

4.1 Production, productivity and business costs

Name: _____ Class: _____ Date: _____

Total: 22 marks

KEY WORDS productivity • economies of scale

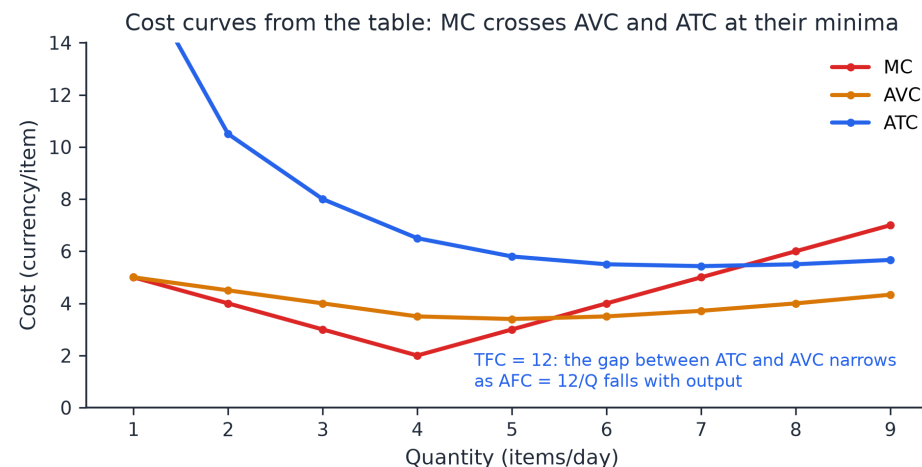
Production, productivity and business costs

Objective

Name the factors and sectors, calculate productivity, apply the division of labour, and compute revenues and costs from the table with the economies of scale lists (spec 1.2.1–1.2.3).

1 Key knowledge and worked examples

Production and costs. Factors: land, labour, capital, enterprise; sectors: primary, secondary, tertiary – shifting to services with development. Productivity = output per input: 8 → 10 items per worker-hour is +25%. $TR = P \times Q$; $AR = TR/Q$; $MR = \Delta TR / \Delta Q$. Table (TFC 12; TVC 5, 9, 12, 14, 17, 21, 26, 32, 39): MC 5, 4, 3, 2, 3, 4, 5, 6, 7; AVC min 3.4 at $Q = 5$; ATC min 5.43 at $Q = 7$. Profit = $TR - TC$. Six internal economies; four external; four diseconomies.



Original data; the minima are worked in the questions.

2 Practice

2.1 Name the four factors of production. [2]

2.2 Name the three sectors and state which grows most in developed economies. [2]

2.3 Output per worker-hour rises from 8 to 10. Calculate the percentage productivity gain. [2]

2.4 State the formula and one advantage and one disadvantage of the division of labour. [3]

2.5 Name any four of the six internal economies of scale. [2]

3 Exam-style questions

3.1 (*Original.*) On AR $P = 70 - Q/2$ with price 50: calculate TR and AR at $Q = 40$, and state where TR is maximised. [4]

3.2 (*Original.*) From the table (TFC 12; TVC 5, 9, 12, 14, 17, 21, 26, 32, 39): calculate TC, AVC and ATC at $Q = 7$, and state the quantity at which ATC is minimised. [4]

3.3 (*Original.*) A firm doubles its output and its total costs rise from 38 to 68 currency units (per-day scale from the table doubled). Using the LRAC diagram, explain whether the firm is experiencing economies or diseconomies of scale. [3]

Solutions

2.1 Land; labour; capital; enterprise.

2.2 Primary; secondary; tertiary (1). The tertiary (services) sector grows most as economies develop (1).

2.3 $\frac{10-8}{8} \times 100 = 25\%$.

2.4 The division of labour is the specialisation of workers in one task each within production. Advantage: workers become quick and skilled at one task, raising productivity. Disadvantage: work becomes monotonous, lowering morale and raising turnover.

2.5 Any four of: purchasing (bulk buying); marketing; technical; financial; managerial; risk bearing.

3.1 $TR = P \times Q = 50 \times 40 = 2000$; $AR = TR/Q = 2000/40 = 50$ (the price itself). TR is maximised where $MR = 0$: $70 - Q = 0$ gives $Q = 70$, price 35, $TR = 2450$.

3.2 At $Q = 7$: $TVC = 26$, so $TC = 26 + 12 = 38$; $AVC = 26/7 \approx 3.71$; $ATC = 38/7 \approx 5.43$. ATC is minimised at $Q = 7$ – exactly this output (values either side: 5.5 and 5.67).

3.3 Costs per unit BEFORE: $38/7 \approx 5.43$; AFTER: doubling output to $Q = 14$ with TC 68 gives $ATC = 68/14 \approx 4.86$. Average cost has FALLEN as output grew, so the firm is on the falling LRAC – economies of scale (bulk buying, technical or managerial savings spreading over more units).

Local review guidance: percentage change with the ORIGINAL value as denominator; table answers show the division; (R1) the LRAC verdict compares ATC before and after – “costs rose” alone is not an answer, only COST PER UNIT decides. This is authored classroom guidance.