Management accounting techniques: Summary of corrections to course materials

These changes affect version V001 of the materials.

Inventory control calculations:

The formulas used to calculate these inventory control measures have changed. As per the latest AAT specification, the formulas you should be using are:

Buffer inventory = re-order level - (average usage x average lead time)

Re-order level = (average usage x average lead time) + buffer inventory

Note: students will be provided with either buffer inventory or re-order level values when completing calculations.

Maximum inventory level = buffer inventory + maximum re-order quantity

Maximum re-order quantity = maximum inventory level – buffer inventory

Note: students will be provided with either maximum inventory level or maximum re-order quantity values when completing calculations.

Minimum re-order quantity = average usage x average lead time

Please make the following amendments to your materials in light of this change:

Course Notes & Questions

<table>
<tr><td>Pg 65</td><td>Replace the formulas at the bottom of page 65 with the formulas listed above.</td></tr>
<tr><td>Pg 66
Illustration</td><td>Replace with the following:

Information related to a particular line of stock:

<table>
<tr><td>Buffer inventory (the minimum inventory level we would want)</td><td>280 units</td></tr>
<tr><td>Maximum usage (the most we could sell)</td><td>20 units per day</td></tr>
<tr><td>Average usage (the likely amount we will sell)</td><td>15 units per day</td></tr>
<tr><td>Minimum usage (the least we could sell)</td><td>5 units per day</td></tr>
<tr><td>Maximum lead time (the longest time it could take the supplier to deliver)</td><td>5 days</td></tr>
<tr><td>Average lead time (the expected time it should take the supplier to deliver)</td><td>4 days</td></tr>
<tr><td>Minimum lead time (the shortest time it could take the supplier to deliver)</td><td>3 days</td></tr>
<tr><td>Maximum reorder quantity (the highest number of units we would order)</td><td>300 units</td></tr>
</table>
</td></tr>
</table>

	Calculate the following: **(i) Reorder level** **Reorder level** = (average usage x average lead time) + buffer inventory In our illustration the average usage is 15 units per day and the average lead time is 4 days. If we multiply 15 units per day x 4 days, we get 60 units. Then we add on the buffer inventory which we are told is 280 units, to give us a reorder level of **340 units.** If we place an order for new material when our inventory falls to 340 units, then we should feel confident that we will not run out of units before the delivery arrives. **(ii) Maximum inventory level** = buffer inventory + maximum re-order quantity If we always have a buffer inventory of 280 units and we are told that the maximum order we would place is 300 units, then the maximum we would ever have in inventory would be 280 units + 300 units = **580 units.** **(iii) Minimum reorder quantity =** average usage x average lead time You may have noticed that this formula uses the first part of the formula for reorder level. This is essentially calculating how much we would need to order to top the inventory back up from the buffer amount to the reorder level. 15 units x 4 days = **60 units.**
Pg 67/85 Lecture example 4	Replace with the following question: Information related to a particular line of stock: Usage varies from 60 units to 100 units per day. Lead times vary from 5 to 9 days. The maximum amount of inventory that can be stored in the warehouse is 1,500 units. A new order is placed when inventory levels fall to 1,000 units. **Calculate the following:** **(i) Buffer inventory** **(ii) Maximum reorder quantity** Solution: **(i) Buffer inventory =** re-order level - (average usage x average lead time) Re-order level = 1,000 units Average usage = (60 + 100) / 2 = 80 units Average lead time = (5 + 9) / 2 = 7 days Buffer inventory = 1,000 – (80 x 7) = **440 units** **(ii) Maximum reorder quantity** = maximum inventory level – buffer inventory Maximum inventory level = 1,500 units Buffer inventory = 440 units (calculated above) 1,500 – 440 = **1,060 units**

<table>
<tr>
<td>Pg 79/90
Practice example 7</td>
<td>Replace with the following question:

Information related to a particular line of stock:

<table>
<tr><th></th><th>Maximum</th><th>Average</th><th>Minimum</th></tr>
<tr><td>Usage (units per day)</td><td>10</td><td>7</td><td>5</td></tr>
<tr><td>Lead time (days)</td><td>8</td><td>6</td><td>4</td></tr>
</table>
The business always keeps 50 units of this stock line as buffer inventory.

The maximum re-order quantity is 70 units.

Calculate the following:

(i) Re-order level

(ii) Minimum re-order quantity

(iii) Maximum inventory level

Solution:

(i) Re-order level = (average usage x average lead time) + buffer inventory

(7 units x 6 days) + 50 units = 92 units

(ii) Minimum re-order quantity = average usage x average lead time

(7 units x 6 days) = 42 units

(iii) Maximum inventory level = buffer inventory + maximum re-order quantity

50 units + 70 units = 120 units</td>
</tr>
<tr>
<td>Pg 79/90
Practice example 8</td>
<td>Replace with the following question:

Information related to a particular line of stock:

Usage: 40 to 50 units per day

Lead time: 8 to 12 days

Re-order level: 700 units

Maximum inventory level: 1,000 units

Calculate the following:

(i) Minimum re-order quantity

(ii) Buffer inventory

(iii) Maximum re-order quantity</td>
</tr>
</table>

	Solution: **Calculate the following:** **(i) Minimum re-order quantity =** average usage x average lead time Average usage = (40 + 50) / 2 = 45 units Average lead time = (8 + 12) / 2 = 10 days 45 x 10 = **450 units** **(ii) Buffer inventory =** re-order level - (average usage x average lead time) 700 – 450 (part i) = **250 units** **(iii) Maximum re-order quantity** = maximum inventory level – buffer inventory 1,000 – 250 (part ii) = **750 units**

Task Bank

Pg 9/121 Task 1 Task briefing	**Inventory control levels** You may be required to calculate the control levels and should do so with the following equations: ▸ Buffer inventory = re-order level - (average usage x average lead time) ▸ Re-order level = (average usage x average lead time) + buffer inventory Note: you will be provided with either buffer inventory or re-order level values when completing calculations. ▸ Maximum inventory level = buffer inventory + maximum re-order quantity ▸ Maximum re-order quantity = maximum inventory level – buffer inventory Note: you will be provided with either maximum inventory level or maximum re-order quantity values when completing calculations. ▸ Minimum re-order quantity = average usage x average lead time
Pg 17/67 Task 1 Revision example 4	Updated question and answer: Below is information relating to the new running water bottles Ruma Ltd have started producing. Maximum usage 150 units per day Average usage 70 units per day Minimum usage 40 units per day Maximum lead time 7 days Average lead time 4 days Minimum lead time 2 days Maximum reorder quantity 600 units Reorder level 1050 units **(c) Calculate the following: (answers to the nearest whole number)** **(i) Buffer inventory for Ruma's water bottles**

	(ii) Maximum inventory level for Ruma's water bottles	
	(iii) Minimum reorder quantity for Ruma's water bottles	
	Solution:	
	(i) Buffer inventory for Ruma's water bottles	770
	Re-order level – (average usage x average lead time) 1050 (given) – (70 x 4) = 770 units	
	(ii) Maximum inventory level for Ruma's water bottles	1370
	Buffer inventory + maximum reorder quantity 770 (from part i) + 600 (given) =	
	(iii) Minimum reorder quantity for Ruma's water bottles	280
	Average usage x Average lead time 70 x 4 = 280	

Other errata:

Course Notes & Questions

<table>
<tr><td>Pg 54

Practice example 11 solution</td><td>Food for canteen should be classed as Materials not Expenses.</td></tr>
<tr><td>Pg 87

Lecture example 6 solution</td><td>The highlighted figures have been corrected as follows:
<table>
<tr><th rowspan="2">Date</th><th colspan="3">Receipts</th><th colspan="3">Issues</th><th colspan="2">Balance</th></tr>
<tr><th>Qty
kg</th><th>Cost/kg
£</th><th>Cost
£</th><th>Qty
kg</th><th>Cost/kg
£</th><th>Cost
£</th><th>Qty
kg</th><th>Cost
£</th></tr>
<tr><td>1 Jan</td><td></td><td></td><td></td><td></td><td></td><td></td><td>8,000</td><td>16,000</td></tr>
<tr><td>3 Jan</td><td>15,000</td><td>2.20</td><td>33,000</td><td></td><td></td><td></td><td>23,000</td><td>49,000</td></tr>
<tr><td>6 Jan</td><td></td><td></td><td></td><td>6,000</td><td>2.13</td><td>12,780</td><td>17,000</td><td>36,220</td></tr>
</table></td></tr>
<tr><td>Pg 91

Practice example 9 solution</td><td>Solution didn’t fit on the page:
FIFO:
<table>
<tr><th rowspan="2">Date</th><th colspan="3">Receipts</th><th colspan="3">Issues</th><th colspan="2">Balance</th></tr>
<tr><th>Qty
kg</th><th>Cost/kg
£</th><th>Cost
£</th><th>Qty
kg</th><th>Cost/kg
£</th><th>Cost
£</th><th>Qty
kg</th><th>Cost
£</th></tr>
<tr><td>1 Jan</td><td></td><td></td><td></td><td></td><td></td><td></td><td>500</td><td>1,000</td></tr>
<tr><td>3 Jan</td><td>1,000</td><td>2.500</td><td>2,500</td><td></td><td></td><td></td><td>1,000
1,500</td><td>2,500
3,500</td></tr>
<tr><td>6 Jan</td><td></td><td></td><td></td><td>500
800
1,300</td><td>2.000
2.500
2.308*</td><td>1,000
2,000
3,000</td><td>(1,300)
200</td><td>(3,000)
500</td></tr>
<tr><td>12 Jan</td><td>1,000</td><td>3.000</td><td>3,000</td><td></td><td></td><td></td><td>1,000
1,200</td><td>3,000
3,500</td></tr>
<tr><td>16 Jan</td><td></td><td></td><td></td><td>200
900
1,100</td><td>2.500
3.000
2.909**</td><td>500
2,700
3,200</td><td>(1,100)
100</td><td>(3,200)
300</td></tr>
<tr><td>21 Jan</td><td>1,000</td><td>3.500</td><td>3,500</td><td></td><td></td><td></td><td>1,000
1,100</td><td>3,500
3,800</td></tr>
<tr><td>28 Jan</td><td></td><td></td><td></td><td>100
700
800</td><td>3.000
3.500
3.438***</td><td>300
2,450
2,750</td><td>(800)
300</td><td>(2,750)
1,050</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Pg 261

Lecture example 1 solution</td><td>The profit variance figure should be 15,000 not 17,500.</td></tr>
<tr><td>Pg 268

Practice example 9 solution</td><td>The electricity variance should be £1,500, not £700.</td></tr>
<tr><td>Pg 357

Lecture example 3 solution</td><td>The highlighted figures have been corrected as follows:

<table>
<tr><th></th><th>Apr
£</th><th>May
£</th><th>Jun
£</th><th>Jul
£</th></tr>
<tr><td>Cash receipts</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Capital introduced</td><td>200,000</td><td></td><td></td><td></td></tr>
<tr><td>Bank loan</td><td>300,000</td><td></td><td></td><td></td></tr>
<tr><td>From customers</td><td></td><td></td><td>120,000</td><td>132,000</td></tr>
<tr><td>Sale of machine</td><td></td><td></td><td></td><td>25,000</td></tr>
<tr><td>Total receipts</td><td>500,000</td><td>0</td><td>120,000</td><td>157,000</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Cash Payments</td><td></td><td></td><td></td><td></td></tr>
<tr><td>To suppliers</td><td></td><td>80,000</td><td>88,000</td><td>96,800</td></tr>
<tr><td>Other</td><td>30,000</td><td>30,000</td><td>30,000</td><td>30,000</td></tr>
<tr><td>Loan repayments</td><td>25,000</td><td>25,000</td><td>25,000</td><td>25,000</td></tr>
<tr><td>Drawings</td><td></td><td></td><td>3,000</td><td>3,000</td></tr>
<tr><td>Non current assets</td><td>200,000</td><td></td><td></td><td></td></tr>
<tr><td>Total payments</td><td>255,000</td><td>135,000</td><td>146,000</td><td>154,800</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Net cash flow</td><td>245,000</td><td>(135,000)</td><td>(26,000)</td><td>2,200</td></tr>
<tr><td>Opening cash balance</td><td>0</td><td>245,000</td><td>110,000</td><td>84,000</td></tr>
<tr><td>Closing cash balance</td><td>245,000</td><td>110,000</td><td>84,000</td><td>86,200</td></tr>
</table>
</td></tr>
<tr><td>Pg 358

Lecture example 7 solution</td><td>There were some rounding inconsistencies in this chapter. Apply normal mathematical rounding rules unless specifically told otherwise.

Trade receivables collection period should be 89 days, making the overall working capital cycle 80 days.</td></tr>
</table>

Task Bank

<table>
<tr><td>Pg 23
Task 2
RE 1</td><td>Part (b) should say “giving your answer to the nearest whole £” rather than round to two decimal places.</td></tr>
<tr><td>Pg 33
Task 3
RE 1</td><td>The question should refer to “Budgeted hours” not “Budgeted miles.”</td></tr>
<tr><td>Pg 40
Task 3
RE 4</td><td>Parts (g) (i) and (g) (ii) are the wrong way round. Part (i) should be a single box with a £ sign and part (ii) should be the POP15 Budget table.</td></tr>
<tr><td>Pg 47
Task 4
RE 3</td><td>Sales revenue figure should be £369,600 not £396,600.</td></tr>
<tr><td>Pg 79
Task 3
RE 1
Solution</td><td>The highlighted figures have been corrected as follows:
<table>
<tr><th></th><th>800 units
£</th><th>1,000 units
£</th><th>1,200 units
£</th></tr>
<tr><td>Revenue</td><td>8800</td><td>11000</td><td>12540</td></tr>
<tr><td>Variable material costs</td><td>5200</td><td>6500</td><td>6000</td></tr>
<tr><td>Variable labour costs</td><td>2400</td><td>3000</td><td>3240</td></tr>
<tr><td>Contribution</td><td>1,200</td><td>1500</td><td>3300</td></tr>
<tr><td>Fixed costs</td><td>2,000</td><td>2,000</td><td>2650</td></tr>
<tr><td>Forecast profit/(loss)</td><td>(800)</td><td>(500)</td><td>650</td></tr>
</table></td></tr>
<tr><td>Pg 86
Task 4
RE 1
Solution</td><td>“Now the business has been trading for three years more suppliers now allow the business 30 days credit.” The tick and the explanation should be in the “Improve” column.</td></tr>
</table>

Pg 106 Task 5/6 RE 3 Solution	Correction to the following formula in part (ii): Cell C15 =B5*(1+C23) The completed workbook then looks like this:

J.W. Lewis					
Current Year Actuals		**(£ 000's)**			
Description		**Current Actuals**			**% Total Sales Revenue**
Sales	£	73,320			
Cost of sales	£	43,957			60%
Gross profit	£	29,363			40%
Labour costs	£	16,039			22%
Storage costs	£	3,682			5%
Other overheads	£	1,465			2%
Operating profit	£	8,177			11%
Next Year Budget		**(£ 000's)**		**(£ 000's)**	
		Original Budget		**Revised Budget**	
Sales	£	76,984	£	78,452	
Cost of sales	£	46,155	£	47,034	
Gross profit	£	30,829	£	31,418	
Labour costs	£	16,840	£	17,162	
Storage costs	£	3,867	£	3,940	
Other overheads	£	770	£	785	
Operating profit	£	9,352	£	9,532	
% Sales revenue increase		**5%**		**7%**	

Mock Bank

Pg 161 Mock 1 Task 6 Solution	Fixed production overheads should not have been flexed. Cell C13 should be 10,000. The completed workbook then looks like this:

Units made and sold	50,000	51,280	51,280			
	Budget	**Flexed budget**	**Actual**	**Variance**	**Variance**	**Significant?**
	£	**£**	**£**	**£**	**%**	
INCOME						
Sales	499,500	512,287	538,440	26,153	5%	Not significant
COSTS						
Direct materials	132,500	135,892	153,840	(17,948)	13%	Significant
Direct labour	62,500	64,100	58,972	5,128	8%	Significant
Variable production overhead	72,500	74,356	76,920	(2,564)	3%	Not significant
Fixed production overhead	10,000	10,000	9,800	200	2%	Not significant
Total costs	277,500	284,348	299,532	(15,184)		
PROFIT / (LOSS)	222,000	227,939	238,908	10,969		

Pg 187	**Mock 2 Task 3** – The solution to part **(e)** was missing:

Statement	True ✓	False ✓
At the breakeven point a business will be making a profit. **At breakeven point, the business makes neither a profit nor a loss.**		✓
On a breakeven graph the total revenue line meets the fixed cost line at the breakeven point. **The total revenue line meets the <u>total</u> cost line at the breakeven point.**		✓
Contribution is the price of the item less the variable costs.	✓	
A product with a £25 selling price and £15 contribution will breakeven at 4,000 units if fixed costs are £60,000. **Breakeven point is fixed costs / contribution per unit, here £60,000 / £15 = 4,000 units.**	✓	

Extra notes

Please see the extra handout at the end of this document regarding CVP analysis.

AAT LEVEL 3

Management Accounting Techniques (MATS)

Extra notes on cost-volume-profit (CVP) analysis

first intuition
where people count

Chapter 13 – Short term decision making

In this chapter, we learnt a number of calculations relating to short term decision making. Here is a reminder:

$$\text{Break-even point (BEP) (units)} = \frac{\text{Fixed costs}}{\text{Contribution per unit}}$$

$$\text{Break-even revenue (£)} = \text{BEP} \times \text{Sales price}$$

$$\text{Margin of safety (units)} = \text{Budget volume} - \text{BEP}$$

$$\text{Margin of safety (\%)} = \frac{\text{Budget volume} - \text{BEP}}{\text{Budget volume}} \times 100$$

$$\text{Sales required to achieve a target profit (units)} = \frac{\text{Fixed costs} + \text{Target profit}}{\text{Contribution per unit}}$$

In addition to these formulas, you also need to know the following:

Profit Volume (PV) Ratio

Profit Volume (PV) ratio is a financial ratio that is used to measure the relationship between a company's contribution and its sales volume. It helps a business to determine the level of profitability for each unit of product or service sold. A high PV ratio indicates that the company is generating a large profit for each unit of sales, which is typically a good sign for the business. On the other hand, a low PV ratio may indicate that the company is struggling to generate profits or is not pricing its products or services appropriately.

The formula is:

$$\text{PV ratio} = \frac{\text{Contribution per unit}}{\text{Sales price per unit}} \times 100 \quad \text{or} \quad \frac{\text{Total contribution}}{\text{Total sales}} \times 100$$

Reminder: Contribution = Selling price – Variable costs (either per unit or in total)

This ratio is sometimes referred to as the **Contribution Sales (CS) ratio.**

We can use the PV ratio to calculate the **break-even revenue** and **sales required to achieve a target profit** in monetary terms rather than in units:

$$\text{Break-even revenue (£)} = \frac{\text{Fixed costs}}{\text{PV ratio}}$$

$$\text{Sales required to achieve a target profit (£)} = \frac{\text{Fixed costs} + \text{Target profit}}{\text{PV ratio}}$$

ILLUSTRATION – PV RATIO

A business sells a product for £0.80 per unit. The variable costs per unit are £0.20 and the fixed costs are £11,500. Budgeted sales are 125,000 units and target profit is £20,000.

What value of sales will give the business their desired profit?

First, we will need to calculate the PV ratio on a per unit basis:

$$\text{PV ratio} = \frac{\text{Contribution per unit}}{\text{Sales price per unit}} \times 100$$

$$= \frac{£0.80 - £0.20}{£0.80} \times 100 = \frac{£0.60}{£0.80} \times 100 = 75\%$$

Then we can enter it into our target profit formula. **Note:** We enter the PV ratio into the formula as a decimal, so 0.75 not 75.

$$\text{Sales required to achieve a target profit (£)} = \frac{\text{Fixed costs} + \text{Target profit}}{\text{PV ratio}}$$

$$\text{Sales required to achieve a target profit (£)} = \frac{£11{,}500 + £20{,}000}{0.75} = £42{,}000$$

We can check that this gives us the same answer as using the original formula we learnt:

$$\text{Sales required to achieve a target profit (units)} = \frac{\text{Fixed costs} + \text{Target profit}}{\text{Contribution per unit}}$$

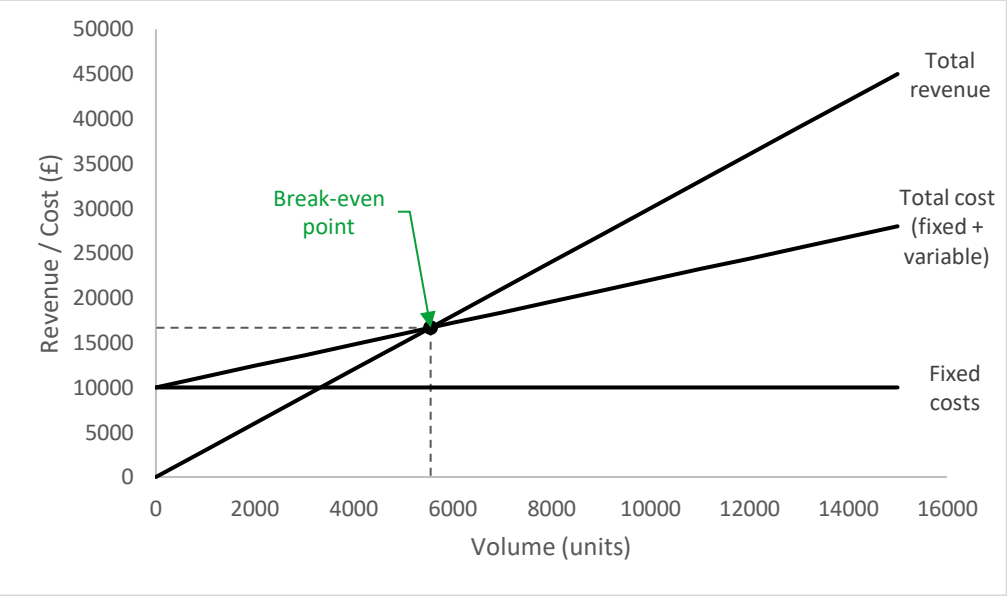
$$\text{Sales required to achieve a target profit (units)} = \frac{£11{,}500 + £20{,}000}{£0.60} = 52{,}500 \text{ units}$$

52,500 units x £0.80 selling price = £42,000.

As well as the calculations we saw above, we can also use charts in our cost-volume-profit analysis:

Break-even chart

A breakeven situation can be shown graphically, linking sales volumes, revenues and costs.



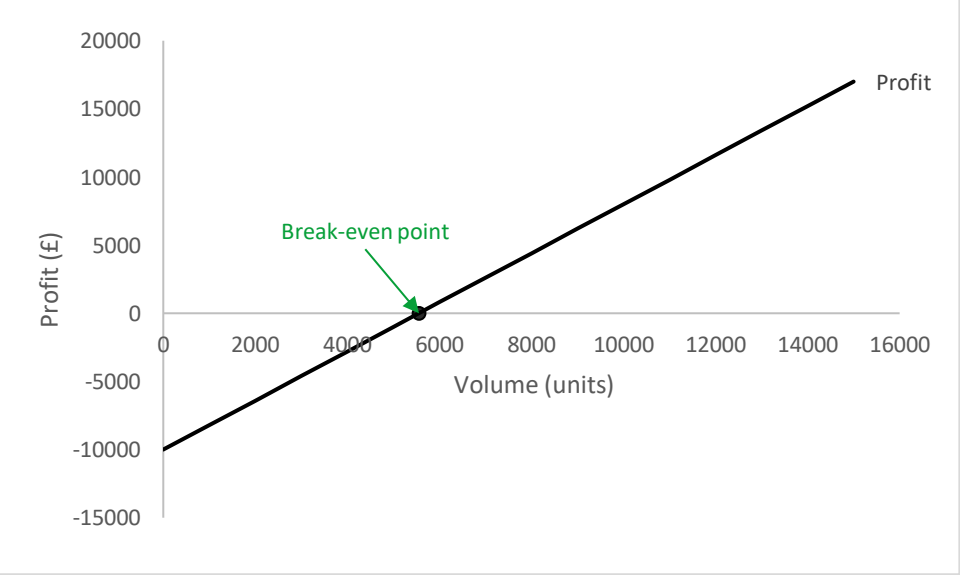
You may be required to extract figures from a chart.

In the example above, we can see that the break-even point is around 5,500 units or £17,000.

(The actual figures are 5,556 units and £16,668 but it would be difficult to read them to this level of accuracy.)

Profit Volume chart

A profit/volume chart is similar to break-even chart, but it illustrates the relationship between sales volume and profit. For example, if zero sales are made then the business will make a loss equal to its fixed costs.

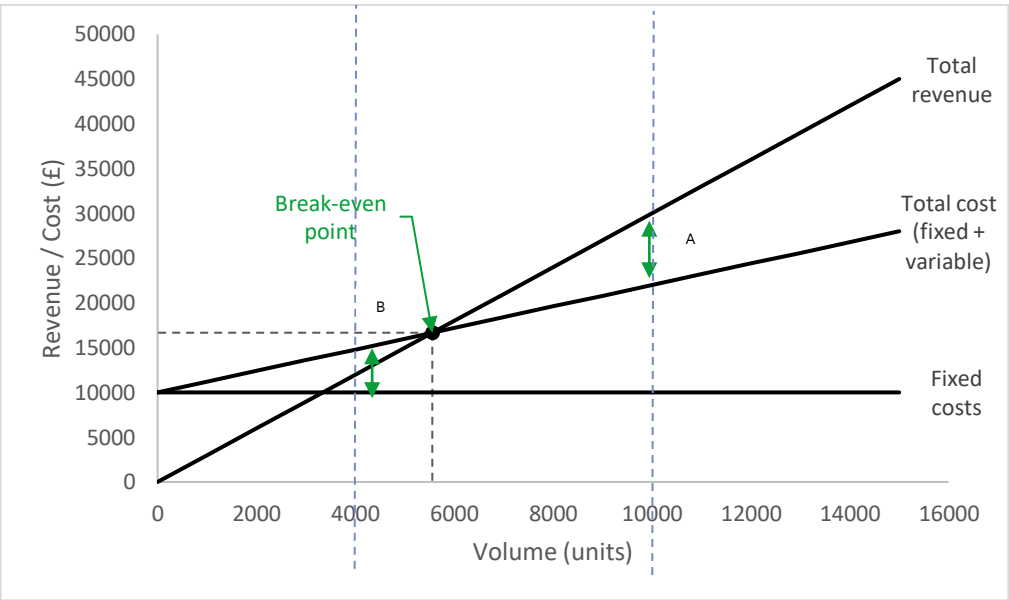


Interpreting CVP analysis

There is a range of information we can identify from the breakeven and profit/volume charts.

Using the chart above and knowing there is a budget set to produce and sell 10,000 units we can use the chart to answer the following questions:

- What is the budgeted revenue?
- What profit is budgeted?
- What contribution in budgeted?
- What is the budgeted margin of safety in units?
- If sales were to fall to 4,000 units how will this impact performance?



Using the chart above we can answer these questions:

What is the budgeted revenue?

At 10,000 units the budgeted revenue is approximately £30,000.

What profit is budgeted?

The area at 'A' is the profit generated and the total profit at 10,000 units is the difference between the total revenue line and the total cost line (approximately 30,000-20,000 = £10,000).

What contribution in budgeted?

The contribution generated at 10,000 is the difference between the total revenue at 10,000 units and the fixed costs (approximately 30,000-10,000 = 20,000).

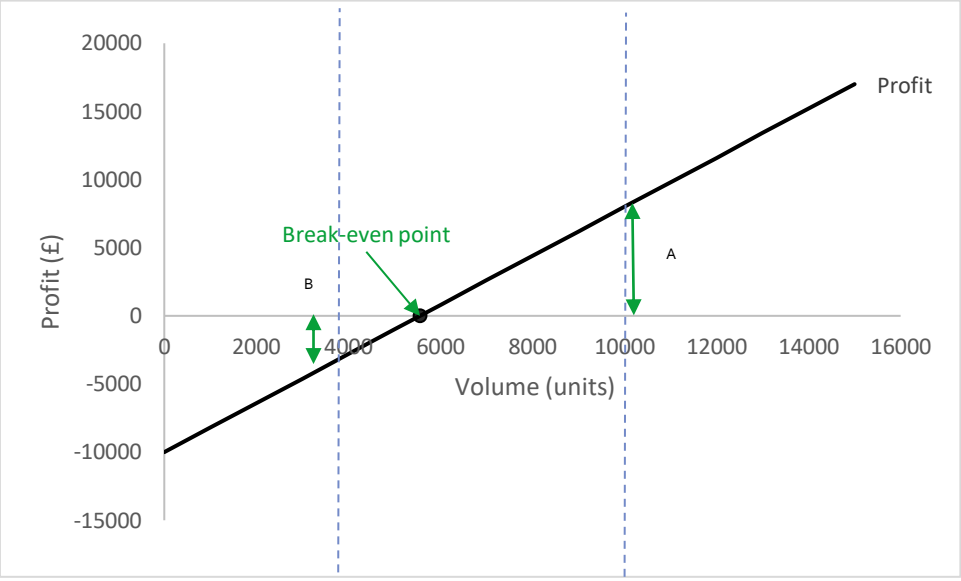
What is the budgeted margin of safety in units?

If 10,000 units are budgeted and reading off the graph, we identify the break-even point of 5,500 then the margin of safety is approximately 10,000 – 5,500 = 4,500 units.

If sales were to fall to 4,000 units how will this impact performance?

If sales were at 4,000 units, we can see the we are to the left of the breakeven point and therefore there will be a loss to the value of the difference between the total revenue and total costs at that point (B). If sales were to fall to 4,000 the business would not longer generate enough revenue to cover costs and would now be making a loss.

The profit/volume chart can also be interpreted to provide information useful for decision making. As we can see below at a budget of 10,000 units the profit 'A' is generated and if sales were to fall to 4,000 units then the loss at 'B' will be generated.



Reporting CVP analysis

Our cost volume profit analysis supports decision making:

- How many units must we sell in order to cover our costs?
- What impact on profit is there is the selling price is changed?
- What is the impact of an increase in fixed costs?
- What is our target for sales units or revenue in order to meet a required level of profit?

We do need to use caution when using CVP analysis as there are a number of assumptions which are made:

- Fixed costs will remain fixed at all levels of output. In reality there may be an element of stepped fixed costs with significant changes in output volumes.
- Variable costs are constant. This means there are no changes in the unit variable costs, we are ignoring any potential economies of scale for volume purchases.
- Efficiency and productivity do not change with volume.
- Selling prices will remain the same per unit at all volumes.
- It is also assumed that the only impacting factor on cost is volume and there are no other internal or external factors which will cause a change in the costs.