

Firms, costs, growth and competition

Pearson Edexcel · International A-Level · Economics

Pearson Edexcel International A Level Economics (WEC13), specification Issue 2, June 2018. This topic covers spec sections 3.3.1–3.3.3 in full: types, sizes and growth of businesses and business objectives (3.3.1); revenue, costs and profits with economies of scale (3.3.2); and the whole market-structures spectrum from perfect competition to contestability (3.3.3) – 57 lettered objectives. The demand side stays on the shared model (AR: $P = 70 - Q/2$), and the cost machinery is built from one original table so every figure cross-checks.

Must-know for this topic:

Family	Relationship
revenue	$TR = P \times Q$; $AR = TR/Q$; $MR = \Delta TR/\Delta Q$ (here $MR = 70 - Q$)
costs	$TC = TFC + TVC$; $ATC = TC/Q$; $AVC = TVC/Q$; $MC = \Delta TC/\Delta Q$
profit	profit max where $MR = MC$; shutdown where $P < \min AVC$; break-even at $P = \min ATC$
structures	CR4 here = $40+25+15+10 = 90\%$; monopoly $Q_m = 40$, $P_m = 50$, profit 800, DWL 200

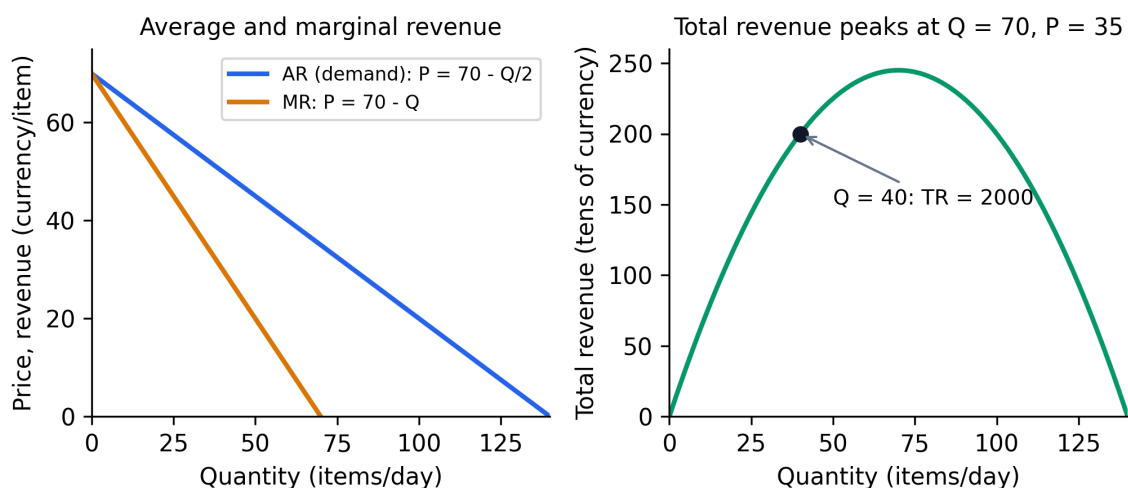
Types, sizes and growth of businesses

Business types (3.3.1.1): private sector organisations (owned by shareholders or proprietors for profit); state-owned enterprises in the public sector; for-profit versus NOT-FOR-PROFIT organisations (surplus reinvested, not distributed); co-operatives (owned by members, one member one vote); and joint ventures (two firms pool resources for one project, sharing risk and control). Sizes run from **SMEs** (small and medium enterprises) to large corporations (3.3.1.2a). Businesses grow **ORGANICALLY** (reinvested profits, new products, new outlets) or by **MERGER** and **TAKEOVER** (3.3.1.2b): **FORWARD** vertical integration buys a customer stage (a brewer buys pubs); **BACKWARD** vertical buys a supplier stage (the brewer buys a hop farm); **HORIZONTAL** integration buys a rival at the same stage; **CONGLOMERATE** integration buys an unrelated business. Advantages: vertical secures supply or outlets and internalises mark-ups; horizontal cuts costs and market rivalry; conglomerate spreads risk. Disadvantages: integration is costly, cultures clash, and size invites diseconomies and regulation (3.3.1.2c). Growth constraints: the size of the market, access to finance, the owner's objectives, and government regulation and bureaucracy (3.3.1.2d); firms stay small where markets are local, finance is thin, owners prefer control, or rules bite – and grow where the reverse holds (3.3.1.2e). Growth affects businesses (market power, scale), workers (jobs, but restructuring) and consumers (lower prices versus less choice) (3.3.1.2f); **Demergers** split conglomerates back

into focused units when coordination fails, with mirror effects on all three groups (3.3.1.2g).

Business objectives

Objectives (3.3.1.3): **profit maximisation** ($MR = MC$); **REVENUE MAXIMISATION** (revenue max where $MR = 0$ – here $Q = 70$, $P = 35$, exactly the topic-1 unitary-PED point); **SALES VOLUME MAXIMISATION** (largest output subject to covering costs); and **BEHAVIOURAL theories** – **SATISFICING**, where managers aim for a satisfactory result rather than the maximum (Herbert Simon). The **DIVORCE OF OWNERSHIP FROM CONTROL** makes objectives contestable: shareholders (principals) want profit; managers (agents) run the firm daily and may prefer growth, pay or quiet lives – the **principal-agent problem** (3.3.1.3b). Formulae: profit max at $MR = MC$; revenue max at $MR = 0$; sales-volume max at $AR = ATC$ (normal profit constraint) (3.3.1.3c).



Original model: AR $P = 70 - Q/2$, MR $P = 70 - Q$; $TR(40) = 2000$ and the TR maximum at $(70, 35)$.

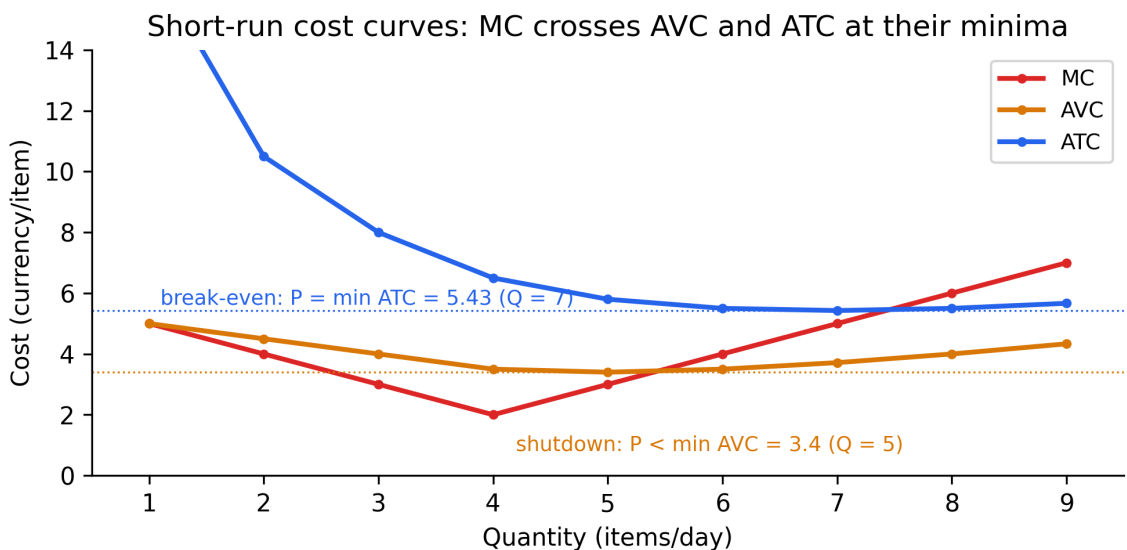
Revenue, costs and profits

Revenue (3.3.2.1): $TR = P \times Q$, $AR = TR/Q$ (the demand curve) and $MR = \Delta TR / \Delta Q$; when the demand curve is a straight line, MR has TWICE its slope – AR $P = 70 - Q/2$ gives MR $P = 70 - Q$. PED links to revenue: with $|PED| > 1$ a price cut RAISES revenue (MR positive), with $|PED| < 1$ it lowers it – at $Q = 40$, price 50, $TR = 2000$ and $MR = 30$ (positive, so still in the elastic range).

Costs (3.3.2.2): the **SHORT RUN** has at least one fixed factor, and the **law of diminishing returns** makes marginal product fall as more variable input is added to it – which is why marginal cost eventually rises and the cost curves take their U-shapes. The original table ($TFC = 12$): TVC for $Q = 1 \dots 9$ runs 5, 9, 12, 14, 17, 21,

26, 32, 39, so MC runs 5, 4, 3, 2, 3, 4, 5, 6, 7, falling while specialisation dominates and rising once diminishing returns bite. $TC = TFC + TVC$; per unit, ATC and AVC are U-shaped and MC cuts EACH at its minimum: AVC is minimised at $Q = 5$ (3.4) and ATC at $Q = 7$ (5.43). Marginal product and marginal cost are mirror images (high MP $\rightarrow$ low MC); average product mirrors AVC ; total product mirrors TC ; and in the LONG RUN all factors are variable, so only then can the whole cost structure change (3.3.2.2d).

Profits and losses (3.3.2.4): **normal profit** is the minimum return keeping the entrepreneur in the industry – an opportunity COST, included in ATC ; **super-normal profit** is anything above it ($P > ATC$); a LOSS is $P < ATC$. The firm should SHUT DOWN in the short run only when $P < \min AVC = 3.4$: below that, revenue fails to cover even variable costs; between AVC and ATC it trades at a loss smaller than its fixed costs, which are sunk in the short run. In the long run the exit point is $P = \min ATC = 5.43$.

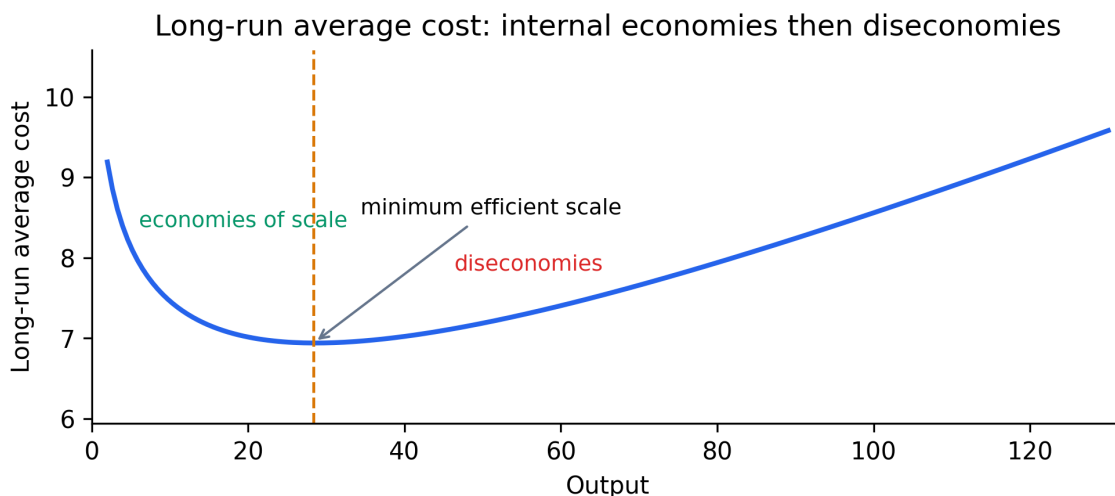


Original table plotted: MC crosses AVC at its minimum (3.4, $Q = 5$) and ATC at its minimum (5.43, $Q = 7$).

Economies and diseconomies of scale

The long-run average cost curve (LRAC) falls with INTERNAL economies of scale, flattens at the **minimum efficient scale** (MES) – the smallest output at which lowest average cost is achieved – and rises with diseconomies (3.3.2.3a–b). Internal economies (inside the firm, 3.3.2.3d): FINANCIAL (cheaper borrowing), TECHNICAL (larger plant), MANAGERIAL (specialist managers), MARKETING (spread advertising), PURCHASING (bulk discounts), RISK-BEARING (diversified products). EXTERNAL economies (industry-wide, 3.3.2.3e): availability of skilled labour, access to transport links, sharing knowledge. Diseconomies (3.3.2.3f): com-

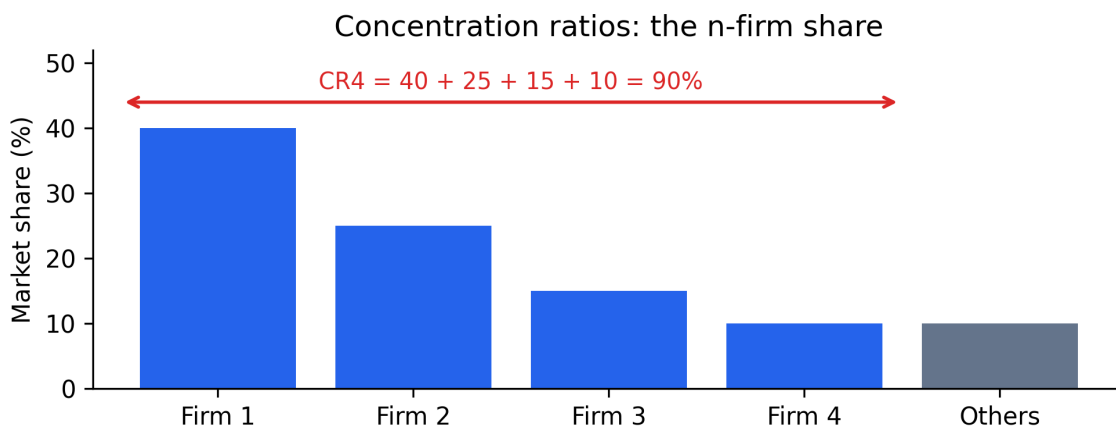
munication problems, coordination problems, and X-INEFFICIENCY (costs drifting above the achievable minimum for lack of competitive pressure).



Original curve: internal economies of scale to the MES, then diseconomies.

Efficiency and concentration

The four efficiency concepts (3.3.3.1): **ALLOCATIVE** efficiency ($P = MC$ – price reflects marginal cost to society); **PRODUCTIVE** efficiency (output at minimum ATC); **DYNAMIC** efficiency (investment and innovation over time, funded by profits); and **X-INEFFICIENCY** (wasteful production above the cost floor). Each market structure scores differently – perfect competition is allocatively and productively efficient in the long run but dynamically weak; monopoly may be dynamically efficient but is rarely allocatively so. The n-firm **concentration ratio** (3.3.3.2): with shares 40, 25, 15, 10 and 10, the four-firm ratio is $CR4 = 40 + 25 + 15 + 10 = 90\%$ – a concentrated market; its significance: high ratios flag market power (but miss foreign competition and contestability).



Original data: $CR_4 = 90$ percent of a five-firm market.

Market structures: competition to monopoly

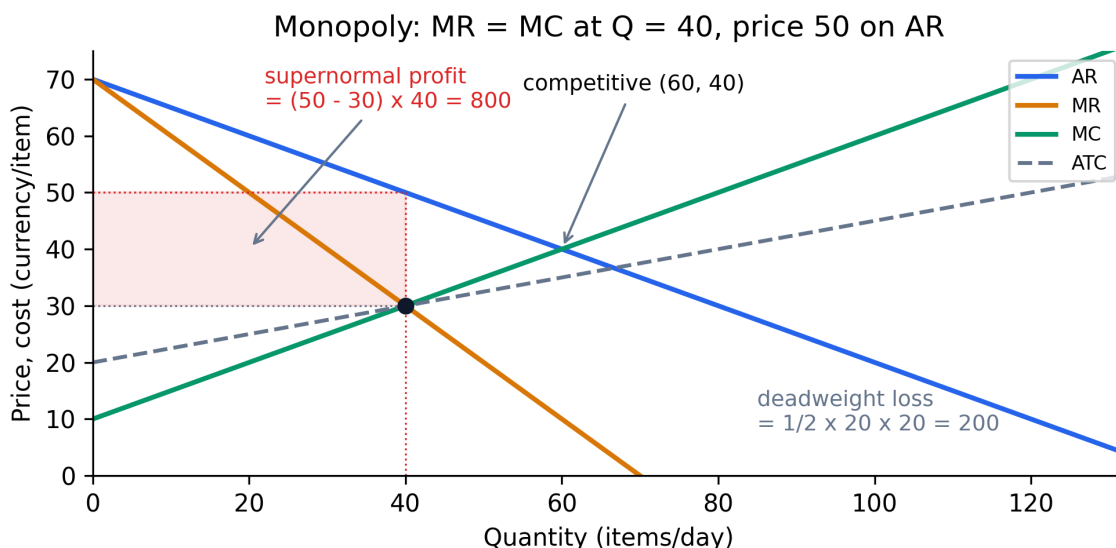
Perfect competition (3.3.3.3): many small firms, identical products, perfect information, free entry and exit – each firm is a PRICE TAKER, so $P = AR = MR$; short-run profit maximisation at $MC = MR$, long-run entry driving price to $P = \min ATC$ – only normal profit, with productive AND allocative efficiency ($P = MC$) in the long run; the short-run shutdown is $P < AVC$.

Monopolistic competition (3.3.3.4): many firms, DIFFERENTIATED products – physically (features), by marketing (advertising, packaging) or distribution (shop, online, telephone) – so each faces a downward-sloping demand curve: short-run supernormal profits attract entry, which in the long run drives profits to normal while price sits above MC (excess capacity, not allocatively efficient).

Oligopoly (3.3.3.5): few large INTERDEPENDENT firms behind barriers to entry – economies of scale, LIMIT PRICING (pricing below the profit-maximising level to deter entry), patents, branding, SUNK COSTS and legal barriers (3.3.3.5b). Interdependence brings strategic behaviour: the simple two-firm, two-outcome game below shows why collusion is fragile – defecting is each firm's dominant strategy, so both end at the **Nash equilibrium** (2, 2) although collusion (4, 4) pays both better (3.3.3.5c). Collusion can be formal (**cartels**) or tacit (PRICE LEADERSHIP); PRICE WARS break out when the discipline fails. Collusion benefits producers (higher profits) at the cost of consumers (higher prices), workers (uncertain) and governments (deadweight loss, illegality) (3.3.3.5d). Price competition includes price wars, PREDATORY PRICING (below cost to drive out entrants) and limit pricing (3.3.3.5e); NON-PRICE competition runs through advertising and branding, quality, endorsement, product placement and after-sales service (3.3.3.5f) – each with costs and benefits to firms, consumers, employees and suppliers (3.3.3.5g).

Monopoly (3.3.3.6): one seller behind barriers; profit maximisation where $MR = MC$. On the shared model with $MC = 10 + Q/2$: $70 - Q = 10 + Q/2$

gives $Q_m = 40$; price on the AR curve is $P_m = 50$; with $ATC = 30$ at that output, supernormal profit is $(50 - 30) \times 40 = 800$ per day. Against the competitive benchmark ($P = MC$: $Q_c = 60$, $P_c = 40$) the monopoly raises price by 10, cuts output by 20 and creates a deadweight loss of $\frac{1}{2} \times 20 \times 20 = 200$ (3.3.3.6c-d). A **natural monopoly** has falling average costs over the whole market (one network is cheapest) – its implication: regulate rather than fragment (3.3.3.6e). **third-degree price discrimination** (3.3.3.6f) needs market power, separable groups with different PEDs, and no resale: charging each group its profit-maximising price raises producer surplus, benefits price-elastic groups with lower prices and harms inelastic groups (3.3.3.6g). Monopoly is productively and allocatively inefficient but may be dynamically efficient (3.3.3.6h).



Original model: MR = MC at (40, 30); price 50 on AR; supernormal profit 800 shaded; deadweight loss 200 against the competitive (60, 40).

Prisoners' dilemma: both collude (4, 4) beats the Nash outcome (2, 2)

		Firm B	
		collude	defect
Firm A	collude	A 4 B 4	A 1 B 6
	defect	A 6 B 1	A 2 B 2

<- Nash equilibrium
defect, defect (2, 2)

Original payoffs: the Nash equilibrium (2, 2) is worse for both than collusion (4, 4).

Monopsony and contestability

Monopsony (3.3.3.7): ONE buyer facing many sellers – conditions: the buyer dominates the input market (a single big employer in a town). It pushes the input price BELOW the competitive level: the firm gains (lower costs, higher profits) while suppliers or EMPLOYEES lose (lower wages), and output falls – consumers may gain from lower prices if cost savings are passed on (3.3.3.7b).

Contestability (3.3.3.8): a market is contestable when ENTRY AND EXIT are cheap – the key is SUNK COSTS: with none, hit-and-run entry disciplines incumbents. Implications: even a single incumbent keeps profits near normal and prices near competitive levels, often through LIMIT PRICING (3.3.3.8a–b). Contestability benefits consumers (low prices, choice) and disciplines firms; its costs fall on incumbents' shareholders, and low sunk costs mean little commitment to quality investment (3.3.3.8c–d).

Checklist

- Business types (private, state, not-for-profit, co-operatives, joint ventures); SMEs vs large corporations; organic growth and the four integrations with advantages and disadvantages; growth constraints; why firms stay small; growth and demerger effects on businesses, workers, consumers (3.3.1).
- Objectives: profit max ($MR = MC$), revenue max ($MR = 0$, $Q = 70$ here), sales-volume max, satisficing; the principal-agent problem and the divorce of ownership from control (3.3.1.3).
- $TR/AR/MR$ with the twice-the-slope rule and the PED link (3.3.2.1).
- Short-run cost curves from diminishing returns: the table with MC 5→2→7, AVC min 3.4 at $Q = 5$, ATC min 5.43 at $Q = 7$; the four mirror relationships; normal/supernormal profit; shutdown and break-even rules (3.3.2.2, 3.3.2.4).
- $LRAC$, MES , six internal and three external economies, three diseconomies (3.3.2.3).
- Allocative, productive, dynamic efficiency and X-inefficiency; $CR4 = 90\%$ calculation and significance (3.3.3.1–2).
- Perfect competition (price taker, $LR\ P = \min ATC$, efficient), monopolistic competition (differentiation, excess capacity), oligopoly (barriers, the prisoners' dilemma with Nash (2, 2) vs collusion (4, 4), cartels, price leadership, price wars, predatory and limit pricing, non-price competition), monopoly (Q_m 40, P_m 50, profit 800, DWL 200, natural monopoly, third-degree price discrimination) (3.3.3.3–6).
- Monopsony and contestability with sunk costs (3.3.3.7–8).

Boundary notes: WEC13 papers are 2 hours, 80 marks and draw on Units 1–2. Diagrams carry marks: label $AR/MR/MC/ATC$, mark Q_m and P_m , shade the profit box and the deadweight triangle. Worked numbers are original and consistent.