ECO101: Introduction to Microeconomics

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SECTION: 11

LECTURE 07-08

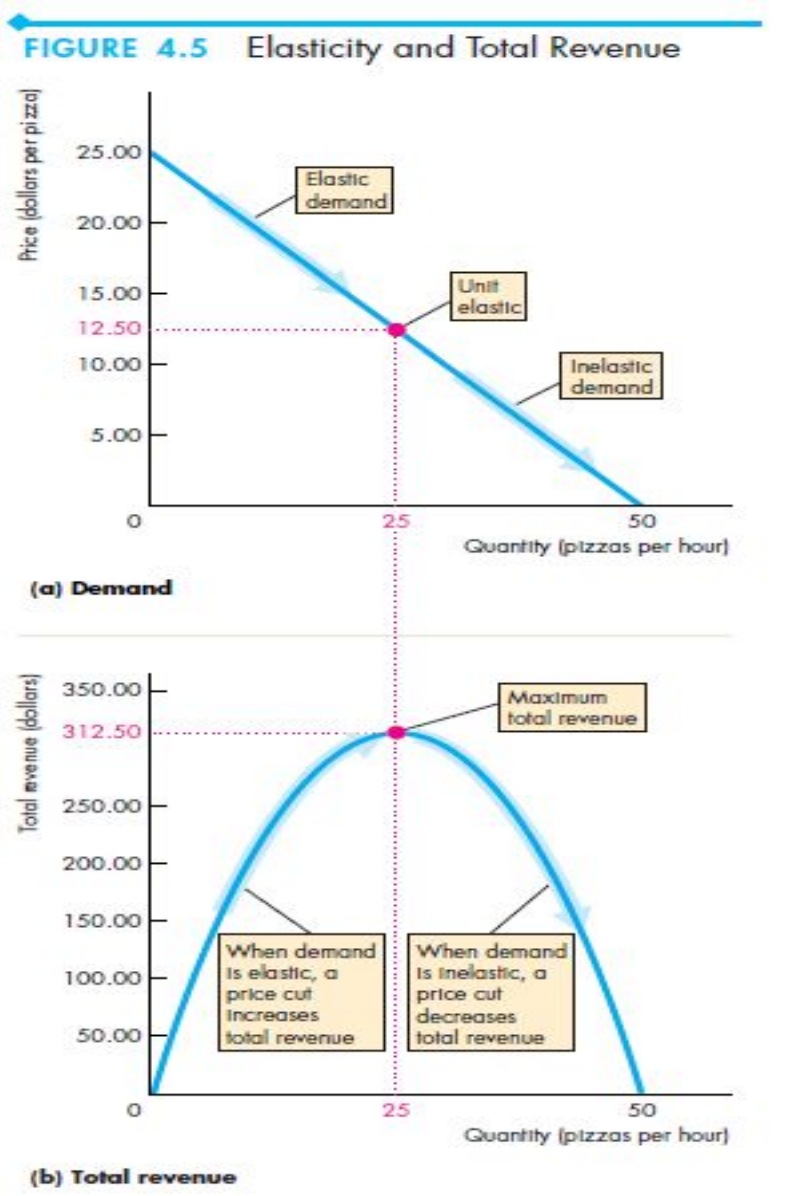
TOPIC: ELASTICITY

Total Revenue and Elasticity

- The **total revenue** from the sale of a good equals the price of the good multiplied by the quantity sold.
- When a price changes, total revenue also changes. But a cut in the price does not always decrease total revenue.
- The change in total revenue depends on the elasticity of demand in the following way:
  - If demand is elastic, a 1 percent price cut increases the quantity sold by more than 1 percent and total revenue increases.
  - If demand is inelastic, a 1 percent price cut increases the quantity sold by less than 1 percent and total revenue decreases.
  - If demand is unit elastic, a 1 percent price cut increases the quantity sold by 1 percent and total revenue does not change.

Contd.

- Figure 4.5 shows how we can use this relationship between elasticity and total revenue to estimate elasticity using the total revenue test.
- The **total revenue test** is a method of estimating the price elasticity of demand by observing the change in total revenue that results from a change in the price, when all other influences on the quantity sold remain the same.
  - If a price cut increases total revenue, demand is elastic.
  - If a price cut decreases total revenue, demand is inelastic.
  - If a price cut leaves total revenue unchanged, demand is unit elastic.



Expenditure and Elasticity

- When a price changes, the change in your expenditure on the good depends on *your* elasticity of demand.
  - If your demand is elastic, a 1 percent price cut increases the quantity you buy by more than 1 percent and your expenditure on the item increases.
  - If your demand is inelastic, a 1 percent price cut increases the quantity you buy by less than 1 percent and your expenditure on the item decreases.
  - If your demand is unit elastic, a 1 percent price cut increases the quantity you buy by 1 percent and your expenditure on the item does not change.

Factors that Influence the Elasticity of Demand

- ***The elasticity of demand for a good depends on***

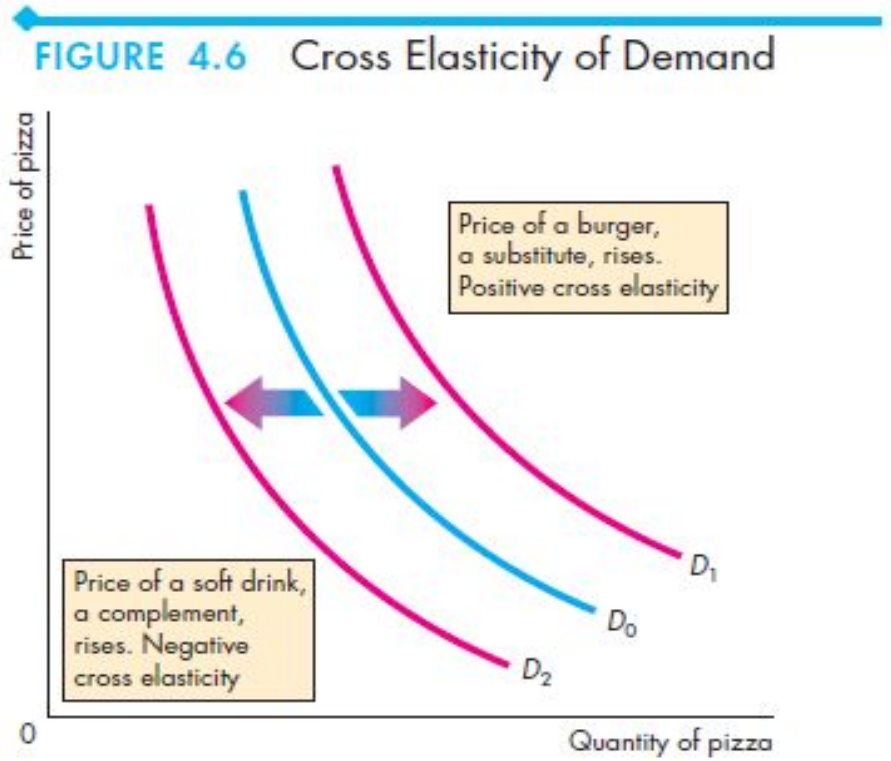
  ■ ***The closeness of substitutes:*** The closer the substitutes for a good or service, the more elastic is the demand for it. The degree of substitutability depends on how narrowly (or broadly) we define a good.

  ■ ***The proportion of income spent on the good*** : Other things remaining the same, the greater the proportion of income spent on a good, the more elastic (or less inelastic) is the demand for it.

  ■ ***The time elapsed since the price change***: The longer the time that has elapsed since a price change, the more elastic is demand.

Cross Elasticity of Demand

- The **cross elasticity of demand** is a measure of the responsiveness of the demand for a good to a change in the price of a substitute or complement, other things remaining the same.
- Cross Elasticity of Demand (XED)= (Percentage change in quantity demanded) / (Percentage change in price of a substitute or complement)
- The cross elasticity of demand can be positive or negative. It is positive for a substitute and negative for a complement.



Cross Elasticity of Demand: The case for Substitutes

- Suppose that the price of pizza is constant and people buy 9 pizzas an hour. Then the price of a burger rises from $1.50 to $2.50. No other influence on buying plans changes and the quantity of pizzas bought increases to 11 an hour.
- **$\Delta Q/Qave$ * 100 = (+2/10) * 100 = + 20%.**
- **Δ *P/Pave* * 100 = (+ $1/$2) * 100 = +50%**
- So the cross elasticity of demand for pizza with respect to the price of a burger is **(+20%)/ (+50%) = 0.4**
- Pizza and burgers are substitutes. Because they are substitutes, when the price of a burger rises, the demand for pizza increases.
- Because a *rise* in the price of a burger brings an *increase* in the demand for pizza, the cross elasticity of demand for pizza with respect to the price of a burger is *positive*. Both the price and the quantity change in the same direction.

XED: The Case for Complements

- Now suppose that the price of pizza is constant and 11 pizzas an hour are bought. Then the price of a soft drink rises from $1.50 to $2.50. No other influence on buying plans changes and the quantity of pizzas bought falls to 9 an hour.
- The change in the quantity demanded is the opposite of what we've just calculated:
- The quantity of pizzas demanded decreases by 20 percent (–20%).
  - $\Delta Q/Qave$ *** 100 = (-2/10) * 100 = - 20%.**
- The change in the price of a soft drink, a complement of pizza, is the same as the percentage change in the price of a burger that we've just calculated.
  - Δ ***P/Pave*** *** 100 = (+ $1/$2) * 100 = +50%**
- **XED= -20% / +50% = -0.4**
- Because pizza and soft drinks are complements, when the price of a soft drink rises, the demand for pizza decreases.

Income Elasticity of Demand (YED)

- The **income elasticity of demand**, which is a measure of the responsiveness of the demand for a good or service to a change in income, other things remaining the same.
- ***YED= (% change in quantity demanded) / (% change in income)***
- Income elasticities of demand can be positive or negative and they fall into three interesting ranges:
  - Greater than 1 (*normal* good, income elastic)
  - Positive and less than 1 (*normal* good, income inelastic)
  - Negative (*inferior* good)

Income Elastic Demand

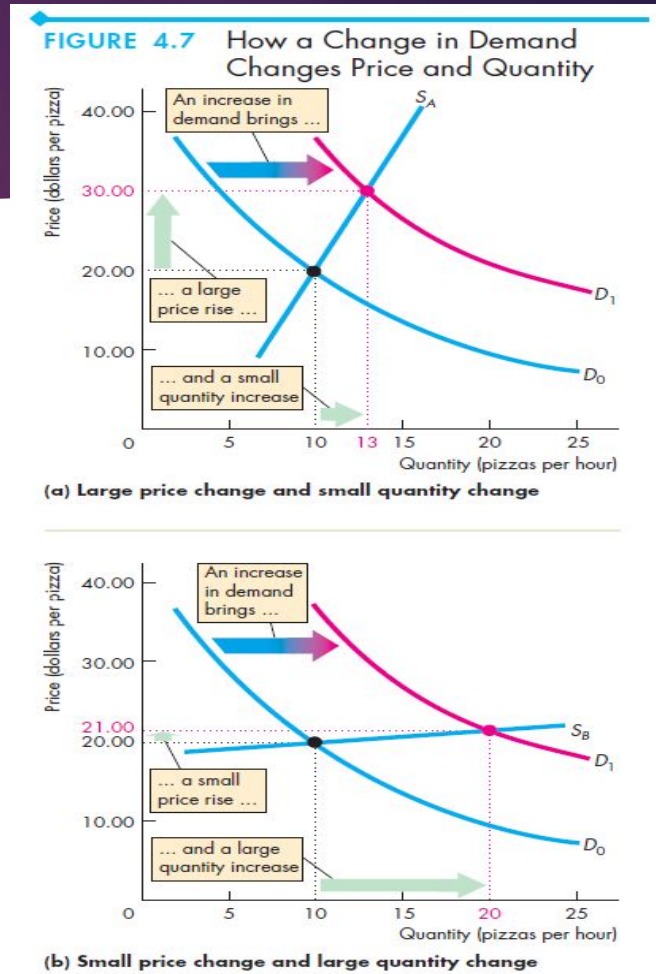
- Suppose that the price of pizza is constant and 9 pizzas an hour are bought. Then incomes rise from $975 to $1,025 a week. No other influence on buying plans changes and the quantity of pizzas sold increases to 11 an hour.
- The change in the quantity demanded is +2 pizzas. The average quantity is 10 pizzas, so the quantity demanded increases by 20 percent.
- The change in income is +$50 and the average income is $1,000, so incomes increase by 5 percent.
- **YED= +20%/ 5% = 4**
- The demand for pizza is income elastic. The percentage increase in the quantity of pizza demanded exceeds the percentage increase in income. *When the demand for a good is income elastic, the percentage of income spent on that good increases as income increases*

YED (contd.)

- ***Income Inelastic Demand*** If the income elasticity of demand is positive but less than 1, demand is income inelastic.
- The percentage increase in the quantity demanded is positive but less than the percentage increase in income.
- *When the demand for a good is income inelastic, the percentage of income spent on that good decreases as income increases.*
- ***Inferior Goods*** If the income elasticity of demand is negative, the good is an *inferior* good.
- The quantity demanded of an inferior good and the amount spent on it *decrease* when income increases.
- Goods in this category include small motorcycles, potatoes, and rice. Low-income consumers buy most of these goods.

Elasticity of Supply

- When demand increases, the equilibrium price rises and the equilibrium quantity increases. But does the price rise by a large amount and the quantity increase by a little? Or does the price barely rise and the quantity increase by a large amount?
- The answer depends on the responsiveness of the quantity supplied to a change in price.
- The different outcomes arise from differing degrees of responsiveness of the quantity supplied to a change in price. We measure the degree of responsiveness by using the concept of the elasticity of supply.



Calculating Elasticity of Supply

- The **elasticity of supply** measures the responsiveness of the quantity supplied to a change in the price of a good when all other influences on selling plans remain the same.
- PES= (% change in the quantity supplies)/ (% change in the quantity demanded)
- We use the same method that you learned when you studied the elasticity of demand.
- If the quantity supplied is fixed regardless of the price, the supply curve is vertical and the elasticity of supply is zero. Supply is perfectly inelastic.
- A special intermediate case occurs when the percentage change in price equals the percentage change in quantity. Supply is then unit elastic.
- If there is a price at which sellers are willing to offer any quantity for sale, the supply curve is horizontal and the elasticity of supply is infinite. Supply is perfectly elastic.

Factors that Influence the Elasticity of Supply

- The elasticity of supply of a good depends on
  - Resource substitution possibilities
  - Time frame for the supply decision
    - Momentary supply
    - Short-run supply
    - Long run supply

READ Factors that influence the Elasticity of Supply from the text book, and ask me if you have any questions.