

## TOPIC 16: ELASTICITY III

- I. Planet Money and Christmas Trees
- II. Price elasticity of supply
  - a. This is a similar concept as price elasticity of demand except it describes how *producers* respond to a price change.
    - i. Again, inelasticity implies a steep curve and elasticity implies a gentle curve.
  - b. Determinants
    - i. *Availability of Inputs*. The easier it is to gather more inputs of production (labor, raw materials, etc), the easier production can adapt to changes in price.
    - ii. *Capacity/Transition*. Industries with flexible production capacity tend to have more elastic supply curves. Firms can easily respond to minor changes in prices by reducing or increasing capacity as needed. Similarly, industries that can easily move to and from another industry witness greater elasticity. Textbook production is more elastic than ocean liner construction. Both capacity and transition address the willingness to find inputs (because there's only so much one can handle).
    - iii. *Global and Local*. The local supply of any good will be more elastic than the regional supply and *that* will be more elastic than the global supply. Increasing world production requires spending a lot more to produce. Increase local production simply requires transporting goods from one part of the world to another, spending the much smaller transportation cost. Note how this idea connects with the capacity/transition determinant. In practice, it is a particular form of capacity since their production is more flexible.
    - iv. *Time*. The more time a producer has to adapt to change, the easier it is to find more inputs. It takes time to build factories and find labor. Time addresses the ease of employing inputs, both in finding them and in using them.
  - c. A good can have a perfectly elastic supply. Everywhere on the supply curve the calculation reveals an elastic supply. Perfectly elastic supply curves are horizontal lines. An example would be toothpicks.

- d. A good can have a perfectly inelastic supply. Everywhere on the supply curve the calculation reveals an inelastic supply. Perfectly inelastic supply curves are vertical lines. Picasso paintings are example.

### III. Calculating elasticity of supply

- a. In general, elasticity of supply for good x is calculated using the formula:

$$\epsilon_s = \frac{\% \Delta Q_x}{\% \Delta P_x}$$

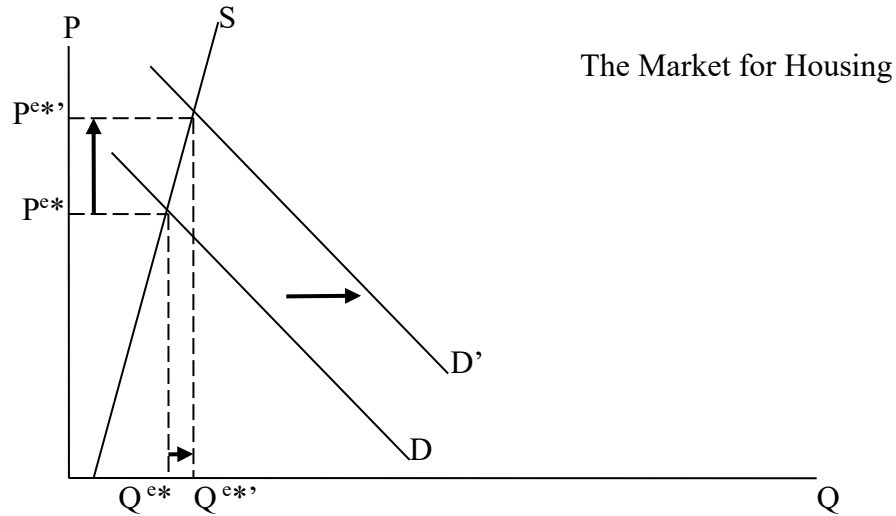
- i. If  $\epsilon_s > 1$ , the good is elastic.
  - ii. If  $\epsilon_s = 1$ , the good is unit elastic.
  - iii. If  $\epsilon_s < 1$ , the good is inelastic.
- b. The arc price elasticity of supply for good x (or, the midpoint method) is:

$$\epsilon_s = \frac{\Delta Q_x / \overline{Q_x}}{\Delta P_x / \overline{P_x}}$$

- c. *Example:* Suppose hamburgers sell for \$1 each with 1900 pieces produced. Also suppose the price falls to \$0.90 and so the number produced falls to 1500. Elasticity is  $\frac{1900-1500/1700}{1.00-0.90/0.95}$ , or 2.235: an elastic good.

### IV. Applications

- a. The price elasticity of supply of housing is tremendously inelastic. It takes a lot of time, skilled labor, and materials to build homes and there are numerous regulatory hurdles to jump through. Politicians will often suggest giving money to various groups (low income groups, first time homebuyers) but these efforts shift the demand curve and prices just go up and up as a result with very little increase in quantity supplied.



b. Gun buyback programs

- i. Between August of 1999 and December of 2000, DC police bought over 6000 guns from residents (at a total cost of \$528,000). Similar programs have occurred in other US cities. The theory is, less guns on the street means less crime.
- ii. Is it true that DC police buying guns will reduce the total number of guns on the streets of DC?
- iii. What types of guns will be sold back to DC?
- iv. What is the elasticity of supply?
- v. Could this *increase* the number of guns on the street?