

FOUNDATION COURSE IN MANAGERIAL ECONOMICS

Dr Barnali Nag
IIT Kharagpur

Lecture 6: Elasticity of Demand and Supply

What we plan to learn this week

- What is elasticity? How is the concept of elasticity applied to economics?
- What is price elasticity of demand? What is price elasticity of supply?
- How are these elasticities related to demand, supply and revenue and expenditure?
- What other elasticities can one measure -what are cross price elasticities and income elasticity?

Elasticity

- *“The ability of a body to resist a distorting influence or stress.....”*
- Elasticity of demand implies how much demand responds to changes in variable like price or income
- Definition: **Elasticity** is a numerical measure of the responsiveness of **quantity demanded** or **quantity supplied** to one of its determinants
- **Price Elasticity of Demand** = $\frac{\% \text{ Change in } Q_d}{\% \text{ Change in } P}$
- i.e. how much demand responds to price change

Price Elasticity of Demand explained

- Law of demand implies if price rises, the quantity demanded in the market will fall. What happens to revenue?
- Price elasticity of demand < 0
- Start and end point matter in calculating... Hence, **mid point method** used

FOUNDATION COURSE IN MANAGERIAL ECONOMICS

Dr Barnali Nag
IIT Kharagpur

Lecture 7: Determinants of Elasticity

What determines price elasticity?

- Responsiveness of demand to price changes varies across commodities, price ranges and other factors
- What factors determine if price elasticity should be high or low?
- Some principles determining price elasticity:
 - breakfast cereal vs. sunglasses
 - ***Price elasticity is higher when substitutes are available***
 - chocolate ice cream vs ice cream
 - ***Price elasticity is higher for narrowly defined goods***
 - Insulin vs meal at a five star restaurant
 - ***Price elasticity is higher for luxuries than necessities***
 - Petrol in the short run vs petrol in the long run
 - ***Price elasticity is higher in the long run than the short run.***

Price elasticity and the slope of the demand curve

- Flatter the demand curve, larger the elasticity and steeper the demand curve, more inelastic the demand
- Perfectly inelastic demand curve: Elasticity = 0
- Perfectly elastic demand curve: Elasticity = ∞
- Inelastic demand curve
- Elastic demand curve
- Unit elasticity of demand
- Although the slope of a linear demand curve is constant, its elasticity varies at different points of the curve

FOUNDATION COURSE IN MANAGERIAL ECONOMICS

Dr Barnali Nag
IIT Kharagpur

Lecture 8: Price Elasticity and Revenue

Price elasticity and total revenue

- Question – What happens to total revenue when I raise the price?
- Since, $TR = P \times Q$, :
- TR may increase from rise in P or,
- TR may fall from fall in Q
- What happens depends on price elasticity of demand

Price elasticity and total revenue

- Price elasticity = % change in Q / % change in P
- Revenue, $TR = P \times Q$
- Inelastic demand \rightarrow Elasticity $< 1 \rightarrow$ % change in $Q < \%$ change in P
- When price rises, TR_{\downarrow} from $Q_{\downarrow} < TR_{\uparrow}$ from P_{\uparrow}
- When price falls, TR_{\uparrow} from $Q_{\uparrow} < TR_{\downarrow}$ from P_{\downarrow}

Case: Does drug interdiction help reducing drug related crimes?

- Two policies to control drug use – 1) interdiction and 2) creating awareness
- Assuming that the total value of drug related crime is equal to total revenue from sale of drugs
- Drugs are addictive, hence necessary to users, hence inelastic

FOUNDATION COURSE IN MANAGERIAL ECONOMICS

Dr Barnali Nag
IIT Kharagpur

Lecture 9: Price Elasticity of Supply

Price Elasticity of Supply

Price Elasticity of Supply = $\frac{\% \text{Change in Supply}}{\% \text{Change in } P}$

- How much Supply responds to Price change
- Mid point method may be used to calculate elasticity
- Flatter the curve, larger the elasticity, steeper the curve, smaller the elasticity
- Price elasticity of supply is always > 0

Types of Supply curves

- Perfectly inelastic supply curve → Elasticity = 0
- Inelastic supply curve → Elasticity < 1
- Elastic supply curve → Elasticity > 1
- Unit elasticity → Elasticity = 1
- Perfectly elastic supply curve → Elasticity = ∞

What factors determine supply elasticity?

- Responsiveness of supply to price changes varies across commodities, price ranges and other factors
- What factors determine if price elasticity of supply would be high or low?
- Some principles :
 - ***Beachfront properties vs new cars***
 - The more easily the suppliers can change the quantity supplied, higher the elasticity
 - ***Hybrid cars in the long run vs hybrid cars in the short run***
 - Firms may need a longer run to expand capacity of production and raise supply. Elasticity of supply is more in the long run than the short run

Other elasticities

- **Cross-price elasticity of demand:** change in demand for one good to in response to change in the price of another good

Cross Price Elasticity of Demand = $\frac{\% \text{ Change in quantity demanded of Good1}}{\% \text{ Change in price of Good2}}$

- Substitutes: Cross Price Elasticity >0
- Complements: Cross Price Elasticity of demand <0