

12.1: Price Elasticity Calculations

Learning Objectives

- Calculate the price elasticity of a product based on the given situation

Remember, elasticity measures the responsiveness of one variable to changes in another variable. In the last section we looked at price elasticity of demand, or how much a change in price affects the quantity demanded. In this section we will look at both elasticity of demand and elasticity of supply. Supply can also be elastic, since a change in price will influence the quantity supplied.

In order to measure elasticity, we need to calculate percentage change, also known as a **growth rate**. The formula for computing a growth rate is straightforward:

$$\text{Percentage change} = \text{Change in quantity} / \text{Quantity}$$

Suppose that a job pays \$10 per hour. At some point, the individual doing the job is given a \$2-per-hour raise. The percentage change (or growth rate) in pay is:

$$\$2 / \$10 = 0.20 \text{ or } 20\%.$$

Now, recall that we defined elasticity as the percentage change in something divided by the percentage change in something else. Let's take the price elasticity of demand as an example. The price elasticity of demand is defined as the percentage change in quantity demanded divided by the percentage change in price:

$$\text{Price elasticity of demand} = \text{Percentage change in quantity demanded} / \text{Percentage change in price}$$

There are two general methods for calculating elasticities: the point elasticity approach and the midpoint (or arc) elasticity approach. Elasticity looks at the percentage change in quantity demanded divided by the percentage change in price, but which quantity and which price should be the denominator in the percentage calculation? The point approach uses the initial price and initial quantity to measure percent change. This makes the math easier, but the more accurate approach is the midpoint approach, which uses the average price and average quantity over the price and quantity change. (These are the price and quantity halfway between the initial point and the final point. Let's compare the two approaches.)

Suppose the quantity demanded of a product was 100 at one point on the demand curve, and then it moved to 103 at another point. The growth rate, or percentage change in quantity demanded, would be the change in quantity demanded (103–100) divided by the average of the two quantities demanded (103+100) / 2.

In other words, the growth rate:

$$\begin{aligned} & 103-100 / ((103+100) / 2) \\ & = 3 / 101.5 \\ & = 0.0296 \\ & = 2.96\% \text{ growth} \end{aligned}$$

Note that if we used the point approach, the calculation would be:

$$\begin{aligned} & (103-100) / 100 \\ & = 3\% \text{ growth} \end{aligned}$$

This produces nearly the same result as the slightly more complicated midpoint method (3% vs. 2.96%). If you need a rough approximation, use the point method. If you need accuracy, use the midpoint method.

If:

% change in quantity > % change in price > 1 = Elastic demand

% change in quantity > % change in price < 1 = Inelastic demand

Practice Questions

<https://assessments.lumenlearning.co...sessments/9275>

Contributors and Attributions

CC licensed content, Original

- Price Elasticity in a Given Situation. **Authored by:** Bob Danielson. **Provided by:** Lumen Learning. **License:** [CC BY: Attribution](#)

[12.1: Price Elasticity Calculations](#) is shared under a [not declared](#) license and was authored, remixed, and/or curated by LibreTexts.

- [12.1: Price Elasticity Calculations](#) is licensed [CC BY 4.0](#).