WILLIAM NEISH / ALAN BANKS

management accounting

revised 3e

Principles and applications

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The McGraw-Hill Companies

Sydney New York San Francisco Auckland
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Seoul Singapore Taipei Toronto

National Library of Australia Cataloguing-in-Publication Data
Neish, William J.
Management accounting : principles and applications /
William Neish ; Alan Banks.

3rd ed., rev.
9780070278448 (pbk.)
Includes index.

Cost accounting–Textbooks.
Managerial accounting–Textbooks.
Banks, Alan, 1946-

657.42

Published in Australia by
McGraw-Hill Australia Pty Ltd
Level 2, 82 Waterloo Road, North Ryde NSW 2113

Publisher:
Sponsoring Editor:
Development Editor:
Production Editor:
Editor: Emma Driver
Permissions Editor: Haidi Bernhardt
Art Director: Astred Hicks
Designer and Typesetter:
Cover and text design: Cristina Neri, Canary Graphic Design
Illustrrator:
Typeset in Bembo by
Printed in <country> on <stock> by <printer>

contents

text at a glance

Management Accounting: Principles and Applications 3e, is a pedagogically-rich learning resource. The features laid out on these pages are especially designed to encourage and enhance the students' acquisition of the concepts of management accounting.

Learning objectives

Each chapter opens with a set of learning objectives that outline the skills students will learn in that chapter. They are a useful checklist for revision.

Introduction

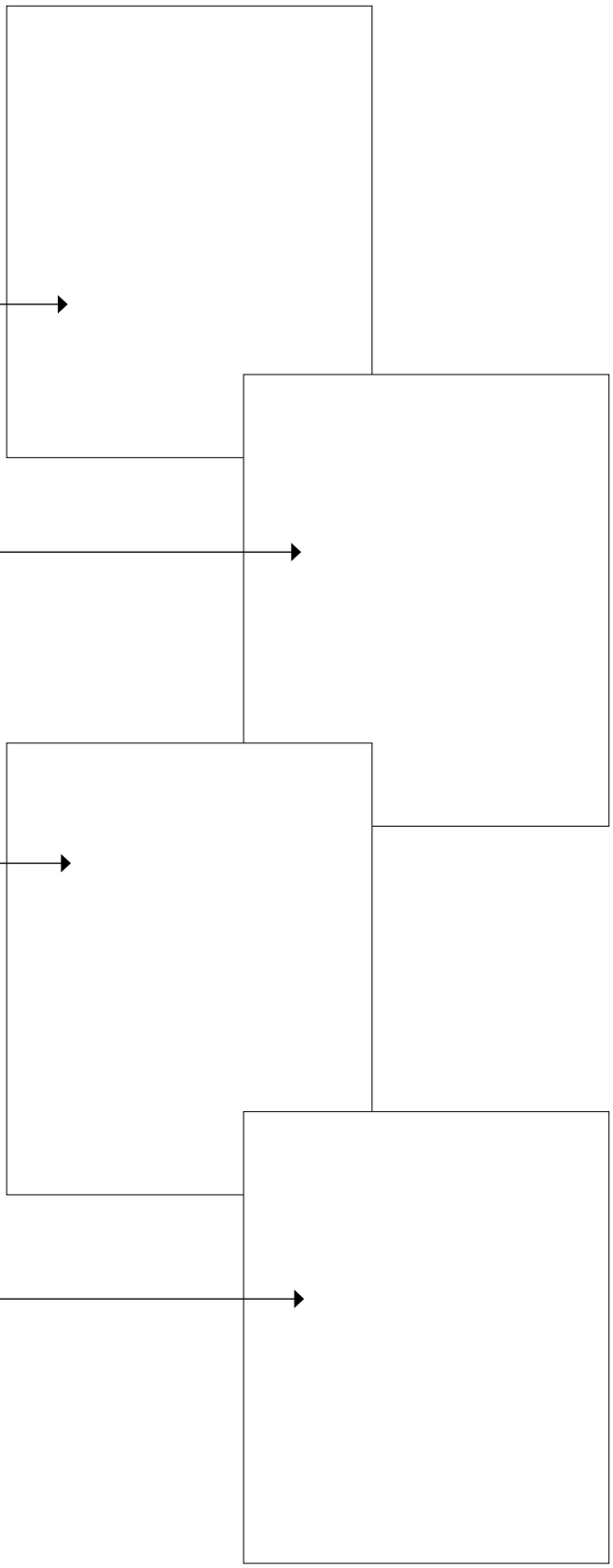
The introduction, combined with the learning objectives, help to set a clear path for learning and a foundation for the key principles in the chapter.

Self-test problems

Dispersed throughout the chapters, self-test problems allow students another opportunity to quickly test their understanding of theoretical concepts.

You should now be able to…

This cross-referencing tool helps students identify the knowledge required to answer the end of chapter questions.



Examples

Worked examples guide students through a problem step by step, providing a great reference when they are completing similar problems.

Summary

This feature uses point form to consolidate core concepts derived from the chapter and is ideal for examination revision.

Revision questions

A list of revision questions are at the close of every chapter designed to test the students' grasp of the principles explored in the chapter. The 'You should now be able to…' feature is crossreferenced with these questions.

Resources for learning

At the end of the text are the solutions to the self-test problems, a glossary and an index, designed to place the answers within easy reach of students.

e-student

Online LearningCentre

Online Learning Centre

The Online Learning Centre is an integrated online product to assist you in getting the most from your course. This text provides a powerful learning experience beyond the printed page. Each component of the Online Learning Centre is described below and can be found in the student edition of the website.

PowerPoint® Slides

The student edition also showcases a set of PowerPoint® slides which discuss key concepts from each chapter of the book.

e-instructor

Solutions to Past Examination Papers

Suggested, worked solutions to the 2009 Final Year Examination papers featured in the text are listed on the Online Learning Centre.

Instructor Resource Manual

- The Instructor Resource Manual features:
- Chapter by Chapter teaching objective summary guides
- Solutions Manual to the review questions at the end of each chapter
- Additional questions for in class use
- Solutions to the Self-Test Problems contained in the text

PowerPoint® Slides

This text comes with a full suite of colour PowerPoint® slides that distil key concepts from each chapter of the book. Present these slides in classrooms to reinforce management accounting principles to your class, and distribute them as class notes.

Course Management Systems

Course Management Systems (CMS) allow you to deliver and manage your course via the Internet. McGraw-Hill can provide online material to accompany this text formatted for your chosen CMS.

Chapter	Topics	Module unit code
1	Introduction to management accounting	FNSACCT507A*
2	Manufacturing statements	FNSACCT507A*
3	Cost flows	FNSACCT507A*
4	Materials – control and accounting	FNSACCT507A
5	Labour – control and accounting	FNSACCT507A
6	Factory overhead – control and accounting	FNSACCT507A
7	Job costing	FNSACCT507A*
8	Responsibility accounting	FNSACCT507A
9	Cost-volume-profit analysis	FNSACCT507A
10	Direct costing	FNSACCT613A
11	Activity-based costing	FNSACCT613A
12	Process costing fundamentals	FNSACCT613A
13	Advanced process costing	FNSACCT613A
14	Operation costing	FNSACCT613A
15	Joint and by-product costing	FNSACCT613A
16	Standard costing	FNSACCT613A

* Chapters 1, 2, 3 & 7 cover material that was included in the FNS04 unit FNSACCT402B 'Produce job costing information'. The range statement of the FNS10 unit FNSACCT507A includes these topics.

preface

This revision of Management Accounting 3e has been written to align the text more closely with the requirements of the FNS10 Training Package. The chapter on differential costing and linear programming (Chapter 11 in the 3e), which was judged to be superfluous to the requirements of FNS10, has been removed. In addition, the questions and exercises have been extensively revised, and the text has been given a new more open and accessible design, to significantly improve its learner-friendliness. A new competency grid matches chapters to the performance criteria in FNS10.

This text is suitable for most courses dealing with cost or management accounting. Many management accounting texts assume that students have a basic knowledge of cost accounting. This text provides students with that basic knowledge, which is then applied to practical situations using a variety of management accounting systems.

Each topic is organised into smaller parts, each of which is followed by a self-test problem. These self-test problems allow practice and assessment of the student's knowledge in a non-threatening way. Immediate feedback can be obtained and thus the student can take further remedial action.

It is the intention of this text to provide students with a comprehensive understanding of management accounting and its role as an aid to decision making in the modern business organisation..

acknowledgments

Thanks are due to Techline Communications Pty Ltd, who are the editors of NIES magazine and C'oz. Many of the real-life examples and problems are reprinted or adapted with their kind permission.

The authors and publishers would also like to thank the following reviewers for their valuable assistance and comments:

Sue Stephenson, TAFE SA, Panorama campus; Alastair Shaw, University of Ballarat TAFE; Denis Sager, Devonport TAFE; Barbara Vanner, Gippsland TAFE; Gmaiy Elbarbary, Wetherill Park TAFE; Donna Dicks, South West TAFE; David Flanders, Kangan TAFE; Doug Gourlay, Kangan TAFE; Ian Nash, RMIT; Steuart Senn, Kangan TAFE; Steven Hams, Wodonga TAFE. Tony Nesci, NMIT Preston campus; John Pileggi, NMIT Preston campus.

The staff at McGraw-Hill deserve special commendation for their efforts. Special mention should be made of Michael Buhagiar (Acquisitions Editor), Kathryn Fairfax (Production Manager), Claire Linsdell (Production Editor), and Astred Hicks (Art Director).

Finally, this text would not have been completed without the cooperation and support of our families.

Bill Neish and Alan Banks

author profiles

WILLIAM NEISH joined the Australian Society of Accountants in 1969 and holds a BA from Macquarie University. Since then he has had varied experience, working as an accountant and also full-time as a Planning Manager for 4 years. In addition, William has worked with ANTA to establish the introduction of training packages in the VET system. He has since lectured in post-graduate accounting subjects at Macquarie University and is currently working as a technical consultant in the qualifications section of the Institute of Chartered Accountants in Australia. As well as authoring Computer Accounting Using MYOB Business Software 8e, Bill has co-authored textbooks on cost accounting, management accounting, and computer accounting using QuickBooks Pro 2003.

ALAN BANKS joined the Australian Society of Accountants (now CPAAustralia) in 1969 and holds an MBA (Distinction) from Southern Cross University. Alan completed his initial accounting studies through TAFE. He has had practical accounting and management experience in the banking, printing, hotels, unit trusts, land development and home building industries. Alan was a head teacher of accounting .and management in TAFE for 25 years. He is also a member of the Australian Institute of Management.

He is also a member of the National Institute of Accountants and the Australian Institute of Management. Alan has produced continuing professional education material for the National Institute of Accountants and has written book reviews for CPA Australia. In addition, he has co-authored a text book on budgeting and written an article on developing and documenting spreadsheets. Alan has also been involved in curriculum development and examination setting and assessing.

10

direct costing

LEARNING OBJECTIVES

By the end of this chapter, you will be able to:

Introduction

The cost accounting and reporting procedures discussed in previous chapters of this book have used absorption costing. This was not defined as such, because the term 'absorption' is really only useful when used to differentiate between the different methods of costing used. In this chapter the alternative method of costing, direct costing, will be examined.

Direct costing evolved in the middle of the last century as a more useful costing method for management planning and decision making. This chapter examines the differences in profits and inventory values between the two methods, as well as the requirements of the Australian accounting standards and of the Australian Taxation Office. The arguments for and against each method will also be briefly examined.

The only difference between the two methods is in the treatment of fixed manufacturing overhead. In the absorption costing method discussed so far, both fixed and variable manufacturing overhead were debited to the work in process account and, together with direct materials and direct labour, became part of the cost of the product—that is, the product 'absorbed' all manufacturing costs, including fixed manufacturing overhead.

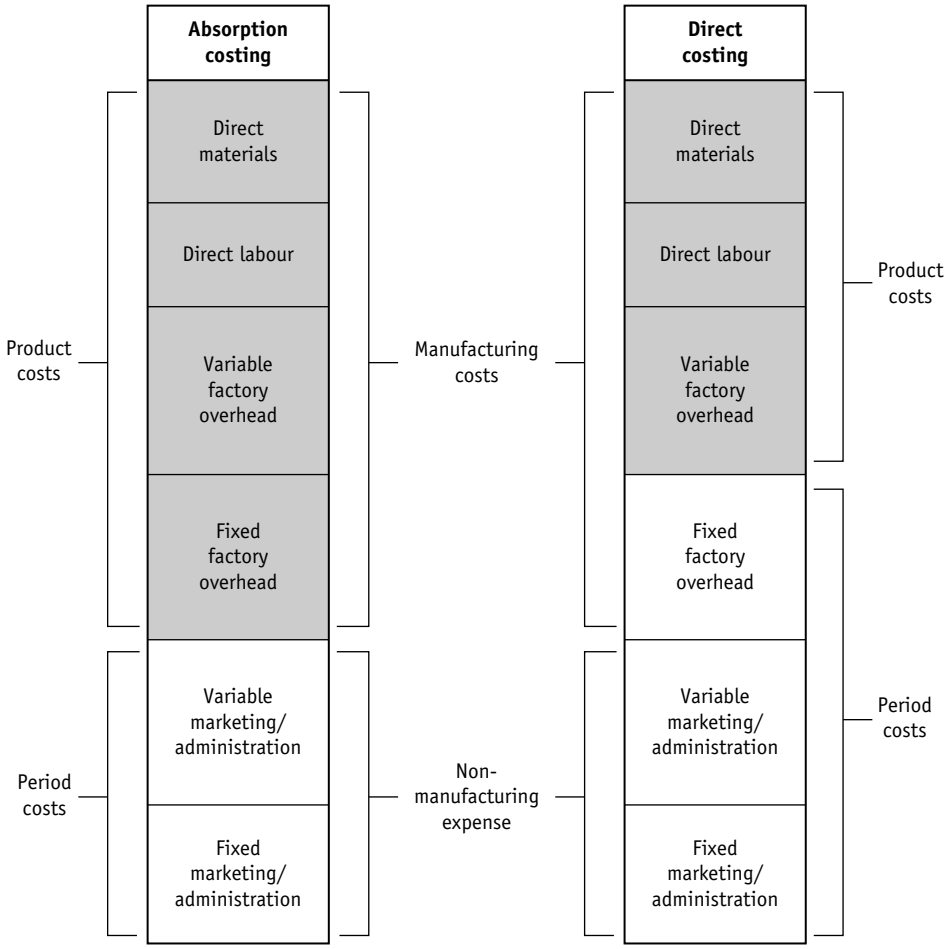
In direct costing, the fixed manufacturing overhead is not debited to the work in process account but is instead written off as an expense in the period within which it is incurred. Fixed manufacturing overhead using direct costing is, therefore, not treated as a product cost but as a period cost. Using direct costing, the cost of the manufactured product, therefore, only includes direct materials, direct labour and variable manufacturing overhead. The terms used and the differences between absorption and direct costing are illustrated in Figure 10.1.

Figure 10.1 shows that the total costs incurred are the same for both methods. Manufacturing costs and non-manufacturing expenses remain the same. The only difference is in the treatment of fixed manufacturing overhead, which is treated either as a product cost (absorption costing) or a period cost (direct costing). A product cost is one that is included as a cost when determining the cost of inventory. A period cost is one that is written off (expensed) in the period within which it is incurred.

As direct costing excludes fixed manufacturing overhead from the cost of the product, only variable manufacturing costs are added to the product cost. Remember that direct materials and direct labour are considered variable. In fact, many textbooks call this topic 'variable costing'. Retailers and wholesalers use direct costing—they never include any of their fixed overhead costs as part of the cost of acquiring goods, only the direct purchasing cost and inwards charges. On the other hand, many service industries include all overhead, including non-product fixed costs, when costing a service. This is referred to as 'full costing'.

If fixed manufacturing overhead is excluded from the cost of a product when using direct costing, inventory values at the end of an accounting period will be lower than the values reported using absorption costing in the statement of financial position. If there is a difference between opening and closing stock levels, there will also be a difference in reported profits between the two methods.

FIGURE 10.1 Direct and absorption costing



Inventory valuation

LO1

Values placed on closing inventory are costs incurred in the current period that are to be carried forward as an asset into the next accounting period. The values placed on closing inventory by a manufacturer will be higher when using absorption costing because fixed manufacturing costs are included.

EXAMPLE 10.1

The actual per-unit cost of making a single product and the total cost of making 15 000 units in a period has been determined as follows.

	Per unit $	Total $
Direct materials costs	1.50	22 500
Direct labour costs	2.00	30 000
Variable factory overhead	1.00	15 000
Fixed factory overhead	1.50	22 500

continued

The following will now be calculated below.
(a) The manufacturing cost per unit
(b) The total product cost of the 15 000 units if:
  (i) absorption costing is used
  (ii) direct costing is used
(c) The inventory value if 1000 units are in stock at the end of the period, using:
  (i) absorption costing
  (ii) direct costing

(a) Manufacturing cost per unit

The manufacturing cost per unit is $6.00—that is, the total of all the individual elements.

(b) Total product cost

(i) The total product costs of making 15 000 units using absorption costing will be as follows.

	Total $
Direct materials costs	22 500
Direct labour costs	30 000
Variable factory overhead	15 000
Fixed factory overhead	22 500
	90 000

(ii) The total product costs of making 15 000 units using direct costing will be as follows.

	Total $
Direct materials costs	22 500
Direct labour costs	30 000
Variable factory overhead	15 000
	67 500

(c) Inventory value

(i) The unit cost for valuing inventory using absorption costing is $6.00. The closing inventory will be valued at:
1000 units × $6.00 = $6000

(ii) The unit cost for valuing inventory using direct costing is $4.50 (that is, excludes fixed manufacturing overhead). The closing inventory will be valued at:
1000 units × $4.50 = $4500

ST 10.1 SELF-TEST PROBLEM 10.1

Domaro Piping Products Pty Ltd has completed six months of production and sales since starting operations on 1 October. It has only produced one product to date. Its costs have been as follows.

ST 10.1 cont.

	$
Direct materials	42 300
Direct labour	54 000
Fixed factory overhead	72 000
Variable factory overhead	36 000
	204 300

During the six months, Domaro manufactured 9000 m of piping and sold 8600 m.

(a) Calculate the manufacturing cost per metre.
(b) Calculate the total product cost, using:
  (i) absorption costing
  (ii) direct costing.
(c) Calculate the value of closing inventory, using:
  (i) absorption costing
  (ii) direct costing.

▶ You should now be able to do Questions 10.1 to 10.3

Statements of comprehensive income with actual factory overhead

LO2

In Chapter 2, statements of comprehensive income were prepared from accounts using periodic inventory and a manufacturing account in the ledger. The actual factory overhead incurred was charged, or debited, to the manufacturing account and became part of the cost of the product. This overhead included fixed factory overhead, and absorption costing was used.

A statement of comprehensive income prepared using absorption costing follows the summary pattern as follows.

Sales	XXXXX
less Cost of goods sold	XXXXX
Gross profit	XXXX
less Operating expense	XXXX
Net profit	XXXX

EXAMPLE 10.2

Farad's Alloy Wheels Pty Ltd makes a single product. The following relates to its first six months of operations.

	$
Sales—20 000 units @ $15 per unit	300 000
Production—21 000 units	
Production costs	
Direct materials used	60 900

continued

	$
Direct labour incurred	48 300
Variable factory overhead incurred	31 500
Fixed factory overhead incurred	64 050
Marketing, administrative and financial expense incurred	66 580

The company keeps all accounts in a single ledger, does not apply overhead and uses the periodic inventory system. There is never any work in process at the end of a period and there was no finished inventory at the start of the period.

A statement of comprehensive income for the six months will now be prepared, using absorption costing.

Statement of comprehensive income

	$	$
Sales		300 000
less Cost of goods sold		
Opening inventory	nil	
Costs of production		
Direct materials	60 900	
Direct labour	48 300	
Variable factory overhead	31 500	
Fixed factory overhead	64 050	
	204 750	
less Closing inventory[1]	9 750	195 000
Gross profit	105 000	
less Operating expense	66 580	
Net profit	38 420	

[1]Absorption cost of each unit produced = $204 750 ÷ 21 000 units = $9.75.
Closing inventory = 1000 units × $9.75 = $9750.

ST 10.2 SELF-TEST PROBLEM 10.2

Prepare a statement of comprehensive income for the year ended 30 June, using absorption costing, from the following information.

	$
Sales—18 500 units @ $25 per unit	
Production—19 400 units	
Production costs	
Direct materials used	97 000
Direct labour incurred	64 020

ST 6.6 cont.

	$
Variable factory overhead incurred	54 320
Fixed factory overhead incurred	106 700
Marketing expense	45 325
Administrative expense	92 500
Financial expense	9 460

There is no opening or closing work in process and there was no finished goods inventory at the start of the year.

You should now be able to do Question 10.4

A major reason for using direct costing is its usefulness to management in making short-term operational decisions. Many of these decisions rely on the amount that is earned from a sale which will contribute towards covering all fixed costs and then to producing a profit. This contribution margin is determined by deducting all variable costs from sales. Remember that total variable costs will depend on the total volume of activity. The relationship between sales, costs, profit and activity was examined in Chapter 9.

Statements of comprehensive income prepared using direct costing follow the summary format as follows.

Sales	XXXXX
less Variable costs	XXXXX
Contribution margin	XXXX
less Fixed costs	XXXX
Net profit	XXXX

The variable costs include the variable cost of goods sold and other variable operating expenses (for example, variable marketing expense). The fixed costs include fixed manufacturing costs and fixed operating expenses.

EXAMPLE 10.3

Refer to the information provided in Example 10.2. A statement of comprehensive income using direct costing will now be for Farad's Alloy Wheels Pty Ltd's operations for six months.

It will be assumed that all marketing, administrative and financial expenses are fixed and that there is no work in process. At the start of the period there was no finished goods inventory. The company keeps all accounts in a single ledger, does not apply overhead and uses the periodic inventory system.

Statement of comprehensive income

	$	$
Sales		300 000
less Variable costs		
Cost of goods sold		
Opening inventory	nil	

continued

Statement of comprehensive income		
	$	$
Costs of production		
Direct materials	60 900	
Direct labour	48 300	
Variable factory overhead	31 500	
	140 700	
less Closing inventory[1]	6 700	134 000
Contribution margin		166 000
less Fixed costs		
Manufacturing	64 050	
Marketing, administrative, financial	66 580	130 630
Net profit		35 370

[1]Variable cost of each unit produced = $140 700 ÷ 21 000 units = $6.70. Closing inventory = 1000 units × $6.70 = $6700.

ST 10.3

SELF-TEST PROBLEM 10.3

Using the data provided for Self-test problem 10.2, prepare a statement of comprehensive income using direct costing. Assume that all of the marketing, administrative and financial expenses are fixed.

▸ **You should now be able to do Questions 10.5 to 10.7**

LO3

Reconciliation of reported profits—absorption and direct costing

All of the examples, self-test problems and exercises so far regarding statements of comprehensive income have had no opening inventory, and production in units has exceeded sales in units. As a result, in each case the final net profit using absorption costing has been higher than the profit shown using direct costing.

Compare the solution provided in Example 10.2 with that provided in Example 10.3, and the answer to Self-test problem 10.2 with that to Self-test problem 10.3. The only difference between the figures for the two methods is in the closing inventory. The closing inventory credited to the profit and loss account when using absorption costing is higher than that when using direct costing by the amount of fixed factory overhead. Without any opening finished goods inventory, the difference between the final profits of both methods will be caused by the amount of fixed factory overhead included in the absorption cost final inventory but excluded when using direct costing. The fixed factory overhead included in the opening inventory will also affect the reconciliation of profits. The following example shows how to reconcile the profits shown under each method.

EXAMPLE 10.4

Gammon Exi Pty Ltd purchases unsold or rejected wine stock to produce a commercial vinegar, which it sells in bulk. It commenced operations on 1 July, and details for its first two months are as follows.

continued

	July	August	Total
Sales in litres	64000	64000	128000
Production in litres	70000	62500	132500
No work in process in either month			
Sale price per litre	$1.10	$1.10	
	$	$	$
Production costs (actual)			
Direct materials	14000	12500	26500
Direct labour	5600	5000	10600
Variable factory overhead	7000	6250	13250
Fixed factory overhead	17500	17500	35000
Marketing and administration expense (fixed)	17280	17280	34560

The following will now be shown below.

(a) Columnar statements of comprehensive income by month and in total will be prepared using absorption costing. It will be assumed that actual factory overhead is debited to cost of production, and that that the FIFO method is used—that is, that closing inventory is valued at the current month's costs.

(b) An explanation to management will be prepared as to why the profit is different in each month, when sales are the same.

(c) Columnar statements of comprehensive income by month and in total will be prepared, using direct costing. It will be assumed that actual variable factory overhead is debited to cost of production.

(d) A statement reconciling the profits shown each month and in total will be prepared using absorption costing, with the profits shown using direct costing.

(a) Statements of comprehensive income using absorption costing

	July	August	Total
Sales (@ $1.10 per litre)	70400	70400	140800
less Cost of goods sold			
Inventory at start of month	nil	3780	nil
Cost of production	44100	41250	85350
	44100	45030	85350
less Inventory at end of month	3780	2970	2970
	40320	42060	82380
Gross profit	30080	28340	58420
less Marketing and administration	17280	17280	34560
Net profit	12800	11060	23860

Note: Inventory cost per litre at the end of each month is calculated by dividing the cost of production in the month by the litres produced. The variable and fixed production costs per litre in each month are as follows.

continued

	July	August
Variable production costs	$26 600	$23 750
Production in litres	70 000	62 500
Variable cost per litre	$0.38	$0.38

	July	August
Fixed production costs	$17 500	$17 500
Production in litres	70 000	62 500
Fixed cost per litre	$0.25	$0.28
Total absorption cost per litre	$0.63	$0.66

As stated above, it has been assumed that the FIFO method is used. The calculations above, therefore, assume that the opening inventory in August (valued at $0.63 per litre) is sold first, leaving a closing inventory valued at the August cost of $0.66 per litre. Using actual fixed factory overhead means that the cost per litre increases in August. The number of litres produced is less in August than in July, while fixed manufacturing overhead remains the same at $17 500.
In the 'Total' column, the opening inventory is the July opening inventory and the closing inventory is the August closing inventory. It would not make sense to add inventory values over periods of time.

(b) Why monthly profits are different

The difference in profits between July and August is caused by the amount of fixed factory overhead that ends up in the cost of goods sold. In July, the amount of fixed factory overhead credited in closing inventory is 6000 L × $0.25 = $1500. In effect, this cost is removed from the cost of goods sold in July and transferred as a debit (opening inventory in August). The amount of fixed factory overhead credited in the closing inventory in August is 4500 L × $0.28 = $1260. The amount of fixed factory overhead expensed as cost of goods sold in each month is, therefore, as follows.

	July $	August $
Debited in opening inventory	nil	1 500
Debited in cost of production	17 500	17 500
	17 500	19 000
less Credited in closing inventory	1 500	1 260
Fixed cost in cost of goods sold	16 000	17 740

The difference in fixed factory overhead expensed = $1740.
The difference in monthly profits = $1740.

(c) Statements of comprehensive income using direct costing

	July	August	Total
Sales (@ $1.10 per litre)	70 400	70 400	140 800
less Variable costs			
Cost of goods sold			
Inventory at start of month	nil	2 280	nil

continued

	July	August	Total
Cost of production	26 600	23 750	50 350
	26 600	26 030	50 350
less Inventory at end of month	2 280	1 710	1 710
	24 320	24 320	48 640
Contribution margin	46 080	46 080	92 160
less Fixed costs			
Manufacturing	17 500	17 500	35 000
Marketing and administration	17 280	17 280	34 560
	34 780	34 780	69 560
Net profit	11 300	11 300	22 600

(d) Reconciliation of profits

The difference in profits between absorption costing and direct costing is caused by the amount of fixed factory overhead in the opening and closing inventories. These costs are included when using absorption costing but excluded when using direct costing. A statement reconciling the profits shows the following.

	July	August	Total
Net profit using absorption costing	12 800	11 060	23 860
add Fixed costs in opening inventory using absorption costing	nil	1 500	nil
	12 800	12 560	23 860
less Fixed costs in closing inventory using absorption costing	1 500	1 260	1 260
Net profit using direct costing	11 300	11 300	22 600

SELF-TEST PROBLEM 10.4

ST 10.4

Minette Natural Water Pty Ltd produces mineral water at its production facility at Featherdale Springs. Budgets for the two months of August and September were presented to a management meeting by the accountant. The sales in these two months are expected to remain the same but production will be increased to build up inventory. The budgets show the following.

	August	September
Sales in litres	98 000	98 000
Production in litres	100 000	110 000
	$	$
Production costs		
Direct materials	5 000	5 500
Direct labour	25 000	27 500
Variable manufacturing overhead	5 000	5 500
Fixed manufacturing overhead	44 000	44 000
Selling and administration expense (fixed)	30 000	30 000
Sale price per litre	$1.20	$1.20

ST 10.4 cont.

Finished goods inventory at 1 August was 20 000 L valued at $15 800. This value included $7000 variable production cost and $8800 fixed production cost. No work in process is kept, and the company assumes the FIFO method in valuing closing finished goods inventory.

(a) For each element of production costs and in total, calculate the cost per litre each month, using absorption costing.
(b) Prepare columnar statements of comprehensive income by month and in total using absorption costing. Actual factory overhead is debited to cost of production.
(c) Explain to management why the profit in each month is different when sales are the same.
(d) Prepare columnar statements of comprehensive income by month and in total using direct costing. Actual variable factory overhead is debited to cost of production.
(e) Prepare a statement reconciling the profits shown each month and in total using absorption costing, with the profits shown using direct costing.

▸ **You should now be able to do Questions 10.8 to 10.10**

Reporting variable marketing and administrative expense—direct costing

The statement of comprehensive income using direct costing is divided into two main areas—variable costs and fixed expense. Variable non-manufacturing expense must, therefore, be separated from fixed non-manufacturing expense and shown in the statement of comprehensive income before the contribution margin line. The usual format for a statement of comprehensive income using direct costing is therefore changed to the following.

gross contribution margin the same as gross profit in a traditional income statement but cost of goods sold only includes variable (or direct) manufacturing costs

net contribution margin the result of deducting variable marketing and administrative expense from the gross contribution margin

Sales	XXXXX
less Variable costs	
Cost of goods sold	XXXXX
Gross contribution margin	XXXX
less Variable marketing and administrative expense	XXXX
Net contribution margin	XXXX
less Fixed costs	XXXX
Net profit	XXXX

It should be noted that non-manufacturing expense, whether fixed or variable, never becomes part of the product cost in either absorption or direct costing (see Figure 10.1). In direct costing, the total amount of variable non-manufacturing expense is shown as a variable cost after the variable cost of goods sold has been determined.

EXAMPLE 10.5

Partha Spice Company Pty Ltd produces various blends of curry powder and keeps simple manufacturing accounts using a periodic inventory system. Internal management reports are prepared using direct costing. Results for the three months to 31 March show the following.

continued

	$
Inventory at 1 January (variable cost)	11 900
Inventory at 31 March (variable cost)	14 780
Sales	148 950
Manufacturing costs	
Direct materials used	21 980
Direct labour incurred	18 785
Variable factory overhead incurred	14 950
Fixed factory overhead incurred	26 870
Non-manufacturing costs	
Variable marketing expense	19 665
Fixed marketing and administrative expense	22 770

A statement of comprehensive income for the quarter will now be prepared, using direct costing.

Statement of comprehensive income for the quarter ended 31 March

	$	$	$
Sales			148 950
less Variable costs			
Cost of goods sold			
Inventory at 1 January		11 900	
Variable cost of production			
Direct materials	21 980		
Direct labour	18 785		
Variable factory overhead	14 950	55 715	
		67 615	
less Inventory at 31 March		14 780	52 835
Gross contribution margin			96 115
less Variable marketing expense			19 665
Net contribution margin			76 450
less Fixed costs			
Manufacturing fixed factory overhead		26 870	
Marketing and administrative		22 770	49 640
Net profit			26 810

ST 10.5

SELF-TEST PROBLEM 10.5

Prepare a correctly formatted statement of comprehensive income, using direct costing, from the following data.

	$
Inventory at 1 July (variable cost)	26485
Sales	274543
Manufacturing costs	
Direct materials used	45965
Direct labour incurred	46980
Variable factory overhead incurred	22698
Fixed factory overhead incurred	72458
Non-manufacturing costs	
Variable marketing expense	16258
Fixed marketing and administrative expense	57632
Inventory at 30 June (variable cost)	25660

You should now be able to do Questions 10.11 and 10.12

Statements of comprehensive income with applied factory overhead

under- or overapplied overhead the difference between the actual factory overhead incurred and the amount of factory overhead that has been charged (applied, recovered) to the product in work in process

Where factory overhead is applied, any **under- or overapplied overhead** may be added to or subtracted from the cost of goods sold. In absorption costing, the under- or over-applied overhead may include both variable and fixed elements. In direct costing, under- or over-applied overhead will only contain variable factory overhead, as the fixed factory overhead is not applied but written off as a period cost. The difference in profits between absorption and direct costing is still the fixed factory overhead included in inventories using absorption costing.

EXAMPLE 10.6

Caddage & Hooper Pty Ltd produce a single product. The budgeted costs for producing 48000 kg of this product in a year are as follows.

	$
Direct materials	120000
Direct labour	96000
Variable factory overhead	24000
Fixed factory overhead	110400

Factory overhead is applied using the above costs and activity level.

continued

Budgeted data for the first three months of the year are as follows.

	July	August	September
Sales in kilograms	4000	3800	4100
Production in kilograms	4000	4300	3900
Selling price per kilogram	$15	$15	$15
Marketing and administrative expense (fixed)	$20000	$20000	$20000

Inventory at 1 July is 1000 kg. It will be assumed that the current cost per kilogram applies to this inventory. There is never any work in process at the end of a month.

No variances from budgeted costs are expected other than factory overhead volume variance (under- or over-applied fixed factory overhead).

The following will now be shown below.

(a) The cost per kilogram will be calculated for each cost element and in total, using:
  (i) absorption costing
  (ii) direct costing.

(b) Columnar budgeted statements of comprehensive income will be prepared for the three months using absorption costing. Calculations will be shown for any under- or over-applied fixed factory overhead.

(c) Columnar budgeted statements of comprehensive income will be prepared for the three months using direct costing.

(d) The profits shown under each method will then be reconciled.

(a) Cost per kilogram

		$
Direct materials $120000 ÷ 48000 kg	=	2.50
Direct labour $96000 ÷ 48000 kg	=	2.00
Variable overhead $24000 ÷ 48000 kg	=	0.50
Fixed overhead $110400 ÷ 48000 kg	=	2.30
(i) Total absorption cost per kilogram	=	$7.30
(ii) Direct cost per kilogram = $7.30 – $2.30	=	$5.00 (excludes fixed overhead of $2.30)

(b) Statements of comprehensive income using absorption costing

	July	August	September
Sales (@ $15 per kilogram)	60000	57000	61500
less Cost of goods sold			
Inventory at start of month (@ $7.30 per kg)	7300	7300	10950
Cost of production (@ $7.30 per kg)	29200	31390	28470
	36500	38690	39420
less Inventory at end of month (@ $7.30 per kg)	7300	10950	9490
	29200	27740	29930
add Under- or (over-)applied overhead	nil	(690)	230
	29200	27050	30160

continued

	July	August	September
Gross profit	30 800	29 950	31 340
less Marketing and administration	20 000	20 000	20 000
Net profit	10 800	9 950	11 340

Note: The amount of under- or over-applied fixed factory overhead (volume or capacity variance) is calculated each month as follows.

	July	August	September
Budgeted fixed overhead (4000 × $2.30)	9200	9200	9200
Applied in July (4000 × $2.30)	9200		
Applied in August (4300 × $2.30)		9890	
Applied in September (3900 × $2.30)			8970
Under- or (over-)applied fixed overhead	nil	(690)	230

(c) Statements of comprehensive income using direct costing

	July	August	September
Sales (@ $15 per kilogram)	60 000	57 000	61 500
less Variable costs			
Cost of goods sold			
Inventory at start of month (@ $5.00 per kg)	5000	5000	7 500
Cost of production (@ $5.00 per kg)	20 000	21 500	19 500
	25 000	26 500	27 000
less Inventory at end of month (@ $5.00 per kg)	5000	7 500	6 500
	20 000	19 000	20 500
Contribution margin	40 000	38 000	41 000
less Fixed costs			
Manufacturing	9200	9200	9200
Marketing and administration	20 000	20 000	20 000
	29 200	29 200	29 200
Net profit	10 800	8 800	11 800

(d) Reconciliation of profits

	July	August	September
Net profit using absorption costing	10 800	9 950	11 340
add Fixed costs in opening inventory using absorption costing (@ $2.30 per kg)	2 300	2 300	3 450
	13 100	12 250	14 790
less Fixed costs in closing inventory using absorption costing (@ $2.30 per kg)	2 300	3 450	2 990
Net profit using direct costing	10 800	8 800	11 800

continued

Note: An alternative and quicker reconciliation where there is a single product is to multiply the increase or decrease in the inventory level by the fixed cost per unit. For example, in August the difference in profits is due to an increase in inventory of 500 kg at a fixed factory overhead cost of $2.30 per kilogram—absorption costing shows a higher profit by 500 × $2.30 = $1150. In September, the inventory goes down by 200 kg. Absorption costing, therefore, shows a lower profit than direct costing by 200 × $2.30 = $460.

SELF-TEST PROBLEM 10.6

ST 10.6

Uhuru Enterprises makes and sells a single product. Details for the first two months of the financial year show the following.

	July Litres	August Litres
Opening inventory	4000	6000
Closing inventory	6000	3000
Sales	30000	32000
Production	32000	29000

Budgeted and actual variable costs per unit in both months are as follows.

	$
Direct materials	2.00
Direct labour	1.50
Factory overhead	1.00
Marketing	0.30

Total budgeted and actual fixed costs in both months are as follows.

	$
Factory overhead	75000
Marketing, administration and financial	36000

The sale price in both months was $9.00 per litre.

The business uses absorption costing and applies fixed factory overhead on a per-unit basis, using a normal capacity of 30000 L per month as the activity level. Under- or over-applied factory overhead is adjusted against cost of goods sold. Management would like to use direct costing for internal reporting and has asked you, as the accountant, to do the following.

(a) Calculate the production cost per litre for each cost element and in total, using:
  (i) direct costing
  (ii) absorption costing.

(b) Prepare columnar statements of comprehensive income for the two months using absorption costing. Cost the inventory at 1 July using the product cost calculated in part (a) above. Show calculations for any under- or over-applied fixed factory overhead.

ST 10.6 cont

(c) Prepare columnar statements of comprehensive income for the two months using direct costing. Cost the inventory at 1 July using the product cost calculated in part (a) above.
(d) Prepare a statement that reconciles the profits shown in each month using absorption costing with those shown using direct costing.
(e) Explain to management why the profit in August is less than that in July when absorption costing is used, despite an increase in sales.

▸ **You should now be able to do Questions 10.13 to 10.15**

There can be under- or over-applied overhead for variable factory overhead costs when using direct costing. Where standard costing or activity-based costing is used, there may also be variances for materials and labour.

EXAMPLE 10.7

Refer to the information provided in Example 10.6. It will be assumes that actual variable factory overhead incurred in each month was as follows.

	$
July	2100
August	2000
September	2050

The following will now be shown below.
(a) The under- or over-applied variable factory overhead in each month will be calculated.
(b) Columnar budgeted statements of comprehensive income will be prepared for the three months using absorption costing.
(c) Columnar budgeted statements of comprehensive income will then be prepared for the three months using direct costing.

(a) Under- or over-applied variable factory overhead

	July	August	September
Actual variable factory overhead incurred	2100	2000	2050
Applied in July (4000 × $0.50)	2000		
Applied in August (4300 × $0.50)		2150	
Applied in September (3900 × $0.50)			1950
Under- or (over-)applied variable overhead	100	(150)	100
The under- or (over-)applied fixed factory overhead in Example 10.6 was	nil	(690)	230
Total under- or (over-)applied factory overhead	100	(840)	330

continued

(b) Statements of comprehensive income using absorption costing

	July	August	September
Sales (@ $15 per kilogram)	60 000	57 000	61 500
less Cost of goods sold			
Inventory at start of month (@ $7.30 per kg)	7 300	7 300	10 950
Cost of production (@ $7.30 per kg)	29 200	31 390	28 470
	36 500	38 690	39 420
less Inventory at end of month (@ $7.30 per kg)	7 300	10 950	9 490
	29 200	27 740	29 930
add Under- or (over-)applied overhead (total fixed and variable as above)	100	(840)	330
	29 300	26 900	30 260
Gross profit	30 700	30 100	31 240
less Marketing and administration	20 000	20 000	20 000
Net profit	10 700	10 100	11 240

(c) Statements of comprehensive income using direct costing

	July	August	September
Sales (@ $15 per kilogram)	60 000	57 000	61 500
less Variable costs			
Cost of goods sold			
Inventory at start of month (@ $5.00 per kg)	5 000	5 000	7 500
Cost of production (@ $5.00 per kg)	20 000	21 500	19 500
	25 000	26 500	27 000
less Inventory at end of month (@ $5.00 per kg)	5 000	7 500	6 500
	20 000	19 000	20 500
add Under- or (over-)applied overhead (variable only as above in part (a))	100	(150)	100
	20 100	18 850	20 600
Contribution margin	39 900	38 150	40 900
less Fixed costs			
Manufacturing	9 200	9 200	9 200
Marketing and administration	20 000	20 000	20 000
	29 200	29 200	29 200
Net profit	10 700	8 950	11 700

Note: The difference in the profits shown using absorption and direct costing is exactly the same as in Example 10.6. The difference is still as a result of the fixed factory overhead being included in opening and closing inventory when using absorption costing. Variable factory overhead incurred, applied and under- or over-applied is the same under both methods.

ST 10.7

SELF-TEST PROBLEM 10.7

Domestica Concrete Pty Ltd makes special concrete blocks. Production details for the year to 30 June 20X2 show the following.

	Units
Work in process—1 July 20X1	nil
Finished goods—1 July 20X1	4 000
Sales for the year	26 000
Work in process—30 June 20X2	nil
Finished goods—30 June 20X2	8 000

Budgeted data for the year was as follows.

Sales	$390 000
Direct materials cost	$60 000
Direct labour cost	$30 000
Fixed factory overhead	$150 000
Variable factory overhead	$45 000
Marketing and administrative expense—fixed	$18 500
Marketing and administrative expense—variable	$30 000
Production in blocks	30 000 units
Direct labour hours	15 000 hours

Factory overhead is applied using direct labour hours as the activity level.

Actual data for the year recorded showed the following.

Sales	$338 000
Direct materials cost	$60 000
Direct labour cost	$30 000
Fixed factory overhead	$154 000
Variable factory overhead	$48 000
Marketing and administrative expense—fixed	$18 100
Marketing and administrative expense—variable	$33 280
Production in blocks	30 000 units
Direct labour hours	15 000 hours

(a) Calculate the fixed factory overhead recovery rate, the variable factory overhead recovery rate and the combined factory overhead recovery rate.
(b) Calculate the under- or over-applied combined factory overhead. Determine how much of this relates to variable overhead and how much to fixed overhead.
(c) Prepare a statement of comprehensive income for the year using absorption costing.
(d) Prepare a statement of comprehensive income for the year using direct costing.
(e) Prepare a statement reconciling the profit obtained using absorption costing with that obtained using direct costing.

◗ **You should now be able to do Questions 10.16 and 10.17**

Australian Accounting Standard AASB 102 *Inventories*

LO4

LO5

Accounting Standard AASB 102 *Inventories* is issued by the Australian Accounting Standards Board under s. 334 of the *Corporations Act 2001*, and therefore has legal authority.

The standard and explanatory material quite clearly indicate that absorption costing must be used for external reporting. There is no clear indication in the standard as to why direct costing cannot be used in published financial reports. As a result, reported profits and statement of financial position valuations of inventory must be presented using absorption costing. For businesses using direct cost accounting for management reporting, this requires an adjusting journal entry to convert direct cost inventories and profit to those shown using absorption costing.

The most relevant sections of the standard are the following.

10. The cost of inventories shall comprise all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition.
12. The costs of conversion of inventories include costs directly related to the units of production, such as direct labour. They also include a systematic allocation of fixed and variable production overheads that are incurred in converting materials into finished goods. Fixed production overheads are those indirect costs of production that remain relatively constant regardless of the volume of production, such as depreciation and maintenance of factory buildings and equipment, and the cost of factory management and administration. Variable production overheads are those indirect costs of production that vary directly, or nearly directly, with the volume of production, such as indirect materials and indirect labour.
13. The allocation of fixed production overheads to the costs of conversion is based on the normal capacity of the production facilities. Normal capacity is the production expected to be achieved on average over a number of periods or seasons under normal circumstances, taking into account the loss of capacity resulting from planned maintenance. The actual level of production may be used if it approximates normal capacity. The amount of fixed overhead allocated to each unit of production is not increased as a consequence of low production or idle plant. Unallocated overheads are recognised as an expense in the period in which they are incurred. In periods of abnormally high production, the amount of fixed overhead allocated to each unit of production is decreased so that inventories are not measured above cost. Variable production overheads are allocated to each unit of production on the basis of the actual use of the production facilities.

Accounting Standard AASB 102 *Inventories* the Australian Accounting Standards Board standard that covers the costing and reporting of inventories

These sections are in line with the absorption costing method described at the start of this chapter and shown in Figure 10.1. The standard also includes guidance material that, while not forming part of the standard, must be read as it includes notes on some terms not defined within the standard itself. You should read the whole standard and the guidance notes.

You should now be able to do Question 10.18

Australian Taxation Office requirements

The Australian Taxation Office requires that inventories be valued using absorption costing. This is not specified in the *Income Tax Assessment Act 1936*, but is an internal ruling. The effect is that taxable income, on which tax is based, must be determined using absorption costing. This ruling flows from a case brought against the Phillip Morris tobacco company, which used direct costing over a seven-year period in which its inventories of cigarettes increased every year. You should now know that had absorption costing been used, its profits (and therefore tax) would have been higher. The Australian Taxation Office was successful in this case and has issued an internal ruling to its staff requiring absorption costing to be used in valuing inventories.

You should now be able to do Question 10.19

Advantages and disadvantages of direct costing

In the long term, there will be no difference in final profit results between absorption and direct costing methods. In a period in which inventories increase, absorption costing will show a higher profit than direct costing, as more fixed manufacturing overhead is transferred to the next accounting period. In a period in which inventories decrease, direct costing will show a higher profit than absorption costing, because there will be a larger amount of fixed manufacturing costs brought forward into opening inventory. If there is little or no change in inventory levels over a period, both methods will show the same profit for the period.

The main argument against direct costing for external reporting is the lower value shown under current assets for the finished goods inventory. The arguments for and against each method are not conclusive and have been examined over the past few decades. It is obvious that direct costing (and the resulting contribution margin) is most important in operational management decisions. Examples of its use were examined in Chapter 9. Longer-term strategic management decisions must take into account the fixed manufacturing overhead, as these costs must eventually be covered.

A summary of the advantages and disadvantages of direct costing follows.

LO6

Advantages

1. *Internal management reporting:* Direct or variable costing is used in short-term operational decisions such as cost–volume–profit analysis, pricing, make-or-buy and other decisions.
2. *Analysis of costs:* Management is required to examine and take note of the relationship between costs and activity levels. This leads to a more informed management.
3. *Profit not affected by inventory changes:* The profit from one period to another changes in its relationship with sales and not production. The net profit shown when using direct costing eliminates the effects of changes in inventory levels in a period. Profits shown when using absorption costing can be manipulated by either increasing or decreasing inventory levels at the end of a period.
4. *Simplified flexible budgeting and standard costing:* Eliminating fixed manufacturing costs makes variance analysis in standard costing (see Chapter 16) less confusing. The variance analysis carried out in Chapter 8 would only have a spending variance (the capacity variance only arises from applied fixed factory overhead).

Disadvantages

1. *Long-term strategic decisions:* All costs must be recovered in the long term, and there is a danger that the over-use of direct costing may ignore the fact that fixed factory overhead must be covered.
2. *Classification of costs:* Many costs cannot readily be classified as fixed or variable. There are even costs that do not conform to the 'high/low' analysis into fixed and variable components examined in Chapter 6. Compromises must, therefore, be made, which could prejudice the usefulness of the results. Costs such as indirect labour and indirect materials may be treated as fixed where in fact they do vary with activity levels.
3. *Elimination of manufacturing volume variance:* This was listed above as an advantage (see point 4, above); however, the under-use of fixed facilities may be an important reporting tool for management. An idle capacity variance (see Chapter 8) or a volume variance in standard costing (see Chapter 16) will provide useful information for senior management. These would be reported using absorption costing.
4. *Cost of system:* A direct cost system that requires recording costs as either variable or fixed would cost more than an absorption costing system.

5. *External reporting:* As indicated above, absorption costing must be used for external annual reporting and for taxable income determination.

For each of the advantages and disadvantages listed above, a counter-argument may be raised. An obvious compromise would be to use direct costing for internal management reporting and absorption costing for external reporting and taxable income determination. This can be achieved by either:

- using a normal absorption costing system for recording accounting data and using these results for external reporting—internal management reports are then adjusted by expected differences; or
- using direct costing for recording accounting data and adjusting these to absorption costing at balance date for external reporting.

EXAMPLE 10.8

Dopaz Pty Ltd uses direct costing in its records and reports to management. Results for its first year of operations include the following.

Finished goods inventory at end of period: 2000 units @ $4.50 per unit
Cost of goods sold: 27 000 units @ $4.50 per unit
Under-applied variable factory overhead: $2190
Actual fixed factory overhead incurred: $87 000
Direct cost net profit: $52 900

The following will now be shown below.

(a) The actual fixed factory overhead cost per unit will be calculated.
(b) A pro-forma journal entry will be prepared to adjust finished goods and cost of goods sold to absorption costing.
(c) The net profit shown when using absorption costing will be calculated, and reconciled with the results above.

(a) Fixed factory overhead cost per unit

Fixed factory overhead cost per unit = $87 000 ÷ 29 000 units = $3.00 per unit

(b) **Journal entry to close out fixed factory overhead cost**

	$	$
Finished goods (2000 units × $3)	6000	
Cost of goods sold (27 000 units × $3)	81 000	
Fixed factory overhead		87 000
Adjusting record for external reporting		

Note: This is not necessarily posted to the accounts but used in worksheets in the preparation of external reports. If it is posted, there would need to be a reversing entry at the start of the next year.

(c) Profit shown when using absorption costing

The profit shown using absorption costing will be higher than that shown using direct costing, as a result of the fixed factory overhead in the closing inventory. This is 2000 units × $3 = $6000. The profit will, therefore, be $52 900 plus $6000 = $58 900. Another way of looking at it is that, in direct costing, the whole $87 000 fixed factory overhead becomes a period cost, whereas under absorption costing only $81 000 is expensed as cost of goods sold.

EXAMPLE 10.9

Refer to the information provided in Example 10.8. In the following year, results using direct costing show the following.

Finished goods inventory (start of year): 2000 units @ $4.50 per unit
Finished goods inventory (end of year): 1000 units @ $4.80 per unit
Units sold: 31 000 units
Over-applied variable factory overhead: $1880
Actual fixed factory overhead incurred: $96 000
Direct cost net profit: $63 800

The following will now be shown below.

(a) Assuming that the FIFO method is used, the current year's actual fixed factory overhead cost per unit will be calculated.
(b) A pro-forma journal entry will be prepared to adjust closing finished goods, cost of goods sold and opening retained earnings to absorption costing.
(c) A statement will be prepared that will determine the profit shown under absorption costing.

(a) Current year's fixed factory overhead cost per unit

There were 30 000 units produced in the current year (31 000 sold plus 1000 in closing inventory less 2000 in opening inventory). The current year's fixed factory overhead cost per unit is, therefore, $96 000 ÷ 30 000 units = $3.20 per unit.

(b) Pro-forma journal entry

	$	$
Finished goods (1000 units × $3.20)	3 200	
Cost of goods sold	98 800	
Fixed factory overhead		96 000
Retained profits (start of year)[1]		6 000
Adjusting record for external reporting		

[1]Opening retained profits are adjusted because the closing retained profits at the end of the previous year obtained using absorption costing was $6000 higher.

Using the FIFO method, the cost of goods sold includes 2000 units @ $3 per unit (from the previous year) plus 29 000 units from this year's production @ $3.20 per unit.

(c) Profit shown under absorption costing

	$
Profit shown under direct costing	63 800
add Fixed costs in closing inventory using absorption costing—1000 units @ $3.20	3 200
	67 000
less Fixed costs in opening inventory using absorption costing—2000 units @ $3.00	6 000
Profit shown under absorption costing	61 000

SELF-TEST PROBLEM 10.8

ST 10.8

Domenica Flowmeters uses direct costing for internal management reporting. These results are then adjusted to absorption costing at year end for external reporting.

Direct costing results for the year show the following.

Finished goods inventory (start of year): 6000 units @ $3.00 per unit

Finished goods inventory (end of year): 8000 units @ $3.10 per unit

Units sold: 50 000 units

Over-applied variable factory overhead: $2650

Actual fixed factory overhead incurred: $104 000

Direct cost net profit: $33 460

The fixed factory overhead cost per unit at the end of the previous year was $1.95 per unit.

(a) Assuming that the FIFO method is used, calculate the current year's actual fixed factory overhead cost per unit.

(b) Prepare a pro-forma journal entry to adjust closing finished goods, cost of goods sold and opening retained earnings to absorption costing.

(c) Prepare a statement that will determine the profit shown under absorption costing.

You should now be able to do Questions 10.20 and 10.21

Summary

1. Direct costing is a method of costing manufactured products whereby fixed manufacturing overhead is treated as a period cost rather than as a product cost.
2. Direct costing is also known as variable costing, as most direct costs are variable with respect to activity levels.
3. The value of inventory on a statement of financial position using direct costing will be less than that shown using absorption costing. This is because the inventory will not include any fixed manufacturing overhead.
4. The net profit shown when using direct costing will be lower than the profit shown using absorption costing if the level of inventories increases over the accounting period.
5. The net profit shown when using direct costing will be higher than the profit shown using absorption costing if the level of inventories decreases over the accounting period.
6. Over a number of accounting periods, the total profits shown when using either direct costing or absorption costing will tend to be the same. There will be no difference in profit results where there is no change in the general level of inventories.
7. Under- or over-applied fixed factory overhead will only appear in a statement of comprehensive income when using absorption costing. This is because fixed factory overhead is not applied using direct costing—it is written off as a period cost and not treated as part of the product cost.
8. A spending variance for variable factory overhead is the only under- or over-applied overhead that will be reported where a business uses normal direct costing (that is, where standard costing is not used).
9. The Australian accounting standard AASB 102 *Inventories* requires that absorption costing be used in the valuation and presentation of inventories in financial statements. This may require pro-forma adjustment entries for those businesses using direct costing for internal accounting.
10. The Australian Taxation Office requires that taxable income be determined using absorption costing to value inventories at cost.

Key terms

Questions

10.1 **a.** What is meant by the term 'absorption costing'?
b. How does absorption costing differ from direct costing?
c. What is meant by the term 'full costing'?

10.2 **a.** Explain what is meant by the term 'product cost' and distinguish this from the term 'manufacturing cost'.
b. Under which method—absorption costing or direct costing—do product costs equal manufacturing costs?
c. How are marketing, administrative and financial expense treated under absorption costing and under direct costing?

10.3 A manufacturing statement for the six months to 30 June shows the following.

	$	$
Direct materials		
Materials inventory at 1 January	2200	
Purchases and inwards charges	104300	
	106500	
less Materials inventory at 30 June	1500	105000
Direct labour		56000
Prime cost		161000
Factory overhead		
Fixed factory overhead	98000	
Variable factory overhead	28000	126000
Total cost		287000

During the six months, 14000 kg of a single product was produced. The figures shown in the statement above take into account small amounts of work in process at the start and end of the period.

a. State the total manufacturing cost, the total product cost using absorption costing and the total product cost using direct costing.
b. Calculate the manufacturing cost per kilogram for each element of cost. Calculate the fixed and variable factory overhead costs per kilogram.
c. There are 2000 kg of finished product on hand at 30 June. Value this inventory using:
i. absorption costing **ii.** direct costing.

10.4 Sticktile makes a contact adhesive. During the year to 30 June it produced 48000 L and sold 47000 L. The sale price per litre was $11.00.

Costs incurred during the year were as follows.

	Variable $	Fixed $
Direct materials used	57 600	
Direct labour	52 800	
Factory overhead	62 400	115 200
Marketing expense	19 200	46 000
General and administrative expense	17 800	96 800
Financial expense		4 200

There was no opening inventory.

Using absorption costing, prepare a statement of comprehensive income for Sticktile for the year.

10.5 Kruger Randos Pty Ltd makes a single product. Budget details for the year to 30 June are as follows.

	$
Sales—26 000 units @ $25 per unit	650 000
Production—28 000 units	
Production costs	
Direct materials used	154 000
Direct labour incurred	126 000
Variable factory overhead incurred	84 000
Fixed factory overhead incurred	168 000
Marketing and administrative expense incurred (all fixed)	98 850

There is no opening finished goods inventory and no work in process is budgeted.

Prepare a correctly formatted statement of comprehensive income for Kruger Randos using direct costing.

10.6 Prepare a statement of comprehensive income using direct costing from the following information relating to the year ended 30 June.

	Litres
Opening inventory	4 000
Sales	45 000
Production	46 000

Costs incurred:

	Fixed $	Variable $
Direct materials used		96 600
Direct labour		66 700
Factory overhead	69 000	195 500
Marketing expense	71 450	
General and administrative expense	132 600	
Financial expense	6 450	

The sale price is $15 per litre. There is no opening or closing work in process. The opening inventory has the same unit cost as current production.

10.7 During the year to 30 June, Doncaster Deer Fencing Pty Ltd produced 39 000 m of fencing and sold 40 000 m. It uses absorption costing but management would like a statement of comprehensive income using direct costing. The statement of comprehensive income for the year using absorption costing was as follows.

	$	$
Sales		760 000
less Cost of goods sold		
Opening inventory	30 000	
Costs of production		
Direct materials		179 400
Direct labour		93 600
Variable factory overhead		46 800
Fixed factory overhead		265 200
	615 000	
less Closing inventory	15 000	600 000
Gross profit		160 000
less Operating expense		
Marketing	48 900	
Administration	78 600	127 500
Net profit		32 500

The opening inventory is 2000 m at $15 per metre. Of this cost, $6.80 is fixed factory overhead. Operating expense is assumed to be all fixed.

Using direct costing, prepare the statement of comprehensive income for the year.

10.8 State which costing method—direct or absorption—would show the higher profit in each of the following situations.

a. The volume of production exceeds the sales volume within an accounting period.
b. The level of inventories increases over the accounting period.
c. A job cost manufacturer who manufactures to order has little or no work in process or finished goods at the end of any accounting period.
d. The sales volume exceeds the production volume in an accounting period.
e. There is no increase or decrease in the level of inventories over an accounting period.
f. The level of inventories decreases over the accounting period.

10.9 Artfunkel Pty Ltd makes and sells a single product. It keeps simple manufacturing accounts in which actual factory overhead is charged to production costs. The following relates to its first year of production.

	$
Sales (20 000 units @ $30 per unit)	600 000
Production—25 000 units	
Production costs	
Direct materials	112 500
Direct labour	95 000

continued

	$
Variable factory overhead	81 250
Fixed factory overhead	136 250
Marketing and administrative costs (all fixed)	175 000

a. Calculate the manufacturing cost per unit.
b. Calculate the cost per unit for valuing closing inventory, using:
i. absorption costing **ii.** direct costing.
b. Use absorption costing to prepare a statement of comprehensive income for the year.
c. Use direct costing to prepare a statement of comprehensive income for the year.
d. Reconcile the profit shown using absorption costing with the profit shown using direct costing.
e. Explain the difference in profits to management.

10.10 MacGregor & Sons Pty Ltd produces Mac's Hydroponic Kits. Statements of comprehensive income are prepared quarterly from simple manufacturing accounts using a periodic inventory system. No work in process is kept and actual overhead incurred is recorded as the manufacturing cost. A build-up in inventory occurs in the first quarter of the financial year (July to September) to cater for increased sales in spring and summer.

Production, sales and inventory of kits for each quarter in the coming year are budgeted as follows.

	First quarter	Second quarter	Third quarter	Fourth quarter
Sales	2000	2500	1800	800
Production	2800	2000	1500	800
Opening inventory	500	1300	800	500

The variable manufacturing costs per kit are budgeted as follows.

	$
Materials	
Polystyrene box	0.50
Growing medium	1.20
Chemicals	2.60
Direct labour	1.60
Manufacturing costs	0.60

Total fixed costs per quarter are expected to be as follows.

	$
Manufacturing fixed costs	8 400
Marketing and administration	8 000

	First quarter	Second quarter	Third quarter	Fourth quarter
Average sale price per kit is budgeted at	$16.00	$20.00	$20.00	$15.00

a. Prepare budgeted statements of comprehensive income for each quarter and for the year using absorption costing. These should be prepared in columnar form.
b. Prepare budgeted statements of comprehensive income for each quarter and for the year using direct costing. These should be prepared in columnar form.
c. Prepare a statement that reconciles the profits for each quarter and for the year shown using absorption costing with the profits shown using direct costing. Use this as a basis for a written report to management explaining the difference in profits.

10.11 Prepare a correctly formatted budgeted statement of comprehensive income for the year ending 30 June using direct costing from the following data.

	$
Inventory at 1 July (variable cost)	13 500
Sales	280 000
Manufacturing costs	
Direct materials used	57 000
Direct labour incurred	39 000
Variable factory overhead incurred	15 500
Fixed factory overhead incurred	70 000
Non-manufacturing costs	
Variable marketing expense	18 500
Fixed marketing and administrative expense	75 000
Inventory at 30 June (variable cost)	14 500

10.12 Fosters Paints Pty Ltd makes rustproofing paint. During the year to 30 June, it produced 48 000 L and sold 47 000 L. The sale price per litre over the year was $13.00. Inventory at the start of the year was 3000 L, with a variable manufacturing cost of $2.60 per litre.

Costs incurred during the year were as follows.

	Variable $	Fixed $
Direct materials used	57 600	
Direct labour	38 400	
Factory overhead	33 600	140 000
Marketing expense	12 000	56 000
General and administrative expense	8 800	106 800
Financial expense		2 900

Using direct costing, prepare a statement of comprehensive income for the year. As the business assumes the FIFO method, value closing inventory at the current year's variable cost per litre.

10.13 A business makes a single product. It applies manufacturing overhead based on a production level of 5000 units per month and the following monthly manufacturing costs.

	$
Variable manufacturing overhead	5 000
Fixed manufacturing overhead	10 000

Production figures for July show the following.

	Units
Opening inventory	800
Units produced	5100
Units sold in July	5000

Actual costs incurred in July were as follows.

	$
Direct materials	40800
Direct labour	25500
Variable manufacturing overhead	5100
Fixed manufacturing overhead	5000
Marketing expense (variable)	15000
Marketing and administrative expense (fixed)	8000

The sale price is $22 per unit.

a. Calculate the predetermined manufacturing overhead application rate, using:
i. absorption costing **ii.** direct costing.
b. Prepare a statement of comprehensive income for July using absorption costing. Assume that inventory at 1 July is costed at the current month's costs. Show workings for any under- or over-applied manufacturing overhead.
b. Prepare a statement of comprehensive income for July using direct costing. Assume that inventory at 1 July is costed at the current month's costs.
c. Explain why there is no under- or over-applied overhead when direct costing is used.
d. Reconcile the profits shown using absorption costing with those shown using direct costing.

10.14 Abinitio Pty Ltd is preparing monthly budgets for the next year. Some of the budget data relating to its single product for the first three months of the financial year are as follows.

	July	August	September
Metres of finished product			
Opening inventory	2000	5500	7000
Sales	18500	21500	23800
Production	22000	23000	21000
Selling price per metre	$10	$10	$10
Marketing and administrative expense (fixed)	$50000	$50000	$50000

There is no opening or closing work in process.
Budgeted manufacturing costs per metre are as follows.

	$
Direct materials	2.80
Direct labour	1.20
Variable manufacturing overhead	0.50
Fixed manufacturing overhead	3.00

The fixed manufacturing overhead cost per metre is based on a normal annual capacity of 252000 m.

The only variance expected in any month is under- or over-applied fixed factory manufacturing overhead.

a. Prepare budgeted statements of comprehensive income for each of the three months, using absorption costing. Value the inventory at 1 July at the budgeted cost per metre. Under- or over-applied fixed manufacturing overhead is adjusted against cost of goods sold.

b. Repeat part (a) using direct costing.

c. Prepare a statement reconciling the profits shown in each month using absorption costing with the profits determined using direct costing.

10.15 **a.** A manufacturer uses absorption costing to value finished goods and work in process inventories. Discuss why it is possible for sales to be higher in September than in August, but the gross profit to be lower in September than in August.

b. Explain why there can never be a capacity or volume variance when using direct costing.

10.16 The following are the results for Abinitio Pty Ltd for the first three months of the financial year.

	July	August	September
Metres of finished product:			
Opening inventory	2000	5000	5000
Sales	19000	20000	22000
Production	22000	20000	21000
Selling price per metre	$10	$10	$10

There is no opening or closing work in process.

The manufacturing overhead recovery rate per metre is as follows.

	$
Variable manufacturing overhead	0.50
Fixed manufacturing overhead	3.00
	3.50

The fixed manufacturing overhead cost per metre is based on a normal annual capacity of 252000 m.

The opening inventory of finished goods has unit costs as follows.

	$
Direct materials	2.80
Direct labour	1.20
Variable manufacturing overhead	0.50
Fixed manufacturing overhead	3.00

Actual costs incurred in the three months were as follows.

	$	$	$
Marketing and administrative expense			
Fixed	40000	40000	40000
Variable	8550	9000	9900
Direct materials	61600	56000	58800
Direct labour	26400	24000	25200

continued

	$	$	$
Manufacturing overhead			
Fixed	61000	62000	63000
Variable	12000	9500	10800

a. Prepare budgeted statements of comprehensive income for each of the three months using absorption costing. Under- or over-applied fixed manufacturing overhead is adjusted against cost of goods sold.
b. Repeat part (a) using direct costing.
c. Prepare a statement reconciling the profits shown in each month when using absorption costing with the profits determined using direct costing.

10.17 Trepidity Pty Ltd makes a single product and uses absorption costing. It applies manufacturing overhead at $3.00 per unit, based on an annual production level of 72000 units and the following annual manufacturing costs.

	$
Variable manufacturing overhead	72000
Fixed manufacturing overhead	144000
	216000

Opening inventory, production and sales for the first month in the financial year show the following.

	Units
Opening inventory	1000
Units produced in July	5900
Units sold in July	6000

Actual costs incurred in July were as follows.

	$
Direct materials	14750
Direct labour	10620
Variable manufacturing overhead	6100
Fixed manufacturing overhead	12100
Marketing expense—variable	7200
Marketing and administrative expense—fixed	18300

The sale price is $11 per unit.
a. Prepare a statement of comprehensive income for July using absorption costing. Assume that inventory at 1 July is costed at the current month's costs. Show workings for any under- or over-applied manufacturing overhead.
b. Management is considering the use of direct costing for internal reporting. Prepare a statement of comprehensive income for July using direct costing. Assume that inventory at 1 July is costed at the current month's costs.
c. Reconcile the profits shown when using absorption costing with those shown when using direct costing.

10.18 **a.** Accounting Standard AASB 102 *Inventories* requires the use of absorption costing for external reporting. Discuss the reasons why the standard excludes the use of direct costing.

b. Discuss the meaning of 'normal capacity' and the treatment of variances caused by excess idle capacity.

c. Estimate a normal operating capacity from the following data.

	Litres
Designed production capacity under prevailing operating conditions	40 000
Budgeted production level for current period	35 000
Budgeted production level for next period	38 000
Actual production level for last period	37 000

Give reasonable arguments for your choice. Does the standard assist you in making your decision?

10.19 The Australian Taxation Office requires that absorption costing be used in determining the cost of manufactured inventory. Discuss why this is a requirement and the effect on taxable income in the following situations.

a. Production is higher than sales in the taxable period.

b. Sales are higher than production in the taxable period.

c. Over a number of years, production and sales are the same.

10.20 Celiopsis Pty Ltd uses direct costing in its records and in its reports to management. Results for its first year of operations include the following.

Finished goods inventory end of year: 2000 units @ $3.50 per unit

Cost of goods sold: 20 000 units @ $3.50 per unit

Actual fixed factory overhead incurred: $66 000

Direct cost net profit: $32 500

a. Calculate the actual fixed factory overhead cost per unit.

b. Prepare a pro-forma journal entry to adjust finished goods and cost of goods sold to absorption costing.

c. What will be the net profit shown when using absorption costing? Reconcile this with the results above.

10.21 William's Panelling Pty Ltd uses direct costing for internal management reporting. These results are then adjusted to absorption costing at year-end for external reporting.

Direct costing results for the year show the following.

Finished goods inventory (start of year): 5000 units @ $5.00 per unit

Finished goods inventory (end of year): 3000 units @ $5.20 per unit

Units sold: 30 000 units

Actual fixed factory overhead incurred: $84 000

Direct cost net profit: $44 564

The fixed factory overhead cost per unit at the end of the previous year was $2.90 per unit.

a. Assuming that the FIFO method is used, calculate the current year's actual fixed factory overhead cost per unit.

b. Prepare a pro-forma journal entry to adjust closing finished goods, cost of goods sold and opening retained earnings to absorption costing.

c. Prepare a statement that will determine the profit shown under absorption costing.