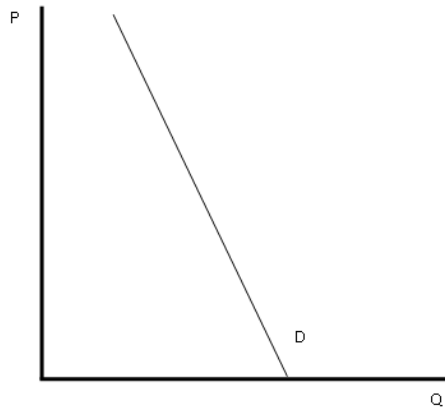


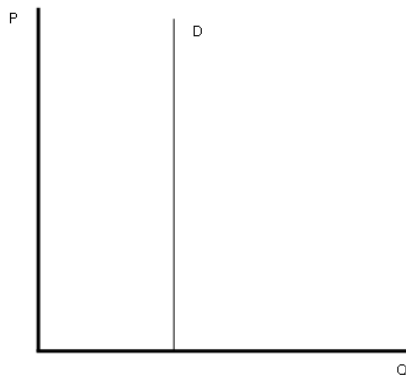
# Lecture # 5 – Elasticity

## I. Elasticity

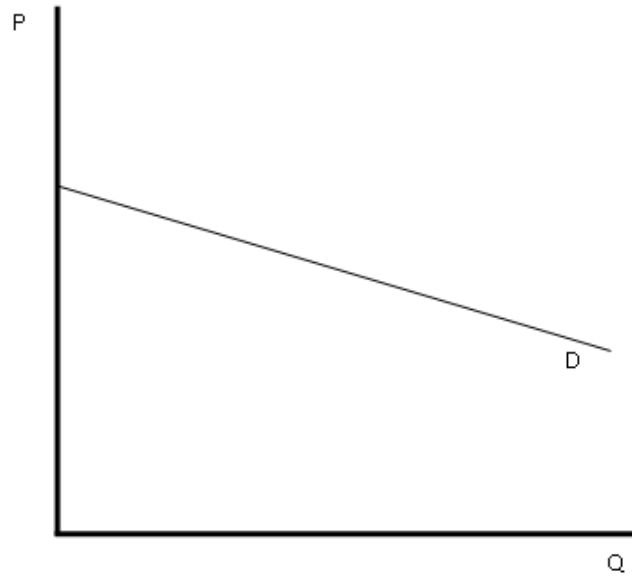
- Elasticity tells us the percentage change that will occur in one variable due to a one percent change in another variable.
  - It is a unit-free measure of comparison.
- Price elasticity of demand measures the sensitivity of quantity demanded to price changes. It tells us the percentage change in quantity demanded for a 1% change in price.
  - $\epsilon_p = \% \text{ change quantity demanded} / \% \text{ change price}$
  - Elastic vs. inelastic
    - absolute value  $> 1 = \textit{elastic}$
    - absolute value  $< 1 = \textit{inelastic}$
  - Demand curves are steeper when demand is inelastic
    - Inelastic demand is a steep demand curve
      - Quantity demanded does not change much, even for large changes in price.



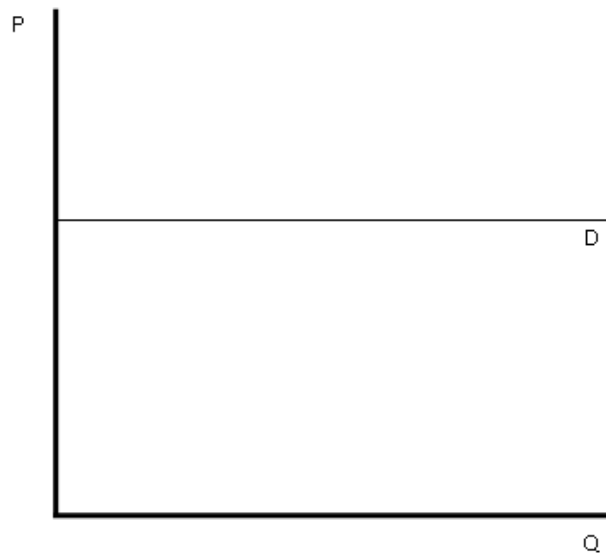
- An extreme case is perfectly inelastic demand: quantity demanded is the same at any price:



- Elastic demand is a flat demand curve.
  - Even small changes in price result in large changes in quantity demanded.



- An extreme case is perfectly elastic demand: the price is the same for any quantity demanded.

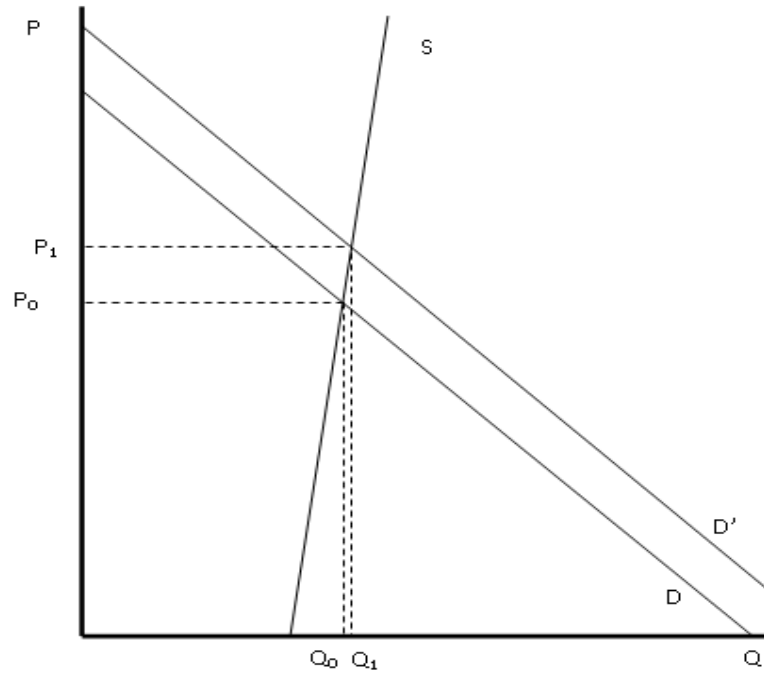


- Elastic vs. inelastic
  - absolute value  $> 1$  = *elastic*
  - absolute value  $< 1$  = *inelastic*
  - Elasticity and revenue:
    - When price is inelastic, price and revenue move together. An increase in price raises revenue.
      - *Intuition:* if demand is inelastic, consumers will not respond much to a change in price. Most people still purchase the good, and they pay more to do so.
    - When price is elastic, price and revenue move in the opposite direction. Revenues fall when the price is raised.
      - *Intuition:* if demand is elastic, consumers respond strongly to a change in price. The drop in quantity dominates the increased price.
- Cross-price elasticity of demand -- the percentage change in quantity demanded of good  $x$  due to a 1% change in price of good  $y$ .
  - $e_{xy} < 0$  implies compliments (e.g. coffee and sugar)
  - $e_{xy} > 0$  implies substitutes (e.g. honey and sugar)
- Income elasticity of demand -- the percentage change in quantity demanded due to a one percent change in income.
  - $e_y < 0$  is an inferior good
  - $e_y > 0$  is a normal good
    - $e_y > 1$  is a luxury
    - $e_y$  between 0 and 1 is a necessity
- Although the above examples are for demand, note that we can do the same thing for supply.

## II. Short-run vs. Long-run elasticities

- Factors influencing elasticity include:
  - Availability of substitutes
  - Need: how important is the good to consumers
  - Time: consumers are more flexible when they have more time to change (more on this below)
  - Expenditure as a percentage of income
    - Price changes matter more when the good uses up a larger share of your income
- In this section, we focus on the role of time.
- Short- vs. long-run elasticity
  - For most goods, demand is more inelastic in the short run than the long run
    - More opportunities to change behavior are available in the long run.
    - For example, when gas prices rise, people can't do much right away, but eventually they can buy more fuel-efficient cars.
  - For *durable* goods, demand is more elastic in the short run.
    - Durable goods are goods that last a long time, such as cars. When prices rise, people can put off buying a new car. However, eventually they will need to buy one, so demand becomes more inelastic as time passes.

- The articles on housing illustrate why elasticity is important.
  - In the short-run, supply is very inelastic. This is particularly true in areas where there isn't much room for new housing, such as the Bay Area. Thus, as demand increases, prices rise sharply.



- We will discuss what this means for policy in class.