

Exercise walk-through

2.4

Price Elasticity of Supply

AP Microeconomics

Price elasticity of demand

PED $= \frac{\% \Delta Q_d}{\% \Delta P}$ – how strongly quantity responds to price. Use the stated percentage changes and read $|\text{PED}|$.

Elastic

$$|\text{PED}| > 1$$

Unit elastic

$$|\text{PED}| = 1$$

Inelastic

$$|\text{PED}| < 1$$

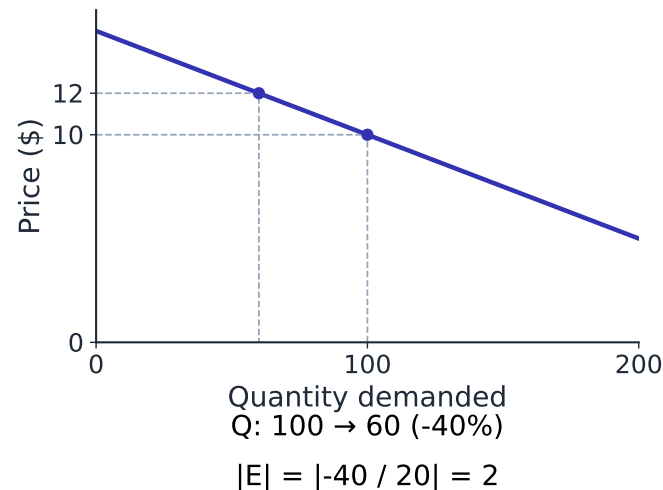
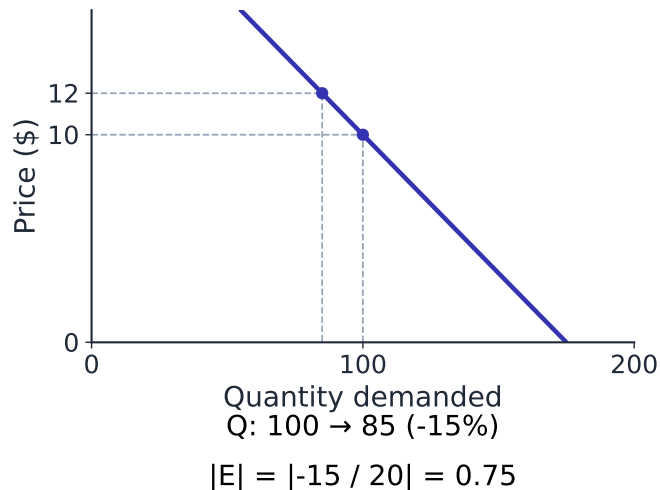
More elastic when: many substitutes, a large share of income, more **time** to adjust.

Inelastic versus elastic demand

Price: 10 → 12 (+20%); both quantities start at 100

Inelastic

Elastic



Inelastic versus elastic demand: a small versus large response to a price change

Calculate demand elasticity and revenue

The opening market: price \$10 to \$12; quantity 100 to 85

Use initial values as the percentage-change base.

$$\% \Delta P = \frac{12 - 10}{10} \times 100 = 20\%$$

$$\% \Delta Q_d = \frac{85 - 100}{100} \times 100 = -15\%$$

$$|E_d| = \left| \frac{\% \Delta Q_d}{\% \Delta P} \right| = \left| \frac{-15}{20} \right| = 0.75$$

Demand is inelastic. $TR = PQ$: revenue rises from \$1000 to \$1020. Slope alone does not give elasticity.

The total revenue test

$TR = P \times Q$. When you change price, elasticity decides whether revenue rises.

Elastic

price & TR move **opposite**

cut price $\rightarrow$ TR up

Inelastic

price & TR move **together**

raise price $\rightarrow$ TR up

On a straight-line demand curve the **upper** half is elastic, the **midpoint** is unit elastic, the **lower** half inelastic. TR is greatest at the midpoint.

Price elasticity of supply

Two firms face the same price rise

Both start at $P = \$10$, $Q_s = 100$. Price rises to \$12. Firm A supplies 110 units; firm B supplies 140.

$$E_s = \frac{\% \Delta Q_s}{\% \Delta P}$$

Attempt: calculate each percentage change from its initial value. Which firm has elastic supply? What might spare capacity or more time allow?

Vertical supply: perfectly inelastic ($E_s = 0$). Horizontal supply: perfectly elastic. Use percentage changes to classify other curves.

Exercises 2.1-2.3

2.1 Define price elasticity of supply.

[1]

2.2 Price rises from \$8 to \$12 and quantity supplied rises from 40 to 60. Find the PES (midpoint method).

[2]

2.3 State how a longer time horizon affects PES.

[1]

Exercises 2.1-2.3

2.1 Define price elasticity of supply.

[1]

2.1

- the responsiveness of quantity supplied to a change in price

2.2 Price rises from \$8 to \$12 and quantity supplied rises from 40 to 60. Find the PES (midpoint method).

[2]

2.2

- $\% \Delta Q = \frac{20}{50} = 40\%$; $\% \Delta P = \frac{4}{10} = 40\%$; $PES = \frac{40}{40} = 1$ (unit elastic)

2.3 State how a longer time horizon affects PES.

[1]

2.3

- it makes supply more elastic

Exercises 3.1-3.2

3.1 Supply is elastic when PES is

[1]

☐

A less than 1

B equal to 1

C greater than 1

D zero

3.2 A perfectly inelastic supply curve is

[1]

☐

A horizontal

B vertical

C upward-sloping

D downward-sloping

Exercises 3.1-3.2

3.1 Supply is elastic when PES is

[1]

☐

- A less than 1
- B equal to 1
- C greater than 1
- D zero

3.1 C

- greater than 1.

3.2 A perfectly inelastic supply curve is

[1]

☐

- A horizontal
- B vertical
- C upward-sloping
- D downward-sloping

3.2 B

- vertical.

Exercise 3.3 (a)

3.3 A farm can quickly grow more output using its spare land.

(a) State whether its supply is likely elastic or inelastic.

[1]

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(a) State whether its supply is likely elastic or inelastic.

[1]

(a)

- elastic

Exercise 3.3 (b)

3.3 A farm can quickly grow more output using its spare land.

(b) State one factor that makes supply more elastic.

[1]

Exercise 3.3 (b)

3.3 A farm can quickly grow more output using its spare land.

(b) State one factor that makes supply more elastic.

[1]

(b)

- a longer time horizon or more spare capacity (any one)

Exercise 3.3 (c)

3.3 A farm can quickly grow more output using its spare land.

(c) State the PES of a vertical (fixed-quantity) supply curve.

[1]

Exercise 3.3 (c)

3.3 A farm can quickly grow more output using its spare land.

(c) State the PES of a vertical (fixed-quantity) supply curve.

[1]

(c)

- zero