

BREAK-EVEN ANALYSIS

SALES REVENUE/TURNOVER

Revenue is the money a business makes from sales. The total amount of money a business receives from its sales is called total revenue.

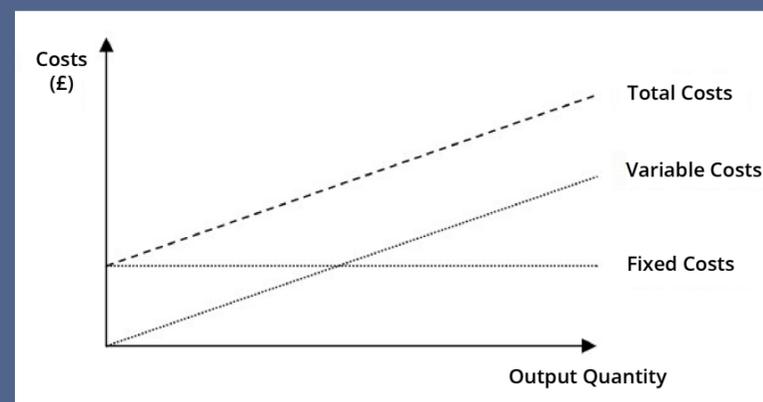
$$\text{Total revenue} = \text{quantity sold} \times \text{selling price}$$

TYPES OF COSTS

Fixed Costs: Do not vary with output. Fixed costs only change in the long run. For example: rent, management salaries, interest charges and depreciation.

Variable Costs: Costs that vary in direct proportion to changes in output. For example: raw materials, fuel and labour (when staff are paid for what they produce).

$$\text{Total Costs} = \text{Fixed Costs} + \text{Variable Costs}$$



Semi-Variable Costs: Costs that contain both fixed and variable elements, such as telephone charges where there is a fixed standing charge plus an extra rate that varies according to the number of calls made.

PROFIT

Calculation: Total Revenue – Total Costs

Example: Calculate the profit made if the business was operating at maximum capacity.

Maximum possible output (100% capacity)	400 000 units
Actual output	240 000 units
Variable Costs (per unit)	£6
Fixed Costs	£360 000
Selling Price (per unit)	£14

$$\begin{aligned} \text{Total Revenue} &= 400000 \times £14 \\ \text{Total Revenue} &= £5600000 \end{aligned}$$

$$\text{Fixed Costs} = £360000$$

$$\begin{aligned} \text{Variable Costs} &= 400000 \times £6 \\ \text{Variable Costs} &= £2400000 \end{aligned}$$

$$\begin{aligned} \text{Total Costs} &= \text{Fixed Costs} + \text{Variable Costs} \\ \text{Total Costs} &= £360000 + £2400000 \\ \text{Total Costs} &= £2760000 \end{aligned}$$

$$\begin{aligned} \text{Profit} &= \text{Total Revenue} - \text{Total Costs} \\ \text{Profit} &= £5600000 - £2760000 \\ \text{Profit} &= £2840000 \end{aligned}$$

CONTRIBUTION

Definition: It is the difference between the income generated from sales and the variable costs of producing the goods to generate those sales. This allows a business to analyse whether each of its products covers its own variable costs.

Contribution is used to pay the company's overheads (fixed costs). Once these have been covered, additional contribution generates profit.

$$\text{Contribution per unit} = \text{Selling Price per unit} - \text{Variable Costs per unit}$$

DIRECT COSTS

Definition: Costs that arise specifically from the production of a product or the provision of a service.

Examples of direct costs include:

- rent on a shop
- materials or components
- direct labour
- expenses such as copyright payments on a published book
- licence fees for use of patents.

These direct costs can be totalled to give the direct costs of producing the product. However, revenue minus direct costs does not indicate profitability. The business must also apportion **overheads** or **indirect** costs to the product.

OVERHEADS/INDIRECT COSTS

Definition: Costs not directly related to production.

Examples of overheads costs include:

- employing the secretary or receptionist
- advertising costs.

The true profitability of a product, factory, outlet etc. can only be judged if we take from revenue both direct costs and overheads.



BREAK-EVEN ANALYSIS

BREAK-EVEN

Definition: A diagram that shows the level of output where a business does not make a profit nor a loss

Calculation:

$$\frac{\text{Fixed costs}}{\text{(Selling price per unit minus variable cost per unit)}}$$

Advantages:

- ✓ **Easy visual** means of analysing a business' financial position at different levels of output - gives a valuable rule-of-thumb guide to potential profitability.
- ✓ **Cheap to construct** and can be carried out quickly.
- ✓ Profit and loss situation can be **seen at a glance** - good for non-financial specialists.
- ✓ Helpful for making decisions in **'what if'** situations - can cope with changing circumstances in relation to revenues and costs.
- ✓ Break-even analysis, as part of a **business plan**, can be helpful in gaining finance.
- ✓ **Target setting** made easier.
- ✓ Can **identify the margin of safety** - aids planning

Limitations:

- ✗ Often regarded as **too simplistic** as some assumptions are unrealistic.
- ✗ It **assumes all output is sold**, which is often not the case.
- ✗ **Assumes that conditions remain unchanged** - wages, prices and technology can all change suddenly.
- ✗ **Relies on the data being accurate** and often under- or over-estimations are made.
- ✗ **Assumes that total revenue and cost curves are always linear** - this may not be the case.
- ✗ **Allocating fixed costs** in a multi-product business can be problematic - thus making break-even analysis output inaccurate.
- ✗ **Fixed costs are often stepped** - this makes break-even analysis difficult.

EXAM QUESTION

BLUE RIVER KAYAKS (BRK)

Blue River Kayaks (BRK) produces Kayaks for sale to the outdoor pursuits market.

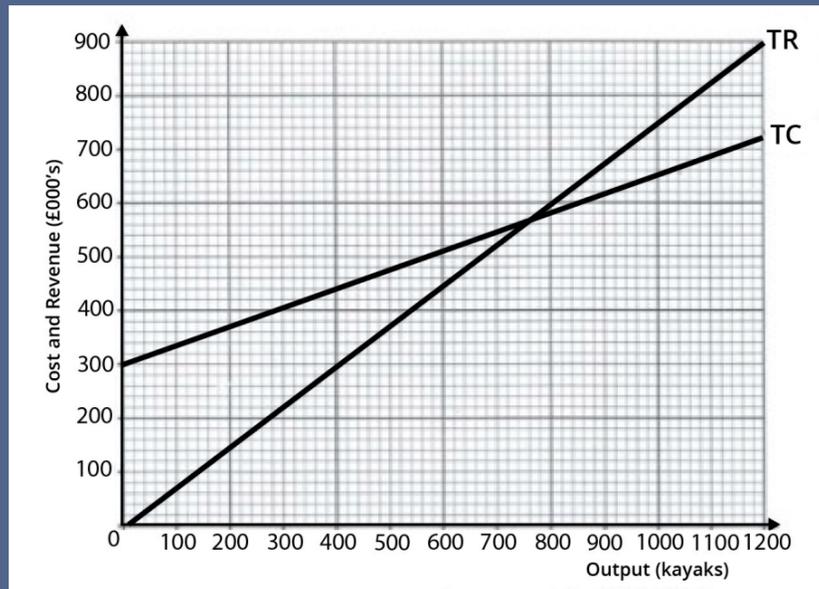
The information below relates to the year ending 31 December 2010.

COSTS in 2010
 Fixed costs = £300 000
 Labour costs = £150 per kayak
 Material costs = £200 per kayak

SALES in 2010 = 1200 kayaks
PRICE per kayak in 2010 = £750

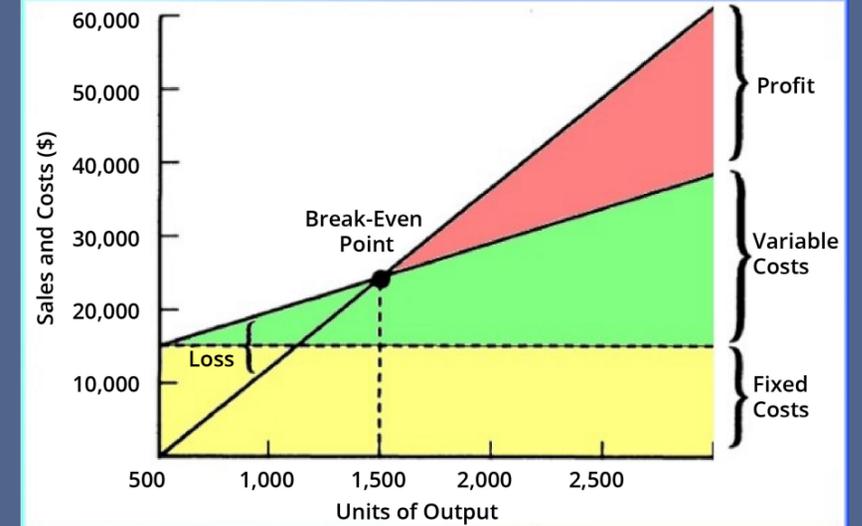
The rent BRK pays for its factory is due to increase in 2011 by £20 000. Whilst the workforce has been persuaded that a rise in wages is not possible for 2011, it is estimated that material costs are likely to increase by 15%. BRK operates in a very competitive market and a 3% rise in price is as much as it feels it can charge in 2011 and yet still match its 2010 sales volume.

A. Construct and label the break-even chart for the year 2010.



B. Based on the figures given in the passage, calculate by how much BRK's profit would change in 2011 compared with 2010.

Revenue: 1200 x £750 = £900,000	1200 x £772.50 = £927,000
Costs FC = £300,000	£320,000
VC = £420,000	£456,000
TC = £720,000	£776,000
PROFIT = £180,000	£151,000
Change in profit = (£29,000)	A fall of 16% or 16.1%



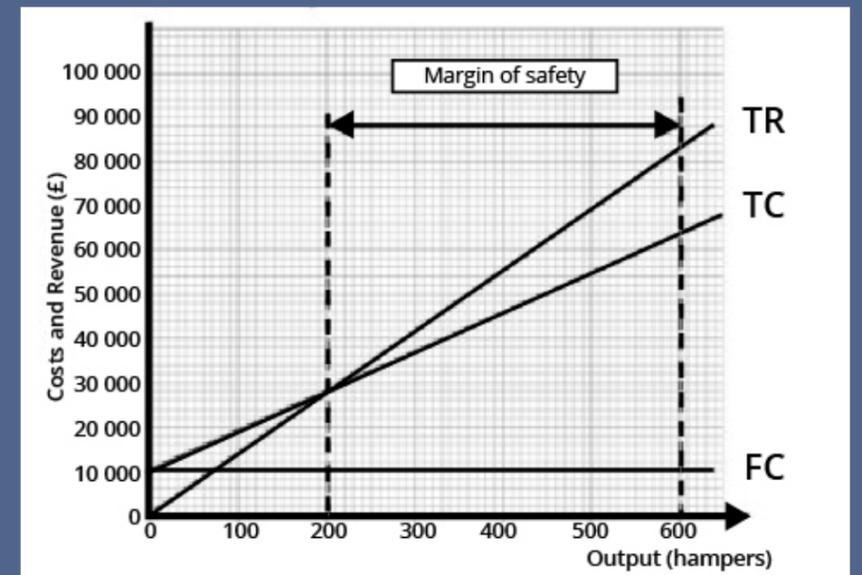
MARGIN OF SAFETY

Definition: The margin of safety shows how much a producer can reduce output before the business starts to make a loss.

Calculation:

Selected level of business activity - Break-even Point

Exam Questions: Draw the margin of safety on the chart if all the hampers were sold in the first year.



The margin of safety consists of how many hampers?

Margin of safety = 600 - 200
 Margin of safety = 400 hampers