

CASE STUDY***Break-even and 'what-if?' calculations***

Jo and Mo are friends who think they have hit on a sound business idea. They have noticed the need for expert DJs in clubs, and believe that there is a market to teach people Disc Jockey skills. They plan to provide courses, calling the business the JoMo School for DJs.

They have hired a local club, sound equipment and experts to demonstrate DJ techniques. There are still a few issues that concern them.

Mo explains:

'We've researched the competition, and have a good idea of what we can charge for coming on the course. We have also estimated what it will all cost. What we need are some costing techniques so that we can answer some important questions, for example:

How many people do we need to take on our course in order to break-even?

How much profit would we make if more or less than that number signed up?

What would happen if we charged more, or less, or if we revised our costs?

What is the most we could make, or lose?'

In this chapter we will use the costing technique of marginal costing to help Mo answer her questions quickly and easily. We will return to the JoMo School for DJs and learn how to estimate key profit and output figures in given situations. We will also see how the same techniques can be applied to other organisations and businesses.

Learning objectives

When you have studied this chapter you will be able to:

- *understand the ideas behind marginal costing, and how it differs from absorption costing*
- *calculate break-even points*
- *carry out 'what-if' analysis on projected figures*
- *use marginal costing to help with pricing*
- *understand the limitations of some marginal costing techniques*
- *understand the impact of using marginal costing on reported profit figures*

COST BEHAVIOUR AND MARGINAL COSTING

Before we can look at the specific techniques that we are going to use, it will be useful to see what the basic idea behind marginal costing is, and what some of the terms that are used mean.

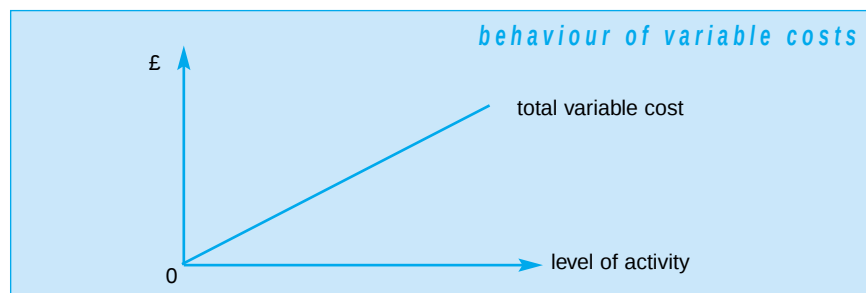
marginal costing

It is important to understand that costs behave in different ways as the volume of activity changes. This is fundamental to marginal costing.

There are three ways that the costs could behave within a range of activity levels:

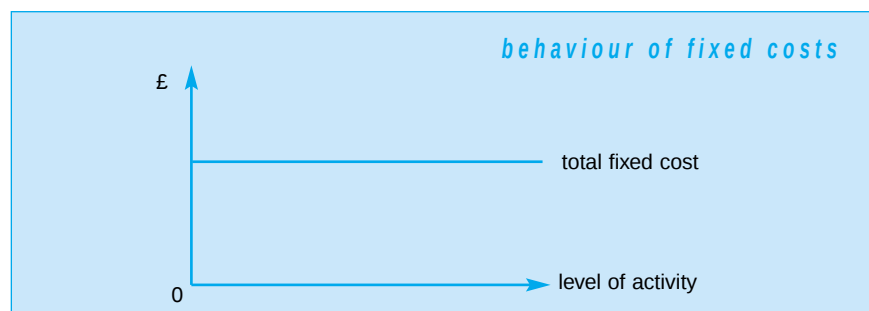
variable costs

These are the costs where the cost varies in proportion to the activity level. For example, if a car manufacturer makes more cars it will use more sheet metal – a variable cost. Variable costs are also known as marginal costs.

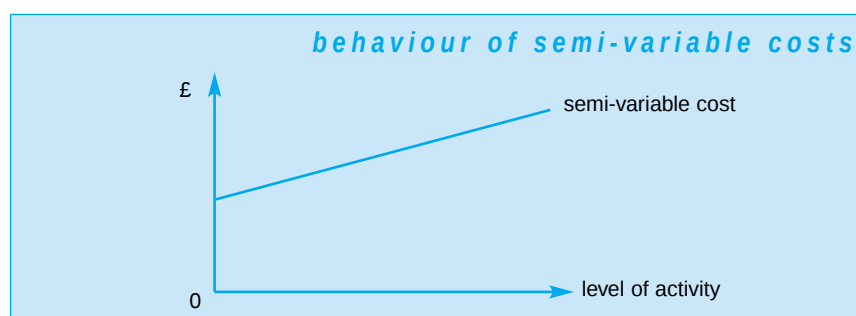


fixed costs

These are costs that do not normally change when the level of activity changes. The cost of insuring a car factory against business risks will not vary in line with the number of cars produced – it is a fixed cost.



semi-variable costs These are costs where a part of the cost acts as a variable cost, and a part acts as a fixed cost. Some fuel bills are semi-variable: there is a fixed 'standing charge' and a variable 'unit charge'.



costs, contribution and profit

In marginal costing all costs need to be classified as variable costs or fixed costs. As part of this exercise, semi-variable costs are divided into their fixed and variable components. For example, a car manufacturer will need to identify:

- the variable costs of each car
- the total fixed costs of a manufacturing business over a period of time

When the manufacturer sells a car it will receive the selling price, which it will use to cover the variable costs of the car. As the selling price is greater than the variable cost there will also be money available to pay off the fixed costs incurred. This amount is known as the **contribution**. The formula is:

contribution = selling price per unit less variable cost per unit

It follows that the difference between the sales income and the variable costs of the units sold in a period is the **total contribution** that the sales of all the units in the period make towards the fixed costs of the organisation.

A business can work out its profit for any given period from the fixed costs and total contribution figures:

profit = total contribution less total fixed costs

A marginal costing statement can be prepared using the following format:

	sales
less	variable costs
equals	contribution
less	fixed costs
equals	<u>profit</u>

CASE STUDY***The Marginal Company – marginal costing***

The Marginal Company manufactures one product, the Marg. The following costs relate to a financial year, when 100,000 units of Marg are made:

Direct Materials	£350,000
Direct Labour	£230,000
Indirect Costs	£310,000

Investigations into the behaviour of the costs has revealed the following information:

- Direct Materials behave as variable costs.
- Direct Labour behaves as a variable cost.
- Of the Indirect Costs, £270,000 behaves as a fixed cost, and the remainder as a variable cost.

required

- 1 Calculate the cost of one unit of Marg using Marginal Costing.
- 2 If each unit of Marg sells for £10, and all the production of 100,000 units is sold, calculate the profit for the year using a marginal costing statement. Show the contribution per unit and total contribution.

solution**1 COSTING A UNIT OF MARG**

Using only the variable (marginal) costs to cost one unit of Marg:

Direct Materials (£350,000 ÷ 100,000)	£3.50
Direct Labour (£230,000 ÷ 100,000)	£2.30
Variable Costs	
(£310,000 – £270,000 = £40,000 ÷ 100,000)	<u>£0.40</u>
Total marginal cost per unit	<u>£6.20</u>

2 MARGINAL COSTING STATEMENT FOR THE FINANCIAL YEAR.

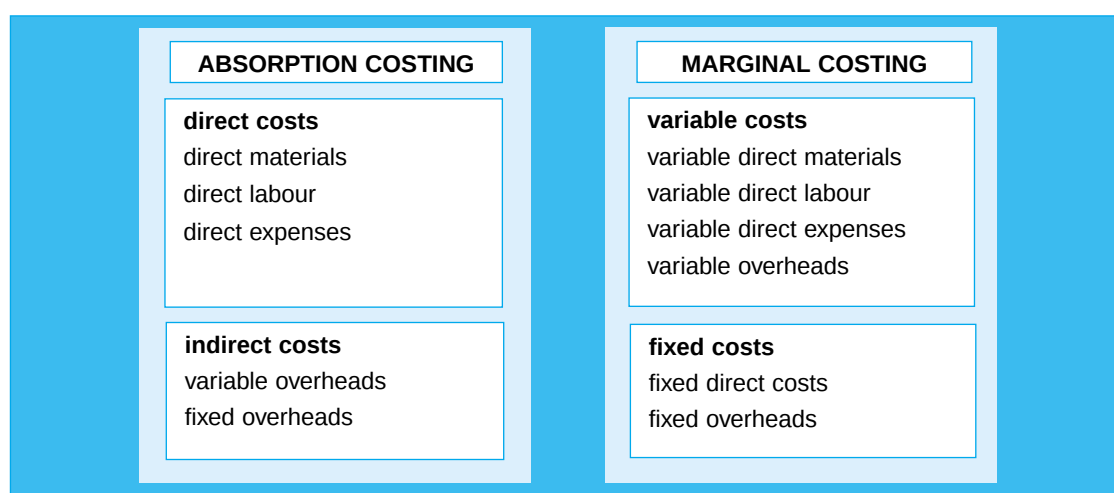
	<i>Per Unit</i>	<i>For Year</i>
	£	£
Sales	10.00	1,000,000
Less Variable Costs	6.20	620,000
Contribution	3.80	380,000
Less Fixed Costs*		<u>270,000</u>
Profit		<u>110,000</u>

*Note that the fixed costs are not calculated in unit terms, but are simply deducted in total from the total contribution.

COMPARING ABSORPTION COSTING AND MARGINAL COSTING

You will be familiar with the terminology of absorption costing from the earlier chapters in this book. The diagram below demonstrates how the terms in marginal costing can relate to the same costs as those categorised under absorption costing terms.

Note that when using marginal costing it is the behaviour of the cost that is important, not the origin of the cost.



BREAK-EVEN

The break-even point for a business is the output level (units manufactured or services provided) at which the income from sales is just enough to cover all the costs. Break-even is the point at which the profit (or loss) is zero. The output level can be measured in a way that is appropriate for the particular business. It is commonly measured in sales units. The formula for break-even in sales units is:

$$\text{break-even point (in sales units)} = \frac{\text{fixed costs}}{\text{contribution per unit}}$$

The JoMo School for DJs Case Study which follows, shows how this formula is used to calculate a break-even point.

CASE STUDY**JoMo School for DJs – break-even**

Jo and Mo are planning to run a one-day introductory course to teach participants the basic techniques of being a DJ. All students will be charged a fee of £125 to include refreshments, lunch and all materials. The maximum number of students that can be comfortably accommodated on the course is 20. The estimated costs of running the course are as follows:

Hire of club	£150
Lunches	£ 10 per student
Advertising	£ 300
Equipment hire	£ 100
Refreshments	£ 5 per student
Fees for DJs	£ 400
Student materials	£ 10 per student
Insurance	£ 50

required

Calculate the break-even point in terms of the number of students signed up for a DJ course.

solution

The first thing to do is to divide the estimated costs into fixed and variable costs. Fixed costs will be incurred regardless of the number of participants on the course (up to the course capacity), while variable costs change in proportion to the number of students. This gives us the following analysis, with totals:

	<i>Fixed Costs for the course</i>	<i>Variable Costs per student</i>
	£	£
Hire of club	150	
Lunches		10
Advertising	300	
Equipment hire	100	
Refreshments		5
Fees for DJs	400	
Student materials		10
Insurance	50	
Totals	<u>1000</u>	<u>25</u>

Since Jo and Mo will be charging each student £125 for the course, the 'contribution' that each student makes is:

selling price	£125 per student
less variable cost	<u>£25 per student</u>
= contribution	<u>£100 per student.</u>

Because the variable costs for the student have been taken into account, this 'contribution' is towards covering the fixed costs, and ultimately making a profit.

The break-even formula now makes sense – it is simply saying 'How many students' contributions of £100 each will it take to cover the fixed costs?' The fixed costs are £1000, and therefore will be covered by 10 students' contributions.

Using the formula, this calculation is carried out as follows:

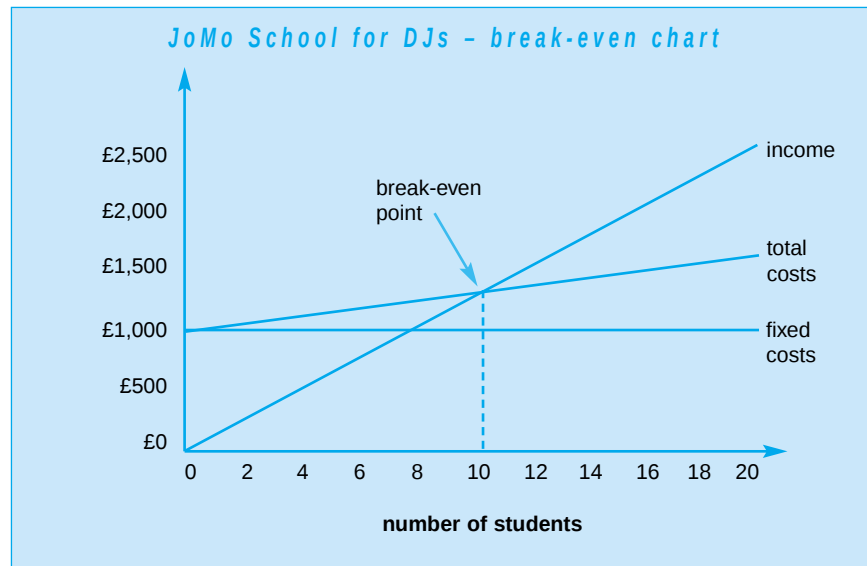
$$\text{Break-even point (in sales units)} = \frac{\text{Fixed Costs}}{\text{Contribution per unit}} = \frac{\text{£1000}}{\text{£100}} = 10 \text{ students}$$

We can see that if Jo and Mo enrol 10 students for a DJ course they will achieve break-even. Since they can accommodate up to 20 students, any number of students between 11 and 20 will generate a profit.

USING BREAK-EVEN CHARTS

Break-even calculations can also be demonstrated using a break-even chart. The chart at the top of the next page is based on the calculations from the Case Study. The chart makes the same assumption that costs within the range are either fixed or variable, and therefore uses straight lines to show how costs behave. Any semi-variable costs would be divided into their fixed and variable parts. Notice the similarity between the way that costs are shown on this chart, and the earlier individual cost behaviour diagrams (see pages 441 to 442). The chart which follows is constructed as follows:

- The scales on the graph are chosen so that the horizontal axis measures output from 0 to 20 students, and the vertical axis represents the income and costs at those levels. This means that the maximum that the vertical axis will need to reach will be $(20 \times £125) = £2,500$.
- The fixed cost line is a horizontal line at the £1,000 level. It is horizontal since the fixed cost will remain the same no matter how many students enrol.



- The total cost line starts at the £1,000 point based on zero students. This is because if the course goes ahead with no students the fixed costs will still have to be paid. The line is drawn to a point of £1,500, situated at the 20 students level. This is based on a total cost of £1,500, ie fixed cost £1,000 plus variable costs of £500 ($20 \times £25$) for 20 students.
- The income line is drawn from zero income (zero students), to the income of £2,500 that would be generated from 20 enrolments.

What we now find is that:

- the break-even point of 10 students is represented on the graph where the total cost line crosses the income line
- student numbers to the left of this point will result in losses since the income line is below the total cost line
- student numbers exceeding 10 will result in profit, since in the part of the graph to the right of the break-even point the income line is higher than the total cost line

WHAT-IF ANALYSIS

Marginal costing enables us to work out quickly and easily the profit or loss at any level of output if we already know the break-even point and the contribution per unit. This is because for every unit that is sold above the break-even point the profit will equal the contribution (ie income less variable costs) per unit. If we sell fewer than the break-even number, we will lose the contribution of that shortfall.

The profit or loss calculation can be expressed as a formula:

profit (or loss) =

(units sold – units needed for break-even) x contribution per unit

The 'what-if' scenario involves the management of a business wanting to see the effect of altering selling prices or any of the costs. If this is carried out it will be necessary to recalculate the revised break-even point and then apply the above formula to the revised sales level.

We will now rejoin Jo and Mo to see how these principles can be applied to their business.

CASE STUDY

JoMo School for DJs – 'what-if' analysis

Having established the break-even point as 10 students, Jo is keen to see what would happen to the profit or loss at various different numbers of students.

'I would like to know how much profit we would make if the maximum of 20 students signed up, or how much we would lose if only 5 enrolled.'

'What about if we charged £160 instead of £125, but spent an extra £10 per student on better materials?' asked Mo, 'or even reduced the price to £100, but cut advertising by £100?'

required

- 1 Based on Jo's question, calculate the profit or loss if 20 or 5 students enrol, and use a break-even chart to demonstrate.
- 2 Based on Mo's two suggestions, calculate the new break-even points, and for each suggestion, the profit or loss if 20 or 5 students enrol.

solution

- 1 Based on the original figures, if 20 students enrol the profit would be:

number of courses sold – number of courses needed to break-even x contribution per unit

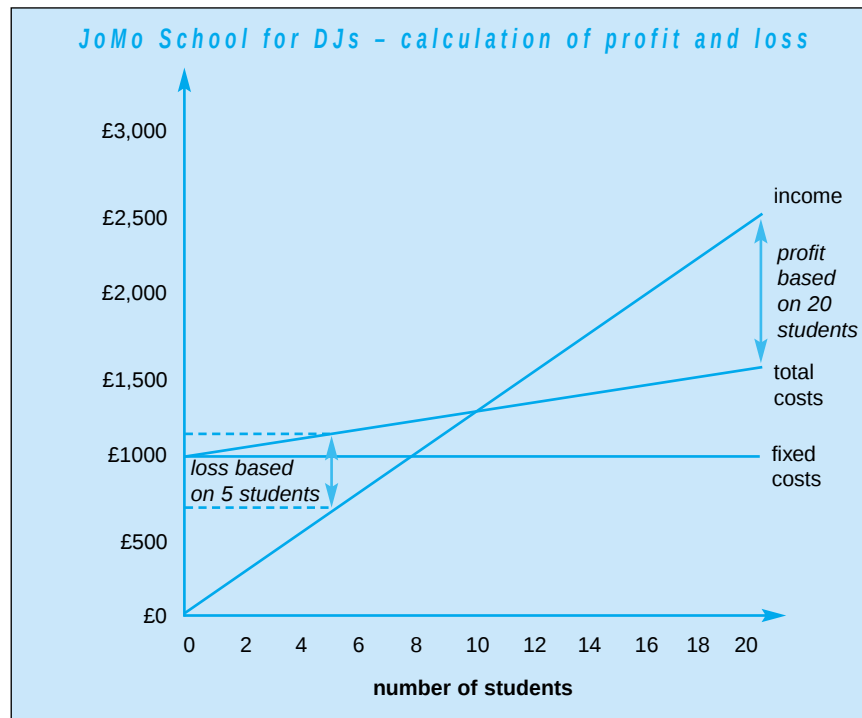
$$= (20 - 10) \times £100 = £1,000 \text{ profit}$$

If only 5 enrol the calculation would be:

$$= (5 - 10) \times £100 = £500 \text{ loss (since the answer is negative)}$$

Look at the break-even chart on the next page.

- The profit when 20 students enrol is found by measuring the vertical distance between the income line and the total cost line at the 20 students point on the horizontal axis. This distance is read from the vertical scale to estimate the profit in £s.
- The loss if only 5 students enrol can similarly be found by measuring the distance between the same two lines at the 5 students point on the horizontal axis.



- 2 Mo's first suggestion is to increase the course fee from £125 to £160 and spend an extra £10 per student on materials. The revised contribution that each student makes would then be:

'selling price'	£160	per student
less variable cost (£25 + £10)	£35	per student
= contribution	<u>£125</u>	per student

Since the fixed costs are still £1000, this gives a revised break-even point of

$$£1000 \div £125 = 8 \text{ students}$$

Based on these first revised figures, if 20 students enrol the profit would be:

$$= \text{number of courses sold} - \text{number of courses needed to break-even} \times \text{contribution per unit}$$

$$(20 - 8) \times £125 = \underline{£1,500 \text{ profit}}$$

If only 5 students enrol the position would be:

$$(5 - 8) \times £125 = \underline{£375 \text{ loss}}$$

Mo's second suggestion was to cut the course fee to £100 and reduce advertising costs by £100.

Here the revised contribution that each student makes is:

selling price	£100	per student
less variable cost	<u>£25</u>	per student
= contribution	<u>£ 75</u>	per student

Since the fixed costs are now £900 (£1000 – £100), this gives a revised break-even point of

$$£900 \div £75 = 12 \text{ students}$$

Based on these revised figures, if 20 students enrol the profit would be:

$$(20 - 12) \times £75 = \underline{\underline{£600 \text{ profit}}}$$

If only 5 enrol the position would be:

$$(5 - 12) \times £75 = \underline{\underline{£525 \text{ loss}}}$$

PRICING DECISIONS

The question of what to charge customers is a complicated one, and depends on issues like:

- what competitors are charging
- the costs levels of the business
- the level of sales the business can expect
- what the business thinks its customers will be prepared to pay

One area in which marginal costing can help is in determining an absolute minimum price that could be charged. This can be particularly useful for pricing additional sales at a special reduced rate when sales have already been made at the normal selling price.

The rule is simple – you assume fixed costs have already been paid off and so all you have got to do is to cover the variable costs of any additional sales. If further sales are made at a price that is above the variable costs of each unit then that ‘contribution’ (ie sales price minus variable costs) will all be profit.

We will now see how this applies to the JoMo School for DJs.

CASE STUDY***JoMo School for DJs – minimum pricing decisions***

The introductory course for DJs looks like being a success. The original costs and prices were agreed on as follows:

Selling Price	£125 per student
Variable costs	£ 25 per student
Fixed costs	£1,000 for the course

Twelve students have signed up and paid their fees, and the course is to run in a few days time.

At this point Mo gets a telephone call from a local activity holiday centre. They would like to book places for eight students who are interested in making the course a part of their holiday. The problem is that the holiday centre is on a tight budget; they are only prepared to pay £80 per student, and if that price is not acceptable they will send their holidaymakers go-karting instead.

required

Calculate whether by accepting these terms for the additional 8 students Mo and Jo will increase their overall profit, and if so by how much. List other factors that they may like to consider before making a final decision.

solution

The introductory course currently has the capacity (just) to take the extra eight students, without changing the existing fixed costs.

The additional income would be 8 x special price of £80	= £640
The additional costs incurred would be 8 x variable costs of £25	= £200
Therefore additional contribution would be made of	<u>£440</u>

Since fixed costs are unchanged this £440 will all represent additional profit.

Other factors to be considered by Jo and Mo include:

- Whether there may be last-minute demand from customers willing to pay the usual price. If they go ahead with the above proposal they would have to turn these customers (and their higher contributions) away.
- Whether the activity holiday centre would expect similar deals for any courses run in the future. While this could be a welcome source of additional students, it should not form a substitute for students paying the normal rate.
- Whether the students paying the normal rate may become aware of the cheap deal offered to the activity holiday centre, and demand a similar price. This seems unlikely in this case.

LIMITATIONS OF BREAK-EVEN ANALYSIS

Break-even analysis is a useful tool, and is easy to understand and apply. There are some limitations to its use which mean that it will not always work as well as it has in the Case Studies that we have looked at.

- We should be careful that we do not assume that costs will behave the same at any level of output. Some fixed costs may increase if output goes beyond certain levels – for example if Jo and Mo needed a bigger venue or had to bring in more DJs to cope with the number of students. The variable costs might not stay exactly in proportion to sales either – there may be discounts available for large quantities that would distort the analysis.
- Break-even analysis is at its simplest when the output is in a form that can be measured in units, and all the fixed costs relate to those outputs – just like the case studies we have examined. When organisations have several outputs and some fixed costs relate to more than one output, break-even becomes more complicated and difficult to apply. If Mo and Jo ran several courses at different prices, but using some of the same facilities, it would be more difficult to apply these techniques and produce meaningful results.

MARGINAL COSTING AND RECORDED PROFIT

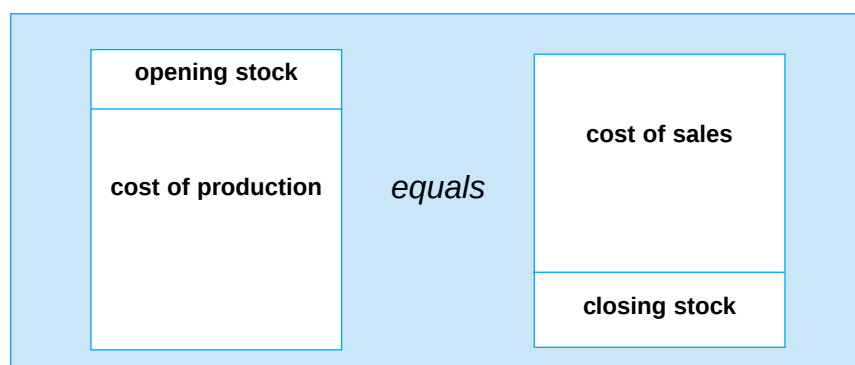
We have seen in this chapter that marginal costing can be useful to organisations because it focuses on the way that costs behave. This means that techniques like break-even and ‘what-if’ analysis can be carried out to help plan and monitor costs and make decisions. The choice of costing system that an organisation uses will, however, have implications not only for the way that its profit statements are laid out, but also for the amount of profit that is recorded.

variations in stock valuation

One of the reasons that organisations use a costing system is so that the value of the stock of finished goods (and work in progress) can be calculated and incorporated into profit statements. Since the different approaches to costing that we have examined give different costs per unit, they will result in different valuations of stock. This will in turn affect the profit calculation when stock levels change. A marginal costing system will value stock at just the variable costs, but a system that absorbs fixed costs into the stock valuation can result in fixed costs being charged to a period other than the one in which they were incurred.

the effect of stock valuation on profit

The costs incurred in producing goods in a given period *plus* the cost of the opening stock at the beginning of that period *equals* the cost of sales for that period *plus* the cost of the closing stock. This can be seen as follows:



The method of *valuation* of the closing stock is therefore critical as it will affect both the cost of sales and also the level of recorded profit.

The Case Study below shows how the same data is treated using different costing systems.

CASE STUDY

The Alternative Company – costing methods and profit

The Alternative Company manufactures a single product, and produces monthly management accounts.

In each of Month 1 and Month 2, 10,000 units were produced, and the following costs were incurred:

Direct Material	£100,000
Direct Labour	£150,000
Fixed Overheads	<u>£250,000</u>
Total Costs	<u>£500,000</u>

Both the costs and the volume of output were in line with the budget.

Units were sold for £70 each, and in Month 1 the whole production of 10,000 units was sold, whereas in month 2 only 8,000 units were sold. There was no stock at the start of Month 1.

Direct Material and Direct Labour are both variable costs.

required

- 1 Calculate the cost per unit using:
 - (a) absorption costing using units as an absorption base
 - (b) marginal costing
- 2 Draft management accounts for each month using:
 - (a) absorption costing
 - (b) marginal costing
- 3 Comment on the reasons for any difference in profits.

solution**1 Calculation of cost per unit**

- (a) Absorption Costing (using all costs)
 $\text{£}500,000 \div 10,000 = \text{£}50 \text{ per unit}$
- (b) Marginal Costing (using variable costs only)
 $\text{£}250,000 \div 10,000 = \text{£}25 \text{ per unit}$

2 Producing management accounts**(a) ABSORPTION COSTING**

	Month 1		Month 2	
	£	£	£	£
Sales		700,000		560,000
Less cost of sales:				
Opening stock	—		—	
Cost of production (10,000 x £50)	500,000		500,000	
Less closing stock (2,000 x £50)	<u>—</u>		<u>100,000</u>	
		500,000		400,000
Profit		<u>200,000</u>		<u>160,000</u>

(b) MARGINAL COSTING

	Month 1		Month 2	
	£	£	£	£
Sales		700,000		560,000
Less variable cost of sales:				
opening stock	—		—	
Variable cost of production				
(10,000 x £25)	250,000		250,000	
less closing stock				
(2,000 x £25)	—		50,000	
		<u>250,000</u>		<u>200,000</u>
Contribution		450,000		360,000
Less fixed costs		<u>250,000</u>		<u>250,000</u>
Profit		<u>200,000</u>		<u>110,000</u>

3 Comments on the reasons for differences in profit

The profits are identical when there is no change in stock level, as in Month 1, when both opening and closing stocks are zero. However when the stock level changes between the start and end of the period (as in Month 2) the stock valuation has an impact on profit.

The additional reported profit of £50,000 (£160,000 compared with £110,000) by using the absorption system is due to £50,000 of the fixed costs being absorbed into the closing stock and effectively carried into the next period. If the stocks again fell to nil in Month 3 the profit difference would be reversed.

The differences in reported profits are only timing differences – the differences in profit are just reported in different periods.

conclusion

- Where stock levels increase, absorption costing will record a higher profit than marginal costing, as more of the cost incurred is pushed into the next period.
- Where stock levels decrease, absorption costing will record a lower profit than marginal costing, as more of the costs from the previous period are set against income.
- Where stock levels are constant, then, providing there has been no change in unit costs, there will be no difference in recorded profit under either system.

You can therefore see that if an organisation uses absorption costing, significantly building up (or reducing) stock levels can distort profits.

chapter summary

- Marginal costing can be used as an alternative to absorption costing. It is based on analysing costs according to their behaviour at different output levels rather than their origin.
- Break-even analysis is one of the techniques that marginal costing enables us to use. It determines the output level that is required to just cover the costs. Break-even charts can be used to illustrate the situation.
- Marginal costing can help with analysing the outcome of various alternative output, pricing and cost scenarios. This is often called 'what-if' analysis.
- Marginal costing can help with pricing decisions, especially when a lowest price needs to be established or an additional order priced.
- Break-even analysis has its limitations. Care needs to be taken to make sure that it is applied appropriately.
- Using marginal costing instead of absorption costing will have an impact on reported profit for a period. The differences will be due to the exclusion of fixed costs from stock valuations under marginal costing.

key terms

variable costs	costs where the total amount varies in proportion to the activity level when the activity level changes; these costs are also known as marginal costs when using marginal costing
fixed costs	costs that do not change when the level of activity changes (within a certain range)
semi-variable costs	costs that contain elements that behave as variable costs and elements that behave as fixed costs; these costs are analysed into these elements for marginal costing purposes
marginal costing	this costing system categorises costs according to their cost behaviour, and divides them into variable and fixed costs; this system uses a cost for each unit of output based purely on the variable (or 'marginal') costs – all fixed costs are regarded as time based and are therefore linked to accounting periods rather than units of output
contribution	this is the difference between the selling price and the total variable costs, calculated for a single unit of output or for the output of a period of time – it provides the 'contribution' that the sale of a unit (or units) makes towards fixed costs and ultimately profit

break-even point	the level of sales (or output) that produces income that exactly covers costs, and where profit/loss is therefore zero
break-even chart (or graph)	a chart that illustrates the effect of various output levels in terms of income and costs, and shows the location of the break-even point
what-if analysis	a technique that demonstrates the effect of different output, price and cost scenarios on profit – it is usually based on the concept of marginal costing

activities

Note: an asterisk () after an activity number means that an answer is provided in Appendix 1.*

22.1* Each of the following types of costs is incurred by Seedy Limited, a company that makes music CDs:

- (a) factory rates
- (b) CD cases
- (c) production workers paid a basic wage plus a bonus per CD made
- (d) production supervisors paid a fixed salary
- (e) blank CDs
- (f) factory rent
- (g) cellophane for packaging individual CDs
- (h) royalties paid to recording artists for each CD made

Required:

State whether each of the above costs behaves as a fixed, variable, or semi-variable cost.

22.2 You have been asked to organise a day of lectures on costing techniques for students. You will need to advertise the event, and hire a suitable room in a local hotel, and speakers. You will also need to provide lunch and course materials for each person who books a place, and decide how much to charge them each for the day.

Required:

Using your own estimates for the relevant costs and price, calculate the following:

- (a) total fixed costs for the event
- (b) total variable costs per delegate
- (c) contribution per delegate
- (d) break-even point in numbers of delegates

- 22.3** The Last Company Ltd. is famous for its 'Snowdon' range of hill-walking boots. The management of the company are considering the production for next year and have asked you, as cost clerk, to help with certain financial decisions.

The following information is available:

Wholesale selling price (per pair)	£30.00
Raw materials (per pair)	£7.50
Direct labour (per pair)	£5.50
Fixed costs	£150,000.00 per year

The company is planning to manufacture 12,500 pairs of boots next year.

- (a) You are asked to calculate:
- the marginal cost per pair
 - the absorption cost per pair
 - the break-even point (in pairs of boots)
 - the profit or loss if 12,500 pairs of boots are sold
- (b) A mail order company, Salesbypost Ltd, has approached The Last Company Ltd. with a view to selling the 'Snowdon' boot through its catalogue. Salesbypost Ltd is prepared to guarantee to sell 2,500 pairs of boots each year but, in view of the large quantity, offers a price of £20 per pair. As The Last Company Ltd usually sells through specialist shops, it is not expected that 'normal' sales will be affected. This 'special order' is within the capacity of the factory, and fixed costs will remain unchanged. You are to advise the management as to whether this offer should be accepted.
- (c) A manufacturer in the Far East has offered to make the 'Snowdon' boot under licence at a price of £20 per pair up to 10,000 pairs, and then £15 per pair above this level. Quality is guaranteed and, if this option is taken, The Last Company Ltd would cease manufacturing and would act as distributors: as a result, fixed costs would fall to £50,000 pa. You are to advise the company, in financial terms, if this offer should be taken up. Are there any other points, besides financial, that The Last Company Ltd should consider before making its decision?

- 22.4** The System Company manufactures one product, the Tem. Budgeted production is 4,000 Tems per week. During each of the first two weeks of this year it had costs as follows, exactly as budgeted.

Direct Materials	£5,000
Direct Labour	£9,000
Fixed Overheads	£6,000

The company had no finished goods in stock at the start of week 1. In both weeks it produced 4,000 units. Sales in week 1 were 3,000 units, and in week 2 were 5,000 units, all at £8 per Tem.

Both Direct Materials and Direct Labour behave as Variable Costs.

- (a) Produce profit statements for each of the two weeks, using:
 - 1 absorption costing, absorbing fixed overheads on a per unit basis
 - 2 marginal costing
- (b) Explain briefly the reason for the difference between recorded profits under the alternative costing systems.

22.5* Kings B & B is a bed and breakfast establishment that caters for individual travellers who want a good night's sleep in a clean bed with a hearty breakfast. There are 10 single bedrooms available, and bed and breakfast is priced at £16 per person per night. Kings B & B is open 7 nights a week.

The following are typical costs:

	<i>Weekly Costs (for the whole place)</i>	<i>Costs Per Guest Night</i>
Heating & lighting	£20	
Breakfast foods		£3
Cleaning staff – basic pay	£100	
Cleaning staff – bonus		£1
Administration	£10	
Laundry		£2
Breakfast staff	£70	
Other overheads	£80	

- (a) Calculate the fixed costs per week and the contribution per guest per night.
- (b) Calculate the average number of guests per night it would take to break-even.
- (c) Calculate the weekly profit or loss if there were 42 guest nights in a week (ie an average of 6 guests on each of the 7 nights).