

Price Elasticity of Demand (PED)

What PED measures

Definition

Price elasticity of demand (PED) shows how sensitive quantity demanded is to a change in price. It tells you whether consumers change how much they buy by a lot or by a little when price changes.

Elastic demand = consumers are extremely responsive to a change in price thus and small change in price will lead to a larger / at least proportional change in quantity demanded .

Inelastic Demand = consumers are relatively unresponsive to price changes, meaning even a large change in price results in only a small change in quantity demanded. For example addictive goods or life saving medication, as an individual would pay any price to save their life meaning they are not responsive to a change in price .

How to calculate PED

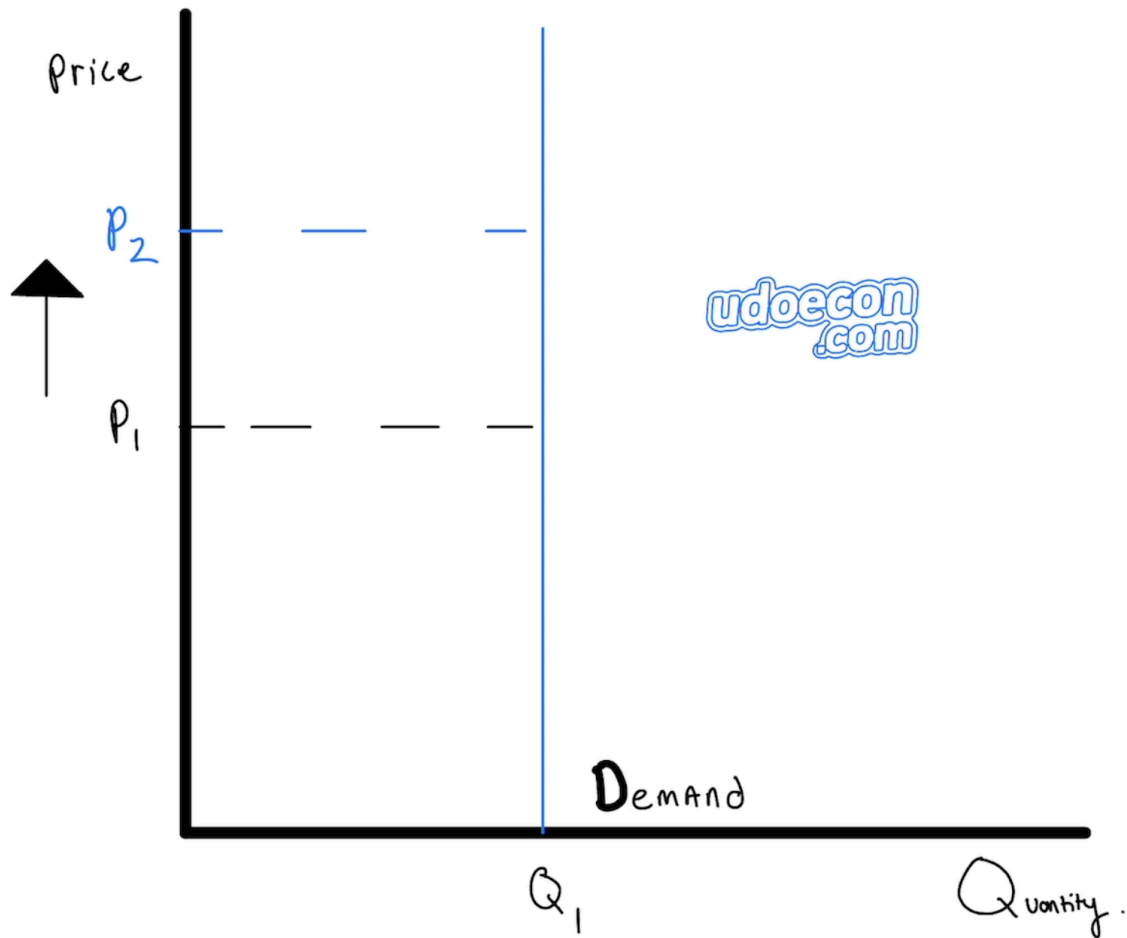
Formula

$$PED = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}}$$

Interpreting PED values

Perfectly inelastic (PED = 0):

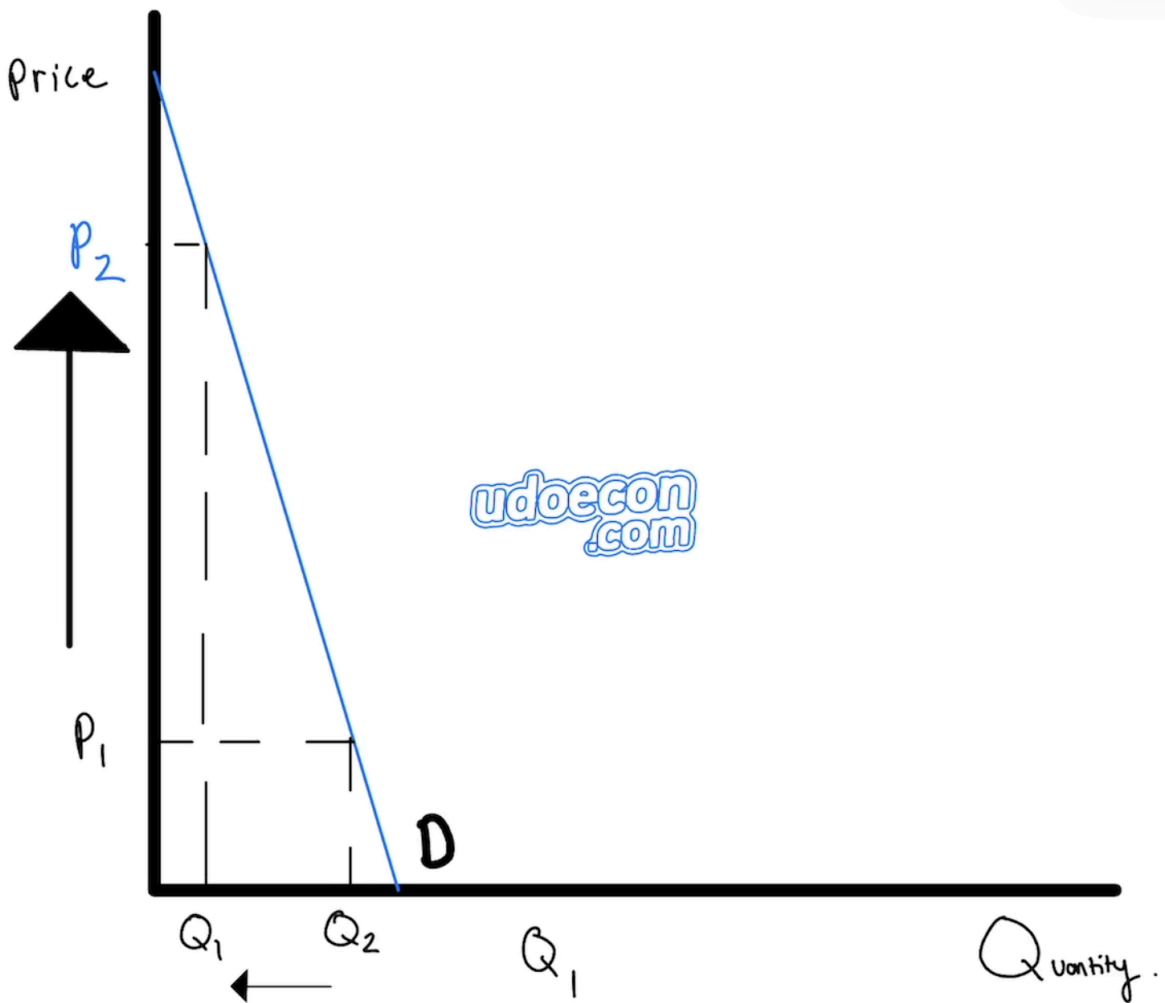
Quantity demanded does not change at all, so the demand curve is vertical. With regards to examples , perfectly inelastic is more of a theoretical concept as it is not perfectly applicable to the real world (Great Evaluation point !) . A close example could be insulin , as individuals suffering from diabetes cannot survive without it, this is life saving medication thus consumers do not respond at all to an increase in price from p1 to p2



Inelastic ($PED = \text{Less than } 1$):

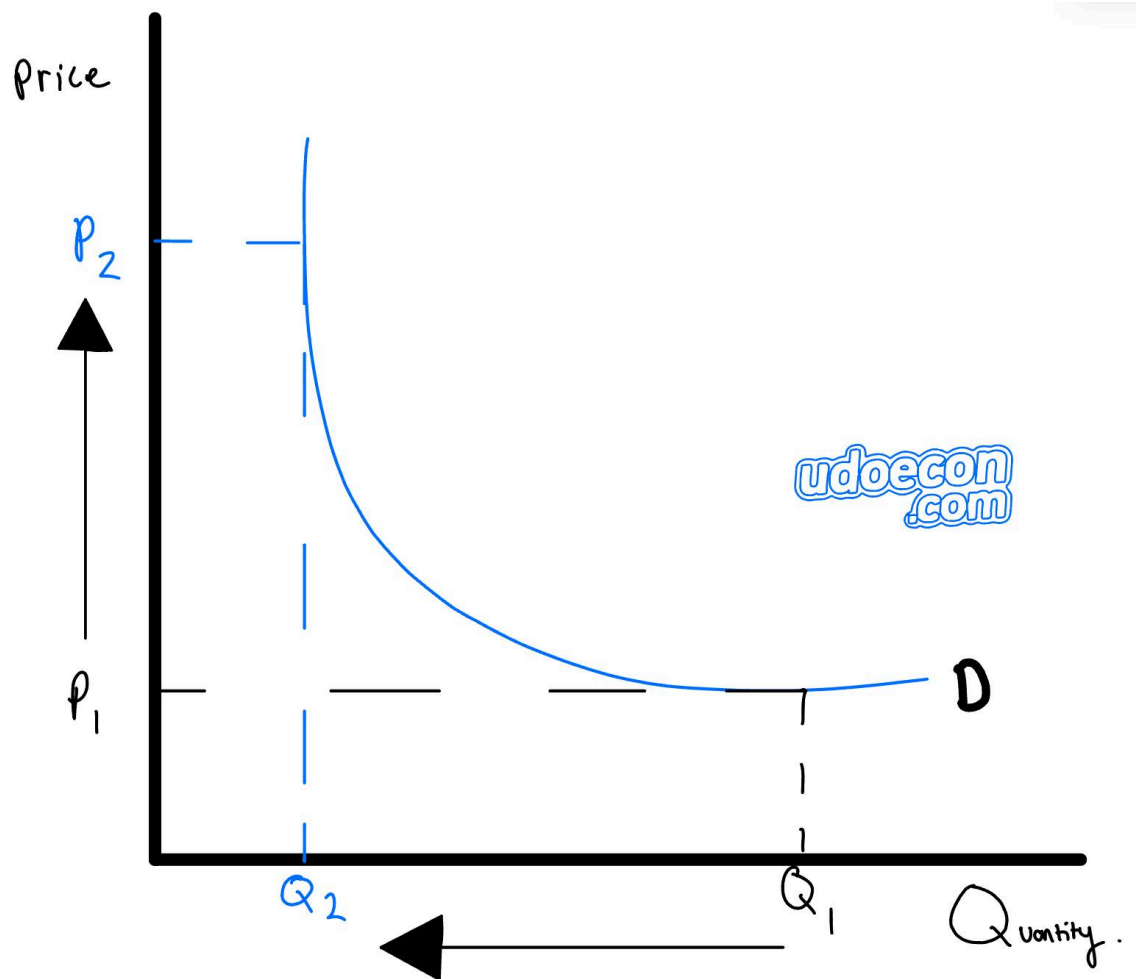
A **significant increase** in price from p_1 to p_2 causes a proportionally **smaller decrease** in quantity demanded from q_2 to q_1 , representing consumers are **not** very **responsive** to a change in price thus representing **inelastic** demand E.G Addictive Goods, despite an increase in price of sugary drinks (**Sugar Tax 2018** → Great real world Application) due to

addictive nature of sugar did not significantly decrease quantity demanded of sugary drinks .



Unitary elastic ($PED = 1$):

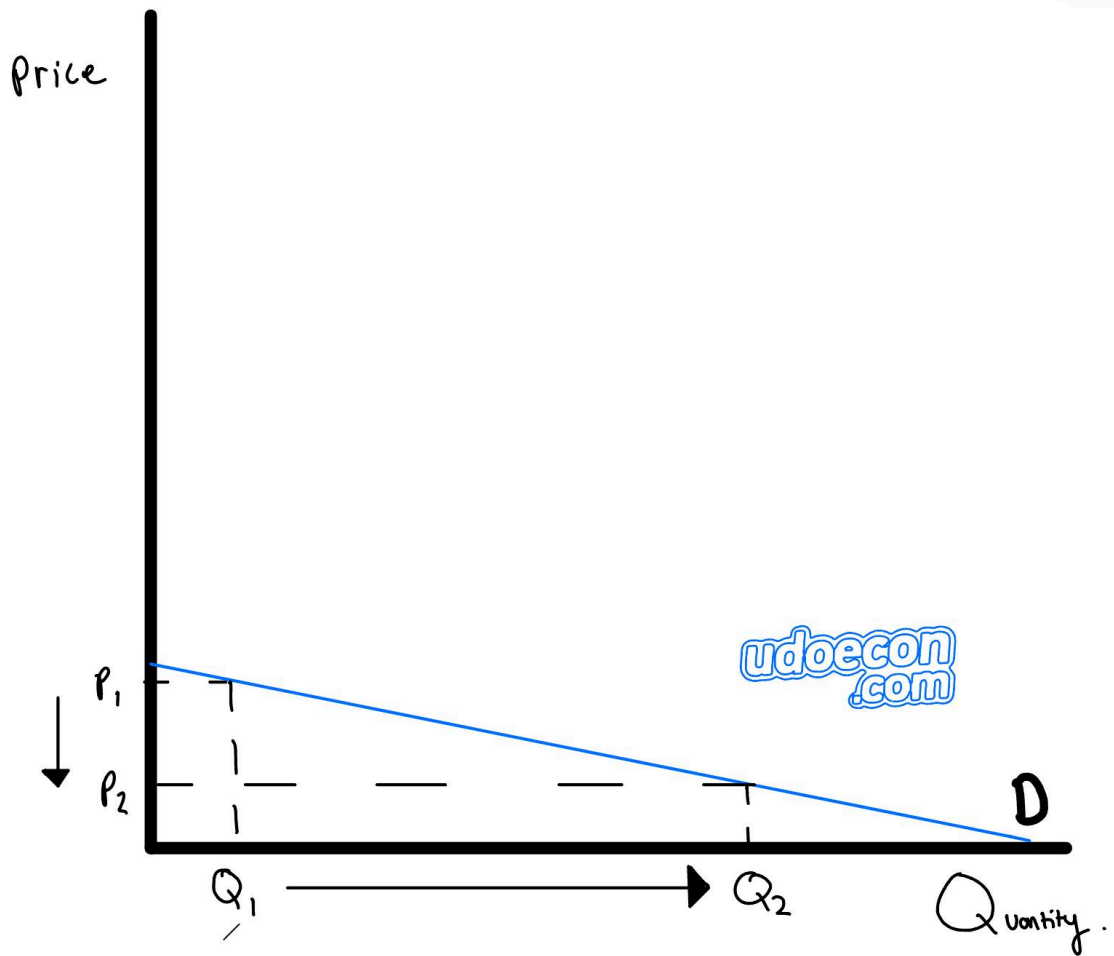
Demand changes in the same proportion as price. Easiest way to remember the curve is that it is half a U shape .



Elastic (PED= More than 1):

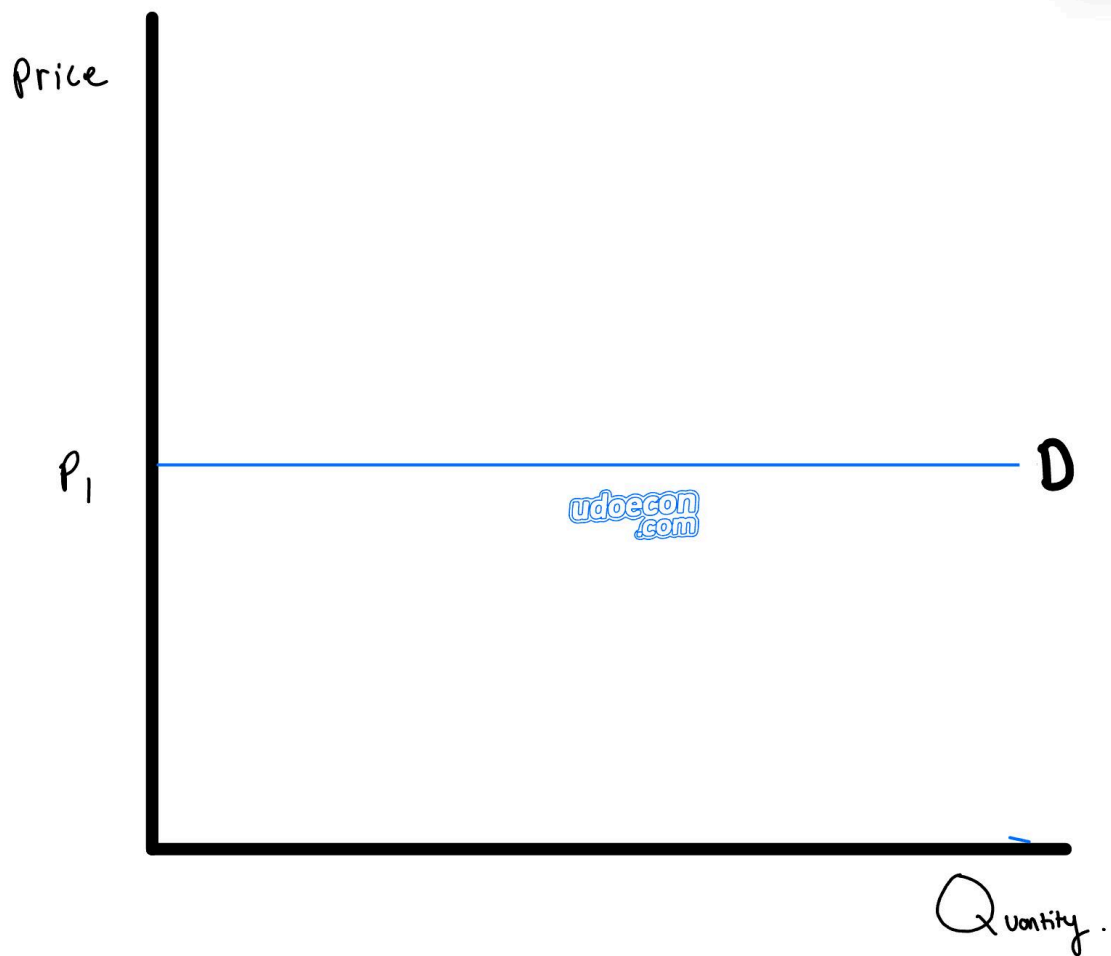
A **small decrease** in price from p_1 to p_2 causes a **significant increase** in quantity demanded from q_1 to q_2 , representing consumers are very **responsive** to a change

in price thus representing **elastic** demand



Perfectly elastic ($PED = \infty$):

A **tiny** price rise causes demand to fall to **zero**, vice versa for lowering price
(**Theoretical Concept** , not applicable in the real world !)



What affects PED (SNAPS)

Substitutes

If there are more close substitutes, it is easier to switch, so demand is more elastic.

Necessity vs luxury

Necessities tend to be more inelastic because people keep buying even after a price rise.
Luxuries tend to be more elastic because consumers can cut back more easily.

Addictiveness

Addictive goods tend to have more inelastic demand because consumption is hard to reduce.

Proportion of income

If the good is a small share of income, price changes feel less important, so demand is more inelastic. Expensive items that take up a larger share of income tend to be more elastic.

Short run vs long run

Short run = The period of time where at least 1 factor of production is fixed

Long run = The period of time where all factors of production are variable

Demand is usually more inelastic in the short run because habits and contracts limit switching. Over time, consumers can find alternatives, so demand becomes more elastic.

Why PED matters

Total revenue (TR) and pricing decisions

Total revenue is $TR = P \times Q$. PED helps predict how TR changes when price changes.

- If demand is inelastic, raising price tends to increase TR because quantity falls by a smaller percentage than the price rises.
- If demand is elastic, lowering price tends to increase TR because quantity rises by a larger percentage than the price falls.
- If demand is unit elastic, TR stays roughly the same because the percentage changes offset.

Income Elasticity of Demand (YED)

What YED measures

Income elasticity of demand shows how responsive quantity demanded is to a change in consumer income.

Formula

$$YED = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in income}}$$

Interpreting the sign and size

Positive YED: normal goods

A positive YED means demand rises when income rises and falls when income falls. These goods are normal because higher income leads consumers to buy more of them.

Negative YED: inferior goods

A negative YED means demand falls as income rises. Consumers substitute away from these goods towards higher-quality alternatives (i.e normal goods) , such as moving from Sainsbury's own brand baked beans to Heinz baked beans .

Cross Elasticity of Demand (XED)

What XED measures

Cross elasticity of demand shows how the demand for one good changes when the price of another good changes. It is used to identify relationships between products in the same or related markets.

Formula

$$XED = \frac{\% \text{ change in quantity demanded of good A}}{\% \text{ change in price of good B}}$$

Interpreting XED

Positive XED: substitutes

A positive XED means the goods are substitutes. For example If the price of Android phones rises, demand for iphones increase as consumers substitute .

Negative XED: complements

A negative XED means the goods are complements. For example if the price of printers rises, demand for printer ink falls because the goods are used together.

Zero XED: unrelated goods

An XED of zero means the goods are unrelated. A price change in one good has no effect on demand for the other.