

Price Elasticity of Demand

AP Microeconomics | Unit 2 | the coefficient, its determinants, and the total revenue test

Running example. Two coffee shops raise the price of a latte from \$4 to \$5. Shop A's sales fall from 100 cups a day to 90, and its revenue *rises* from \$400 to \$450. Shop B's sales fall from 100 to 60, and its revenue *falls* from \$400 to \$300.

1. What elasticity measures

Price elasticity of demand

$$E_d = \left| \frac{\% \Delta Q_d}{\% \Delta P} \right|$$

How strongly buyers react to a change in price. Price and quantity demanded move in opposite directions, so the ratio is negative; we report its size.

Both shops: $\% \Delta P = \frac{5 - 4}{4} = +25\%$.

	$\% \Delta Q_d$	E_d	demand is
Shop A	$\frac{90 - 100}{100} = -10\%$	$\frac{10}{25} = 0.4$	inelastic
Shop B	$\frac{60 - 100}{100} = -40\%$	$\frac{40}{25} = 1.6$	elastic

2. Elastic or inelastic?

$E_d < 1$	inelastic	quantity changes by a smaller % than price
$E_d = 1$	unit elastic	quantity and price change by the same %
$E_d > 1$	elastic	quantity changes by a larger % than price
$E_d = 0$	perfectly inelastic	vertical demand curve
$E_d = \infty$	perfectly elastic	horizontal demand curve

Demand is more elastic when the good has many close substitutes, is a luxury rather than a necessity, takes a large share of the buyer's income, and when buyers have more time to adjust.

Supply has an elasticity built the same way: $E_s = \frac{\% \Delta Q_s}{\% \Delta P}$.

3. The total revenue test

$$\text{Total revenue} = P \times Q$$

Inelastic demand: P and TR move *together* ($P \uparrow \Rightarrow TR \uparrow$).

Elastic demand: P and TR move in *opposite* directions ($P \uparrow \Rightarrow TR \downarrow$).

Unit elastic: TR does not change.

Shop A (0.4): price +25%, quantity only –10%, so revenue rises. Shop B (1.6): price +25%, quantity –40%, so revenue falls. The test runs both ways: told what happened to revenue, you can name the elasticity.

4. One demand curve, three elasticities

Take the straight demand curve $P = 10 - Q$. Its slope is the same everywhere; its elasticity is not.

P	Q	$TR = P \times Q$	
\$8	2	\$16	top half: elastic (lower the price, revenue rises)
\$5	5	\$25	midpoint: unit elastic , total revenue is at its maximum
\$2	8	\$16	bottom half: inelastic (lower the price, revenue falls)

So a demand curve is not “elastic” or “inelastic” as a whole: it is elastic or inelastic *over a range of prices*. Slope is not elasticity.

Where students lose points

1. Putting price on top: it is % change in quantity over % change in price.
2. Using the changes in dollars and units instead of the percent changes.
3. Saying a steep curve is inelastic: slope is not elasticity.
4. Getting the revenue test backwards: inelastic means P and TR move together.
5. Answering “elastic” with no reason: give the coefficient compared with 1, or the change in total revenue.

Now practise it

Theory sticks once you use it. On **sad-academy.com** you'll find practice questions for this exact subtopic in the AP format, and an AI that grades your free-response answers against the scoring guidelines, the way an AP reader would.

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