Cambridge

AS - Level

Business studies

CODE: (9609)

Unit 05- Chapter 29

Costs

Before we can begin to use cost data to assist in making important decisions, it is important to understand the different cost classifications. Th e most important categories are:

■ direct costs ■ indirect costs ■ fixed costs ■ variable costs ■ marginal costs

Direct costs

■ One of the direct costs of a hamburger in a fast-food restaurant is the cost of the meat.
■ One of the direct costs for a garage in servicing a car is the labour cost of the mechanic.
■ One of the direct costs of the Business Studies department is the salary of the Business Studies teacher

Indirect costs Indirect

costs are often referred to as overheads. Examples are:

■ One indirect cost to a farm is the purchase of a tractor.
■ One indirect cost to a supermarket is its promotional expenditure.
■ One indirect cost to a garage is the rent.
■ One indirect cost of running a school is the cost of cleaning it

How are costs affected by the level of output?

It is important for management to understand that not all costs will vary directly in line with production increases or decreases. costs may be classified as follows:

■ Fixed costs: These remain fixed no matter what the level of output, such as rent of premises.

■ Variable costs: These vary as output changes, such as the direct cost of materials used in making a washing machine or the electricity used to cook a fast-food meal. Semi variable costs include both a fixed and a variable element,

■ Marginal costs: These are the additional costs of producing one more unit of output, and will be the extra variable costs needed to make this extra unit. So the marginal costs involved in making one more wooden table are the additional costs of wood, glue and screws plus the labour costs incurred.

KEY TERM

Direct costs: these costs can be clearly identified with each unit of production and can be allocated to a cost centre.

KEY TERM

Indirect costs: costs that cannot be identified with a unit of production or allocated accurately to a cost centre.

KEY TERMS

Fixed costs: costs that do not vary with output in the short run.

Variable costs: costs that vary with output.

Marginal costs: the extra cost of producing one more unit of output.

Problems in classifying costs

Do you find it easy to classify all of the costs in Activities 29.1 and 29.2? In practice, it may not be very easy or even worthwhile to classify every cost into the categories explained above:

■ Labour costs are not necessarily variable, as they can become overhead costs and not directly allocated to output. For instance, wages for television presenters may be fixed-contract, not related to work. Indirect costs like administration and sales salaries are likely fixed in the short run.

■ Telephone charges in a busy factory could be directly allocated to each range of products made, as long as an accurate and reliable record was kept of the purpose of each call. In practice, this may not be worthwhile and telephone charges would normally be considered as an indirect overhead expense.

Break-even analysis

T h is form of analysis is widely used in business as it provides useful information for decision-making

Break-even analysis can be undertaken in two ways:

1 the graphical method 2 the equation method.

The graphical method – the break-even chart

T h e break-even chart requires a graph with the axes shown in Figure 29.1. Th e chart itself is usually drawn showing three pieces of information

1 Fixed costs, which, in the short term, will not vary with the level of output and which must be paid whether the firm produces anything or not.

2 Total costs, which are the addition of fixed and variable costs; we will assume, initially at least, that variable costs vary in direct proportion to output.

3 Sales revenue, obtained by multiplying selling price by output level. Figure 29.2 shows a typical break-even chart. Note carefully the following points:

■ The fixed-cost line is horizontal, showing that fixed costs are constant at all output levels.

■ Sales revenue starts at the origin (0) because if no sales are made, there can be no revenue.

■ The variable-cost line starts from the origin (0) because if no goods are produced, there will be no variable costs. It is drawn to aid your understanding of how the chart is constructed. It is not necessary to interpret the chart and is often omitted.

■ The total-cost line begins at the level of fixed costs, the difference between total and fixed costs being accounted for by variable costs.

Margin of safety

This is a useful indication of how much sales could fall without the firm falling into loss. For example, if the break-even output is 400 units and current production is 600 units, the margin of safety is 200 units

$$\text{Production over break-even point} = \frac{200}{400} = 50.0\%$$

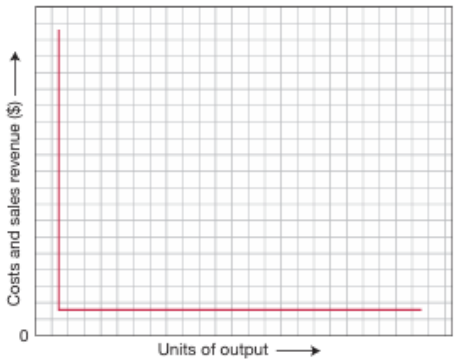

Figure 29.1 The axes for a break-even chart

KEY TERM

Margin of safety: the amount by which the sales level exceeds the break-even level of output.

KEY TERM

Break-even point of production: the level of output at which total costs equal total revenue, neither a profit nor a loss is made.

The break-even equation

A formula can be used to calculate break-even:

$$\text{break-even level of output} = \frac{\text{fixed cost}}{\textbf{contribution per unit}}$$

KEY TERM

Contribution per unit: selling price less variable cost per unit.

Break-even analysis – further uses

In addition to obtaining break-even levels of production and margins of safety, the break-even techniques can also be used to assist managers in making key decisions. Th e charts can be redrawn showing a potential new situation and this can then be compared with the existing position of the business.

Here are three examples of further uses of the break-even technique:

1 A marketing decision – the impact of a price increase (Figure 29.4). The assumption made in this example is that maximum sales will still be made. With a higher price level, this may well be unlikely.

2 An operations-management decision – the purchase of new equipment with lower variable costs (Figure 29.5).

3 Choosing between two locations for a new factory.

T h e usefulness of break-even analysis can be summarised as follows:

■ Charts are relatively easy to construct and interpret.

■ Analysis provides useful guidelines to management on break-even points, safety margins and profit/loss levels at different rates of output.

■ Comparisons can be made between different options by constructing new charts to show changed circumstances. In the case study above, charts could be amended to show the possible impact on profit and break-even point of a change in the product's selling price.

■ The equation produces a precise break-even result.

■ Break-even analysis can be used to assist managers when taking important decisions, such as location decisions, whether to buy new equipment and which project to invest in.

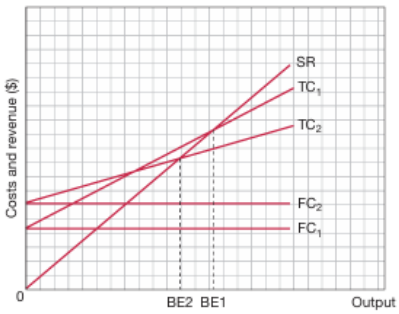

Figure 29.5 A break-even chart showing the possible impact of new equipment (raising fixed costs), but offering lower variable costs (BE2)

Evaluation of break-even analysis

T h e advantages of this technique were examined above. It is important now to recognise the limitations that this model has in practice

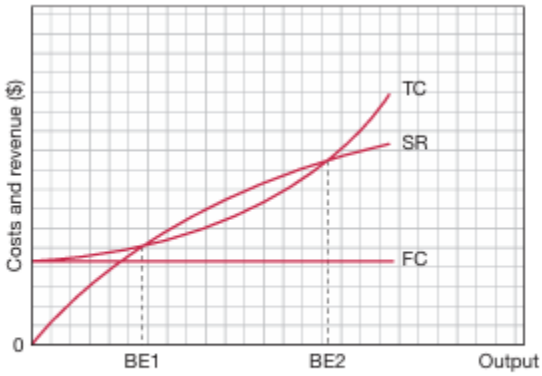

Figure 29.6 A break-even chart showing how non-linear assumptions can lead to two break-even points

■ The assumption that costs and revenues are always represented by straight lines is unrealistic. Not all variable costs change directly or 'smoothly' with output.

■ Not all costs can be conveniently classified into fixed and variable costs. The introduction of semi-variable costs will make the technique much more complicated.

■ There is no allowance made for inventory levels on the break-even chart. It is assumed that all units produced are sold. This is unlikely to always be the case in practice.

■ It is also unlikely that fixed costs will remain unchanged at different output levels up to maximum capacity

Revision questions

Q1: Case Study 145: Jim's Farm (JF).9609/22/F/M/19/Q1 (a) (ii)
Define the term 'break-even' (line 6). [2]

Q2: Case Study 1: The Furniture Maker (TFM) 9707/02/M/J/03/Q1 (d)
Define fixed costs. [3]

Q3: Case Study 2: (The Tee Business Ltd) 9707/02/M/J/03/Q2 (b)
Calculate break-even output, if the new payment system were to be introduced. [3]

Q4: Case Study 8: (Rite on Clothes Ltd) 9707/02/O/N/04/Q2 (c)
Explain the following term: direct costs. [3]

Q5: Case Study 11: (The Read & Learn Bookshop) 9707/02/O/N/05/Q1 (c)
Explain the following term: contribution. [3]

Q6: Case Study 13: (Star pharmaceuticals) 9707/02/M/J/06/Q1 (c)
Explain the following term: variable costs. [3]

Q7: Case study 24: (Jane's book) 9707/21/M/J/09/Q1 (b)
(i) Calculate the number of books that Jane needs to sell to break even. [2]
(ii) What is the profit if Jane sells 10000 books? [2]
(iii) Explain the usefulness to Jane of your answer to (i) and (ii). [4]

Q8: Case Study 13: (Star pharmaceuticals) 9707/02/M/J/06/Q1 (c)
(i) The breakeven level of production for the factory in country A is 1.5 million units. Using the data from the case, calculate the breakeven level of the production for the factory in country B. [2]

(ii) Using your answer to (d)(i) and other information in the case, evaluate the decision to relocate some production to country B. [8]

Q9: Case Study 19: (Excellent Training) 9707/02/O/N/07/Q2 (d)
(i) Using table 1 calculate how many people ET need on each course to break even. [3]
(ii) Calculate the profit if 20 people attend a course. [3]
(iii) Briefly comment on the usefulness to management of ET of the result in b(i) and (ii). [2]

Q10: Case Study 25: (Bob's Band) 9707/22/M/J/09/Q1(a)(ii)
Explain the term: margin of safety. [3]

Q11: Case Study 43: Loader Lorries (LL) 9707/21/M/J/11/Q1 (a) (i)
Explain the following term: cost of sales. [3]

Q12: Case Study 50: (Newtown Arts Center) 9707/21/O/N/11/Q2 (c)
(i) Calculate how many days NAC needs to rent out the art galleries in order to break even.[3]
(ii) Explain the limitations to NAC of your break-even calculation. [3]

Q13: Case Study 52: (Rex Cinema)9707/22/O/N/11/Q2 (c)
(i) Calculate the price that lake would need to charge in order to break even at 150 people per extra film show. [3]

(ii) If Rex charges $2 then the break-even would increase to 200 people. Comment briefly on the usefulness to lake of this break-even information. [3]

Q14: Case Study 54: (The Dream box Theatre) 9707/23/O/N/11/Q2 (c)
(i) If ho charges $6 per student, calculate how many tickets DT would need to sell to break- even. [3]

(ii) If ho changed the price to $3 per student, the break-even would become 250 tickets.
Comment on the usefulness to ho of these break-even calculations. [3]

Q15: Case Study 74: Freshly Frozen (FF) 9707/21/O/N/13/Q2 (d)
(i) TP sells its paints at an average price of $10 per liter. Using table 1, calculate the break- even. Level of production per year for TP's proposed new production system. [3]

(ii) The annual break-even level for the existing production system is 40 million liters.
Comment on the change in break-even if TP introduces the new production system. [3]

Q16: Case Study 70: Trendy Paints (TP) 9707/22/M/J/13/Q2 (c)
(i) Refer to table 3, calculate the break-even output for fruit burst. [3]
(ii) Explain one advantage to FF of using break-even analysis. [3]

Q17: Case Study 71: Coffee Paradise (CP) 9707/23/M/J/13/Q1 (b)
Assume CP uses a markup of 70% on costs for pricing its meals. Using the information in table 1, calculate the price that CP would charge for its meals. [3]

Q18: Case Study 76: School Sports Shop (SSS) 9707/O/N/J/13/Q2 (a) (i)
(i) Paula plants to add 20% to the unit cost of each item in order to calculate the selling price. Using table 3, calculate the selling price for a sports jacket. [2]

(ii) Using your answer from (b)(i), explain two disadvantages to SSS of using cost based pricing. [4]

Q19: Case Study 96: Frank's Farm (FF) 9707/23/M/J/15/Q2 (d)
Explain the following term: unit costs. [3]

Q20: Case Study 90: Fine Furniture (FF) 9707/23/O/N/14/Q2 (c)
(i) For plan B, calculate the margin of safety if James sells the expected level of tables and chairs. [2]
(ii) Using your answer to (b)(i), briefly explain the importance to FF of the margin of safety.[4]

Q21: Case Study 101: Classic Cushions (CC) 9707/23/O/N/15/Q1 (d)
(i) Refer to table 1 and other information. Calculate CC's total contribution from the sale of a collection six cushions and covers. [3]

(ii) Explain the important of accurate cost data to CC. [3]

Q22: Case Study 93: Easy Television (ET) 9707/22/M/J/15/Q1 (c)
(i) Calculate how many T.V companies need to buy a typical documentary in order for ETV to break even. [3]
(ii) Briefly comment on the usefulness to ETV of your answer to (b) (i). [3]

Q23: Case Study 96: Frank's Farm (FF) 9707/23/M/J/15/Q2 (d)
(i) Calculate the number of school visits needed each year for FF to break even. [3]
(ii) Using your result to (i) comment on the usefulness of break even to FF. [3]

Q24: Case Study 102: Wonderful Windows (WW) 9707/23/O/N/15/Q2 (d)
(i) Using table 2, calculate the margin of safety for 2015. [3]
(ii) Explain two limitations to WW of using breakeven analysis. [3]

Q25: Case Study 106: Prestige Jeweler (P J) 9609/21/M/J/16/Q2 (a) (ii)
Explain one benefit to PJ of accurate cost data. [3]

Q26: Case Study 117: Gourmet Ices (GI) 9609/22/F/M/17/Q1 (c)
(i) Refer to table 1. Calculate the break-even level of production with CAM. [3]
(ii) Explain one benefit to GI of using break-even analysis. [3]

Q27: Case Study 129: Jones Sticky Labels (JS) 9609/23/O/N/17/Q1 (a) (i)
(i) Refer to table 1 and lines 16-17. Calculate the profit that JS would make on the supermarket order. [3]
(ii) Explain one possible problem of all allocating fixed costs for JS. [3]

Q28: Case Study 143: Onetime Taxis (OT) 9609/23/O/N/18/Q1 (d)
Using table 2 and any other relevant information, calculate the break even number of kilometers each month for vehicle Z. [3]

Q29: Case Study 143: Onetime Taxis (OT) 9609/23/O/N/18/Q1 (d)
Explain one reason why break even analysis might not be useful to OT when choosing the new vehicle. [3]

Q30: Case Study 25: (Bob's Band) 9707/22/M/J/09/Q1 (a) (ii)
(i) Calculate the price that FB should charge in order to break even at 150 ticket sales. [4]
(ii) Explain the usefulness to FB of using break even analysis. [4]

Q31: Case Study 10: (Our News Ltd) 9707/02/M/J/05/Q2 (a) (i)
(i) Calculate the percentage (%) change in total revenue of monthly magazines from 2002 to 2004. [2]

(ii) Outline additional market information our news LTD. would fine useful before taking the decision to produce the monthly magazine. [4]