



IMPLICATIONS OF DIGITAL TRANSFORMATION ON THE ECONOMICS & BUSINESS LANDSCAPE

The Determinants of INDIVIDUAL's Demand



- ↳ Price of a Good/Service: “own price”
- ↳ *Price & Quantity of Related Goods/Services*
 - ↳ prices of other related goods/services: “cross-price”
 - ↳ substitutes & complements
 - ↳ quantities of other related goods/services
- ↳ *Consumer's Tastes & Preferences*
- ↳ *Consumer's Income*
- ↳ *Other Socio-Economic/Cultural/Environmental factors*
 - ↳ age and family size
 - ↳ expectations [& *bandwagon effect*]
 - ↳ idiosyncrasy
 - ↳ wealth
 - ↳ weather



Deriving the Demand Curve The Rationale ..!

Non-Price Determinants

- price of related products
- tastes & preferences
- income & wealth
- future expectations
- number of buyers

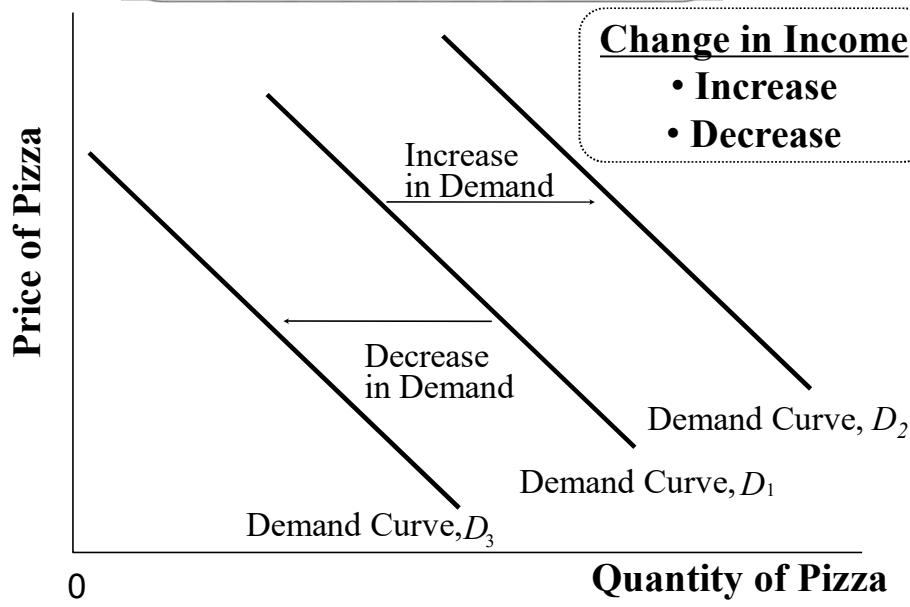
Constant

Changes

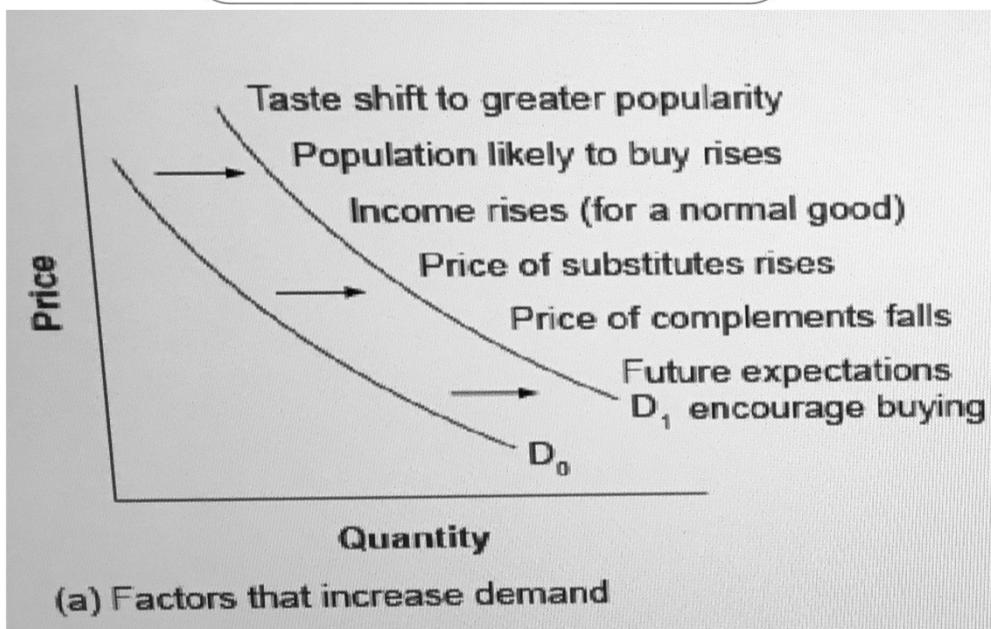
Short-Run

Long-Run

Change in Demand Shifts in the DD Curve



Change in Demand Shifts in the DD Curve

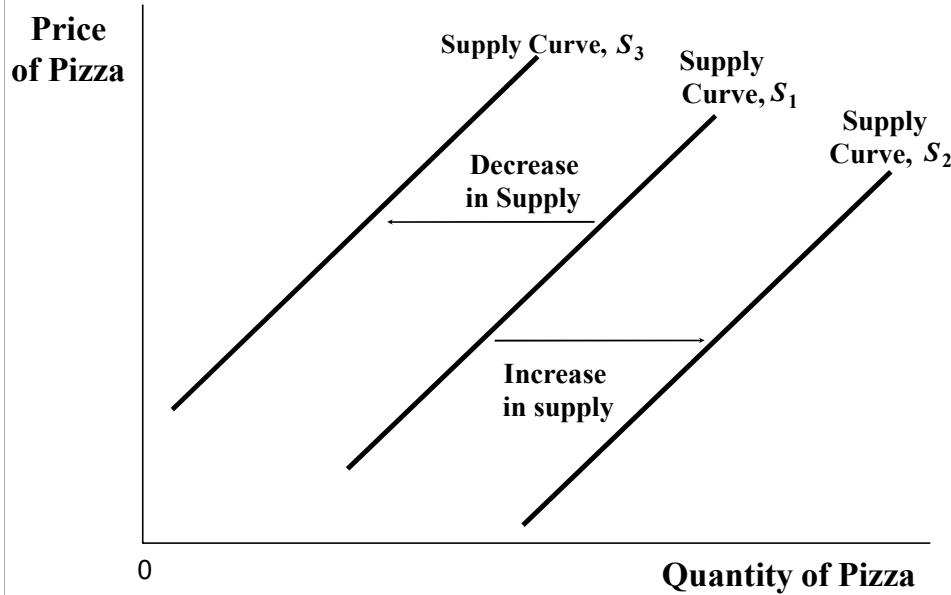


Shifts in the Supply Curve



- 👉 **Movement Along the Supply Curve**
 - ☝ A up(down) movement along the SS curve is due to a change in – rise (decrease) in the price only, and it is called as *change in quantity supplied*
- 👉 **Shifts in the Supply Curve**
 - ☝ A rightward/leftward shift in the SS Curve is due to *change (increase/decrease) in SS* at a given price
- 👉 **Reasons for the Shifts (other than Price)**
 - ☝ change in the price of inputs
 - ☝ improvement in technology
 - ☝ expectations
 - ☝ number of sellers

Shifts in the Supply Curve

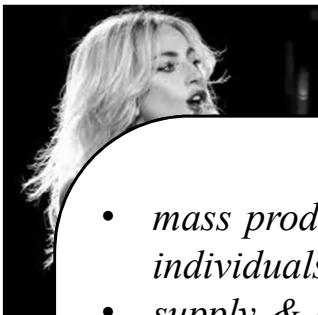


Economics of Value!!



*Economics of Value
is Easy to Understand
If You Just Remember that
in Economics
The Tail Wags the Dog.
It is the Tail of Marginal Utility
that Wags the Dog of Prices*

- Samuleson & Noradus, Economics

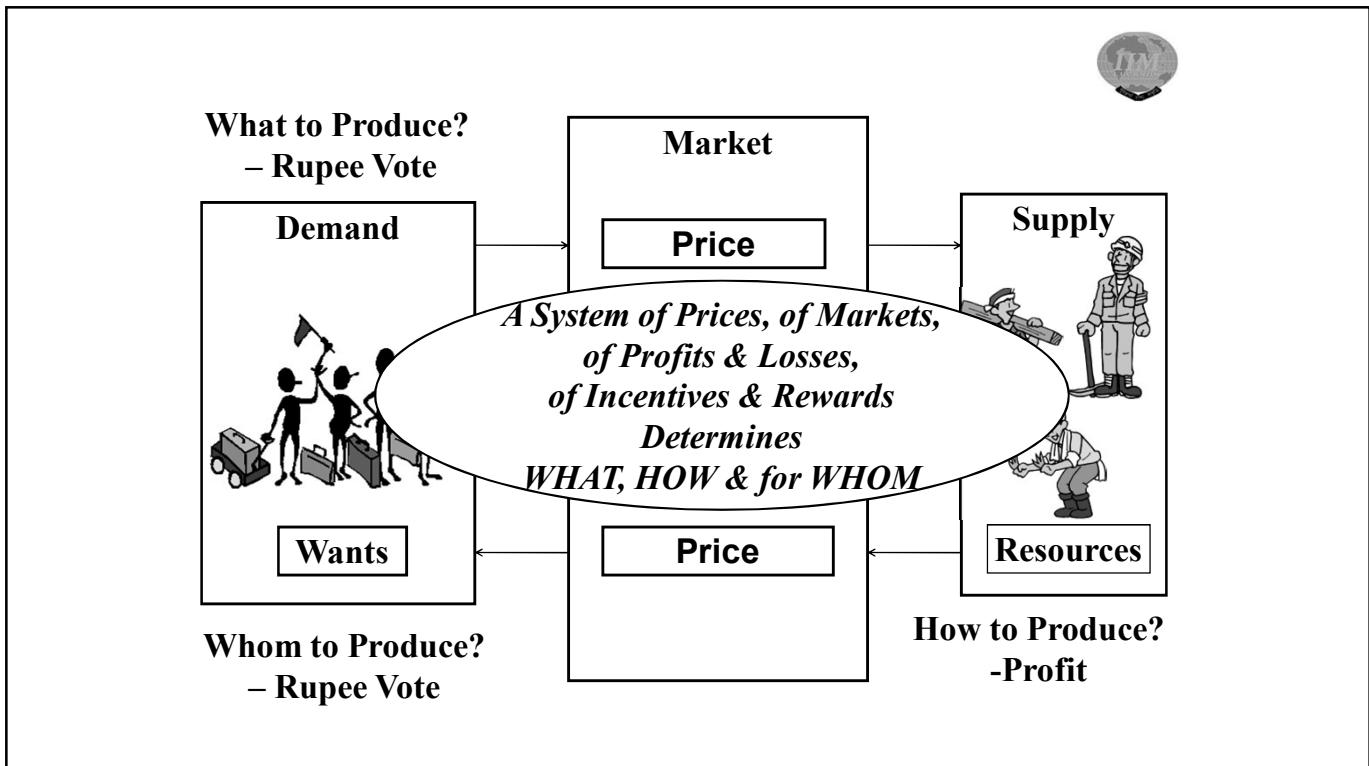


A picture is worth a thousand words.
- Chinese Proverb

IMM

Market System

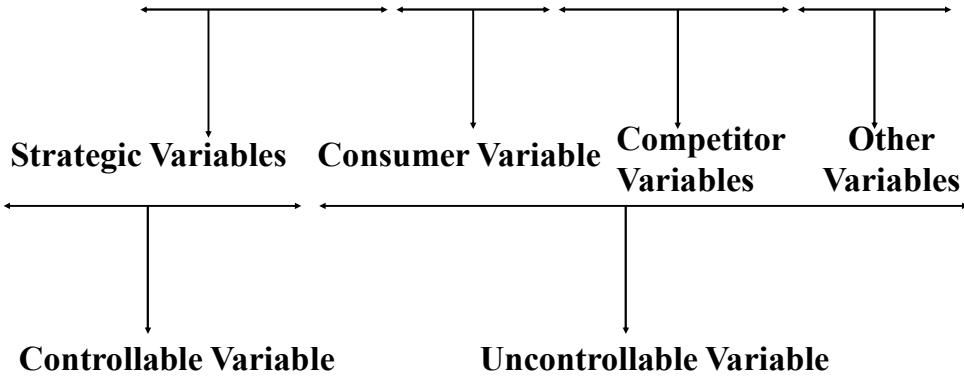
- mass production owned & operated by private individuals/groups
- supply & demand forces determine production & consumption of goods & services
- individual's income is based on his/her ability to transform resources into something that society values
- higher the society values, higher the income

Determinants of Demand for a PRODUCT



$$Q_x = f(P_x, A_x, D_x, O_x, Y_c, T_c, E_c, P_y, A_y, D_y, O_y, G, N, W)$$



Product (X) – Price, Adv Exp, Design, Outlets for Distribution

Consumer – Income, Tastes & Preferences, Expectations

Competitor – Price of Other, Adv of Related, Design, Outlets

Other – Government Policy, Population, Weather Condition

PRICE ELASTICITY OF DEMAND (Pe_D)



- ↳ Pe_D : percent change in Q_D to a small/unit change in price
- ☞ Quantities *bought* are sensitive to producer's *price* change

$$\epsilon_P = \% \text{ change in } Q_X / \% \text{ change in } P_X$$

$$\epsilon_P = (\Delta Q_X/Q_X * 100)/(\Delta P_X/P_X * 100)$$

$$\epsilon_P = (P_X/Q_X)^* (\Delta Q_X/\Delta P_X)$$

↳ $P_X = a + bQ_X$

$$\Delta Q_X/\Delta P_X = B_I$$

or, reciprocal of $B_I = b = \text{slope of } DD \text{ curve}$

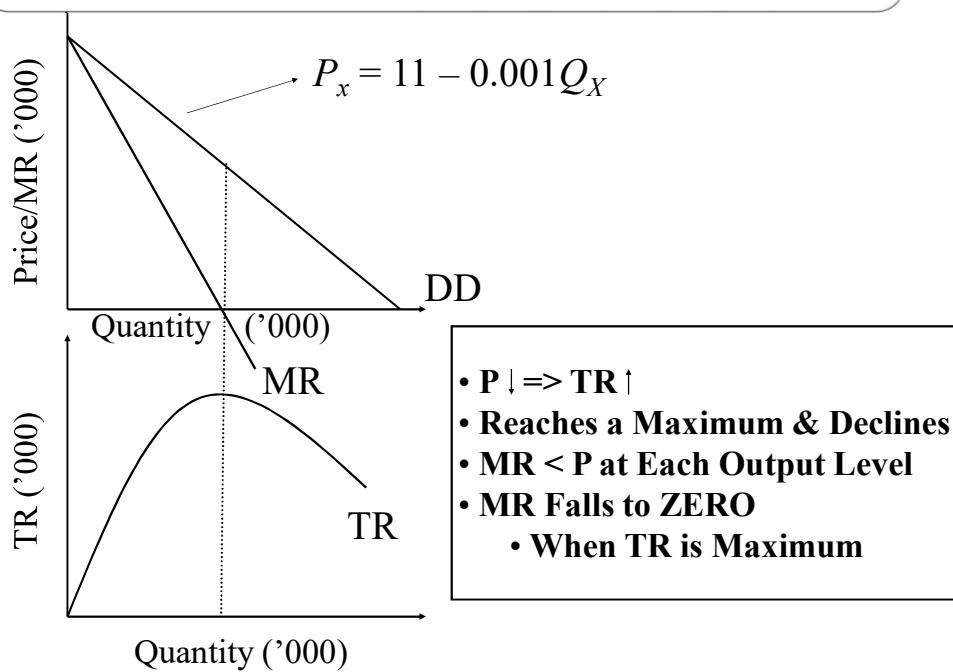
Relationship between Price & Q_D Impact on Total Sales & Revenue



Price	Q_D (Units)	TR (PQ) (Rs.)	MR (Rs.)
10	1000	10000	--
9	2000	18000	$ \epsilon > 1$
8	3000	24000	6
7	4000	28000	4
6	5000	30000	2
5	6000	30000	0
4	7000	28000	-2
3	8000	24000	$ \epsilon < 1$
2	9000	18000	-4
1	10000	10000	-6
			-8

Revenue Implications of Law of Demand

Relationship between DD, MR & TR



Revenue Implications



- 👉 Relationship between *Price Elasticity & Total Revenue*
- Decision Tree**

<u>Elasticity</u>	<u>Price Rise</u>	<u>Price Decrease</u>
Infinity $> \epsilon > 1$	TR Falls	TR Rises
$ \epsilon = 1$	TR Constant	TR Constant
$0 < \epsilon < 1$	TR Rises	TR Falls

- ☛ Pe_D & MR
- ☛ MR is NEGATIVE when *elasticity* is less than 1
- ☛ *DD drops* a LOT when *P increases*, then *TR falls*
- ☛ *DD drops* a LITTLE when *P increases*, then *TR rises*
- ☺ lot of implications for the decision making process

Factors Affecting Demand Elasticity



- ☛ *ease of substitution* (+)
- ☛ *proportion of total expenditure* (+)
- ☛ *durability/postponing purchase* (+)
 - ☛ *possibility of repair* (+)
 - ☛ *used product market* (+)
 - ☛ *length of the time period* (+)

Income Elasticity



↳ percent change in Q_D to percent change in consumer income

↳ Point Income Elasticity

$$\Leftrightarrow \theta = (\% \Delta Q_X / \% \Delta I_X) \text{ or } (dQ_X/dI * I/Q_X)$$

↳ ARC Income Elasticity

$$\Leftrightarrow \theta = (Q_1 - Q_2 / I_1 - I_2) * (I_1 + I_2 / Q_1 + Q_2)$$

↳ coefficients can either be '+ve or -ve'

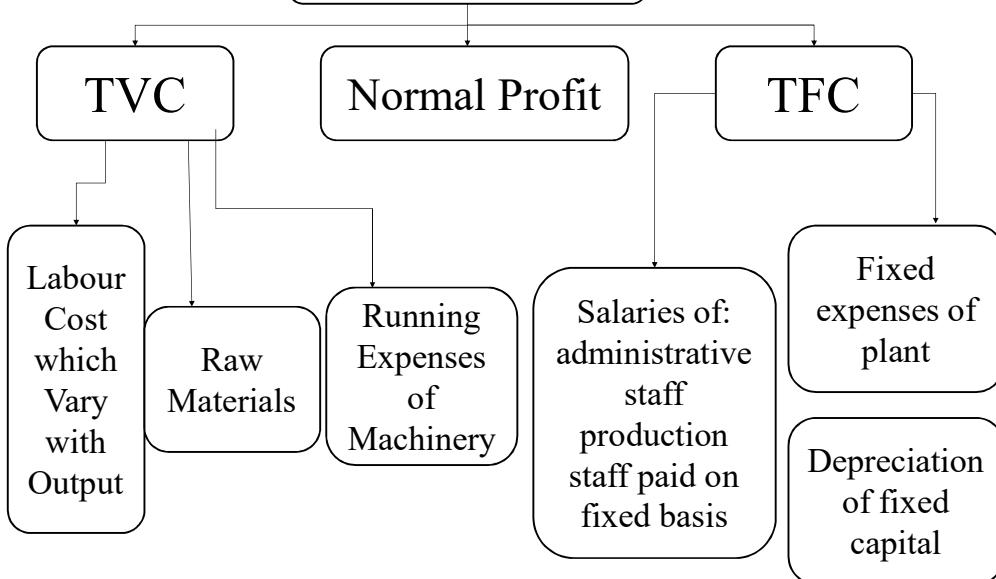
Inference

↳ *Luxuries*: proportionate change in Q_D is greater than such change in income: θ is positive & > 1

↳ *Necessities/Normal*: θ will be positive but < 1

↳ *Inferior*: θ will be negative & < 0

Short-Run TC



Accounting vs. Opportunity Cost for a Firm



Accounting Cost

- ☞ historical outlay of funds for wages & salaries, raw material, rental utilities, interest & so forth
- ☞ also includes estimated periodic reductions in asset valuations, such as *depreciation*

Opportunity Cost

- ☞ forgoing certain opportunities or alternatives in favour of pursuing others
- ☞ things we give up, or, our *second choice*
- ☞ subjective value forgone from the next best alternative

Opportunity Cost: *Indirect or Implicit Cost*

Out-of-Pocket Cost: *Direct or Explicit Cost*

Accounting vs. Economic Profit



***Accounting Profit =
Revenue - Explicit Cost***

***Economic Profit =
Revenue - Explicit cost – Implicit cost***

Different Costs for a Firm



- ↳ Sunk Cost (R&D, Marketing, Specialised Equipments)
 - ⇒ that have been made in the past or must be paid in the future as a part of contractual agreement
 - ⇒ opposite of Opportunity Cost (zero & not recovered)
 - ⇒ visible but to be ignored after a managerial decision
- ↳ Prospective Sunk Cost (evaluation looking forward!)
 - ⇒ a proposed investment – will it be a good decision?
 - ⇒ future uncertainty – of price, marketing a new product
 - ⇒ The Era of Disruptive Technology??
- ↳ Fixed Cost
 - ⇒ Can be eliminated if firm shuts down
 - ⇒ Amortizing Sunk Costs => treating as fixed costs over life time period of the capital equipment

Total Cost vs. Marginal Cost



- ↳ Marginal Cost
 - ⇒ change in TC resulting from one more unit of production
 - ⇒ in general, *MC* measures *rate of change*
 - ⇒ *MC curve*: change in costs/a given change in output
 - ⇒ *short run*: TFC is fixed
 - ⇒ *MC* equals the change in TVC
 - ⇒ for first unit: $MC(1) = AVC$
 - ⇒ while AC is declining, MC is LESS than AVC
 - ⇒ while AC is rising, MC is GREATER than AVC
 - ⇒ MC intersects AC at its minimum point
 - ⇒ MC is significant for business decisions
 - ⇒ allocation of resources & product pricing

An Exercise ..!



- ↳ $TC = 120 + 50Q - 10Q^2 + Q^3$
- ⇒ 120 represents fixed cost or intercept term
- ⇒ firm incurs FC even when $Q = 0$; remaining is TVC
- ⇒ subtracting for different values for Q:

<u>Q</u>	TFC	+	TVC	=	TC	MC
0	120		0		120	--
1	120		41		161	41
2	120		68		188	27
3	120		87		207	19
4	120		104		224	17
5	120		125		245	21
6	120		156		276	31
7	120		202		322	46
8	120		272		392	70
9	120		369		489	97
10	120		500		620	131

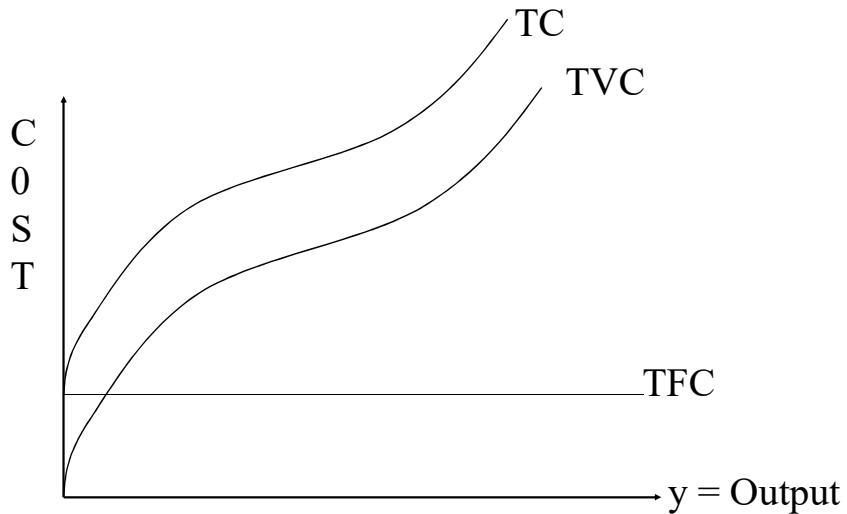
An Exercise ..!



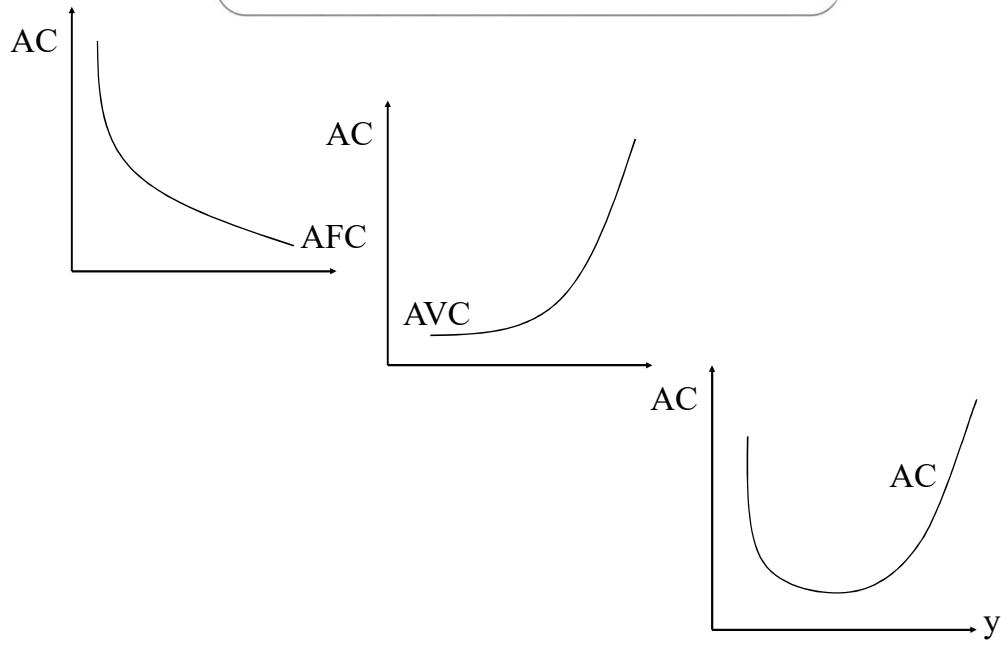
<u>Q</u>	MC	AC	AFC	AVC
1	41	161	120	41
2	27	94	60	34
3	19	69	40	29
4	17	56	30	26
5	21	49	24	25
6	31	46	20	26
7	46	46	17.14	28.86
8	70	49	15	34
9	97	54.33	13	33.41
10	131	62	12	50



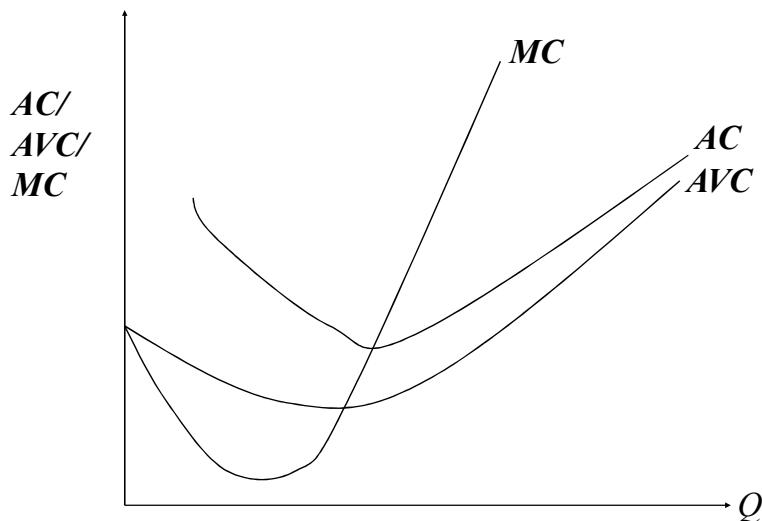
Cost Curves ..!



Average Cost Curves ..!



Average Cost Curves



Sunk, Fixed and Variable Costs for Computer, Software & Pizzeria



- 👉 **Computer Industry**
 - 👉 most costs are **variable**
 - 👉 competition is intense
 - 👉 profitability depends *on the ability to keep costs low* opposite of Opportunity Cost (zero & not recovered)
 - 👉 visible but to be ignored after a managerial decision
- 👉 **Software Firm**
 - 👉 most costs are **sunk costs** – developing new software
 - 👉 recoup investments by selling as many as copies of new software
- 👉 **Pizzeria**
 - 👉 mostly **fixed costs**
 - 👉 both sunk & variable costs are low

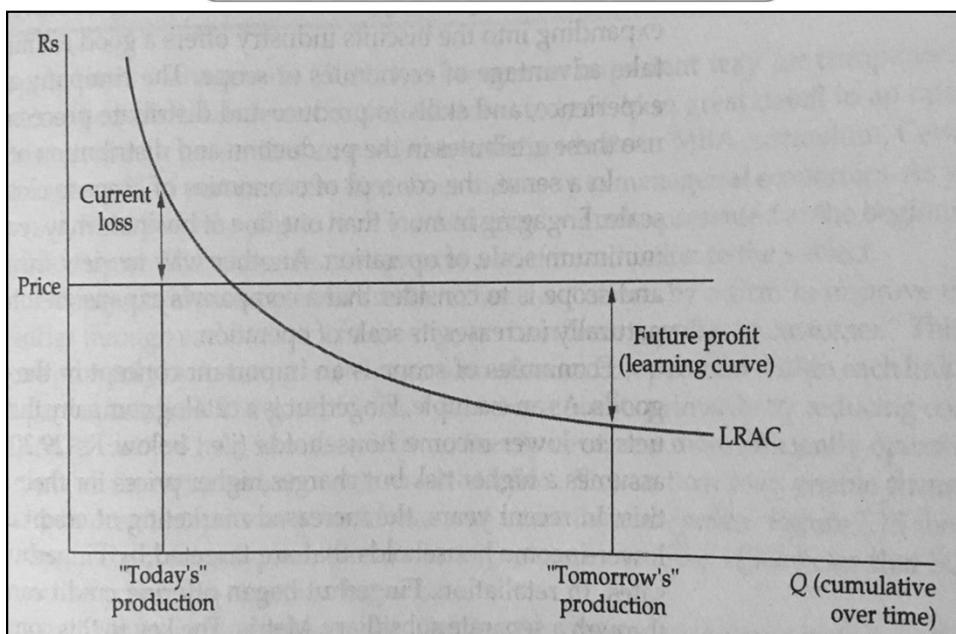
Modern Theory of Costs ..!



- ↳ Questioning the *U-shaped* cost curves!
- ↳ SRAC has a **FLAT** stretch over a *range* of output
- ↳ reflecting that firms build plants with some **FLEXIBILITY** in their productive capacity
- ↳ **RESERVE CAPACITY**
- ↳ LRAC is *L-shaped* rather than *U-shaped*
- ↳ avoiding managerial diseconomies by modern methods of management science
- ↳ even at “too large scale production”, diseconomies can be insignificant relative to technical economies

☺ *George J Stigler, an Economist*

The LEARNING CURVE..!



Possible Reasons for Economies of Scale ..!

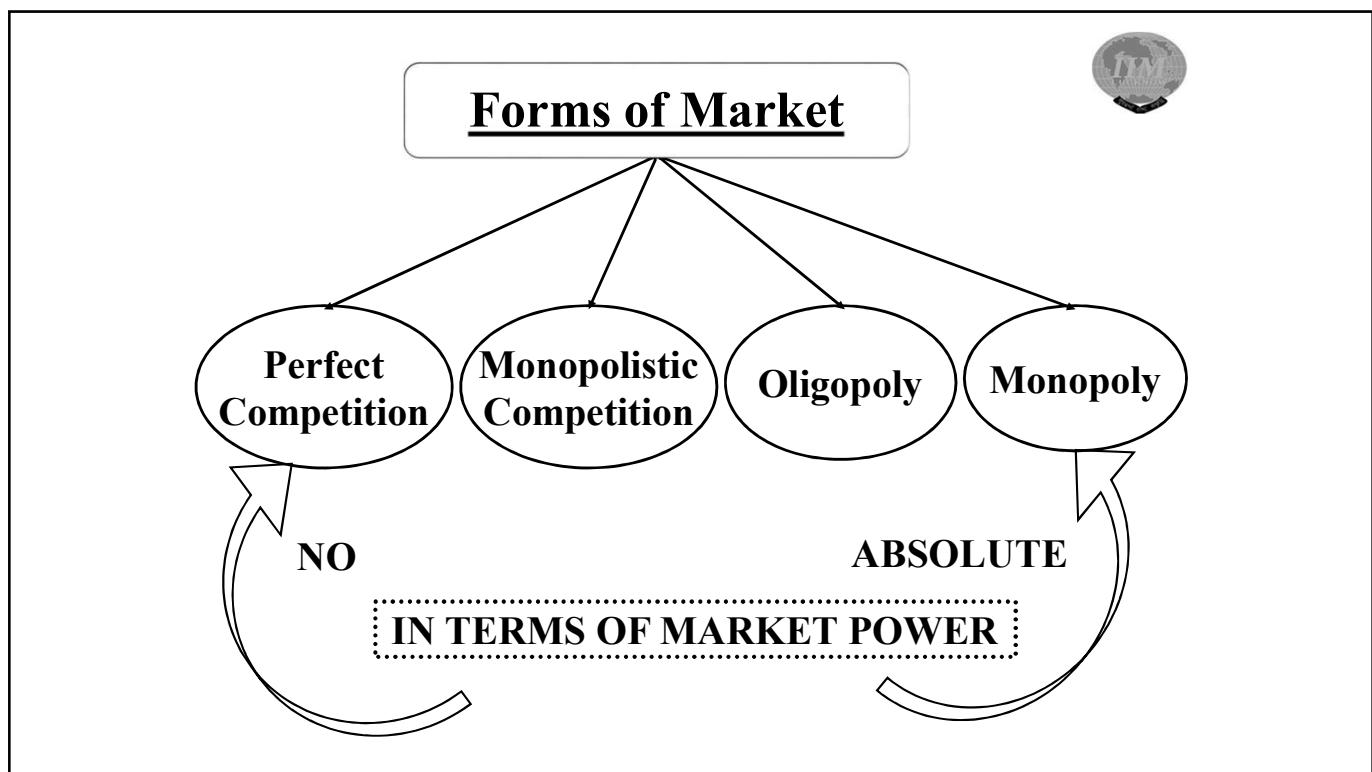


- Specialisation in the use of labour & capital
- Indivisible nature of many types of capital equipment
- Productive capacity of capital equipment rises faster than purchase (input) price
 - Economies in maintaining inventory of replacement parts & maintenance personnel
 - Discounts from bulk purchases
 - Lower cost of raising capital funds
 - Spreading of promotional & R & D costs

Possible Reasons for Diseconomies of Scale ..!



- Disproportionate rise in transportation costs
 - Input market imperfections
 - ex: wage rates driven up
 - Management inefficiencies (line & staff)
- Management coordination & control problems
- Disproportionate rise in staff & indirect labour



Monopoly Markets ..!

- ⌚ Monopoly Market consists of one firm:
 - ☛ Firm is the market: sells all the industry output
 - ☛ no (close)substitutes
 - ☛ Monopolist
 - ☛ always with reference to region/geographical area
 - ☛ *for ex:* Doctor, Dry Cleaner or Medical Store
- ⌚ Differentiating by Regulated Monopoly
 - ☛ we had/have mostly govt. monopolies
 - ☛ Railways, Posts & Telegraphs & IOC for aviation fuel (earlier Telephones)
 - ☛ regulations constrain the ability to price & fix output

Does Economies of Scale Induce Monopoly



↳ Technology Exhibiting Substantial Economies of Scale

- transport, electricity & communications
- economies can be reached only at large scales of output
- Govt. provisioning to avoid exploitation of consumers

↳ Existing firms adopts limit pricing policy

- combined with heavy advertising/product differentiation
- creating new barriers to competition

Does Economies of Scale Induce Monopoly



↳ Economies of Scale

- for some industries economies of scale may operate over a *large range of outputs*
- but size of the market may not support more than one plant of optimal size; supplying the entire market
- such firm is called as NATURAL MONOPOLY
- *for ex:* heavy industries: iron & steel, copper, aluminum, & automobiles
- high set up costs: *fixed costs*
 - profit enjoyed by increasing output

Monopoly Markets ..!



↳ Characteristics

- ☞ firm has the power to fix (control) the price
- ☞ monopolist is “price-maker”
 - ☞ $(P - MC)$: mark-up pricing
- ☞ absence of substitutes: strong monopoly power
- ☞ strength lies in successfully preventing others entry
- ↳ Does a Monopolist can set price as s/he wishes to be?
- ☞ “as much as I CAN” or “whatever market will bear”
- ☞ firm’s ability to set its price is limited by the *demand curve* for its product
- ☞ depends on *price elasticity* of DD for its product

Characteristics of Oligopoly



- ☞ *A few large producers*:- firms are generally large & together they dominate the industry
for instance: Big 3; Big 4; refers to an oligopoly with that number of prominent “players”
- ☞ *Either homogeneous or differentiated products*:- the products are standardized, or differentiated with heavy advertising
 - *homogeneous* : steel, aluminum, cement
 - *differentiated products*: cars, tires, appliances, breakfast cereals
 - engage in considerable “non-price competition” by *heavy advertising*

Characteristics of Oligopoly



- ⇒ *Price Maker – the firm can set its price & output levels to maximize its profit*
- ⇒ *Strategic Behavior – self-interested behavior that takes into account the reactions of others*
- ⇒ *Mutual Interdependence – each firm's profit depends not entirely on its own price & sales strategies but also on those of the other firms*

Monopolistic Competition Characteristics



- ⇒ *Relatively large number of sellers*
 - firms have small market shares
 - collusion is unlikely &
 - each firm can act independently
- ⇒ *Cross-price elasticities*
 - slightly differentiated products often promoted by heavy advertising – highly substitutable & large cross price elasticities (but not perfect substitutes)
 - brand consciousness consumers willing to pay “a little more”
- ⇒ *Easy entry to, and exit from, the industry*
 - economies of scale are few
 - capital requirements are low but
 - financial barriers exist

Monopolistic Competition Characteristics



1. Large number of Buyers and Sellers

- Under monopolistic competition, an individual buyer is unable to influence price s/he pays
- But an individual seller, in spite of having many competitors, decides what price to charge

Monopolistic Competition Characteristics



2 . Differentiated Products

- Product differentiation is a form of non-price competition in which a firm tries to distinguish its product or service from all competing ones on the basis of attributes such as, design & quality
- Production differentiation entails
 - ❖ product attributes
 - ❖ service
 - ❖ location
 - ❖ brand names & packaging
 - ❖ some control over price
 - ❖ advertising

Monopolistic Competition Characteristics



3. Easy Entry and Exit

- ❑ same as in perfect competition
 - ensures firms earn zero economic profit in LR

- ❑ however, assumption about easy entry goes further
 - no barrier stops any firm from copying the successful business of other firms

Perfect Competition .!



- 👉 All firms are “price takers”
 - ☞ price of product is determined by natural market forces of DD & SS:- market DD & SS curves
 - ☞ new entrant firm takes price as given
 - ☞ if any firm raises its price it will lose buyers
 - ☞ individual firms DD curve is PERFECTLY ELASTIC

Perfectly Elastic Demand Curve ..!

