10. Price Elasticity of Demand (PED)

As you saw in #8, sometimes to reach equilibrium **P** and **Q**, demand and supply have to adjust - this takes **time**

Sometimes, demand changes very **quickly** in response to price changes – demand is price **elastic**
Sometimes, demand changes very **slowly** in response to price changes – demand is price **inelastic**

Price Elastic Your mobile phone provider increases its charges – you can switch to a choice of other companies *or* you can cut your usage to fit the new tariff

Price Inelastic When oil prices rise, you cant change suppliers – you have to just pay the higher price. Some might choose to drive less or buy less heating oil but demand stays relatively stable

How to Measure PED?

$$PED = \frac{\%\Delta Q}{\%\Delta P} \quad \textit{or} \quad \frac{\text{Proportionate Change in } Q_D}{\text{Proportionate Change in } P}$$

P_1 = Original Price
P_2 = New Price
Q_1 = Original Quantity Demanded
Q_2 = New Quantity Demanded

Is a good a normal good?

Ans: PED must be **negative**

$$PED = \frac{\%\Delta Q}{\%\Delta P} = \text{- or + value (decimal answer)}$$

$\downarrow Q_D / \uparrow P$ = MINUS / PLUS *or* $\uparrow Q_D / \downarrow P$ = PLUS / MINUS

Both **NEGATIVE**

Working Out the Sums…

1 PERFECTLY INELASTIC
PED = 0
Q_D isn't changed by a Δ in **P**
Vertical Demand Curve

2 PRICE INELASTIC
PED < 1
Q_D isn't very responsive to Δ in **P**
If P↑10% and Q_D↓ 2.5%
PED = 0.25

3 UNIT ELASTIC
PED = 1
Q_D is perfectly responsive to Δ in **P**
If P↑10% and Q_D↓ 10%
PED = 1

4 PRICE ELASTIC
PED > 1
Q_D is responsive to Δ in **P**
If P↓5% and Q_D↓ 10%
PED = 2.0

5 PERFECTLY ELASTIC
PED = ∞
Q_D falls to zero after any Δ in **P**
Evident in perfectly competitive markets

Exceptions

Not **ALL** goods obey the Law and Demand (*See* **#6**)

- Inferior Goods
- Giffen Goods
- Snob 'Status Symbol' Goods

All these have a **POSITIVE PED**

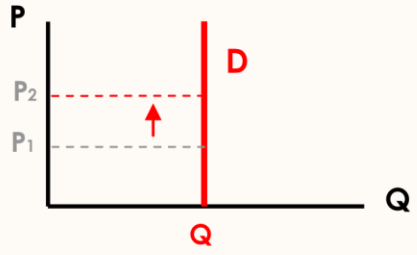
What Determines PED of a good?

1. **Availability of Substitutes**
   - > No. of substitutes > **Price elasticity**
2. **Its Price (Luxury or Necessity)**
   - > Price >Likelihood the good is **elastic** (a price rise could be too much for current customers)
3. **Durability**
   - > Price could mean postponing replacing the good (i.e. washing machines) – **price elastic**
4. **Income Spent**
   - A low proportion of income spend on it means its more likely to be **price inelastic**
5. **Brand Loyalty/Habits**
   - If strong loyalty/addiction, you will buy at any price = **price inelastic**
6. **Complementary Good?**
   - If its 1 of 2 goods used together cheaper good = **price inelastic**

Price Elasticity of Demand (PED) for Normal Goods

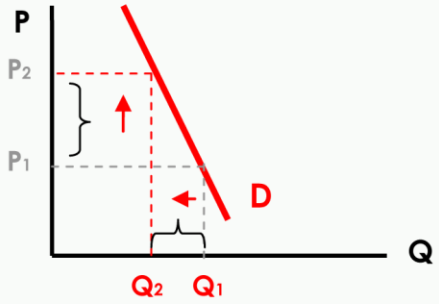
1
PERFECTLY INELASTIC DEMAND

- A good is have perfectly inelastic demand if a change in its price **(P)** will cause **no** change in the **Q_D**
- Demand is fixed, **Q_D** wont change
- **Maximise Revenue/Profit** by increasing **P** as much as possible. Costs wont rise as **P** does because no more goods are produced
- **Example:** Lifesaving drugs



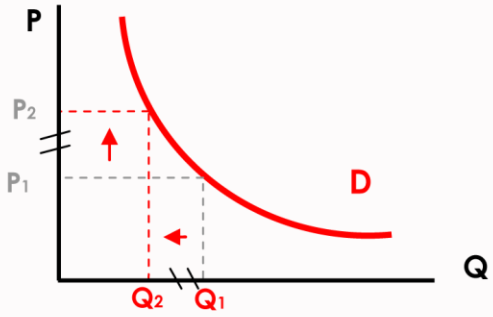
2
RELATIVELY INELASTIC DEMAND

- An increase from **P1** to **P2** will cause a smaller drop in **Q_D** from **Q1** to **Q2**
- Demand is not very responsive to P changes
- **Example**: Petrol, Alcohol, tobacco (***Less*** responsive – ***more*** likely to be taxed)



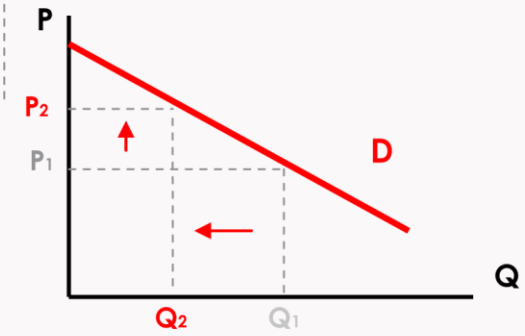
3
UNIT ELASTICITY OF DEMAND

- If the prop change in **Q_D** = prop change in **P** (i.e. **PED=1**)
- **Revenue** = Constant
- **Profit** = Max profit by increasing **P** as high as possible – could sell sell at higher **P** (less costs/unit more profitable)



4
RELATIVELY ELASTIC DEMAND

- If proportional change in **Q_D** is greater than proportional change in **P** = Good is elastic
- Demand for such goods is **very responsive** to **P**



5
PERFECTLY ELASTIC DEMAND

- Situation where **PED = ∞**
- Customers are prepared to buy ALL they can of a product at **ONE price ONLY**
- Any increase in **P** will cause demand to fall to 0
- **Example**: Any homogenous product with many substitutes i.e. potatoes, vegetables