variable)

Long run

\rightarrow All factors of productⁿ are variable

STC₁ & (STC)

- Short run total cost for different levels of cap. i/p



ie Initially benefit of having more labor is \uparrow but after a pt the benefit \downarrow

- Shape of STC curve reflects the diminishing marginal returns to labor

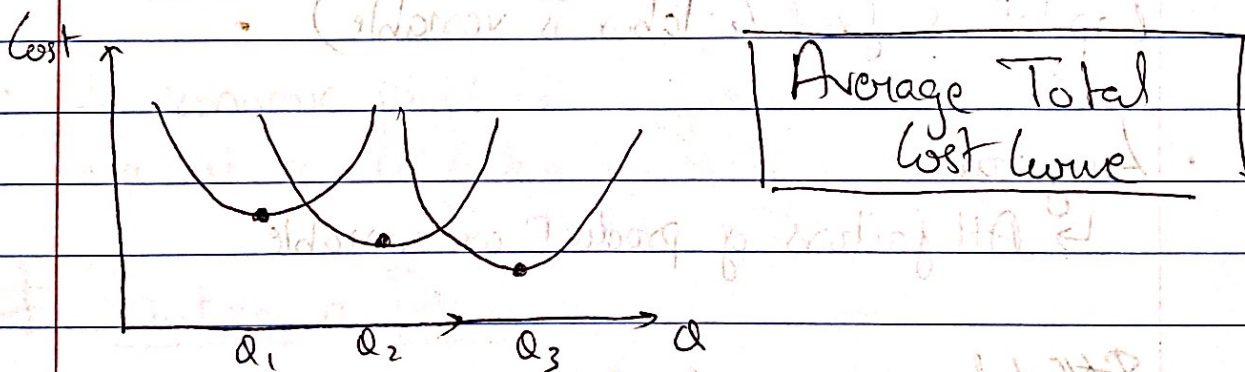
- The long run total cost is derived from the lowest-level of STC for each level of o/p

- Envelope curve

↳ The long-run total cost curve

Economies of Scale

- Short run avg total cost curves for diff plant sizes & long run avg. cost curve



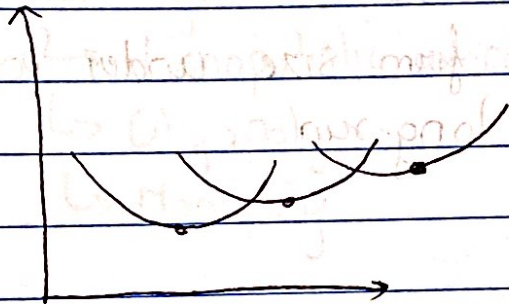
- Economies of Scale

↳ Decreasing long-run cost per unit as o/p \uparrow

• Factors contributing to economies of scale

- ↳ \uparrow o/p larger than \uparrow in i/p
- ↳ Specialisation
- ↳ More expensive but more efficient equip.
- ↳ Lower waste & lower costs
- ↳ Better use of mkt informatⁿ
- ↳ Volume discounts from suppliers.

Diseconomies of Scale



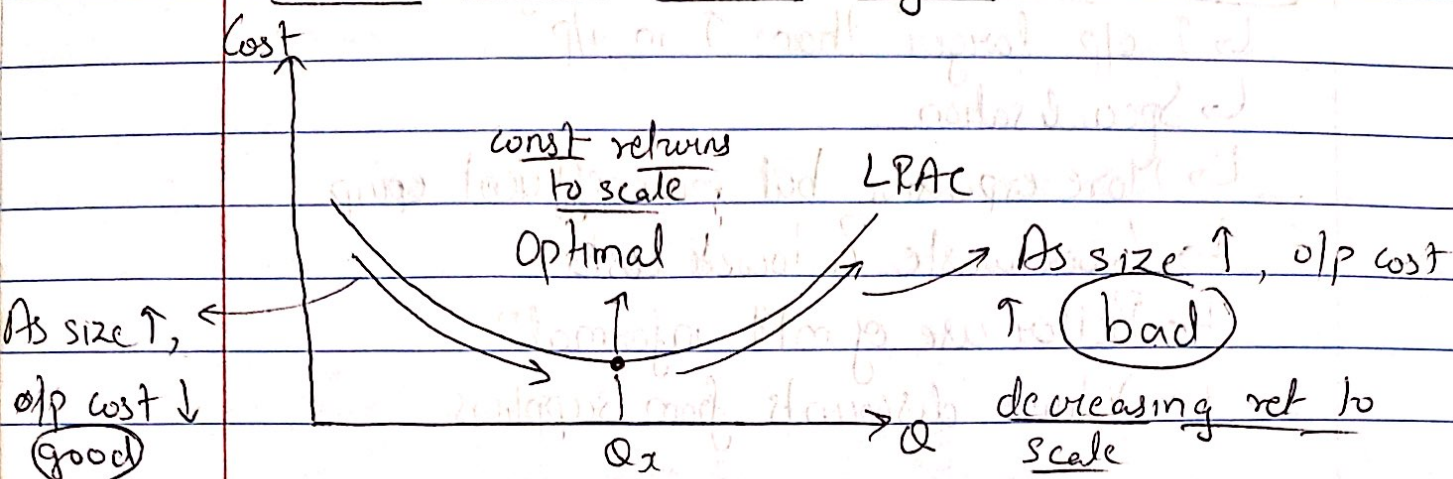
• Diseco of scale

- ↳ increasing long-run cost per unit as o/p \uparrow

• Factors contributing

- ↳ \uparrow o/p are less than \uparrow in o/p
- ↳ Too large to manage efficiently
- ↳ Duplication
- ↳ Higher labor costs
- ↳ Higher resource costs

Economies & Diseconomies of Scale



Increasing returns to scale

Minimum efficient scale

- ↳ Min. point on LRAC curve
- ↳ Represents optimal firm size under perfect competition in long-run

The firm & Reading 15: Analysis of Market Structure

* Analysis of mkt structure

• Market

↳ Group of buyers & sellers that are aware of each other & are able to agree on a price for exchange of goods & services

• 4 types of mkt struct.

↳ Perfect competition

↳ Monopolistic competition

↳ Oligopoly

↳ Monopoly

• Factors that determine mkt structure

↳ No. & relative size of firm supplying the prod

↳ Degree of prod. differentiation

↳ Power of seller over pricing decisions

↳ Relative strength of barriers to mkt entry & exit

↳ Degree of non-price competition

• Characteristics of MKT structure

	Perfect Competit ⁿ	Monopolistic comp.	Oligopoly	Monopoly
No. of Sellers	Many firms	Many firms	Few	Single
Barriers to Ent	Very low	low	High	V. High
Product different ^r	Homogenous	Subs but differentiated	Close subs / diff	Unique prod
Non-Price comp.	None	Adv. & prod. diff	Adv. & prod. diff	Advertising
Price Power	None Eg. Oranges	Some Eg. Toothpaste	Some - Significant Eg. Pepsi	Considerable Eg. Electricity

* PERFECT COMPETITION

Demand analysis in perfectly competitive mkt

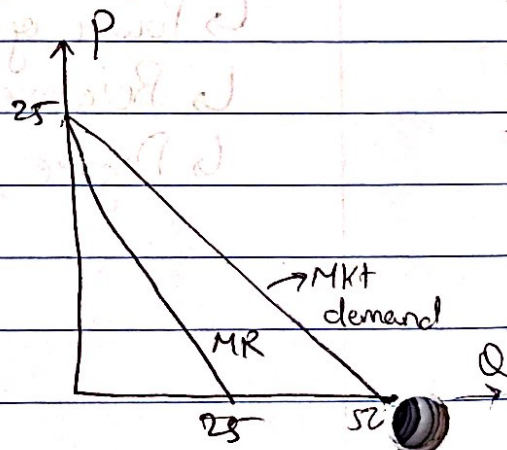
- MKT demand curve is downward sloping

$$Q = 50 - 2P$$

$$P = 25 - 0.5Q$$

$$TR = PQ = 25Q - 0.5Q^2$$

$$MR = \frac{\Delta TR}{\Delta Q} = 25 - Q \dots \left(\frac{d}{dx} TR \right)$$



• Other factors affecting demand

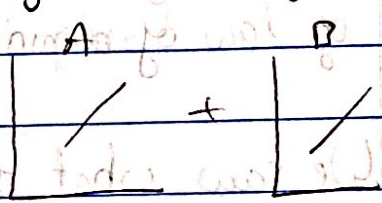
↳ Movement along demand curve vs shift in demand curve

↳ Income & Cross elasticity of demand

Supply analysis in perfectly competitive mkt

• When mkt price ↑, firms supply greater quantities

• Mkt supply curve is the sum of the supply curves of the individual firms



Optimal Price & Q in perfectly competitive mkt

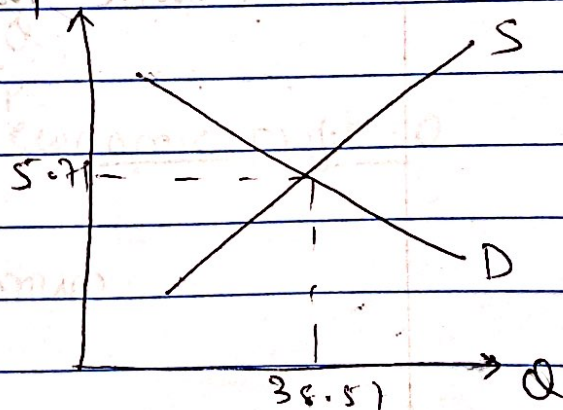
• Combine mkt supply & demand function to solve for equilibrium price & quantity

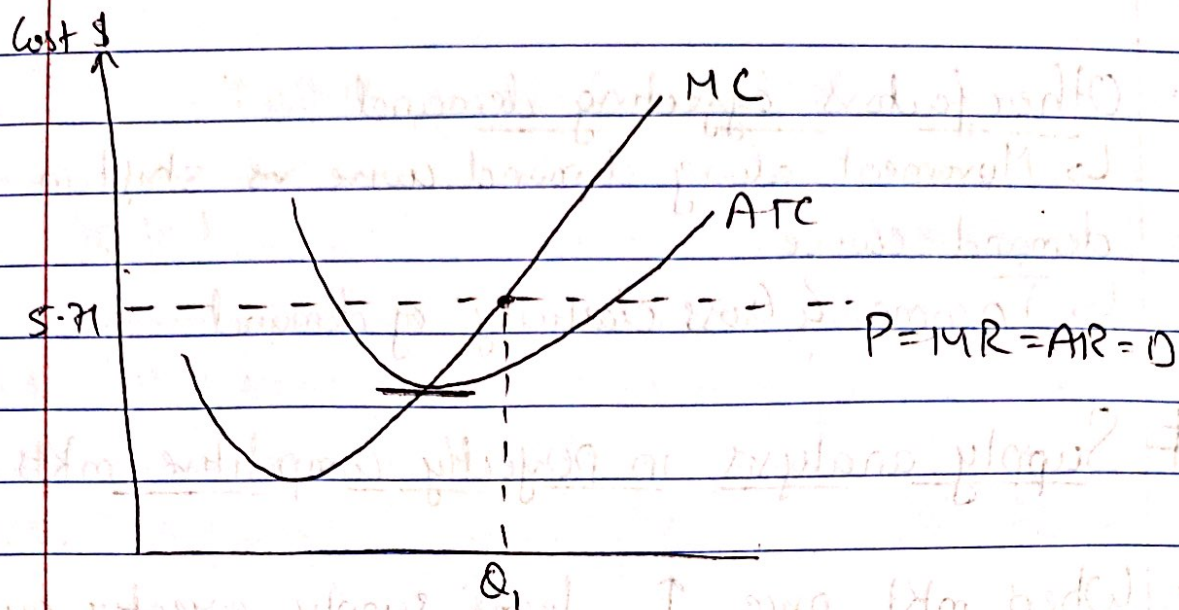
$$P = 25 - 0.5Q_D$$

$$P = -2 + 0.2Q_S$$

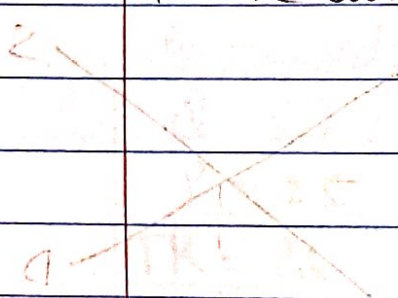
$$\therefore P = 5.71 \text{ \& } Q = 38.57$$

• Each firm is a price taker





- Generally cost curves are U-shaped because of law of diminishing returns
- We saw what is the optimal price. But now we need to know what is the quantity at which profit will be maximized \rightarrow Ans. MC = MR i.e. Q_1
- What is the link b/w firm's supply & MC curve
 \hookrightarrow Your's supply curve is directly related to MC curve as long as MC \geq ATC



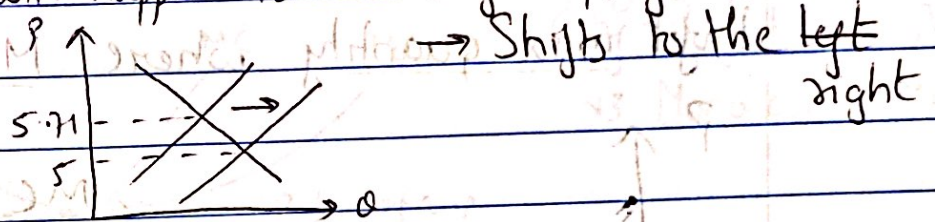
$$P = 15.71 = 0.5 \cdot 15.71 = 9$$

12.2830

Factors affecting Long Run Equilibrium in Perfectly Competitive MKT

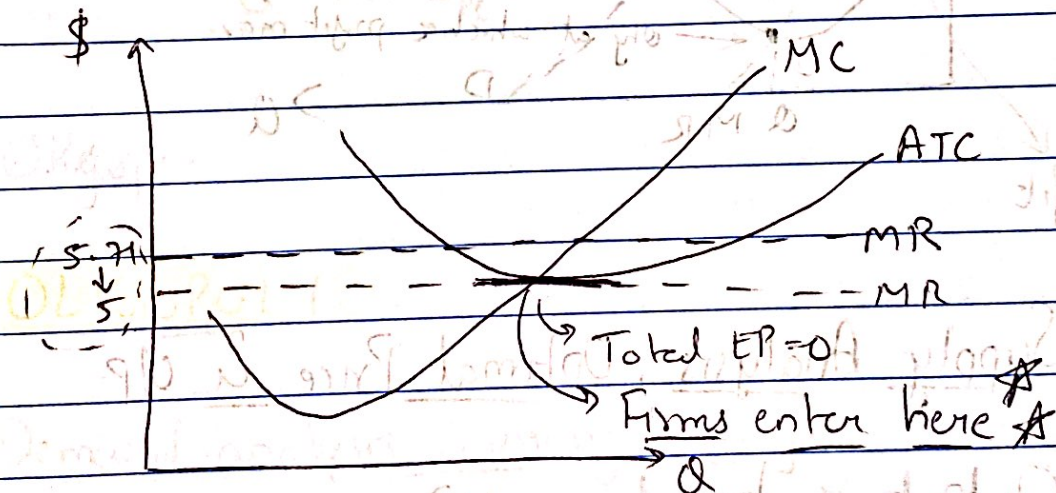
• If economic profit > 0 , other firms will enter the market

↳ What will happen to industry supply curve?



↳ What will happen to mkt price?

→ Decrease



∴ When, $MC = MR = ATC$, $P = P$, economic profit = 0

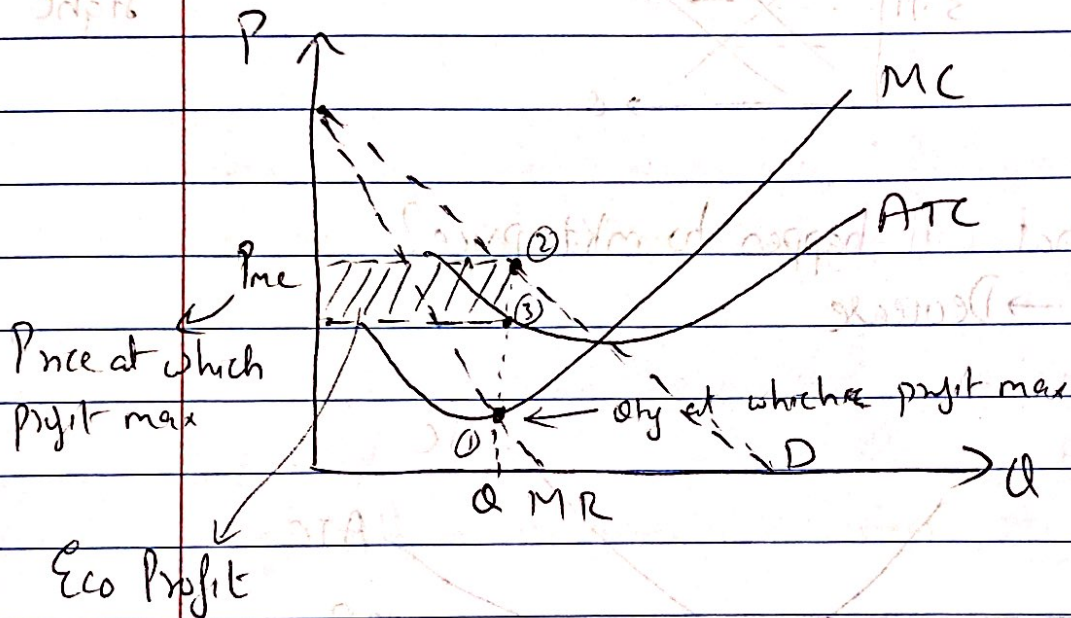
↳ Long run equilibrium.

* MONOPOLISTIC COMPETITION

Demand analysis in mono-comp. mkt

- Downward sloping curve for each firm

- Profit max quantity where $MR=MC$



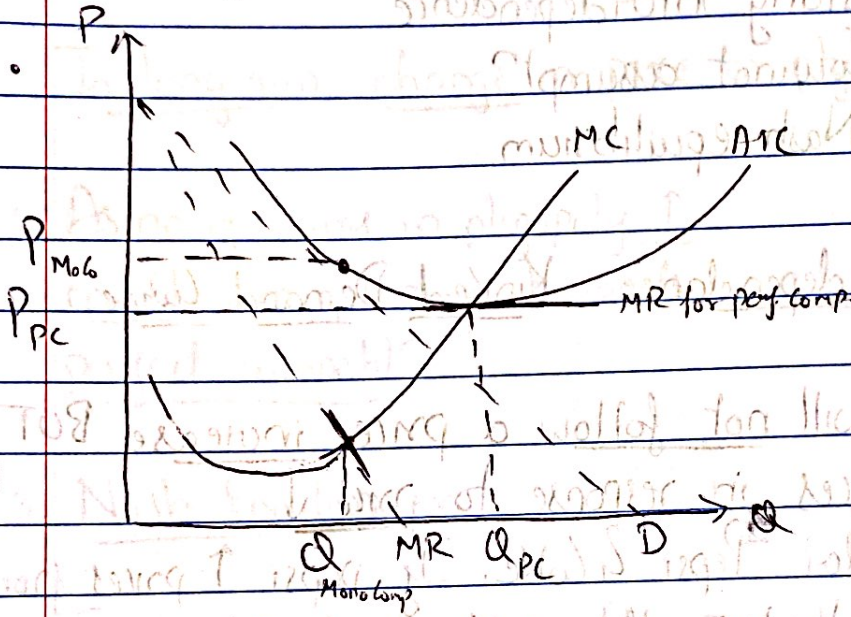
Supply Analysis, Optimal Price & OP

- Output is based on $MR=MC$
- Price is based on demand curve
- Supply functⁿ is not well-defined

- * Prices \uparrow & $Q \downarrow$ than perfect compⁿ

Factors Affecting Long-Run Equilibrium in Mono comp mkt

- In long run, economic profit will be 0



Long-run Price & Qty: Perfect comp (PC) vs Mono comp (MC)

* Oligopoly

* OLIGOPOLY

Demand analysis & pricing strategies in oligopoly mkt

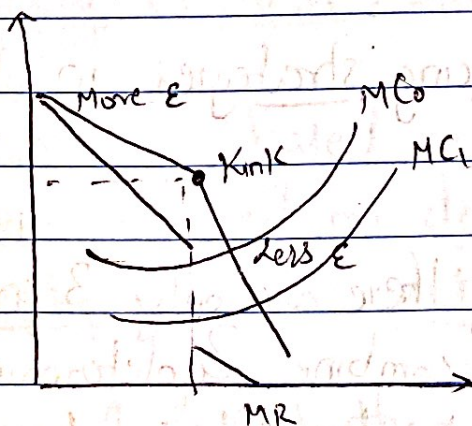
- If firms collude (i.e. if there are only 3 firms in the mkt, they would combine & determine pricing power \rightarrow market demand is divided)

- If firms do NOT collude
 - ↳ each firm faces an individual demand curve & mkt demand curve will depend on pricing strategies
1. Pricing interdependence
 2. Cournot assumption
 3. Nash equilibrium

1. Pricing Interdependence - Kinked Demand Curve

- Competitor will not follow a price increase BUT will cut prices in response to price \downarrow .

Eg. Consider Pepsi & Coke. If pepsi \uparrow prices from original 100 to 105, then coke won't \uparrow price so the demand for coke \uparrow hence MORE ELASTIC in the region above kink. If pepsi \downarrow from 100 to 95, even coke will \downarrow

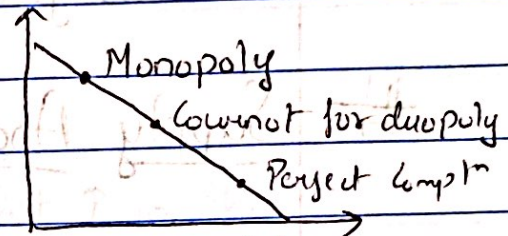


- Model helps explain stable prices.

- Does not tell what prices should be

2. Cournot Assumption

- Each firm determines profit-maximizing quantity assuming other firms' output will not change
- In long run, change in price or qty will NOT ↑ profits
- As no. of firms in oligopoly ↑, equilibrium pt moves towards perfect competition



3. Nash Equilibrium

- Firms arrive at an equilibrium strategy after considering other company's actions (interdep.); no incentive for any firm to deviate from Nash equilibrium.
- Assume firms do not cooperate

Eg. Wesco & Riglo sell a similar prod. Explained in IFT video @ 17:53

	Wesco - Low Price	Wesco - High Price
Riglo - Low Price	50, 70	80, 0
Riglo - High Price	300, 300	500, 300

It would be better if they collude

- Factors that affect chance of successful collusion
 - ↳ No. of & size of sellers $\downarrow \rightarrow$ \uparrow succ
 - ↳ Similarity of prod. $\uparrow \rightarrow$ succ
 - ↳ Cost struct. (similar) \rightarrow succ
 - ↳ Order size & freq $\uparrow \rightarrow$ succ
 - ↳ Retaliatⁿ $\uparrow \rightarrow$ succ
 - ↳ Degree of external compⁿ $\uparrow \rightarrow$ \uparrow succ

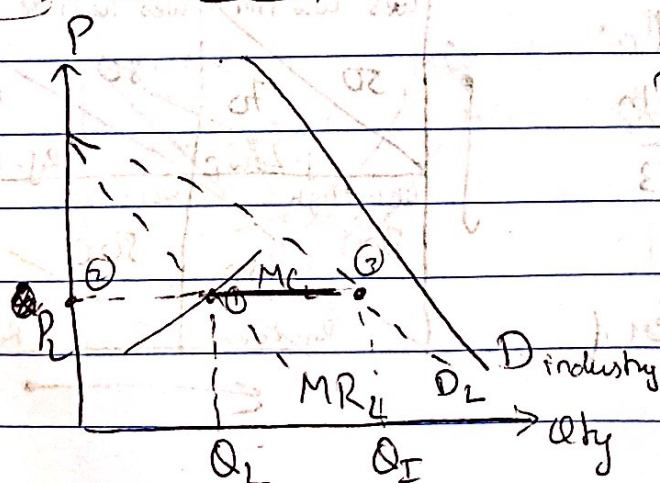
Supply Analysis in Oligopoly mkt

- No well defined supply functⁿ

- Profit maximised when MR=MC

- Ex. \uparrow price based on demand curve
- Say we have oligopoly mkt where one firm has significantly lower cost of prodⁿ than its competitor & has 40% mkt share

Criteria for dominant leader



D_L = Demand for leader

• What qty will be supplied by mkt leader & at what price?

↳ Q_L supply by mkt lead & P_L is the price set

↳ All other firms will keep the same price as P_L as they don't want price wars

• Qty by other firms = $Q_T - Q_L$

• D_T & D_L are not parallel lines. Dist ↑ in the upper part & less dist in lower.

Reason:- As price ↓, small firms exit & mkt share of leader ↑ so overall D_T ↓ at faster rate but rate of D_L ↓ is constant

Optimal Price & Factors affecting long-run equilibrium

• No. single optimum price & olp model works for all oligopoly mkt situatⁿ

• Long-run economic profits are possible but empirical evidence suggest that over time the mkt share of dominant firm declines

* MONOPOLY

• How monopolies are created

↳ Patent or copyright

↳ Control over critical resources

↳ Gov. autho:

(Patex)

↳ Strong brand quality which creates barriers to entry

↳ Ntwk effect (MSFT)

Demand Analysis in Mono. MKTs

• Demand curve is downward sloping

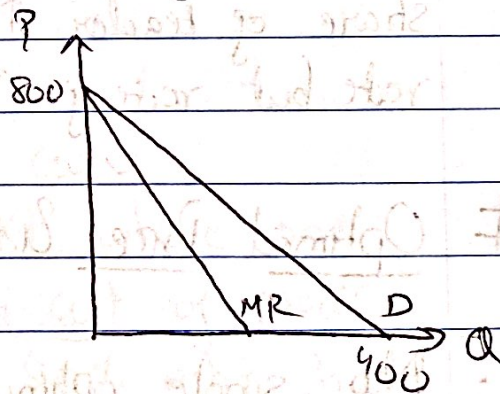
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$$P = \underline{800 - 2Q}$$

$$TR = PQ = 800Q - 2Q^2$$

$$MR = \frac{\Delta TR}{\Delta Q} = \underline{800 - 4Q}$$

$$AR = \frac{TR}{Q} = \underline{800 - 2Q}$$



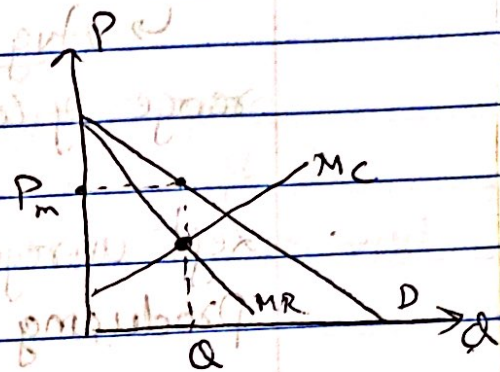
Supply analysis in Monopoly mkt

- Profit maximizing level of op is when $MR = MC$

- Price based on demand curve

Given, $TC = 20000 + 50Q + 3Q^2$

$$MC = \frac{\Delta TC}{\Delta Q} = 50 + 6Q$$



Optimal Price & Output in Monopoly mkt

- Optimal op is when $MR = MC$ & $\Delta \pi = 0$ (ie. change in profit w.r.t ΔQ)

If profit $(\pi) = -20000 + 75Q - 5Q^2$, at what qty is profit max? $\rightarrow \frac{\Delta \pi}{\Delta Q} = 0$

$$75 - 10Q = 0$$

$$Q = 7.5$$

$$MR = P \left(\frac{1}{E} \right) = MC$$

$E = \text{Own Price Elasticity}$

$$\therefore P = \frac{MC}{1 - \frac{1}{E}}$$

Natural Monopoly in Regulated Pricing Env

• Natural Monopoly

↳ Avg cost of prodⁿ falls over the relevant range of consumer demand

• Left unregulated, monopoly will max profits by producing the qty for which MR=MC

• Government regulatⁿ may attempt to improve resource allocation by requiring avg cost pricing or marginal cost pricing

Price Discriminatⁿ & Consumer Surplus

• First Degree Price Discriminatⁿ

↳ Consumer charged maximum he is willing to pay; no consumer surplus.

• Second Degree Price Discrⁿ

↳ Consumer charged differently based on how they value the product

Eg. A TI BAIL Plus Professional

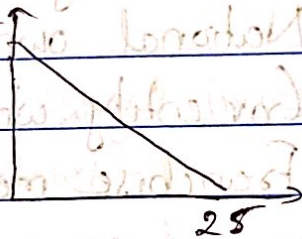
• Third Degree Price Discr

↳ Consumers chosen segregated based on demographic or other traits eg. Airline tickets - Business class / Eco class

★ ★ Eg. My monthly demand visits for gym is given by $Q = 25 - 5P$ where $Q = \text{no. of visits / month}$ & P is the price per unit. The gym's MC is $\$1$ per visit

→ Demand Curve

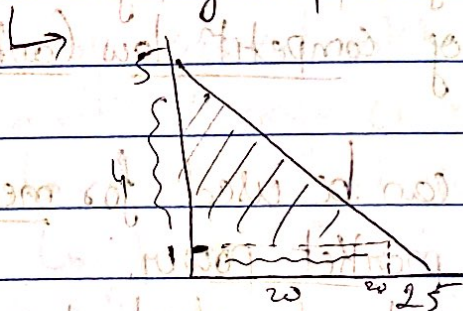
$$P = \frac{25 - Q}{5}$$



→ If gym charged per price per visit equal to MC, how many visits would I make per month

$$\begin{aligned} \text{MC} &= P = 1 \\ \therefore 1 &= \frac{25 - Q}{5} \quad \underline{Q = 20} \end{aligned}$$

→ What is my surplus amount at this price?



$$= \frac{1}{2} \times 4 \times 20 = \underline{\underline{40}}$$

→ How much could the club charge / month for membership fee?
↳ \$40 + \$1 per visit

Factors affecting long-run equilibrium in Monopoly mkt's

- Unregulated mono. can earn eco profit in the long run

For regulated, there are several solutions

↳ Price = Marginal Cost

↳ National ownership

↳ Gov entity which regulated authorized monopoly

↳ Franchise monopolistic firm through bidding war

* Identificatⁿ of MKT Structure

- Analysts & regulators are concerned w/ degree of mkt competitⁿ

• When there is a merger possible, you should consider the impact of competitⁿ law (anti trust law)

- Econometrics approach can be used for measuring mkt concentratⁿ or market power.

↳ Use regression to estimate elasticity of demand & supply

- ↳ Very inelastic curve \rightarrow High pricing power
- ↳ Data not available

• Similar approaches

↳ N-firm concentration

↳ Herfindahl-Hirschman Index (HHI)

1. N-firm concentration: Ratio that Eg. 5-firm
 $25, 15, 10, 10, 10$
 $= 75\%$

• Sum of mkt shares of N largest firms

• Simple & easy to understand

x Unaffected by mergers among top incumbents

x Not quantify mkt power

x Not consider barriers to entry

x Not consider elasticity of demand.

2. Herfindahl-Hirschman Index (HHI)

$$0.25^2 + 0.15^2 + 0.10^2 + 0.10^2$$

• Sum of squared mkt shares of N largest comp. in a mkt (range 0 to 1)

↳ 0 \rightarrow perfect competitive

↳ 1 \rightarrow Monopoly (only 1 comp \therefore 100% \therefore 1)

• Simple & commonly used by regulators

X Not consider barriers to entry

X Not consider elasticity of demand

Kaplan

• If comp^y can earn eco profits in perf. comp. mkt, over the long run the supply curve will most likely shift to right

• A gov. that auth. monopoly will most likely base regulated price on long run avg cost

Reading 16: Aggregate o/p prices & Economic o/p

- Macroeconomics
↳ Study of aggregate behaviour of households, firms & mktts

- This reading analyzes nations' agg. o/p & income, its competitive & comparative advantages.

- Level of inflatⁿ, unemployment, consumptⁿ, government spending & invest affect the overall level of activity in a country.

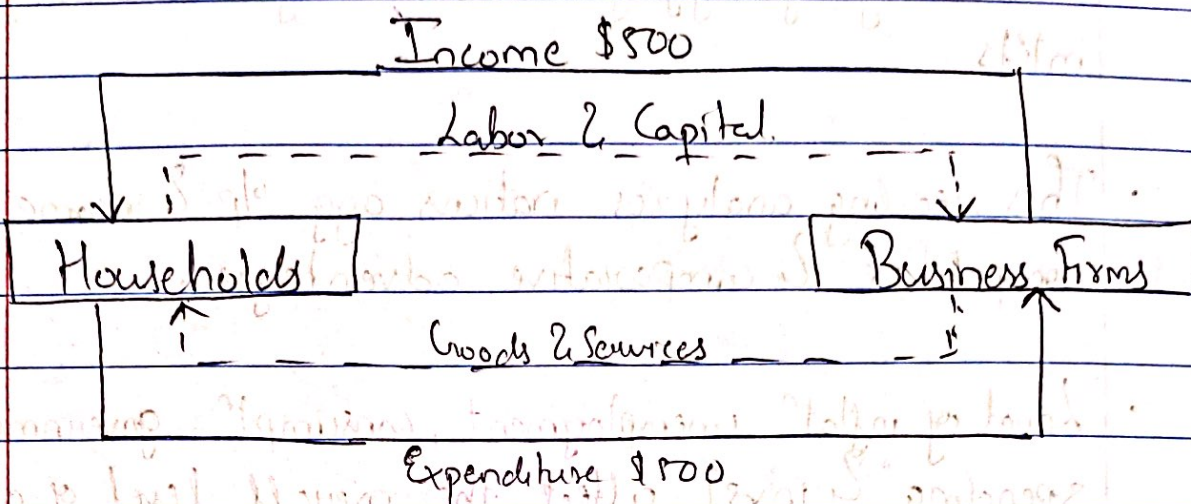
* Aggregate o/p & income:

- Agg. o/p of eco
↳ Value of all goods & services produced in a period

- Agg. inc. of eco
↳ Value of all profits earned by the suppliers of factors used in prodⁿ of goods & services.
↳ Eg. compensatⁿ of employees, rent, interest & profits

- Agg. expenditure
↳ Total amt spent on goods & services produced in eco during a time period

• Agg. Exp = Agg. o/p = Agg. inc



Gross Domestic Product (GDP)

- MKT value of all final goods & services produced w/ an economy over a given period (o/p)

OR

Agg. income earned by all households, companies & govs over a period of time (income)

- To ensure consistency across countries & across time, the following criteria are used:

1. Only count goods produced during measurement period

2. Count goods whose value can be determined by being sold in the mkt (goods included @ imputed price)

3. Use mkt value of final goods & services

Calculating GDP

Income Approach

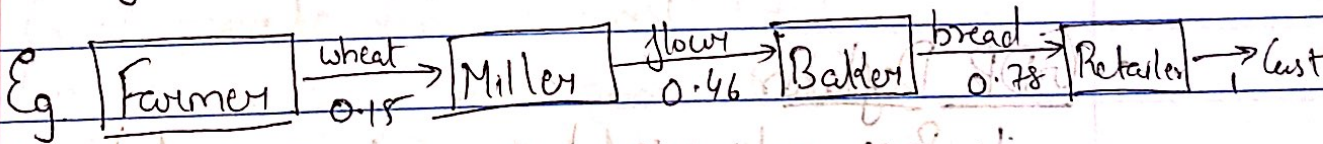
↳ Computes GDP as total income earned by households, business & gov. in a given period.

Expenditure Approach

↳ Based on calculating total amt spent on goods & serv.

↳ Sum-of-value-added (GDP is calc. by summing the additions to value created at each stage of prodⁿ & distⁿ)

↳ Value-of-final-output (GDP is calc by summing the values of all final goods & serv. produced during the period)



	Val. of final o/p	Sum-of-value-added
Receipts of farmer from miller	0.15	0.15
millar from baker	0.46	0.31 {0.46-0.15}
baker from retailer	0.78	0.32
retailer from final buyer	1	0.22
	<u>1</u>	<u>1</u>

• If real GDP > Nominal \rightarrow prices have \downarrow

Nominal & Real GDP

• Nominal GDP

\hookrightarrow Values goods & serv at their current price

• Real GDP

\hookrightarrow Measures current year's o/p using prices from a base year

\hookrightarrow Eliminate inflatⁿ effect

Eg. In 2010, 1 mil tons goods cotton prod. @ Rs. 100/ton.
In 2012, 1 mil tons goods cotton prod. @ Rs 120/ton

Base year is 2010.

\rightarrow Nominal GDP in 2012 = $120 \times 1 \text{ mil} = 120 \text{ mil}$

Real GDP = $100 \times 1 = 100 \text{ mil}$

• GDP Deflator

\hookrightarrow Price index used to convert nominal to real GDP

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

Real GDP

Eg. Calculate implicit GDP price deflator from 2009 to 2012 & inflatⁿ rate for 2012

	2009	2010	2011	2012
Nom. GDP	100	110	118	125
Real GDP	90	92	94	95
Implicit GDP	$\frac{100}{90}$	<u>120.65</u>	<u>125.53</u>	<u>131.58</u>
Deflator	= <u>111.11</u>			

$$\text{Inflat}^n \text{ rate @ 2012} = \frac{131.58 - 125.53}{125.53} = \underline{4.8\%}$$

Components of GDP

Comp

GDP_n based on expenditure approach

1. Consumer spending on final goods (C)
2. Gross private domestic invest (I)
3. Gov. spending on final goods (G)
4. Net exports (X - M) where X = exp & M = imports

Household & Business Sector

Either consume (C) Invest (I) from
 or save (S) their their inc. / borrowing
 income

• Government Sector

↳ Taxes are their income source (T) & G is expend

↳ If Expenditure (G) > T, ^{fiscal} deficit

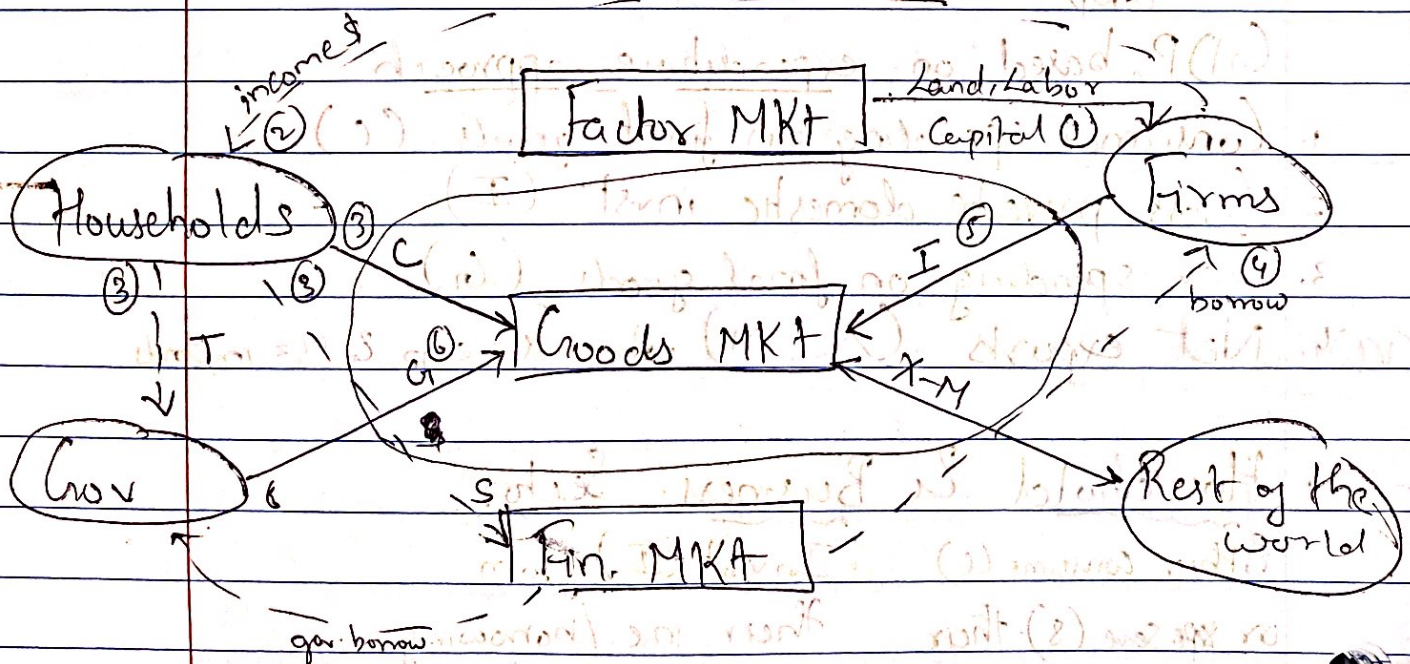
fiscal deficit

↳ Money gov spends on unemployed ppl are not included cos gov doesn't get anything from that exp.

• External Sector

↳ Trade & Capital Flows b/w given economy & rest of the world.

↳ Trade deficit - Domestic economy is spending more on foreign goods relative to how much foreign comp are spending on domestic goods i.e. If Imports > Exports



Based on Expenditure approach

$$\therefore \text{GDP} = C + I + G + (X - M)$$

Based on Income Approach

$$\text{GDP} = \text{National inc} + \text{Capital consumption Allowance} + \text{Statiscal discrepancy}$$

→ Measure of depreciatⁿ

where

National inc = Compensation of employee + Corp profits before taxes + Interest inc + Unincorporated business net inc + Rent + Indirect tax less subsidies

- GDP value shd be same irrespective of the approach but it isn't because of diff. data sources. So we add Statiscal Discrepancy to both approaches to make them equal

• Personal Inc.

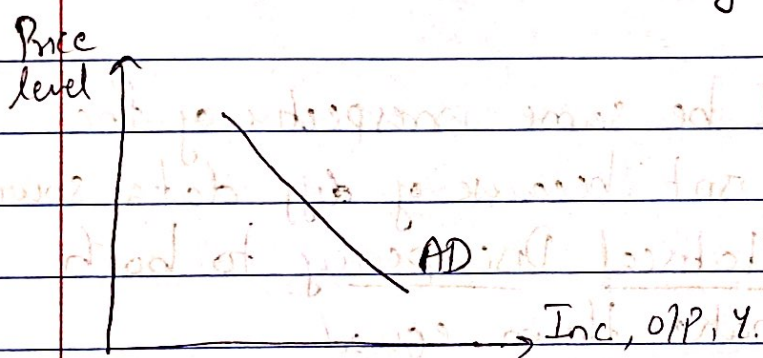
↳ Broad measure of household inc

↳ Measures ability of consumers to make purchases

* Agg. Demand, Agg. Supply & Equilibrium

Agg. Demand (AD)

- Shows the qty of real o/p demanded at different price levels but 2 conditions must be satisfied
 - ↳ Agg. income & planned expenditure must be balanced. (IS curve)
 - ↳ Equilibrium in money mkt (LM curve)



- Aggregate inc = Agg. Exp.

$$C + S + T = C + G + I + (X - M)$$

$$\underline{(S - I)} = \underline{(G - T)} + \underline{(X - M)}$$

- Consumptⁿ spending is a fⁿ of disposable inc (Y-T)
- Marginal propensity to consume
 - ↳ If it is 0.7 (70%), means for \$1

additional disposal income, 70 cents will be spent & rest will be saved (Marginal propensity to save)

Balancing Agg. Inc & Exp. : The IS Curve

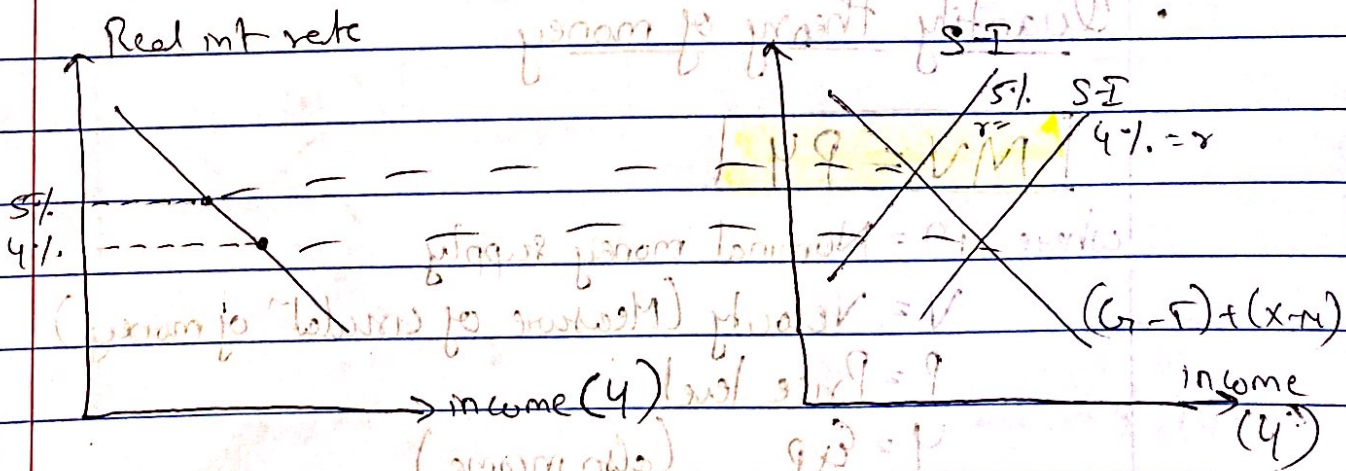
* IS curve shows combination of income & real interest rate at which planned exp. = inc.

$$S - I = (G - T) + (X - M)$$

Investment spending ↑ when interest rates ↓
 ↑ $\frac{(Y)}{\text{agg. income}} \uparrow$

Gov. spending is determined outside the model but taxes depend on income

• Net exports depend on inc. differential & price differential b/w domestic economy & rest of the world



- Reason for $(G-T) + (X-M)$ downward sloping.
 - As inc \uparrow , $T \uparrow \therefore (G-T) \downarrow$
 - inc \uparrow , $M \uparrow \therefore (X-M) \downarrow$
 - \therefore As inc \uparrow , $(G-T) + (X-M) \downarrow$.

- S-I upward sloping cos \rightarrow but $S \uparrow$ more so overall
 - As income \uparrow , invest $\downarrow \therefore (S-I) \uparrow$

- When int. rate \downarrow from 5 to 4%,
 - invest \uparrow & saving \uparrow less $\therefore (S-I) \downarrow$ & shifts left

Equilibrium in Money MKT: LM Curve

$$\text{Supply (S)} = \text{Demand (D)}$$

- The IS curve does not tell us about appropriate level of interest rate; it also does not consider price level.

- Quantity theory of money

$$MV = PY$$

where M = Nominal money supply

V = Velocity (Measure of circulatⁿ of money)

P = Price level

Y = Exp (also income)

$$\frac{M}{P} = \left(\frac{1}{v}\right) \cdot Y \cdot i = \left(\frac{M}{P}\right)_D$$

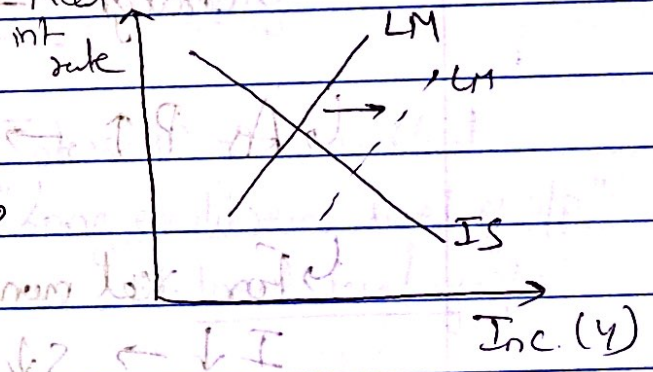
Real money supply

- Demand for money inversely related to interest rates directly related to income

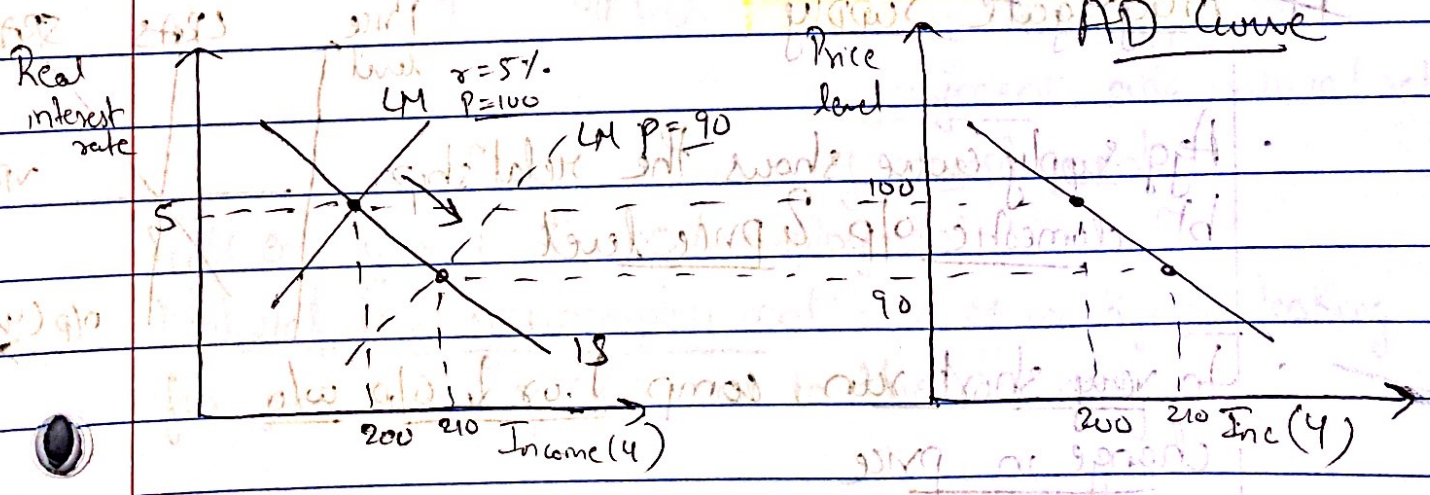
$$\therefore D \propto \frac{Y}{i}$$

• Int. rates & inc. are truly related; hence upward sloping curve

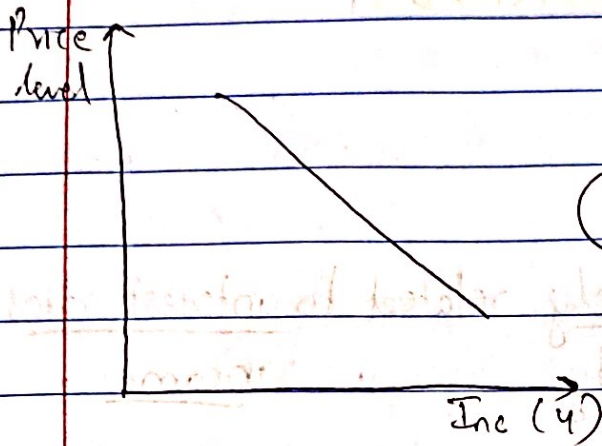
- If price level (P) ↓ → Real money $\left(\frac{M}{P}\right)$ ↑ → Y ↑ → LM curve shifts to right



- IS & LM curve to derive AD curve



The Agg. Demand (AD) Curve



• Movement along AD Curve

↳ Agg. inc = Agg. exp
 (IS) $S - I = (G - T) + (X - M)$

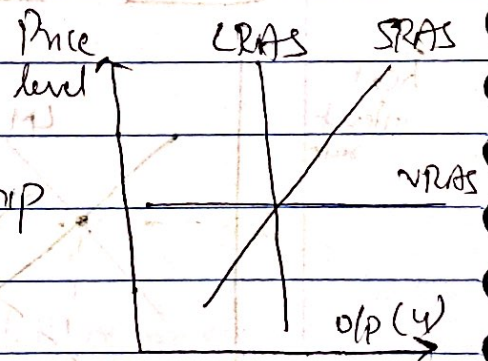
↳ Real money supply $\left(\frac{M}{P}\right)$ is held at eqm (LM)

↳ Assuming no changes in fiscal bal or trade bal
 Change: $\Delta S = \Delta I$

↳ As $P \uparrow \rightarrow$ Real money supply \downarrow

↳ For real money supply to \downarrow , r must $\uparrow \rightarrow$
 $I \downarrow \rightarrow S \downarrow$

Aggregate Supply



• Agg supply curve shows the "relationship" bt' domestic o/p & price level

• In very short run, comp. \uparrow or \downarrow o/p w/o change in price

- In short run, some costs are sticky so businesses ↑ output when prices ↑.

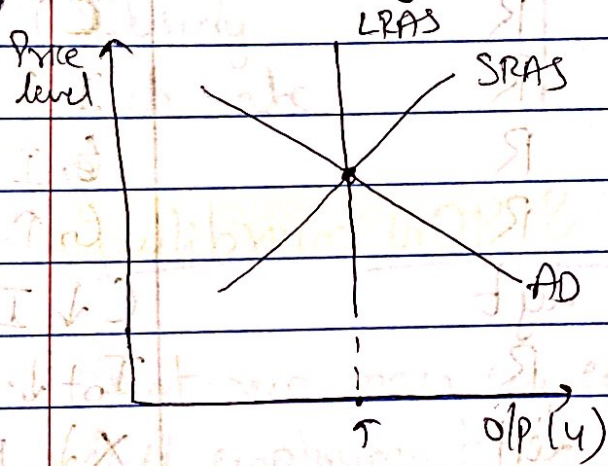
- In long run, wages, prices & expectat adjust

- What is relatⁿ b^t wages & slope of SRAS curve?

- ↳ If wages are sticky i.e. they do not change that often & if prices ↑, slope will be ↑ but less steep

- ↳ If wages are not sticky, slope ↑ & very steep

Shifts in Agg. Demand & Agg. Supply



- Intersectⁿ pt is called "Long equilibrium level of o/p" or "Natural level of o/p"

- When we are at nat level of o/p we say we are at full employment aka natural rate of unemployment.

Full employment \neq 100% employment

Natural level of unemployment: % of workforce looking for jobs \approx No. of vacancies in the economy.

- GDP growth impacts corporate profits which impact stock prices

- Expected inflatⁿ impacts bond yields

- While looking at how AD is affected, just remember $AD = C + G + I + (X - M)$

SHIFTS IN AGG DEMAND.

An ↑ in following factors	Shifts the AD curve	Reason
1. Stock prices	Right	Consump ↑
2. Housing prices	Right	C ↑
3. Consumer confidence	R	I ↑
4. Business confidence	R	I ↑
5. Capacity Utilizat ⁿ	R	I ↑
6. Government spending	R	G ↑
7. Taxes	Left	C ↓ I ↓
8. Bank reserves	R	I ↑
9. Exchange Rate	Left	X ↓ M ↑
10. Global growth	R	X ↑

SHIFTS IN AGG SUPPLY

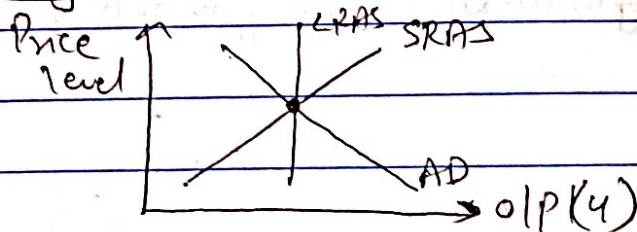
An ↑ in foll. factors	Shifts SRAS	Shifts LRAS	Reason
1. Supply of Labor	R	R	Resources ↑
2. Supply of natural resource	R	R	- " -
3. - " - human capital	R	R	- " -
4. - " - physical capital	R	R	- " -
5. Productivity & technology	R	R	Efficiency ↑
6. Nominal wages	L	↑	Cost ↑
7. I/p prices	L	no	Cost ↑
8. Expectat of future prices	R	impact	
9. Business Taxes	L		
10. Subsidy	R		
11. Exch. rate	R	↓	

Equilibrium GDP & Prices

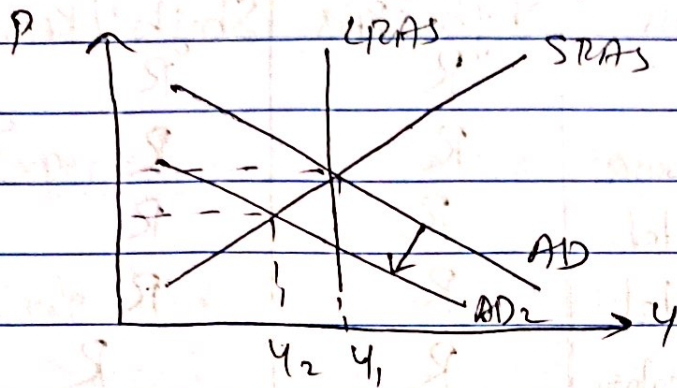
- Short-run macroeco eq can occur above or below full employment/natural rate of unemployment

- 4 types of macroeco equilibrium

↳ Long-run macroeco eq

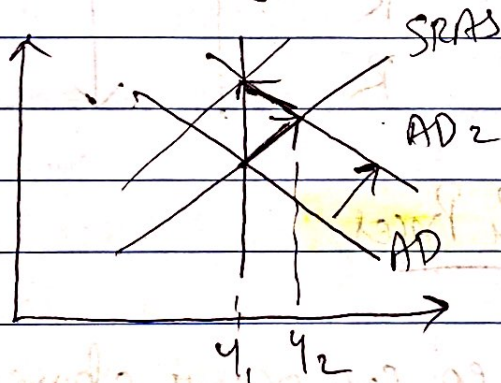


↳ Revolat Recessionary Gap



- Falls below natural rate of unemploy
- $Y_2 - Y_1 = \text{Recessionary Gap}$

↳ Inflationary Gap

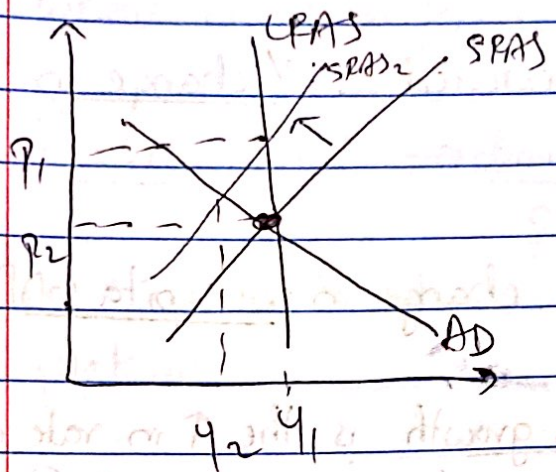


- Falls above nat rate of unemp.
- $Y_2 - Y_1 = \text{Infl. gap}$

Workers are working hard so they will demand more wages hence inflat but over the long run $Y_2 = Y_1$

price ↑ ← demand ↓

↳ Stagflation (Worst Condition)



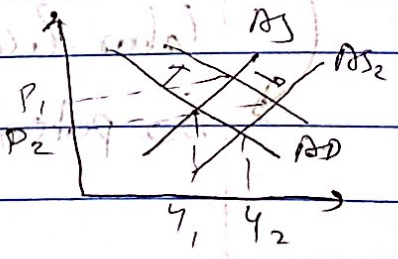
SRAS Shifts

• Here both $op \downarrow$ & $price \uparrow$ decreases

Effect of Combined Changes in AS & AD

Change in AS	Change in AD	Effect on GDP	Effect on Agg. Price level
↑	↑	↑	Intermediate
↓	↓	↓	- " -
↑	↓	Inter.	↓
↓	↑	Inter.	↑

↳ By drawing graphs & shifting



• \uparrow household wealth \rightarrow \uparrow consumption exp.

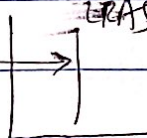
* Economic Growth & Sustainability

- Economic growth is measured as % change in real GDP.
- Eco growth also seen as change in per capita GDP
- Sustainable rate of eco growth is the \uparrow in rate of economy's productive capacity or potential GDP
The pt where \leftarrow
LRAS intersects x-axis
- Investor would prefer 4% sust. rate of eco growth as compared to 4% real GDP

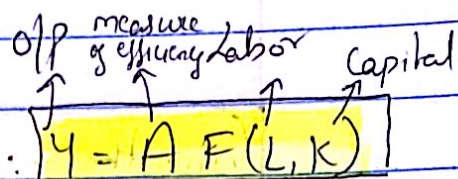
Productⁿ Functⁿ & Potential GDP

- According to neoclassical model / Solow growth model, potential GDP \uparrow for following reasons
 - \hookrightarrow Accumulatⁿ of factors of prodⁿ
 - \hookrightarrow Discovery of new technologies that make labor & capital more efficient

So potential GDP refers to \rightarrow

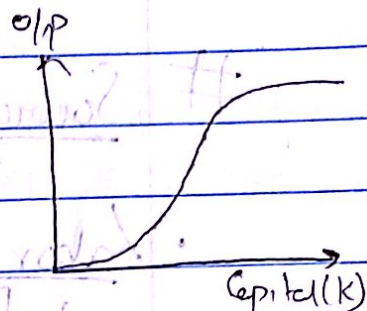


- This model is based on a prodⁿ fn: $Y = A F(L, K)$
 where A = Total factor productivity (TFP)



• Productⁿ functⁿ → diminishing marginal productivity

ie o/p ↑ w/ K upto a point after which it plateaus



• 2 implications of diminishing marginal productivity

↳ Long-term sust. growth can't rely on capital deepening investment

↳ ↑ productivity of K in developing countries should lead to convergence (ie w/ units of K; o/p ↑ by a greater amt in developing as compared to developed countries)

• Growth Accounting Equation

↳ Tells us where growth comes from

$$\text{Growth in potential GDP} = \text{Growth in Technology} + W_L (\text{Growth in labor}) + W_K (\text{Growth in capital})$$

W_L & W_K are relative share of labor & Capital in national income

Growth in per capita = Growth in technology +
potential GDP W_c (Growth in K/L ratio)

Sources of Economic Growth

• Labor Supply $\uparrow \rightarrow$ Eco growth \uparrow

\hookrightarrow Total hrs worked = Labor force \times hours/worker

\hookrightarrow Labor force is part of working age popⁿ available to work but not necessarily working

• Human Capital $\uparrow \rightarrow$ Eco Gr \uparrow

• Physical Capital $\uparrow \rightarrow$ Eco Gr \uparrow

Technology $\uparrow \rightarrow$ Eco Gr \uparrow (increased productivity)

\hookrightarrow Measures efficiency

\hookrightarrow Remember Remember TFP & growth acc eqⁿ

Natural resources $\uparrow \rightarrow$ Eco Gr \uparrow

Measures of Sustainable Growth

- Not easy to measure potential GDP
- # Measure of Sustainable growth
- Labor productivity easy to measure
- * ↳ Used to estimate rate of sustainable growth of eco
- ↑ Labor prod. → ↑ goods & services per person
- Growth rate of labor productivity : % ↑ in prod over a year

$$\text{Potential GDP} = \text{Agg. hours worked} \times \text{Labor productivity}$$

$$\text{Labor productivity} = \frac{\text{Real GDP}}{\text{Agg. hours worked}}$$

$$= \frac{Y}{L} = A \cdot F(K, L)$$

$$\text{Potential growth rate} = \text{Long-term growth rate of labor force} + \text{Long-term labor productivity growth rate}$$

Summary

- Calculate & interpret of real GDP

↓
Expenditure approach
($C + G + I + (X - M)$)

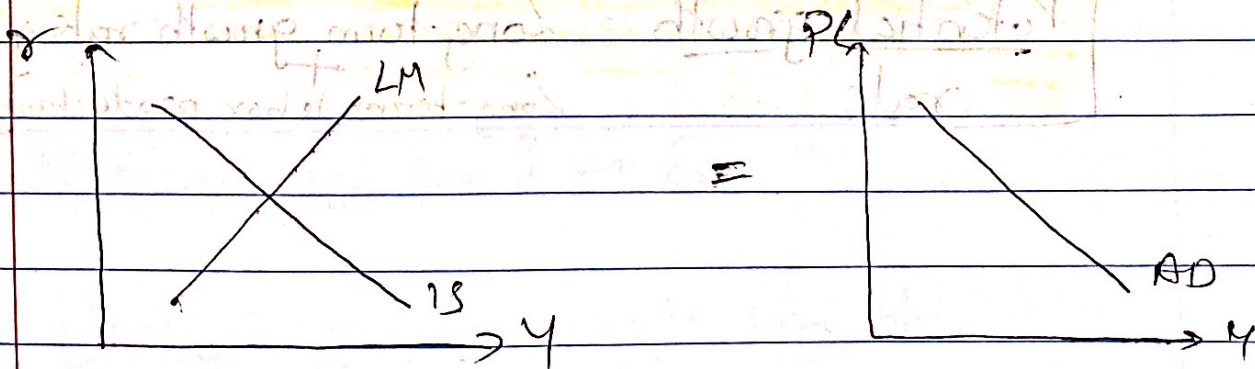
↓
Income App.
($NI + (AA + SD)$)
E

- Nominal & Real GDP

- National, personal & personal disposable inc

- Saving, invest, fiscal balance & trade balance
$$\underline{S - I} = \underline{(G - T)} + \underline{(X - M)}$$

- IS, LM & AD curves



• AS in short-run & long-run

• Shifts in AD/AS curves & impact on economy

• Economic growth

• A cycle consists of expansion, peak, contraction, and trough. Some time in every economic cycle is followed by general recession, unemployment, etc. The seq of events is RECURRENT BUT NOT PERIODIC. It is almost always followed by a recession more than 10% in 1980-82.

Phases of Business Cycle

Expansion: real GDP ↑
• Growth ↑
• Inflation ↑
• Interest rate ↑

Reading 17: Understanding Business Cycles

- This reading focuses on short term movements in economic activity.

* Overview of business cycle

- Bus. Cycle are a type of fluctuatⁿ found in aggregate economic activity of nations that organize their work mainly in BUSINESS ENTERPRISES ①
- A cycle ② consists of expansions occurring at about same time in many economic activities ③, followed by general recession, contractⁿ etc
- This seq. of events is RECURRENT BUT NOT PERIODIC ④; in duratⁿ, business cycles vary from more than 1 yr to 10 to or 12 yrs

Phases of Business Cycle

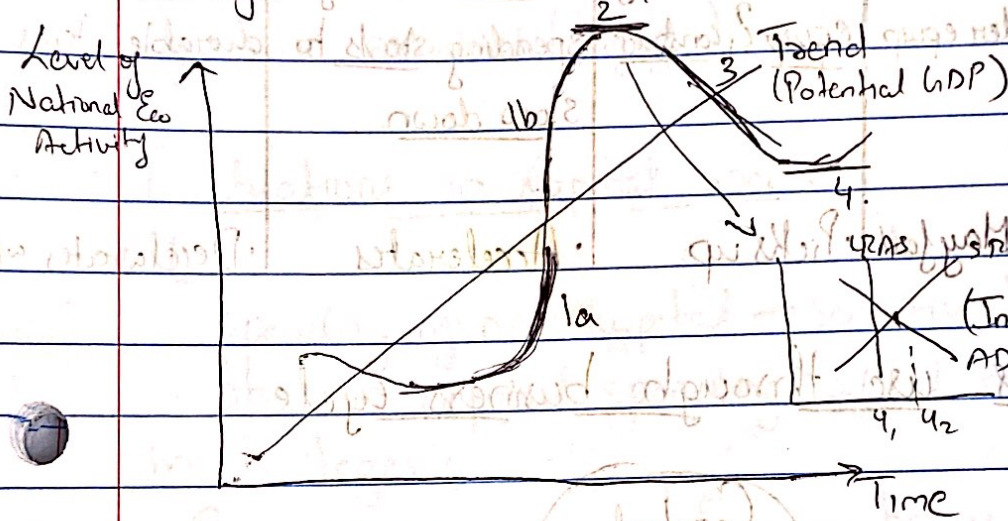
1. Expansion: real GDP ↑
 - a. Early exp
 - b. Late exp

• Recession has started when country experiences two consecutive quarters of -ve real GDP growth.

2. Peak: real GDP stops ↑

3. Contraction/Recession: real GDP ↓

4. Trough: real GDP stops ↓



Business Cycle Characteristics

	<u>Early Exp. (Recovery)</u>	<u>Late Exp.</u>	<u>Peak</u>	<u>Contraction (Recession)</u>
Eco. Activity	• GDP & other measures turn from decline to expansion	• Activity measures show accelerated rate of growth	• Act measures show decelerating rate of growth	• Act measures show outright decline
Employment	• Layoffs slow • Net employ. +ve • New hiring doesn't occur	• Full time working as overtime ↑ • Unemploy rate falls to low level	• Slow hiring rate • Unemploy continues to ↓	• First cuts hours & freezes hiring & then layoff • Unemploy ↑

- Fluctuations in Inventory levels

- ↳ Inv. $\uparrow \downarrow$ happens VERY RAPIDLY & has MAJOR effect on Eco growth.

- ↳ Inventory (I/S) ratio \rightarrow Indicator
Sales

$\frac{I}{S}$ \downarrow	Top of eco. cycle; Sales fall or slow	$\frac{I}{S}$ \downarrow Prod ⁿ rate < Sales rate	Sales begin $\frac{I}{S}$ \uparrow cyclic upturn
	<ul style="list-style-type: none"> • Takes a while to cut back on prodⁿ • Inv. accumulates $\rightarrow I/S \uparrow$ • Cut prodⁿ to $\downarrow I$ • Layoffs may exagg. downturn: \uparrow prodⁿ / up 	<ul style="list-style-type: none"> • I/S ratio \downarrow • Once I/S is back to normal, prodⁿ \uparrow even though sales might not be up 	<ul style="list-style-type: none"> • Initially prodⁿ can't keep w/ sales $\rightarrow I/S \downarrow$ • Surges in prodⁿ • Turn in hiring patterns.

- ↳ Inv. tend to rise when I/S ratios are low

- Consumer Behavior

- ↳ 70% of US Economy (common in developed world)

- ↳ Patterns of household consumptⁿ determine overall economic directⁿ of overall economy more than any sector

↳ Indicator :- Retail Sales sensitive to busi cycle

★ Some indicators make dist btⁿ durables, non-durables, services.
Eg. Cars Eg. cereals

↳ Durables more sensitive to business cycle

↳ Growth in inc → consumptⁿ prospects ↑

↳ Some analyst focus on PERMANENT INCOME

↳ Better ind^r to spending on Services

• Housing Sector Behavior → Affected by rate of family formatⁿ

↳ Smaller part as comp. to consumer spending expectⁿ of price ↑

↳ Moves ↑ ↓ quickly can count more in overall eco movements

↳ Data readily available in developed countries

↳ Sector sensitive to interest rates, demographics

↳ Housing sector might follow its own internal cycle

When rates ↓, D (House) ↑

• External Trade Sector Behavior

↳ Varies in size & imp. from one country to another

↳ Imports ↑ w/ domestic GDP ↑

↳ Exports ↑ w/ ↑ in rest of the world

↳ Major imp. on implexp^t → currency value ↑

↳ If currency value ↓, exports ↑

* Theories of Business Cycle

- Until 1930's Economists believed that business cycles were natural features of economy & recessions were temporary.

Neoclassical School

- MKTs will reach equilibrium because of "invisible hand" or "free MKTs"
- All resources used efficiently based on $MR=MC$
- If eco shifts AD/SRAS curve, economy will readjust & reach eq. via lower interest rates & wages

Austrian School

- Agreed w/ neoclassical model, but focused on impact of money & gov. intervention
- Fluctuations are caused by gov's expansionary monetary policies

Keynesian School

- Focus on AD fluctuations
- Wages are downward sticky, even if lower wages accepted, consumptⁿ & hence AD (will be lower)
- Simply \downarrow int. rate won't ignite growth
- Gov. should use monetary & fiscal policy to keep capital & labor employed even if this means large fiscal deficit
- Agreed w/ Neoc. & Aust about eco self-correcting but 'in the long run we are all dead'

Monetarist School

- Objected to Keyn. in 4 reasons:
 - ↳ Keyn. does not recognize imp. of money supply
 - ↳ Lacks complete representⁿ of utility-maximiserⁿ agents
 - ↳ Fails to consider long term costs of gov. interventⁿ
 - ↳ Timing of gov. policy is uncertain

- Monetarist say:
 - ↳ Monetary & fiscal policy → clear inconsistent; limited role of gov
 - ↳ Grow money supply at steady predictable rate
 - ↳ Business cycle occur because of exogenous shocks (eg. change in tech) & gov. intervention
 - ↳ Let AD & AS find their own equilibrium rather than risking further economic fluctuatⁿ.

New Classical School

- Economic agents shd be represented w/ utility functⁿ & budget constraint
- Models w/o money: Real Bus. Cycle Theory (RBC)
 - ↳ Emphasize effect of real economic vari. such as changes in tech & exogenous shocks.
 - ↳ AS imp. part of model
 - ↳ Expansion & contractⁿ → efficient opⁿ of eco. → gov. should not intervene
- Models w/ money
 - ↳ Built on RBC but recognize role of monetary policy
 - ↳ Neo-Key. build models on microeco principles say gov. must intervene

Comment (Eq. vs eq.)

Recommended Policy

Neo-classical

Invisible hand

Do nothing

Austrian

Fluctuatⁿ caused by mis-guided gov. interventⁿ

Do nothing

Keynesian

Focus on AD curve
Eco. doesn't automatically correct

Use fiscal/money policy
cos in long run we are all dead

Monetarist

Monetary policy

Steady, predictable growth of money supply

New classical

Exp. & contract represent efficient opⁿ of economy

Do nothing

RBC

* Unemployment & Inflation

Most gov try to limit unemployment & limit inflation

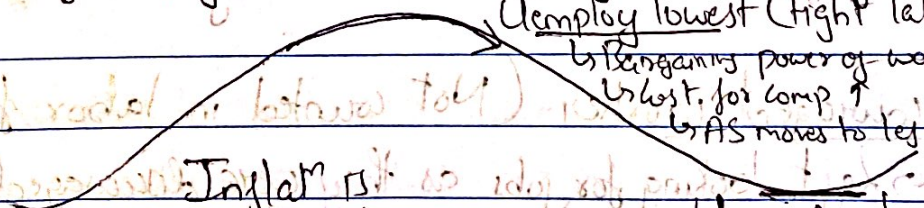
Unemploy lowest (tight labor mkt)

- ↳ Bargaining power of wages ↑
- ↳ cost for comp ↑
- ↳ AS moves to left

→ Downturn

Inflation prob-cyclical

Unemploy highest



Unemployment

- Employed

- ↳ Those who are working

- Labor Force

- ↳ Working + Looking for work

- Unemployed (Part of under labor force)

- ↳ Long-term Unemployed: Looking for work since 3-4 months

- ↳ Frictionally unemployed: BT jobs

- ↳ Structurally unemployed

- ↳ People having skills which is not required by employers e.g. use of ~~pp~~ postman after arrival of email

- Activity (participatⁿ) ratio

- ↳ Labor Force

- ↳ Working age Populatⁿ

- Underemployed

- ↳ High skill individual working for a low skill job

- Discouraged worker (Not counted in labor force)

- ↳ Left looking for jobs as they were discouraged

• Voluntarily unemployed

↳ Ppl in working age but not looking for emp. (eg. Masters student)

$$\text{Unemployment rate} = \frac{\text{Unemployed}}{\text{Labor force}}$$

↳ Measured diff. in diff. countries

↳ Inaccurate in predicting direct of economy (lags business cycle) because

↳ Business reluctant to lay off people

↳ In diff. times, discouraged workers stop looking for jobs.

• Overall Payroll Enrollment & Productivity Indicators

↳ Analysts look for payroll growth

↳ Other measures: Overtime hours & no. of temp. workers

↳ Drop in productivity ($\frac{O/P}{L}$) precedes ↓ in full-time payrolls.

↳ ↑ in productivity precedes ↑ in full-time payrolls

Inflation

• Pro-cyclical (goes up & down w/ business cycle)

- Helps infer state of economy: \uparrow inflatⁿ \rightarrow Overheated eco
- It is sustained rise in overall prices in economy
- % change in price index \rightarrow Inflatⁿ rate

• Unexpected change \rightarrow Trigger change in monetary policy which can impact prices.

• High inflatⁿ, economic growth & low unemployment \rightarrow economic overheating

Deflatⁿ :- \downarrow sustained \downarrow in price level $\frac{100}{99} \downarrow$

• Hyperinflatⁿ :- Fast \uparrow in agg. price level (Eg. 100% \uparrow , within 3 yrs)

• Disinflatⁿ :- \downarrow in inflatⁿ rate [Inflatⁿ rate is +ve but less +ve]
15% \rightarrow 12% \rightarrow 10%

Measuring Inflatⁿ: Constructⁿ of Price Index

\hookrightarrow Price Index represents avg prices of basket of goods & services

\hookrightarrow Laspeyres index

\hookrightarrow Commonly used

\hookrightarrow Created by holding consumptⁿ basket const.

↳ Substitut bias (Upward)

↳ Quality bias

↳ New product bias (Upward)

↳ Paasche index Substitut bias → downward

↳ Allows composition to change

↳ Fisher Index

↳ Geometric mean of above two

Eg

Date: January 2012 February 2012

Goods: Qty Price Qty Price

Sugar: 7Kg 90/Kg 9Kg 110/Kg

Milk: 10Kg 100/Kg 12Kg 120/Kg

Base period = Jan 2012. The price level for base period is set to 100

→ Laspeyres index

Jan 2012	Feb 2012
7×90	7×110
$+ 10 \times 100$	$+ 10 \times 120$
1630	1970
$\div 1630$	$\div 1630$
$\times 100$	$\times 100$
100	121

1630

÷ 1630

× 100

100

1970

÷ 1630

× 100

121

$$\text{Paasche index} : \frac{9 \times 90}{12 \times 100} \quad \frac{9 \times 110}{12 \times 120}$$

$$\frac{2010}{\div 2010 \times 100} \quad \frac{2430}{\div 2010 \times 100}$$

$$\underline{100} \quad \underline{120.9}$$

$$\text{Fisher index} : (120 \times 120.9)^{1/2}$$

• Price Indices & their usage

CPI
Cons. goods
≡

↳ CPI to track inflatⁿ

↳ Wts of diff. categories vary across countries

↳ Scope of each index is diff.

↳ CPI-U (CPI - Urban)

↳ PCE (Personal Consumption Exp)

↳ PPI (Producer Price Index)

↳ Price changes exp by domestic producers

↳ Many eco. activities indexed to certain CPI

↳ Eg. TIPS adjust price value based on CPI-U

↳ Headline inflatⁿ (Reflects actual cost of living)

↳ Covers all goods & services in eco

↳ Core inflatⁿ (Used by Policy makers)

↳ Ignores energy & food items

↳ Sub-indices

↳ Price index for particular category eg. foods

• CPI used

by central

banks to

monitor inflatⁿ

↳ Relative Price

↳ Price of specific good in comparison w/ others

Explaining Inflat

• Cost-push inflat

↳ Results from ↓ in agg supply caused by ↑ in real price level of imp. factors of prodⁿ such as ↑ in wages, labor, energy or commodity prices which can cause AS to move left

↳ Non-accelerating inflat rate of unemp. (NARU)

↳ If unemployment falls below this level → inflationary pressure

↳ Natural rate of unemp. (NARU)

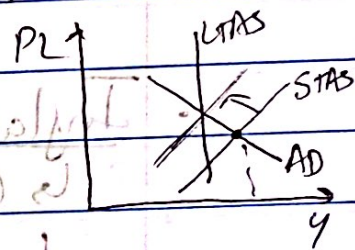
↳ If unemploy below this → upward wages

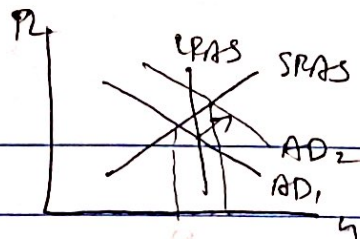
Limitatⁿ of NARU & NARU

↳ The appr level might change overtime.

↳ These measures doesn't consider bottlenecks

↳ As productivity ↑, unit labor cost ↓ ∴ labor cost ↓. That means even if wages ↑, because of ↑ prod, it is highly unlikely to cause upward pressure





• Demand-pull inflation

↳ Results from persistent \uparrow in AD that \uparrow price level & temp. \uparrow economic o/p above its potential or full employment level

↳ If actual GDP close to potential \rightarrow shortages or bottlenecks \rightarrow price \uparrow

↳ Monetarist perspective :- Inflation is monetary phenomenon

So if money growth $\uparrow \rightarrow$ inflation

• Inflation Expectations (If growth in money supply $>$ growth in GDP, more money chasing few goods \rightarrow inflation)

↳ Can be self-sustaining

↳ Gauge by looking at past trends

* Economic Indicators

• Used to assess current state of economy & for insights into future eco activity

Leading indicators

↳ Turning pts precede business cycle

↳ Eg. weekly hrs manf

• Coincident indicators

- ↳ Turn pts tend to coincide w/ business cycle
- ↳ Indicates current phase of bus.

• Lagging indicators

- ↳ Lagging indicators are reported after the fact

Leading indicators

* ↳ Avg weekly hrs. manf

↳ Avg weekly initial claims for unemp. insur.

↳ Manf's new orders for consumer goods & for non-defense cap goods

↳ ISM new order index

↳ Building permits for new put housing

* ↳ S&P 500 index

* ↳ Leading Credit Index

* ↳ Int. rate spread: 6m/10yr & overnight rates

↳ Avg. consumer expectat. of 1970s

• Index of leading economic indicators (LEI)

↳ Keeps a track of all above composites

• Diffusion index

↳ Reflects proportⁿ of index's component that are moving in a pattern consistent w/ overall index

Coincident indicators

- ↳ Employees on non-agricult payroll
- ↳ Agg. real personal inc
- ↳ Ind. Prodⁿ Index
- ↳ Manuf. & trade sales

Lagging indicators

- ↳ Avg duratⁿ of unemp
- * ↳ Inventory/Sales Ratio
 - ↳ ↑ after bus. cycle peak
- * ↳ Change in unit labor costs
- ↳ Avg bank prime lending rates
- * ↳ Commercial & ind. loans outstanding
- ↳ Ratio of consumer installment debt to inc
- ↳ DCP1 for services

- Coinc & lagg. can confirm leading
- Trade assos & public agencies also provide cgg. cyclical measures.

Leading, lagging & coincident indicators are based on historical cyclical obs

Leading indicators

Theoretical *

Practical *

Impact of influencing the economy & interest rates

Money #

to the extent of exist

for measure of end of most pe

to the extent of exist

to the extent of exist

to the extent of exist

to the extent of exist

Reading 18: Monetary & Fiscal Policy

- Govts. decisions & actions have large impact
- They are the largest borrowers & largest employers
- Goal: Stable growth & ↓ inflation

~~**~~ Monetary Policy

* Monetary Policy

- Impact by influencing qty of money & interest rates

Money

↳ Medium of exch.

- For medium of exch it must be
 - ↳ Readily accep.
 - ↳ Known value
 - ↳ Divisible
 - ↳ High val. relative to wt
 - ↳ diff. to counterfeit

- Money fulfills 3 imp. functions:
 - ↳ Act as med. of exch
 - ↳ Way of storing wealth
 - ↳ Convenient measure of val. & unit of account

• Fractional reserve system

Eg. Consider you deposit \$100 to Bank A. Let's say fract. rate is 10%. Following is what happens.

\$100		
Bank A	↓	Bank B
Assets	Liabilities	Assets Liabilities
Reserves = 90	Deposits = 100	Res. = 90 Dep. = 90
Loan = 90		Loan = 81

So now \$100 deposited equal 190 (\$100) i.e. creating money

↳ Fract. rate of req: % of money req. to be kept in reserve

Money Created = New deposit

Reserve requirement

Money Multiplier = $\frac{1}{\text{Reserve requirement}}$

Reserve requirement

• Narrow Money (M1)

↳ Notes & coins in circulatⁿ, travelers' cheq & other liquid deposits

• Broad Money (M2)

↳ M1 + Savings & money mkt deposits, time deposit accts, balances in retail money mkt & mutual fund

• Quantity Theory of Money

↳ Total spending is proportional to qty of money

$MV = PY$

where M = Qty of money

Price & nominal rate

V = Velocity of circulatⁿ of money

P = Price level

Y = Real o/p.

↑ in money supply will ↓
does not affect int. rate

↳ Money neutrality [You cannot change Y by changing M]

↳ States that with T in M & V being constant, there will be ↑ in P only. viz. we can control inflatⁿ by manipulating growth of money supply

↳ Monetarist Monetarist agree w/ this.

- Demand for money

- ↳ Amt of wealth citizens choose to hold in the form of money rather than bonds/equities

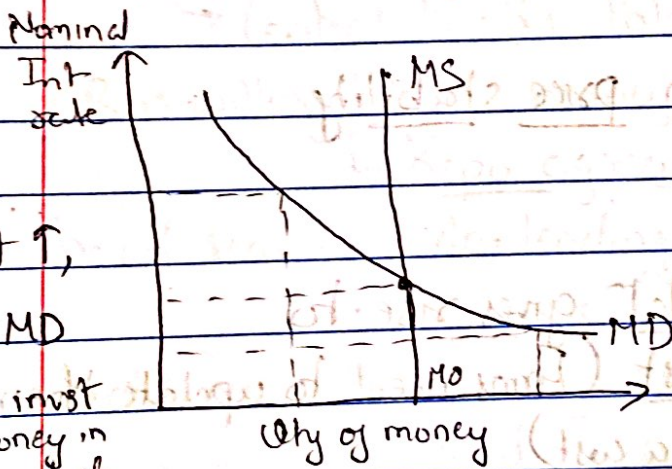
- ↳ Motives for holding

- ↳ Transact based: (For goods & serv. buying) \propto GDP

- ↳ Precautionary: (Protect against emergencies)

- ↳ Speculative: (If you think stK mkt will go \downarrow , then demand for money \uparrow)

- Supply & Demand for Money



As int \uparrow ,

$MS > MD$

so ppl invest excess money in bonds etc which

then causes

$P \uparrow$

- As int \uparrow , demand for money \downarrow .

- Intersect of MS & MD \rightarrow equilibrium int. rate

- ↳ Short-run impact of \uparrow in MS: $AD \uparrow \quad Y \uparrow$

- ↳ Long-run: $P \uparrow \quad Y \downarrow$

- The Fisher Effect

$$R_{nom} = R_{real} + \text{Exp. inflat}^n$$

- ↳ Directly related to money neutrality

- ↳ When we consider uncertainty, nom. int. rates have 3 components: Real return, Exp. inflatⁿ, Risk premium.

Roles of Central Bank

- Monopoly supplier of currency
- Banker to gov. & banks
- Lender of last resort
- Regulator & supervisor of pmt system
- Conductor of monetary policy
- Supervisor of banking system

Objectives of Monetary Policy

Objective: Maintain price stability

Costs of inflation

↳ Expected inflat. gives rise to
↳ Menu cost (Firms need to update their menu & it comes at a cost)

↳ Shoe leather cost (While going & coming to banks can wear off shoes so ...)

leads to

↳ Unexpected / Unanticipated inflatⁿ can, in addition

↑ in real wealth
of borrowers

↳ lead to inequitable transfers of wealth betⁿ
borrowers & lenders

↳ Contract risk & premium to compensate for

↳ Reduce info. content of mkt price

• Monetary Policy Tools

↳ Open MKT ops

↳ Central bank (CB) sells gov. secu. to commer. banks or buys from them.

↳ When CB sells, $MS \downarrow$

↳ buys, $MS \uparrow$

↳ Central Bank's Policy Rate (Rate at which CB is willing to lend money) aka Disc rate, int. rate

↳ Repo agreement (Agreement to buy back securities after lending it. Rate use is Repo rate)

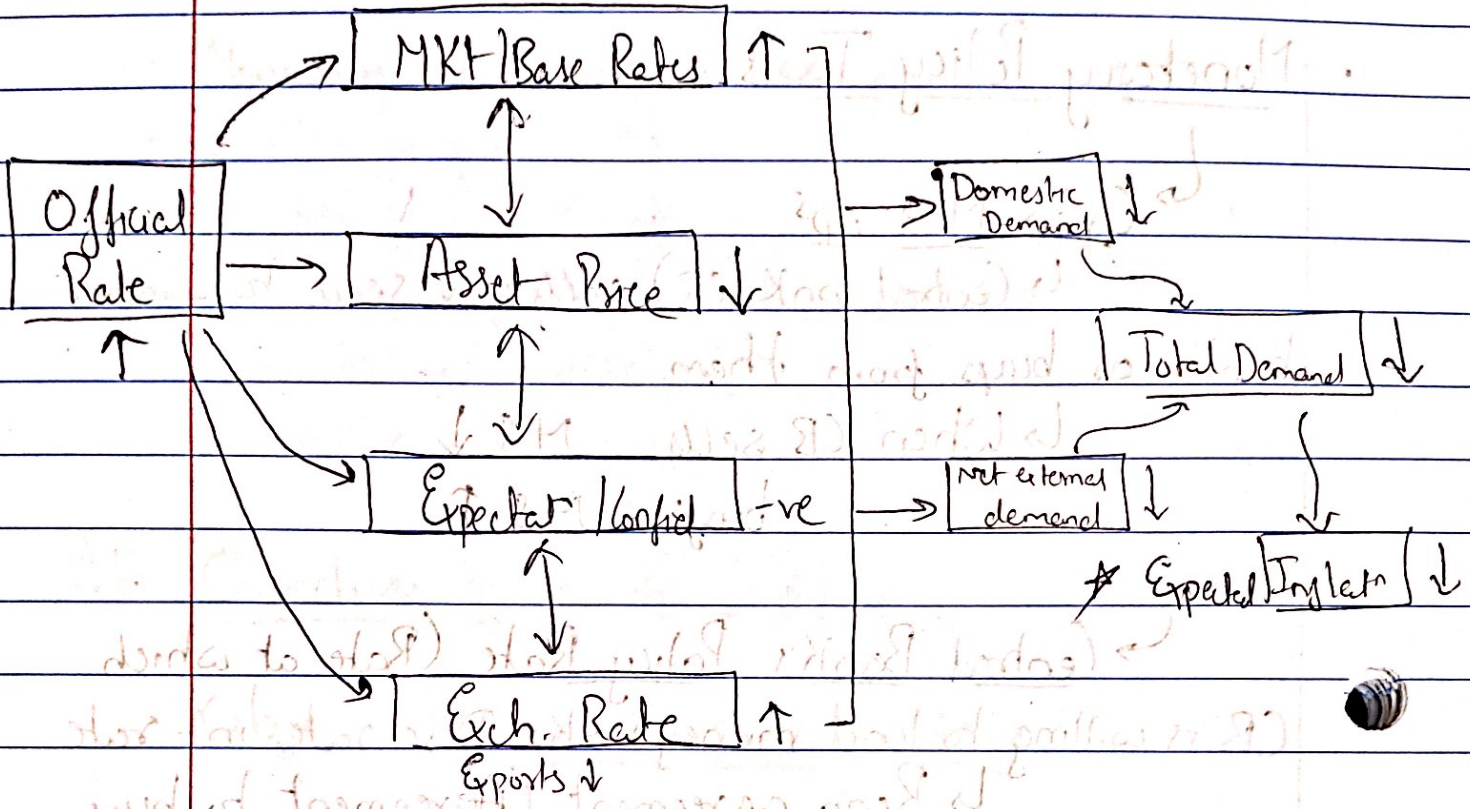
↳ Base rate (Rate @ which commercial banks are willing to lend each other)

↳ Federal Funds Rate: (Interbank lending rate on overnight borrowing of reserves)

↳ Raise Policy rate \rightarrow lending $\downarrow \rightarrow M \downarrow$

↳ Reserve Req.

* Transmission Mechanism



* Inflation Targeting

↳ Target a certain level of inflatⁿ & then ensure this level is met by monitoring range of monetary & real eco. indicators

↳ Success depends on

↳ Central Bank independence (free from political mtr)

↳ Operatⁿ indep.: Govt sets the target &

CB does the monitoring

↳ Target & Opⁿ independ: CB sets the target & also monitors it

imp as their targets become self-fulfilling prophecies

↑
↳ Credibility (follows through on its stated intent)

↳ Transparency

↳ Other features of inflatⁿ targeting framework

↳ Decision-making framework that considers a wide range of economic & fin. mkt indicators

* ↳ Target sufficiently above 0 to avoid deflatⁿ but low enough to ensure significant degree of price stability 2-3%

Contractionary & Expansionary Monetary Policies & Neutral Rate

• Contractionary monetary policy
↳ ↑ off. policy rate → ↓ ^{growth} rate of money supply & economy contract

• Expansionary monetary policy
↳ ↓ official policy rate → growth rate of money supp. & economy expand

• High & low policy rate is w/out neutral rate of interest
↳ Rate that neither spurs nor slows the economy
* ↳ Trend growth + inflatⁿ tgt

Limitations of Monetary Policy

• The will of monetary policy authority does not necessarily transmit seamlessly.

• C.B. cannot control

↳ Amt of money households & corp. put in bank on deposit

↳ Willingness of banks to create money by expanding credit

• Easy to influence short term rates. Long term depends on expectation of interest rates

• Quantitative Easing

↳ Aggressive policy

↳ Gov. printing money & putting in the system to avoid the risk of deflation

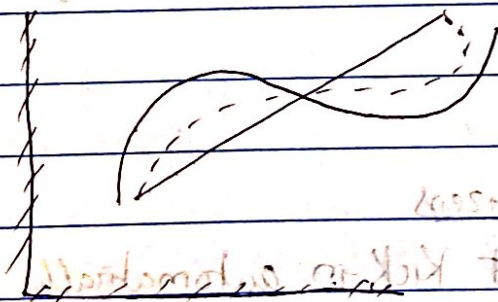
↳ Helps during declining bank reserves & eco activity

* Fiscal Policy

- Taxing & spending policies of govt.
- A gov. can influence eco. following aspects:
 - ↳ Overall level of AD & level of economic activity
 - ↳ Dist of income & wealth among diff. segments
 - ↳ Allocatⁿ of resources b^t diff. sectors.

Roles & Objective of Fiscal Policy

- Objective - Manage economy through its influence on agg. national o/p (real GDP)
Basically to ↓ magnitude of peak & trough.



- Fiscal Policy & Aggregate Demand
 - ↳ Expansionary fiscal policy can take several forms
 - ↳ Lower Taxes = $(G-T) \uparrow$
 - ↳ cuts in personal inc. tax
 - ↳ sales tax
 - ↳ corp tax

↳ Higher gov. spending

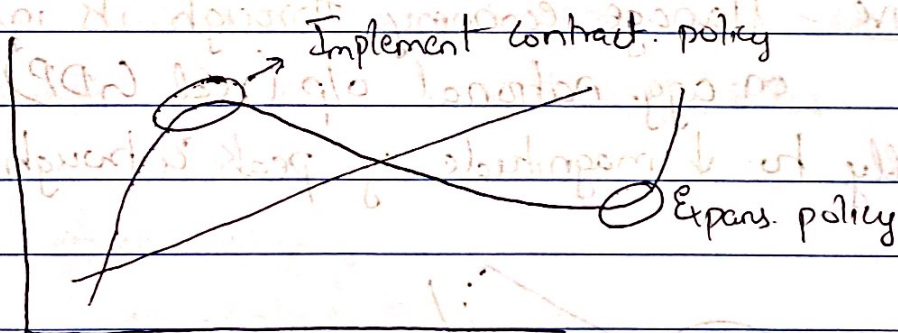
↳ Contractionary fiscal policy $\rightarrow (G-T) \downarrow$
↳ Higher taxes

↳ Lower gov. spending

↳ Keynesian := Support fiscal policy of gov. intervention

Monetarist := Support monetary policy

↳ Fiscal policy can influence o/p \rightarrow can be used for economic stabilization



↳ Automatic stabilizers

↳ Factors that kick in automatically depending on economic cycle. eg. Tax system

↳ Government = Revenue - Expenses
deficit

↳ Government deficits adds to national debt

Don't worry because ... Worry because ...

- Overstated prob. as debt is owed internally to fellow citizens
 - Proportⁿ of money borrowed may have been used for capital invest projects
 - Flawed tax struct. might be the reason for such a debt. Solⁿ is to fix the tax struct
 - Ricardian Equivalence: As debt ↑, ppl will save more, hence there will not be any net impact of debt
- ↳ ↑ debt → ↑ tax rates to ↑ tax revenue.
- If mkt's lose confid in gov then C.B. may have to print money to finance gov deficit
- Crowding Out Effect: Gov is borrowing so much money that businesses are not getting enough money to borrow.

Fiscal Policy Tools & Macroeconomy

Gov spending can take different forms:

↳ Transfer pmts

↳ Current gov. spending

↳ Capital Exp.

• Direct gov spending → larger impact on GDP

Economic & social justification for gov spending

Gov revenues can take diff. forms

↳ Direct taxes

↳ Indirect taxes

Desirable attributes of tax policy

↳ Simplicity

↳ Efficiency

↳ Fairness

↳ Revenue Sufficiency

Adv. & Disadv. of fiscal policy

Advantage

- Can adjust indirect taxes & generate revenue for the government

- Social policies like discourag. tobacco can be adjusted instantly by ↑ taxes

Disadvantage

- Direct taxes difficult to change

• Same for welfare & social transfers

- Capital spending take longer to formulate & implement

• Structural/Cyclical adjusted deficit

↳ Deficit when cw is

↳ Deficit that would exist @ full employment

• Fiscal Multiplier

↳ Tells us about changes in $dp(y)$ when there is change in gov. spending & taxes ($G \uparrow$ & $T \uparrow$?)

$$\text{Fiscal Multiplier} = \frac{1}{1 - c(1-t)}$$

where c = marginal propensity to consume/spend
 t = tax rate

↳ Eg. ^(a) what is the fiscal multiplier if $c = 95\%$ & $t = 20\%$?

(b) What is the \uparrow in total inc. if gov. spend. \uparrow by 1 bill.?

→ above Fiscal Mult. = $\frac{1}{1 - 0.9(0.8)} = 3.57$

b. If $G \uparrow$ by 1 then

Total inc. $(y) \uparrow$ by $1 \times 3.57 = 3.576$

• Balanced budget multiplier

↳ If gov. spend. & taxes \uparrow by same amt then

GDP up! (Gov. spending has \uparrow impact on GDP)

Fiscal policy implementation: Active & Discretionary Policy

• Deficit might not be an indicator of gov's fiscal stance because here $T \uparrow$ & $G \downarrow$ ∴ low deficit & here $T \downarrow$ & $G \uparrow$ so \uparrow deficit

• Different stat model will predict different impact for fiscal stimuli

• ∴ Analyst can look at structural or cyclically adjusted budget deficit

• Automatic fiscal adj

↳ Eg. Tax quotes, social security pmts

• Discretionary fiscal adj

↳ The law making authorities makes explicit changes to spending or taxat policy.

↳ Eg. large pgm of expanding highway system

↳ Difficult to execute because

↳ Recognit lag aka 'driving in rear view mirror'

↳ Act lag (Time to actually implement the plan)

↳ Impact lag (Time to make an impact)

* Relat b/w Monetary & Fiscal Policy



Easy/Expans. Fiscal Policy

Tight Fiscal Policy

Easy/Exp. Monetary Pol.

AD ↑, Low rates → Private sector Demand ↑
Growing private & public sector

AD ↓, Low rates → Pvt sector ↑
Private sector ↑ % of GDP

Tight Monetary Policy

AD ↑, High int rates → Pvt sector D. ↓
Public spending ↑ % of GDP

AD ↓, High rates → Pvt sector ↓
Shrinking pvt & public sectors

largely short bond market. If you hold
cash

• If Ricardian Eq. holds true \rightarrow Use monetary policy.

• If concerned w/ growth of potential o/p \rightarrow Use monetary

w/ lack of good quality workforce \rightarrow Use fiscal policy

• Liquidity trap associated w/ deflation

→ (M/P) < 1
→ (M/P) < 1
→ (M/P) < 1

Terms of trade = price of exports / price of imports

Trade surplus / Deficit

→ If exports > imports \rightarrow surplus
→ If imports > exports \rightarrow deficit



When a necessary component is needed

of the world, the world will get it

at the lowest possible price

Reading 19: International Trade & Capital Flows

* International Trade

Basic Terminology

GDP

↳ Total mkt val. of goods produced in the country

GNP

↳ GDP - Income of foreigners + Inc. of citizens working abroad

$$\text{Terms of trade} = \frac{\text{Price of Export}}{\text{Price of Import}}$$

• Trade Surplus / Deficit

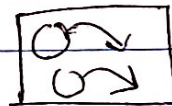
↳ If $\text{exp} > \text{imp}$, → surplus
else deficit

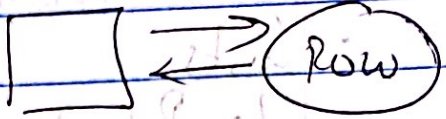
• Autarky

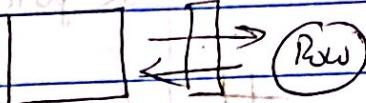
↳ When a country does not trade w/ rest of the world

↳ Goods produced & consumed in the same country

↳ Also called closed economy



• Free trade / Open Economy 
↳ Opposite of autarky

• Trade protection
↳ Protection on trades like tariffs 

• Foreign Direct Invest (FDI) / MNC
↳ Eg. German company opening textile factory in India

• Foreign portfolio invest (FPI)
↳ Eg. US-based invest mgmt firm investing in Indian stocks

Benefits & Costs of International Trade

- Benefits
- ↳ Countries gain from exch. & specialisation if:
 - ↳ Higher price for exports relative to selling internally
 - ↳ Lower price for imports relative to producing
 - ↳ Industries experiences economies of scale
 - ↳ Households & firms have greater variety
 - ↳ Competⁿ ↑ & efficient allocation of resources
 - ↳ Greater employment in exporting countries

Costs

- ↳ Potential for income inequality
- ↳ Loss of jobs as less efficient firms will be forced to exit

*

Comparative Adv. & Gains from Trade

Absolute Adv.

- ↳ ~~Country~~ ^{Country} A has abs. adv. over Country B in producing machinery if Country A can produce machinery at lower cost or use fewer resources

Comparative Adv.

- ↳ Country A has comp. adv. over B if A can produce machinery at lower opportunity cost

Eg. Suppose there are 2 countries. India exports cloth to UK & imports machinery. O/P per worker per day in each country is:

	Machinery	Cloth
UK	4	8
India	2	16

Which country has absolute adv in machinery?

→ UK as UK's mach. is more productive

Which country has comp. adv. in machinery?

→

$$\text{Opportunity cost for UK} = \frac{8}{4} = \textcircled{2}$$

machinery

$$\text{OC for India machine} = \frac{16}{2} = \textcircled{8}$$

OC of UK means

If you do not produce 1 machine then you will get 2 units of cloths

OC of UK < OC of India

UK

Price of Export
Price of Imp

- A company's gains from trade are maximized when terms of trade $\left(\frac{P_e}{P_i}\right)$ are closer to partner's autarkic prices than its own autarkic prices

Eg. if India sells cloth in India for Rs. 5 & in UK cloth's price is £5 then while exporting it makes sense to India to export go clothes to UK as closer to £5 & not Rs. 5.

• Ricardian Model

↳ Adam Smith: Trade if you have absolute adv.

↳ Ricardo: Trade even if you have comparative adv.

↳ Labor is the only variable factor of prodⁿ

- Abundant factor gains relative to scarce in each country

↳ Differences in technology lead to difference in labor productivity; this is the Key Source of comparative adv.

• Heckscher-Ohlin model

↳ Both capital & labor are variable

↳ Goods produced w/ varying combinations of labor & capital.

↳ Differences in relative endowment of these factors are source of comparative advantage

↳ Countries w/ relatively high labor will focus on labor intensive industries

↳ Allows income redistribution through trade

↳ Technology in each industry is same across countries, but various across industries

* Trade Capital Flows: Restrictions & Agreements

Tariffs

- Are taxes on imported goods collected by the government

- Small country \rightarrow Demand $<$ Global demand
- \rightarrow Price taker
- \rightarrow less impact on overall eco.

Justification

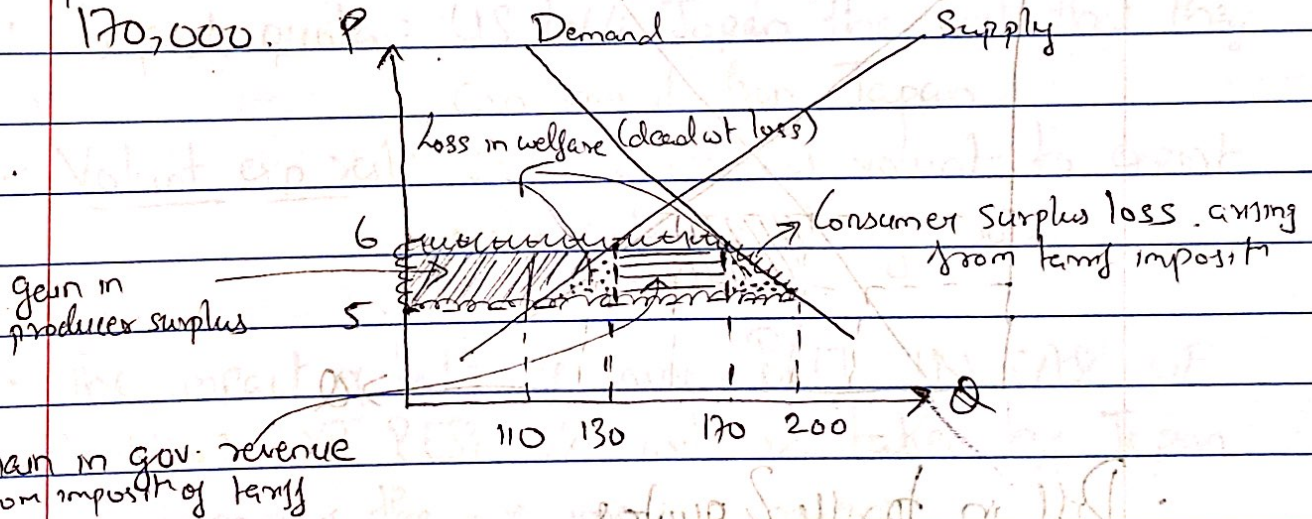
- \rightarrow To protect domestic industry
- \rightarrow To reduce trade deficit

- Generally result in loss in welfare

*

Eg. South Africa manufactures 110,000 tons of paper. However domestic demand is 200,000 tons. World price for paper is \$5/ton. SA will import 90,000 tons of paper from world mkt at free trade prices.

If SA decides to impose 20% tariff on paper imports, the price of imported ppr will \uparrow to \$6/ton, domestic prodⁿ \uparrow to 130,000 & qty demanded \downarrow to 170,000.



Loss in consumer surplus = Rectangle + triangle = $170 \times 1 + \frac{1}{2} \times 1 \times 30 = 185K$

Gain in producer surplus = Rect + Δ = $110 \times 1 + \frac{1}{2} \times 20 \times 1$
 total = 120K

- Gain in gov. rev = $1 \times 40 = 40K$

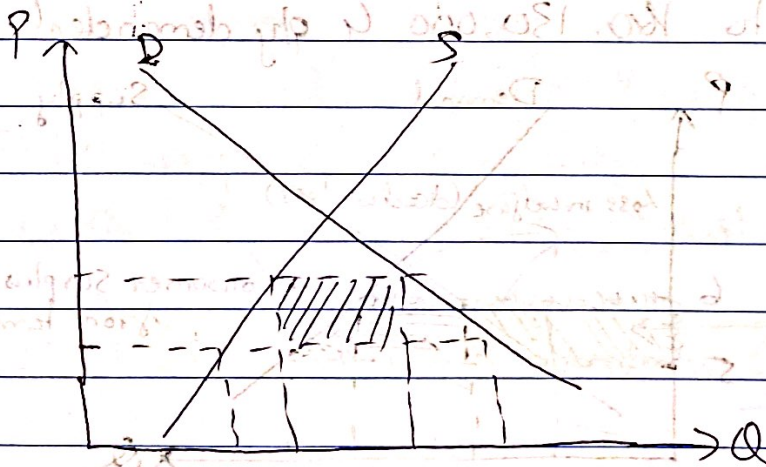
- Dead wt loss = Sum of 2 Δ

$$= \frac{1}{2} \times 20 \times 1 + \frac{1}{2} \times 30 \times 1$$

$$= 25K$$

Quotas

- They are limits on the absolute amt of imports allowed over some period, typically a yr



• Diff. in tariffs & quotas

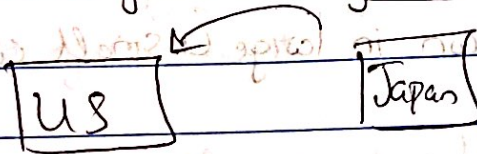
↳ $////$ in the diag is what we refer to as tariff revenue that goes to the gov. But in quotas, exporter can \uparrow the price & take $////$ away from the gov. $////$ = Quota rent

↳ Welfare loss in tariffs were = 2 Δ's beside $///$
 quota = 2 Δ's beside $///$ + $///$

↳ If the gov. can impose a license fee & capture $///$
 then revenue in tariff = revenue in quota

↳ Voluntary export restraint

↳ Exporting country agrees to limit exports of
 particular good (Highest welfare loss) (Exporting country
 takes away $///$ quota
 rent. Importing
 country cannot impose
 license fee)



Import quota: US tells Japan the limit that they
 can import from Japan

• Volunt. exp. rest.: Japan decides volunt to export
 only certain amt of goods

• The impact of both are same BUT IN CASE OF
 VOLUNT EXP. REST. $///$ will be taken by Japan
 as Japan is the one imposing restrict.

Export Subsidy

Home and

Home and

Home and

or T label

or T label

or T label

or T label

or T label

or T label

- Payments by government for each unit exported
- Objective: To simulate exports
- Exporter has incentive to focus on export mkt
- Countervailing duties might be levied by importing country
- If "small" country imposes export subsidies, domestic price \uparrow (As exporters want to send their goods out, domestic $Q \downarrow \rightarrow P \uparrow$)
- If "large" country \rightarrow , world prices \downarrow as $Q \uparrow$
- Net welfare is down in large & small country

	Tariff	Import Quota	Export Subsidy	Volunt Exp. Rest
Impact On	Impt country	Importing country	Exporting country	Impt country
Producer surp.	\uparrow	\uparrow	\uparrow	\uparrow
Consumer surplus	\downarrow	\downarrow	\downarrow	\downarrow
Gov. revenue	\uparrow	Mixed (depends on whether the quota rents are captured by import countries through sale of lic or by exporters)	Falls (gov spending rises)	No change
National welfare	\downarrow in small country, would \uparrow in large	\downarrow in small, would \uparrow in large	\downarrow	\downarrow

	Tariff	Import Quota	Export Subsidy	VER
Price	↑	↑	↑	↑
Domestic consumption	↓	↓	↓	↓
Domestic production	↑	↑	↓	↑
Trade	Imports ↓	Imports ↓	Exports ↑	Imports ↓

★ Eg. Thailand, small country, has to decide whether to impose tariff or quota on import of computers. You are considering investing in local firm that is a major importer of computers.

→ 1. What will be the impact of tariff on prices, qty produced, qty imported in Thailand?

2. If Thailand imposes tariff, what will the impact be on prices in exporting country? → No impact (Thailand being small country)

3. How would tariff affect consumer surplus, producer surplus & gov. revenue in Thailand?

4. Whether net welfare effect of tariff is same as that of quota?
Mixed

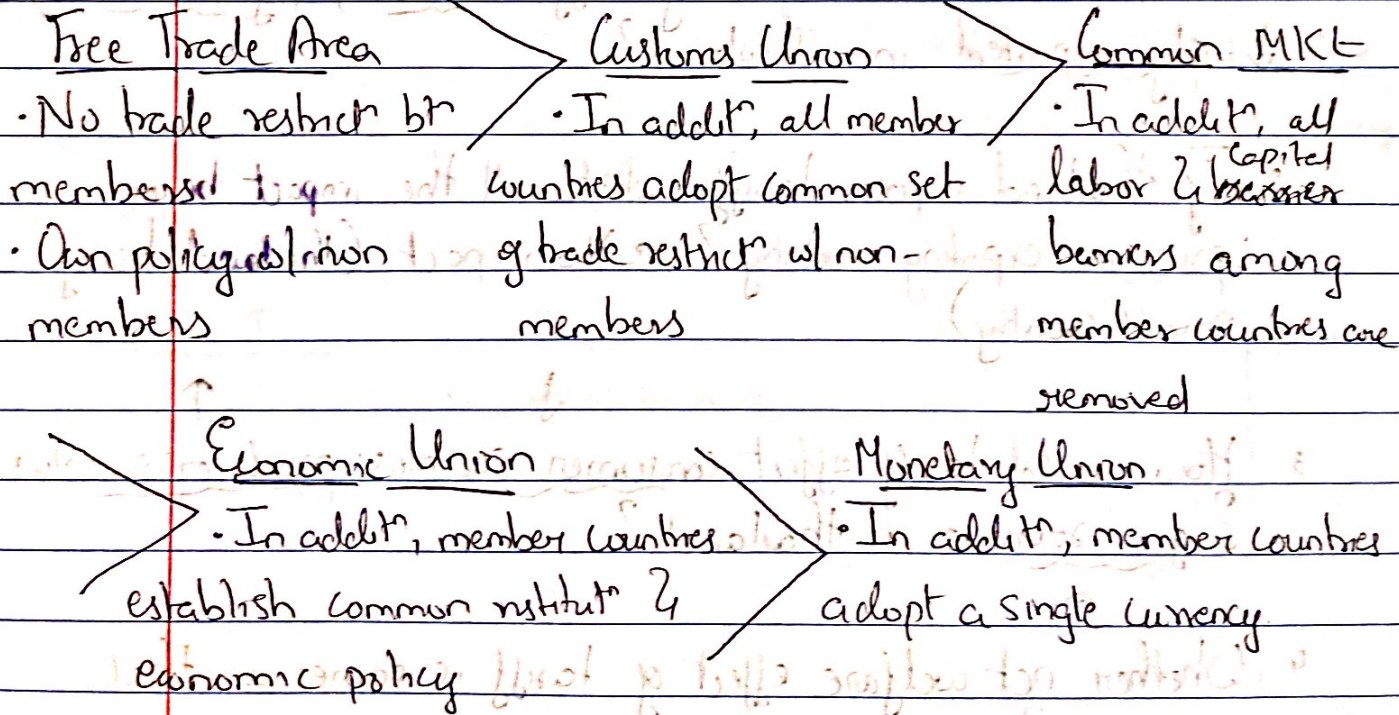
5. Tariff or Quota, which would be most beneficial to local importer in which you may invest

↳ Tariff not beneficial as gov will get the revenue & Q ↓.

↳ Quota might be beneficial if the importer is able to get the quota rent

Trading blocs, Common MKTs & Eco Unions

• Also called regional trading agreements (RTA)



Capital Restrictions

- Some govts restrict inward and/or outward flow of capital
- Restrict on inflows might be due to strategic or defense-related reasons

During economic crises; capital might flow out of country

Countries w/ scarce foreign exch. might restrict outflows, might also want to boost local invest.

- Over the long term capital restrict reduce welfare?

* Balance of Payments (BOP)

- BOP is a double-entry bookkeeping system that summarizes a country's economic transact^{ns} w/ rest of the world for particular period of time
- BOP analyzing help understand country's macroeconomic environment, monetary & fiscal policy

- Inv. use data on trade & capital flows to evaluate country's overall level of cap invest, profitability, risk.

Balance of Payment Accounts

Debts (\uparrow in Assets & \downarrow liab.)

Credits (\downarrow in Assets, \uparrow liab.)

- | | |
|--------------------------------------|--------------------------------|
| • Value of imported goods & serv. | • Pmts for imports |
| • Purchases of foreign fin. assets | • foreign fin. assets |
| • Receipts of pmts from foreigners | • Value of exported goods |
| • \uparrow debt owed by foreigners | • Pmt of debt by foreigners |
| • Pmt of debt owed to foreigners | • \uparrow debt owed to fore |

So for eg. if US imports car from Japan, under

Debts \rightarrow Val. of imp. goods & serv \uparrow

Credits \rightarrow \uparrow debt owed to fore \uparrow

Balance of Payment Components

- Current Account \rightarrow Flow of goods & services

\hookrightarrow Merchandise trade (Import / Exp. of goods)

\hookrightarrow Services (Imp / Exp. of services)

\hookrightarrow Income Receipts (Cpn pmts ^{dividends} received by A Country ^{of} investing in country B)

\leftarrow Invest inc recd from foreigners

Invest inc paid to foreigners

↳ Unilateral transfer of assets (One way transfer of asset in the company country)

• Financial Account → Investment Flows (AI)

↳ Fin. assets abroad ← Official reserve asset
↳ Gross assets

↳ Assets ← Pvt. assets

↳ Assets include gold, foreign currencies, govt reserve positⁿ in IMF, direct foreign invest^{ment}

↳ Foreign-owned assets in reporting country ← Off. assets
↳ other foreign assets

• Capital Account → (Capital Transfers)

↳ Capital transfers of intangible assets

↳ Sales & purchases of non-produced, non-fm. assets (intangible)

• If we own patents/copyrights & earn royalties on it from another country → Services

• If we sell patents → Capital Account

★ IMP. TO KNOW WHAT KIND OF TRANS. SHOW UP IN WHICH ACCOUNTS.

Eg Consider Turkey's Balance of Pmts. Where will each be recorded?

1. Sell gas exp. rights to Russia → Capital Acc

2. Sell software-related patents & serv. to Canada → Current Acc

3. Borrow 100mil euro from Germany → Financial Acc

4. Receive \$5 mil dividend from an equity invest. in US → ~~Current~~ Capital Acc

- Country having imports > exports
↳ Curr Acct deficit

National & Economic Accts & BOP

$$\text{Current Acct (CA)} = \text{Pvt Saving} + \text{Gov saving} - \text{Investment}$$

Eg.

What is the impact of the following on CA:

1. Higher consumption → ↓ Savings → CA ↓
2. High Gov. spend. → - " -
3. High Invest → - " -

* Trade Organizations

International Monetary Fund

- Ready to lend foreign currencies to assist them during periods of significant external deficits.
- A pool of gold & currencies contributed by members provides IMF w/ resources required for lending ops.
- Keeps global systematic risk under control
- The IMF:
 - ↳ provide forum for cooperation on int'l monetary prob.
 - ↳ facilitate growth of int'l trade & promotes employment

- Supports exch. rate stability & open system of intⁿ pmts
- lends for exch. to members when needed, on temp. basis

World Bank

→ explicitly focused on this

- Help developing countries fight poverty & enhance environmentally sound economic growth.
- Provides low or no interest rate loans to countries that have unfavorable or no access to intⁿ mkt
- Provide analysis, advice & info. to its member countries.

World Trade Organizatⁿ

- Regulates cross-border trade relatⁿ among nations on global scale
- Imp functⁿ
 - ↳ Implementⁿ, admin & opⁿ of individual agreements
 - ↳ Acting as a platform for negotiatⁿ
 - ↳ Settling disputes.

- WTO agreements signed by large majority
- WTO can review its members trading policies & ensure coherence & transparency of trade policies.

Eg. very imp in this reading

Reading 20: Currency Exchange Rates

* Foreign Exchange Market

Currency codes

↳ Eg. USD, EUR, INR etc

• Exchange rate

↳ 1 EUR = 1.3 USD can be written as $\frac{\text{USD}}{\text{EUR}} = 1.3$

where EUR = Base currency
USD = Price currency

• Currency Appreciation & Depreciation

↳ If $\frac{\text{USD}}{\text{EUR}}$ changes from 1.3 to 1.5 means

EUR has appreciated (stronger) & USD has depreciated (weaker)

• Nominal exchange rate

↳ Normal exch. rates that we see

• Real exchange rate

↳ Measures relative purchase power of one currency compared w/ other

If $R_{\frac{AUD}{HKD}}$ is higher \rightarrow Means relative purchasing power of HKD denominated income is higher, & AUD lower

$$R_{P/B} = \frac{S_{P/B} \times P_B}{P_P}$$

where P_B = price level in base cur

P_P = " - price cur

$S_{P/B}$ = Nominal exch. rate

< Example 1 from curriculum >

Market Function

2.1. Motivations for FX transact

\hookrightarrow International Trade

\hookrightarrow Capital Market Trans.

• Hedging vs Speculat

\hookrightarrow Hedging \rightarrow try to reduce your invest risk

• Spot transaction

\hookrightarrow Transact that take place on spot, usually

T+1, T+2

• Forward Contracts

\hookrightarrow Discussed in derivatives

< Example 2 from curriculum >

MKT Participants

- | <u>Sell Side</u> | <u>Buy Side</u> |
|--|---|
| <ul style="list-style-type: none"> • Large FX trading banks
Such as Citi, UBS, HSBC, Deutsche • Other banks fall into 2nd & 3rd tier of FX mkt | <ul style="list-style-type: none"> • Clients who use banks to undertake FX trans. • Corporate accts • Real money accts • Leveraged accts • Retail accts • Gov. • Central Banks • Sovereign wealth funds |

MKT size & composition

<u>FX turnover by instrument</u>		<u>FX Flows by counterparty</u>	
Spot	36%	Interbank	39%
OTC forwards	12%	Fin. clients	48%
Exch-traded derivs	4%	Non-fin clients	13%
Swaps	44%		
OTC Opt	4%		

Example 3

True/False

- False =
- Forex transactⁿ for spot settlements see the most trade vol. in terms of avg daily turnover
 - Cos of FX mkt is primarily focussed on settling int^l trade flows → False

* < Currency Exch. Rate Calculations

Exchange Rate Quotations

Given this quote: 1.4 USD/EUR

Price currency: USD

Base currency: EUR

• Direct quotes

↳ Domestic currency as price currency

• Indirect quotes

↳ Domestic currency as base currency

Eg. From a German investor perspective, is the above a direct quote?

↳ No, its indirect

Currency also quoted as
 Bid-Ask: 1.3990 - 1.4010 USD/EUR (Dealers perspective)

Bid: Price at which dealer can buy currency from you
 Ask: Price at which dealer can sell currency to you

Eg. A dealer based in NYC provides spot exch. rate quote of 12.4035 MXN/USD to client in Mexico City. The inverse of 12.4035 is 0.0806 USD/MXN

1. From perspective of Mexican client, what is direct exchange rate?

↳ Direct exch. rate = Price currency

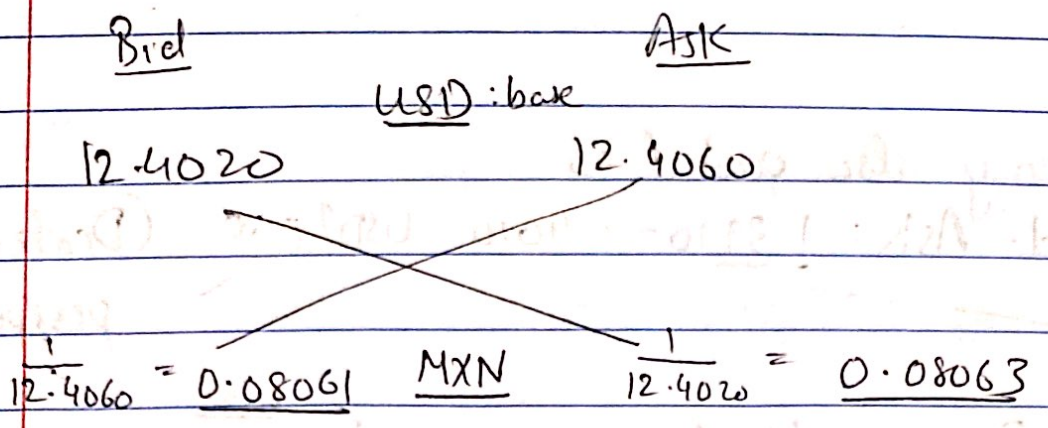
Mexican client wants his currency as price currency

↳ for direct quote viz. $\frac{\text{MXN}}{\text{USD}} = 12.4035$

2. If bid/offer quote from dealer was 12.4020 ~ 12.4060 MXN/USD, what is bid/offer quote in USD/MXN?

↳ Dealer is willing to buy 1 USD @ 12.4020 (bid)
 viz. dealer is will. - to sell 0.08063 (new ask)

Dealer is will. - to sell 1 USD @ 12.4060 (ask)
 viz. dealer - buy 1 MXN @ $\frac{1}{12.4060} = 0.08061$ (new bid)



Cross-Rate Calculations

Given 2 exch. rates 2 currencies, it is possible to determine the 3rd exch. rate

Given 2 exch. rates below, what is INR/PKR - cross rate?

Ratio	Spot Rate
PKR/USD	100.00
INR/USD	60.00

$$\frac{\text{PKR}}{\text{INR}} = \frac{\text{PKR}}{\text{USD}} \times \frac{\text{USD}}{\text{INR}} = 100 \times \frac{1}{60} = \underline{\underline{1.667}}$$

Eq. Spot Rate Exp. Spot Rate

$\frac{\text{USD}}{\text{EUR}}$	1.3960	1.3863
$\frac{\text{CHF}}{\text{USD}}$	0.9585	0.9551
$\frac{\text{USD}}{\text{GBP}}$	1.5850	1.5794

Strongest currency, appreciates the most

1. What is spot CHF/EUR cross-rate?

$$\hookrightarrow \frac{\text{CHF}}{\text{EUR}} = \frac{\text{CHF}}{\text{USD}} \times \frac{\text{USD}}{\text{EUR}} = 0.9585 \times 1.3960 = \underline{1.3381}$$

2. What is spot GBP/EUR cross rate?

$$\hookrightarrow \frac{\text{GBP}}{\text{EUR}} = \frac{\text{GBP}}{\text{USD}} \times \frac{\text{USD}}{\text{EUR}} = 1 \times 1.3960 = \underline{0.8801}$$

3. Is EUR expected to appreciate or depreciate against USD? By how much?

$$\hookrightarrow \text{Depreciate by } \frac{1.3883 - 1.3960}{1.3960} = \underline{-0.7\%}$$

4. Which currency is expected to be strongest over the year?
 Got that by comparing spot & E(spot) to know what appr. or depr.

\hookrightarrow CHF is strongest

Strong

CHF @
USD @

(EUR @ GBP @)

Forward Calculations

Generally quoted in terms of points or pips

If spot rates given have 2 decimal pts, then to convert points to rate \rightarrow divide by 10^2

Maturity Spot Rate or Fuel Points

Spot 1.2875

1 week 0.3

1 month -1.1

3 months -5.5

6 months +13.3

12 months -26.5

12-month fuel rate = $\frac{-26.5}{10^4} = -0.00265$

$1.2875 - 0.00265$

1.28485

At times, fuel pts are expressed as % of spot rate.

Eg. If JPY/USD spot exch. rate = 100.55

6 month fuel rate = 100.40. The 6-month fuel points would be closest to?

→ Diff = 0.15

in decimal

Points = $0.15 \times 100 = 15$

- Decimal to pts $\rightarrow \times 10^2$
- Pts to decimal $\rightarrow /10^2$

• Link bt Spot rates, Forward rates & Interest rates

$$F_{PIB} = S_{PIB} \frac{(1+i_p)}{(1+i_r)}$$

↳ Currency w/ higher (lower) int. rates will always trade at a discount (premium) in fwd mkt

↳ \uparrow int. rate \rightarrow Discount traded \rightarrow Currency depreciates

↳ \downarrow int. rate \rightarrow Premium \rightarrow Currency appreciates

↳ This relationship ensures that there is no arbitrage

* ↳ If the fwd contract is for x days, make an adjustment based on $x/360$ conv't unless told otherwise

Eg. if we want to cal. 90-day fwd rate

$$F_{PIB} = S_{PIB} \cdot \frac{(1+i_p \times \frac{90}{360})}{(1+i_r \times \frac{90}{360})}$$

< Example 6 of curriculum > (contract level)

* Exchange Rate Regimes

- Every exch. rate is managed by to some degree by central banks; policy framework adopted by central bank is called 'exchange rate regime'

- Properties of ideal exch. rate: (1)

Has to be a trade-off

↳ Exch. rate b/w any 2 currencies be fixed

↳ Each country would be able to undertake fully independent monetary policy

↳ All currencies are fully convertible

CANNOT BE AN IDEAL REGIME

A taxonomy of current regime

At one end, we have fixed rates & at other, we have floating

- A country doesn't have its own currency (no separate legal tender)

↳ Dollarized (Importing currency & policy of another country)

↳ Monetary union (Eg. countries in eurozone has adopted currency - Euro)

Regime where money auth is legally req. to hold forex reserves backing 100% of domestic cur = Currency board

- Currency board system → Very credible
↳ Explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exch. rate; has small band

- Fixed parity
↳ A country pegs its currency within 1% band vs another country
↳ No legislative commitment
↳ Level of foreign exch. reserves are discretionary

- Target zone *
↳ Like fixed parity but w/ wider bands (+1-2%)
↳ Gives more flexibility *

- Active & Passive crawling peg (currency pegged against another currency)
↳ Exch. rate adjusted frequently to keep pace w/ inflat (passive crawl)
↳ Exch. rate pre-announced for coming weeks (active crawl)

- Fixed parity w/ (crawling bands) = M-X
↳ Allows for gradual exit strategy from fixed parity

- Managed float (Dirty float)
 - ↳ Exch. rate policy based on either internal or external policy: intervening or not to achieve trade balance, price stability or emp. obj.

- Independently floating rates
 - ↳ Exch. rate left to mkt. determinat. & the monetary authority is able to exercise independent monetary policy aimed at achieving such obje: as price stability & full employment.

* Exchange Rates, International Trade Bal. &

Capital Flows

*

- Impact of exch. rates & other factors on trade balance must be mirrored by their impact on capital flows.

↳ e.g. If a country has trade deficit, i.e. $X - M < 0$ then it should be lending from ROW.

- A trade surplus reflects excess savings over investment spending.

$$X - M = (S - I) + (T - G)$$

Elasticities Approach (Based on microeconomic)

• Marshall-Lerner condition

↳ Describes combination of export & import demand elasticities such that depreciation (appreciation) of domestic currency will move trade balance toward surplus (deficit)

↳ If $w_x \epsilon_x + w_m (\epsilon_m - 1) > 0$, currency depreciation will reduce trade deficit.

where $w_x =$ wt of export $w_m =$ wt of import

$\epsilon_x =$ wt of elasticity of exp. $\epsilon_m =$ elasticity of import

(w) Impact on (X-M) in 4 scenarios

	> 0	< 0	
currency ↑	↓	↑	short run of net exports
(i) ↓	↑	↓	(tough) when?

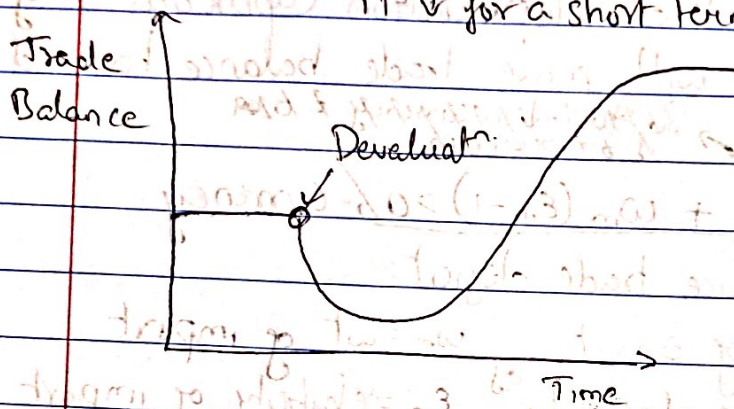
• If $w_x \epsilon_x + w_m (\epsilon_m - 1) = 0.09$
 then 1% ↓ price in currency = 0.09% ↑ in trade surplus

• Impact depends on elasticities

• Elasticity depends on whether there is a substitute or not

↳ Whether the goods imported/exp. are luxury goods

• J-curve [So as currency devalues, trade bal. shd ↑ but it ↓ for a short term as the devalⁿ affects the import faster & then later on import affects exports)



Absorption Approach (Based on macroeconomics)

• In order to move trade balance towards Surplus (deficit), a Δ exch. rate must ↓ (↑) domestic expend. also called absorption relative to income. Equivalently, it must ↑ (↓) domestic saving relative to domestic invest.

• If there is excess capacity in economy
↳ Currency dep. can ↑ o/p inc by switching demand towards domestically produced goods.
Because some additional inc will be saved.

income rises relative to expenditure & trade balance improves.

- If economy at full employment
 - ↳ Currency depts must ↓ domestic expend.
 - ↳ Wealth effect :- A weaker currency reduces the purchasing power of domestic-currency-denominated assets & households respond by ↓ expend & ↑ savings.

Risk of single currency is limited to 100% of reserves
 Diversification = Risk of country vs. risk of currency

Market matter for risk-return portfolio

Portfolios do not generate covariance benefits

Investment Choice *

low	high	high	low	low	high
low	high	low	high	low	high
low	high	low	high	low	high
low	high	low	high	low	high