



## Notes – Module 3

### Elasticity

- I. Price Elasticity of Demand
  - a. Amount demand changes in response to a price change.
  - b.  $E_d = \text{percent change in } Q_d / \text{percent change in price}$
  - c. Can't use absolute quantities since it would be ambiguous -- \$1 would yield a different ratio than 100¢, for example.
  - d. Midpoint Formula
    - i. Subtracting different ways can yield different answers, so the "midpoint" of each percent must be calculated.
    - ii.  $E_d = (Q / (Q / 2)) / (P / (P / 2))$
  - e. Elasticities  $> 1$  are *inelastic*. Price changes more than quantity.
  - f. Elasticities  $< 1$  are *elastic*. Quantity changes more than price.
  - g. Increasing price in the *inelastic* region of the demand curve will *raise* total revenue.
  - h. Increasing price in the *elastic* region will *lower* total revenue.
  - i. Determinants of Price Elasticity
    - i. Substitutes. If consumers feel comfortable using another product, they'll be less inclined to tolerate price increases. Demand will be elastic.
    - ii. Income. If prices compose a large proportion of consumers' income, demand will be more elastic. Cars have more inelastic demand than pencils.
    - iii. Luxury. Products consumers deem necessities will have more inelastic demand than luxury products.
    - iv. Time. The longer a price increase is in effect, the more responsive consumers will be.
- II. Price Elasticity of Supply
  - a.  $E_s = \% Q / \% P$
  - b. Same rules for inelasticity vs. elasticity apply as for demand.
  - c. Market Period
    - i. Immediate market period. Suppliers have no time to adjust to changes in price, so supply is perfectly inelastic – they must sell their entire inventory regardless of price.
    - ii. Short run. Suppliers can add resources to their existing capital (more workers to the plant, for example), but don't have enough time to buy more capital. Supply is slightly elastic.
    - iii. Long run. Suppliers can buy or sell capital to adjust to price changes. Supply is very elastic.
- III. Cross Elasticity of Demand
  - a. Measures how much demand changes in response to a change in price for a *different* product.
  - b.  $E_{XY} = (\% Q_X / \% P_Y)$
  - c. Substitutes. Cross elasticity of demand is positive – an increase in price for one product sparks an increase in demand for the other.
  - d. Complements. Cross elasticity of demand is negative – an increase in price for one product decreases demand for the other.
  - e. Independent goods. A cross elasticity near zero means there's little to no relationship between the two goods (airplanes and carrots, for example).
- IV. Income Elasticity of Demand
  - a. Measures how much demand changes in response to a change in income.
  - b.  $E_I = \% Q / \% I$
  - c. Normal goods. Positive income elasticity of demand. An increase in income increases demand.
  - d. Inferior goods. Negative income elasticity. An increase in income decreases demand. (Used cars, etc).