Price elasticity of supply (PES)

RIDLEY COLLEGE
SINCE 1889

Assessment Objectives

Specific Expectations	
AO4	Use the formula for price elasticity of supply (PES) to calculate PES, changes in price and changes in quantity.
AO2	Identify the various degrees and range of values of PES.
AO4	Draw diagrams showing the range of values for PES, including relatively elastic and inelastic supply; and constant values for perfectly elastic supply, perfectly inelastic supply and unitary PED.
AO2	Analyze the determinants of PES.
AO2	Apply PES to analyze the reasons why primary commodities generally have a lower PES than manufactured products.

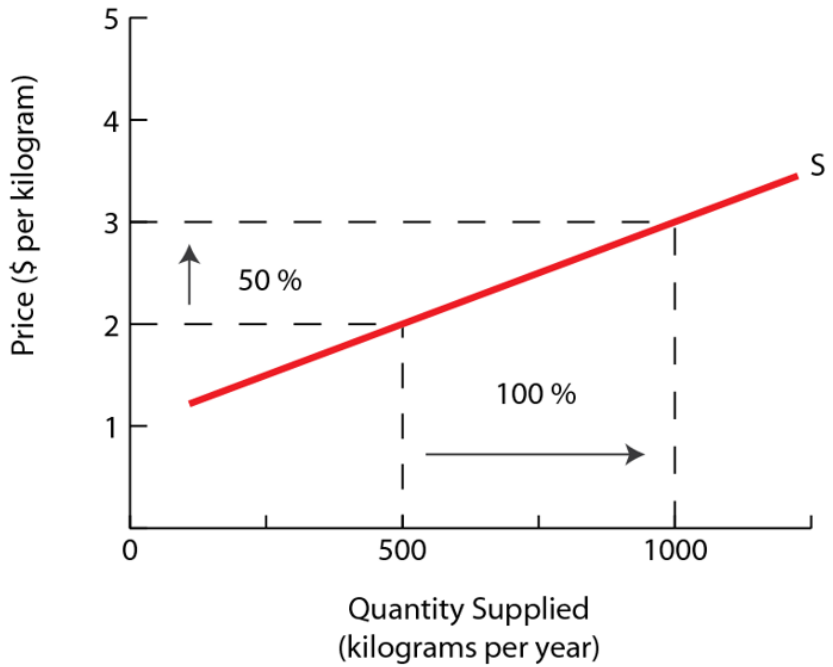
Price elasticity of supply (PES)

- **Price elasticity of supply** is a measure of the responsiveness of the quantity of a good supplied to changes in its price.
  - PES is calculated along a given supply curve
  - In general, if there is a relatively large responsiveness of quantity supplied, supply is referred to as being **elastic**.
  - If there is a relatively small responsiveness, supply if **inelastic**.

$$\text{Price elasticity of supply (PES)} = \frac{\%\Delta Q_S}{\%\Delta P} = \frac{\Delta Q_S/Q_S}{\Delta P/P}$$

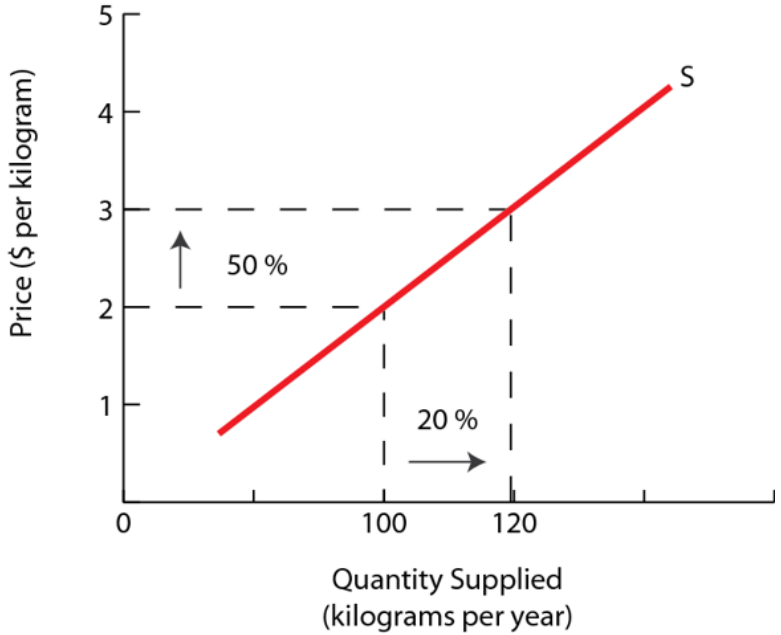
Elastic Supply

- **Price elastic** the percentage change in the quantity supplied is larger than the percentage change in price.
  - The value of PES is greater than one (PES > 1).
  - Quantity supplied is relatively responsive to price changes, and supply is price elastic or elastic.



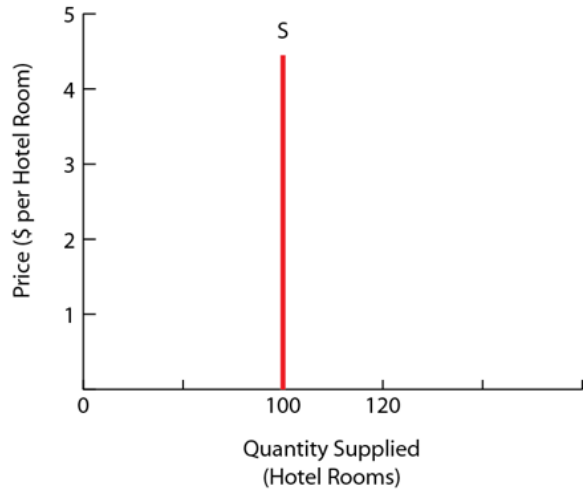
Inelastic Supply

- **Price inelastic** the percentage change in the quantity supplied is smaller than the percentage change in price.
  - The value of PES is less than one (PES < 1).
  - Quantity supplied is relatively unresponsive to price changes, and supply is price inelastic or inelastic.



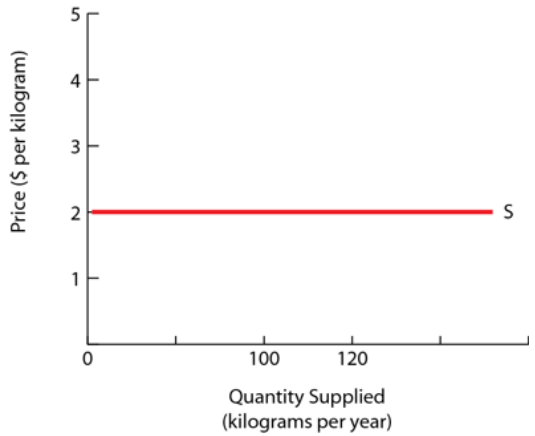
Perfectly Inelastic Supply

- **Perfectly inelastic supply** occurs when the percentage change in quantity supplied is zero.
  - There is no change in quantity supplied, which remains constant no matter what happens to price.
  - The supply for a good is perfectly inelastic if the supply curve is a vertical line.
  - The value of PES is equal to zero (PES $= 0$).



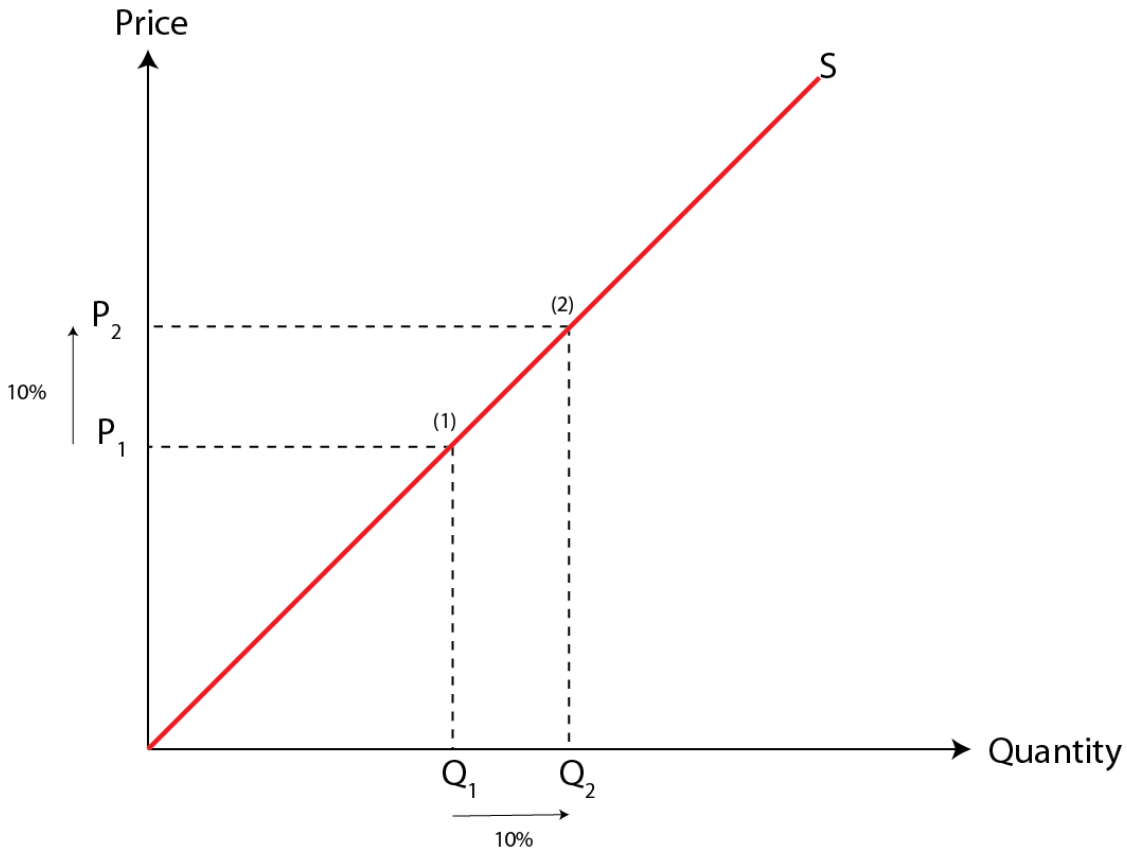
Perfectly Elastic Supply

- **Perfectly elastic supply** occurs when a change in price results in an infinitely large change in quantity supplied.
  - The price of the good remains constant regardless of the quantity supplied.
  - The supply for a good is perfectly elastic if the supply curve is a horizontal line.
  - The value of PES is equal to infinity (PES $= \infty$).



Unit Elastic Supply

- **Unit Elastic Supply** occurs when the percentage change in quantity supplied is equal to the percentage change in price.
  - The value of the PES is equal to 1 (PES = 1)

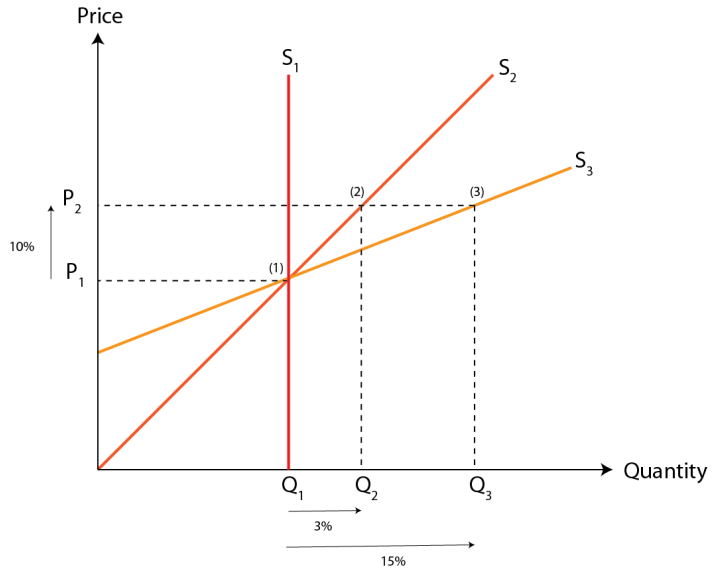


Price elasticity of demand (PES): Summary

Value of PED	**Classification**	**Interpretation**
$0 < \text{PES} < 1$	Price inelastic	Quantity supplied is relatively unresponsive to price.
$1 < \text{PES} < \infty$	Price elastic	Quantity supplied is relatively responsive to price.
$\text{PES} = 1$	Unit elastic	Percentage change in quantity supplied equals percentage change in price.
$\text{PES} = 0$	Perfectly inelastic	Quantity supplied is completely unresponsive to price.
$\text{PES} = \infty$	Perfectly elastic	Quantity supplied is infinitely responsive to price.

Determinants of price elasticity of supply (PES)

- There are five major factors that affect the price elasticity of supply.
  1. **Length of time** – the amount of time that firms have to adjust their inputs and the quantity supplied in response to changes in price.
     - Over a very short time period, the firm may be unable to increase or decrease any of its inputs to change the quantity it produces.
     - As the length of time that firms have increases, the responsiveness of quantity supplied to price changes begins to rise, and PES increases.



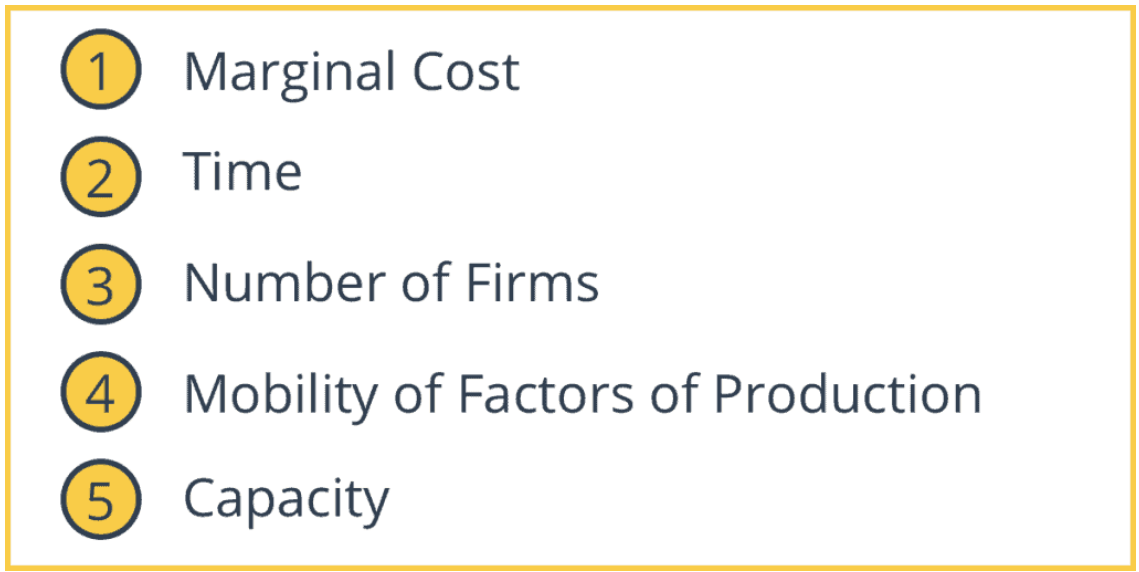
Determinants of price elasticity of supply (PES)

2. **Mobility of factors of production** – the ease and speed with which firms can shift resources and production between different products.
    - The more easily and quickly resources can be shifted out of one line of production and into another, the greater the responsiveness of quantity supplied to changes in price.
3. **Spare (unused) capacity of firms** – sometimes firms may have capacity to produce that is not being used (for example, factories or equipment may be idle for some hours each day).
    - The greater the spare (unused) capacity, the higher the PED (the more elastic the supply).
4. **Ability to store stocks** – some firms store stocks of output they produce, but do not sell it right away.
    - Firms that have an ability to store stocks are likely to have a higher PES (more elastic) for their products than firms that cannot store stocks.

Determinants of price elasticity of supply (PES)

5. **Rate at which costs increase** – if the costs of producing extra output increase rapidly, then supply will be inelastic, as firms will have difficulty expanding their output since they are unlikely to want to incur large costs.

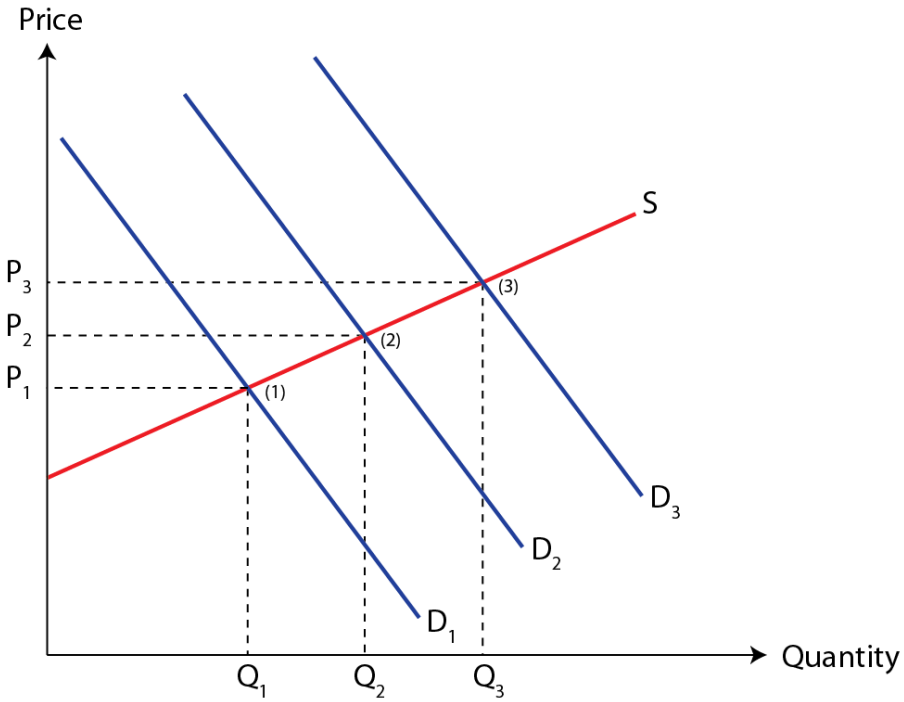
    - If the costs of producing more output rise slowly, it will be easier for firms to expand their output so supply will be elastic.

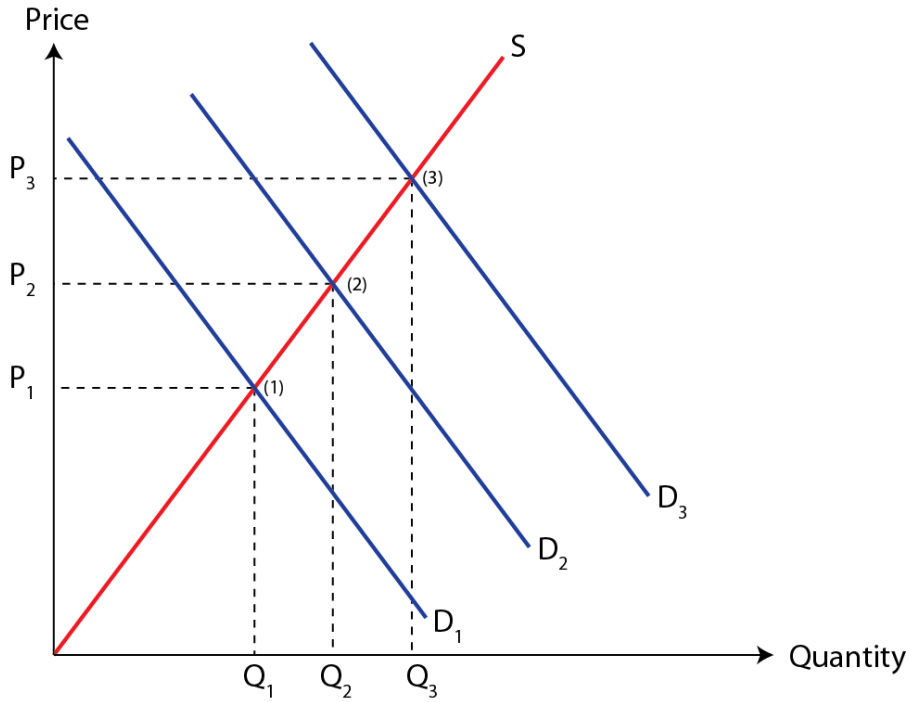


Applications of price elasticity of supply

- In general, primary commodities usually have a lower PES than manufactured products.
  - The main reason is the time needed for quantity supplied to respond to price changes.
  - The longer the time producers have to make the necessary adjustments, the greater the responsiveness of the quantity supplied to changes in price.
  - Inelastic supply of agricultural and other primary products also contributes to price and income instability for primary product producers.
    - Price fluctuations are larger in the case of inelastic supply.
    - Large price fluctuations mean large revenue fluctuations, or unstable revenue for producers of primary commodities.

Applications of price elasticity of supply





Applications of price elasticity of supply: Examples

Commodity	**Short-term PES**	**Long-term PES**
Cabbage	0.36	1.20
Carrots	0.14	1.00
Cucumbers	0.29	2.20
Onions	0.34	1.00
Green Peas	0.31	4.40
Tomatoes	0.16	0.90
Cauliflower	0.14	1.10
Celery	0.14	0.95