

complex cases:

Increase in Supply, Demand Increase mein hamara quantity increase hogi price is variable.

chapter # 06

Price Elasticity of Demand

• Measure responses by price changing.

Formula:

$$E_d = \frac{\text{Percentage Change in Quantity Demanded of Product X}}{\text{Percentage Change in Price of Product X}}$$

$$\frac{\text{Percentage change in Quantity Demanded of Product X}}{\text{Percentage Change in Price of Product X}} = \frac{\text{change in quantity demanded of X}}{\text{original quantity demanded of X}}$$

$$\frac{\text{Percentage change in Price of Product X}}{\text{Percentage Change in Price of Product X}} = \frac{\text{change in price of X}}{\text{original price of X}}$$

Price ↓ Quantity Demanded ↑
Ignore the minus sign, focus on the absolute value.

- $E_d > 1$ Elastic
- $E_d = 1$ unit Elastic
- $E_d < 1$ Inelastic

Extreme cases:

- Perfectly Inelastic : Vertically parallel, $E_d = 0$.
- Perfectly Elastic : Horizontally Parallel, $E_d = \infty$.

Total Revenue (TR):

Total price/amount, the seller gets from
• Sale of product in particular time duration.

Calculated By:

Product Price multiplies by quantity sold.

$$TR = P \times Q$$

- Demand Elastic, $P \downarrow$ $TR \uparrow$ (Indirect)
- Demand Inelastic, $P \uparrow$ $TR \uparrow$ (Direct)
- Demand Unit Elastic, No change
{ Price changes And TR remains constant }

Substitute Goods	\uparrow	Price Elasticity Demand	\uparrow
Price of Income	\uparrow	Price Elasticity Demand	\uparrow
Luxury Goods	\uparrow	Price Elasticity Demand	\uparrow
Time	\uparrow	Product Demand Elastic	\uparrow

Cross Elasticity of Demand

- Measures responsiveness of sales to change in price of another good
- Substitutes - positive sign (Evian water & Dasani water)
- Complements - Negative sign (Digital cameras & Memory sticks)
- Independent goods - zero (Walnuts & plums)

Formula :

$$E_{xy} = \frac{\text{Percentage Change in Quantity Demanded of Product X}}{\text{Percentage Change in Price of product Y}}$$

• Income Elasticity of Demand :

- Measures degree to which consumers respond to change in their incomes by buying more or less of particular good.

Formula :

$$E_i = \frac{\text{Percentage change in Quantity Demanded}}{\text{Percentage change in income}}$$

• Price Elasticity of Supply :

- Measures responsiveness to price changes
- = Supply is elastic, Quantity supply is responsive to price changes
- = Supply is inelastic, Quantity supply is insensitive to price changes

$$E_s = \frac{\text{Percentage change in Quantity Supplied of Product X}}{\text{Percentage change in price of product X}}$$

- $E_s > 1$, supply is elastic
- $E_s < 1$, supply is inelastic

Economics:

Chapter # 07.

Consumer Behaviour

⇒ Law of Diminishing Marginal Utility:

Utility is satisfaction one gets from consuming a good or service.

Utility is difficult to quantify.

Util is one unit of satisfaction or pleasure.

Total utility (TU) is total amount of satisfaction.

Marginal utility (MU) is extra satisfaction from an additional unit of good.

$$MU = \Delta TU / \Delta Q$$

Consumption of Goods ↑ MU ↓

⇒ Downward Sloping Demand:

Inverse relationship b/w price & quantity demanded.

- Due to availability of substitutes

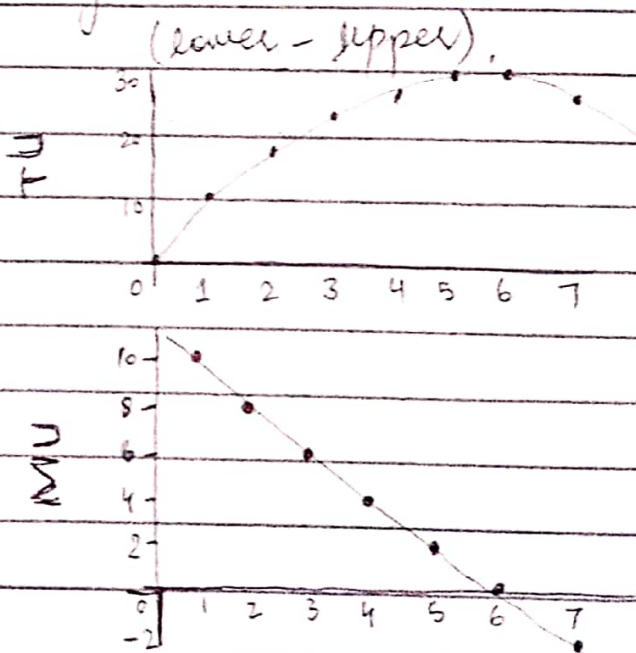
- Income effect

- Main reason is law of diminishing marginal utility.

⇒ Total Utility and Marginal Utility:

Consumed Unit | TU Util's | MU Util's

0	0	10
1	10	8
2	18	6
3	24	4
4	28	2
5	30	0
6	30	-2
7	28	



Marginal utility is positive but declining, when total utility is positive and

- Falling at Decreasing Rate

marginal utility: consumes \uparrow Additional satisfaction \downarrow

- If TU is positive, means consumer is receiving some level of satisfaction from consuming good or service.
- If MU is declining, means rate at which TU is increasing is also decreasing.

\Rightarrow Theory of Consumer Behavior:

- Rational Behavior
- Preferences
- Budget constraint
- Prices

\Rightarrow utility maximizing rule:

- The consumer should allocate his or her money income so that the last dollar spent on each product yields the same amount of extra (marginal) utility.

- When the consumer has 'balanced his margins' using this rule, he has achieved consumer equilibrium and has no incentive to alter his expenditure pattern.

Algebraically,

$$\frac{\text{MU of product A}}{\text{Price of A}} = \frac{\text{MU of product B}}{\text{Price of B}}$$

Economics:

chapter #09 Businesses and the costs of Production

• Economic costs:

The payment that must be made to obtain and retain the services of a resource.

$$\text{Economic costs} = \text{Explicit costs} + \text{Implicit costs}$$

- Explicit costs: Monetary payments
- Implicit costs: Value of next best use - self-owned resources.

Example:

Total sales revenue	Rs \$120,000
Total (Explicit) costs	\$63,000
Accounting profit	\$57,000
Total (Implicit) costs	\$33,000
Economic profit	\$24,000

- Accounting Profit = Revenue - Explicit costs
- Economic Profit = Accounting Profit - Implicit costs
or = Total Revenue - Economic Cost
or = Total Revenue - Explicit costs - Implicit costs.

• Short Run

→ Some variable inputs → fixed plant.

• Long Run

→ All inputs are variable → variable plant → firms enter & exist

• Short-Run Production Relationships

- Total Product (TP)

- Marginal Product (MP) = $\frac{\text{Change in TP}}{\text{Change in Labor Input}}$

- Average Product (AP) = $\frac{TP}{\text{Units of Labor}}$

• Short-Run Production Costs

• Fixed cost, Variable costs, Total costs.

- Fixed cost (TFC).

costs do not vary with output

- Variable cost (TVC).

costs vary with output.

- Total costs (TC).

Sum of TFC and TVC.

$$TC = TFC + TVC$$

- Average Fixed Cost (AFC)

$$= TFC / Q$$

- Average Variable Cost (AVC)

$$= TVC / Q$$

- Average Total Cost (ATC)

$$= TC / Q$$

• Long-Run Production Costs

- The firm can change all input amounts, including plant size

- All costs are variable in the long-run.

- Long Run ATC

• Different short run ATCs

• Long run cost curve also known as Planning curve.

• Economies and Diseconomies of Scale

- Economies of Scale

→ Labor specialization

→ Managerial specialization

→ Efficient capital

→ Other factors

- Constant returns to scale.

- Diseconomies of scale :

- control and coordination problems
- communication problems
- worker alienation
- sinking

o MES and Industry Structure.

- Minimum Efficient Scale

- lowest level of output where long-run AC are minimized.
- Can determine the structure of industry.

Unit Labor TP MP AP

0	0	10	-
1	10	15	10
2	25	20	12.5
3	45	15	15
4	60	10	15
5	70	5	14
6	75	0	12.5
7	75	-5	10.71
8	70		8.75

$$MP = \frac{TP}{\Delta L}$$

$$AP = \frac{TP}{L}$$

10, 25 1, 2

$$\frac{25-10}{2-1} = \frac{15}{1}$$

25, 45 2, 3

$$\frac{45-25}{3-2} = \frac{20}{1}$$

45, 60 3, 4

$$\frac{60-45}{4-3} = \frac{15}{1}$$

60, 70 4, 5

$$\frac{70-60}{5-4} = \frac{10}{1}$$

70, 75 5, 6

$$\frac{75-70}{6-5} = \frac{5}{1}$$

75, 75 6, 7

$$\frac{75-75}{7-6} = \frac{0}{1}$$

75, 70 7, 8

$$\frac{70-75}{8-7} = \frac{-5}{1}$$

$$10 \div 1 = 10$$

$$25 \div 2 = 12.5$$

$$45 \div 3 = 15$$

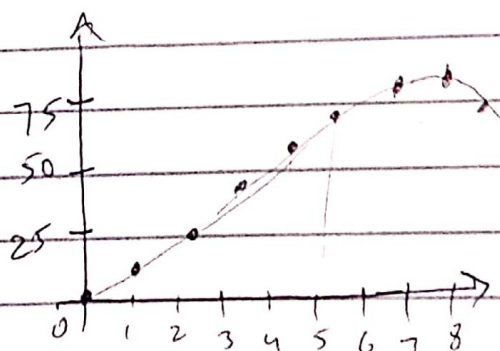
$$60 \div 4 = 15$$

$$70 \div 5 = 14$$

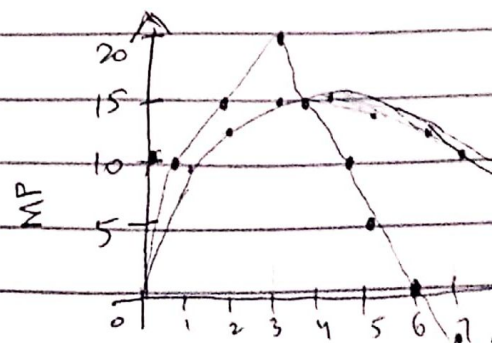
$$75 \div 6 = 12.5$$

$$75 \div 7 = 10.71$$

$$70 \div 8 = 8.75$$



TP



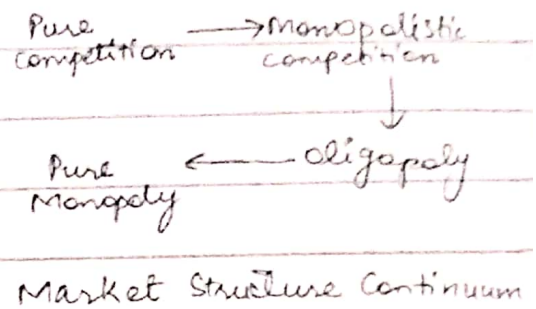
Economics: eco-no-mix

chapter # 10.

Pure competition in the short run.

* Four Market Models:

- Pure competition
- Pure monopoly
- Monopolistic competition
- Oligopoly



* Pure competition :-

characteristics:

- Very large no. of sellers
- Standardized product
- 'Price takers'
- Easy entry & exit
- Perfectly elastic demand
 - Firm produces as much or little as they want at the price.
 - Demand graphs as horizontal line
- Example : Agriculture.

* Monopolistic competition :-

characteristics:

- Many sellers
- Differentiated products
- Some how you can control price within rather narrow limits.
- Relatively easy entry.
- Emphasis on advertising, brand names, trademarks.
- Example : Retail trade, dresses, shoes.

* Oligopoly :-

Characteristics:

- Few sellers
- Standardized or differentiated
- Price is limited by mutual inter-dependence.
- Significant obstacles while entering this market
- It's a great deal typically, not as such a competition.
- Example: Steel, auto, farm implements.

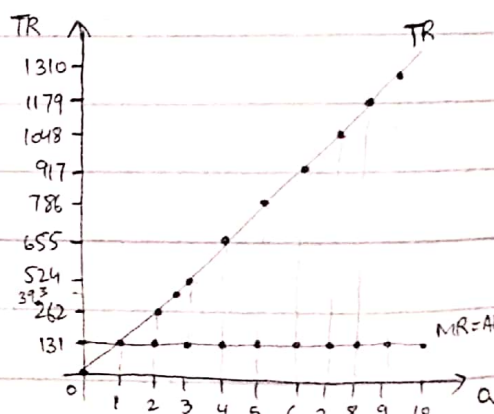
* Monopoly :-

Characteristics:

- One seller
- Unique product
- considerable control over price
- No entries
- Public relation advertisements
- Example: local utilities.

Q_d P $TR = P \times Q_d$ $MR = \frac{\text{change in TR}}{\text{change in } Q_d}$

0	131	0	131
1	131	131	131
2	131	262	131
3	131	393	131
4	131	524	131
5	131	655	131
6	131	786	131
7	131	917	131
8	131	1048	131
9	131	1179	131
10	131	1310	131



* Average Revenue $AR = \frac{TR}{Q} = P$
 • Revenue per unit

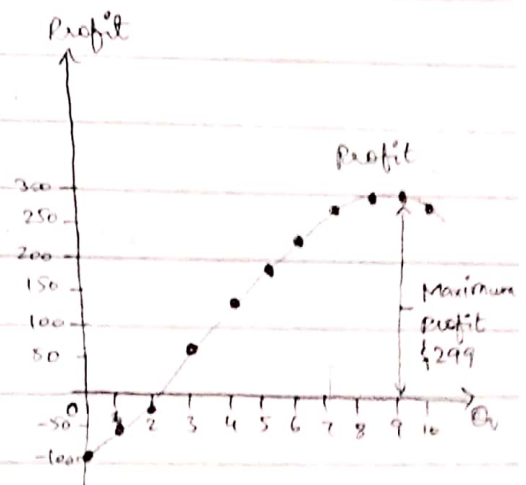
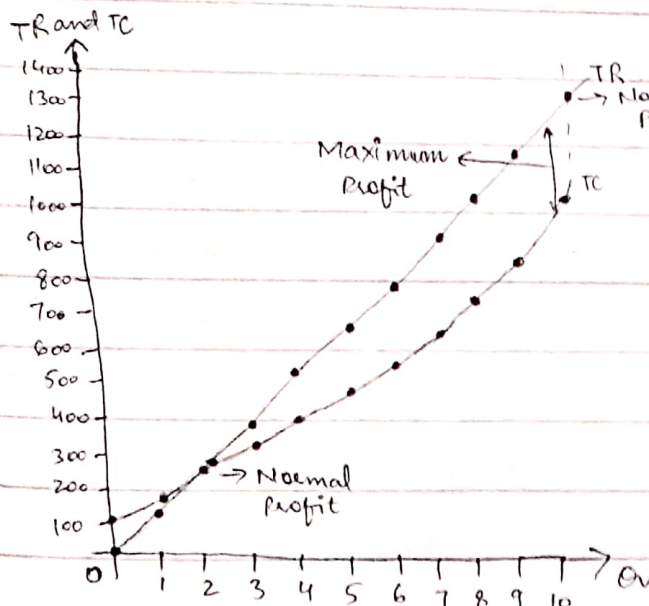
* Total Revenue = $Q_D \times P$

* Marginal Revenue = $\frac{\Delta TR}{\Delta Q}$

Profit Maximisation :

TR-TC Approach

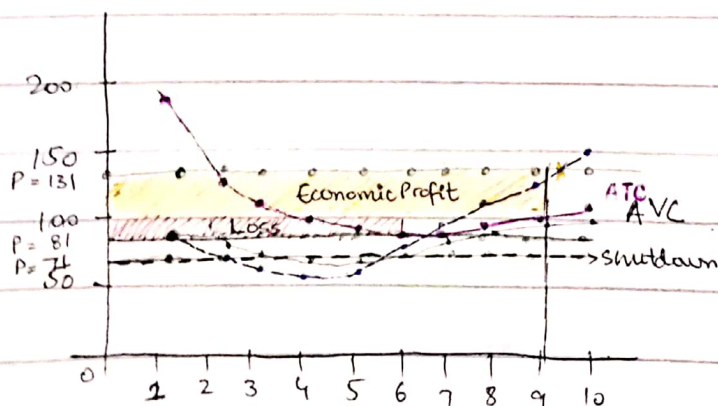
Given Q	Given TFC	Given TVC	TC = TFC + TVC	(From last part) TR = Q x P	Profit or loss (TR - TC)
0	100	0	100	0	-100
1	100	90	190	131	-59
2	100	170	270	262	-8
3	100	240	340	393	+53
4	100	300	400	524	+124
5	100	370	470	655	+185
6	100	450	550	786	+236
7	100	540	640	917	+277
8	100	650	750	1048	+298
9	100	780	880	1179	+299 ← Max. Profit
10	100	930	1030	1310	+280



Profit Maximization : (using previous data)

MR-MC Approach.

Q	AFC = $\frac{TFC}{Q}$	AVC = $\frac{TVC}{Q}$	ATC = $\frac{TC}{Q}$	MC = $\frac{\Delta TC}{\Delta Q}$	MR = $\frac{\Delta TR}{\Delta Q} = P$ (previously found)	Profit
0	-	-	-	-	-	-100
1	100	90	190	90	131	-59
2	50	85	135	80	131	-8
3	33.3	80	113.3	70	131	+53
4	25	75	100	60	131	+124
5	20	74	94	70	131	+185
6	16.67	75	91.67	80	131	+236
7	14.3	77.1	91.43	90	131	+277
8	12.5	81.2	93.75	110	131	+298
9	11.11	86.67	97.78	130	131	+299
10	10	93	103	150	131	+280



- Loss-Minimizing Case;

$P > AVC$, where $MR = MC$

- Shutdown Case

$P < \text{Minimum } AVC$

⇒ Production Result:

Profit if $P > ATC$

Loss if $ATC > P$.

Firm should Produce? If price is $> \min. AVC$.

Quantity should firm produce? $MR(=P) = MC$; Profit is maximized