# Supply and Demand

# **Session Outline**

- What is demand?
- What are the factors that affect the demand?
- Individual & market demand functions
- What is supply?
- What are the factors that influence supply?
- Individual & market supply functions

# **Analysis of Demand**

- What is demand?
  - Want + Willingness + Ability = Demand
- Law of Demand
  - "Other things being constant, as price falls, the quantity demanded rises and vice versa"
- Demand function, schedule and demand curve

## Demand Function, Schedule and Curve

DEMAND SCHEDULE		
Price of Quantit Pen (in units		
22	0	
20	10	
18	20	
16	30	
14	40	
12	50	
10	60	
8	70	
6	80	



Q = f(P) = 110 - 5P

## **Exceptions to Law of Demand**

- Giffen goods
- Veblen effect
- Snob effect
- Expectations

# Other Factors Influencing the Demand

- Prices of related goods
  - Substitutes
  - Complementary goods
- Population
- Tastes and preferences
- Income of the consumer
- Wealth of the consumer
- Expectations
- Special influences

## Other Factors Affecting Demand for Car

Factors Affecting the Demand Curve	Example for Cars
a. Income	• The demand for cars increases/ decreases if income of the people increases/decreases.
b. Population	• As population increases, demand for cars also increases.
c. Prices of related goods	• Increase in petrol prices reduces the demand for cars.
d. Tastes and preference	• As people are showing preference towards small size cars, the demand for these cars has increased.
e. Special influences	• As people expected drop in car prices, the demand has dropped from their present level.

# Change in Quantity Demanded and Change in Demand



• Change in Demand



#### **Individual and Market Demand**

Individual and Market Demand Schedule			
Price of Shirt (in Rs.)	A	В	Total
300	0	0	0
275	1	0	1
250	2	1	3
225	3	2	5
200	4	3	7
175	5	4	9
150	6	5	11

## Individual and market demand



## Elasticity of demand

- Elasticity of demand = % Change in Quantity demanded / % change in any of direct/indirect variable affecting demand
- Price Elasticity of demand = % change in quantity demand/ % change in price
- % change = {(New value Old value)/ Old value} x 100

## Elasticity of demand

- Income Elasticity of demand = % change in quantity demanded/% change in Income of consumers, keeping price of the good unchanged, prices of other related goods unchanged and all other indirect factors unchanged.
- Cross Price Elasticity of demand = % change in quantity demanded/% change in price of related good, keeping Income of consumers constant, price of the product same, and all other indirect factors unchanged.

## Elasticity of Demand

- Related Good may be complementary good/substitute good (Tea and coffee are substitutes), (Car and Petrol/Diesel are complementary goods)
- $e_p = \Delta q / \Delta p \ge p/q$
- Please note that elasticity of demand is always negative.

## MEASUREMENT OF ELASTICITY OVER A SEGMENT



## MEASUREMENT OF ELASTICITY OVER A SEGMENT

• When we want to measure elasticity of demand between point R and S, we donot know whether the prices are moving from R to S or S to R. Therefore, we use the following formula to calculate elasticity of demand.

$$e_{p} = \frac{(q2-q1)}{(p_{2}-p_{1})} \times \frac{(p_{1}+p_{2})}{(q_{1}+q_{2})}$$

## RULES FOR FINDING ELASTICITY OF DEMAND

- In the problem when it has been specifically stated to find arc price elasticity of demand use the formula
- $e_p = (q2-q1)/(p2-p1)x(p1+p2)/(q1+q2)$
- We also use the above formula when we do not know the movement of prices, from what to what?
- In all other problems we will use

 $e_p = (q2-q1)/(p2-p1)x(p1/q1)$ 

#### Summary of elasticity measures

Unitary Elastic	%ΔQ/ %ΔP =1	e=1
Relatively Elastic	%∆Q/ %∆P >1	e>1
Perfectly Elastic	%∆Q -> ∞ due to a small %∆P. Therefore %∆Q/ %∆P =∞	e=∞
Relatively Inelastic	%ΔQ< %ΔP	e<1
Perfectly Inelastic	% $\Delta Q \rightarrow 0$ due to a small % $\Delta P$ . Therefore % $\Delta Q$ / % $\Delta P$ =0	e=0

## Measures of elasticity-Characteristics

- Goods which are elastic, tend to have some or all of the following characteristics
- They are luxury goods
- They are expensive and a big % of income e.g. sports cars and holidays
- Goods with many substitutes and a very competitive market. E.g. if Simsbury's put up the price of its bread there are many alternatives, so people would be price sensitive
- Bought frequently



## Measures of elasticity-Characteristics

- Goods which are inelastic tend to have some or all of the following features:
- They have few or no close substitutes, e.g. petrol, cigarettes.
- They are necessities
- They are addictive
- They cost a small % of income or are bought infrequently



## **Using Knowledge of Elasticity**

- If demand is inelastic then increasing the price can lead to an increase in revenue. This is why OPEC try to increase the price of oil.
- Graph showing increase in Revenue following increase in price



# **Using Knowledge of Elasticity**

- 2. If demand is elastic, firms would be unlikely to increase price as this could lead to a fall in revenue. Instead they could try advertising to increase brand loyalty and make demand more inelastic
- 3. Price Discrimination. Some people pay higher prices for tickets for trains because there demand is more inelastic.

## KEY DETERMINANTS OF ELASTICITY OF DEMAND

- The price elasticity of demand depends on four factors
- 1) The closeness of substitutes
- 2) The proportion of income spent on the good
- 3) The time elapsed since a price change
- 4) Nature of the good

- The main determinants of income elasticity of demand
- 1) Nature of the need the good covers
- 2) The initial level of income of a country
- 3) Time period
- The determinants of cross price elasticity of demand
- 1) The nature of the good relative to their uses. If two goods can satisfy well the same need, the cross price elasticity will be high and viceversa.

## Price elasticity, Total Revenue and Total Expenditure

- Total Expenditure and Total Revenue: The total revenue to the seller is the total expenditure to the buyer.
- Example: Wheat purchased by a flour mill from the farmer is an expenditure and for the farmer it is the revenue.

Relation between Average Revenue, Marginal Revenue and Price Elasticity of Demand

Total Revenue (TR) = P.Q**USE PARTIAL** Marginal Revenue (Change in Total Revenue) = DERIVATIVES  $\delta P/\delta Q \ge Q + P \ge \delta Q/\delta Q$  $=Q \delta P / \delta Q + P$  $=P\{1+Q/P \times \delta P/\delta Q\}$ Since,  $\delta Q / \delta P \propto P/Q = e_p$  we have,  $MR = P\{1+1/e_{p}\}$ But since  $e_p$  is always negative, we have  $MR = P\{1-1/e_{p}\}$ 

#### Relation between Average Revenue, Marginal Revenue and Price Elasticity of Demand

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MR = P\{1-1/e_{p}\}TR = P.QAR = P.Q / Q = PTherefore,
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 $MR = AR \{ 1-1/e_{p} \}$ 

# **Analysis of Supply**

- What is supply?
  - Want + Willingness + Ability = Supply
- Law of Supply
  - "Other things being constant, as price increases, the quantity supplied also increases and vice versa"
- Supply function, supply schedule and supply curve

## Supply Schedule, Function and Curve



Supply Schedule		
Price of	Quantity	
Pen	(in units)	
6	0	
8	10	
10	20	
12	30	
14	40	
16	50	
18	60	
20	70	
22	80	

 $Q_s = f(P) = -30 + 5P$ 

## Other Factors Affecting the Supply of Motor Cars

Factors Affecting the Supply Curve	Example for Cars		
a. Prices of related goods	• If prices of heavy vehicles like trucks etc fall, supply of cars increases.		
b. Factor/input prices	• A reduction in steel prices leads to increase in supply of cars.		
c. Technology	• The production costs are reduced with the usage of computerized manufacturing units and consequently, supply of cars increased.		
d. Government policy	• Reduction in tariffs on imported goods leads to decrease in production costs and increase in supply.		
e. Special influences	<ul> <li>With the imposition of higher standards by the government on pollution control norms like eurg<sub>1</sub> &amp; II, supply of cars may fall.</li> </ul>		

# Other Factors Affecting Supply

- Prices of related goods
- Factor prices
- Technology
- Government policy
- Special influences

# Change in Quantity Supplied and Change in Supply

- Change in Quantity Supplied
- Change in Supply

## Firms' and Market Supply

Individual and Market Supply Schedule			
Price of Shirt			
(in Rs.)	Firm A	Firm B	Total
300	6	5	11
275	5	4	9
250	4	3	7
225	3	2	5
200	2	1	3
175	1	0	1
150	0	0	0

## Firms' and Market Supply Curves



## Equilibrium

- What is Equilibrium Price?
- What is Equilibrium Quantity?
- How equilibrium price and output are determined?

## Market Equilibrium

	Quantity	Quantity
Price of	Demanded	Supplied
Pen	(in units)	(in units)
22	0	80
20	10	70
18	20	60
16	30	50
14	40	40
12	50	30
10	60	20
8	70	10
6	80	0



## Market Equilibrium

	Quantity	Quantity		
Price of	Demanded	Supplied	Shortage	Pressure
Pen	(in units)	(in units)	or Surplus	on Price
22	0	80	Surplus	Down
20	10	70	Surplus	Down
18	20	60	Surplus	Down
16	30	50	Surplus	Down
14	40	40	Equilibrium	None
12	50	30	Shortage	Up
10	60	20	Shortage	Up
8	70	10	Shortage	Up
6	80	0	Shortage	Up

## Change in Demand

- Increase in demand
- Decrease in demand

### Increase in Demand



### Decrease in Demand



## Change in supply

- Increase in supply
- Decrease in supply

## Increase in Supply



## Decrease in Supply



#### Effect on Price and Quantity Due to Different Demand and Supply Shifts

	Demand / Supply Shifts	Effect on Price and Quantity
If demand rises	The demand curve shifts to the right	Both price and quantity increase.
If demand falls	The demand curve shifts to the left	Both price and quantity fall.
If supply rises	The supply curve shifts to the right	Price falls but quantity increases.
If supply falls	The supply curve shifts to the left	Price increases, but quantity decreases.

# Simultaneous shifts in supply and demand



# Simultaneous shifts in supply and demand

