

Elasticity of Supply: Price Elasticity of Supply (PES)

What PES measures

Price elasticity of supply (PES) shows how responsive **quantity supplied** is to a **change in price**.

PES focuses on the **producer side** of the market. It is about firms' ability to respond, not consumers' willingness to buy.

The PES formula

$$PES = \frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$$

Interpreting PES values

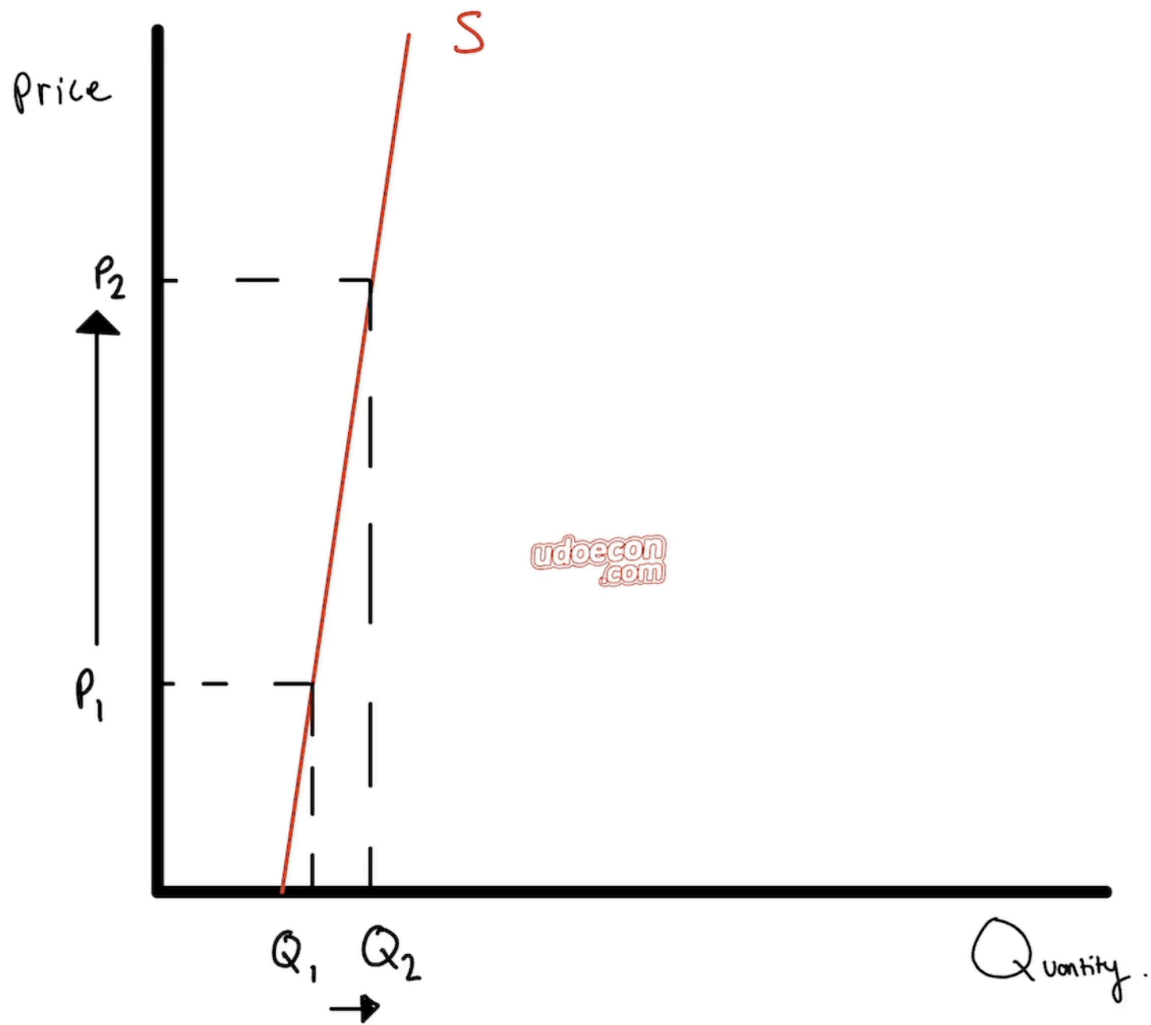
Price inelastic supply (PES = Less than 1)

The supply curve is steep .

A significant increase in price from **P1 to P2** causes a **proportionally smaller increase in quantity supplied from Q₁ to Q₂**, showing that producers are **not very responsive to a change in price**.

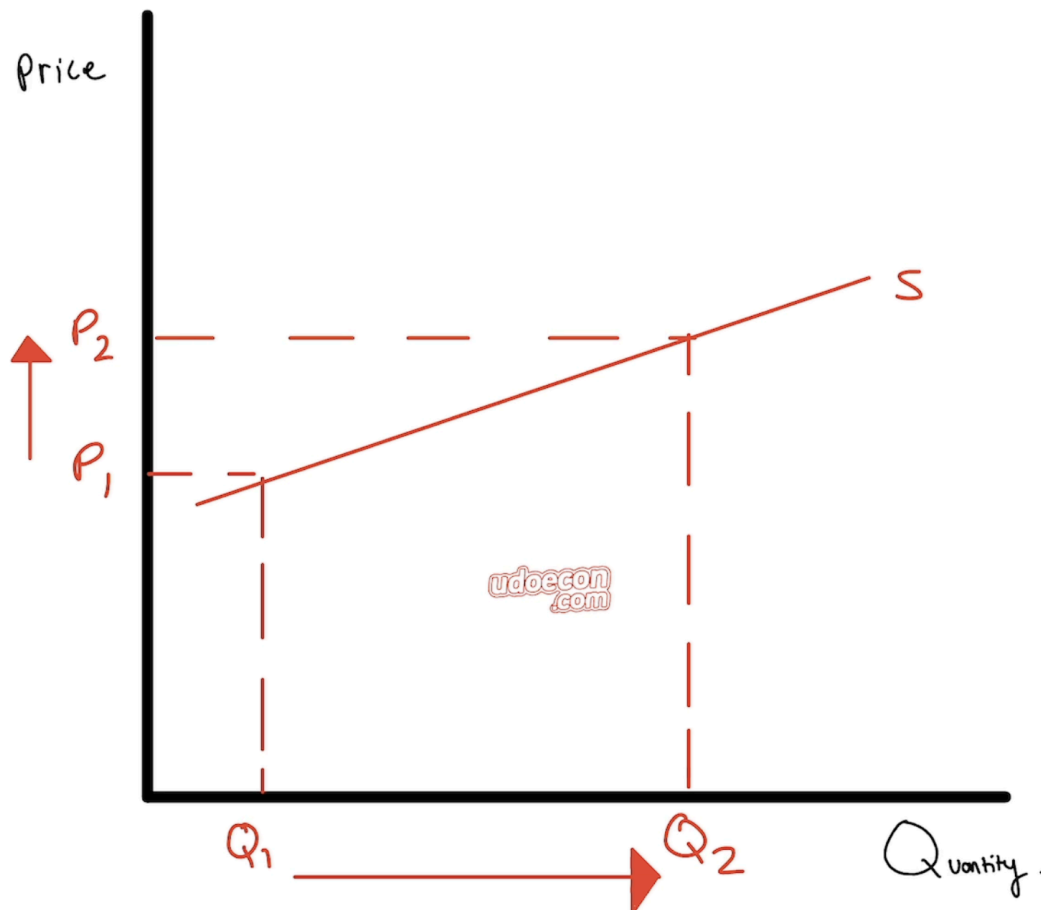
This represents **inelastic supply**, where output cannot be easily increased in response to higher prices.

A regular way this is assessed is time **lag**. For example, if the price of **dates increased sharply overnight**, the quantity supplied would **not rise significantly in the short run**. This is because producers face **physical constraints**: date palm trees can take **up to 10 years to mature**, so output cannot be quickly expanded. As a result, **even large price increases lead to only small increases in quantity supplied**, representing inelastic supply.



Price elastic supply (PES = Greater than 1)

A **small increase in price from P_1 to P_2** leads to a **large increase in quantity supplied from Q_1 to Q_2** , showing that producers are **highly responsive to changes in price**. This indicates that supply is **elastic**, as even a minor fall in price results in a proportionally larger increase in output.



Perfectly inelastic supply ($PES = 0$)

Supply is fixed whatever the price, shown by a **vertical** supply curve. This can happen when output is limited by something that cannot be increased, such as capacity constraints or a fixed supply.

Perfectly elastic supply ($PES = \infty$)

Supply is “unlimited” at a given price, shown by a **horizontal** supply curve. This is mostly theoretical.

What determines PES

PES depends on how quickly firms can expand production when price changes. The key idea is that the easier it is to increase output, the more **elastic** supply will be.

Time period

In the short run, supply tends to be more inelastic because at least one factor of production is fixed (for example, factory size). Over the long run, firms can change more inputs, so supply becomes more elastic.

Spare capacity

If firms have unused resources like machines, staff hours, or space, they can raise output quickly. If they are already near full capacity, supply is more inelastic.

Availability of raw materials

If inputs are scarce, output cannot rise much even if price increases, making supply more inelastic.

For example, in 2021, Porsche and other luxury car producers could not obtain enough **semiconductors**; because this critical input was unavailable, they were physically unable to produce more vehicles to meet surging demand, even though prices were at record highs

If raw materials are widely available, firms can expand more easily, making supply more elastic.

Stock levels and ability to store

If firms can store goods or already have inventories, they can increase supply quickly by releasing stock. If goods are perishable or hard to store, supply is more inelastic.

For example, **fresh grapes** have inelastic supply because they rot quickly and must be sold immediately regardless of price. However, **raisins or wine** have more elastic supply because they can be stored in warehouses and released to the market the moment prices rise.

Factor mobility

If labour and capital can be switched between products easily, firms can respond faster when price rises. If factors are specialised and hard to move, supply is more inelastic.

Long run vs Short Run

4 Factors of Production :

Land: natural resources (e.g physical land, oil)

Capital: man-made resources used in production process (e.g tractor)

Labour: workers involved in the production process

Entrepreneurship: the individual involved in coordinating the other factors of production

Short run : is a period of time in which at least one factor of production is fixed.

For example, a restaurant can hire more chefs, but the size of the kitchen and number of cooking stations are fixed, limiting output.

Long run : is a period of time in which all factors of production are variable.

For example, a restaurant can expand the kitchen or open a new branch, allowing it to hire more chefs and increase output.