MICRO ECONOMICS

PAPER1

B.A PART1

TOPIC :- MEASUREMENTS OF ELASTICITY OF DEMAND

Revision1

The following points highlight the top four methods used for measuring elasticity of demand.

The methods are:-

1. The Percentage Method

2. The Point Method

3. The Arc Method

4. Total Outlay Method.

1. The Percentage Method:

The price elasticity of demand is measured by its coefficient (E_p). This coefficient (E_p) measures the percentage change in the quantity of a commodity demanded resulting from a given percentage change in its price.

Thus

$$E_p = \frac{\%\ change\ in\ q}{\%\ change\ in\ p} = \frac{\Delta q / q}{\Delta p / p} = \frac{\Delta q}{\Delta p} \times \frac{p}{q}$$

Where q refers to quantity demanded, p to price and Δ to change. If $E_P > 1$, demand is elastic. If $E_P < 1$, demand is inelastic, and $E_p = 1$, demand is unitary elastic.

With this formula, we can compute price elasticities of demand on the basis of a demand schedule.

Table.1 : Demand Schedule

Combination	Price (Rs.) Per Kg. of X	Quantity Kgs.of X
A	6	0
B	5	10
C	4	20
D	3	30
E	2	40
F	1	50
G	0	60

Let us first take combinations B and D.

(i) Suppose the price of commodity X falls from Rs. 5 per kg. to Rs. 3 per kg. and its quantity demanded increases from 10 kgs.to 30 kgs.

Then

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(30-10)}{(3-5)} \times \frac{5}{10} = \frac{20}{-2} \times \frac{5}{10} = -5 \text{ or } > 1.$$

This shows elastic demand or elasticity of demand greater than unitary.

Note:

The formula can be understood like this:

$\Delta q = q_2 - q_2$ where q_2 is the new quantity (30 kgs.) and q_i the original quantity (10 kgs.).

$\Delta P = p_2 - p_1$ where p_2 is the new price (Rs.3) and p_l the original price .

In the formula, p refers to the original price (p_1) and q to original quantity (q_1). The opposite is the case in example (i) below, where Rs. 3 becomes the original price and 30 kgs. as the original quantity.

(ii) Let us measure elasticity by moving in the reverse direction. Suppose the price of Arises from Rs. 3 per kg. to Rs. 5 per kg. and the quantity demanded decreases from 30 kgs. to 10 kgs.

Then

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(10-30)}{(5-3)} \times \frac{3}{30} = \frac{-20}{2} \times \frac{3}{30} = -1$$

This shows unitary elasticity of demand.

Notice that the value of Ep in example (ii) differs from that in example (i) depending on the direction in which we move. This difference in the elasticities is due to the use of a different base in computing percentage changes in each case.

Now consider combinations D and F.

(iii) Suppose the price of commodity X falls from Rs. 3 per kg to Re.lper kg. and its quantity demanded increases from 30 kgs. to 50 kgs.

Then

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(50-30)}{(1-3)} \times \frac{3}{30} = \frac{20}{2} \times \frac{3}{30} = -1$$

This is again unitary elasticity.

(iv) Take the reverse order when the price rises from Re. 1 per kg. to Rs. 3 per kg. and the quantity demanded decreases from 50 kgs. to 30 kgs.

Then

$$E_p = \frac{\Delta q}{\Delta p} \times \frac{p}{q} = \frac{(30-50)}{3-1} \times \frac{1}{50} = \frac{-20}{2} \times \frac{1}{50} = -\frac{1}{5} < 1$$

This shows inelastic demand or less than unitary.

The value of E_p again differs in this example than that given in example (iii) for the reason stated above.

2. The Point Method:

Prof. Marshall devised a geometrical method for measuring elasticity at a point on the demand curve. Let RS be a straight line demand curve in Figure. 2. If the price falls from PB (= OA) to MD (= OC), the quantity demanded increases from OB to OD.

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Elasticity at point P on the RS demand curve according to the formula is:

EP = Δq/Δp x p/q

Where Δq represents change in quantity demanded, Δp changes in price level while p and q are initial price and quantity levels.

From Figure 2.

$\Delta q = BD = QM$

$\Delta p = PQ$

$p = PB$

$q = OB$

Substituting these values in the elasticity formula:

$$E_p = \frac{QM}{PQ} \times \frac{PB}{OB}$$

Moreover, $\frac{QM}{PQ} \times \frac{BS}{PB}$

[$\angle PQM = \angle PBS$ being right angles and PQM and PBS are similar Δ_s]

$$\therefore \frac{BS}{PB} \times \frac{PB}{OB} = \frac{BS}{OB}$$

Since, ΔPBS and ΔROS are similar,

$$Ep \text{ at point } P = \frac{BS}{OB} = \frac{OA}{AR} = \frac{PS}{PR} = \frac{Lower\ Segment}{Upper\ Segment}$$

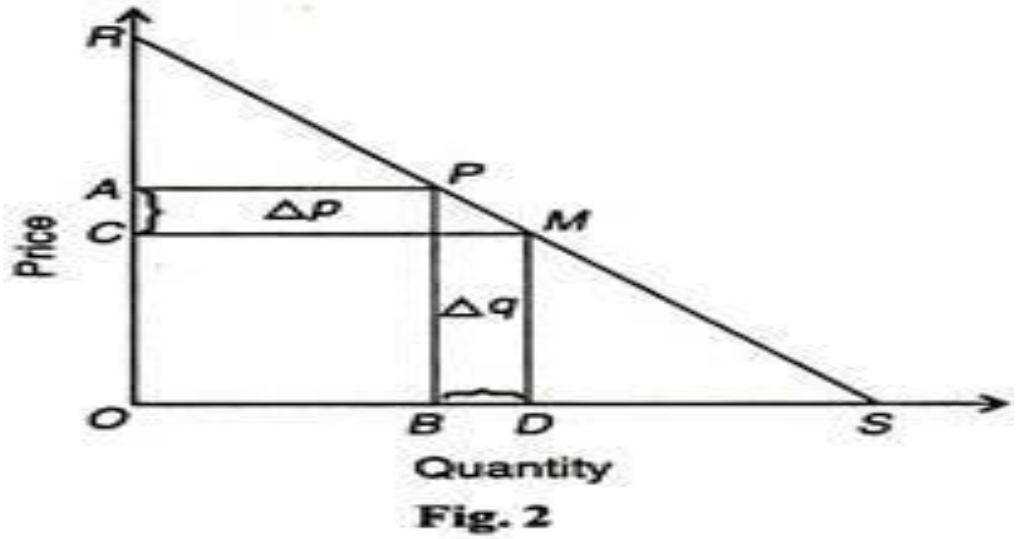


Fig. 2

With the help of the point method, it is easy to point out elasticity at any point along a demand curve. Suppose that the straight line demand curve DC in Figure. 3 is 6 centimeters. Five points L, M, N, P and Q are taken on this demand curve. The elasticity of demand at each point can be known with the help of the above method. Let point N be in the middle of the demand curve. So elasticity of demand at point.

$$N = \frac{CN\ (Lower\ Segment)}{ND\ (Upper\ Segment)} = \frac{3}{3} = 1\ (Unity)$$

Elasticity of demand at point

$$M = \frac{CM}{MD} = \frac{5}{1} = 5 \text{ or } > 1.$$

(Greater than Unity)

Elasticity of demand at point

$$L = \frac{CL}{LD} = \frac{6}{0} = \infty\ (infinity).$$

Elasticity of demand at Point

$$P = \frac{CP}{PD} = \frac{1}{5} = (Less\ than\ Unity).$$

Elasticity of demand at point

$$Q = \frac{CQ}{QD} = \frac{0}{6} = 0\ (Zero)$$

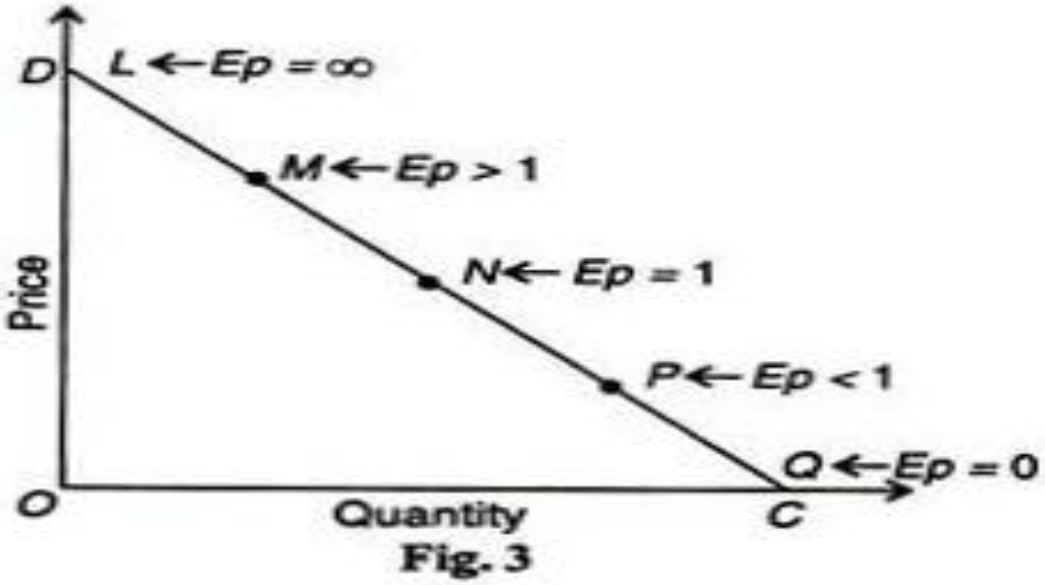


Fig. 3

We arrive at the conclusion that at the mid-point on the demand curve, the elasticity of demand is unity. Moving up the demand curve from the mid-point, elasticity becomes greater. When the demand curve touches the Y- axis, elasticity is infinity. Ipso facto, any point below the mid-point towards the A'-axis will show elastic demand. Elasticity becomes zero when the demand curve touches the X -axis.

Revision2

Gross Domestic Product

The Gross domestic Product (GDP) is the market value of all final goods and services produced within a country in a given period of time. The GDP is the officially recognized totals. The following equation is used to calculate the GDP:

$$GDP=C+I+G+(X-M)GDP=C+I+G+(X−M)$$

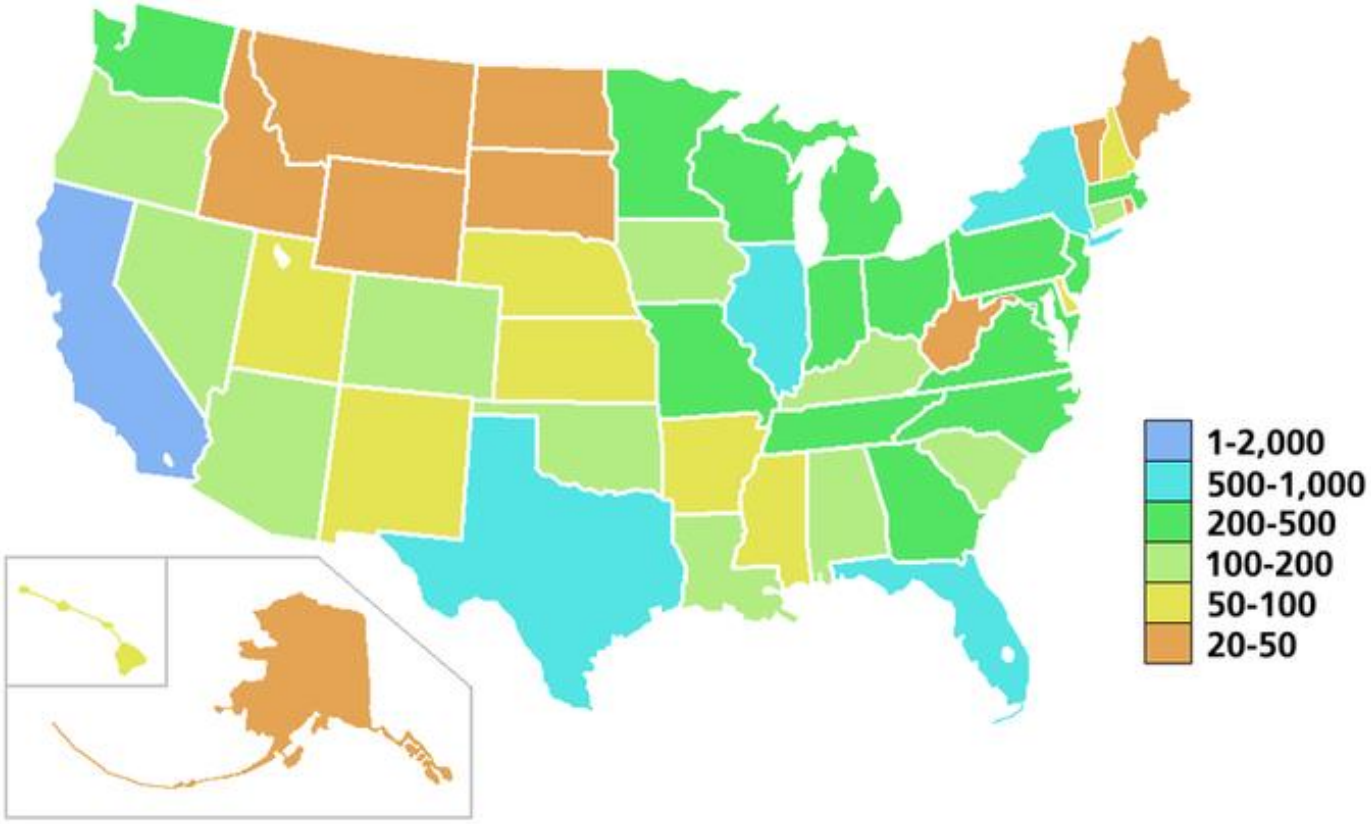
Written out, the equation for calculating GDP is:

GDP = private consumption + gross investment + government investment + government spending + (exports – imports).

For the gross domestic product, “gross” means that the GDP measures production regardless of the various uses to which the product can be put. Production can be used for immediate consumption, for investment into fixed assets or inventories, or for replacing fixed assets that have depreciated. “Domestic” means that the measurement of GDP contains only products from within its borders.

Nominal GDP

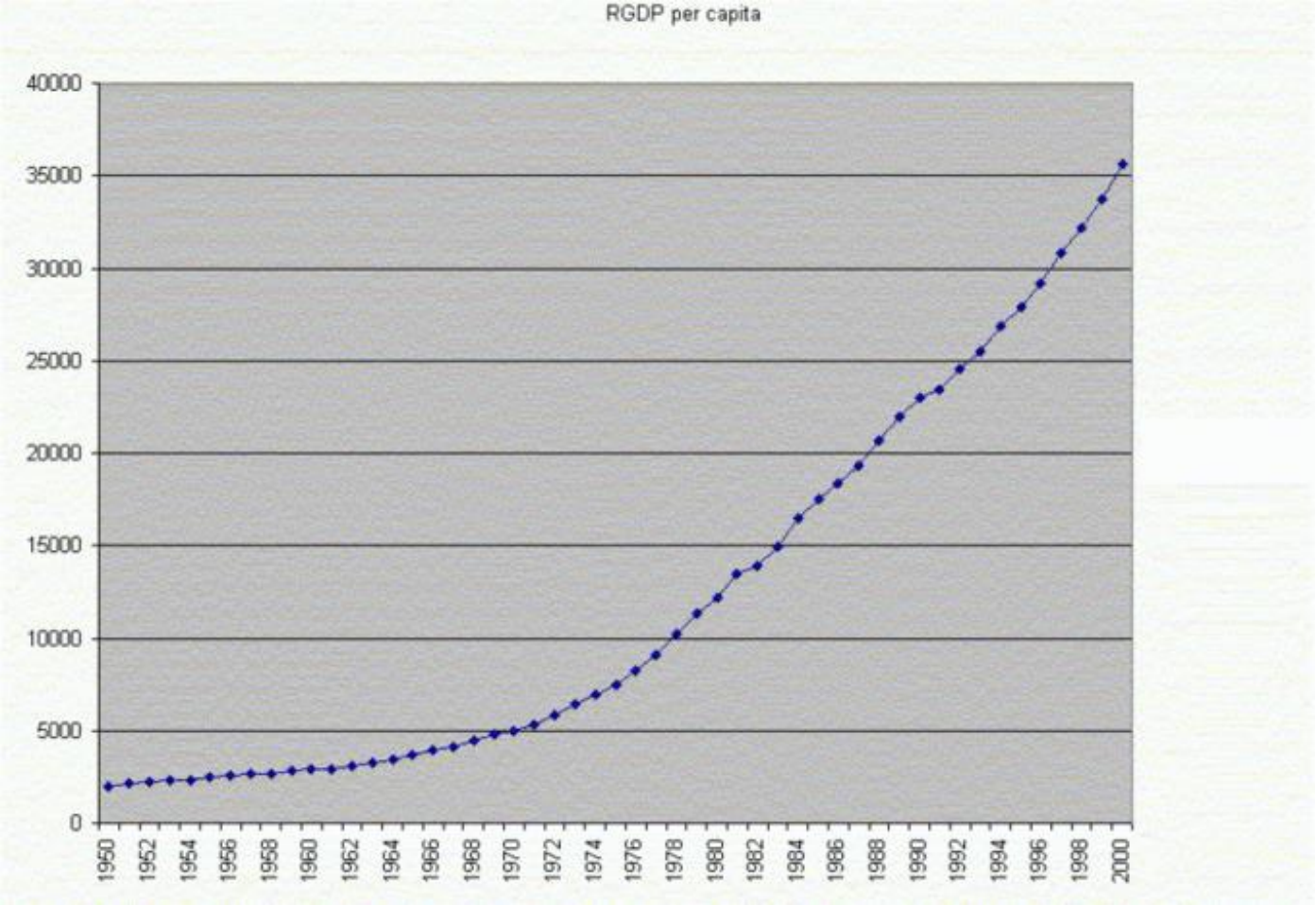
The nominal GDP is the value of all the final goods and services that an economy produced during a given year. It is calculated by using the prices that are current in the year in which the output is produced. In economics, a nominal value is expressed in monetary terms. For example, a nominal value can change due to shifts in quantity and price. The nominal GDP takes into account all of the changes that occurred for all goods and services produced during a given year. If prices change from one period to the next and the output does not change, the nominal GDP would change even though the output remained constant.



Nominal GDP: This image shows the nominal GDP for a given year in the United States.

Real GDP

The real GDP is the total value of all of the final goods and services that an economy produces during a given year, accounting for inflation. It is calculated using the prices of a selected base year. To calculate Real GDP, you must determine how much GDP has been changed by inflation since the base year, and divide out the inflation each year. Real GDP, therefore, accounts for the fact that if prices change but output doesn't, nominal GDP would change.



Real GDP Growth: This graph shows the real GDP growth over a specific period of time.

In economics, real value is not influenced by changes in price, it is only impacted by changes in quantity. Real values measure the purchasing power net of any price changes over time. The real GDP determines the purchasing power net of price changes for a given year. Real GDP accounts for inflation and deflation. It transforms the money-value measure, nominal GDP, into an index for quantity of total output.

The GDP Deflator

The GDP deflator is a price index that measures inflation or deflation in an economy by calculating a ratio of nominal GDP to real GDP.