Module 5: Elasticity

elasticity: a general concept used to quantify the response in 1 variable when another variable changes

price elasticity of demand: measure of how responsive buyers are to price changes $= \left| \frac{\% \Delta QD}{\% \Delta P} \right|$ (note absolute value ... $\varepsilon_D > 0$ by convention)

inelastic vs elastic: $\varepsilon_D > 1 \rightarrow$ elastic (very responsive consumers, flatter demand)

$\varepsilon_D < 1 \rightarrow$ inelastic (less responsive consumers, steeper demand)

$\varepsilon_D = \infty \rightarrow$ perfectly elastic (QD drops to 0 for small price increase, flat demand)

$\varepsilon_D = 1 \rightarrow$ unit elastic

$\varepsilon_D = 0 \rightarrow$ perfectly inelastic (QD remains constant w/ price change, vertical demand curve)

determinants of elasticity: amt of competing products, specificity, necessity, consumer search, time

midpoint formula: $\% \Delta QD = \left(\frac{QD_2 - QD_1}{\left(\frac{QD_2 + QD_1}{2} \right)} \right) \times 100$

$\% \Delta P = \left(\frac{P_2 - P_1}{\left(\frac{P_2 + P_1}{2} \right)} \right) \times 100$

$\varepsilon_D = \frac{\% \Delta QD}{\% \Delta P} = \frac{\left(\frac{Q_2 - Q_1}{Q_2 + Q_1} \right)}{\left(\frac{P_2 - P_1}{P_2 + P_1} \right)}$

elasticity & total revenue: $P \times QD = TR$

elasticity tells us which effect wins

inelastic: $\overset{\uparrow}{P} \times \overset{\downarrow}{QD} = \overset{\uparrow}{TR}$; $\overset{\downarrow}{P} \times \overset{\uparrow}{QD} = \overset{\downarrow}{TR}$

elastic: $\overset{\uparrow}{P} \times \overset{\downarrow}{QD} = \overset{\downarrow}{TR}$; $\overset{\downarrow}{P} \times \overset{\uparrow}{QD} = \overset{\uparrow}{TR}$

cross price elasticity: how sensitive QD is to price changes in other goods

$\varepsilon_{xy} = \frac{\% \Delta QD(x)}{\% \Delta P(y)}$

COMPLEMENTS ← | | | → SUBSTITUTES
             -1 0 1

income elasticity: how sensitive QD is to changes in income

$\varepsilon_i = \frac{\% \Delta QD}{\% \Delta I}$

INFERIOR ← | NORMAL | LUXURY →
         -1   0   1
              NECESSITY

price elasticity of supply: how QS changes w/ price changes

inelastic vs elastic: $\varepsilon_S = \frac{\% \Delta QS}{\% \Delta P}$ (very responsive supply, flatter supply)

$\varepsilon_S > 1 \rightarrow$ elastic (less responsive supply, steeper supply)

$\varepsilon_S < 1 \rightarrow$ inelastic (QS drops to 0 for small price decrease, flat supply)

$\varepsilon_S = \infty \rightarrow$ perfectly elastic

$\varepsilon_S = 1 \rightarrow$ unit elastic (QS remains constant w/ price change, vertical supply curve)

$\varepsilon_S = 0 \rightarrow$ perfectly inelastic

determinants of elasticity: amt of inventory, availability of inputs, capacity, entry & exit, time

$\varepsilon_S = \frac{\% \Delta QS}{\% \Delta P} = \frac{\left(\frac{Q_2 - Q_1}{Q_2 + Q_1} \right)}{\left(\frac{P_2 - P_1}{P_2 + P_1} \right)}$