

absorption and marginal costing

relevant to Professional Scheme Paper 1.2

costing principles

■ **An understanding of absorption costing (AC) and marginal costing (MC) – the two costing principles – underpins many aspects of cost and management accounting. In the Paper 1.2 syllabus, AC and MC have their own subheading under ‘Costing methods and techniques’, and appear to be treated as a self-contained topic. However, it is important to understand that AC and MC also impact on other key syllabus topics.**

This article looks at the basic concepts relating to AC and MC, and also explores some of the implications these costing principles have for other key syllabus areas – in particular, standard costing and short-term decision making. This article illustrates aspects of AC and MC with short multiple-choice questions (MCQs). It has been noticeable in recent exam sittings that some candidates perform less well in Section A of Paper 1.2 (the MCQs) than in Section B (the five, longer, traditional style questions).

First, it is important to understand the key difference between AC and MC. Exam candidates often simply say that the difference between these two costing principles is the way in which fixed costs are treated. This is not specific enough. It is the treatment of the fixed production costs that is the key issue. In AC, these are treated as part of the product cost, and it is the product cost which is the basis for the valuation of stocks. Under MC, the fixed production cost is not included

in the product cost, but is treated instead as a period cost. This means that the fixed production cost is written off in the period in which it arises, and is not included within any stock valuation. As a result, an organisation calculating its profit for a period in which the finished goods stock level has changed will arrive at a different profit or loss depending on whether it has used AC or MC. This is a frequently examined topic because it tests basic understanding of costing principles. The following example illustrates the effect on profit of using AC or MC in a period when stock levels are rising.

EXAMPLE 1

An organisation manufactures a single product which it sells at a standard price of £50 per unit. The cost structure is as follows:

- standard variable production cost – £8 per unit
- total fixed production cost per month – £120,000 (10,000 units of production are planned per month)
- standard variable selling cost – £5 per unit
- total fixed non-production costs – £150,000 per month.

In Month 1, when the opening stock is 1,000 units, production of 10,000 units is planned and sales of 8,000 units are expected. What would be the net profit for Month 1 under (i) AC and (ii) MC?

Initially, full profit statements will be produced to emphasise the different valuations for production and stocks, as shown in **Table 1** on page 51.

This example shows that different net profits for Month 1 have been calculated under AC (£50,000) and MC (£26,000). Sales, variable selling costs and fixed non-production costs have, in effect, been treated in the same way under AC and MC. Therefore, the difference in net profit must be due to the different treatments of the fixed production costs and the change in stock levels in the period. A simple way of reconciling the two net profits is to calculate the change in stocks (2,000 units) and multiply this by the standard fixed production cost per unit ($£120,000 \div 10,000 \text{ units} = £12$). So $2,000 \times £12 = £24,000$.

The AC net profit is higher than the MC net profit in Month 1 by £24,000 because this was a period when stocks were rising. Under AC, where stocks are increasing, a greater amount of the fixed production cost is carried forward in the closing stock valuation than was brought forward in the opening stock valuation.

This, in effect, delays the impact of these costs on profit and thus ‘inflates’ the AC profit compared with MC, where the full impact of the fixed production costs on profit is immediate (remember, they are treated as a period cost in MC).

In a period when stocks are falling, MC net profit will be higher than AC net profit. The difference is calculated in exactly the same way as – and the explanation the exact opposite of – the increasing stocks scenario. Candidates are recommended to calculate the net profit for Month 2 under AC and MC by producing the full profit statements, and then to check the difference using the method described. In Month 2, sales are planned to be 11,000 units and production is still 10,000 units (remember, the opening stock for Month 2 will be the closing stock for Month 1). The key figures for Month 2 can be found at the end of this article. If there is no change in stock levels in a period then the AC and MC net profits will be the same.

Paper 1.2 Section B questions sometimes require candidates to produce full profit statements, either under AC or MC, like the ones in the previous example. MCQs in Section A have also been set, but as such questions carry only two marks (which means an average time allocation of only 3.6 minutes per question) candidates are not expected to work through a full profit statement in order to arrive at either the AC or MC net profit. A typical MCQ is given in **Example 2**, with a suggested ‘quick’ approach to its solution.

EXAMPLE 2

The following information relates to a manufacturing company for next period:

	Units	£
Production	12,000	Fixed production costs 102,000
Sales	10,000	Fixed selling costs 60,000

Using absorption costing, the profit for next period has been calculated as £105,000.

What would the profit for next period be using marginal costing?

- A £76,000
- B £88,000
- C £122,000
- D £134,000

This question could be tackled in the following way. As production is greater than sales, then closing stock is higher than opening stock. Therefore, AC profit will be higher than MC profit. Note that this immediately eliminates two of the choices (C and D which are both above the AC profit) – helpful if a candidate needs to guess. The profit difference equals the difference between the opening and closing stocks in units multiplied by the fixed production cost per unit. So 2,000 units $\times$ (£102,000 $\div$ 12,000), which equals £17,000, is the amount by which the MC profit

will be lower than the AC profit. So the correct answer is B, £88,000, which is £105,000 – 17,000. Remember that no workings need to be shown in answering MCQs, so a question of this kind should take less than the standard 3.6 minutes to complete.

Example 3 illustrates a different way in which the understanding of this topic could be examined.

EXAMPLE 3

A company manufactures and sells a single product in two consecutive months (M1 and M2). The following levels of production and sales (in units) occurred:

	M1	M2
Sales	3,800	4,400
Production	3,900	4,200

The opening stock for M1 was 400 units.

Profits or losses have been calculated for each month using both absorption and marginal costing principles.

Which of the following combination of profits and losses for the two months is consistent with the above data?

	Absorption costing		Marginal costing	
	profit/(loss)		profit/(loss)	
	M1	M2	M1	M2
	£	£	£	£
A	200	4,400	(400)	3,200
B	(400)	4,400	200	3,200
C	200	3,200	(400)	4,400
D	(400)	3,200	200	4,400

In M1, stocks are increasing and therefore AC profit will be greater than MC profit. Choices A and C are consistent with this. In M2, stocks are decreasing and MC profit will be greater than AC profit. Choices C and D are consistent with this. Therefore, the only choice consistent with both is C. **Example 4** allows you to practise your understanding of this topic. The answer is given at the end of this article.

EXAMPLE 4

A company manufactures and sells a product that has a variable cost per unit of £24, and a contribution to sales ratio of 40%. Total monthly fixed costs are £90,000, of which £30,000 are non-production costs. Planned production is 10,000 units per month.

What is the AC profit in a month when sales are 9,000 units?

- A £54,000
- B £57,000
- C £60,000
- D £63,000

Standard costing and its associated variance analysis are key topics within the Paper 1.2 syllabus. Standard costing is a costing technique rather than another costing principle. The important point to understand is that either of the two costing principles already covered in this article, AC and MC, can be linked to standard costing. Therefore, one can have standard absorption costing or standard marginal costing.

Variance analysis is the key aspect of standard costing in the syllabus. The majority of the variances calculated under standard absorption costing and standard marginal costing are the same – these are the variances for direct materials, direct labour, and variable production overheads, as well as the sales

price variance. It is in the area of volume variances where there are differences. The sales volume variance is different under AC and MC, and the fixed production overhead volume variance calculated under AC has no equivalent under MC. Each of these will be discussed in turn.

A sales volume variance measures the effect on profit of any difference between the budgeted or planned sales units and the actual number of units sold in a period. The difference in the number of units is multiplied by the standard profit per unit in AC, and by the standard contribution per unit in MC, to obtain an evaluation of the variance. Standard profit per unit is the standard unit selling price less the standard product cost per unit, which in AC includes the fixed production overhead cost.

Remember, the fixed production overhead cost is not treated as part of the product cost under MC, so the standard contribution per unit is the standard unit selling price less the standard variable production cost per unit. Any sales volume variance will have a larger value when calculated under MC than under AC, because the standard contribution per unit would be higher than the standard profit per unit.

Example 5 is taken from Section B Question 3 of the December 2004 exam.

EXAMPLE 5

Oakapple Ltd manufactures a single product which has a standard selling price of £15 per unit. It operates a standard absorption costing system. The total production cost is £9 per unit, of which £4 per unit represents the variable cost element.

The following data relate to the month just ended:

	Budget units	Actual units
Production	48,000	47,000
Sales	45,000	46,000

The actual total sales revenue for the month just ended was £678,500. Calculate the sales price and sales volume variances for the month just ended. (4 marks)

The sales price variance is the actual sales revenue (£678,500) compared with the actual sales units at the standard selling price (46,000 x £15). This equals £11,500 Adverse, as the actual unit selling price (£14.75) is less than the standard selling price per unit.

The sales volume variance under AC is the difference between the budgeted and actual sales units (1,000 units Favourable) evaluated at the standard profit per unit (£15 - £9) which equals £6,000 Favourable. This answers the question set. However, if the question had asked for the same two variances under MC, then the sales price variance would be the same but the sales volume variance would be larger, at £11,000 Favourable [1,000 units Favourable x the standard contribution per unit (£15 - £4)].

Under AC, the fixed production cost is treated as part of the standard product cost. The standard fixed production cost per unit is calculated by dividing the budgeted cost by the budgeted production units. Therefore, if the budgeted cost and the actual cost for a period are different there will be an expenditure variance. Similarly, if budgeted and actual production are different in any period, then there will be a volume effect and therefore a fixed production overhead volume variance. This volume variance can be further divided (into a capacity and an efficiency variance) if a standard fixed production overhead cost per hour is established and used. This is much simpler under MC as there is no volume variance, because the fixed production overhead does not form part of the product standard cost. The only effect under MC is one of expenditure – all that can be measured is whether the actual and budgeted costs are different. This is either referred to as the expenditure or the total variance. The figure is the same as the expenditure variance when calculated under AC. **Example 6** tests candidates' understanding of AC and MC under standard costing.

EXAMPLE 6

An organisation manufactures and sells a single product which has a unit standard selling price of £20. The product has a contribution to sales ratio of 55%. Last month, budgeted production and sales were both 10,000 units, actual sales

were 9,000 units, and actual production was 9,500 units. The sales volume profit variance under AC was £4,000 Adverse last month, and the actual expenditure on fixed production overheads was £65,000.

What were the fixed production overhead expenditure and volume variances last month?

	Expenditure variance £	Volume variance £
A	5,000 Adverse	3,500 Favourable
B	5,000 Adverse	3,500 Adverse
C	5,000 Favourable	3,500 Favourable
D	5,000 Favourable	3,500 Adverse

The following logic can be used to answer this question. The contribution per unit is £11 (55% of £20). The sales volume profit variance of £4,000 Adverse is [(10,000 - 9,000) units x standard profit per unit]. Therefore, the standard profit per unit was £4 and the budgeted fixed production overhead cost per unit was £7 (£11 - 4). Budgeted fixed production cost was £70,000 (10,000 x £7). The fixed production overhead variances were: expenditure £5,000 Favourable

(£70,000 - 65,000) and volume £3,500 Adverse [£70,000 - (9,500 x £7)]. The correct answer was choice D.

Finally, it is important to understand the relevance of AC and MC to short-term decision making. In decision making, the relevant costs need to be identified – those costs which will change as a direct consequence of making the decision. In short-term decision making, the variable costs are always relevant as, by definition, they vary with activity and decisions usually involve changes in activity. The fixed costs are relevant if the decision causes a change in the total expenditure on fixed costs. The amount of the change is the relevant cost or relevant saving to the decision. Clearly, the distinction between fixed and variable costs, in terms of cost behaviour, is crucial to short-term decision making and as MC makes this distinction it is therefore the more relevant costing principle. AC involves the arbitrary apportionment and absorption of fixed costs into cost units. Using such costs in the decision-making process can lead to wrong decisions being made. Fixed costs need to be considered on a total basis, not on a per unit basis.

A clear understanding of the two costing principles is fundamental to any basic study of cost and management accounting. These principles can be used to calculate far more than simply the different periodic profits. Their impact is much more far reaching, and covers standard costing variances and short-term decision making as well.

ANSWERS

Key figures to Example 1 (Month 2)

AC profit = £125,000 and MC profit = £137,000. The change in stocks is 1,000 units (down) x £12 per unit = £12,000. MC profit is greater than AC profit by £12,000.

Answer to Example 4

Contribution per unit = £16 [(24 ÷ 0.60) - 24]. Profit under MC = (16 x 9,000) - 90,000 = £54,000. Production is greater than sales by 1,000 units. Therefore AC profit will be greater than MC profit by 1,000 x fixed production cost per unit = 1,000 x (60,000 ÷ 10,000) = £6,000. Therefore AC profit = (54,000 + 6,000) = £60,000. Answer C is correct. ■

David Forster is examiner for Paper 1.2

TABLE 1: FULL PROFIT STATEMENTS

	(i) Month 1 under AC		(ii) Month 1 under MC	
	£			£
Sales (8,000 @ £50)	400,000			400,000
Cost of sales:				
Opening stock (1,000 @ £20)	20,000	(1,000 @ £8)	8,000	
Production (10,000 @ £20)	200,000	(10,000 @ £8)	80,000	
Less: Closing stock (3,000 @ £20)	(60,000)	(3,000 @ £8)	(24,000)	
	(160,000)			(64,000)
Gross profit	240,000			336,000
Less: Variable selling cost		(8,000 @ £5)		(40,000)
Contribution				296,000
Less: Other costs:				
Fixed production (Note 1)	–		(120,000)	
Fixed non-production	(150,000)		(150,000)	
Variable selling (Note 2)	(40,000)		–	
	(190,000)			(270,000)
Net profit	50,000			26,000

Notes

- 1 Fixed production cost is already included in the cost of sales figures.
- 2 Under MC, the variable selling costs are already shown immediately below the gross profit so that the key figure of contribution can be highlighted.