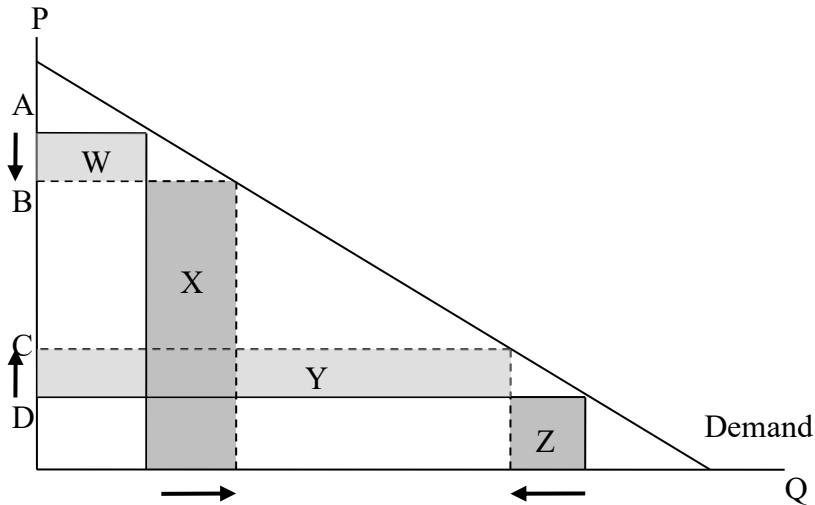


TOPIC 09: ELASTICITY I

- I. Price elasticity of demand
 - a. We've discussed that people buy less or more of something as the price changes but how much more or less? That depends on the elasticity of the good.
 - i. When a good is elastic, a change in price drastically changes the quantity demanded (such as fast food).
 - ii. When a good is unit-elastic, a change in the price equally changes the quantity demanded.
 - iii. When a good is inelastic, a change in price slightly changes the quantity demanded (such as gasoline).
 - b. The elasticity changes based on where you are on the demand curve. It is not the same thing as the slope as the demand curve.
 - c. Determinants
 - i. *Availability of Substitutes*. More available alternatives offer options to consumers when the price rises and more places for new consumers to come from when the price falls. Overseas travel has very few substitutes—air travel and the occasional cruise. City travel has several substitutes—metro, taxis, driving, buses, and walking.
 - ii. *Proportion of budget/Importance*. Goods that consume a larger size of a budget tend to be more elastic than goods that are much smaller. People will shop around a great deal more when buying a car than a frozen dinner. At the same time, goods that are more critical to a particular desire tend to be less elastic than goods that are merely a casual interest because those are easier to simply walk away from. Both of these notions speak to the willingness to find substitutes.
 - iii. *Time/Search costs*. The more time a consumer has to adjust to price changes, the more elastic the good becomes. Time offers more chances to find substitutes—such as learning about a cruise ship that travels to Europe—or decrease in the good's importance—such as kicking a smoking habit. Methods of making it easier to, say, compare prices also generate greater elasticity. Books are more elastic thanks to Amazon. Both of these notions speak to the ease of finding substitutes.

II. Elasticity and Revenue

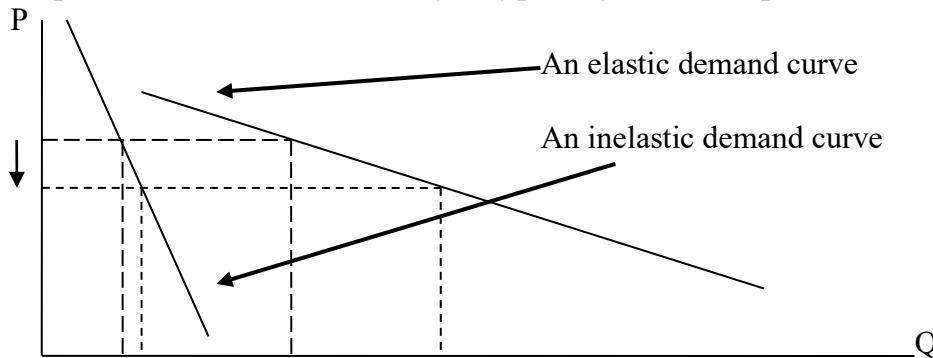
- a. Firms fundamentally care about elasticity because it impacts revenue, or the price of a good multiplied by the quantity sold.
- b. Elasticity implies that a decrease a price increases total revenue.
- c. Unit-elasticity implied a decrease in price does not change total revenue.
- d. Inelasticity implies that a decrease in price decreases total revenue.
- e. Consider the graph showing when goods are elastic and inelastic.



- f. If a firm lowers its price from point A to point B, it loses **W** in revenue but gains **X**—overall its revenue increases. If a firm increases its price from point D to point C, it loses **Z** in revenue but gains **Y**—overall its revenue increases.

III. Demand curves

- a. When we call a good or service “elastic,” it’s more of a shorthand conveying that a good or service is *in general* elastic or *on average* elastic. Flatter demand curves convey a typically elastic product. Steeper demand curves convey a typically inelastic product.



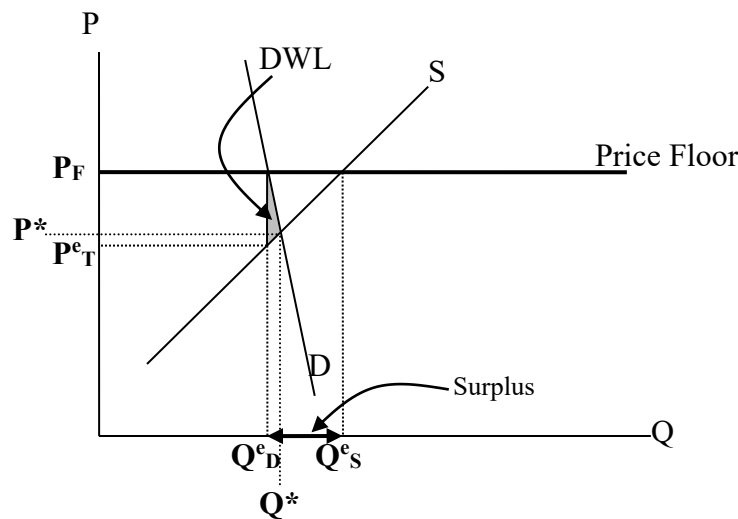
- i. Note the same decrease in price decreases total revenue for inelastic demand curve but increases for the elastic demand

curve. Elasticity may not be the same thing as slope, but it's certainly correlated with it.

- ii. A good can have a perfectly elastic demand. Everywhere on the demand curve the calculation reveals an elastic demand. Perfectly elastic demand curves are horizontal lines. An example would be the demand for a single vendor's popcorn at a fair (when he has several identical competitors).
- iii. A good can have a perfectly inelastic demand. Everywhere on the demand curve the calculation reveals an inelastic demand. Perfectly inelastic demand curves are vertical lines. Antibiotics get very close.

IV. Policy implications

- a. Some economic research suggests there's little to no effect of increasing the minimum wage. This is partly due to the elasticity of the demand for labor. In the short-run, it's very inelastic.



- b. Note we have a relatively small surplus effect and very little deadweight loss (both of which would shrink even more if supply was more elastic, which is very well might be). But, as time passes, elasticity will increase and thus both the deadweight loss and the surplus.

V. Calculating elasticity of demand

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

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

- i. If $|\epsilon_d| > 1$, the good is elastic.

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

$$\epsilon_d = \frac{\Delta Q_x / \overline{Q}_x}{\Delta P_x / \overline{P}_x}$$

- i. *Example:* Suppose fruit sells for \$1 each with 1400 pieces sold. Also suppose the price falls to \$0.90 and sales increase to 1500. Elasticity is $\frac{1500-1400/1450}{0.90-1.00/0.95}$, or -0.655, an inelastic good.