11: Theory of Demand

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Lecture No - 11: Theory of Demand
Recap from last session

- Simultaneous shift in demand and supply
- Price elasticity of demand
- Degree of price elasticity of demand
- Elasticity and revenue
- Factors influencing price elasticity of demand
Income Elasticity of Demand

Income elasticity ($E_M$) measures the responsiveness of quantity demanded to changes in income, holding the price of the good & all other demand determinants constant.

$$E_M = \frac{\% \Delta Q_d}{\% \Delta M} = \frac{\Delta Q_d}{\Delta M} \times \frac{M}{Q_d}$$
Income Elasticity of Demand

- Positive for a normal good
- Negative for an inferior good
- Zero for a neutral goods
Income Elasticity of Demand

If Em > 1, Luxury good - More than proportionate increase in sales
If Em < 1, Necessity Goods - Less than proportionate change in sales
If Em = 1, Semi Luxury goods - Almost proportionate change in sales
Use of Income Elasticity of Demand

Income-elasticity of products is highly significant in long-run planning and management of production, especially during the period of business cycles.

The concept of income-elasticity can be used in the estimation of future demand, provided that the rate of increase in income and income-elasticity of demand for the given product are known.
Use of Income Elasticity of Demand

This can be useful in forecasting demand for expected changes in consumers’ personal incomes, other things remaining the same.

Knowledge of income-elasticity of demand is also helpful in the avoidance of over- and underproduction.
Cross-Price Elasticity of demand

Cross-price elasticity of demand \((E_{XY})\) measures the responsiveness of quantity demanded of good \(X\) to changes in the price of related good \(Y\), holding the price of good \(X\) & all other demand determinants for good \(X\) constant.
Cross-Price Elasticity of demand

\[ E_{XY} = \frac{\% \Delta Q_X}{\% \Delta P_Y} = \frac{\Delta Q_X}{\Delta P_Y} \times \frac{P_Y}{Q_X} \]

- Positive when the two goods are substitutes
- Negative when the two goods are complements
Promotional/ Advertising Elasticity of Demand

• Expenditure on advertisements and on other sales promotion activities help in promoting sales, but not in the same magnitude or degree at all levels of sales.

• The concept of advertisement elasticity is found useful in the determination of optimum level of advertisement expenditure.
Promotional/Advertising Elasticity of Demand

• This concept assumes a greater significance in deciding advertisement expenditure than other decision variables.

• This is so especially when the government imposes restriction on advertisement cost (as is the case in most developed economies), or there is competitive advertising by the rival firms.
Promotional/ Advertising Elasticity of Demand

It measures the response of quantity demanded to change in the expenditure on advertising and other sales promotion activities.
Promotional/ Advertising Elasticity of Demand

\[ Ea = \frac{\partial Q}{\partial A}. \frac{A}{Q} \]

\( Q = \) quantity of goods sold

\( A = \) unit of advertising expenditure on goods

• The advertisement-elasticity of sales varies between zero and infinity. Thus, \( 0 \leq e_A \leq \infty \)
Promotional/ Advertising Elasticity of Demand - Interpretation

- $e_A = 0$ Sales do not respond to advertisement expenditure
- $0 < e_A < 1$ Increase in total Sales is less than proportionate to the increase in advertisement expenditure
- $e_A = 1$ Sales increase in proportion to the increase in expenditure on advertisement
- $e_A > 1$ Sales increase at a higher rate than the rate of increase in advertisement expenditure.
Promotional/ Advertising Elasticity of Demand – Factors

- The level of total sales. As sales increase, the advertisement-elasticity of sales decreases.

- Advertisement by rival firms. In a highly competitive market, the effectiveness of advertisement by a firm is determined by the relative effectiveness of advertisement by the rival firms.
Promotional/ Advertising Elasticity of Demand – Factors

• Cumulative effect of past advertisements. Additional doses of advertisement expenditures do have cumulative effect on the promotion of sales, and this may considerably increase the advertisement-elasticity of sales.

• Other factors affecting the advertisement-elasticity of sales are those factors demand for the product, including change in product’s price; consumer’s income; growth of substitute goods and their prices.
## Numerical -1

**Demand Schedule**

<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity Demanded</th>
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<tbody>
<tr>
<td>3</td>
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- Compute point price elasticity of demand for decrease in price from Rs 6 to 5.
- Compute point price elasticity of Demand for a increase in price from Rs 5 to 6.
The current price is Rs 12 per kg. Compute E using arc method for an increase in price by one rupee per kg.

<table>
<thead>
<tr>
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<th>Quantity Demanded</th>
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<tbody>
<tr>
<td>10</td>
<td>30</td>
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<tr>
<td>11</td>
<td>25</td>
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<tr>
<td>12</td>
<td>21</td>
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<td>13</td>
<td>18</td>
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</tbody>
</table>
Numerical -3

Government announces a 10 percent dearness allowances to its employees. As a result, average monthly salary of employees increases from 150 liters to 165 liters per month.
Numerical -4

A company increases its advertising expenditure from Rs 10 million to Rs 20 million, as a result its sale increase from 50,000 units to 60,000 units. Find out the advertising elasticity of demand.
The price elasticity of demand is generally defined as the degree of responsiveness of demand for a commodity to changes in its own price. It is the percentage change in quantity demanded as a result of one percent change in the price of the commodity. The own-price elasticity can be measured between two points on a demand curve (for arc elasticity) or on a point (for point elasticity).
Session Summary

- The determinants of a commodity’s price-elasticity of demand include: availability of substitutes
- Nature of the commodity
- Proportion of income spent on the commodity
- Time
- Durability of the commodity and
- Items of addiction.
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Session Summary

• The cross-elasticity (or cross-price elasticity) can be defined as the degree of responsiveness of demand for a commodity to the changes in price of its substitutes and complementary goods.

• If the cross-price elasticity between two goods is positive, the two goods may be considered as substitutes to one another.
Session Summary

• The greater the cross-price elasticity coefficient, the closer the substitute.

• If the cross-price elasticity is negative, the two goods may be considered as complements.

• The higher the negative cross-elasticity coefficient, the higher the degree of complementarity.
Session Summary

• The income-elasticity of demand can be defined as the degree of responsiveness of demand to changes in the consumer’s income.
• The income-elasticity of demand is always positive, especially for normal goods. In the case of inferior goods, the income elasticity of demand is always negative. This is so because the demand for inferior goods decreases with increases in consumer’s income, and vice versa.
Session Summary

The concept of advertisement elasticity is found useful in the determination of optimum level of advertisement expenditure. This concept assumes a greater significance in deciding advertisement expenditure than other decision variables.
Session References

Managerial Economics; D N Dwivedi, 7th Edition
Managerial economics – Christopher R Thomas, S Charles Maurice and Sumit Sarkar
Managerial economics – Geetika, Piyali Ghosh and Purba Roy Choudhury
Managerial economics- Paul G Keat, Philip K Y Young and Sreejata Banerjee
Micro Economics : ICFAI University Press