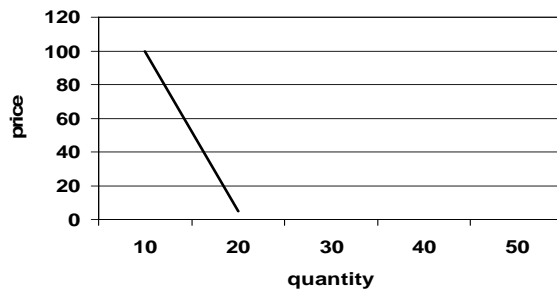


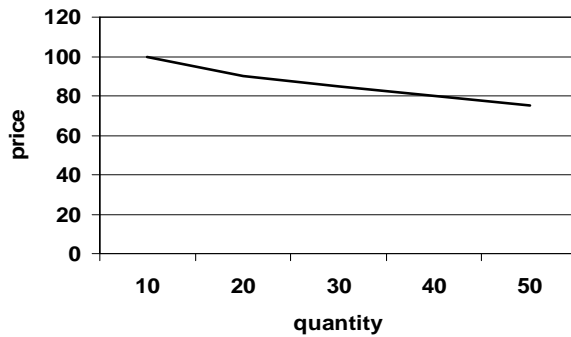
Lecture 6: Price and Revenue

Elasticity

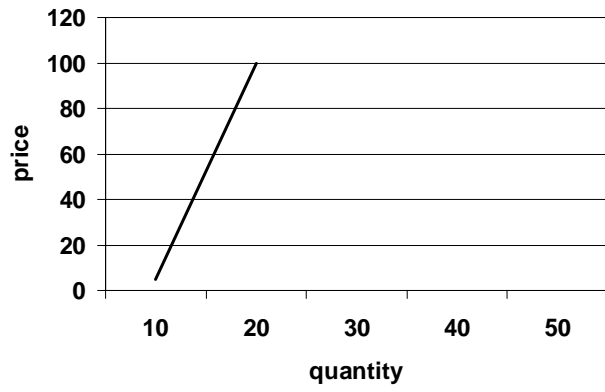
1. Although demand curves are downward sloping and supply curves are upward sloping, their degree of "steepness" or "flatness" can vary.
2. What does this mean?
A "steep" demand curve, like:



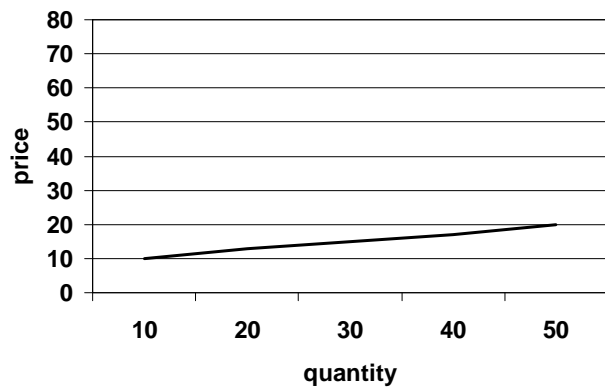
means consumers don't change their purchasing behavior as much as with a more "flat" demand curve like:



Likewise, with a "steep" supply curve, like:



businesses don't change their production as much when price changes as with a more "flat supply curve like:



Steep demand curves are more likely with "necessities", and "flat" demand curves are more likely with "luxuries". A steep supply curve is more likely for products or services that take a long time to develop (pharmaceuticals, surgeons, electricity), whereas a flat supply curve is more likely for products or services that can be quickly produced (food, clothes).

3. Economists have developed measures of the relative steepness or flatness of demand and supply curves. For demand curves, the measure is called *price elasticity of demand*.

- a. Measured as (proportional change in quantity bought/proportional change in price). This will be a negative number.
- b. If the number is a "fractional" negative number, that is, between 0 and -1, then the demand curve is relatively steep, and we call it *price inelastic*. If the number is a "large" negative number, like -1.5, -3, -3.5 (technically, a number smaller than -1; remember -2 is "smaller" than -1), then this demand curve is relatively flat, and we call it *price elastic*. If the price elasticity of demand is exactly -1, it is called *unit elastic*.

c. **BIG SIGNIFICANCE OF THIS FOR BUSINESS**

If demand curve is *price inelastic*, then increasing the price will increase revenues to the business. Revenues are P x Q. Price inelastic means when P rises, Q falls, but the drop in Q is not large, so the new P x Q is larger. I'll give an example later.

But, if the demand curve is *price elastic*, then increasing the price will decrease revenues. Price elastic means when P rises, Q falls a lot, so the new P x Q is smaller.

d. Example 1

Mr. Pizza sells 200 pizzas per week when he prices each pizza at \$10, whereas he sells 150 pizzas per week when he charges \$15 per pizza.

Formula for price elasticity of demand:

$$- \frac{(\text{change in quantity sold} / \text{average quantity sold})}{(\text{change in price} / \text{average price})}$$

$$= - \frac{50 / 175}{5 / 12.50} = - \frac{0.28}{0.40} = -0.7$$

This demand curve is price inelastic, so revenue increases when the price is increased:

Revenue at \$10 per pizza: \$10 x 200 = \$2000
 Revenue at \$15 per pizza: \$15 x 150 = \$2250

Example 2

The CAT bus system has 5000 weekly riders when each ride is priced at \$1. The CAT bus system has 3000 weekly riders when each ride is price at \$1.20.

Using the formula, the price elasticity of demand is calculated as:

$$- \frac{2000 / 4000}{.20 / 1.10} = - \frac{.50}{.18} = - 2.77$$

This demand curve is price elastic, so revenue decreases when the price is increased:

Revenue at \$1: \$1 x 5000 = \$5000

Revenue at \$1.20: \$1.20 x 3000 = \$3600

If the demand curve is price inelastic, then what's to prevent the business from constantly increasing price to increase revenues? There are two reasons. First is competition. If other competing businesses don't follow, the business constantly increasing its price will lose customers. Second is the fact that as the price rises and quantity sold falls, demand curves tend to become price elastic.

4. Price elasticity of supply: Measures how the quantity produced by business changes when the price changes.

Will be a positive number (businesses supply more when the price increases, and they supply less when the price decreases). Is *price inelastic* if the number is between 0 and 1, and is *price elastic* if the number is greater than 1.

Formula:

$$\frac{(\text{change in quantity produced} / \text{average quantity produced})}{(\text{change in price} / \text{average price})}$$

Example 1: When the price of corn is \$2 per bushel, farmers grow 5 million bushels. When the price of corn is \$2.50 per bushel, farmers grow 11 million bushels.

$$\text{Price elasticity of supply: } \frac{6 / 8}{.50 / 2.25} = \frac{0.75}{0.22} = 3.41 \text{ (price elastic)}$$

Example 2: When their average salary is \$100,000, there are 1 million surgeons. When their average salary is \$250,000, there are 1.2 million surgeons.

$$\text{Price elasticity of supply: } \frac{0.2 / 1.1}{150,000 / 175,000} = \frac{0.18}{0.86} = 0.21 \text{ (price inelastic)}$$

5. Income Elasticity

Measures how quantity purchased changes when income of the buyer changes.
Positive for *normal goods*; negative for *inferior goods*

Calculation:

$$\frac{(\text{change in quantity sold} / \text{average quantity sold})}{(\text{change in income} / \text{average income})}$$

Example 1 Marla buys 3 steaks a month when her income is \$30,000, but she buys 7 steaks a month when her income increases to \$50,000.

Calculation:

$$\frac{4 / 5}{20,000 / 40,000} = \frac{0.8}{0.5} = 1.6 \quad \text{Steak is a normal good}$$

Example 2 Marla buys 10 fast food hamburgers a month when her income is \$30,000, but she buys 6 fast food hamburgers when her income is \$50,000.

Calculation:

$$\frac{-4 / 8}{20,000 / 40,000} = \frac{-0.5}{.5} = -1.0 \quad \text{Therefore, a fast food hamburger is an inferior good}$$