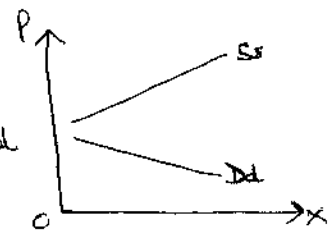


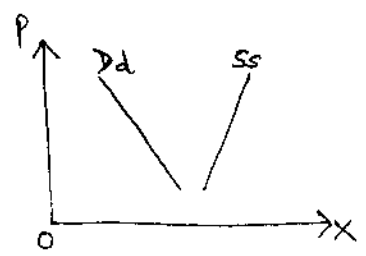
CHAPTER 30 EXISTENCE AND STABILITY OF EQUILIBRIUM UNDER PERFECT COMPETITION

* EXISTENCE OF EQUILIBRIUM: There might be cases where demand and supply curves do not ^{intersect} ~~exist~~ for any positive price-output combination. 2 particular cases:

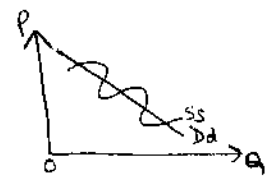
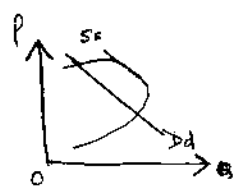
(a) Goods that are so expensive to produce that supply curve is everywhere above the demand curve; such goods are not produced at all, and thus the equilibrium doesn't exist.



(b) Free goods: Goods such as air are present in such large quantities that the marginal cost of supplying them is either zero, or in any case, extremely small. No intersection of Dd & Ss curves, thus no equilibrium



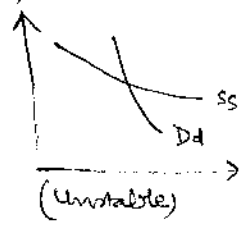
* MULTIPLE EQUILIBRIA:



In cases such as backward-bending supply curve of labour, there might not exist a unique equilibrium.

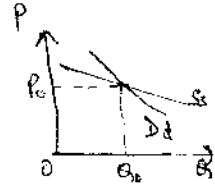
* STABILITY OF EQUILIBRIUM: Equilibrium is said to be stable if following a disturbance from the equilibrium situation, market forces are such that the automatic tendency is for the system to revert back to the equilibrium point.

- At higher than equilibrium prices, if $(S > D)$, & v.v., then equilibrium is stable; else unstable (Excess dd < 0 at 'high' prices; $E_d > 0$ at low).



- Walrasian Price adjustment
- Marshallian Quantity adjustment
↳ stable equilibrium even if $E_d < 0$ when $(P > P^*)$

① SHOW (V. Imp) the difference b/w Walrasian and Marshallian approaches to equilibrium determination:



In the figure alongside, which of the 2 approaches, if either, leads to a stable equilibrium?

② REVISE COBWEB MODEL FROM BOOK:

- Main assumption: $S_t = P_{t-1}$; $D_t = P_t$
- With this, equilibrium is stable if $|slope\ of\ supply\ curve| > |slope\ of\ demand\ curve|$ (⇒ supply curve is steeper than demand curve)
- Examine the cases for 'dampened oscillations', 'perpetual oscillations', and 'explosive oscillations' (2 DIAGRAMS FOR EACH CASE).

- What is the policy significance of the entire analysis of stability of equilibrium under PC? (P. 708)

CHAPTER 31 INCOMPATIBILITY OF EQUILIBRIUM w/ PERFECT COMPETITION

Perfect competition theory assumes:

- Price of the product is given for the firm; the firms, individually, are 'price takers'
- Prices of the factors (inputs) are given for the firm, and remain constant and unchanged when the firm expands its level of output

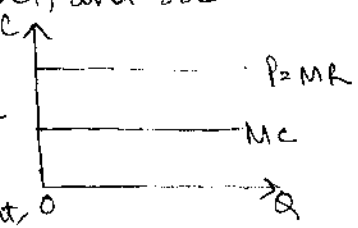
In the LONG RUN, in addition, it is assumed that all factors are freely flexible (unlimited supply). ^{I think this because perfect competition is also assumed to exist in factor markets.}
 (In the SR, some factors are fixed \rightarrow SMC can be rising and equilibrium is possible).

Thus, under all the above assumptions, for a given firm in the LONG RUN, ~~cost~~ unit (marginal) costs of production cannot rise.

This is KALDOR's analysis - given the assumptions of PC, in LR, there's no way MC curve could be rising. Thus, the SOC for PC equilibrium will never be satisfied \Rightarrow equilibrium doesn't exist under PC. (Note that eq. exists in short run, a/c to Kaldor).

Criticism of Kaldor's view: As output \uparrow , ^{marginal} production inefficiencies will \uparrow , supervision costs will \uparrow , and \therefore diseconomies of scale will set in, MC will ~~fall~~ start rising, & \therefore equilibrium will exist.

SRAFFA (argued along similar lines) ^{says that unit costs cannot be rising in LR equilibrium.} and said that under assumptions of PC, rising MC will not reset, and SOC will never be satisfied. Under constant-cost conditions, $P (= MR)$ will everywhere have to be



($> MC$), if the firm is to exist in the LR ^{if it's} (think why). Thus, firm will keep expanding output, until PC breaks down and monopoly is established.

(*) SEE Atiyah's conspiracy theory on how decreasing long-run costs ARE compatible with PC equilibrium.

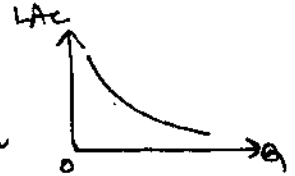
CHAPTER 32 : MONOPOLY

- 3 characteristics of monopolistic markets:
 - Single producer/seller
 - No close substitutes for the product (cross-elasticity is very small) (zero)
 - Strong barriers to entry of new firms

• Reasons for existence of monopolies:

- Patents / copyrights
- Control of essential raw materials
- Advertising and brand loyalties
- Economies of scale / Natural Monopoly: Exists when

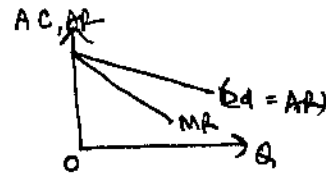
there are strong \uparrow returns to scale ($\Rightarrow \downarrow$ ^{avg.} costs). In such cases, if more than one firm produces, each will produce at an irr inefficient scale, producing at a higher than min. per unit cost.



• In monopoly, demand curve ~~is~~ for the monopolist-producer is downward sloping.

$$MR = P \left(1 - \frac{1}{|e|} \right)$$

$$\therefore \left(1 - \frac{1}{|e|} \right) < 1 \neq e, \therefore \boxed{MR < P}$$



\therefore in equilibrium, $MR = MC$, \therefore for a monopolist, $\boxed{P > MC}$

(Corollary): - Monopolist will never produce at a point of the demand curve where $|e| < 1$ (y lower half of linear dd curve)

- In case $MC = 0$ (no cost of production), then monopoly equilibrium is established at a level where $\boxed{|e| = 1}$

⊛ LONG-RUN EQUILIBRIUM UNDER MONOPOLY: As discussed in costs chapter, in the long run, plant size can be modified. Accordingly, an 'LMC' curve can be derived from SMCs associated w/ successive plant sizes (remember, every point on the LMC is a point on some SMC). The LR eq. will be when:

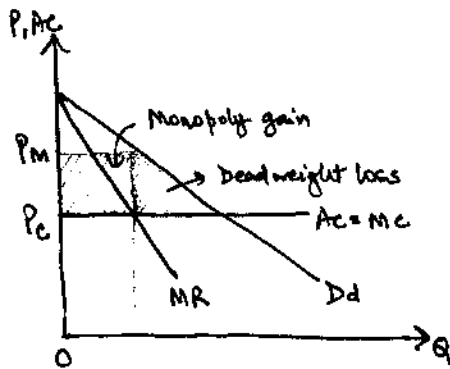
- (i) $MR = LMC$ (= SMC for LR plant)
- (ii) $SAC = LAC$ (Remember, LAC is just hypothetical. This condition means that production will be at the level when SAC corresponds to plant size used then = lowest possible LAC).
- (iii) $P \geq LAC$ (can't make losses in the long run).

⊛ COMPARISON OF MONOPOLY w/ P.C.:

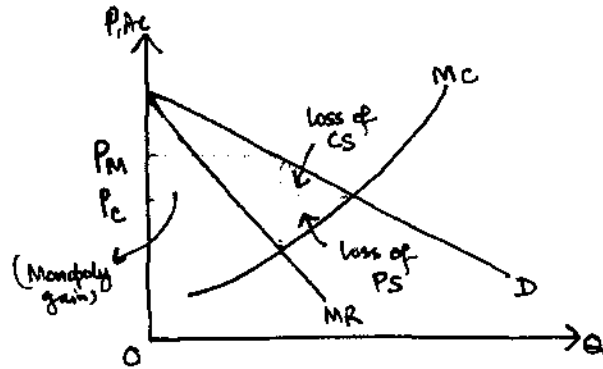
P.C.	MONOPOLY
(i) $P = MC$	(i) $P > MC$
(ii) Equilibrium can <u>only</u> occur when MC is ↑ (constant costs or ↑ returns to scale & SOC not satisfied)	(ii) Equilibrium can occur when MC is ↑, ↓, or constant (in monopoly, <u>no</u> need of SOC!)
(iii) LR equilibrium occurs at the minimum point of the LAC curve	(iii) Equilibrium (LR) occurs at a point where AC is still falling & hasn't reached min. level (generally true)
(iv) Zero a/c profits in LR	(iv) LR supernormal profits are possible
(v) No price discrimination possible	(v) Price discrimination possible
(vi) (See >>)	(vi) Equilibrium price is higher, & output lower than under P.C. (assuming <u>same</u> demand & cost conditions) (Stoyn) P. 738

⊕ Supply curve (i.e., unique combination of P & Q) don't exist in Monopoly, \because P depends on demand conditions. Thus, same Q can be supplied at a higher or lower price depending on market demand curve.
(Draw 2 relevant diagrams here.)

* Social Welfare:



[CONSTANT COST CASE]



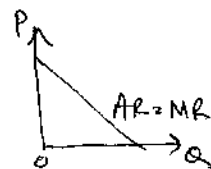
[INCREASING COST CASE]

Thus, it can be seen that monopoly is economically inefficient, and causes misallocation of resources as it does not extend production of a product to the level desired by the consumers.

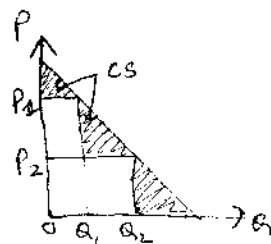
CHAPTER 33 PRICE DISCRIMINATION

Sale of 'technically similar' products (having the same MC) at different prices to different consumers. Pigen outlined 3 types:

(i) First degree P.D.: 'Perfect' P.D., as the monopolist can sell each unit to every consumer at a price = his 'reservation price'. Thus, $AR=MR$, and monopolist appropriates the entire consumer surplus.



(ii) Second degree: Under same demand conditions, selling different groups of consumers differently priced goods. Some CS is left for consumers.



(iii) Third degree: Seller divides his buyers into 2 or more than 2 groups depending on differing demand conditions in each group. This kind is most common, & we study only this. ✓

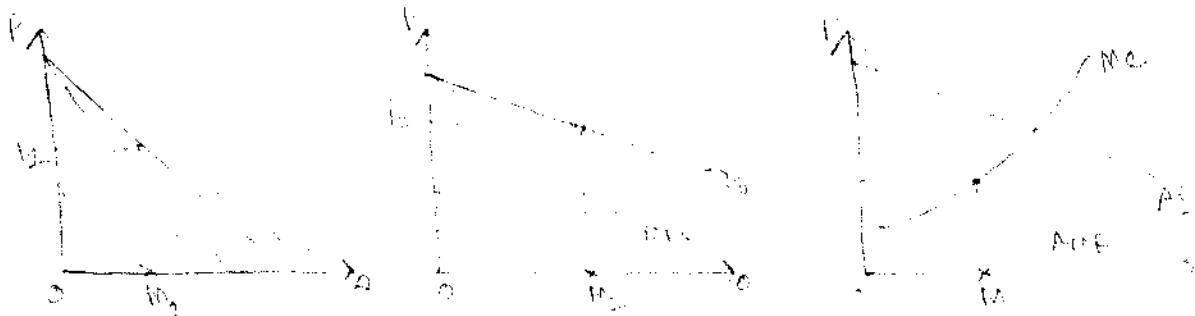
Price discrimination of 3rd degree is only possible if markets can be effectively separated, with no 'seepage' of product or consumers between markets. Possible causes:

- Nature of commodity (Surgeons, lawyers etc.)
- Long distances / Tariff barriers
- Imperfect information w/ consumers
- Legal sanction etc.

P.D. is possible in all imperfect competition market structures, (not in P.C.) but is most likely under monopoly.

* PD is only profitable when demand conditions are different in different markets, i.e., price elasticities (& hence MR curves) are different across markets. **MONOPOLIST WILL DIFFERENTIATE PRICES TO ENSURE THAT MR IS EQUALIZED IN ALL DIFFERENT MARKETS.**

* Price and output determination under 3rd degree P.D.:



$AMR = (MR_A + MR_B) ; AD = (D_A + D_B)$

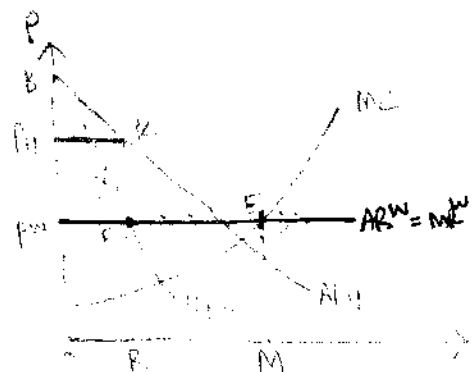
Total output = $M = (M_1 + M_2) ;$ ~~MR > MC~~ price $P_2 > P_1$

• THUS, PRICE IS HIGHER ~~AND OUTPUT LOWER~~ IN MARKET WHICH HAS LESS ELASTIC DEMAND. (The figure above is wrong).

• (Relative output produced for each market can't be determined w/o exact equations for D & MR curves) (No Thumb rule) (IMPORTANT!)

* International Dumping: Practice of selling a good internationally at a price lower than the 'domestic' market selling price. Happens when producer faces:

- Downward sloping demand curve at home (⇒ domestic monopoly), and
- Horizontal dd curve abroad (⇒ P.c. internationally)



(Doubt, just learn): Aggregate MR curve (AMR) in this case is the lateral summation of MR_H and MR_W curves, which results in the composite curve BFED. Monopolist equates MC to AMR, produce total output = OM , and sells output OR domestically at price OP_H , and output RM internationally at price $OP^W (=P^W)$

This is an example of "persistent Dumping", which is made possible by different price elasticities in markets. "Predatory Dumping" is, however, resisted (think why - P 762)

* SPECIAL CASE: ~~not~~ Production possible only under P.D. -

(VERY WISHY-WASHY, JUST LEARN).

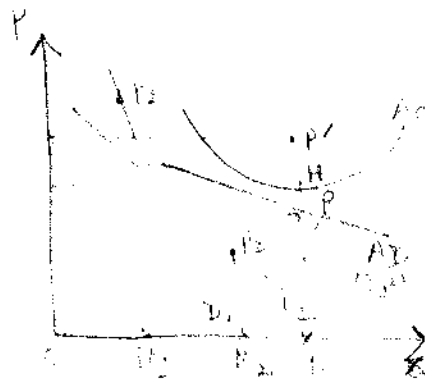
Assume D_1 & D_2 are such that $(D_1 + D_2) = AD$ curve lies below AC curve everywhere.

As we can see, even if monopolist produces at minimum point of AC, he'll produce output OM , charge price OP , and will incur cost OH ($> OP$) and

∴ won't produce. BUT, assume that he's able to P.D.

and charge OP_1 and OP_2 , producing OM_1 & OM_2 ($OM_1 + OM_2 = OM$), and assume that equiv. avg. revenue = OP' . Then, $OP' > OH$

A production will occur (RAILWAYS example)



* P.D. AND SOCIAL WELFARE:

- Compared to Perfect competition, PD is of-course worse
- In monopoly, 2 different forces:

- (i) Under PD, MHS of different consumers will be different,
 \therefore inefficient (doesn't allocate goods efficiently)
- (ii) However, TOTAL output may \uparrow / production may only be possible under PD; \therefore social welfare on this count might improve.

~~(1) Definition of Price Discrimination~~

(2) 3 different kinds of PDs

(3) Conditions required for 3rd degree PD

(4) Show PD when there are 2 markets with different demand elasticities. In which market is the price higher? output?

(5) Case: International Dumping

(6) Differentiate between persistent and predatory dumping.

(7) Case: Production only possible under Price Discrimination.

(8) Social welfare under Price Discrimination, compared to:

- Perfect competition
- Monopoly w/o P.D.

All of them have the drawback that they only consider price competition, and not quantity.

CHAPTER 34 DEGREE OF MONOPOLY POWER Competition:

3 different measures and their criticisms:

- Elasticity of demand as a measure of monopoly power: lesser the elasticity of demand, greater the monopoly power (think 2 extreme case: ∞ elasticity, 0 elasticity). Criticism:
 - A/c to this measure, degree of monopoly changes at different levels of output
 - Concentrates only on price competition; in some oligopolistic industries, where competition is high, firms compete via quantity adjustments instead

- Lesner's measure: Measures 'departure from perfect competition' as strength of monopoly. $el = (p - mc) / p$; P.C. $\rightarrow p = mc \rightarrow el = 0$. Monopolist w/ zero mc. $el = 1$. Thus, $el \in [0, 1]$, and greater the el , greater the monopoly power. Criticism:

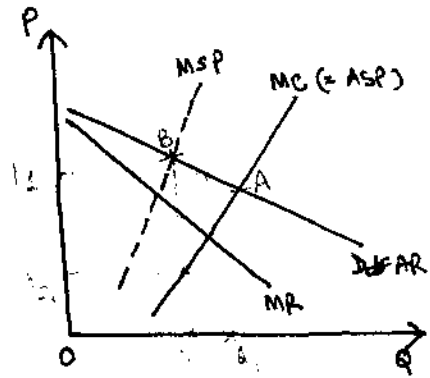
- It's not a new measure; $el = (p - mc) / p$; and in equilibrium, $MR = MC \rightarrow el = (p - MR) / p$ But $MR = p(1 - 1/e) \rightarrow \boxed{el = \frac{1}{e}}$
- (Refers to only equilibrium state, the first criticism)
- Doesn't consider non-price competition
- Doesn't consider ease of entry into the market
- P.C. is imaginary; no use comparing real circumstances w/ imaginary

- Cross-elasticity of demand: Kaldor / Triffin defined pure monopoly as one where cross-e.o.d. is zero (no substitutes). Under P.C., cross-e.o.d. = ∞ . Criticism:

- Some economists say that under P.C., cross-e.o.d. = 0 (NOT ∞)
 - \rightarrow no difference w/ monopoly (which also has cross-e.o.d. = 0).
- Ignores non-price competition

CHAPTER 55 PRICE AND OUTPUT UNDER BILATERAL MONOPOLY

~~Monopoly~~ 'Bilateral Monopoly' means a market with only one seller (monopolist) and only one buyer (monopsonist) (eg: labour union v/s big corporation cartel, deciding on a wage rate).



Monopolist: The single buyer's demand curve (Dd) acts as the monopolist's AR curve. Corresponding MR curve can be derived. Given his MC curve, monopolist would like to produce Q_1 level of output, and charge price P_1 . HOWEVER, the buyer also has market power.

Monopsonist: Knows the supplier's MC curve \Rightarrow takes that as the market supply curve he's facing. This, in a sense, is for the buyer a 'demand curve' for his money. There's an associated 'Marginal Supply Price' curve. Given that the demand curve (Dd = AR) encapsulates his Marginal utility/willingness to pay, he would maximize his satisfaction when $MSP = Dd$.
Monopsonist wants output Q_2 , at price P_2 (think why).

Thus, there's a standoff b/w monopolist and monopsonist. Depending on bargaining power, price will ultimately settle somewhere b/w P_2 and P_1 , but is economically not determinable within this range.

⊕ SEE briefly contract-curve approach to the above (P. 777) - just 1 important point.

CHAPTER 36 MONOPOLISTIC COMPETITION

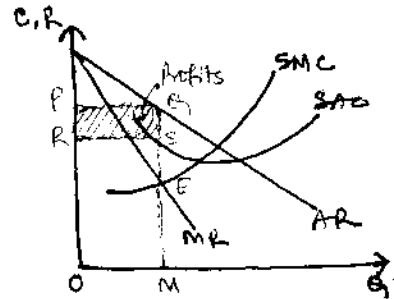
Monopolistic competition is a market structure where a number of firms produce differentiated, but closely related products (close substitutes). This gives each firm some market power, such that the demand curve facing each firm is downward sloping (but highly elastic). (CHANGELING calls the collection of firms a 'group', not 'industry'. Think why). Defining characteristics of Mon. Comp.

- (i) A large number of firms
- (ii) Product differentiation (but close substitutes)
- (iii) Freedom of entry and exit (unlike monopoly).

(A) PRICE-OUTPUT EQUILIBRIUM: Each firm under Mon. Comp. needs to make 3 decisions: Price, Nature of the product, and advertising - entry. Holding the latter 2 constant, we only focus on price/output:

- SHORT-RUN EQ. OF FIRM:

(NOTE: we hold prices of all other substitutes constant. Assumption is that given the large number of firms, any one firm's price decisions (change) will be uniformly spread over a large no. of firms, and will not have any appreciable effect). - (SYMMETRY ASSUMPTION)



As can be seen, in the SR, firms can make profits (LOSSES are also possible - if SRAC curve lies above AR curve everywhere).

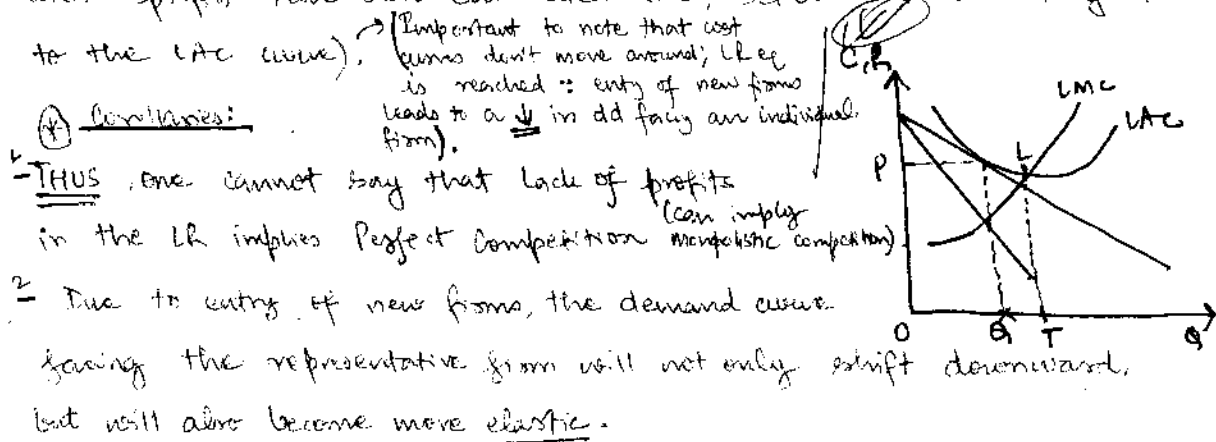
- LONG-RUN, 'GROUP' EQUILIBRIUM: Given that the above 'NOTE' made a 'SYMMETRY ASSUMPTION', to easily facilitate LR equilibrium

exposition, Chamberlin further assumes that both demand and cost curves for all firms are uniform throughout the group.

('UNIFORMITY ASSUMPTION'). These U & S assumptions are together called 'HERCULEAN ASSUMPTIONS'.

Now, as shown above, in the $st.$ firms might be making profits. This will attract more firms to produce close substitutes. This will lead to a downward/leftward shift in the demand curve facing the 'representative' firm. This shift will continue.

until profits have been eliminated (i.e., D or AR curve is tangent to the LAC curve).



3. **EXCESS CAPACITY:** In Mon. Comp., given that the rep. firm faces a downward sloping demand curve, the LAC curve will be tangent to the AR curve when LAC is falling, i.e., before its lowest point (minimum cost point) is reached (point L).

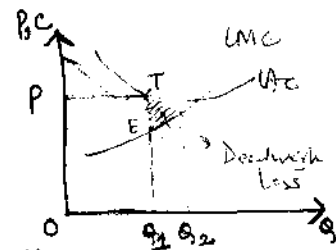
'Socially ideal' output (i.e., output under Perfect Comp) will be $= QT$. The 'shortfall' under Mon. Comp. $= QT$ is thus known as 'excess capacity'.

4 - Note that greater the elasticity of the demand curve, lesser will the excess capacity be, and closer will be the output to the socially optimal level.

5 - Given the same demand and cost conditions, number of firms will be larger under Mon. Comp. than under P.C., \therefore by expanding the output to Q_1 , fewer firms will be required to meet the given demand for industry's product. (thus, kind of inefficient).

6 - Price under Mon. Comp. is higher, and output lower, when compared to the Perfect Competition case.

7 - While Mon. Comp. leads to deadweight loss and allocative inefficiency ($P \neq MC$), some economists argue that consumers gain due to the availability of a large number of substitutes to satisfy their demands.



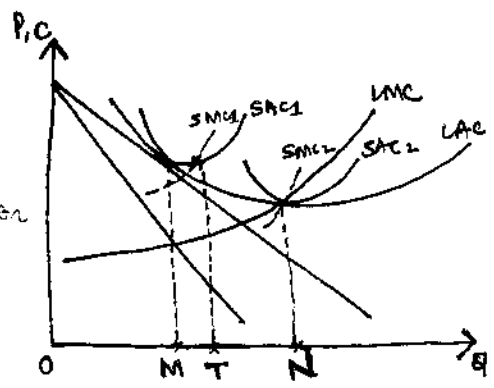
• CRITIQUE OF CHAMBERLIN'S THEORY (CHAPTER 37)

- (1) Uniformity assumption renders the products virtually homogeneous,
- (2) Symmetry assumption won't hold; a price change for one product will have more pronounced effects on firms that produce closer substitutes of this product, and less pronounced effects for more distant substitutes
- (3) Under 'free' entry, elasticity of demand would go on \uparrow , till situation becomes same as perfect competition

CHAPTER 30 CRITICAL EVALUATION OF EXCESS CAPACITY DOCTRINE:

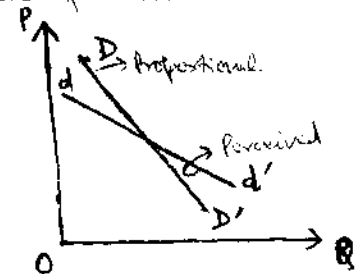
CASSEL'S 2 CONCEPTS OF EXCESS CAPACITY:

Chamberlain's excess capacity = MT
 Cassel said that social optimum production will actually be ON ; thus, socially-relevant excess capacity = MN .



Chamberlain's 'perceived' and 'proportional' demand curves:

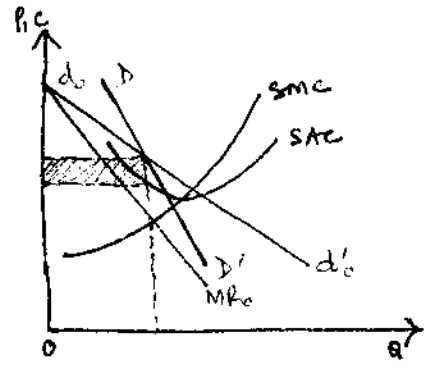
- 'proportional' demand curve: Shows the demand for a firm's product when the prices of all firms in the 'group' change, all of them simultaneously, and by the same amount. Also, greater the no. of firms in the group, ^{smaller} ~~greater~~ the demand for an individual firm's product. i.e., upon entry of other firms, DD' shifts left.



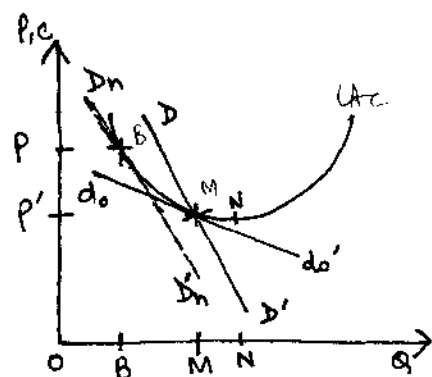
- 'perceived' demand curve: Shows change in quantity demanded of a firm's product when all other firms keep their prices constant. (thus, more elastic than DD')

Chamberlain's alternative Non-Comp. Equilibrium:

BR equilibrium is reached at the price-output combination where $MR=MC$ such that it corresponds to the point of intersection of perceived ($d'd_0$) and proportional (DD') demand curves.



LONG-RUN: Chamberlin asserts that concept of 'ideal output' cannot be associated w/ P.C., since differentiation of products is a desirable characteristic. Thus, he claims that as long as there exists price competition between firms (V.IMP)



perceived and proportional demand curves will be different, and LR equilibrium of the group's rep. firm will be at point M where due to free entry, LAC has become tangential to PERCEIVED $d_0 d_0'$, and the proportional $D \cdot D'$ 'cuts' the LAC & $d_0 d_0'$ at this point. Thus, Chamberlin says that as long as there is price competition, ideal output is ON, and NOT ON, & there is no excess capacity.

Behaviors

(Chamberlin concedes that in absence of price competition, perceived demand curve concept is irrelevant. Production, thus, happens at point B, and excess capacity = BM (NOT BN) now exists.

- Walsh criticized all of the above by saying that, under any form of product differentiation, as soon as the 'HEFOIC ASSUMPTIONS' are relaxed, demand curves will become indeterminate!

CHAPTER 40 PRICE AND OUTPUT DETERMINATION UNDER OLIGOPOLY

There's no clear definition of oligopoly. It just means 2+ firms (but not many). 2 types:

- 'Pure' oligopoly: Product of each firm is homogeneous
- 'Differentiated' oligopoly: Differentiated products

Under oligopoly, the demand curve facing an individual firm is **INDETERMINATE**. We cannot assume that rival firms will keep their prices unchanged following a single firm's price change. (→ 'Symmetry' assumption of Chamberlin's oligopoly doesn't hold).

Oligopolies can result due to

- (i) Economies of scale - a few firms can satisfy entire demand
- (ii) Economies of scope - production of different products w/in one firm leads to lower average cost of production than if they were produced in separate firms.
- (iii) Barriers to Entry (iv) Product differentiation

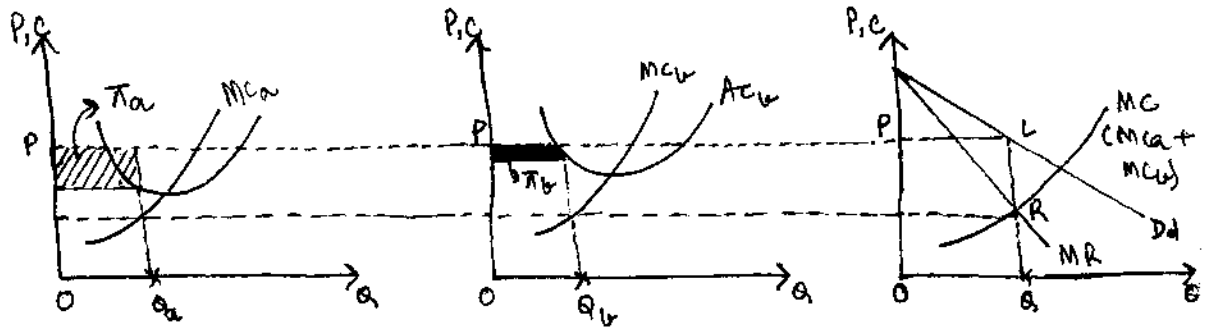
⊛ Since demand curve for any oligopolist is indeterminate, we can only study equilibrium in oligopoly under restrictive assumptions about the nature of the oligopolists and their strategies: There can be 'cooperative equilibria' (cartel formation / Price leadership), or non-cooperative equilibria (Nash).

⊛ CARTELS:

There can be of 2 broad types:

- (i) 'Perfect' cartels, where an outside regulatory authority decides product split
- (ii) Market sharing by output quota.

(i) 'Project' Cartel: Outside authority decides which firm produces how much!



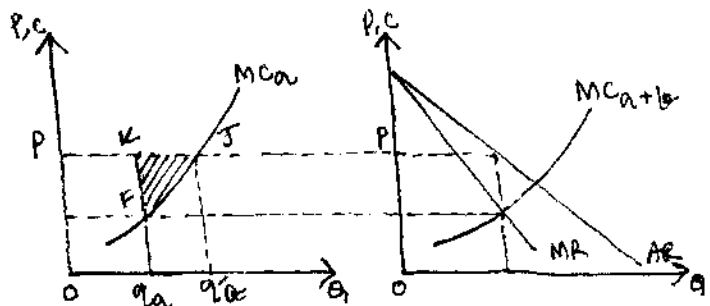
Say, market demand curve is D_d . Authority will calculate $MC = (MC_A + MC_B)$ so as to ensure that in product equilibrium, MC of both firms is same (otherwise, inefficiency). Thus, total output = Q , and both firms will produce output such that $MC_A = MC_B = MR$.

(ii) 'loose' cartel: Market-sharing by output quotas / or non-price competition (such as advertising). These are inherently unstable, as lower-cost firms have an incentive to undercut.

• **INSTABILITY OF A CARTEL:**

For either of the 2 firms, once price 'P' is decided by collusion, there'll be an incentive to cheat. eg, for A,

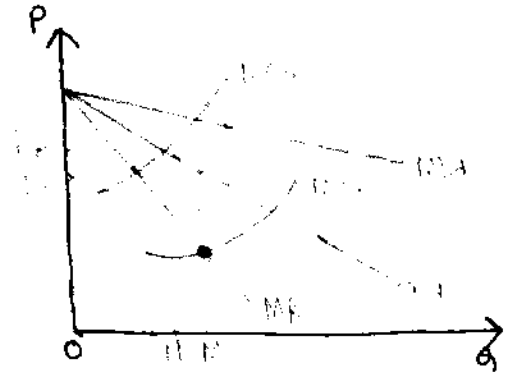
profits can be ↑ by ↑ production from q_A to q'_A . But this will invite retaliation from firm B. Thus, the cartel will break down.



(This is called 'price war').

⊛ PRICE LEADERSHIP Another type of collusive behaviour in oligopoly. Price leadership can be of various types: by a low-cost firm; by a dominant firm, 'Barometric' (old, largest, most respected firm leads), or exploitative/predatory price leadership.

- low-cost price leadership: Assume -
 - (i) 2 firms, $MC_A < MC_B$ (generally, A's costs lower than B's)
 - (ii) Homogeneous products & market dd equality, split b/w the two (each firm's dd curve = $1/2$ mkt demand)

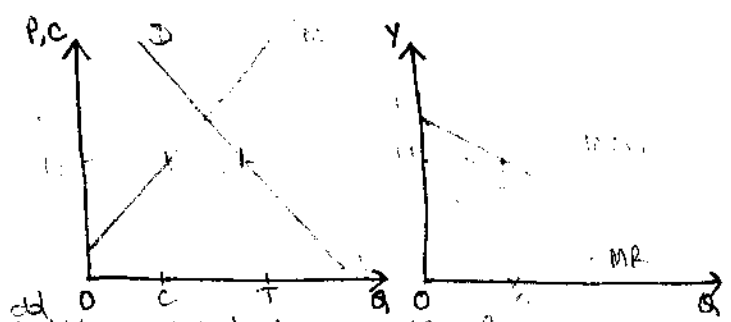


MD: market demand curve; $D_A = 1/2 (MD)$.

A has lower costs; will set $P = P_A$, produce Q_A . B wants to set P_B , produce Q_B , but can't, so will mimic A, and produce Q_B at price P_A (∴ A is price leader).

- Dominant firm price leadership:

Assume: dominant firm has perfect information about total market demand curve, and total supply curve.



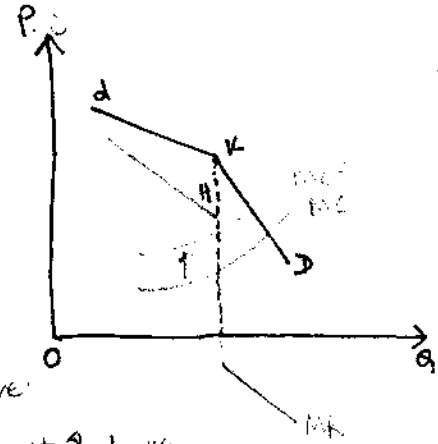
BY THE SMALLER FIRMS (S_m).

∴ At price P_1 , entire market ~~supply~~ supplied by smaller firms. Dominant firm equates own MR to MC, sets price P_1 , and produces output $Q_1 (= Q_T)$.

• Kinked Demand curve theory of oligopoly:

Empirically, it has been seen that many oligopolistic markets exhibit significant price rigidity. This can be explained by assuming 'kinked' demand curve facing an oligopolist; AND a discontinuous MB curve.

- Position dk is very elastic \Rightarrow oligopolist won't \uparrow price
- Position kD is very inelastic \Rightarrow if $p \downarrow$, total revenue will fall.



Thus, each oligopolist believes that if he raises the price, no one will follow him; if he reduces, all will follow: no rigid prices. This kind of demand curve arises \therefore of discontinuous MB curves: even if costs \uparrow , price won't \uparrow (until point H)

Criticism: Ex-post framework; doesn't say anything about how this price is determined. Just says that once this price is reached, it will be stable.

CHAPTER 4 | CLASSICAL MODELS OF OLIGOPOLY

★ Cournot's Duopoly Model: Assumptions -

- (i) 2 firms, producing homogeneous products
- (ii) Production costs are nil (can be easily relaxed)
- (iii) Each firm has complete info regarding the market demand curve, which is assumed to be linear.
- (iv) Each firm decides its level of output independently, without considering the reactions of the rival in response to his decision ('zero conjectural variation' assumption)

- SHOW that under the above assumptions, if there are 'n' firms, total output produced will be $(N/n+1)$, with each firm ~~output~~ producing $1/(n+1)$ units.

- Raise 'Reaction Curves' approach

- Criticism of Cournot: Each firm is myopic, and doesn't raise its expectations of other firms' reaction even after such expectations are repeatedly belied. ('zero conjectural variation implies stupid firms').

★ BERTRAND MODEL: Assumptions are same as Cournot; the major difference is that firms compete by adjusting prices rather than by adjusting output. Each firm (no matter which firm moves first) has an incentive to undercut the other firm, and thus, in Bertrand's formulation, price will reduce to MC, and the same amount of output will be produced as under Perfect Competition.

* Edgeworth duopoly solution is one of perpetual disequilibrium, price constantly oscillating between the monopoly price and the competitive price? DEMONSTRATE. (Edgeworth assumes that both firms have their own maximum production units).

• All the above 3 'classical' models of duopoly assume 'zero conjectural variation', and hence ignore the mutual interdependence which is the chief characteristic of oligopoly.

* CHAMBERLIN'S DUOPOLY: Makes the same assumptions as Cournot. However, assumes that firms learn from their past experiences and reactions of competitors. In the first period, firm A produces monopoly output. Then, given this, firm B produces $\frac{1}{2}$ of remaining or market demand. Now, things diverge from Cournot: given that firm 1 is intelligent, it reduces its output to ensure firm 1 and 2 together produce the monopoly output. Firm 2 also sees that this is best, and stays put. (draw diagram).

Criticisms: - closed model, doesn't consider entry of new firms
- Assumes all firms have the same costs (zero) and perfect information about market demand; unless this holds, monopoly solution won't be reached

* STACKELBERG MODEL: (leader-follower) revise yourself)

CHAPTER 50 THEORY OF DISTRIBUTION: A GENERAL VIEW

• TOPICS:

- Functional v/s personal distribution
- Clark's view of Marginal Productivity theory of distribution
- Marshall's view
- Criticism: Product-exhaustion problem
- Wicksell's solution
- Criticism of Wicksell
- Resolution of P.E.T. by Wicksell, Marshall etc.
- Resolution by Hicks and Samuelson

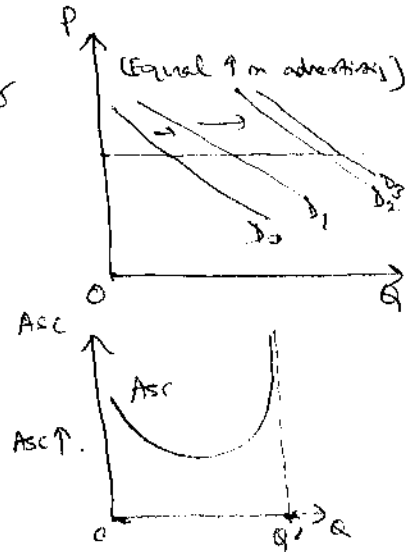
MICRO

NON-PRICE COMPETITION: SELLING COSTS AND ADVERTISING.

- ① Production costs: Manufacturing, transportation, handling, storing, delivering costs.
Selling costs: All outlays made in order to secure a demand or a market for the product (~~the~~ advertising is a part of these).

- ② There's no rationale for advertising costs under PC and Monopoly. They make sense under monopolistic competition and oligopoly as they help in product differentiation.

- ③ In the beginning, there might be increasing returns to scale to advertising expenditure. Eventually, however, diminishing returns set in (season why)



- ④ Curve of average selling cost. Initially, IRS \Rightarrow selling cost per unit (Asc) \downarrow ; then, DRS \Rightarrow Asc \uparrow .

- ⑤ Equilibrium condition under advertising:
 $MR = MC^*$ where $MC^* = (MC + \text{Marginal outlay on advertising})$.

==

(Pretty useless, truth be told. check book for two models.)

- key is to remember that advertising outlays can shift the demand curve. Also, remember that in the LF, in monopolistic competition, profits are zero
- Advertising can also make the demand more inelastic.

CHAPTER 45 SALES MAXIMISATION MODEL
OF OLIGOPOLY FIRM

① Baumol believed that managers focus not on profit maximisation, but on maximizing the total revenue from sales (NOTE: NOT maximizing the total volume of sales).

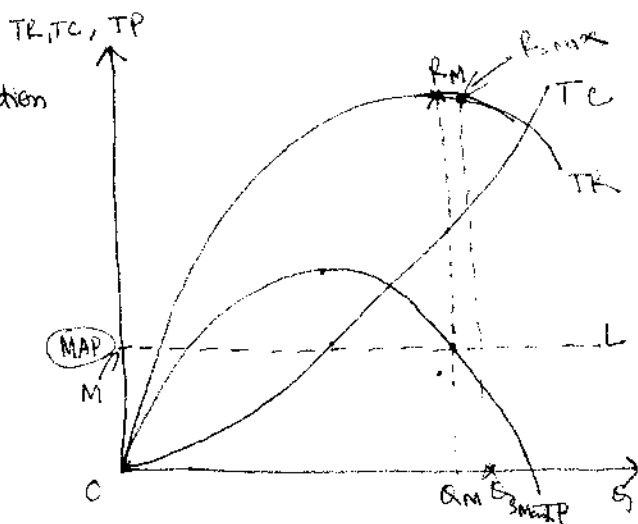
⇒ a.k.a. 'Revenue Maximization Model'

② However, Baumol maintains that a 'minimum acceptable' level of profit is required, and acts as a constraint on 'pure' sales maximisation. ('MINIMUM PROFIT CONSTRAINT')

③ Output under sales maximisation
(w/o minimum π -constraint)

$$= Q_{SM}$$

$$\text{Price} = \left(\frac{TR}{\text{Output}} \right)$$



④ Output w/ M.P.C.

say, 'minimum acceptable π ' (MAP) = ML

⇒ Output = Q_M ; Total Revenue = R_M .

⑤ Implications:

- (i) Price is lower and output greater under sales maximisation than under profit maximisation
- (ii) Advertising expenditure will generally be increased
- (iii) Price is likely to be sticky.

① Criticisms:

- (i) Oligopolists are believed to ~~to~~ face a 'kinked' demand curve; if this is true, TR and π will be max. at the same level of output.
- (ii) Hawkins: A/c to Baumol, a sales maximizing firm will produce greater output than a π -maximizer. Hawkins said this isn't always true and depends on the responsiveness/elasticity of demand and total revenue to price cuts.

MICROECONOMICS - Revision questions

TOPIC: Alternative Distribution Theories (Chapters 55, 56 from HL Ahuja)

(1) Define 'rent'.

(2) Explain the difference between 'land rent' and 'Economic Rent'.

(3) What are 'Transfer earnings'?

Ricardian Theory of rent:

(4) List 5 key assumptions of the Ricardian Theory of Rent.

(5) What are the 2 different kinds of rent outlined by Ricardo?

Explain each (using diagrams).

(6) Explain scarcity rent using:

(a) Demand and supply of land

(b) Production costs

(7) Usually, rents should be eliminated in the long run. Explain why.

Also explain why your outlined mechanism doesn't work in the case of land.

(8) Consider a case where land in the economy is of 3 distinct qualities, with cost of production on the highest quality land being the lowest. Show a series of diagrams showing how rents will be determined for each kind of land. What is such rent called?

(9) What did Ricardo mean when he said "Corn is not high because a rent is paid; rather, a rent is paid because corn is high"?

(10) What is the one major criticism of Ricardo's theory of rent?

(11) What was Ricardo's 'grim prophecy' based on his theory of rent?

(12) What is the difference between the Ricardian and Paretian definitions of rent?

(13) How is rent related to the elasticity of supply of a factor?

(14) What is meant by 'Scarc Rent'?

(15) In terms of the questions that they set out to answer, what is the difference between 'neoclassical' and 'alternative' theories of distribution?

⌈

* RICARDIAN THEORY OF INCOME DISTRIBUTION =]]

(16) What are the 4 key assumptions?

↓

(17) How is the wage rate determined in this theory?

(18) What determines the demand for labour in the neoclassical theory? In Ricardian theory?

(19) Draw a relevant graph demonstrating the share of wages, rents, and profits in the Ricardian model.

↓

(20) Define: 'r' rate of profits made' in Ricardian theory.

↓

(21) In a simple 2-sector Ricardian economy, what is the necessary equilibrium condition?

(22) Show why under Ricardian assumptions, an economy will eventually reach a stagnant 'steady state' in the absence of technological progress.

(23) Which of the following is true?

- In Ricardian theory, profits and wages are both endogenously determined
- Both exogenously determined
- Profits exogenous, wages endogenous
- Wages exogenous, profits endogenous

²
(24) Assume that the industrial sector in a Ricardian economy is not subjected to diminishing returns to scale. Explain what will happen to profits in the industrial sector when employment and output expand in agriculture.

(25) What are the 3 main implications of the Ricardian model that have not been borne out by historical evidence?

* KALECKI'S 'DEGREE OF MONOPOLY' THEORY OF DISTRIBUTION SHARES *

(26) List ⁴ main assumptions. (2 main + 2 subsidiary).

(27) What is Leamer's measure of degree of monopoly of a single firm?

(28) Using the Leamer measure of monopoly for an individual firm, using Kalecki's assumptions, derive the relationship between the 'aggregate' degrees of monopoly and the share of wages in national income.

- (29) In Kalecki's formulation, explain the difference between aggregate turnover and national income.
- (30) How does the share of wages in national income depend on the relative cost of raw materials compared to the wage bill?
- (31) How did Kalecki explain the 'Historical Constancy of Wages', especially with reference to:
- Colonial-imperial expansions
 - Business cycle booms
 - Business cycle slumps
- (32) What are the two major criticisms of Kalecki's theory?

K
W
ALDOR'S (KEYNESIAN) THEORY OF INCOME DISTRIBUTION

- (33) List the 3 main assumptions of Kaldor. (+2)
- (34) How are these critically different from Kalecki's assumptions?
- (35) Show that in Kaldor's model, the share of profits in national income depends on the investment to income ratio.
- (36) What is the 'coefficient of sensitivity of income distribution'?
- (37) What are the 2 critical conditions for stability of Kaldor's model?

(38) Explain why the system is unstable if $b_p < b_w$ (P. 1185).

(39) In Kaldor's theory, trace the effects of an exogenous \uparrow in Invest - Income ratio. What happens in case the savings - income ratio does not rise to equal the (now increased) I/Y ? (P. 1186)

(40) How does the change in distribution of income occur as a result of an exogenous change (say, \uparrow) in investment expenditure?

(41) How important is the ~~the~~ assumption of sticky wages to Kaldor's formulation? In this regard, examine whether the Picasardian assumption about ~~the~~ (real) wages can hold true in the Kaldorian system.

(42) Apart from ($b_p > b_w$), what are the 2 other constraints that need to be satisfied in order for Kaldor's theory to work? Examine the consequences of each of these constraints being relaxed.

(43) 'In the Kaldorian system, savings govern investments' Elaborate. (P. 1187) (check!)

(44) 'Entrepreneurial decisions play a much larger role in the Kaldorian system than that allowed by the marginal productivity theory of distribution'. Comment -

(45) Kaldor's theory contains no mention of technological progress.

Examine the implications of this critical omission.

(48) list 7 drawbacks of Kaldor's model (p. 1187-89).

CHAPTER 61: CONCEPT & CONDITIONS OF PARETO OPTIMALITY

• Traditional approach to social welfare:

'Social welfare' = sum of cardinally measurable utilities of all society members. optimum allocation is one that maximizes this sum.

• Pareto's differences:

- Rejected notion of cardinal utility & its additive nature (no role for value judgements).
- Detached welfare economics from interpersonal utility comparisons.
- Introduced concept of max. SW based on ordinal utilities.

• Definition: (simple) ; Pareto's optimality criterion has 3 aspects:

- Exchange efficiency
- Product " "
- Product-mix efficiency

• Exchange efficiency: Distribⁿ of output s.t: its not possible to reallocate & make someone better off w/o making someone else worse off.

• Production efficiency: Allocation of ^{→ factors of production} (resources) s.t: it is not possible to produce more of any good by reallocation w/o reducing output of some other good. 2 aspects:

- Intra-firm: Allocation of resources s.t: max. output produced given cost-constraint
- Inter-firm: Allocation of resources efficient when all firms have the same marginal cost

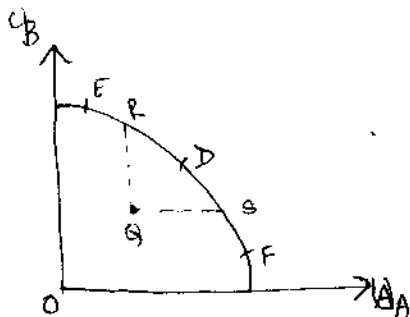
(by corollary, production efficiency in an economy implies production on the PPF). (where does PPF come from? remember).

- Product-mix efficiency: Allocation of resources among producⁿ of various goods in accordance w/ preferences of the people. (i.e., choice among alternative points on the PPF).

(Competitive markets achieve all 3 criteria - demonstrate).

(Show Pareto-optimality in a contract curve in the Edgeworth box).

- Pareto-criterion and Utility Possibilities Curve.



UPC is locus of various combinations of utilities obtained by 2 people from consumpⁿ of a particular bundle of goods.

Pareto criterion says movements from S to R , D , or S are improvements; this criterion, however, is useless when evaluating moves outside arc RS .

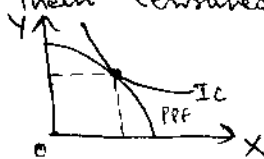
- MARGINAL CONDITIONS OF PARETO OPTIMUM: (derived by Lerner-Hicks, not Pareto). First-order conditions in a competitive economy:

(1) Efficiency in exchange: MRS b/w any 2 goods must be same for every individual who consumes them both (consumption on the contract curve).

(2) Efficiency in production: MRTS b/w any pair of factors must be the same for any 2 firms producing any 2 products and using both the factors to produce the products (\Rightarrow producⁿ can't be \uparrow by factor reallocation). (Edgeworth box for production w/ 2 firms, 2 factors)

(3) Efficiency in product mix: MRS b/w any pair of products for any person consuming both must be same as the MRTS (for the community) b/w them (ensures producⁿ in accordance w/ consumer's preferences)

$$\boxed{MRS_{xy} = MRTS_{xy}}$$



If $MRTS_{xy} > MRS_{xy}$, then too much of X is being produced. By reducing producⁿ of X, there will be enough Y generated so as to more than compensate ~~loss~~ consumers for their loss of X w/ more Y.

* (contd.)₂

(4) Optimum degree of specialization: If a firm produces multiple (2) goods, it has to decide the proportion of resources to be used for the producⁿ of 2 goods. For Pareto opt., MRTS b/w any 2 products must be same for any 2 firms that produce both.

i.e., $\boxed{MRTS_{x,y}^A = MRTS_{x,y}^B}$

(5) Optimum factor-product relⁿ: Marginal product of any factor in producing a particular product must be the same in all firms producing that product, otherwise it's possible to reallocate that factor \leftarrow \uparrow total producⁿ.

(6) Optimum allocation of factor's time: MRS b/w leisure & income of the factor must equal MRTS b/w factor's time and product.

⌈ Second-Order and Total conditions: ⌋

FOCs above are necessary but not sufficient. SOCs All ICs are convex to the origin, all transformation curves concave to it, in the neighbourhood of any position where marginal conditions are satisfied

Total Conditions (Hicks): If welfare is to be a maximum, it must be impossible to \uparrow welfare by producing product not otherwise produced, or by using a factor not otherwise used.

• Criticisms of Pareto criterion:

(1) Not completely free from value judgements, like it claims - encloses policy changes that might make the rich richer & leave the poor exactly where they are ($\Rightarrow \uparrow$ inequality may be justified under Pareto).

(2) Can't be used to judge most policy proposals, as these usually benefit some and harm others (\therefore , limited applicability).

(3) Infinite no. of Pareto-optimal solutions exist - indeterminate.

(4) Circumvents the issue of optimal income distribution.

Usefulness: reduces the range ~~of~~ w/in which socially best alternatives are to be looked for, and \therefore serves as a useful first step.

• Perfect Competition and Pareto optimality:

→ FIRST THM OF WELFARE ECONOMICS: General equilibrium reached in perfectly competitive markets leads to maximum social welfare or economic efficiency in the Pareto sense. ("General competitive equilibrium is Pareto-optimal"). Proof:

(1) Efficiency in exchange: Under PC, all consumers are price-takers, and for each consumer, $MRS_{xy} = (p_x/p_y) \Rightarrow \boxed{MRS_{xy}^i = MRS_{xy}^j} \forall i, j$.

(2) Optimal factor allocation: All firms are price takers, \therefore for each firm, $MRTS_{L,U} = (w/r) \Rightarrow \boxed{MRTS_{L,U}^i = MRTS_{L,U}^j} \forall i, j$

(3) Optimum composition of production: All firms and all consumers are price takers $\Rightarrow MRS_{xy} = (p_x/p_y) \forall$ consumers, and $MRTS_{xy} = (p_x/p_y) \forall$ firms $\Rightarrow \boxed{MRS_{xy} = MRTS_{xy}}$.

(4) Optimum degree of specialization: $MRTS_{xy}^A = MRTS_{xy}^B \forall A, B$.

Criticism: Proponents say the above demonstrates 'invisible hand', but:

→ Restrictive conditions; requires Gen. eq. exists at all times

→ Requires that Soc. be fulfilled (convex Ics, concave PPFs); won't work under \uparrow returns to scale, or if preferences are "smooth".

→ won't work if there exist externalities in production/consumption

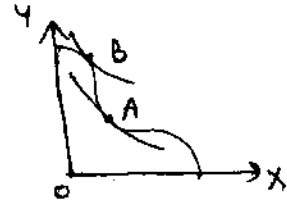
→ Ensures only Pareto efficiency, not social justice.

→ 2nd TH^m OF WELFARE ECONOMICS: For every Pareto optimal situation, there is a competitive equilibrium, given the initial distribution of income or factor endowment. ⇒ no matter what the initial income distribution in a society, corresponding P-O economic efficiency in exchange can be reached through a perfectly competitive equilibrium.

⊛ DOES PERFECT COMPETITION ALWAYS LEAD TO PARETO-EFFICIENT OUTCOMES?

(NO); doesn't, if

(1) First SOCs aren't satisfied (say, under ↑ returns: (FOC satisfied at both A & B, but only B is P-O)).



(2) Externalities exist in production or consumption

(3) Available resources aren't fully employed.

-
- 3 differences b/w Pareto & classical approaches to welfare
 - Pareto criterion: demonstration using UPF
 - Marginal conditions of Pareto optimum (6 FOCs, 2 SOCs)
 - Hicks' 'Total' conditions for Pareto optimality
 - First Th^m of welfare economics, & proof
 - Second Th^m " " "
 - 3 cases where perfect competition doesn't lead to a Pareto-optimal outcome:

CHAPTER 62 (NEW) WELFARE ECONOMICS - COMPENSATION PRINCIPLE

Pareto criteria can't help us in policy decisions that involve making some people worse-off while making others better-off. COMPENSATION PRINCIPLE aims to correct this, under following assumptions:

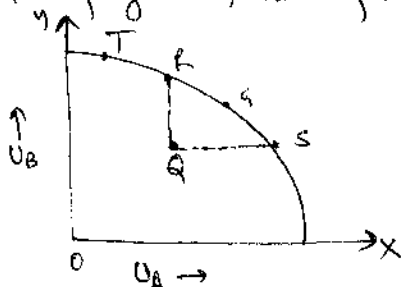
- (1) Satisfaction of an individual is independent of others
- (2) No externalities exist in consumption or production
- (3) Tastes for all individuals remain constant
- (4) Separates production & exchange from problems of distribution - ignores effects of change in distribution on social welfare
- (5) Utility can be measured ordinally; interpersonal comparisons of utilities are not possible (V.I.M.P.)

• KALDOR-HICKS CRITERION

→ Kaldor: If a certain change in economic policy makes some people better-off and others worse-off, then that change will ↑ social welfare if gainers could compensate losers and still be better-off than before.

→ Hicks: A change is an improvement if losers in the changed situation cannot profitably bribe the gainers not to change from original situation.

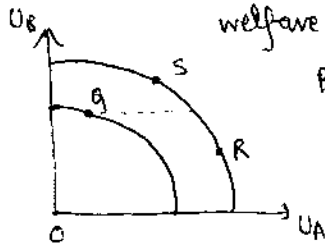
→ Difference b/w Kaldor & Hicks: Only in statement - Kaldor states from POV of gainers; Hicks from POV of losers



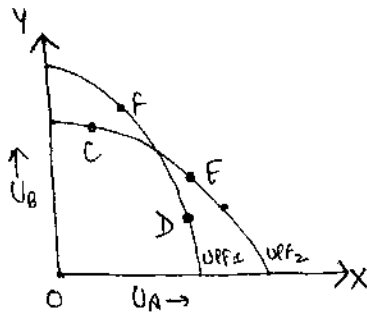
UPF: Pareto says nothing about moving from Q → T; but o/c to Kaldor-Hicks, T is better (reason why) than Q.

↳ ∴ redistribution is possible that leaves the 2 individuals on one RS, where utility of both is higher.

Corollary: Any change that moves individuals to a higher UPF \uparrow social welfare. (Here, $Q \rightarrow R$ means $U_B \downarrow$; but A could compensate B, move to point S, where both are better-off compared to Q.)



- SCITOVSKY PARADOX: Kaldor-Hicks criterion can, in some cases, lead to inconsistent and contradictory results (happen when UPF after policy change intersects UPF before change) \rightarrow



* C \rightarrow D: $U_A \uparrow, U_B \downarrow$; but A can compensate B, move to F, both better off \Rightarrow C better than D

* D \rightarrow C: $U_A \downarrow, U_B \uparrow$; but B can compensate A, move to E, both better off \Rightarrow D better than C

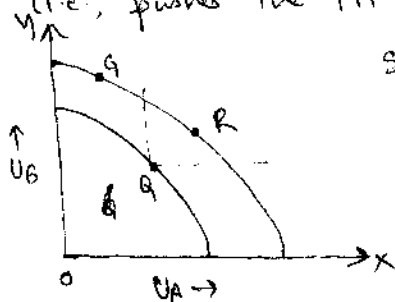
\Rightarrow INCONSISTENT RESULT!

* SCITOVSKY'S DOUBLE CRITERION OF WELFARE: A change is an improvement if:

- \rightarrow Gainers are able to persuade losers to accept the change
- \rightarrow Losers are not able to persuade gainers to remain in original state!

Thus, need to pass K-H test and the reversal test. This happens only when a change brings about \uparrow in total output / real income

(i.e., pushes the PPF out so that it doesn't intersect previous PPF).



Say, $Q \rightarrow R$

\rightarrow Possible to move to B \Rightarrow K-H satisfied; and

\rightarrow No more possible from $Q \rightarrow R$ that raises aggregate welfare \Rightarrow reversal satisfied.

• Critique of Compensation Principle: Proponents claim K-H-S devised a welfare criterion based on ordinal utility & free from interpersonal utility comparisons (value judgements); but bitter criticism:

(1) Does not envision that compensation actually be made \rightarrow refers to potential rather than actual welfare (if compensation is actually made, then Pareto can be used, & K-H is un-necessary)

(2) Implicit value judgements (reason here) \rightarrow (inequality is okay)

(3) Assumes welfare to be a function of \uparrow in production, irrespective of impact on distribution \rightarrow not really a welfare test, but a definition of economic efficiency

(4) Sidesteps questions of distribution and social justice

(Quickly revise from book (Ch. 63))

\rightarrow How to get from factor Endowments and Production functions to the Production Possibility Curve

\rightarrow How to get from Production Possibility Curve to 'Grand Utility Possibility Frontier'

\rightarrow How to get from GUPF to the point of 'CONSTRAINED BLISS' (that represents the unique pattern of production of goods, unique distribution of goods b/w individuals, and unique combination of factors employed to produce the goods).

(Pareto is important because swifs can be modified to suit any desirable value judgements).

CHAPTER 60 WELFARE ECONOMICS - AN INTRO

3 concepts of social welfare:

/Dictatorial

- Paternalistic: Preferences of individual members of society may be ignored; a dictator defines what SW is a/c to his preferences
- Paretian: SW is a function of the welfares of various individuals in a society, but no point doing interpersonal comparisons of utility (not an economist's job to do value judgements).
- Bergson/Samuelson: Changes in SW cannot be assessed w/o making interpersonal comparisons of utility, and \therefore without making value-judgements.

CHAPTER 65 SWF AND THEORY OF SOCIAL CHOICE



Bentham, Rawls, and Bergson

- Classical SWF (Bentham, Pigou, Marshall): SW is sum of cardinal utilities: $W = (U_1 + U_2 + \dots + U_n)$
 - Classicists assume that law of diminishing MU applies to money income \Rightarrow max. SW will be achieved iff MU_{money} is same for all individuals \Rightarrow only under equal income distribution (\because everyone has identical tastes)
- 'Maximin'/Rawlsian SWF: SW of a resource allocation depends only on the worst-off individual:
 $W(U_1, U_2, \dots, U_n) = \min(U_1, U_2, \dots, U_n)$

* Draw SWFs on a 2-D figure for Rawls and classical ~~swf~~ frameworks.

• Bergson-Samuelson SWF:

→ Ordinal index of SW; a funcⁿ of utilities of all individuals:

$$W = W(U_1, U_2, \dots, U_n)$$

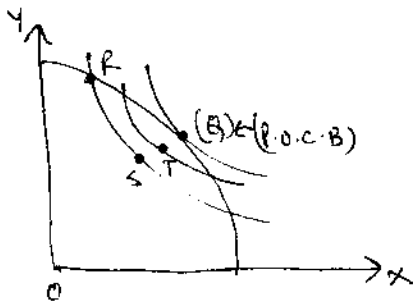
→ Individual utilities depend only on individual's own evaluation (Individualistic)

→ Value judgements determine the form of the SWF; SWF is, thus, not unique. Economists can take value judgements as exogenously given.

→ B-S SWF can be represented using Social ICs (showing clearly that interpersonal comparisons of utility & value judgements would be made how? (see P. 1282).

→ Now, 'Grand UPF' & these Social ICs can be used to get to the socially optimal 'point of constrained bliss'.

→ CONFLICTS B/W EFFICIENCY & EQUITY ARE POSSIBLE:



R is Pareto-efficient (∵ its on SUPF), but society prefers T (as its more equitable, or even otherwise; SWF is such that T is preferred to a more efficient point, R.

→ Critique of Bergson:

- Positive: Incorporates explicit value judgements; is an improvement over earlier attempts such as compensation principle
- Gives unique optimum (given an SWF)

• Drawbacks:

- Limited practical significance
- Arrow has showed that constructing an SWF from individual preferences is impossible, if the SWF has to satisfy certain basic minimum 'derived' conditions
- 'Individualistic' utilities can't always be justified (eg: drug addicts)
- Amartya Sen: Judging welfare/well-being in terms of utility is of limited significance, ∵ the metric of 'happiness' may distort the extent of deprivation in a specific and biased way. Need to consider 'positive freedom' and 'capabilities'.

⊗ Arrow's IMPOSSIBILITY THEOREM

- 3 types/concepts of social welfare
- Classical, Rawlsian, and Bergson-Samuelson SWFs
- Features of B-S SWF (4)
- Show that in the B-S framework, constraints might arise between achieving equity and efficiency
- Critique of B-S SWF:
 - 2 positives
 - 4 negatives
- Arrow's Impossibility Th^m (own notes) of NOR → Conditions (5) → 'consequence' (5) → Arrow's
- Arrow's take on 'values' / 'tastes' ^{vis}, and which one should be included in the SWF (P. 1288)
- Drawback of Arrow's Proof (P. 1291)
- Amartya Sen's interpretation of Arrow (P. 1292 - V. IMP!)