The price system and the microeconomy (AS)

Demand and supply curves and what shifts them, price, income and cross elasticity of demand, price elasticity of supply, how demand and supply interact to set prices, and consumer and producer surplus.

2.1 Demand and supply curves

Demand

Demand is the **quantity of a good that consumers are willing and able to buy at each price in a given period**. The **law of demand**: as price **falls**, **quantity demanded rises** (**ceteris paribus**), so the **demand curve slopes down**.

A **change in the price** causes a **movement along** the demand curve (an **extension or contraction**). A **change in a non-price factor shifts** the curve:

- **Income** (normal goods rise, inferior goods fall)
- **Prices of related goods: substitutes** (a rise in the price of one increases demand for the other) and **complements** (a rise reduces demand for the other)
- **Tastes and fashion**, **advertising**
- **Population** size and structure
- **Expectations** of future prices and incomes
- **Interest rates** and **credit** availability, **taxation** of income

Reasons for the downward slope: the **income effect** (a lower price raises real income), the **substitution effect** (the good becomes cheaper relative to others) and **diminishing marginal utility**.

Supply

Supply is the **quantity producers are willing and able to sell at each price**. The **law of supply**: as price **rises**, **quantity supplied rises**, so the **supply curve slopes up** (higher price means higher profit and covers higher **marginal costs**).

A **price change** moves along the supply curve; a **non-price factor** shifts it:

- **Costs of production** (wages, raw materials, energy)
- **Technology**
- **Indirect taxes** (shift left) and **subsidies** (shift right)
- **Prices of other goods** that producers could make (**joint** and **competitive** supply)

Note Academy

- **Number of firms** in the market
- **Weather and natural events**, **expectations**

> **Movement along the curve = price has changed. Shift of the curve = a non-price determinant has changed.**

2.2 Price elasticity, income elasticity and cross elasticity of demand

Price elasticity of demand (PED)

> **PED = % change in quantity demanded ÷ % change in price. It is normally negative; the size is what matters. Elastic: |PED| > 1; inelastic: |PED| < 1; unitary: |PED| = 1.**

$$\text{PED} = \frac{\%\Delta Q_d}{\%\Delta P}$$

Example: price rises from \$10 to \$12 (+20%), quantity falls from 500 to 450 (−10%). PED = −10 ÷ 20 = **−0.5**: **inelastic**.

Determinants: availability and closeness of substitutes, **necessity or luxury**, the **proportion of income** spent, the **time period** (more elastic in the **long run**), and **addiction** and **brand loyalty**.

PED and total revenue: if demand is **elastic**, a **price rise lowers revenue**; if **inelastic**, a **price rise raises revenue**. **Firms** use PED to set prices; **governments** use it to judge the effect of **indirect taxes** (taxing a good with **inelastic** demand raises more revenue and cuts consumption less).

Income elasticity of demand (YED)

$$\text{YED} = \frac{\%\Delta Q_d}{\%\Delta \text{income}}$$

Positive for **normal** goods (above 1 for **luxuries**, between 0 and 1 for **necessities**) and **negative** for **inferior** goods. **Importance:** shows how **demand responds to the economic cycle** and the **long-term trend** as incomes grow, which guides **investment** decisions.

Cross elasticity of demand (XED)

$$\text{XED} = \frac{\%\Delta Q_d \text{ of good A}}{\%\Delta P \text{ of good B}}$$

Positive for **substitutes** (the bigger the value, the closer the substitute) and **negative** for **complements**. Firms use XED to predict the effect of **rivals' price changes**.

Note Academy

Along a straight-line demand curve, PED **varies**: it is **elastic at high prices** (the top left, where a small quantity is bought), **unitary at the midpoint** and **inelastic at low prices** (the bottom right), because the same absolute change is a bigger percentage of a small number. **PED and total expenditure (revenue):** if demand is **elastic**, a price **rise reduces** total expenditure; if **inelastic**, it **raises** it; at **unit elasticity** it is **unchanged**. A **price cut** has the opposite effect.

2.3 Price elasticity of supply

> **PES = % change in quantity supplied ÷ % change in price. Positive. Elastic: PES > 1; inelastic: PES < 1.**

Determinants: spare capacity, **stocks** of finished goods, **ease of switching** production, **time** (more elastic in the long run), **availability of inputs** and the **mobility of factors**. **Perishable** and **agricultural** goods have **inelastic** short-run supply, so **prices are volatile**.

The **sign** of PES is positive; its **size** shows how responsive supply is: a **larger coefficient** means a **greater percentage change** in quantity supplied for the same percentage price change. **Relative percentage changes** matter, not absolute ones. Elastic supply means firms **react quickly and easily** to new market conditions; **inelastic** supply means they **take time** (for example when capacity, skills or land are limited).

2.4 The interaction of demand and supply

Equilibrium price is where **quantity demanded equals quantity supplied**; there is **no tendency to change**.

- **Excess demand** (a **shortage**): price is **below** equilibrium, so **price rises** until the market clears.
- **Excess supply** (a **surplus**): price is **above** equilibrium, so **price falls**.

Changes in equilibrium: an **increase in demand** (shift right) raises **price and quantity**; a **decrease in supply** (shift left) **raises price and cuts quantity**. A **change in both** needs analysis of **relative sizes** of the shifts.

Price mechanism functions: signalling, **rationing** and **allocating**. **Applications:** commodity markets, housing, labour, the effect of **indirect taxes and subsidies**.

> **TRY IT**
>
> A drought cuts wheat supply. Show the effect on price and quantity.
>
> **Supply shifts left**: **price rises** and **quantity falls**. If demand is **inelastic**, the price rise is **larger**.

Equilibrium is where quantity demanded equals quantity supplied; **disequilibrium** is any other price, with a **shortage or surplus**. Markets are **linked**: **joint demand** (complements such as printers and ink: a fall in one price raises demand for the other), **alternative demand** (substitutes such as tea and coffee), **derived**

Note Academy

demand (the demand for a factor such as steel depends on the demand for cars) and **joint supply** (producing one good gives another, such as beef and leather: a rise in demand for beef **increases the supply of leather**).

The **functions of price** in allocating resources are **rationing** (high prices limit demand when goods are scarce), **signalling** (prices **transmit consumers' preferences** to producers, who move resources to goods in high demand) and **incentivising** (higher prices encourage firms to **produce more** and consumers to **economise**). **Effective demand** is demand backed by the **ability to pay**, not just a want.

2.5 Consumer and producer surplus

- **Consumer surplus** is the **difference between what consumers are willing to pay and the price they actually pay**: the **area under the demand curve and above the price**.
- **Producer surplus** is the **difference between the price received and the minimum price the producer would accept**: the **area above the supply curve and below the price**.

Changes in price alter surplus: a **fall in price** raises consumer surplus; a **rise** cuts it. **Total (economic) surplus** is the sum; it is **maximised at the free-market equilibrium** (allocative efficiency, when no externalities). **Government intervention** or **market failure** can reduce total surplus (**deadweight loss**).

The **extent** to which surplus changes when price changes depends on **elasticity**: when **demand is inelastic**, a price rise takes a **larger fall in consumer surplus** and gives **producers more revenue**; when **supply is inelastic**, a price change moves **producer surplus** by more.

Note Academy