

Part 6

Job costs and stock valuation

19 Job costing

Chapter 19

Job costing

REAL WORLD CASE

This case study shows a typical situation in which management accounting can be helpful. Read the case study now but only attempt the discussion points after you have finished studying the chapter.

The film Monster was a box office success but, coming from an independent film maker rather than the giant studios of Hollywood, did not bring the early profits that other successes could achieve. This extract explains the problems.



Monster generated a respectable \$34.5m at the US box office, according to Nielsen EDI, the cinema research body. However, because it is riskier for cinemas to show small, niche films instead of mainstream blockbusters, cinema chains tend to keep a larger proportion of the ticket price. Although the figures have yet to be audited, according to Mark Damon, another co-producer on the film, this amounted to about 62% for *Monster*, compared to the typical 45% to 55%. As a result, more than \$20m of the box-office revenues stayed with the cinema operators. Some 18% was kept by Newmarket, the film's distributor, leaving behind about \$10m.

Then there was the cost of the release campaign, which included posters and television commercials as well as the cost of making celluloid copies and transporting them to different venues. The film industry categorises these costs as 'print and advertising' or P&A. Usually the P&A cost is advanced by the distributors. But, in the case of *Monster*, the producers struggled to find a partner willing to distribute the film.

... In total the P&A cost came to about \$12m, pushing *Monster* into a loss of \$1.26m at the US box office.

Source: Thomas Clark, *Financial Times*, 15 February 2005, p. 14, 'Why a monster hit did not make giant profits'.

Discussion points

- 1 Why is a job costing approach suitable for a film production?
- 2 Why will each job have a different pattern of costs and revenues?

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Learning outcomes

After reading this chapter you should be able to:

- Explain the contents of a job cost record.
- Prepare a job cost record showing direct material, direct labour, other direct costs and production overhead.
- Analyse transactions involved in job costing, using the accounting equation.
- Compare profit using absorption costing with profit using marginal costing.
- Explain how activity-based costing may be useful in calculating the cost of a job.

19.1 Introduction

In Chapter 18 direct materials, direct labour and production overheads were explained. This chapter brings together the elements of a **job-costing system** and explains the procedures for analysing them to calculate the cost of a job undertaken during a period of time. In a job-costing system there will be a job cost record for each job, showing the costs incurred on that job. A job cost record is illustrated in Exhibit 19.1. The transactions of the period are analysed and recorded using the accounting equation.

A job-costing system for recording the cost of output is appropriate to a business which provides specialised products or makes items to order, so that each customer's

requirements constitute a separate job of work. Job costing is appropriate in manufacturing industries such as shipbuilding, bridge building, construction, property development and craft industries. Job costing would also be used in costing the provision of services by professional persons such as lawyers, doctors, architects and accountants. It could also be used for repair contracts, or specialist service contracts.

Definition

A **job costing system** is a system of cost accumulation where there is an identifiable activity for which costs may be collected. The activity is usually specified in terms of a job of work or a group of tasks contributing to a stage in the production or service process.

The **job cost record** shows the costs of materials, labour and overhead incurred on a particular job. The accounts department knows from the stores requisition the quantity of materials issued to production and knows from the invoice the price per unit charged by the supplier. This allows the cost of **direct materials** to be recorded as the materials are used. Each job will have a job number and that number will be entered on all stores requisitions so that the materials can be traced to the job cost record.

Direct labour costs will be calculated using hours worked and the hourly rate for each employee. The hours worked will be collected from employee time sheets which show each job under its own job number. Hourly rates for the employee will be available from personnel records.

Exhibit 19.1

Illustration of a job cost record

JOB COST RECORD Job No.....		Customer reference		Product code	
DATE	CODE	DETAILS	QUANTITY	£	p
		Direct materials:			
		Type A	kg		
		Type B	kg		
		Type C	litres		
		Direct labour:			
		Employee A	hrs		
		Employee B	hrs		
		Employee C	hrs		
		Other direct costs			
		PRIME COST X			
		Indirect materials			
		Indirect labour			
		Other indirect costs			
		TOTAL PRODUCTION OVERHEAD Y			
		TOTAL PRODUCT COST X + Y			

Other **direct costs** will be charged to jobs by entering on the expense invoice the appropriate job number. The invoices will be used as the primary source from which information is transferred to the job cost record.

Production overhead costs will be shared among the jobs to which they relate, as explained in Chapter 18.

Activity 19.1

You have been employed as the management accountant at a car repair garage. Write down a list of the types of costs you would expect to find on a job cost record for a car service and repair. (You don't need to put any money amounts into the list.)

Exhibit 19.1 shows sufficient details of direct materials, direct labour and other direct costs to give the **prime cost of production**. Addition of indirect costs (production overhead) gives the **total product cost** of a job.

Definitions

Prime cost of production is equal to the total of direct materials, direct labour and other direct costs.

Production overhead cost comprises indirect materials, indirect labour and other indirect costs of production.

Total product cost comprises prime cost plus production overhead cost.

19.2 Job cost records: an illustration

Job costing is illustrated in the example of Specialprint, a company which prints novelty stationery to be sold in a chain of retail stores. The company has only one customer for this novelty stationery. Exhibit 19.2 contains relevant information for the month of June in respect of three separate jobs, 601, 602 and 603. Symbols are attached to each transaction so that the information may be traced through the job cost records.

19.2.1 Information for the job cost record

The **job cost record** requires information on direct materials, direct labour and production overhead. This information must be selected from the list of transactions for the month of June. Care must be taken to extract only that information which is relevant to each job.

Activity 19.2

From Exhibit 19.2 note the transactions which you think are directly relevant to the cost of jobs 601, 602 and 603. Then read the rest of this section and compare your answer with the text. (Use Exhibit 19.1 to remind yourself of the information needed for a job cost record.)

Direct material

Materials are purchased on 1 June and taken into store but that is of no relevance to determining the cost of a job. For job cost purposes what matters is the issue of paper on 3 June. That is entered on each of the job cost records using the detail given for the event on 3 June.

Exhibit 19.2

Specialprint: transactions for the month of June

<i>Date</i>	<i>Symbol</i>	<i>Transaction</i>
1 June	◇	Bought 60 rolls of paper on credit from supplier, invoiced price being £180,000. The rolls of paper acquired consisted of two different grades. 40 rolls were of medium-grade paper at a total cost of £100,000 and 20 rolls were of high grade at a total cost of £80,000.
1 June	♣	Bought inks, glues and dyes at a cost of £25,000 paid in cash. The inks cost £9,000 while the glue cost £12,000 and the dyes £4,000.
2 June	⊗	Returned to supplier one roll of paper damaged in transit, cost £2,500. The roll of paper returned was of medium grade.
3 June	†	Rolls of paper issued to printing department, cost £120,000. 20 high-grade rolls were issued, together with 16 medium-grade rolls. There were three separate jobs: references 601, 602 and 603. The high-grade rolls were all for job 601 (notepaper); 12 medium-grade rolls were for job 602 (envelopes) and the remaining 4 medium-grade rolls were for job 603 (menu cards).
4 June	∅	Issued half of inks, glues and dyes to printing department, £12,500. Exactly half of each item of inks, glue and dyes was issued, for use across all three jobs.
14 June	ψ	Paid printing employees' wages £8,000. Wages were paid to 10 printing employees, each earning the same amount.
14 June	λ	Paid maintenance wages £250. Maintenance wages were paid to one part-time maintenance officer.
16 June	‡	Paid rent, rates and electricity in respect of printing, £14,000 in cash. Payment for rent was £8,000, rates £4,000 and electricity £2,000.
28 June	ϖ	Paid printing employees' wages £8,000. Wages were paid to the same 10 employees as on 14 June.
28 June	φ	Paid maintenance wages £250. Maintenance wages were paid to the same maintenance officer as on 14 June.
30 June	♥	Employee records show that: 5 printing employees worked all month on job 601; 3 printing employees worked on job 602; and 2 printing employees worked on job 603.
30 June	ξ	It is company policy to absorb production overheads in proportion to labour costs of each job.
30 June	#	Transferred printed stationery to finished goods stock at a total amount of £160,000, in respect of jobs 601 and 602, which were completed, together with the major part of job 603. There remained some unfinished work-in-progress on one section of job 603, valued at £3,000. Separate finished goods records are maintained for notepaper, envelopes and menu cards.
30 June	≈	Sold stationery to customer on credit, cost of goods sold being £152,000. The customer took delivery of all notepaper and all envelopes, but took only £7,600 of menu cards, leaving the rest to await completion of the further items still in progress.

Direct labour

Employees are paid during the month and there are records (time sheets) of the jobs on which they work. It is only at the end of the month that the employee records are checked to find where the work was carried out. At that point the relevant direct labour costs are entered on each job cost record.

Production overhead

Production overhead comprises indirect materials (ink, glue and dyes), indirect labour (maintenance wages), rent, rates and electricity.

		£
Indirect materials	ø	12,500
Indirect labour	λ φ	500
Rent	‡	8,000
Rates	‡	4,000
Electricity	‡	<u>2,000</u>
Total production overhead	ξ	<u>27,000</u>

An **overhead cost rate** is required to determine how much production overhead should be absorbed into each job. We are told in Exhibit 19.2 that it is company policy to absorb production overheads in proportion to the direct labour costs of each job. The total direct labour cost for the period is £16,000 and so the overhead cost rate must be calculated as:

$$\begin{aligned} \text{overhead cost rate (in £ per £ of direct labour)} &= \frac{27,000}{16,000} \\ &= \text{£}1.6875 \text{ per £} \end{aligned}$$

This rate is then applied to the amounts of direct labour cost already charged to each job (which was £8,000 for job 601, £4,800 for job 602 and £3,200 for job 603). The resulting amounts are recorded in the relevant job records.

<i>Job number</i>	<i>Calculation</i>	<i>Production overhead</i>
		£
Job 601	8,000 × £1.6875	13,500 ζ
Job 602	4,800 × £1.6875	8,100 ζ
Job 603	3,200 × £1.6875	<u>5,400 ζ</u>
		<u>27,000 ζ</u>

19.2.2 Presentation of the job cost records

The job cost records are set out in Exhibit 19.3. Jobs 601 and 602 are finished in the period and this is shown on the job cost record by a transfer to finished goods of the full cost of the job. Job 603 has a problem with unfinished work-in-progress but the rest of that job is completed and transferred to finished goods. That information is recorded on the job cost record card as shown in Exhibit 19.3.

The total work-in-progress record is useful as a check on the separate job costs and is also useful for accounting purposes in providing a total record of work-in-progress at any point in time. It is created by using the totals of the direct materials issued to production, the total direct labour used on jobs and the total production overhead incurred during the month. Exhibit 19.4 shows the total work-in-progress record.

Exhibit 19.3**Job cost records for jobs 601, 602 and 603**

<i>Job cost record: Job 601</i>		
3 June	Direct materials	80,000 †
30 June	Direct labour	<u>8,000</u> ♥
	<i>Prime cost</i>	88,000
30 June	Production overhead:	<u>13,500</u> ξ
	<i>Total production cost</i>	101,500
	To finished goods	(101,500)
	<i>Work-in-progress</i>	nil
<i>Job cost record: Job 602</i>		
3 June	Direct materials	30,000 †
30 June	Direct labour	<u>4,800</u> ♥
	<i>Prime cost</i>	34,800
30 June	Production overhead:	<u>8,100</u> ξ
	<i>Total production cost</i>	42,900
	Finished goods	(42,900)
	<i>Work-in-progress</i>	nil
<i>Job cost record: Job 603</i>		
3 June	Direct materials	10,000 †
30 June	Direct labour	<u>3,200</u> ♥
	<i>Prime cost</i>	13,200
30 June	Production overhead:	<u>5,400</u> ξ
	<i>Total production cost</i>	18,600
	Finished goods	(15,600)
1 July	<i>Work-in-progress</i>	3,000

Exhibit 19.4**Record of total work-in-progress for month of June**

<i>Total work-in-progress</i>		
3 June	Direct materials	120,000 †
30 June	Direct labour	<u>16,000</u> ♥
30 June	Production overhead	<u>27,000</u> ξ
		163,000
30 June	Finished goods	(160,000)
1 July	<i>Work-in-progress</i>	3,000

19.3 Job costing: applying the accounting equation to transactions

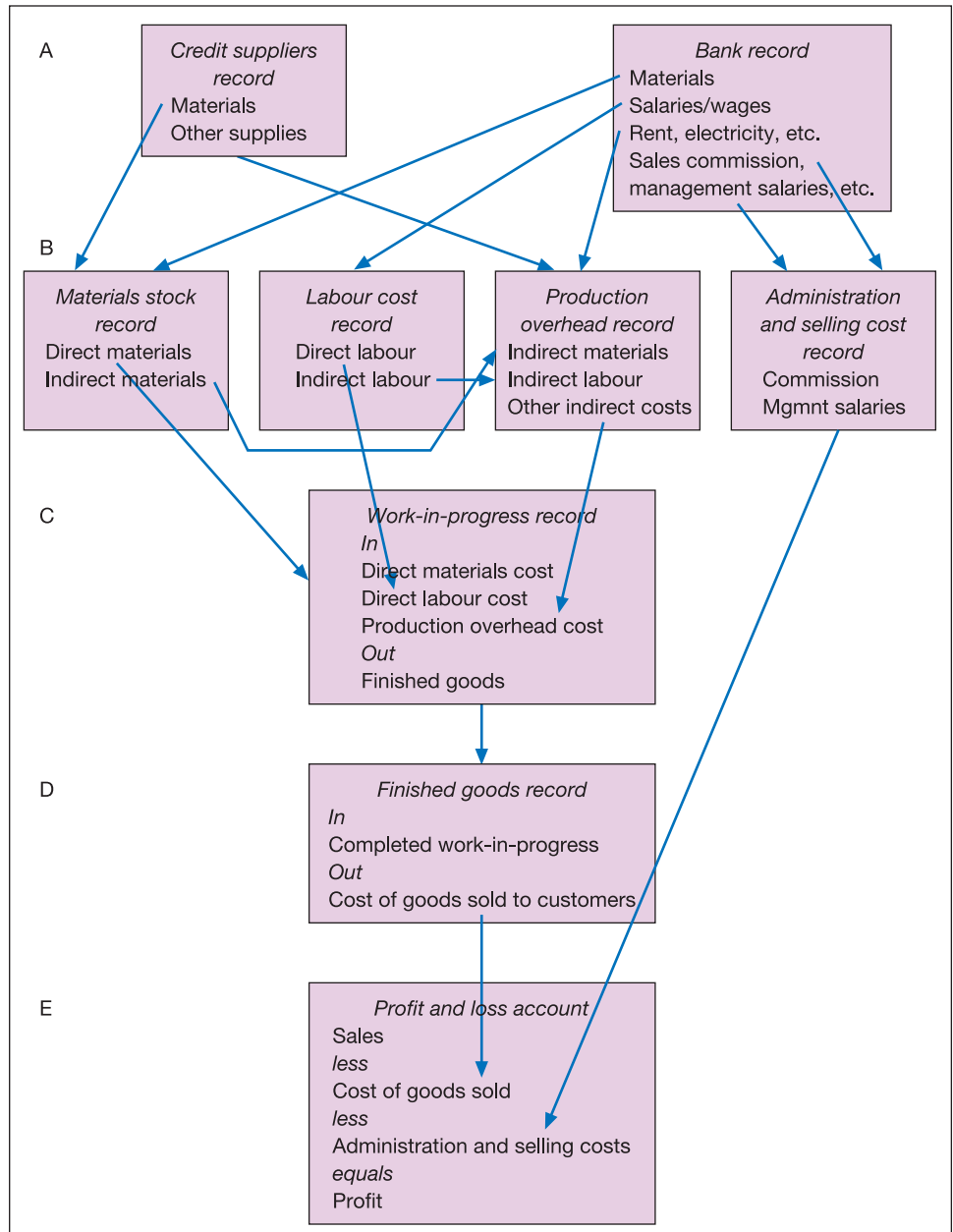
The job cost record cards used only a part of the information contained in Exhibit 19.2. All the transactions must be recorded for purposes of preparing financial statements, using the accounting equation as shown in Chapter 3. This section analyses the transactions of Exhibit 19.2 using the accounting equation and concludes with a spreadsheet record of the transactions for the month. The symbols contained in Exhibit 19.2 are used throughout to help follow the cost trail.

In management accounting there is strong emphasis on the flow of costs. This flow starts when materials, labour and other resources are either acquired on credit terms

or paid for immediately in cash (line A in Exhibit 19.5). The management accounting records trace these credit transactions and cash payments through to separate records for materials, labour, production overhead and the administration and selling costs (line B). The separate records are then considered in more detail.

The materials record includes both direct and indirect materials. When the direct materials are issued for use in production, a stores requisition note is produced and this is the basis for transferring that amount of direct materials cost from the materials record to the work-in-progress record (line C). When the indirect materials are issued for use in production a further stores requisition note is produced. This is the basis for transferring that amount of indirect materials cost from the materials record to the production overhead record.

Exhibit 19.5
Flow of costs in a management accounting information system



The labour cost (line B) record will include both direct and indirect labour. Direct labour hours are recorded on a time sheet and calculation of the cost of these hours is the basis for transferring that amount of direct labour cost from the labour cost record to the work-in-progress record. Calculation of indirect labour cost is the basis for transferring that amount of indirect labour cost from the labour cost record to the production overhead record.

Some items of indirect cost, not involving either materials or labour, will be transferred from the bank payment record (such as payment of rent, electricity or gas). At the end of the accounting period, probably each month, all the production overhead of the period is transferred to the work-in-progress record.

Finally on line B there is the record of administration and selling costs. These are not part of the cost of work-in-progress because they are not costs of production. At the end of the accounting period the total of these costs is transferred to the work-in-progress record.

When the work-in-progress (line C) is completed there is a transfer of cost to the record for finished goods stock (line D). When the finished goods are sold there is a transfer of the cost of those items to the profit and loss account as cost of goods sold.

The profit and loss account (line E) brings together the sales, cost of goods sold and administration and selling costs in a calculation of profit.

♠♣⊗ 19.3.1 Acquisition of inventory: direct and indirect materials

In purchasing the rolls of paper, the business acquires an asset. In taking credit from the supplier it incurs a liability. (♠)

$$\text{Asset } \uparrow - \text{Liability } \uparrow = \text{Ownership interest}$$

In purchasing the inks, glue and dyes, the business acquires a further asset. In paying cash, the asset of cash is diminished. (♣)

$$\text{Asset } \uparrow\downarrow - \text{Liability} = \text{Ownership interest}$$

Returning the damaged roll of paper reduces the asset of materials stock and reduces the liability to the trade creditor. (⊗)

$$\text{Asset } \downarrow - \text{Liability } \downarrow = \text{Ownership interest}$$

† 19.3.2 Converting raw materials into work-in-progress: direct materials

When the rolls of paper are issued from the stores to the printing department, they become a part of the work-in-progress of that department. Since this work-in-progress is expected to bring a benefit to the enterprise in the form of cash flows from sales when it is eventually finished and sold, it meets the definition of an asset. There is an increase in the asset of work-in-progress and a decrease in the stock of materials. (†)

$$\text{Asset } \uparrow\downarrow - \text{Liability} = \text{Ownership interest}$$

∅ 19.3.3 Issuing indirect materials to production

Inks, glue and dyes are indirect materials. The indirect cost is part of the production overhead cost, to be accumulated with other indirect costs and later added to work-in-

progress as a global amount for production overhead. In this case, only half of the indirect materials have been issued (£12,500), the rest remaining in stock. There is a decrease in the asset of materials stock and an increase in the asset of work-in-progress. (ø)

$$\text{Asset } \uparrow\downarrow - \text{Liability} = \text{Ownership interest}$$

ψλωφ 19.3.4 Labour costs

There are two amounts of direct labour costs paid during the period in respect of the printing employees (ψω); and two amounts of indirect wages in respect of maintenance (λω).

In practice, it will only be after analysis of the labour records for the period that an accurate subdivision into direct and indirect costs may be made. Although it is assumed here that all wages of printing employees are direct costs, it could be that enforced idle time through equipment failure would create an indirect cost. Taking the simplified illustration, the direct wages paid become a part of the prime cost of work-in-progress while the indirect wages paid become part of the production overhead cost within work-in-progress.

For the purposes of this illustration it is assumed that the manager of the business knows that all printing employees' wages are direct costs (♥) and so may be recorded immediately as direct costs of work-in-progress. The asset of cash decreases and the asset of work-in-progress increases.

$$\text{Asset } \uparrow\downarrow - \text{Liability} = \text{Ownership interest}$$

It is further assumed that the manager of the business knows that all indirect labour costs will become production overheads (ξ) and hence added to the value of work-in-progress.

$$\text{Asset } \uparrow\downarrow - \text{Liability} = \text{Ownership interest}$$

‡ ξ 19.3.5 Production overhead costs

Rent, rates and electricity costs (‡) paid from cash in respect of printing are production overhead costs (ξ). For management accounting purposes they are regarded as part of the cost of the asset of work-in-progress (‡ ξ).

$$\text{Asset } \uparrow\downarrow - \text{Liability} = \text{Ownership interest}$$

For financial reporting purposes the overhead costs paid are regarded immediately as reducing the ownership claim because they are part of the expense of production overhead. Exhibit 19.5 shows that in both financial reporting and management accounting the production overhead costs eventually emerge as a component of the expense of cost of goods sold.

19.3.6 Transferring work-in-progress to finished goods

When the asset of work-in-progress is completed, it changes into another asset, the stock of finished goods. In the accounting records the asset is removed from work-in-progress and enjoys a new description as the asset of finished goods. (#)

$$\text{Asset } \uparrow\downarrow - \text{Liability} = \text{Ownership interest}$$

Exhibit 19.6

Spreadsheet to show analysis of transactions for the month of June, using the accounting equation

Date	Transaction	Symbol	Assets				Liability	Ownership interest
			Cash	Stock of materials	Work-in-progress	Finished goods	Creditor	Cost of goods sold
			£	£	£	£	£	
June 1	Bought 60 rolls of paper on credit from supplier, invoiced price being £180,000.	◇			180,000			180,000
June 1	Bought inks, glue and dyes, cost £25,000 paid in cash.	♣		(25,000)	25,000			
June 2	Returned to supplier one roll, damaged in transit, £2,500.	⊗			(2,500)			(2,500)
June 3	Rolls of paper issued to printing department, cost £120,000.	†			(120,000)	120,000		
June 4	Issued half of inks, glues and dyes to printing department, £12,500.	∅			(12,500)	12,500		
June 14	Paid printing employees' wages £8,000.	ψ	(8,000)		8,000			
June 14	Paid maintenance wages £250.	λ	(250)		250			
June 16	Paid rent, rates and electricity in respect of printing, £14,000, in cash.	‡	(14,000)		14,000			
June 28	Paid printing employees' wages £8,000.	ϖ	(8,000)		8,000			
June 28	Paid maintenance wages £250.	φ	(250)		250			
June 30	Transferred printed stationery to finished goods stock, valued at cost of £160,000.	#			(160,000)	160,000		
June 30	Sold stationery to customer on credit, cost of goods sold being £152,000.	≈				(152,000)		(152,000)
	<i>Totals</i>		(55,500)	70,000	3,000	8,000	177,500	(152,000)

≈ 19.3.7 Sale of goods

When a sale is made to a customer, that part of the asset of finished goods stock is transformed into the expense of cost of goods sold. Any finished goods remaining unsold continue to be reported as an asset. (≈)

$$\text{Asset} \downarrow - \text{Liability} = \text{Ownership interest} \downarrow (\text{expense})$$

19.3.8 Spreadsheet analysis

The transactions are brought together in spreadsheet form in Exhibit 19.6 using a form similar to that found in Chapters 5 and 6 of Financial Accounting. The entries on each line correspond to the detailed analyses provided in this section. The totals at the foot of each column represent the amounts of the various assets, liabilities and ownership interest resulting from the transactions of the month. Cash has decreased overall by £55,500. The asset of stock of materials (paper, inks, glues and dyes) has increased by £70,000 and the asset of work-in-progress has increased by £3,000. The asset of finished goods has increased by £8,000. The liability to the creditor stands at £177,500. Overall the transactions of the month, as recorded here, have decreased the ownership interest by £152,000, the amount which is recorded as the cost of goods sold.

	£
Overall increase in assets	25,500
Overall increase in liabilities	177,500
Difference	(152,000)
Decrease in ownership interest	(152,000)

19.4 Absorption costing and marginal costing

The problems of **apportioning** fixed production overheads were explained in detail in Chapter 18. Because of the **apportionment** problems, there are situations in management accounting where it is preferable to avoid the problem by allocating only **variable costs** to products. **Fixed costs** are regarded as costs of the period rather than costs of the product. The question to be addressed in this section is how the choice between **absorption costing** (which means absorbing all costs into products) and **marginal costing** (which means taking in only the variable costs of production) may be dependent on the purpose to which management accounting is being applied.

Definitions

In **absorption costing** (full costing), all production costs are absorbed into products and the unsold stock is measured at total cost of production.

In **marginal costing** (variable costing), only variable costs of production are allocated to products and the unsold stock is measured at variable cost of production. Fixed production costs are treated as a cost of the period in which they are incurred.

19.4.1 A note on terminology

Some authors refer to 'marginal costing' while others refer to 'variable costing'. The strict interpretation of 'marginal cost' in economics is the additional cost of one more unit of output. From the economists' viewpoint that extra cost could include a stepped increase in fixed cost if capacity has to be expanded to produce one more item or a new employee is required. For this section we assume that the range of **activity** is narrow so that a marginal change in cost involves variable costs only.

Exhibit 19.8**Profit per period under absorption costing**

	Period 1 £	Period 2 £	Period 3 £	Period 4 £	Period 5 £	Total £
Opening stock	nil	330	990	990	550	nil
Cost of production:						
Variable cost	2,070	2,430	2,340	2,160	2,250	11,250
Fixed cost	500	500	500	500	500	2,500
Closing stock	(330)	(990)	(990)	(550)	nil	nil
Cost of goods sold	2,240	2,270	2,840	3,100	3,300	13,750
Sales	4,000	4,200	5,200	5,600	6,000	25,000
Gross profit	1,760	1,930	2,360	2,500	2,700	11,250

19.4.4 Marginal costing

Using marginal costing, the stock of unsold output at the end of each period would be valued at the variable cost of £9 per unit. The fixed cost would be regarded as a cost of the period, without allocation to products. Exhibit 19.9 illustrates the marginal costing approach.

Exhibit 19.9**Profit per period under marginal costing**

	Period 1 £	Period 2 £	Period 3 £	Period 4 £	Period 5 £	Total £
Opening stock	nil	270	810	810	450	nil
Cost of production	2,070	2,430	2,340	2,160	2,250	11,250
Closing stock	(270)	(810)	(810)	(450)	nil	nil
Cost of goods sold	1,800	1,890	2,340	2,520	2,700	11,250
Fixed costs of period	500	500	500	500	500	2,500
Total costs	2,300	2,390	2,840	3,020	3,200	13,750
Sales	4,000	4,200	5,200	5,600	6,000	25,000
Gross profit	1,700	1,810	2,360	2,580	2,800	11,250

Activity 19.4

Look back at the data of Exhibit 19.7. Before turning to the answer in Exhibit 19.9 attempt to write out the profit calculation under marginal costing. Add a note of narrative explanation to each line as a means of helping understanding by yourself and others.

19.4.5 Comparison of profit under each approach

Exhibit 19.10 compares the profit calculated under each approach. The first point to note from Exhibit 19.10 is that over the total period of time, where total production equals total sales, there is no difference in total profit. The difference between absorption costing and marginal costing is purely a result of timing of the matching of fixed overhead with products.

Exhibit 19.10**Comparison of profit, using absorption costing and marginal costing**

	Period 1 £	Period 2 £	Period 3 £	Period 4 £	Period 5 £	Total £
Absorption costing	1,760	1,930	2,360	2,500	2,700	11,250
Variable costing	1,700	1,810	2,360	2,580	2,800	11,250
Difference	+60	+120	0	-80	-100	0

Activity 19.5

Before reading the rest of this section, write a brief commentary on the most significant features of Exhibit 19.10.

The second point to note is that the differences between the two profit calculations are based entirely on the *change* in volume of stock during the period, multiplied by the fixed overhead cost rate of £2 per unit. During period 1, stock increases by 30 units over the period and, as a consequence, profit under absorption costing is £60 higher than under marginal costing. During period 2, stock increases by 60 units over the period and, as a consequence, profit under absorption costing is £120 higher. During period 3 stock levels remain constant and therefore both approaches give the same answer. During period 4, stock levels decrease by 40 units so that profit under absorption costing is £80 lower. During period 5, stock levels decrease by 50 units and therefore profit under absorption costing is £100 lower.

The third point to note is that the overall effect of the positive and negative differences over the business life is zero, provided the allocation process is applied consistently. Different allocation processes will cause costs to fall in different time periods, but they cannot create or destroy costs in the total.

Finally, the effect of the change in stock levels may be understood using Exhibit 19.10. Making a general statement from this specific example, it appears safe to say that when stock levels are increasing, profit under absorption costing is higher than it is under marginal costing. That is because a portion of the fixed production cost incurred in the period is carried forward to the next period as part of the closing stock valuation.

Generalising further from the analysis, it may be said that when stock levels are decreasing, profit under absorption costing is lower than it is under marginal costing. That is because fixed costs incurred in earlier periods are brought to the current period as part of the opening stock, to be sold during the period.

When stock levels are constant, both approaches give the same answer.

19.4.6 Why is it necessary to understand the difference?

In Chapter 16 it was shown that management accounting has three major roles in **directing attention**, **keeping the score** and **solving problems**. The particular role which applies in any situation will depend upon the management function which is being served. That management function could relate to the formation of a judgement or to making a decision about a course of action. In Chapter 17 it was shown that the classification of costs is very much dependent on which of the three management accounting roles is the dominant one in any specific situation and on the type of management function.

Where the management function relates to **planning** and **control**, the management accountant is carrying out a **score-keeping** function and it is usually necessary to account for fixed overhead costs of production as a part of the **product cost**. That means absorption costing is the appropriate approach. In this situation there is a strong overlap with financial accounting and with external reporting to stakeholders in

a business. If the stakeholders are company shareholders, then the external reporting will be regulated by company law and accounting standards that require fixed costs of production to be treated as product costs and provide guidance on the allocation process. Where the stakeholders are the electorate, in the case of a public sector body, or partners in a business partnership, the rules may be more flexible, but in many cases they conventionally follow the practice recommended for companies.

19.4.7 Arguments in favour of absorption costing

The arguments put forward in favour of absorption costing are:

- 1 Since all production costs are incurred with a view to creating a product for sale, all costs should attach to products until they are sold.
- 2 In the longer term, fixed overhead costs must be recovered through sales if the business is to survive. Setting the stock value by reference to full costs encourages a pricing policy which covers full cost.
- 3 If fixed production costs are treated as period costs (as happens in marginal costing) and there is a low level of sales activity in a period, then a relatively low profit or a loss will be reported. If there is a high level of sales activity, there will be a relatively high profit. Absorption costing creates a smoothing of these fluctuations by carrying the fixed costs forward until the goods are sold.

19.4.8 Arguments in favour of marginal costing

Where the management accounting role is primarily that of directing attention and the management function is primarily one of decision making, it may be dangerous to regard fixed production costs as product costs. The attractions of using marginal costing in such a situation are as follows:

- 1 In the short term, relevant costs are required for decision making and fixed overheads are largely non-relevant because they cannot be avoided. They are best seen as a committed cost of the period.
- 2 Profit calculation is not dependent on changes in stock levels. The illustration in Exhibits 19.8 to 19.10 shows the practical effect of disentangling fixed costs from stock values.
- 3 There is no risk of carrying forward in stock an element of fixed production overhead cost which may not be recovered through sales.
- 4 Allocating all production costs to products and then applying full-cost pricing may result in loss of sales which would have made a contribution to fixed production costs and profit.
- 5 Where sales volumes are declining but output is sustained, marginal costing provides the profit warning more rapidly than does absorption costing in a situation where attention needs to be drawn urgently to the profit implications.

Activity 19.6

Now that you understand the difference between marginal costing and absorption costing, write a short evaluation of the two approaches.

19.5 Moving forward

Fiona McTaggart has participated in a number of consultancy projects where the traditional job costing approach has been modified to reflect changing circumstances. Here she talks about three of them.



FIONA: I recall learning job costing at college and thinking that there must be more to life than this. Since then I have found much more excitement in management accounting but I still have to return to some of the basic principles – seeking where possible to identify costs with products and making sensible allocations where such identification is not possible.

One of my clients is a production engineering business. I was working with the plant controller, a qualified engineer with a good head for figures. The controller was looking for a new management system which escaped from the traditional role of a financial system. What was wanted was management in terms of the activities of the unit but with one eye on the consequences in dollars. The controller wanted the production and engineering personnel to feel that they were in ownership of the management system. So I found myself working in a team which drew on several specialisms, including engineering and human resource management. We had to ask the financial accounting department, very politely, to keep away while we developed our ideas because they kept quoting financial accounting guidelines which were cramping our style. At the end of the day we did work out the cost of a job undertaken by the business, but it was a cost which the engineers understood and could relate to.

Another client is a telecommunications division of a major conglomerate. Their problem was again related to engineers but with a different slant. The engineers were not sufficiently aware of how their choice of operating methods could significantly alter total costs. Traditional overhead costs were too blunt an instrument so we identified the actions which drove costs and effectively turned indirect costs into direct costs. Every time an engineer initiated a process, there was a cost reported. They soon began to concentrate on cost-effective solutions. The end result was to identify the cost of a job but the engineers knew how their choices had affected that cost.

My third client is a major hospital. In the area of health care, relations between medical specialists and the accountants are always somewhat strained and have to be dealt with carefully. The project in this case was to measure the cost of a treatment which involved balancing length of stay, costs and patient welfare. There is a widely held belief that the accountants merely calculate the cost of one overnight stay and then suggest reducing overnight stays for all patients. In reality we worked closely with the clinical specialists so that an element of mutual respect was built up. We helped them to understand our approach to determining the cost of a 'job' (not really the best term for treating a patient – the experts prefer a 'treatment protocol'). The treatment protocol is the standard method for treating a specific condition. That method is developed by the medical experts. The actual treatment does not necessarily follow the standard – if the patient needs extra care then it is given. However, knowing the cost of the standard protocol allows comparative evaluation of the actual treatment. Management accountants develop the cost systems which are used as information by the case managers. The relationship is a partnership – the accountants don't dictate the medical treatment but it remains necessary for the medical experts to know what each treatment of each patient has cost.

The common feature of all these cases which I have described is that the management accounting system produced a report which included a cost for each 'job'. However, it was by no means a mechanical process carried out in isolation. It involved the management accountant becoming part of the operational team. The days of a separate management accounting department in some remote part of an administrative office are gone. The management accountant has to be alongside those who are delivering the product.

19.6 Summary

This chapter has drawn on the information and definitions contained in Chapters 4 and 5 to show the method of preparing job cost statements. Job costing will be found in service businesses as well as in manufacturing. The essential condition is that there

is an identifiable job (item of output) for which costs may be collected with a view to determining the cost of the job. The chapter has also explained the differences between absorption costing and marginal costing.

Key themes in this chapter are:

- A **job costing system** is a system of cost accumulation where there is an identifiable activity for which costs may be collected. The activity is usually specified in terms of a job of work or a group of tasks contributing to a stage in the production or service process.
- A **job cost record** shows the costs of materials, labour and overhead incurred on a particular job.
- The **prime cost** of production is equal to the total of direct materials, direct labour and other direct costs.
- The **production overhead cost** comprises indirect materials, indirect labour and other indirect costs of production.
- The **total product cost** comprises prime cost plus production overhead cost.
- In **absorption costing** (*full costing*), all production costs are absorbed into products. The unsold inventory is measured at total cost of production. Fixed production overhead costs are treated as a product cost.
- In **marginal costing** (*variable costing*), only variable costs of production are allocated to products. The unsold inventory is measured at variable cost of production. Fixed production overhead costs are treated as a period cost of the period in which they are incurred.
- **Under-absorbed or over-absorbed fixed overhead cost** may arise in absorption costing. It is reported in the profit and loss statement as an adjustment to cost of sales.
- Profit under absorption costing differs from profit under marginal costing when inventory levels are *changing*. If total production equals total sales there is no difference in total profit.
- When inventory levels are *falling*, profit under **absorption costing** is *lower* than profit under **marginal costing**. The difference is equal to the *decrease in inventory levels* multiplied by the *fixed overhead cost rate*.
- When inventory levels are *rising*, profit under **absorption costing** is *higher* than profit under **marginal costing**. The difference is equal to the *increase in inventory levels* multiplied by the *fixed overhead cost rate*.
- **Absorption costing** is usually required for **inventory valuation** in financial accounting standards or other regulations. Those using such financial statements need to be aware that reported profit can be affected by the change in the volume of inventory over the period.
- **Marginal costing** may be more useful for **decision-making** because it treats fixed production overhead costs as a cost of the period. Reported profit is not affected by the changes in inventory held.

QUESTIONS

The Questions section of each chapter has three types of question. ‘Test your understanding’ questions to help you review your reading are in the ‘A’ series of questions. You will find the answers to these by reading and thinking about the material in the book. ‘Application’ questions to test your ability to apply technical skills are in the ‘B’ series of questions. Questions requiring you to show skills in problem solving and evaluation are in the ‘C’ series of questions. A letter **[S]** indicates that there is a solution at the end of the book.

A Test your understanding

- A19.1** Define prime cost, production overhead cost and total product cost. (Section 19.1)
- A19.2** List the items you would expect to find in a job cost record. (Section 19.2)
- A19.3** What is the effect on the accounting equation of purchasing direct and indirect materials? (Section 19.3.1)
- A19.4** How does the accounting equation represent the conversion of raw materials into work-in-progress? (Section 19.3.2)
- A19.5** How does the accounting equation represent the issue of indirect materials to production? (Section 19.3.3)
- A19.6** How does the accounting equation represent the transfer of labour costs to work-in-progress? (Section 19.3.4)
- A19.7** How does the accounting equation represent the transfer of production overhead costs to work-in-progress? (Section 19.3.5)
- A19.8** How does the accounting equation represent the transfer of work-in-progress to finished goods? (Section 19.3.6)
- A19.9** How does the accounting equation represent the sale of goods? (Section 19.3.7)
- A19.10** [S] Explain how each of the following transactions is dealt with in a job-costing system:
- The production department orders 16 components from store at a cost of £3 each, to be used on job 59.
 - An employee (A. Jones) receives a weekly wage of £600. In week 29 this employee's time has been spent two-thirds on job 61 and one-third on job 62.
 - On 16 June, job 94 is finished at a total cost of £3,500. The job consisted of printing brochures for a supermarket advertising campaign.
- A19.11** Define absorption costing. (Section 19.4)
- A19.12** Define marginal costing. (Section 19.4)
- A19.13** Explain why absorption costing and marginal costing may lead to different measures of profit in a period. (Sections 19.4.3 and 19.4.4)
- A19.14** Set out the arguments in favour of absorption costing. (Section 19.4.7)
- A19.15** Set out the arguments in favour of marginal costing. (Section 19.4.8)

B Application

B19.1 [S]

The following transactions relate to a dairy, converting milk to cheese, for the month of May:

- 1 May Bought 600 drums of milk from supplier, invoiced price being £90,000.
- 1 May Bought cartons, cost £6,000 paid in cash.
- 2 May Returned to supplier one drum damaged in transit, £150.
- 3 May 500 drums of milk issued to cheesemaking department, cost £75,000.
- 4 May Issued two-thirds of cartons to cheesemaking department, £4,000.
- 14 May Paid cheesemakers' wages, £3,000.
- 14 May Paid wages for cleaning and hygiene, £600.
- 16 May Paid rent, rates and electricity in respect of dairy, £8,000, in cash.
- 28 May Paid cheesemakers' wages, £3,000.
- 28 May Paid wages for cleaning and hygiene, £600.
- 30 May Transferred all production of cheese in cartons to finished goods stock. No work-in-progress at end of month.

Required

Prepare a calculation of the cost of production transferred to finished goods at the end of May.

B19.2 [S]

Restoration Ltd buys basic furniture units and creates period layouts in clients' homes. The following transactions relate to jobs 801, 802 and 803 in the month of May. Prepare job cost records for each job.

1 May	⇧	Bought 70 furniture units on credit from supplier, invoiced price being £204,000. The furniture units acquired consisted of two different grades. 50 units were of standard size at a total cost of £140,000 and 20 units were of king size at a total cost of £64,000.
1 May	♣	Bought stain, varnish and paint at a cost of £30,000 paid in cash. The stain cost £12,000 while the varnish cost £14,000 and the paint £4,000.
2 May	⊗	Returned to supplier one furniture unit damaged in transit, £2,800. The furniture unit returned was of standard size.
3 May	†	Furniture units issued to Finishing department. 40 standard-size units were issued, together with 14 king-size units. There were three separate jobs: references 801, 802 and 803. The standard-size units were all for job 801 (Riverside Hotel); 10 king-size units were for job 802 (Mountain Lodge); and the remaining 4 king-size units were for job 803 (Hydeaway House).
4 May	∅	Issued stain, varnish and paint to Finishing department, £22,500.
14 May	ψ	Paid Finishing department employees' wages £10,000. Wages were paid to 8 printing employees, each earning the same amount.
14 May	λ	Paid security wages £350. Security wages were paid to one part-time security officer.
16 May	‡	Paid rent, rates and electricity in respect of Finishing department, £18,000 in cash. Payment for rent was £9,000, rates £5,000 and electricity £4,000.
28 May	ϖ	Paid Finishing department employees' wages £10,000. Wages were paid to the same 8 employees as on 14 May.
28 May	φ	Paid security wages £350. Security wages were paid to the same security officer as on 14 May.
30 May	♥	Employee records show that: 4 Finishing department employees worked all month on job 801; 2 Finishing department employees worked on job 802; and 2 Finishing department employees worked on job 803.
30 May	ξ	It is company policy to allocate production overheads in proportion to labour costs of each job.
30 May	#	Transferred all finished goods to finished goods stock. There remained no unfinished work-in-progress.
30 May	≈	Riverside Hotel and Mountain Lodge took delivery of their goods. Hydeaway House will take delivery on 10 June.

B19.3

Resistor Ltd manufactures electrical units. All units are identical. The following information relates to June and July Year 5.

(a) Budgeted costs and selling prices were:

	<i>June</i> £	<i>July</i> £
Variable manufacturing cost per unit	2.00	2.20
Total fixed manufacturing costs (based on budgeted output of 25,000 units per month)	40,000	44,000
Total fixed marketing cost (based on budgeted sales of 25,000 units per month)	14,000	15,400
Selling price per unit	5.00	5.50

(b) Actual production and sales recorded were:

	<i>Units</i>	<i>Units</i>
Production	24,000	24,000
Sales	21,000	26,500

(c) There was no stock of finished goods at the start of June Year 5. There was no wastage or loss of finished goods during either June or July Year 5.

(d) Actual costs incurred corresponded to those budgeted for each month.

Required

Calculate the relative effects on the monthly operating profits of applying the undernoted techniques:

- 1 absorption costing;
- 2 marginal costing.

C Problem solving and evaluation

C19.1 [S]

Frames Ltd produces wooden window frames to order for the building industry. The size of frame depends on the specification in the contract. For the purposes of providing job cost estimates the size of frame is ignored and the job cost estimate is based on the type of frame produced, being either single-glazing or double-glazing.

The standard specification is as follows:

	<i>Single-glazing</i> £	<i>Double-glazing</i> £
Direct materials per unit	90.00	130.00
Direct labour per unit		
6.5 hours at £5.00 per hour	32.50	
8.0 hours at £5.00 per hour		40.00
Variable production overhead charged at £6 per hour	39.00	48.00

Fixed overhead is estimated at £160,000 per month for single-glazing and £100,000 per month for double-glazing. Estimated production per month for single-glazing is 4,000 units and for double-glazing is 2,000 units per month.

Required

Prepare a job cost estimate for a customer who intends to order 500 single-glazing and 200 double-glazing units.

C19.2 [S]

Insulation Ltd has been established to manufacture insulation material for use in houses. At present, one machine is installed for production of insulation material. A further similar machine can be purchased if required.

The first customer is willing to place orders in three different sizes at the following selling prices:

<i>Order size</i>	<i>Selling price per package</i> £
430 packages per day	25.20
880 packages per day	25.00
1,350 packages per day	24.80

The customer will enter into an initial contract of 30 days' duration and will uplift completed packages on a daily basis from the premises of Insulation Ltd.

The following assumptions have been made in respect of Insulation Ltd:

- (a) In view of the competitive market the selling prices are not negotiable.
- (b) Direct materials will cost £23.75 per package irrespective of the order size.
- (c) The output of one machine will be 350 packages per shift.
- (d) A maximum of three shifts will be available on a machine within one day. The depreciation charge for a machine will be £100 per day, irrespective of the number of shifts worked.
- (e) Labour costs to operate a machine will be £100 for the first shift, £120 for the second shift and £160 for the third shift of the day. If labour is required for a shift, then the full shift must be paid for regardless of the number of packages produced.
- (f) The total cost of supervising the employees for each of the first two shifts in any day will be £20 per machine. The supervision cost of the third shift will be £40 per machine.
- (g) Other fixed overhead costs will be £280 per day if one machine is used. Buying and using an additional machine would result in a further £100 of fixed costs per day.
- (h) Production and sales volume will be equal regardless of order size.
- (i) The company does not expect to obtain other work during the term of the initial contract.

Required

Prepare a report for the production director of Insulation Ltd giving:

- 1 For each order size, details of the overall profitability per day and net profit per package.
- 2 An explanation of the differing amounts of profit per package.

Cases for study groups

Case 19.1

As a group, you are planning to establish a partnership supplying examination advice and tuition to school pupils in their homes. Each course of lessons will be regarded as a single 'job'. Courses may vary in length and in target ability level, depending on the requirements of the pupil to be tutored. Divide the group to take on three different roles. One role is that of a tutor who is also a member of the partnership, sharing equally the profits of the business. The second role is that of the accountancy adviser to the partnership. The third role is that of a parent making enquiries about the price charged and the justification for that price.

Each member of the group should take on one of the three roles and separately make a note of:

- (a) The expected costs of a job (in terms of types of cost).
- (b) How you would justify the costs (if supplying the service).
- (c) How you would question the costs (if receiving the service).

Then all members of the group should come together, compare answers, and finally prepare a joint report on the problems of job costing in a service business.

Case 19.2

As a group you are planning a garden renovation service to take advantage of the current popularity of television programmes dealing with garden design. Within the group, allocate the following roles:

- design skills
- labouring and building skills
- business planning skills
- marketing skills.

As a team discuss the approach you would take to estimating the cost of a job for quoting to an intending customer. Discuss also the proposal in a gardening advice magazine that those starting out in a new business should seek only to recover variable costs until the reputation is established. Report back to the rest of the class on:

- the costs to be recorded;
- the extent to which team members agree or disagree on costs to be included;
- your views on the suggestion that only variable costs should be recovered initially.