UNIT - 2

Demand Analysis

What is Demand?

- A relation showing the quantities of a good that consumers are willing and able to buy at various prices per period, other things constant.
- Demand for commodity implies
  - **Desire to acquire it**
  - **Willingness to pay for it**
  - **Ability to pay for it**

Types of Demand

- **Individual demand**
- The quantity of a commodity an individual is willing and able to purchase at a particular price, during a specific time period, given his/her money income, his/her taste, and prices of other commodities, such as substitutes and complements, is referred to as the **individual demand for the commodity.**

- **Market demand**
- The total quantity which all the consumers of the commodity are willing and able to purchase at a given price per time unit, given their money incomes, their tastes, and prices of other commodities, is referred to as the **market demand for the commodity.**

- **Firm demand and Industry demand**
- The quantity of a firm's product that can be sold at a given price over time is known as the demand for the **firm's product**.

- The sum of demand for the products of all firms in the industry is referred to as the market demand or **industry demand** for the product.

Firm and Industry demand

Firm demand

- Firm demand represents the demand for products of a single company.
- Example: Demand for Sony TV Colgate Paste

Industry demand

- Industry demand refers to the demand of an industry.
- Example: Demand for TVs Paste

- **Autonomous** and Derived demand

An autonomous demand or direct demand for a commodity is one that arises on its own out of a natural desire to consume or possess a commodity. This type of demand is independent of the demand for other commodities.

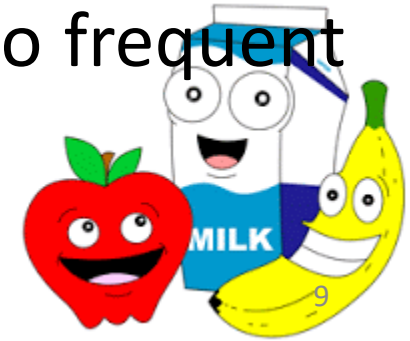
Example: demand for washing machine

- Autonomous and **Derived demand**

- The demand for a commodity which arises from the demand for other commodities, called ‘parent products’ is called derived demand. Demand for land, fertilizers and agricultural tools, is a derived demand because these commodities are demanded due to demand for food.
- Example: demand for tyres derived from demand of car

- Demand for **durable and non-durable goods**
- **Durable goods** are those goods for which the total utility or usefulness is not exhaustible in the short-run use. Such goods can be used repeatedly over a period of time.

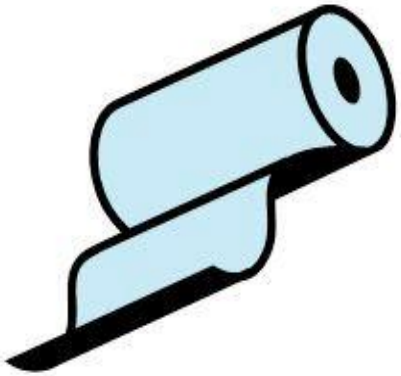
- The demand for **non-durable goods** depends largely on their current prices, consumers' income, and fashion. It is also subject to frequent changes.



Durable Goods vs. Nondurable Goods

Durable Goods

Nondurable Goods



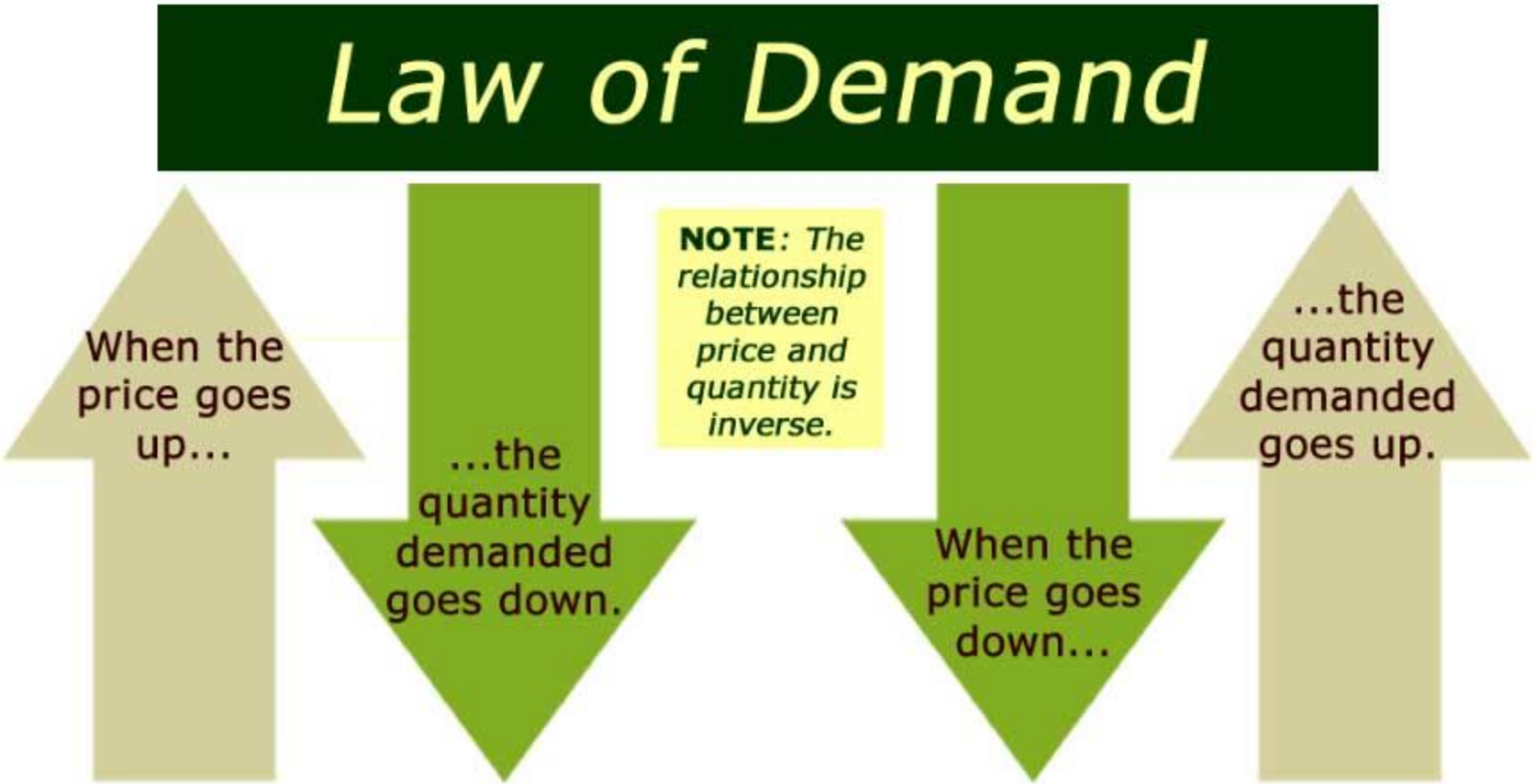
- **Short-term and long-term demand**
- **Short-term demand** refers to the demand for goods over a short period.

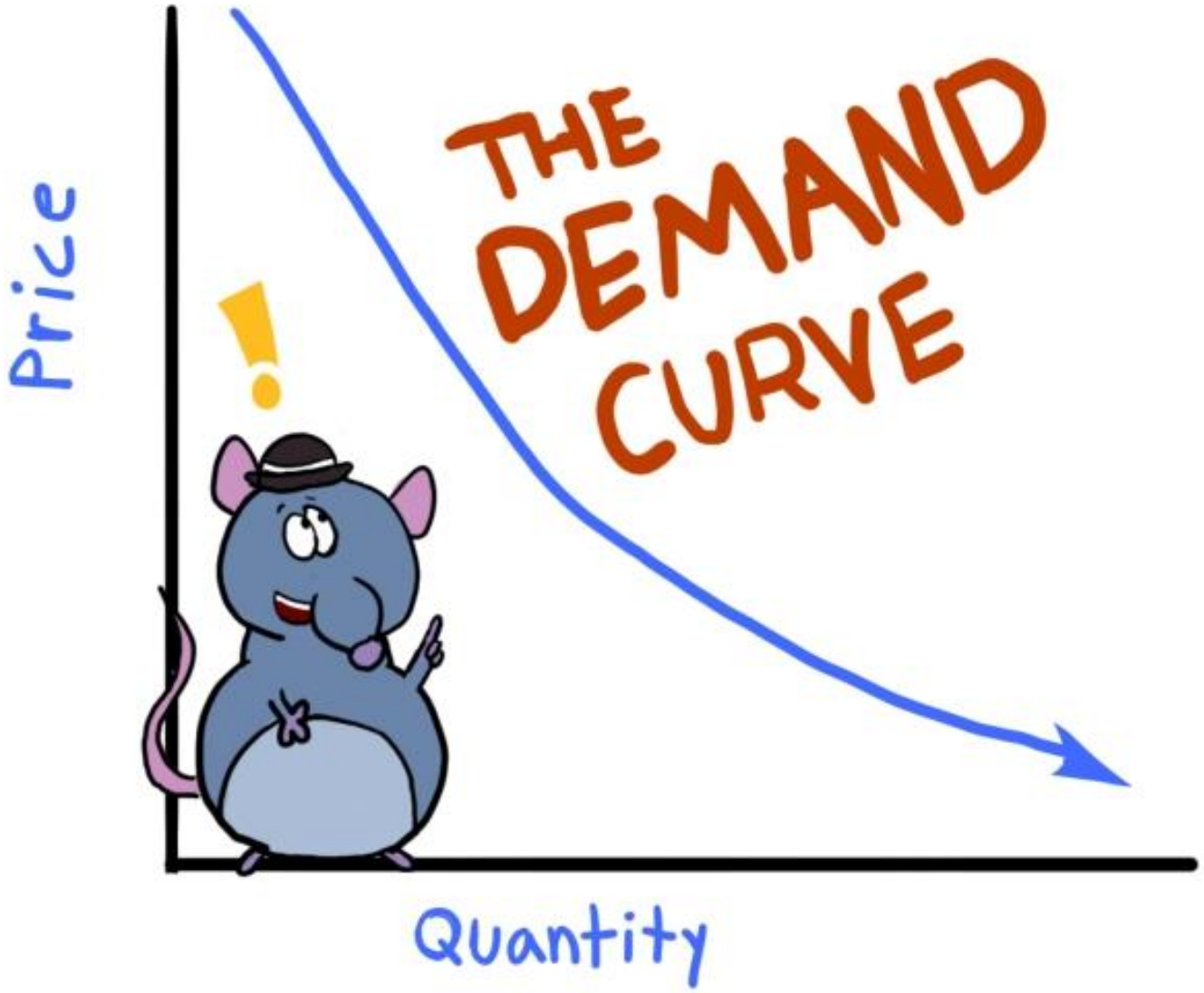
- The **long-term demand** refers to the demand which exists over a long period of time.

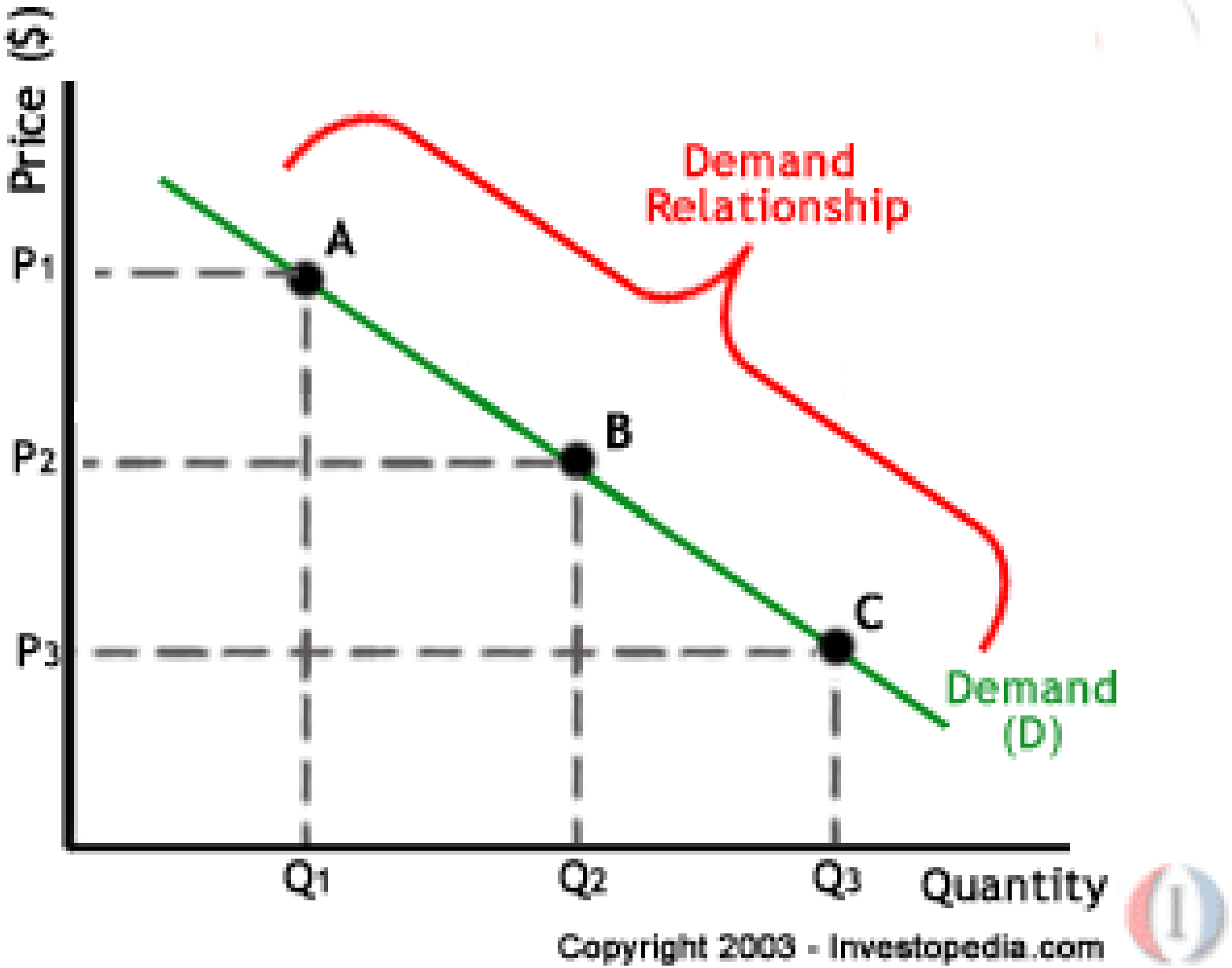

LAW OF DEMAND
DISTINCTION
INCOME
INCREASE
RELATED
DEPENDENT
STATES
OPPOSITE
DETERMINANTS
TASTE
DIRECTION
EXPECT
CURVE
GOOD
RELEVANT
RIDERS
STATUS
QUANTITY
REMAIN
SUBSTITUTION
PARENTHESIS
HOUSEHOLD
INVERSE
EXPANSION
LOWER
POSTULATES
BUY
VARIABLE
DAILY
DEMAND
SYMBOL
UNCHANGED
HIGHER
EXCEPTIONS
SHOWN
PRODUCT
CAUSATIVE
LAW
FUNCTION
CONSUMER
CONTRACTION
CONSTANT
CHANGE
SLOPE
PRICE
VIOLATES
INVERSELY
GREATER
POTATOES
DIAGRAM
FALLS
AMOUNT
FACTOR
CAUSAL
INDEPENDENT
EXPRESSION
RELATION
COMMODITY
EXPENSIVE

The Law of Demand

- There is an inverse relationship between the price of a good and demand.
- As prices fall, we see an expansion of demand.
- If price rises, there will be a contraction of demand.


Law of Demand
When the price goes up...
...the quantity demanded goes down.
NOTE: The relationship between price and quantity is inverse.
When the price goes down...
...the quantity demanded goes up.


THE DEMAND CURVE
Price
Quantity


Price ($)
Demand Relationship
A
B
C
P1
P2
P3
Demand (D)
Q1
Q2
Q3
Quantity
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Law of Demand

- Relationship between Price and quantity demanded is an economic law.

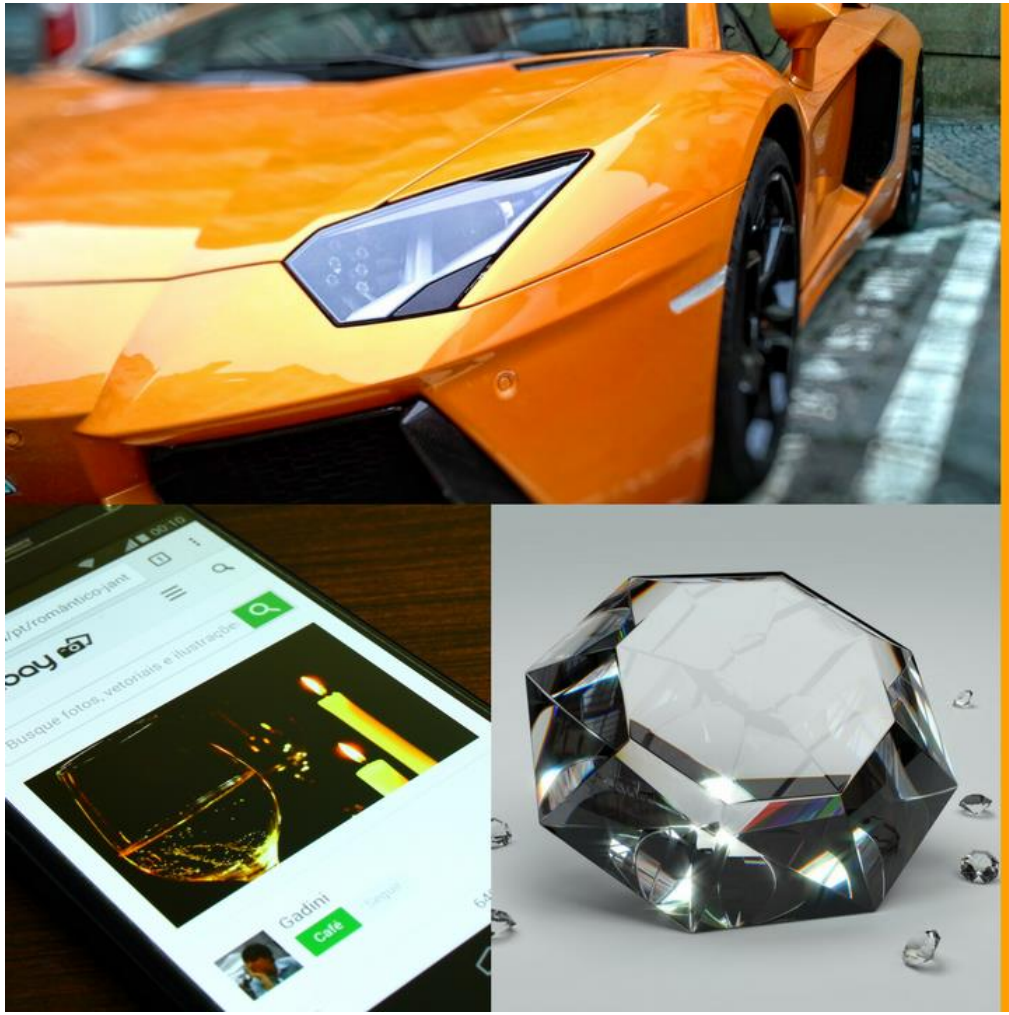
- The quantity of a good demanded per period relates inversely to its price, other things constant

WHAT IS THIS
CETERIS PARIBUS

What does "Ceteris Paribus" mean?

All else remains the same

4



Exceptions to Law of Demand

Assumptions & Exceptions : Law of Demand

Assumptions

- No change in Consumer Income
- No change in Consumer Preference
- No change in the Tastes and Fashions
- No change in the Price Related Product
- No change in the population
- No change in the Govt. Policy
- No change in Weather Conditions

Exceptions

- Giffen Goods/ Inferior Goods
- Veblen Goods
- Consumer Expectation
- Consumer Psychological Bias
- Necessaries
- Impulse Buying

Five Determinants of Demand with Examples and Formula

1 Price of Good or Service

$$qD = f$$

F = price, income, prices of related goods,tastes, expectations

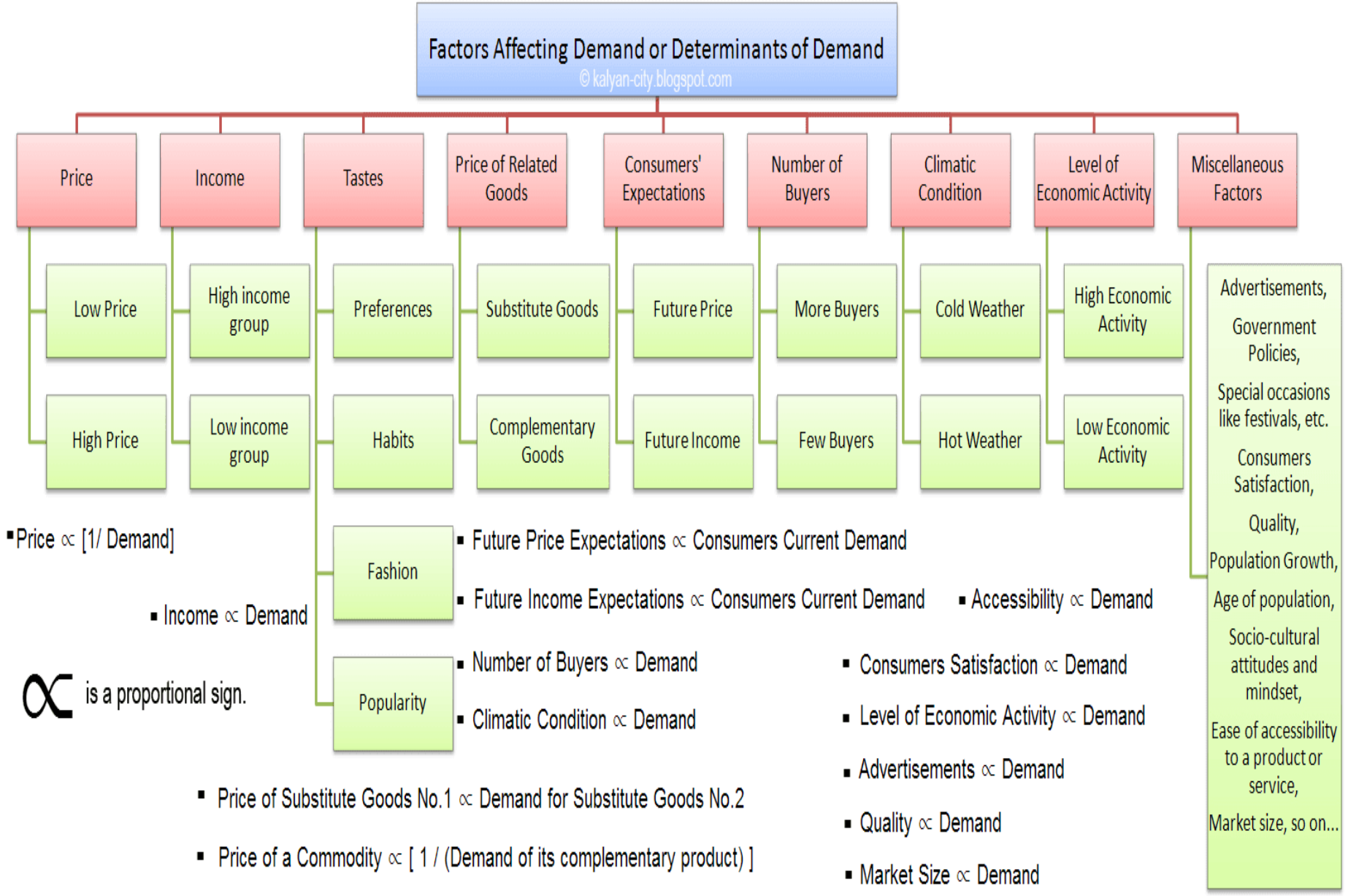
5 Expectations

2 Income of Buyers

4 Tastes of Consumers

the balance

3 Prices of related goods or services


Factors Affecting Demand or Determinants of Demand
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Price
Income
Tastes
Price of Related Goods
Consumers' Expectations
Number of Buyers
Climatic Condition
Level of Economic Activity
Miscellaneous Factors
Low Price
High Price
High income group
Low income group
Preferences
Habits
Substitute Goods
Complementary Goods
Future Price
Future Income
More Buyers
Few Buyers
Cold Weather
Hot Weather
High Economic Activity
Low Economic Activity
Advertisements,
Government Policies,
Special occasions like festivals, etc.
Consumers Satisfaction,
Quality,
Population Growth,
Age of population,
Socio-cultural attitudes and mindset,
Ease of accessibility to a product or service,
Market size, so on...
Price ∝ [1/ Demand]
Income ∝ Demand
∝ is a proportional sign.
Fashion
Popularity
Future Price Expectations ∝ Consumers Current Demand
Future Income Expectations ∝ Consumers Current Demand
Number of Buyers ∝ Demand
Climatic Condition ∝ Demand
Accessibility ∝ Demand
Consumers Satisfaction ∝ Demand
Level of Economic Activity ∝ Demand
Advertisements ∝ Demand
Quality ∝ Demand
Market Size ∝ Demand
Price of Substitute Goods No.1 ∝ Demand for Substitute Goods No.2
Price of a Commodity ∝ [1 / (Demand of its complementary product)]

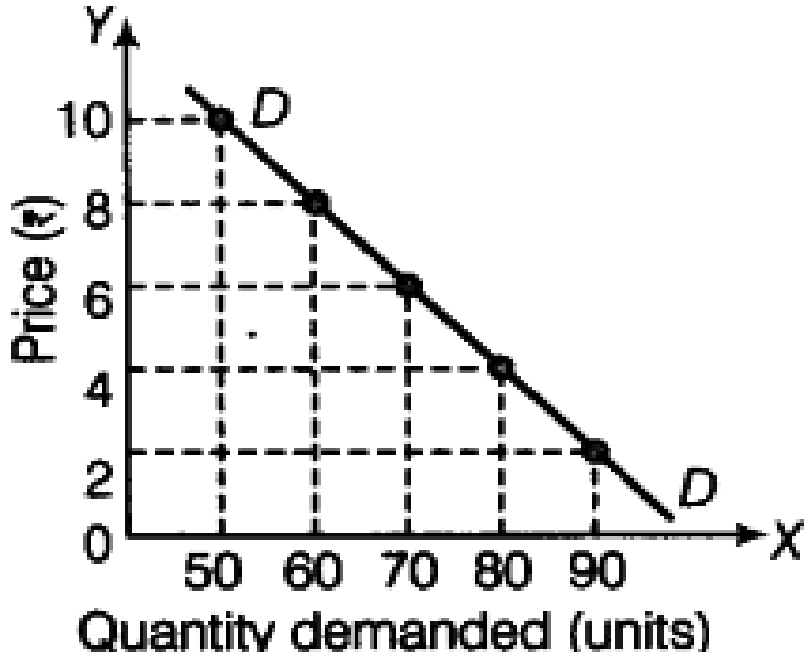
Demand Schedule and Demand Curve

- The **demand schedule** is a table that shows the relationship between the price of the good and the quantity demanded.

- The **demand curve** is a graph of the relationship between the price of a good and the quantity demanded.

Demand schedule

Price per unit (₹)	Quantity demanded (units)
10	50
8	60
6	70
4	80
2	90



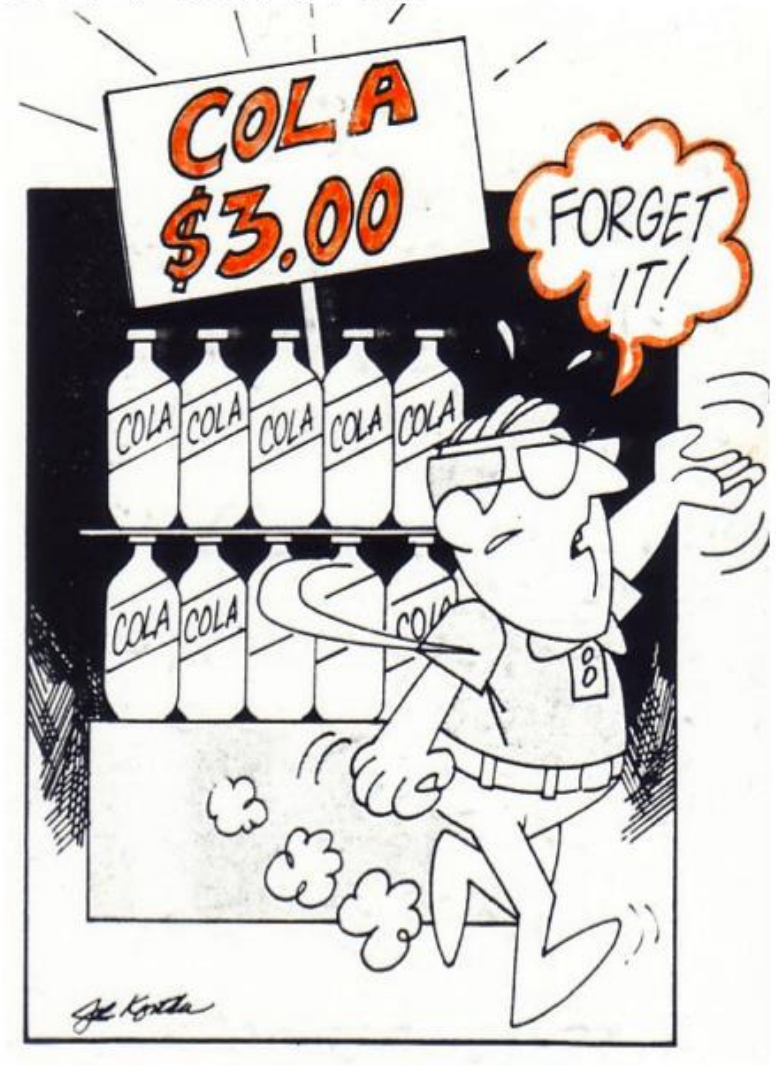
Demand Function

Algebraically, the demand function can be represented as:

Qd = *f* (P, Ps, Pc, Y, A, A', N, CP, PE, TA, T/S*)*

- where Qd = quantity demanded of the good or service
- P = price of the good or service
- Ps = price of substitute goods or services
- Pc = price of complementary goods or services.
- Y = income of consumers.
- A = advertising expenditures (and other marketing expenditures)
- A' = competitors' advertising expenditures on the good or service.
- N = population (and other demographic factors).
- CP = consumer tastes and preferences for the good or service.
- PE= expected (future) changes in price.
- TA= adjustment time period.
- T/S = taxes or subsidies.

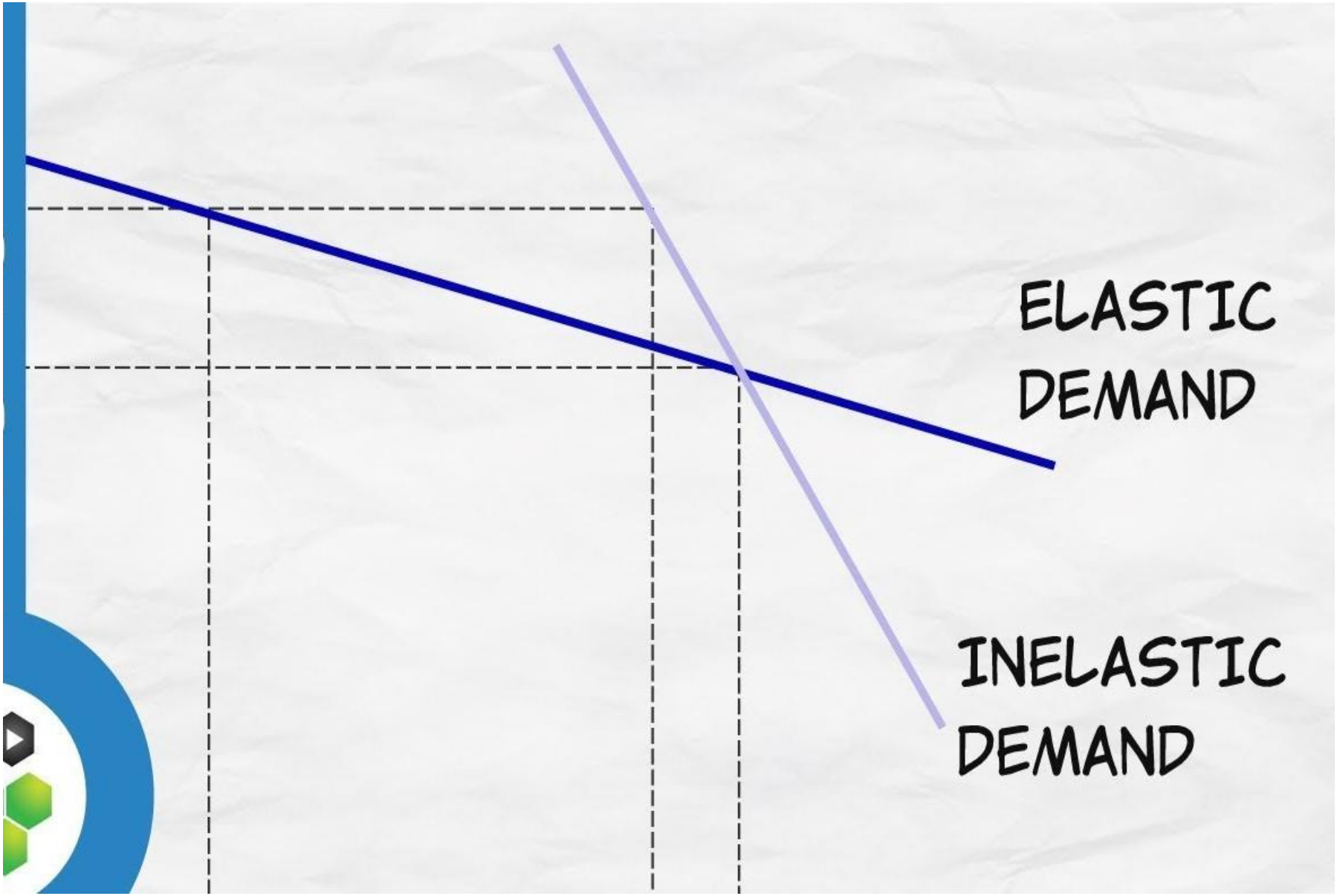
Elastic Demand



Inelastic Demand

Types of elasticity

- Price elasticity of demand
- Income elasticity of demand
- Cross elasticity of demand


ELASTIC
DEMAND
INELASTIC
DEMAND

Price Elasticity of Demand

- The elasticity of demand refers to the extent to which demand changes as prices change.

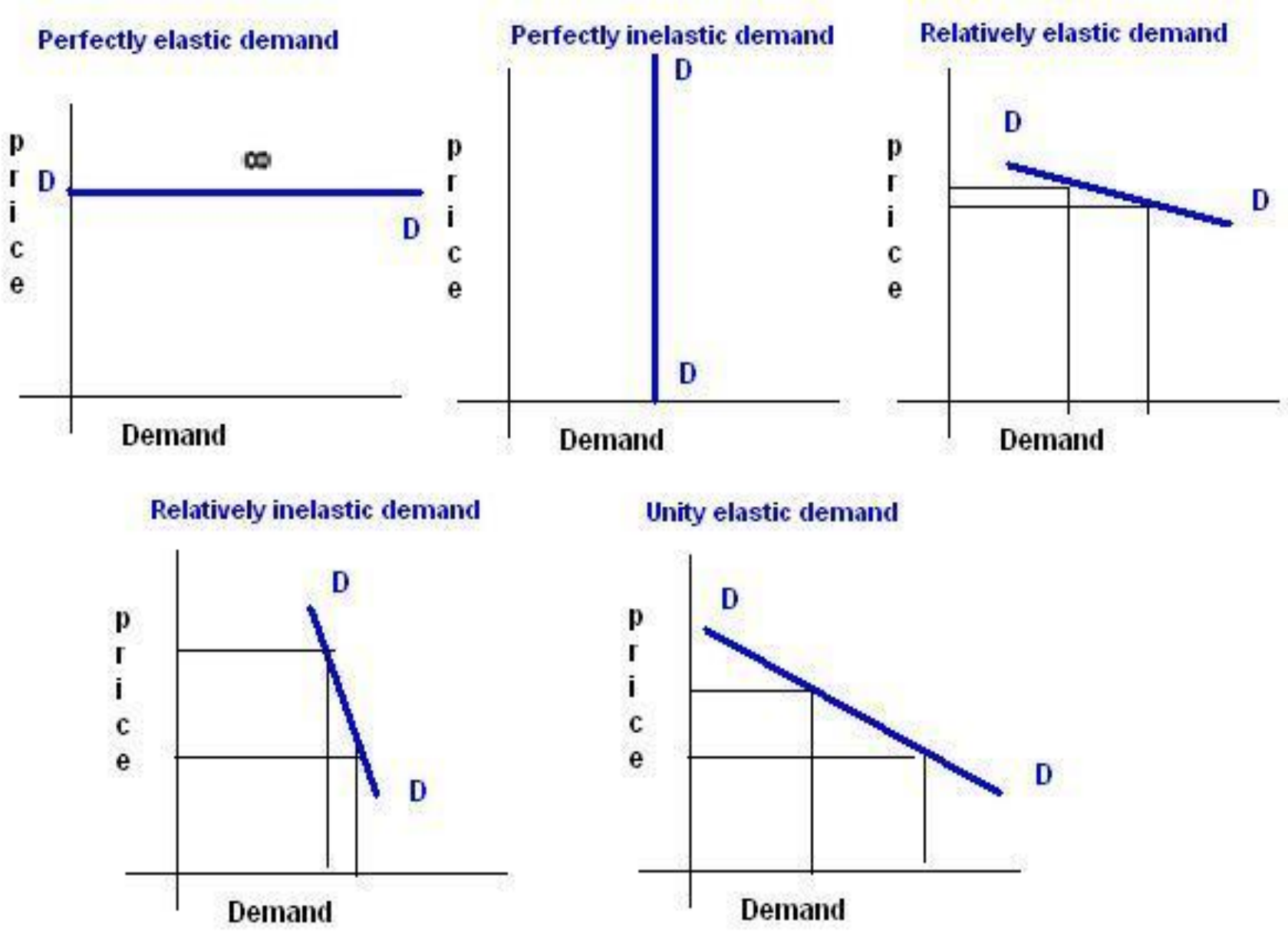
- The precise definition for PED is:
- *The responsiveness of demand to a change in price*

- The formula for Price Elasticity of Demand is:

$$\text{Ped} = \frac{\%\text{ change in quantity demanded}}{\%\text{ change in price}}$$

$$\%\text{ change in quantity demanded} = \frac{\text{difference}}{\text{original}}$$

$$\%\text{ change in price} = \frac{\text{difference}}{\text{original}}$$


Perfectly elastic demand
price
D
∞
D
Demand
Perfectly inelastic demand
price
D
D
Demand
Relatively elastic demand
price
D
D
Demand
Relatively inelastic demand
price
D
D
Demand
Unity elastic demand
price
D
D
Demand

Type	Value	Description
Perfectly Elastic	($E_d = \infty$)	Infinite demand at same price
Perfectly Inelastic	($E_d = 0$)	Same demand at all prices
Highly Elastic	($E_d > 1$)	% Δ in Demand > % Δ in Price
Less Elastic	($E_d < 1$)	% Δ in Demand < % Δ in Price
Unitary Elastic	($E_d = 1$)	% Δ in Demand = % Δ in Price

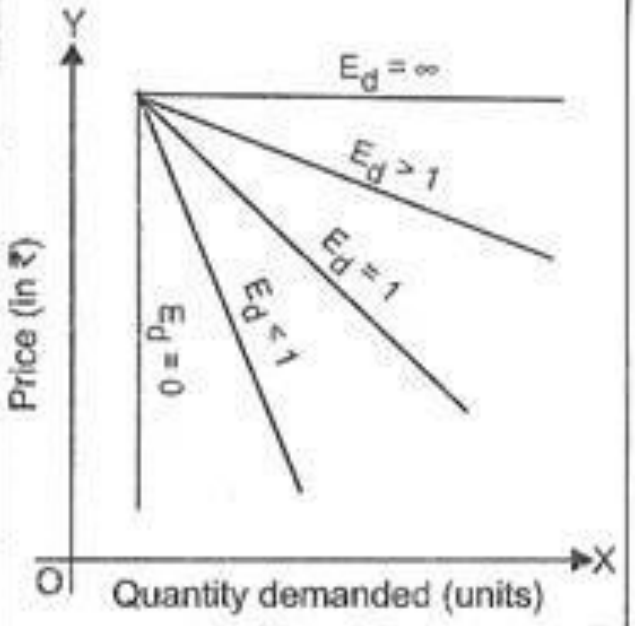


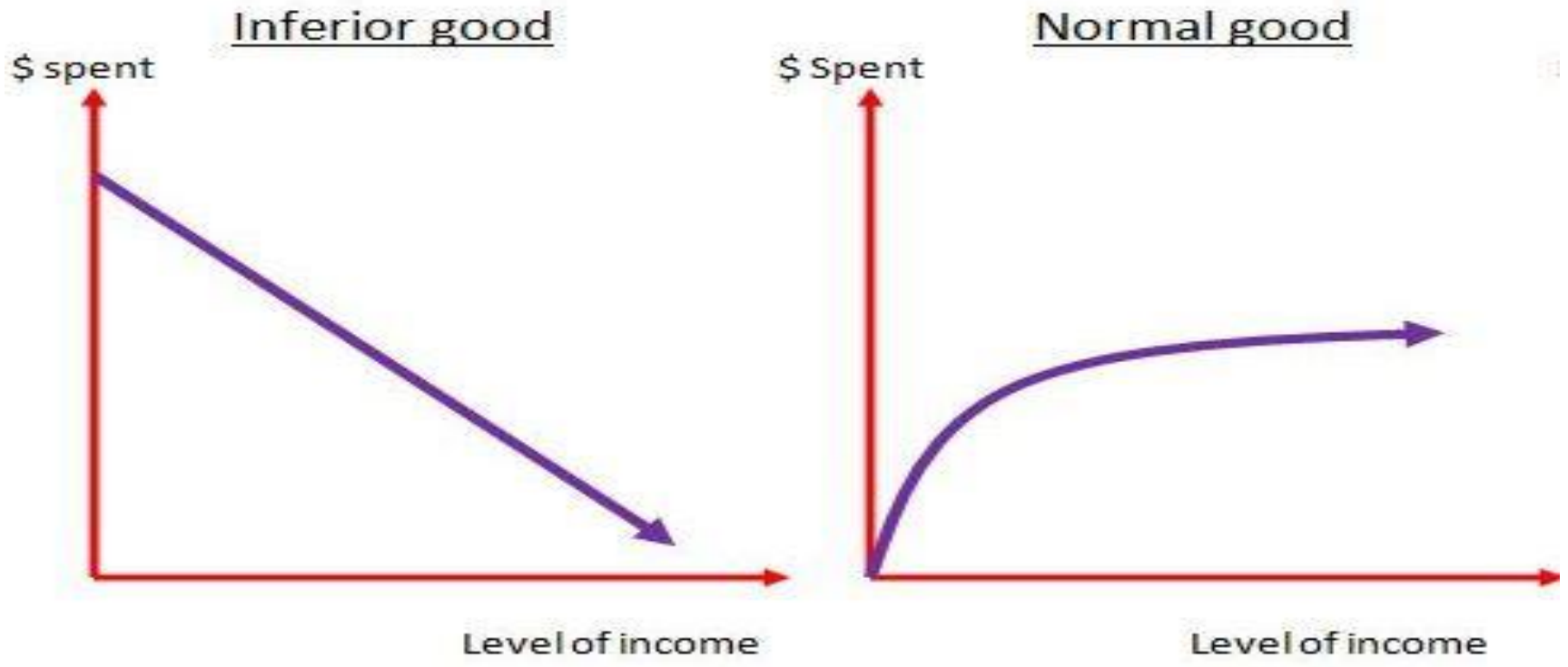
Fig. 4.9

Factors that Affect Price Elasticity

- Necessity or luxury?
- Availability of substitutes
- Consumer income
- Brand loyalty
- Habits
- Frequency of purchase

Income elasticity of demand

$$\text{Income elasticity of demand} = \frac{\%\ \text{change in quantity demanded}}{\%\ \text{change in income}}$$



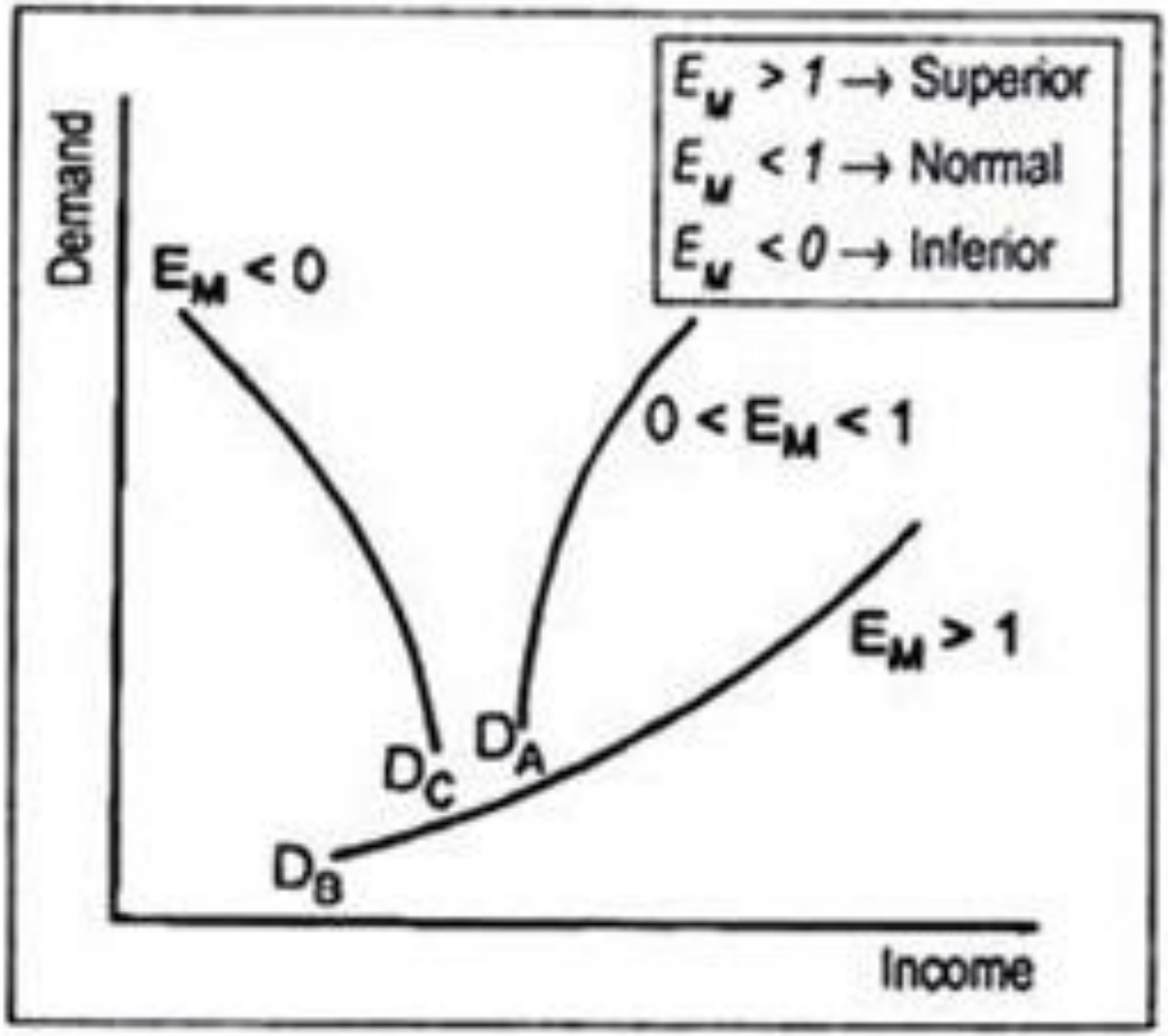
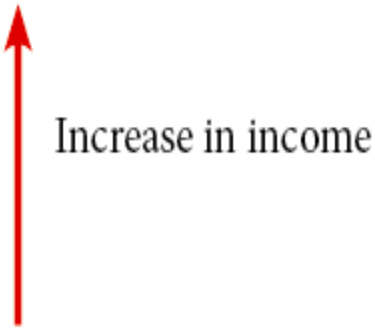


Fig. 2.56: Categories of Income Elasticity

Income Elasticity explained



1. Inferior Good

Fall in demand

e.g. Tesco value bread

2. Income inelastic

small rise in demand

e.g. apples

2. Income elastic 'luxury'

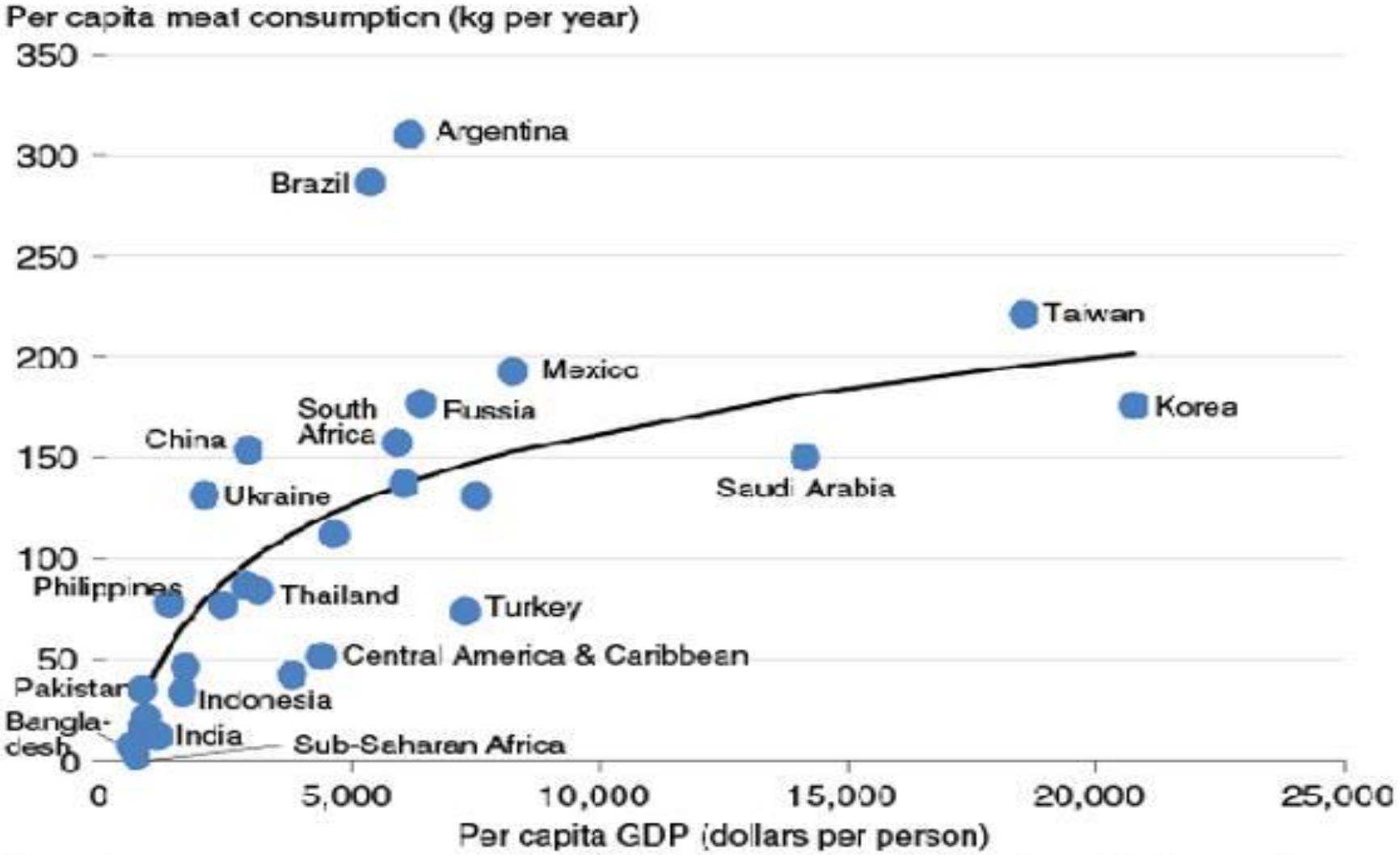
Bigger % rise in demand

e.g. Organic bread

Inferior - higher income but buy less

both are 'normal' goods - higher income = higher demand

Meat consumption generally increases with higher income



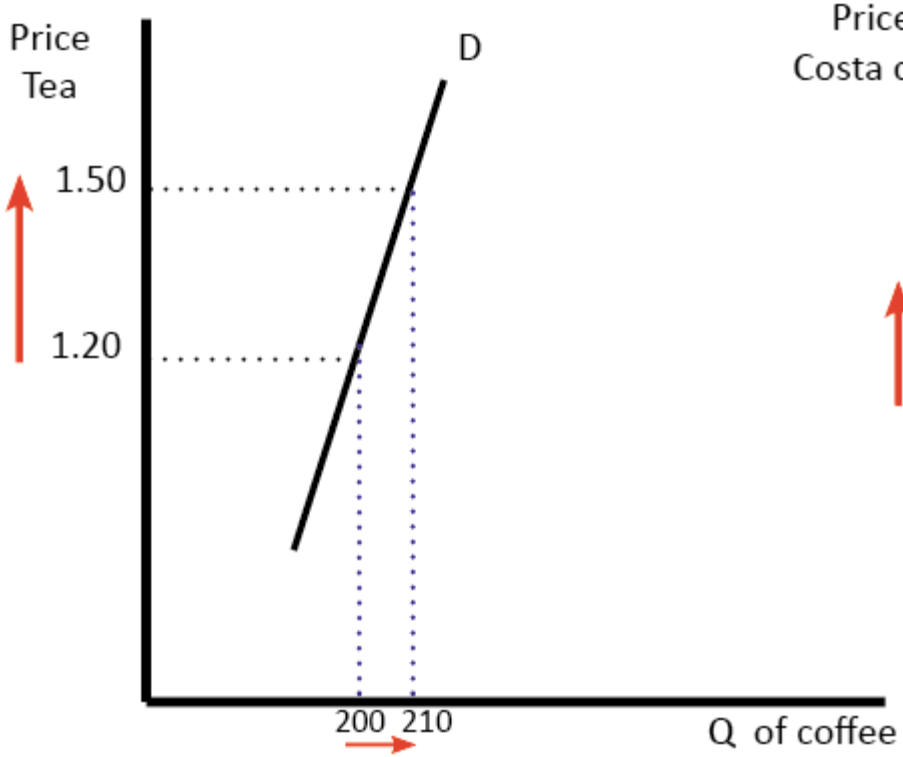
Note: Data are 2009-11 averages for selected developing countries. Logarithmic growth curve based on both developing and developed countries. GDP = Gross Domestic Product.
Source: USDA, Economic Research Service using *USDA Agricultural Projections to 2022* and supporting data.

Cross Elasticity of Demand

Cross elasticity of demand is a measure of the extent to which the demand for a good changes when the price of a substitute or complement changes, other things remaining the same

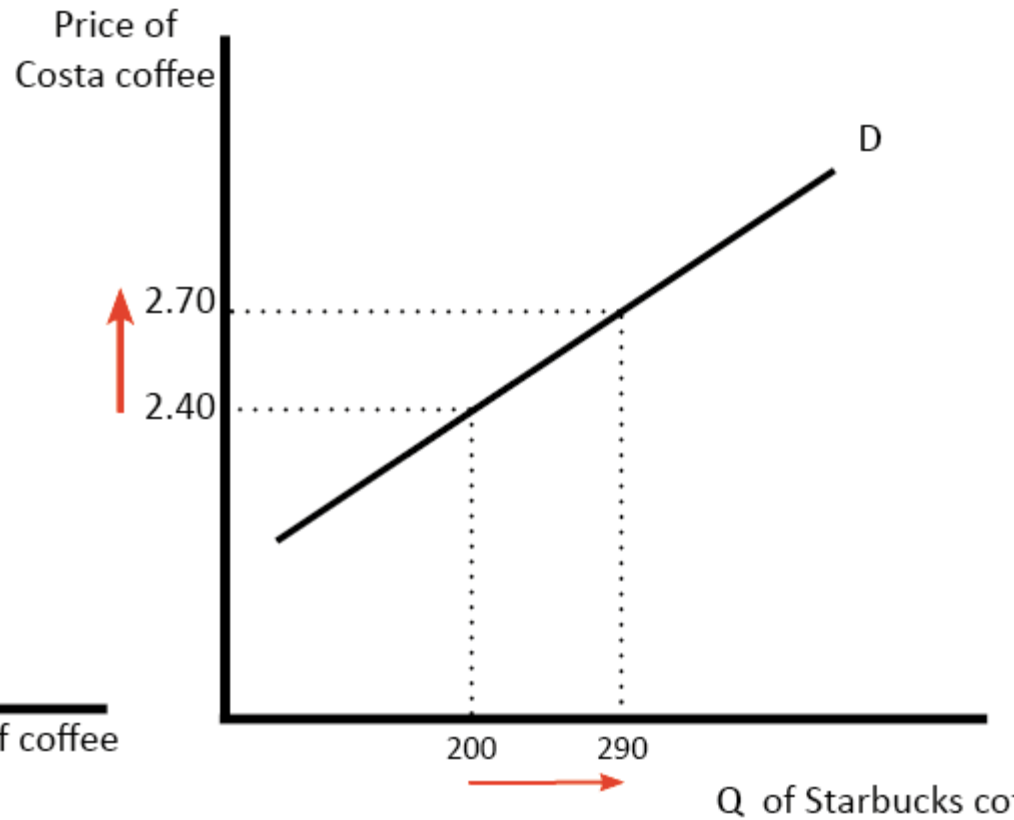
$$\text{Cross elasticity of demand} = \frac{\text{Percentage change in quantity demanded of a good}}{\text{Percentage change in the price of one of its substitutes or complements}}$$

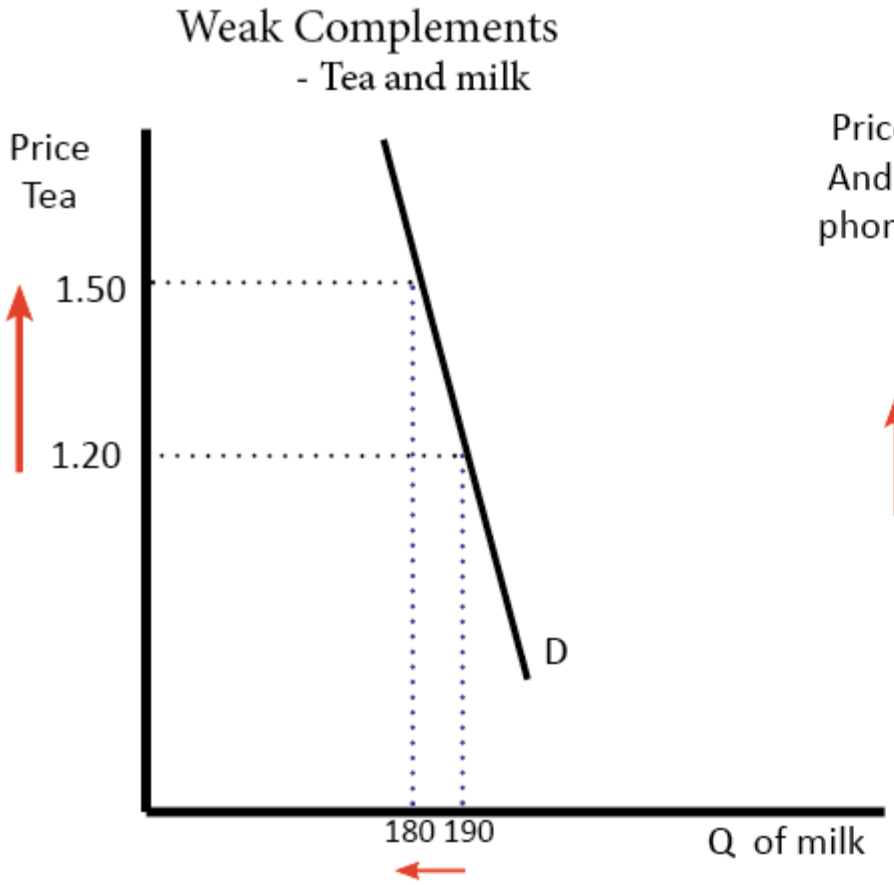
Weak substitutes - Tea and coffee

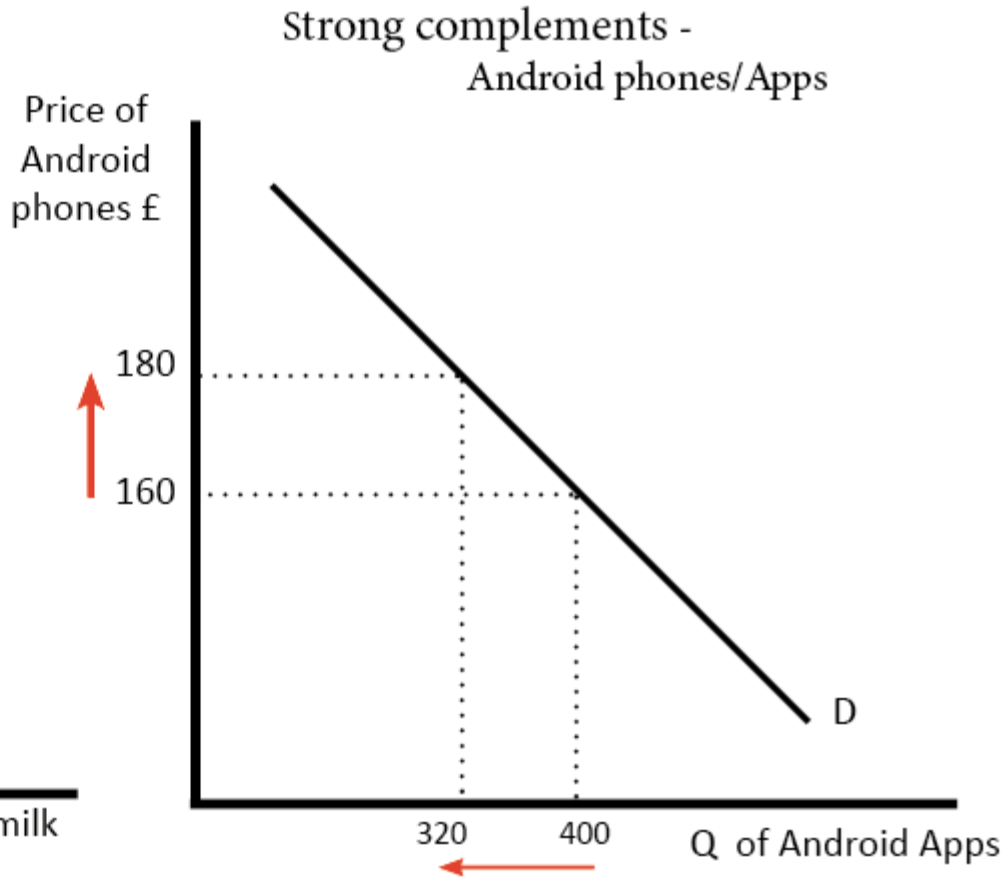


XED = 5/25= **0.2**

Close substitutes - Costa/Starbucks




Weak Complements
- Tea and milk
Price
Tea
1.50
1.20
D
180 190
Q of milk


Strong complements -
Android phones/Apps
Price of
Android
phones £
180
160
D
320
400
Q of Android Apps

PED	
0	Perfectly inelastic
0 to −1	Relatively inelastic
−1	Unitary elastic
−1 to ∞	Relatively elastic
∞	Perfectly elastic

YED	
<0 (negative)	Inferior good – as income rises the demand for the product will fall
0 to +1	Normal good – income inelastic demand
+1 to ∞	Normal good – income elastic demand

XED	
<0 (negative)	Complements
>0 (positive)	Substitutes
0	Unrelated goods

SIGNIFICANCE OF ELASTICITY OF DEMAND

- A) price of factors of production **(land,labour.capital,organisation & technology-rent in industrial areas/village-inecity)**
- B) price fixation
- C) Government policies **(tax policies, raising bank deposit, public utilities(water,ticket), revaluation or derevaluation(importer/xporter)**
- D) forecasting demand **(particular product & services)**
- E) planning levels of output and price**(price elasticity very useful to producer..adequate**

Elasticity Matters!

What do I need to know?

- ✓ The definitions of each elasticity
- ✓ The formula's and be confident in using them
- ✓ How to draw the diagrams
- ✓ The determinants of PED and PES
- ✓ Examples
- ✓ Why they are important

Original Quantity (Q) = 25 units	Original Price (P) = ₹ 4
Fall in Quantity (ΔQ) = – 5 units	Rise in Price (DP) = ₹ 1
New Quantity (Q_1) = 20 units	New Price (P_1) = ₹ 5
Elasticity of Demand (ED) = ?	

Price Elasticity of demand (ED)

$$= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{-5}{1} \times \frac{4}{25} = (-)0.8$$

ED = (–)0.8 (Demand is less elastic as ED < 1)

Negative sign indicates the inverse relationship between price and quantity demanded.

Original Quantity (Q) = 500 units	Original Price (P) = ₹ 20
New Quantity (Q_1) =800 units	New Price (P_1) = ₹ 15
Change in Quantity (ΔQ) = 300 units	Change in Price (ΔP) = –₹ 5
Elasticity of Demand (ED) = ?	

$$\text{Price Elasticity of demand } (ED) = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} = \frac{300}{-5} \times \frac{20}{500} = (-)2.4$$

ED = (–)2.4 (Demand is highly elastic as ED > 1)
Negative sign of ED indicates the inverse relationship between price and quantity demanded.

Income Elasticity of Demand

Normal Good

Income	Quantity
100	20
200	40

$$\frac{\frac{Q_2 - Q_1}{Q_1}}{\frac{Y_2 - Y_1}{Y_1}} = \frac{\frac{40 - 20}{20}}{200 - 100}$$

Cross Price Elasticity of Demand (XED) Calculations

Beats Studio headphones retail at approximately £200 per unit. Following a change in price of the headphones (an increase in £20), there is an increase demand for a rival brand of headphones by 7.5%

What is the cross price elasticity of demand of this price change?

- % change in demand of Y = 7.5%
- % change in price of X = 10%
- Coefficient of PED = +0.75
- The two goods are fairly close substitute products

Table shows price and quantity demanded of goods, X and Y

Price of X	Quantity demanded of X	Quantity demanded of Y
£30	400	250
£20	700	150

Calculate the cross elasticity of demand for Y with respect to the price of X.

- % change in price of X = -33%
- % change in demand for Y = -40%
- XED for good Y =

$$\text{Cross-elasticity} = \frac{\text{Percentage change in quantity demanded of commodity } x}{\text{Percentage change in price of commodity } y}$$

$$\text{or} \quad = \frac{\text{Proportional change in quantity demanded of commodity } x}{\text{Proportional change in price of commodity } y}$$

$$= \frac{\Delta Q_{d_x}}{Q_x} \div \frac{\Delta P_y}{P_y} = \frac{\Delta Q_{d_x}}{\Delta P_y} \times \frac{P_y}{Q_x}$$