The price system and the microeconomy (A Level)

Utility, indifference curves and budget lines, efficiency and market failure, externalities, costs, revenue and profit, market structures (perfect competition, monopoly, monopolistic competition, oligopoly, contestable markets), and the growth, survival and objectives of firms.

7.1 Utility

Utility is the **satisfaction** gained from consuming a good. **Total utility** is the satisfaction from all units; **marginal utility (MU)** is the **extra satisfaction from one more unit**.

> **Diminishing marginal utility: as consumption of a good rises, MU falls. A consumer is willing to pay less for each extra unit; this explains the downward-sloping demand curve.**

A consumer maximises utility when **the marginal utility per dollar is equal across goods**: **$MU_a \div P_a = MU_b \div P_b$**. The **demand curve** is the **MU curve in money terms**.

The **equi-marginal principle**: a consumer allocates income so that **MU ÷ price is equal for all goods**; if one good gives more MU per dollar, buy more of it until diminishing marginal utility restores equality. An **individual demand curve** is **derived** by taking a good's price falling, working out the **new utility-maximising quantity** each time, and plotting price against quantity. **Limitations** of marginal utility theory: utility **cannot be measured** in units, it **assumes rational behaviour** (consumers with perfect information) and **ignores habits, advertising, social influence and impulse**, which behavioural economics shows matter.

7.2 Indifference curves and budget lines

An **indifference curve** shows **combinations of two goods that give the consumer the same satisfaction**. **Properties: downward sloping**, **convex** to the origin (diminishing **marginal rate of substitution**), **do not cross**, and **curves further from the origin** show **higher** satisfaction.

A **budget line** shows **combinations of two goods a consumer can afford** with a given **income and prices**. **Slope = $-P_1 \div P_2$** (the ratio of prices). **Income rise:** the line **shifts outwards in parallel**. **Price fall of one good:** the line **pivots outwards** on the other axis.

> **Consumer equilibrium (utility maximisation) is where the budget line is tangent to the highest attainable indifference curve: the marginal rate of substitution equals the price ratio.**

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Price and income changes: a **fall in a good's price** moves the consumer to a higher curve; the **income effect** and **substitution effect** can be separated. For a **normal good** both effects raise quantity; for an **inferior good** the income effect works the **other way**; a **Giffen good** (very strongly inferior) has an income effect **larger** than the substitution effect, so a price rise **increases quantity demanded**.

7.3 Efficiency and market failure

Efficiency	Meaning
Allocative	resources go to **goods that consumers want most**: **P = MC** (price equals marginal cost)
Productive	output at the **lowest average cost**: **MC = AC** at minimum
Dynamic	efficiency **over time** through **innovation**
Static	efficiency at a **point in time**
X-inefficiency	**organisational slack** in firms **without competition**

> **Pareto optimality (Pareto efficiency) is a situation where no one can be made better off without making someone else worse off. A Pareto improvement makes at least one person better off and no one worse off. A perfectly competitive market with no externalities reaches a Pareto-optimal allocation; the idea says nothing about fairness.**

Market failure exists when the market **misallocates** resources. **Causes: externalities**, **public goods**, **merit and demerit goods**, **information asymmetry**, **monopoly power** and **immobility of factors**.

7.4 Private costs and benefits, externalities and social costs and benefits

> **Social cost = private cost + external cost. Social benefit = private benefit + external benefit. The market ignores externalities, so output differs from the social optimum (where MSB = MSC).**

Negative externalities (pollution): **external cost**; **market output is too high** and **price too low**: the MSC curve is **above** the MPC curve. **Positive externalities** (education, vaccination): **external benefits**; **market output is too low**: MSB is **above** MPB.

Welfare loss is the **area between MSC and MSB** over the units where the market **over- or under-produces**.

Policies to correct externalities:

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Policy	Example
Taxes (equal to the external cost)	pollution or carbon tax, **internalises** the cost
Subsidies	for positive externalities
Regulation	emission limits, bans
Tradable permits	a **cap** with market in permits
Property rights	clearly assign ownership
Provision of information	campaigns

Limits: it is **hard to value** externalities, **tax rates are difficult** to set, **political resistance**, **international** pollution.

Asymmetric information exists when **one party** in a transaction (for example a seller of a used car or a borrower) **knows more** than the other, leading to **poor decisions** and **market failure**. **Moral hazard** is when a person **takes more risk because someone else bears the cost** (an insured driver is less careful, or a bank that expects a bailout lends recklessly). **Deadweight welfare losses** arise from **negative externalities** (too much is produced, so the units where MSC exceeds MSB are a loss) and **positive externalities** (too little is produced, so the units where MSB exceeds MSC are lost); the loss is the **triangle** between MSB and MSC.

Costs and benefits in decisions: private firms compare **private** costs and benefits; the government also considers **external** ones. A project is worthwhile if **total social benefits exceed total social costs**.

7.5 Types of cost, revenue and profit, short-run and long-run production

Production in the short run

The **short run** has at least **one fixed factor**. The **law of diminishing returns**: adding **variable factors** to a fixed factor eventually gives **smaller extra output** (**marginal product falls**). **Total, average and marginal product** relate: **MP** cuts **AP** at the **maximum AP**.

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Costs

Cost	Definition
Total fixed cost (TFC)	does not vary with output
Total variable cost (TVC)	varies with output
Total cost (TC)	TFC + TVC
Average cost (AC)	**TC ÷ Q**
Marginal cost (MC)	**change in TC from one extra unit**

MC cuts AC at AC's minimum. If MC is below AC, AC falls; if MC is above AC, AC rises. MC is U-shaped because of diminishing returns.

Long run: all factors variable. **Returns to scale: increasing** (output rises by more than inputs), **constant**, **decreasing**. The **long-run average cost (LRAC)** curve shows the **lowest cost for each output**: **economies of scale** (falling LRAC), the **minimum efficient scale (MES)**, **diseconomies of scale**.

Internal economies: technical, **purchasing**, **financial**, **marketing**, **managerial**, **risk-bearing**. **External economies** arise from the **industry or area**. **Diseconomies** come from **coordination** and **communication** problems.

Revenue and profit

Total revenue (TR) = P × Q. Average revenue (AR) = TR ÷ Q = price. Marginal revenue (MR) = change in TR from one extra unit. Profit = TR − TC. Profit is maximised where MR = MC (with MC cutting MR from below). Normal profit is the minimum to keep the firm in the industry; supernormal profit is above this. Subnormal profit is below normal profit: the firm covers its variable costs but does not earn enough to stay in the industry in the long run, so it eventually exits.

For a **price taker**, **AR = MR = price (horizontal)**. For a firm with **market power**, **AR slopes down and MR is below it** (MR falls twice as fast for a linear demand curve).

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7.6 Different market structures

	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
Firms	**very many**	many	**few** large firms	**one**
Product	**identical**	**differentiated**	differentiated or identical	unique
Entry barriers	**none**	**low**	**high**	**very high**
Price control	**price taker**	some	**interdependent**	**price maker**
Information	**perfect**			

Perfect competition

Firms are **price takers**; in the **short run** they may make **supernormal** profit or loss; in the **long run**, **entry or exit** returns the industry to **normal profit** at **minimum AC**, so it is **allocatively and productively efficient** (P = MC = min AC).

Monopoly

A single seller with **barriers** (patents, control of resources, economies of scale). It **maximises profit** where **MR = MC** and charges the **price on the demand curve** at that output: **higher price and lower output** than competition, **supernormal profit** persists, there is **deadweight loss** and possible **X-inefficiency**. **Possible benefits: economies of scale** (a **natural monopoly**), **funds for R&D**, **price discrimination** that raises output. **Price discrimination** (different prices to different groups) needs **market power**, **separable markets** and **different elasticities**.

Monopolistic competition

Many firms with **differentiated products**: **short-run supernormal profit** attracts **entry**, shifting demand left until **normal profit** in the long run; **excess capacity** and **product variety**; **non-price competition** (advertising).

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Oligopoly

Few firms; **interdependence**: each reacts to the others. **Collusion** (cartel, tacit) can raise prices but is **illegal** in many places and **unstable** (cheating). The **kinked demand curve** explains **price rigidity**: rivals **match price cuts** but **ignore price rises**. **Game theory** (**prisoners' dilemma**) shows why firms may **compete** even though **co-operation** would pay more. In a **pay-off matrix** for two firms choosing a **high** or **low** price, the numbers show each firm's profit (Firm A, Firm B):

	B: high price	**B: low price**
A: high price	(10, 10)	(4, 12)
A: low price	(12, 4)	(6, 6)

Whatever B does, A earns more by choosing the **low** price (12 > 10 and 6 > 4), and the same is true for B, so both choose **low** and end at (6, 6), although (10, 10) would be better for both. This is a **Nash equilibrium**: neither firm can gain by changing **alone**. Co-operation (a **cartel** or tacit agreement) can reach (10, 10) but each firm is tempted to **cheat**. **Non-price competition** and **barriers** are common.

Contestable markets

A **contestable market** has **low entry and exit barriers (sunk costs)**: even with **few firms**, the **threat of entry** forces **competitive behaviour** (lower prices, **normal profit**). **Limit pricing** and **predatory pricing** may deter entrants.

> **TRY IT**
>
> A monopolist's MR = MC at 100 units where price is $30 and MC $10. Is it allocatively efficient?
>
> **No.** Price ($30) **exceeds** marginal cost ($10), so **too little is produced**; consumers value an extra unit above its cost.

A **concentration ratio** shows the **share of a market's output or sales taken by the largest firms**: a **four-firm concentration ratio of 80%** means the biggest four firms supply 80% of the market. A high ratio indicates an **oligopoly or monopoly**. **Barriers to entry and exit** include **physical barriers** (control of essential resources or a vital location), **legal** barriers (patents, licences), **economies of scale**, **brand loyalty**, **high start-up and sunk costs** and **predatory behaviour**. **Contestable market** features: **low sunk costs**, **free entry and exit** and the **ability of entrants to compete on equal terms**; the **implication** is that even a monopolist must keep price near cost and avoid **abnormal profit** to deter entrants, producing outcomes close to competition. Market **structure** is explained by the **number of buyers and sellers**, **product differentiation**, **freedom of entry and exit**, **availability of information** and **control over price**.

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7.7 Growth and survival of firms

Growth: internal (organic) or **external** (**mergers and takeovers**: horizontal, vertical, conglomerate). **Reasons: economies of scale**, **market power**, **spreading risk**, **managers' objectives**. **Why small firms survive: niche markets**, **flexibility**, **personal service**, **low costs**.

The divorce of ownership and control (shareholders own, managers run) creates a **principal–agent problem**: managers may pursue **their own** aims (**sales, growth, status**) not **profit**.

External growth (integration): horizontal (same stage, same industry), **vertical forward** (towards the customer) and **backward** (towards the supplier), and **conglomerate** (unrelated). **Reasons: economies of scale**, **more market power**, **a larger market share**, **spreading risk**, **access to new technology** and **removing a competitor**. **Consequences:** for **firms**, higher profit and power but also **diseconomies** and integration problems; for **consumers**, possibly **lower costs** or **higher prices and less choice**; for **workers**, **redundancies**. **Reasons for different sizes of firms: market size**, **economies of scale**, **barriers to entry**, **owners' aims**, **finance** and **the nature of the product**.

Cartels are **agreements between firms** to restrict output and raise price. **Conditions for an effective cartel: few firms**, **similar costs and products**, **barriers to entry**, **a way to monitor cheating** and **weak competition law**. **Consequences: higher prices and profits** for members, **lower output and choice** for consumers and a **tendency to collapse** as members cheat.

7.8 Differing objectives and policies of firms

Objective	Condition
Profit maximisation	**MR = MC**
Revenue maximisation	**MR = 0** (the top of the TR curve)
Sales (output) maximisation	**AR = AC** (normal profit)
Satisficing	**enough** profit to satisfy shareholders
Growth and **market share**	long-run aims

Pricing and output policies: limit pricing, **predatory pricing**, **cost-plus**, **price discrimination**. **Competition policy: regulating monopolies**, **preventing cartels**, **price caps**, **public ownership**.

The **traditional objective** is **profit maximisation** (MR = MC). **Survival** matters for new and struggling firms: they may accept **lower profit** or **even losses** to remain in business. **Price leadership** is where one **dominant firm sets the price** and the others **follow**, avoiding price wars. For a **normal downward-sloping demand curve**, **revenue is maximised** where **PED = 1** (MR = 0): above that output demand is **elastic** (a lower price raises revenue); below, **inelastic**. In the **kinked demand curve** model, demand is **elastic above the kink** (rivals do not follow a rise) and **inelastic below** (rivals match a cut), so firms **avoid changing price**.

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