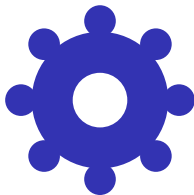


Operations Management

IGCSE Business Studies ■ Topic 4

IGCSE Business Studies



What we will cover

- 1 Methods of production
- 2 Productivity & lean production
- 3 Types of cost
- 4 Break-even
- 5 Quality

1

Production

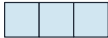
Methods of production

job



one unique
item at a time

batch



a group, then
switch to another

flow



a non-stop
line

- training workers,
- using better machines and **technology** 技术,
- improving **motivation** 激励,
- organising the work better.

The production methods, and the break-even chart

Job production

One unique item at a time: a wedding cake, a bridge. Skilled, flexible, and dear per unit.

Batch production

Batch production 批量生产 makes a group of identical items, then switches – bread of one kind, then another. Setup time between batches is the cost.

Flow production

Continuous, identical output on a line: lowest unit cost, highest setup cost, and no flexibility.

Break-even chart

A **break-even chart** 盈亏平衡图 plots total costs against sales revenue: they cross at the break-even output, and the gap beyond it is profit.

Choose the method from the order: unique, grouped, or identical and endless. **Tariffs** 关税 and transport costs are what pull production nearer the market.

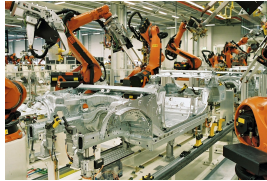
Productivity and lean production

productivity 生产率

output per worker; raise it with training, technology & motivation

lean production 精益生产

cut all waste; **just-in-time** 准时制 holds little **inventory** 库存

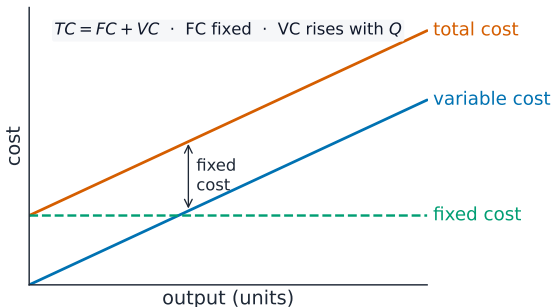


Robots raise output per worker: higher productivity

2

Costs

Types of cost



- **fixed costs** 固定成本 do not change with output – rent, salaries, insurance. You pay them even if you make nothing.
- **variable costs** 可变成本 change with **output** 产量 – materials, and pay for each item made. More output means more variable cost.
- **total cost** 总成本 is fixed costs plus variable costs.
- **average cost** 平均成本 is the total cost divided by the number

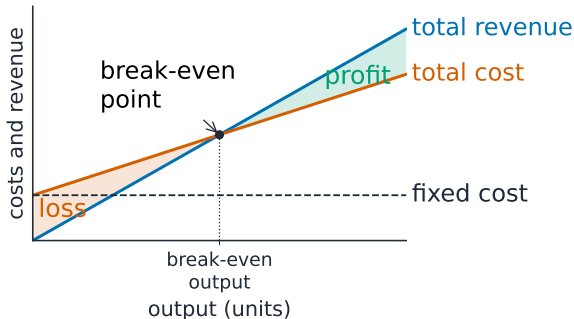
Break-even

The **break-even point** 盈亏平衡点 is where total revenue = total cost (no profit, no loss).

$$\text{break-even output} = \frac{\text{fixed costs}}{\text{contribution per unit}}$$

contribution per unit = price – variable cost per unit

Above break-even output the business makes a **profit**; below it, a **loss**.

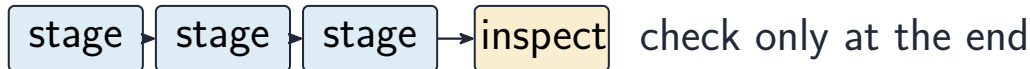


Quality

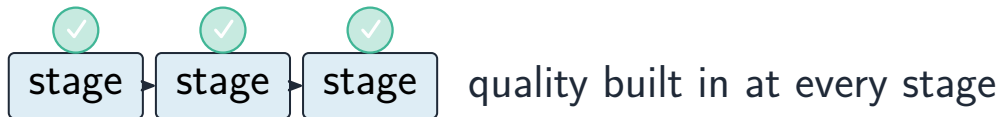
- **quality control** 质量控制 – **check** at the end
- **quality assurance** 质量保证 – **build in** quality throughout

Good quality wins loyal customers & cuts waste.

quality control



quality assurance

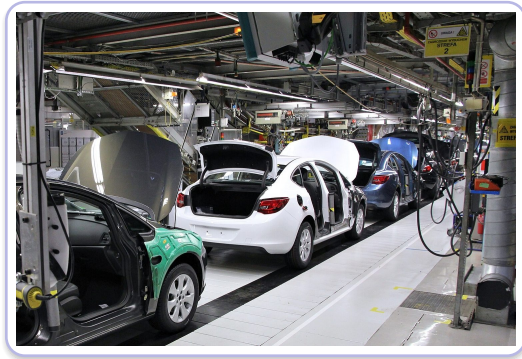


Quality, and the two ways to manage it

why quality matters	builds a strong brand 品牌 and customer loyalty 顾客忠诚度
and	means fewer returns, complaints and wasted materials – so it lowers cost as well as raising price
the risk	poor quality loses customers and damages the brand , which takes far longer to repair than a fault
quality control 质量控制	inspect at the end and find and remove faulty goods – the waste is already made
quality assurance 质量保证	build checks into every stage to stop faults happening at all
automation 自动化	machines and robots doing tasks – consistent quality, high set-up cost, and fewer jobs

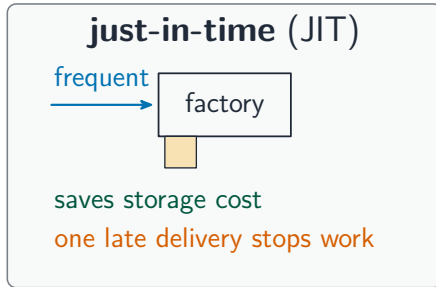
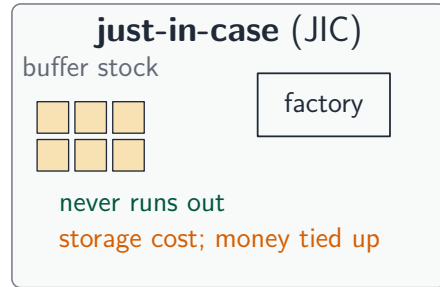
Control finds the fault; assurance prevents it. The saving is in the units that were never made wrong.

Flow production on an assembly line



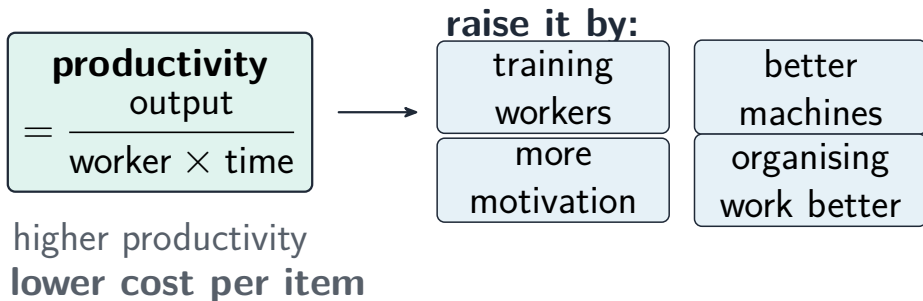
A car assembly line: making many identical products on a moving line

Lean production and just-in-time



Just-in-time holds little stock with frequent deliveries; just-in-case holds a buffer of stock

Productivity



Productivity is output per worker in a set time; raising it lowers the cost per item

Location decisions



Where a business locates – like this distribution centre – affects its costs and service.

Locating a business

Where a business sits affects its costs and its sales.

- nearness to **raw materials** 原材料, because heavy or bulky materials cost a lot to move,
- nearness to customers and the **market** 市场,
- the cost and size of the land,
- a supply of suitable labour,

What decides where a business locates

near the market	essential for a service business – a shop or hair salon must be where its customers are
near the supply	matters most for a manufacturing 制造 business using heavy or perishable inputs
good transport links	roads, rail, a port or an airport – for both inputs and outputs
labour	enough workers with the right skills, at a wage the firm can pay
land and rent	cheaper away from the centre, and the saving must beat the transport cost
government grants	offered in some areas to attract firms to regions with high unemployment

A service business looks first at **being close to customers**; a manufacturer looks first at **total cost**. Say which kind the case study describes.

Locating in another country

A business may produce or sell abroad in order to reach new customers and bigger markets, pay lower wages or rent, get nearer to raw materials.

But it must then deal with different laws, languages and customs, and follow the **legal controls** 法律管制 of both countries.

Exam tips

- Match the production methods: **job** (one-off items to order), **batch** (a group, then switch to another), **flow** (non-stop mass production on a line).
- Learn the formulas: $\text{total cost} = \text{fixed} + \text{variable}$; $\text{average cost} = \text{total cost} \div \text{output}$; $\text{total revenue} = \text{price} \times \text{quantity}$; $\text{profit} = \text{total revenue} - \text{total cost}$.
- **Break-even output** = $\text{fixed costs} \div (\text{selling price} - \text{variable cost per unit})$. How far actual output is above break-even is the **margin of safety**.
- Break-even analysis assumes everything made is sold at one fixed price and cost, so it is only a guide.
- **Quality control** checks finished goods at the end; **quality assurance** builds quality in at every stage.

3

Recap

Worked example – total and average cost

Fixed costs are £8,000, variable cost is £2 per unit, and the factory makes 1,000 units.

- Total variable cost = $2 \times 1,000 = \text{£}2,000$
- Total cost = fixed + variable
= $8,000 + 2,000 = \text{£}10,000$
- Average cost
$$= \frac{\text{total cost}}{\text{output}} = \frac{10,000}{1,000} = \text{£}10$$
- Make more and AC **falls**: the fixed cost is spread over more units.

Fixed costs do not change with output (rent); **variable** costs do (materials). Spreading fixed costs is exactly what **economies of scale** means.

Topic 4 – key takeaways

1

Methods

job, batch & flow production

2

Lean

cut waste; just-in-time holds little stock

3

Costs

total = fixed + variable; average
= total/output

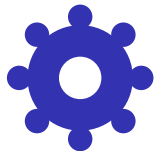
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Break-even

where total revenue = total cost

Check yourself

- 1 Which method suits a one-off wedding cake?
- 2 Do fixed costs change with output?
- 3 What is true at the break-even point?
- 4 When does quality control check the product?



Answers 1. job production 2. no 3. total revenue = total cost 4. at the end of production