



# C9: Accounting and Finance Course

Lecturer Manual



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# Acknowledgements

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# About this lecturer manual

## Introduction

The lecturer manual for this course provides you with an overview of the course and guidelines for lecturers and markers. Answers to the activities, assignments and guidelines for exam marking are outlined.

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## Course outcomes

Upon completion of C9: Accounting and Finance Course, students will be able to:



### Outcomes

- *Demonstrate* knowledge and understanding of the role and applications of management accounting and their contribution to good governance.
- *Demonstrate* knowledge and understanding of the planning and control processes in management accounting and their contribution to strategic decision-making.
- *Demonstrate* knowledge and understanding of the management of resources with specific regard to budgeting and capital investment for planning and production decisions.
- *Demonstrate* knowledge and application of performance measurement with particular reference to setting strategic targets in a multinational corporate setting.
- *Demonstrate* knowledge and understanding of the need for financial management and its impact on the corporation, together with the ability to perform common financial and investment calculations.
- *Demonstrate* knowledge and application of securities for the strategic funding of corporate activities and the valuation thereof.
- *Demonstrate* knowledge and application of alternatives and techniques for the management of capital and awareness of foreign exchange implications in a multinational setting.



# Course overview by units and modules

## Module 1

**Unit 1: Managing the organisation.** Introduces the purpose of management accounting, the goals of the organisation and the role of management accounting in good corporate governance.

**Unit 2: Costing systems.** Identifies cost behaviour and how this is applied to absorption and variable costing.

**Unit 3: Activity-based costing (ABC).** Introduces the principles of ABC.

## Module 2

**Unit 4: Cost-volume-profit analysis.** Develops an understanding of the relationship between variable and fixed costs and how to determine contribution margin and target profits.

**Unit 5: Relevant costs.** Identifies the relevant costs associated with short-term decision-making.

## Module 3

**Unit 6: Budgeting.** Introduces the purpose of budgeting and the various budgets that are completed by organisations. The unit also introduces the concept of flexible budgeting.

**Unit 7: Standard costing.** Explains standard costing and how it is applied together with the calculation and evaluation of variances from actual performance.

## Module 4

**Unit 8: Segment reporting and decentralisation.** Explains how to measure the performance of operating segments or divisions and the differentiation between cost, profit and investment centres.

**Unit 9: Transfer pricing.** Develops an understanding of the relevance of transfer pricing of products or services between segments and the international dimension.

**Unit 10: Balanced scorecard.** Gives the purpose and application of a balanced scorecard for performance measurement.

## Module 5

**Unit 11: Financial markets and managers.** Introduces the purpose of managerial finance, financial markets and the role of the financial manager.

**Unit 12: Regulation of markets.** Develops an understanding of how financial markets operate and the role played by various regulators.

**Unit 13: Financial mathematics.** Introduces some of the mathematical tools and techniques that are used by the financial manager.

## Module 6

**Unit 14: Understanding risk and return.** Develops an understanding of the relationship between risk and return; how to assess required returns and how to measure and manage risk.

**Unit 15: Bonds and shares.** Introduces the different types of bonds and shares and how they are valued.

**Unit 16: Cost of capital.** Develops an understanding of the principles of the cost of finance together with how to assess the cost of the various components of a firm's capital structure.

## Module 7

**Unit 17: Capital investment.** Introduces the various methods to assess the viability of capital investments, including discounted cashflows, payback period and accounting rate of return.

**Unit 18: Short- and long-term finance.** Explains the sources and management of short- and long-term finance.

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## Timeframe



How long?

This course will take you approximately 120 hours of study time.

[How much formal study time is required?]

[How much self-study time is expected/recommended?]

---

## Activities



Activities

Each unit has a small number of activities scattered throughout the unit. Students should work through each activity without looking at the activity feedback which is at the end of the module. Students use the activity feedback to check answers and understand the underlying theory or process.

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## Assessments



Assessments

This course has a final exam that is worth 50 per cent and covers all modules. The time allocated is three hours and the student must complete all questions.

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## Assignments



Assignments

There are two assignments worth 25 per cent each. Assignment 1 covers the topics in the Management Accounting modules. Assignment 2 covers the topics in the Finance modules. Both assignments have a series of small questions that cover a wide range of the topic materials.

[How are the assignments are to be submitted?]

[To whom should the assignments be submitted?]

[What is the schedule for submitting assignments? End of each unit? Specific dates?]

[What is the order of the assignments? Must they be completed in the order in which they are set?]



# Module 1

---

## Introduction

This module introduces the purpose of management accounting, the goals of the organisation and the role of management accounting in good corporate governance. In addition the module identifies cost behaviour and how this is applied to absorption and variable costing and finally there is an introduction to the principles of activity-based costing (ABC).

Upon completion of this module students will be able to:



### Outcomes

- *Understand* the role of management accounting and how this fits with the goals of the organisation.
- *Explain* how management accounting can add to corporate governance.
- *Identify* how costs behave.
- *Explain* the difference between absorption and variable costing.
- *Discuss* the principles of activity-based costing.
- *Explain* the difference between activity-based costing and absorption and variable costing.

# Unit 1

## Managing the organisation

### Learning outcomes

Upon completion of this unit students will be able to:



Outcomes

- *Explain* the difference between management accounting and financial accounting.
- *Describe* the purpose of management accounting.
- *Identify* the different functions of management.
- *Explain* the role of corporate governance in managing an organisation.
- *Identify* the different parties involved in the governance of an organisation.
- *Describe* and explain corporate governance principles.
- *Explain* the role of ethics in business.

### Activity 1.1



Activity

For the organisation that you are currently involved with:

1. List all of the areas where accounting information is used to help with decision-making.
2. Describe how the organisation is governed.
3. Does your organisation have a code of ethics? If so, how does the organisation ensure compliance with the code?
4. Are there any operational areas that may lead to an ethical dilemma? If so, how does the organisation deal with this type of situation?

### Activity 1.1 Feedback

Answers will depend on the organisation the student chooses.

## Unit 2

### Costing systems

#### Learning outcomes



#### Outcomes

Upon completion of this unit students will be able to:

- *Explain* the different classifications of cost.
- *Describe* how costs behave.
- *Explain* the principles of absorption costing.
- *Explain* the principles of variable costing.
- *Identify* the differences between absorption and variable costing.

## Activity 1.2



### Activity

1. Hawkins Electronics Limited manufactures a portable radio designed for mounting on the wall of the bathroom. The following list represents some of the different types of costs incurred in the manufacture of these radios. Classify each of the items as product (inventoriable) cost or period (non-inventoriable) costs for the purpose of preparing external financial statements.
  - a. The plant manager's salary.
  - b. The cost of heating the plant.
  - c. The cost of heating executive offices.
  - d. The cost of printed circuit boards used in the radios.
  - e. Salaries and commissions of company salespersons.
  - f. Depreciation on office equipment used in the executive offices.
  - g. Depreciation on production equipment used in the plant.
  - h. Wages of janitorial personnel who clean the plant.
  - i. The cost of insurance on the plant building.
  - j. The cost of electricity to light the plant.
  - k. The cost of electricity to power plant equipment.
  - l. The cost of maintaining and repairing equipment in the plant.
  - m. The cost of printing promotional materials for trade shows.
  - n. The cost of solder used in assembling the radios.
  - o. The cost of telephone service for the executive offices.
2. Lee Company, which has only one product, has provided the following data concerning its most recent month of operations.
 

• Selling price:	\$95
• Units in beginning inventory	100
• Units produced	6,200
• Units sold	5,900
• Units in ending inventory	400

Variable costs per unit:

- |                                       |      |
|---------------------------------------|------|
| • Direct materials                    | \$42 |
| • Direct labour                       | \$28 |
| • Variable manufacturing overhead     | \$1  |
| • Variable selling and administrative | \$5  |

Fixed costs:

- Fixed manufacturing overhead                      \$62,000
- Fixed selling and administrative                      \$35,400

The company produces the same number of units every month, although the sales in units vary from month to month. The company's variable costs per unit and total fixed costs have been constant from month to month.

**Required:**

- a. What is the unit product cost for the month under variable costing?
- b. What is the unit product cost for the month under absorption costing?
- c. Prepare an income statement for the month using the contribution format and the variable costing method.
- d. Prepare an income statement for the month using the absorption costing method.
- e. Reconcile the variable costing and absorption costing net incomes for the month.

---

## Activity 1.2 Feedback

1. Hawkins Electronic. Classify each item as product (inventoriable) cost or period (non-inventoriable) costs for the purpose of preparing external financial statements.
  - a. Product
  - b. Product
  - c. Period
  - d. Product
  - e. Period
  - f. Period
  - g. Product
  - h. Product
  - i. Product
  - j. Product
  - k. Product
  - l. Product
  - m. Period
  - n. Product
  - o. Period



## 2. Lee Company

**Answers for (a.) and (b.), unit product costs:**

## Variable costing:

• Direct materials	\$42
• Direct labour	\$28
• Variable manufacturing overhead	<u>\$1</u>
• Unit product cost	<u>\$71</u>

## Absorption costing:

• Direct materials	\$42
• Direct labour	\$28
• Variable manufacturing overhead	\$1
• Fixed manufacturing overhead	<u>\$10</u>
• Unit product cost	<u>\$81</u>

**Answers for (c.) & (d.), income statements:**

## Variable costing income statement:

Sales	\$560,500
Less variable expenses	
Variable cost of goods sold:	
Beginning inventory	\$7,100
Add variable manufacturing costs	<u>\$440,200</u>
Goods available for sale	\$447,300
Less ending inventory	<u>\$28,400</u>
Variable cost of goods sold	\$418,900
Variable selling and administrative	<u>\$29,500</u>
	<u>\$448,400</u>
Contribution margin	\$112,100
Less fixed expenses:	
Fixed manufacturing overhead	\$62,000
Fixed selling and administrative	<u>\$35,400</u>
	<u>\$97,400</u>
Net income	<u>\$14,700</u>

## Absorption costing income statement:

Sales	\$560,500
Cost of goods sold:	
Beginning inventory	\$8,100
Add cost of goods manufactured	<u>\$502,200</u>
Goods available for sale	\$510,300
Less ending inventory	<u>\$32,400</u>
	<u>\$477,900</u>
Gross margin	\$82,600
Less selling and administrative expenses:	
Variable selling and administrative	\$29,500
Fixed selling and administrative	<u>\$35,400</u>
	<u>\$64,900</u>
Net income	<u>\$17,700</u>

**Answer for (e.), reconciliation:**

Variable costing net income	\$14,700
Add fixed manufacturing overhead costs	
deferred in inventory under absorption costing	\$3,000
Deduct fixed manufacturing overhead costs	
released from inventory under absorption costing	<u>\$0</u>
Absorption costing net income	<u>\$17,700</u>

## Unit 3

### Activity-based costing

#### Learning outcomes



Outcomes

Upon completion of this unit students will be able to:

- *Describe* a typical ABC system.
- *Explain* the components of an ABC system.
- *Identify* activities and cost drivers.
- *Explain* the advantages and disadvantages of ABC.
- *Explain* the difference between traditional costing systems and ABC.



## Activity 1.3



### Activity

1. Explain how ABC differs from traditional costing methods.
2. DEM manufactures and sells medical equipment. DEM uses an activity-based costing system. Direct materials and direct labour costs are accumulated separately along with information concerning four manufacturing overhead cost drivers (activities). Assume that the direct labour rate is \$20 an hour and that there were no beginning inventories. The following information was available for 2010, based on an expected production level of 400,000 units for the year:

Activity (cost driver)	Budgeted Cost for 2010	Cost driver used as allocation base	Cost allocation rate
	\$		\$
Materials handling	3,600,000	Number of parts used	\$1.50 per part
Milling and grinding	8,800,000	Number of machine hours	\$11.00 per machine hour
Assembly and inspection	6,000,000	Direct labour hours worked	\$5.00 per labour hour
Testing	1,200,000	Number of units tested	\$3.00 per unit

The following production, costs and activities occurred during the month of September:

Units produced/tested	Direct materials costs	Number of parts used	Machine hours	Direct labour hours
50,000	\$3,500,000	275,000	95,000	160,000

### Required:

- a. Calculate the total manufacturing costs and the cost per unit produced and tested during September using the ABC approach.
  - b. Explain the advantages of the ABC approach relative to using a single predetermined overhead application rate based on direct labour hours.
3. Williams Industries manufactures and sells tables. The company uses an activity-based costing system. Direct materials and direct labour costs are accumulated separately along with information concerning three manufacturing overhead cost drivers (activities). Assume that the direct labour rate is \$15 an hour and that there were no beginning inventories. The following information was available for 2010, based on an expected production level of 50,000 units for the year:



Activity (cost driver)	Budgeted Cost for 2010	Cost driver used as allocation base	Cost allocation rate
	\$		\$
Materials handling	250,000	Number of parts used	\$0.20 per part
Cutting and lathe work	1,750,000	Number of parts used	\$1.40 per part
Assembly and inspection	4,000,000	Direct labour hours	\$20.00 per labour hour

The following production, costs and activities occurred during the month of July:

Units produced/tested	Direct materials costs	Number of parts used	Direct labour hours
3,200	\$107,200	70,400	13,120

**Required:**

- Calculate the total manufacturing costs and the cost per unit produced and tested during July using the activity-based costing approach.
- Assume, instead, that Williams Industries applies manufacturing overhead on a direct labour hours basis (rather than using the activity-based costing system described above). Calculate the total manufacturing cost and the cost per unit of the tables produced during July (hint – you will need to calculate the predetermined overhead application rate using the total budgeted overhead cost for 2010).
- Compare the per-unit cost figures calculated in a) and b). Which approach do you think provides better information for manufacturing managers? Explain your answer.

## Activity 1.3 Feedback

- Explain how ABC differs from traditional costing methods.
  - Both ABC and traditional costing methods allocate overhead to cost objects, but the methods of doing this differ.
  - ABC allocates overhead to a cost object (product, service, customer, department and so on) by tracing the cost-causing activities of an organisation directly to a cost object. This results in activities (and their associated costs) being allocated into cost pools and then each cost pool is traced to a cost object.
  - Some complex ABC systems can have several hundred activities and multiple cost pools. The result is a more accurate reflection of the cost object's consumption of cost-causing activities.
  - Traditional overhead allocation models also trace overhead to a cost object, however they typically use a single overhead driver (such as direct labour hours, or machine hours). The result is often a distorted amount of overhead applied to the

cost object. This can be a significant problem in firms where competition is high and/or overhead is a significant proportion of the total cost.

## 2. DEM

- a. Calculate the total manufacturing costs and the cost per unit produced and tested during September.

	Activity	Cost driver used as allocation base	Cost allocation rate		Allocated cost
			\$		
	Materials handling	Number of parts used	1.50 per part	275 000 parts	\$412 500
	Milling and grinding	Number of machine hours	11.00 per hour	95 000 MH	\$1 045 000
	Assembly and inspection	Direct labour hours worked	5.00 per hour	160 000 DLH	\$800 000
	Testing	Number of units tested	3.00 per unit	50 000 units	\$150 000
					<u>\$2 407 500</u>

Total cost:

Direct material           \$3,500,000

Direct labour:

160,000 x \$20           3,200,000

Manufacturing o/h   2,407,500

Total cost               \$9,107,500

Units produced       50,000

Cost per unit           \$182.15

- b. Explain the advantages of the ABC approach relative to using a single predetermined overhead application rate based on direct labour hours.

Multiple allocation rates, as used in ABC costing, overcome the problem of unitising fixed costs since in smaller cost pools an appropriate variable activity can be found. The cost allocations are closer to economic reality and so are more accurate. This is likely to result in more competitive behaviour and better decision-making.

## 3. Williams Industries

- a. Calculate the total manufacturing costs and the cost per unit produced and tested during July using the activity-based costing approach.

	Activity (cost driver)	Cost driver used as allocation base	Overhead Cost allocation rate		Allocated cost
			\$		\$
	Materials handling	Number of parts used	0.20 per part	70 400 parts	14 080
	Cutting and lathe work	Number of parts used	1.40 per part	70 400 parts	98 560
	Assembly and inspection	Direct labour hours	20.00 per hour	13 120 DLH	<u>262 400</u>
					<u>\$375 040</u>



Total cost:

Direct material	\$107,200
Direct labour (13,120 x \$15)	\$196,800
Manufacturing overhead	<u>\$375,040</u>
Total cost of 50,000 tables	<u>\$679,040</u>
Cost per table	\$13.58

- b. Assume instead that Williams Industries applies manufacturing overhead on a direct labour hours basis (rather than using the activity-based costing system described above). Calculate the total manufacturing cost and the cost per unit of the tables produced during.

Predetermined overhead absorption rate:

Estimated overhead/DLH = \$6,000,000/200,000 (hours calculated from assembly and inspection allocation = \$30 per hour.

Total cost:

Direct material	\$107,200
Direct labour (13,120 x \$15)	\$196,800
Overhead (13,120 x \$30)	<u>\$393,600</u>
Total cost of 50,000 tables	<u>\$697,600</u>
Cost per table	\$13.95

- c. Compare the per-unit cost figures calculated in a) and b). Which approach do you think provides better information for manufacturing managers? Explain your answer.

In this situation, the result is not that significant (only 2.7 per cent between the ABC cost per unit of \$13.58 and the absorption costing rate of \$13.95) but in many other instances, this is not the case. A cost benefit analysis is always conducted before installing a new system. One of the risks to be assessed is the consequences of making the wrong decision.

## Module 2

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### Introduction

This module is designed as an introduction to short-term decision-making. In particular the student will be introduced to techniques commonly used to appraise decisions between alternative courses of action. The principle tools to be used are cost-volume-profit and relevant costs.

Upon completion of this module students will be able to:



#### Outcomes

- *Demonstrate* knowledge and understanding of the relationship between selling prices, variable costs and fixed costs.
- *Demonstrate* knowledge and understanding of the concept of contribution margin and how this is used to assist decision-making.
- *Demonstrate* knowledge and understanding of relevant costs.
- *Demonstrate* knowledge and application of a range of short-term decision-making techniques.

## Unit 4

### Cost-volume-profit analysis

#### Learning outcomes

Upon completion of this unit students will be able to:



#### Outcomes

- *Explain* the difference between fixed and variable costs.
- *Understand* the relationship between selling price, costs and volume.
- *Describe* the components of CVP.
- *Calculate* levels of sales, units and margin for a desired target profit.
- *Understand* the relationship between structure and leverage.
- *Explain* the elements of uncertainty.

## Activity 2.1



### Activity

1. In its budget for next month, Jones Company has revenues of \$500,000, variable costs of \$350,000, and fixed costs of \$135,000.
  - a. Calculate the contribution margin percentage.
  - b. Calculate the total revenues needed to break even.
  - c. Calculate the total revenues needed to achieve a target operating income of \$45,000.
  - d. Calculate the total revenues needed to achieve a target net income of \$48,000, assuming the income tax rate is 40 per cent.
2. Sapphire Ltd intends to sell its own label wine for \$20 a bottle. It expects labour and materials will cost about \$12 a bottle. Fixed costs should be \$20,000 a month.
  - a. Calculate the contribution margin per unit.
  - b. Calculate the sales quantity and revenue required each month in order for Sapphire to break even.
  - c. If fixed costs were to decrease by 10 per cent, calculate the new breakeven point and revenue.
  - d. Sapphire's accountant has advised that cost-volume-profit calculations are useful, but not entirely accurate. Do you agree? Give brief reasons for your answer.
3. VP manufactures CDs for music publishers, in units of 100 disks. VP's variable labour cost is \$20 per unit and its variable material cost is \$40 per unit, while its fixed costs are \$800,000 per annum. VP's selling price is \$100 per unit.
  - a. Calculate VP's breakeven revenue.
  - b. Calculate VP's breakeven in units
  - c. VP is considering replacing its press with a faster machine which will reduce labour costs to \$10 per unit and increase fixed costs to \$1,000,000 per annum. With the drop in music sales, sales are expected to drop to 25,000 units per annum. Is this investment worthwhile? Show your calculations.
4. Soccer Imported Ltd imports soccer boots from Indonesia. The selling price is \$90 per pair of soccer boots (product A). The variable costs are \$50 per pair. The fixed costs are \$200,000. The manager of the company seeks your help to achieve the best result for the company. She provides you with the additional information:
  - A one-off special order has been received by a customer, who is willing to buy 200 units (pairs of soccer boots) for \$80 unit. This would require additional fixed costs of \$5,000, the variable costs per unit remain the same.
  - A new supplier has offered the company \$40 per pair (product B). This would require additional quality checks and



other increases of fixed costs by \$52,000. This offer replaces the current position of product A. The company would have a selling price of \$85 for product B.

- The market capacity is 9,000 units (pairs of soccer boots).
  - a. Identify the breakeven point in units (pairs of soccer boots) under the current position.
  - b. Determine whether the special order should be accepted with the new customer. Show all calculations.
  - c. Identify some of the problems that could be associated with completing the order.
  - d. Determine whether the new supplier offer should be accepted. Show all calculations.
  - e. Explain how the company could maximise profit if a mix of the two products was possible.

## Activity 2.1 Feedback

### 1. Jones Company

- a. Contribution margin percentage =  $(\$500,000 - \$350,000) \div \$500,000 = \$150,000 \div \$500,000 = 30\%$

*Note:* variable costs as a percentage of revenues  
 $= \$350,000 \div \$500,000 = 70\%$

- b. Breakeven point =  $\$135,000 \div 0.30 = \$450,000$

*Proof of breakeven point:*

Revenues	\$450,000
Variable costs, $\$450,000 \times 0.70$	<u>315,000</u>
Contribution margin	135,000
Fixed costs	<u>135,000</u>
Operating income	<u>\$ -0-</u>

- c. Let X = Total revenues needed to achieve target operating income of \$45,000

$$X = \frac{\$135,000 + \$45,000}{0.30} = \frac{\$180,000}{0.30} = \$600,000$$

- d. Two steps are used to obtain the answer. First, compute operating income when net income is \$48,000:

$$\square \quad \frac{\$48,000}{1 - 0.40} = \frac{\$48,000}{0.60} = \$80,000$$

□



Second, compute total revenues needed to achieve a target operating income of \$80,000 (that is, a target net income of \$48,000), which is denoted by Y:

$$Y = \frac{\$135,000 + \$80,000}{0.30} = \frac{\$215,000}{0.30} = \$716,667$$

## 2. Sapphire Ltd

a.  $(20 - 12) = 8$

b.  $20x - 12x - 20,000 = 0$

$$8x = 20,000$$

$$x = 2,500 \text{ bottles}$$

$$(20 \times 2,500) = \$50,000 \text{ revenue}$$

c.  $20,000 - (.1 \times 20,000) = 18,000$

$$20x - 12x - 18,000 = 0$$

$$8x = 18,000$$

$$x = 2,250 \text{ bottles}$$

$$(20 \times 2,250) = \$45,000 \text{ revenue}$$

d. Sapphire's accountant is correct.

While CVP is a useful tool for sales, variable costs and fixed costs are often estimates.

Sales values may vary due to discounts etc.

Amounts for fixed costs and variable costs are usually estimated, and may also increase or decrease.

Some costs may not be clearly separated into fixed and variable components.

## 3. VP

a.  $BE \text{ Rev} = FC/CM \text{ ratio} = \$800k/40\% = \$2,000,000$

*Or using the answer from below:*

$$BE \text{ Rev} = BEQty \times Price = 20,000 \times \$100 = \$2,000,000$$

b.  $BE \text{ Qty} = FC/CM = \$800k/(\$100 - 20 - 40) = \$800k/\$40 = 20,000 \text{ units}$

c. With new machine, at 25,000 units revenue is  $\$100 \times 25,000 = \$2,500,000$

$$\text{Costs are } FC + VC = \$1m + 25,000 \times (\$10 + \$40) = \$2,250,000$$

New machine will make a profit of \$250,000

$$\text{Old machine will make a profit of } CM \times \text{excess over } BEQty = \$40 \times 5,000 = \$200,000$$

The new machine is expected to make a greater profit than the old at the new lower sales level hence it is a worthwhile investment.



## 4. Soccer Imported Ltd

a.  $SP \$90 - VC \$50 = CM \$40$

Fixed Costs \$200,000

Breakeven in units =  $\$200,000 / \$40$

= 5,000 units

b. Special order

$SP \$80 - VC \$50 = CM \$30 * 200 = \$6,000$

Fixed costs increase \$5,000

Therefore increase in profit of \$1,000 so accept the order.

c. Existing customers may be alarmed that a new competitor for them is offered a cheaper price. What happens if the special one-off order becomes a regular occurrence? The existing charges of fixed costs would need to be recalculated.

d.  $SP \$85 - VC \$40 = CM \$45$

Fixed costs \$252,000

Breakeven in units =  $\$252,000 / \$45$

= 5,600 units

Or identify the profitability levels for each product:

Prod A Profit = \$160,000

Prod B Profit = \$153,000

So reject new supplier

e. Maximise the product with the highest contribution margin.

e.g. Product B  $6000 * \$45 CM = \$270,000$

Balance of market capacity with Product A  $3000 * \$40 = \$120,000$

Total = \$390,000

Less fixed costs \$210,000

Maximum potential profit \$180,000

## Unit 5

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### Relevant costs for decision making

#### Learning outcomes



Outcomes

Upon completion of this unit students will be able to:

- *Explain* the importance of relevant costs in decision-making.
- *Identify* relevant and non-relevant costs in various decision-making situations.
- *Evaluate* decisions involving relevant and non-relevant costs.
- *Explain* the qualitative characteristics that need to be considered when assessing alternatives.



## Activity 2.2



### Activity

1. The management of Mews Ltd. is considering dropping product E2. Data from the company's accounting system appear below:

Sales .....	\$480,000
Variable expenses .....	\$202,000
Fixed manufacturing expenses .....	\$158,000
Fixed selling and administrative expenses .....	\$130,000

All fixed expenses of the company are fully allocated to products in the company's accounting system. Further investigation has revealed that \$86,000 of the fixed manufacturing expenses and \$67,000 of the fixed selling and administrative expenses are avoidable if product E2 is discontinued.

- a. What is the net operating income earned by product E2 according to the company's accounting system? Show your calculations.
  - b. What would be the effect on the company's overall net operating income of dropping product E2? Should the product be dropped? Show your work!
2. Porch Ltd. makes 30,000 units per year of a part it uses in the products it manufactures. The unit product cost of this part is computed as follows:

Direct materials .....	\$15.70
Direct labor .....	17.50
Variable manufacturing overhead .....	4.50
Fixed manufacturing overhead .....	<u>14.60</u>
Unit product cost .....	<u>\$52.30</u>

An outside supplier has offered to sell the company all of these parts it needs for \$51.90 a unit. If the company accepts this offer, the facilities now being used to make the part could be used to make more units of a product that is in high demand. The additional contribution margin on this other product would be \$219,000 per year.

If the part were purchased from the outside supplier, all of the direct labour cost of the part would be avoided. However, \$6.20 of the fixed manufacturing overhead cost being applied to the part would continue even if the part were purchased from the outside supplier. This fixed manufacturing overhead cost would be applied to the company's remaining products.

- a. How much of the unit product cost of \$52.30 is relevant in the decision of whether to make or buy the part?
- b. What is the net total dollar advantage (disadvantage) of purchasing the part rather than making it?

- c. What is the maximum amount the company should be willing to pay an outside supplier per unit for the part if the supplier commits to supplying all 30,000 units required each year?
3. Nordstrom makes a range of products. The company's predetermined overhead rate is \$20 per direct labour-hour, which was calculated using the following budgeted data:

Variable manufacturing overhead .....	\$70,000
Fixed manufacturing overhead.....	\$630,000
Direct labor-hours .....	35,000

Component B6 is used in one of the company's products. The unit cost of the component according to the company's cost accounting system is determined as follows:

Direct materials .....	\$30.00
Direct labor .....	25.20
Manufacturing overhead applied .....	<u>24.00</u>
Unit product cost .....	<u>\$79.20</u>

An outside supplier has offered to supply component B6 for \$76 each. The outside supplier is known for quality and reliability. Assume that direct labour is a variable cost, variable manufacturing overhead is really driven by direct labour-hours and total fixed manufacturing overhead would not be affected by this decision. Nordstrom has idle capacity.

- a. Is the offer from the outside supplier financially attractive? Why?
4. Part F7 is used in one of Wiltshire Ltd.'s products. The company's accounting department reports the following costs of producing the 7,000 units of the part needed every year.

	Per Unit
Direct materials .....	\$7.00
Direct labor .....	\$6.00
Variable overhead .....	\$5.60
Supervisor's salary .....	\$4.70
Depreciation of special equipment.....	\$1.50
Allocated general overhead.....	\$5.40

An outside supplier has offered to make the part and sell it to the company for \$28.30 each. If this offer is accepted, the supervisor's salary and all of the variable costs, including direct labour, can be avoided. The special equipment used to make the part was purchased many years ago and has no salvage value or other use. The allocated general overhead represents fixed costs of the entire company. If the outside supplier's offer was accepted, only \$9,000 of these allocated general overhead costs would be avoided.

- a. Prepare a report that shows the effect on the company's total net operating income of buying part F7 from the supplier rather than continuing to make it inside the company.



- b. Which alternative should the company choose?

## Activity 2.2 Feedback

### 1. Mews Ltd

	Keep the Product	Drop the Product	Difference
Sales .....	\$480,000	\$0	(\$480,000)
Variable expenses .....	202,000	0	202,000
Contribution margin .....	278,000	0	( 278,000)
Fixed expenses:			
Fixed manufacturing expenses .....	158,000	72,000	86,000
Fixed selling and administrative expenses .....	130,000	63,000	67,000
Total fixed expenses .....	288,000	135,000	153,000
Net operating income (loss) .....	(\$10,000)	(\$135,000)	(\$125,000)

- a. According to the company's accounting system, the product's net operating loss is \$10,000.
- b. Net operating income would decline by \$125,000 if product E2 were dropped. Therefore, the product should not be dropped.

### 2. Porch Ltd.

#### a. Relevant cost per unit:

Direct materials .....	\$15.70
Direct labor .....	17.50
Variable manufacturing overhead .....	4.50
Fixed manufacturing overhead .....	8.40
Relevant manufacturing cost .....	<u>\$46.10</u>

#### b. Net advantage (disadvantage):

Manufacturing cost savings .....	\$1,383,000
Additional contribution margin .....	219,000
Cost of purchasing the part .....	(1,557,000)
Net advantage (disadvantage) .....	<u>\$45,000</u>

#### c. Maximum acceptable purchase price:

Manufacturing cost savings .....	\$1,383,000
Additional contribution margin .....	219,000
Total benefit .....	<u>\$1,602,000</u>
Number of units .....	30,000
Benefit per unit .....	\$53.40

## 3. Nordstrom Ltd.

Direct materials, direct labour and variable manufacturing overhead are relevant in this decision. Fixed manufacturing overhead is not relevant since it would not be affected by the decision. The variable portion of the manufacturing overhead rate is computed as follows:

Variable manufacturing overhead .....	\$70,000
÷ Direct labor-hours .....	35,000
= Variable portion of the predetermined overhead rate ..	\$2.00

The direct-labor hours per unit for the special order can be determined as follows:

Manufacturing overhead applied .....	\$24.00
÷ Predetermined overhead rate.....	\$20.00
= Direct labor-hours .....	1.20

Consequently, the variable manufacturing overhead for the special order would be:

Variable portion of the predetermined overhead rate .....	\$2.00
× Direct labor-hours .....	1.20
= Variable manufacturing overhead.....	<u>\$2.40</u>

Putting this all together:

Direct materials .....	\$30.00
Direct labor .....	25.20
Variable manufacturing overhead .....	2.40
Total variable cost .....	<u>\$57.60</u>

Since the outside supplier has offered to sell the component for \$76.00 each, but it only costs the company \$57.60 to make the component internally, this is not a financially attractive offer.

## 4. Wiltshire Ltd.

a.	Make	Buy
Direct materials (7,000 units @ \$7.00 per unit)....	\$49,000	
Direct labor (7,000 units @ \$6.00 per unit) .....	42,000	
Variable overhead		
(7,000 units @ \$5.60 per unit).....	39,200	
Supervisor's salary		
(7,000 units @ \$4.70 per unit).....	32,900	
Depreciation of special equipment (not relevant) ..	0	
Allocated general overhead (avoidable only).....	9,000	
Outside purchase price		
(7,000 units @ \$28.30 per unit).....		\$198,100
Total cost .....	<u>\$172,100</u>	<u>\$198,100</u>

- b. The total cost of the make alternative is lower by \$26,000. Thus, net operating income would decline by \$26,000 if the offer from the supplier was accepted. Therefore, the company should continue to make the part itself.



## Module 3

### Introduction

This module is designed to further enhance knowledge about management accounting techniques. In particular, the student is introduced to the role of budgeting, the construction of a budget and its use in managerial decision-making. We will then discuss the concept of standard costing and variance analysis.

Upon completion of this module students will be able to:



#### Outcomes

- *Demonstrate* knowledge and understanding of the role of budgets in providing information for decision-making purposes.
- *Demonstrate* knowledge and understanding of the need to produce flexible budgets.
- *Demonstrate* knowledge and understanding of the content of the concept of standard costing.
- *Demonstrate* knowledge and understanding of variance analysis and the ability to interpret the results of this analysis.



## Unit 6

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### Budgeting

#### Learning outcomes



Outcomes

Upon completion of this unit students will be able to:

- *Explain* the purpose of a budget.
- *Understand* the components of a master budget.
- *Prepare* a sales budget.
- *Prepare* an operations budget.
- *Prepare* a cash budget.
- *Explain* the purpose of a flexible budget.
- *Prepare* a flexible budget and analyse the output.

## Activity 3.1



### Activity

For the organisation that you are involved with, answer the following questions:

1. What types of budgets are prepared?
2. Describe the budget preparation process.
3. For what period (daily, weekly, monthly, annually) are the budgets prepared?
4. How often is actual performance assessed against the budget?
5. Describe what part performance against budget plays in the process for the evaluation of managerial performance.

## Activity 3.2



### Activity

1. A sales budget is given below for one of the products manufactured by Key Limited:

	Sales Budget in Units
January .....	20,000
February .....	35,000
March .....	60,000
April .....	40,000
May .....	30,000
June .....	25,000

The inventory of finished goods at the end of each month must equal 20 per cent of the next month's sales. On December 31, the finished goods inventory totalled 4,000 units.

Each unit of product requires three specialised electrical switches. Since the production of these specialised switches by Key's suppliers is sometimes irregular, the company has a policy of maintaining an ending inventory at the end of each month equal to 30 per cent of the next month's production needs. This requirement had been met on January 1 of the current year.

#### Required:

Prepare a budget showing the quantity of switches to be purchased each month for January, February and March and in total for the quarter.

2. Glendale Limited is working on its direct labour budget for the next two months. Each unit of output requires 0.29 direct labour-hours. The direct labour rate is \$7.00 per direct labour-hour. The production budget calls for producing 5,600 units in June and 6,100 units in July.

**Required:**

Prepare the direct labour budget for the next two months, assuming that the direct labour work force is fully adjusted to the total direct labour-hours needed each month.

3. Govan Limited bases its manufacturing overhead budget on budgeted direct labour-hours. The variable overhead rate is \$5.10 per direct labour-hour. The company's budgeted fixed manufacturing overhead is \$78,840 per month, which includes depreciation of \$20,520. All other fixed manufacturing overhead costs represent current cash flows. The November direct labour budget indicates that 5,400 direct labour-hours will be required in that month.

**Required:**

- a. Determine the cash disbursement for manufacturing overhead for November.
- b. Determine the predetermined overhead rate for November.
4. Bowling Limited bases its selling and administrative expense budget on the number of units sold. The variable selling and administrative expense is \$8.30 per unit. The budgeted fixed selling and administrative expense is \$93,870 per month, which includes depreciation of \$16,380. The remainder of the fixed selling and administrative expense represents current cash flows. The sales budget shows 6,300 units are planned to be sold in July.

**Required:**

Prepare the selling and administrative expense budget and the related cash budget for July.

5. Domin Corporation bases its budgets on the activity measure of customers served. During April, the company planned to serve 31,000 customers, but actually served 35,000 customers. Revenue is \$4.80 per customer served. Wages and salaries are \$33,000 per month plus \$1.60 per customer served. Supplies are \$1.00 per customer served. Insurance is \$12,200 per month. Miscellaneous expenses are \$7,400 per month plus \$0.20 per customer served.

**Required:**

Prepare a report showing the company's activity variances for April. Indicate in each case whether the variance is favourable (F) or unfavourable (U).

6. Ahrns Tech is a for-private teaching establishment. The school bases its budgets on two measures of activity (in other words, cost drivers),

	Fixed element per month	Variable element per student	Variable element per course
Revenue.....	\$0	\$362	\$0
Faculty wages.....	\$0	\$0	\$2,500
Course supplies .....	\$0	\$51	\$24
Administrative expenses ....	\$45,200	\$15	\$20



namely student and course. The school uses the following data in its budgeting:

In July, the school budgeted for 1,770 students and 148 courses. The school's income statement showing the actual results for the month appears below:

Ahrns Tech Income Statement For the Month Ended July 31	
Actual students .....	1,470
Actual courses .....	149
Revenue .....	<u>\$544,100</u>
Expenses:	
Faculty wages .....	371,110
Course supplies .....	78,856
Administrative expenses ..	<u>71,070</u>
Total expense .....	<u>521,036</u>
Net operating income .....	<u>\$ 23,064</u>

**Required:**

Prepare a report showing the school's revenue and spending variances for July. Label each variance as favourable (F) or unfavourable (U).

## Activity 3.1 Feedback

Your answers will depend on the organisation you choose.

## Activity 3.2 Feedback

1. Key Limited

The company's production budget is as follows:

	January	February	March	April
Budgeted sales (units) .....	20,000	35,000	60,000	40,000
Add: Desired ending inventory .....	7,000	12,000	8,000	6,000
Total needs .....	27,000	47,000	68,000	46,000
Deduct: Beginning inventory .....	4,000	7,000	12,000	8,000
Units to be produced .....	23,000	40,000	56,000	38,000

The materials purchases budget (based on the above production budget) would be as follows:

	January	February	March	Quarter
Units to be produced .....	23,000	40,000	56,000	119,000
Switches per unit .....	×3	×3	×3	×3
Production needs .....	69,000	120,000	168,000	357,000
Add: Desired ending inventory ...	36,000	50,400	**34,200	34,200
Total needs .....	105,000	170,400	202,200	391,200
Deduct: Beginning inventory .....	*20,700	36,000	50,400	20,700
Required purchases .....	84,300	134,400	151,800	370,500

\*January beginning inventory =  $(23,000 \times 30\%) \times 3 = 20,700$

\*\* March ending inventory =  $(38,000 \times 30\%) \times 3 = 34,200$

## 2. Glendale Limited

The direct labour budget for the next two months, assuming that the direct labour work force is fully adjusted to the total direct labour-hours needed each month, is as follows:

	June	July
Required production in units .....	5,600	6,100
Direct labor-hours per unit .....	0.29	0.29
Total direct labor-hours needed .....	1,624	1,769
Direct labor cost per hour .....	\$7	\$7
Total direct labor cost .....	\$11,368	\$12,383

## 3. Govan Limited

a.	November
Budgeted direct labor-hours .....	5,400
Variable overhead rate .....	\$5.10
Variable manufacturing overhead .....	\$27,540
Fixed manufacturing overhead .....	78,840
Total manufacturing overhead .....	106,380
Less depreciation .....	20,520
Cash disbursement for manufacturing overhead .....	\$85,860
b. Total manufacturing overhead (a) .....	\$106,380
Budgeted direct labor-hours (b) .....	5,400
Predetermined overhead rate for the month (a)/(b) ...	\$19.70

## 4. Bowling Limited

	July
Budgeted unit sales .....	6,300
Variable selling and administrative expense per unit .....	\$8.30
Budgeted variable expense .....	\$52,290
Budgeted fixed selling and administrative expense .....	93,870
Total budgeted selling and administrative expense .....	146,160
Less depreciation .....	16,380
Cash disbursements for selling and administrative expenses ...	\$129,780



## 5. Domin Corporation

Domin Corporation  
Activity Variances  
For the Month Ended April 30

	Planning Budget	Flexible Budget	Activity Variances	
Customers served (q) .....	31,000	35,000		
Revenue (\$4.80q) .....	\$148,800	\$168,000	\$19,200	F
Expenses:				
Wages and salaries (\$33,000 + \$1.60q) .....	82,600	89,000	6,400	U
Supplies (\$1.00q) .....	31,000	35,000	4,000	U
Insurance (\$12,200) .....	12,200	12,200	0	
Miscellaneous (\$7,400 + \$0.20q) .....	13,600	14,400	800	U
Total expense .....	139,400	150,600	11,200	U
Net operating income .....	\$9,400	\$17,400	\$8,000	F

## 6. Ahrns Tech

Ahrns Tech  
Revenue and Spending Variances  
For the Month Ended July 31

	Flexible Budget	Actual Results	Revenue and Spending Variances	
Students (q1) .....	1,470	1,470		
Courses (q2) .....	149	149		
Revenue (\$362q1) .....	\$532,140	\$544,100	\$11,960	F
Expenses:				
Faculty wages (\$2,500q2) .....	372,500	371,110	1,390	F
Course supplies (\$51q1 + \$24q2) ..	78,546	78,856	310	U
Administrative expenses (\$45,200 + \$15q1 + \$20q2) .....	70,230	71,070	840	U
Total expense .....	521,276	521,036	240	F
Net operating income .....	\$10,864	\$23,064	\$12,200	F

## Unit 7

### Standard costs

#### Learning outcomes



Outcomes

Upon completion of this unit students will be able to:

- *Explain* the purpose and role of standard costs.
- *Describe* the advantages and limitations of standard costs.
- *Identify* the steps involved in setting standards.
- *Explain* the purpose of variance analysis.
- *Calculate* variances from expected results.

## Activity 3.3



### Activity

For the organisation that you are involved with, answer the following questions:

1. Does the organisation prepare standard costs? If so:
  - a. What type of standards do they use – ideal or achievable?
  - b. How often are variance reports produced?
  - c. Does management investigate all variances?
  - d. How often are standards revised?
2. If your organisation does not use standard costs, describe how your organisation controls costs.

## Activity 3.4



### Activity

1. Spratt Limited is developing standards for its products. One product requires an input that is purchased for \$62.00 per kilogram from the supplier. By paying cash, the company gets a discount of 6 per cent off this purchase price. Shipping costs from the supplier's warehouse amount to \$4.45 per kilogram. Receiving costs are \$0.50 per kilogram. Each unit of output requires 0.48 kilogram of this input. The allowance for waste and spoilage is 0.04 kilogram of this input for each unit of output. The allowance for rejects is 0.13 kilogram of this input for each unit of output.

**Required:**

- a. Determine the standard price per kilogram of this input. Show your workings.
  - b. Determine the standard kilograms of this input per unit of output. Show your workings.
2. Pittfield Limited is developing direct labour standards. The basic direct labour wage rate is \$13.90 per hour. Employment taxes are 10 per cent of the basic wage rate. Fringe benefits are \$4.28 per hour. A particular product requires 0.90 direct labour-hours per unit. The allowance for breaks and personal needs is 0.07 direct labour-hours per unit. The allowance for clean-up, machine downtime, and rejects is 0.12 direct labour-hours per unit.

**Required:**

- a. Determine the standard rate per direct labour-hour.
- b. Determine the standard direct labour-hours per unit of product.
- c. Determine the standard labour cost per unit of product to the nearest cent.



3. Lindos Limited's standard and actual costs per unit for the most recent period, during which 400 units were actually produced, are given below:

	Standard	Actual
Materials:		
Standard: 2 foot at \$1.50 per foot .....	\$ 3.00	
Actual: 2.1 foot at \$1.60 per foot .....		\$ 3.36
Direct labor:		
Standard: 1.5 hours at \$6.00 per hour .....	9.00	
Actual: 1.4 hours at \$6.50 per hour .....		9.10
Variable overhead:		
Standard: 1.5 hours at \$3.40 per hour .....	<u>5.10</u>	
Actual: 1.4 hours at \$3.10 per hour .....		<u>4.34</u>
Total unit cost .....	<u>\$17.10</u>	<u>\$16.80</u>

**Required:**

From the foregoing information, calculate the following variances. Show whether the variance is favourable (F) or unfavourable (U):  
Materials price variance.

- Materials quantity variance.
  - Materials quantity variance.
  - Direct labour rate variance.
  - Direct labour efficiency variance.
  - Variable overhead rate variance.
  - Variable overhead efficiency variance.
4. The following materials standards have been established for a particular product:

Standard quantity per unit of output .....	5.2	meters
Standard price .....	\$15.60	per meter

The following data pertain to operations concerning the product for the last month:

Actual materials purchased .....	8,500	meters
Actual cost of materials purchased .....	\$139,400	
Actual materials used in production .....	8,200	meters
Actual output .....	1,640	units

**Required:**

- What is the materials price variance for the month?
  - What is the materials quantity variance for the month?
5. Metzger Limited's variable overhead is applied on the basis of direct labour-hours. The standard cost card for product M70T specifies 7.7 direct labour-hours per unit of M70T. The standard variable overhead rate is \$6.30 per direct labour-hour. During the most recent month, 400 units of product M70T were made and 3,000 direct labour-hours were worked. The actual variable overhead incurred was \$18,000.

**Required:**

- a. What was the variable overhead rate variance for the month?
  - b. What was the variable overhead efficiency variance for the month?
6. Stafford Limited, which makes landing gear for aircraft, has provided the following data for a recent month:

Budgeted production .....	8,400	gears
Standard machine-hours per gear .....	9.4	machine-hours
Budgeted supplies cost .....	\$2.40	per machine-hour
Actual production .....	8,500	gears
Actual machine-hours .....	79,030	machine-hours
Actual supplies cost (total) .....	\$210,524	

**Required:**

Determine the rate and efficiency variances for the variable overhead item supplies and indicate whether those variables are favourable or unfavourable.

## Activity 3.3 Feedback

Your answers will depend on the organisation you choose.

## Activity 3.4 Feedback

1. Spratt Limited
  - a. Determine the standard price per kilogram of this input. Show your workings.
  - b. Determine the standard kilograms of this input per unit of output. Show your workings.

a. Standard price	
Purchase price .....	\$62.00
Less cash discount .....	(3.72)
Shipping costs from the supplier's warehouse .....	4.45
Receiving costs .....	0.50
Standard price per kilogram .....	<u>\$63.23</u>
b. Standard quantity	
Material requirement per unit of output, in kilograms ....	0.48
Allowance for waste and spoilage, in kilograms .....	0.04
Allowance for rejects, in kilograms .....	0.13
Standard quantity per unit of output, in kilograms .....	<u>0.65</u>

2. Pittfield Limited

a. Standard rate per direct labor-hour:	
Basic wage rate per hour .....	\$13.90
Employment taxes .....	1.39
Fringe benefits .....	4.28
Standard rate per direct labor-hour .....	<u>\$19.57</u>
b. Standard direct-labor hours per unit of output:	
Basic labor time per unit .....	0.90 DLHs
Allowance for breaks and personal needs .....	0.07 DLHs
Allowance for cleanup, machine downtime, and rejects .....	0.12 DLHs
Standard direct-labor hours per unit .....	<u>1.09 DLHs</u>
c. Standard labor cost per unit:	
Standard rate per direct labor-hour (a) .....	\$19.57
Standard direct-labor hours per unit (b) .....	1.09
Standard labor cost per unit (a) × (b) .....	<u>\$21.33</u>

3. Lindos Limited

- a. Materials price variance =  $AQ(AP - SP)$   
 $= (2.1 \times 400) \times (\$1.60 - \$1.50) = \$84 \text{ U}$
- b. Materials quantity variance =  $SP(AQ - SQ)$   
 $= \$1.50(2.1 \times 400 - 2.0 \times 400) = \$60 \text{ U}$
- c. Direct labour rate variance =  $AH(AR - SR)$   
 $= (1.4 \times 400) \times (\$6.50 - \$6.00) = \$280 \text{ U}$
- d. Direct labour efficiency variance =  $SR(AH - SH)$   
 $= \$6.00(1.4 \times 400 - 1.5 \times 400) = \$240 \text{ F}$
- e. Variable overhead rate variance =  $AH(AR - SR)$   
 $= (1.4 \times 400) \times (\$3.10 - \$3.40) = \$168 \text{ F}$
- f. Variable overhead efficiency variance =  $SR(AH - SH)$   
 $= \$3.40(1.4 \times 400 - 1.5 \times 400) = \$136 \text{ F}$

4. a. Materials price variance =  $(AQ \times AP) - (AQ \times SP)$   
 $= \$139,400 - (8,500 \times \$15.60) = \$6,800 \text{ U}$
- b.  $SQ = \text{Standard quantity per unit} \times \text{Actual output}$   
 $= 5.2 \times 1,640 = 8,528$   
 Materials quantity variance =  $SP(AQ - SQ)$   
 $= \$15.60(8,200 - 8,528) = \$5,117 \text{ F}$

5. Metzger Limited

- a. Variable overhead rate variance =  $(AH \times AR) - (AH \times SR)$   
 $= \$18,000 - (3,000 \times \$6.30) = \$900 \text{ F}$
- b. Variable overhead efficiency variance =  $SR(AH - SH^*)$   
 $= \$6.30(3,000 - 3,080) = \$504 \text{ F}$   
 $*SH = \text{Standard hours per unit} \times \text{Actual output} = 7.7 \times 400 = 3,080$



6. Stafford Limited

Standard machine-hours allowed for the actual output =  $9.4 \times 8,500$   
= 79,900

Variable overhead rate variance =  $(AH \times AR) - (AH \times SR)$   
=  $\$210,524 - (79,030 \times \$2.40) = \$210,524 - \$189,672 = \$20,852 \text{ U}$

Variable overhead efficiency variance =  $(AH \times SR) - (SH \times SR)$   
=  $(79,030 \times \$2.40) - (79,900 \times \$2.40) = \$189,672 - \$191,760 =$   
\$2,088 F

## Module 4

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### Introduction

This module is designed to enhance your knowledge of management accounting techniques. In particular you will be introduced to two aspects of reporting, first how organisations deal with segmental or divisional reporting and secondly the module concludes with a discussion on the balanced scorecard. The module also discusses one particular aspect of segmental or divisional trading and that is the setting of transfer prices.

Upon completion of this module students will be able to:



#### Outcomes

- *Demonstrate* knowledge and understanding of the issues surrounding segmental or divisional reporting.
- *Demonstrate* knowledge and understanding of the need for transfer pricing; the various methodologies; and the additional complication of multi-national divisions.
- *Demonstrate* knowledge and understanding of the philosophy of the Balanced Scorecard; its contents; how to design one, and the associated implementation issues.

## Unit 8

### Segment reporting and decentralisation

#### Learning outcomes



#### Outcomes

Upon completion of this unit students will be able to:

- *Explain* the difference between a centralised and decentralised organisation.
- *Describe* the advantages of both a centralised and decentralised organisation.
- *Understand* the differences between the categories of responsibility centre.
- *Explain* segment margin.
- *Calculate* return on investment and residual income.

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## Activity 4.1



### Activity

1. For the organisation that you are involved with, obtain or prepare an organisation chart that highlights the key areas of responsibility.
2. In your opinion would you describe your organisation as centralised or decentralised? Explain your answer.

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## Activity 4.2



### Activity

1. Forsyth Limited has two business segments – retail and wholesale.  
In March, the retail business segment had sales revenues of \$500,000, variable expenses of \$245,000, and traceable fixed expenses of \$90,000. During the same month, the wholesale business segment had sales revenues of \$240,000, variable expenses of \$101,000, and traceable fixed expenses of \$38,000. Common fixed expenses totalled \$152,000 and were allocated as follows: \$79,000 to the retail business segment and \$73,000 to the wholesale business segment.
  - a. Prepare a segmented income statement in the contribution format for the company.
2. Watford Limited had net operating income of \$150,000 and average operating assets of \$500,000. The company requires a return on investment of 19 per cent.
  - a. Calculate the company's current return on investment and residual income.
  - b. The company is investigating an investment of \$400,000 in project that will generate annual net operating income of \$78,000. What is the return on investment and residual income of the project? Should the company invest in this project?
3. Old Limited uses residual income to evaluate the performance of its divisions. The minimum required rate of return for performance evaluation purposes is 16 per cent. The Games Division had average operating assets of \$470,000 and net operating income of \$72,900 in September.
  - a. What was the Games Division's residual income in September?
4. The Consumer Products Division of Geraldo Limited had average operating assets of \$300,000 and net operating income of \$46,900 in March. The minimum required rate of return for performance evaluation purposes is 16 per cent.
  - a. What was the Consumer Products Division's minimum



required return in March?

- b. What was the Consumer Products Division's residual income in March?

## Activity 4.1 Feedback

Your responses will depend on the organisation you choose.

## Activity 4.2 Feedback

1. Forsyth Limited

	Total	Retail	Wholesale
Sales .....	\$740,000	\$500,000	\$240,000
Variable expenses .....	346,000	245,000	101,000
Contribution margin .....	394,000	255,000	139,000
Traceable fixed expenses ...	128,000	90,000	38,000
Segment margin .....	266,000	\$165,000	\$101,000
Common fixed expenses ....	152,000		
Net operating income .....	<u>\$114,000</u>		

2. Watford Limited

- a. Return on investment = Net operating income ÷ Average operating assets = \$150,000 ÷ \$500,000 = 30%

Residual income = Net operating income - (Average operating assets x Minimum required rate of return) =  
\$150,000 - (\$500,000 x 0.19) = \$55,000

- b. Return on investment = Net operating income ÷ Average operating assets = \$78,000 ÷ \$400,000 = 19.5%

Residual income = Net operating income - (Average operating assets x Minimum required rate of return) =  
\$78,000 - (\$400,000 x 0.19) = \$2,000

The company should invest in this project since its rate of return exceeds the minimum required rate of return. In other words, its residual income is positive.

3. Old Limited

Net operating income .....	\$72,900
Minimum required return (16% × \$470,000) .....	75,200
Residual income .....	<u>(\$2,300)</u>



4. Geraldo Limited

- a. Minimum required return =  $\$300,000 \times 16\% = \$48,000$
- b. Residual income = Net operating income - Minimum required rate of return x Average operating assets =  $\$46,900 - (16\% \times \$300,000) = -\$1,100$

## Unit 9

### Transfer pricing

#### Learning outcomes



#### Outcomes

Upon completion of this unit students will be able to:

- *Explain* the need for transfer pricing.
- *Describe* situations that arise that lead to less profits overall for an organisation.
- *Describe* the different methods of arriving at a transfer price.
- *Explain* the objectives of transfer pricing.
- *Determine* the range, if any, within which a negotiated transfer price should fall.
- *Explain* the effects of different country tax rates on transfer pricing decisions.

## Activity 4.3



### Activity

1. For the organisation that you are involved with, find out if products or services are transferred internally between segments or divisions.
2. If your organisation does transfer products or services internally, find out how the transfer price is established. Does this price enable a reasonable performance evaluation of both the transferring and receiving segments or divisions?

## Activity 4.4



### Activity

1. Division A of Chopper Limited makes and sells a single product which is used by manufacturers of fork lift trucks. Presently it sells 12,000 units per year to outside customers at \$24 per unit. The annual capacity is 20,000 units and the variable cost to make each unit is \$16.

Division B of Chopper Limited would like to buy 10,000 units a year from Division A to use in its products. There would be no cost savings from transferring the units within the company rather than selling them on the outside market.

- a. What should be the lowest acceptable transfer price from the perspective of Division A?
2. Part W4 costs the East Division of Tyrone Limited \$26 to make—direct materials are \$10, direct labour is \$4, variable manufacturing overhead is \$9, and fixed manufacturing overhead is \$3. The East Division can sell all of Part W4 they can make to other companies for \$30. The West Division of Tyrone Limited can use part W4 in one of its products.
    - a. What is the lowest transfer price at which the East Division would be willing to sell part W4 to the West Division?
  3. The Pump Division of Thorn Limited produces pumps which it sells for \$20 each to outside customers. The Pump Division's cost per pump, based on normal volume of 500,000 units per period, is shown below:

• Variable costs	\$12.00
• Fixed costs	<u>\$3.00</u>
• Total cost	<u>\$15.00</u>

Thorn has recently purchased a small company which makes automatic dishwashers. This new company is presently purchasing 100,000 pumps each year from another manufacturer. Since the Pump Division has a capacity of 600,000 pumps per year and is now selling only 500,000 pumps to outside customers, management would like the new Dishwasher Division to begin purchasing its pumps internally. The Dishwasher Division is now paying \$20 per pump,



less a 10 per cent quantity discount. The Pump Division could avoid \$1 per unit in variable costs on any sales to the Dishwasher Division.

- a. Treating each division as an independent profit centre, within what price range should the internal sales price fall?
  - b. Now assume that the Pump Division is selling 600,000 pumps per year to outside customers. Determine the appropriate transfer price.
4. Eastman Limited has a Parts Division that does work for other divisions in the company as well as for outside customers. The company's Machine Products Division has asked the Parts Division to provide it with 10,000 special parts each year. The special parts would require \$15.00 per unit in variable production costs.

The Machine Products Division has a bid from an outside supplier for the special parts at \$29.00 per unit. In order to have time and space to produce the special part, the Parts Division would have to cut back production of another part-the H5 that it presently is producing.

The H5 sells for \$32.00 per unit, and requires \$19.00 per unit in variable production costs. Packaging and shipping costs of the H5 are \$3.00 per unit. Packaging and shipping costs for the new special part would be only \$1.00 per unit. The Parts Division is now producing and selling 40,000 units of the H5 each year. Production and sales of the H5 would drop by 20 per cent if the new special part is produced for the Machine Products Division.

- a. What is the range of transfer prices within which both the divisions' profits would increase as a result of agreeing to the transfer of 10,000 special parts per year from the Parts Division to the Machine Products Division?
- b. Is it in the best interests of Eastman Limited for this transfer to take place? Explain.

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## Activity 4.3 Feedback

Your responses will depend on the organisation you choose.

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## Activity 4.4 Feedback

1. Chopper Limited

From the perspective of division A, profits would increase as a result of the transfer if, and only if:

Transfer price > Variable cost + Opportunity cost.

The opportunity cost is the contribution margin on the lost sales, divided by the number of units transferred:

$$\text{Opportunity cost} = [(\$24 - \$16) \times 2,000] \div 10,000 = \$1.60$$

$$*10,000 - (20,000 - 12,000) = 2,000$$

$$\text{Therefore, Transfer price} > \$16 + \$1.60 = \$17.60.$$

## 2. Tyrone Limited

From the perspective of the East division, profits would increase as a result of the transfer if and only if:

$$\text{Transfer price} > \text{Variable cost} + \text{Opportunity cost}$$

The opportunity cost is the contribution margin on the lost sales, divided by the number of units transferred:

$$\text{Opportunity cost} = \$30 - \$10 - \$4 - \$9 = \$7 \text{ each}$$

$$\text{Therefore, Transfer price} > \$23 + \$7 = \$30.$$

## 3. Thorn Limited

- a. Current price being paid by the Dishwasher Division:

$$\$20 - (10\% \times \$20) = \$18$$

Using the transfer pricing formula, the minimum transfer price is:

$$\begin{aligned} \text{Transfer Price} &> \text{Variable Costs} + \text{Lost Contribution Margin} \\ &> \$11 + \$0 = \$11 \end{aligned}$$

Therefore, the transfer price would be between \$11 and \$18 per unit.

- b. In this case there is no idle capacity. Therefore, the appropriate transfer price would be:

$$\begin{aligned} \text{Transfer Price} &> \text{Variable Costs} + \text{Lost Contribution Margin} \\ &> \$11 + (\$20 - \$12) = \$11 + \$8 = \$19 \end{aligned}$$

## 4. Eastman Limited

- a. From the perspective of the Parts Division, profits would increase as a result of the transfer if, and only if:

$$\text{Transfer price} > \text{Variable cost} + \text{Opportunity cost}.$$

The opportunity cost is the contribution margin on the lost sales, divided by the number of units transferred:

$$\begin{aligned} \text{Opportunity cost} &= [(\$32.00 - \$19.00 - \$3.00) \times 8,000] / 10,000 \\ &= \$8.00 \end{aligned}$$

$$* 20\% \times 40,000 = 8,000$$

$$\text{Therefore, Transfer price} > (\$15.00 + \$1.00) + \$8.00 = \$24.00.$$

From the viewpoint of the Machine Products Division, the transfer price must be less than the cost of buying the units from the outside supplier. Therefore, Transfer price < \$29.00.



Combining the two requirements, we get the following range of transfer prices:  $\$24.00 < \text{Transfer price} < \$29.00$ .

- b. Yes, the transfer should take place. From the viewpoint of the entire company, the cost of transferring the units within the company is \$24.00, but the cost of purchasing the special parts from the outside supplier is \$29.00. Therefore, the company's profits increase on average by \$5.00 for each of the special parts that is transferred within the company, even though this would cut into production and sales of another product.

## Unit 10

### Balanced scorecard

#### Learning outcomes



#### Outcomes

Upon completion of this unit students will be able to:

- *Describe* the purpose of a Balanced Scorecard.
- *Understand* how to use and construct a balanced scorecard.
- *Identify* and describe the four perspectives of the balanced scorecard.
- *Explain* the process for designing a balanced scorecard.
- *Describe* situations that lead to poor implementation of a balanced scorecard.

## Activity 4.5



### Activity

1. For the organisation you are involved with, find out if management use a scorecard to monitor progress towards achieving the organisation's strategic goals.
  - a. If a scorecard is used find out what measures are used and how often they are updated.
  - b. If a scorecard is not used, develop a scorecard that you believe is appropriate for the organisation.

## Activity 4.6



### Activity

1. With a balanced scorecard approach to business performance measurement, what difficulties could occur when trying to balance the four perspectives?
2. Why has the balanced scorecard become such an essential part of so many business management toolkits in recent years?
3. How can the balanced scorecard be used to achieve improved business performance?
4. The balanced scorecard appears to be the grouping together of a number of well-established principles and techniques. In what way does it represent a new technique?
5. Dynamic Systems Limited (DSL) is a small information systems consulting company which specialises in helping companies to implement production control software. The information systems consulting business is highly competitive and DSL must deliver quality service at a competitive cost. The company bills its clients in terms of units of work performed, which depends on the size and complexity of the client's production control system. The following data are provided:

	<u>2009</u>	<u>2010</u>
Units of work performed and sold	60	70
Selling price	\$100,000	\$96,000
Software implementation labour costs	\$3,600,000	\$4,032,000
Software implementation support costs	\$720,000	\$738,000
Selling and customer service costs	\$2,000,000	\$1,881,000
Software development staff	3	3
Software development costs	\$750,000	\$780,000
Software development costs per employee	\$250,000	\$260,000



At the beginning of each year management determines the number of software development staff for the year, but is aware that software development is an important factor in the company's strategy.

- a. Outline the four major sections of a 2010 balanced scorecard for DSL, and indicate at least two measures for each section.
- b. Outline why each measure is likely to lead to improvements in performance.

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## Activity 4.5 Feedback

Your responses will depend on the organisation you choose.

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## Activity 4.6 Feedback

1. With a balanced scorecard approach to business performance measurement, what difficulties could occur when trying to balance the four perspectives?

Answers could include:

- The four perspectives are quite different, and may well be strongly put by experts in one of the areas.
  - Ensuring that the debate is actually balanced will likely prove very difficult.
  - Determining appropriate measures of performance for the four areas will also be difficult, given that some are more easily measurable than others. Measurement scales will be a particular problem.
  - Getting all participants to think strategically.
  - Developing links with all stakeholders, especially avoiding cynicism.
2. Why has the balanced scorecard become such an essential part of so many business management toolkits in recent years?

The balanced scorecard has become an essential part of the management process because it gives top managers a quick but comprehensive view of the business. The balanced scorecard not only includes financial measures, but also includes non-financial (operational) measures on customer satisfaction, internal processes, and the organisation's innovation and improvement activities – operational measures that are the drivers of future financial performance.

The balanced scorecard provides a framework for translating management strategy into operational terms. It is a performance



measurement system that identifies and reports on performance measures for each key strategic area of the business. Performance measures are developed for each level of the organisation that reflect the four perspectives inherent in the scorecard, namely financial, customer, internal business processes, and learning and growth.

The measures in the scorecard provide balance between:

- short-term and long-term objectives,
- the four perspectives,
- outcome measures and the measures of the drivers of those outcomes, and
- measures that are objective and easily quantified versus subjective performance measures.

3. How can the balanced scorecard be used to achieve improved business performance?

The balanced scorecard can be used to improve business performance because the system identifies:

- key performance indicators
- key performance drivers; and
- critical success factors.

Performance measurement systems should focus on these factors.

4. The balanced scorecard appears to be the grouping together of a number of well-established principles and techniques. In what way does it represent a new technique?

The balanced scorecard is a tool that incorporates the various types of key performance indicators (KPIs) and key performance drivers (KPDs) into a type of map that demonstrates how an entity can improve the outcome measures, such as return on assets, by making improvements in the aspects of the business that drive the improvements.

It integrates a wide range of non-financial performance measures with financial performance measures.

The balanced scorecard is structured to reflect 'cause and effect' relationships between the objectives and measuring these objectives.

5. DSL balanced scorecard

- Balanced scorecard measures for 2010 follow:
  - a. **Financial perspective**
    - operating income
    - revenues per employee
    - cost reductions in key areas, for example, software implementation and overhead costs.

These measures indicate whether DSL has been able to reduce costs and achieve operating income increases through cost leadership.

**b. Customer perspective**

- market share
- new customers
- speed of responding to customers
- customer satisfaction.

DSL's strategy should result in improvements in these customer measures that help evaluate whether DSL's cost leadership strategy is succeeding with its customers. These measures are leading indicators of superior financial performance.

**c. Internal business process perspective**

- time to complete customer jobs
- time lost due to errors
- quality of job (e.g. Is system running smoothly after the job is completed? What is the number of reported breakdowns?)
- Time required to analyse and design implementation steps
- time taken to perform key steps implementing the software.

Improvements in these measures are key drivers of achieving cost leadership and are expected to lead to more satisfied customers, lower costs, and superior financial performance.

**d. Learning and growth perspective**

- skill levels of employees
- hours of employee training
- employee satisfaction and motivation.

Improvements in these measures are likely to improve DSL's ability to achieve cost leadership and have a cause-and-effect relationship with improvements in internal business processes, customer satisfaction, and financial performance.

# Module 5

## Introduction

This and the remaining modules in this course are related to the finance topic. This module is designed as a high level overview of finance, financial markets and their participants and an introduction to the time value of money, a concept that lies at the heart of finance decision-making.

Upon completion of this module students will be able to:



### Outcomes

- *Demonstrate* knowledge and understanding of the role of finance in providing information for decision-making purposes.
- *Demonstrate* knowledge and understanding of financial markets and institutions and the role of regulation.
- *Demonstrate* knowledge and application of a range of time value of money related tools and their use in finance decision-making.

## Unit 11

### Finance, financial markets and managers

#### Learning outcomes

Upon completion of this unit students will be able to:



Outcomes

- *Understand* the difference between accounting and finance.
- *Explain* the role of financial institutions in an economy.
- *Describe* the different types of financial institutions.
- *Explain* the difference between a primary and secondary market.
- *Describe* how financial markets operate.
- *Explain* the role of the financial manager.
- *Understand* the conflicts that can arise due to agency theory.

## Activity 5.1



### Activity

1. For your country, describe the main financial institutions.
2. Again for your country, list and describe the main sources of funding that are available for businesses.

## Activity 5.2



### Activity

1. Discuss the two basic differences between finance and accounting.
2. Who are the key participants in the transactions of financial institutions? Who are the net suppliers of funds and who are the net demanders of funds?
3. Who are the key participants in the transactions of financial institutions? What relationship exists between financial institutions and financial markets?
4. Discuss the suggestion that the threat of a hostile takeover can motivate management to act in the best interests of the firm's owners.
5. Discuss the role of the primary and secondary segments of the financial markets.
6. Explain what the two primary activities of the financial manager are that relate to the firm's balance sheet.
7. What is the goal of the firm and therefore of all managers and employees? Discuss how the achievement of this goal is measured.

## Activity 5.1 Feedback

Your responses will depend on the organisation you choose.

## Activity 5.2 Feedback

1. Discuss the two basic differences between finance and accounting.  
The two differences are in relation to the emphasis on cash flows and decision-making. Accountants use the accrual basis which recognises revenues at the point of sale and expenses when incurred. The financial manager places primary emphasis on cash flows, recognising revenues and expenses only with respect to actual inflows and outflows of cash.

The accountant devotes the majority of his/her attention to the collection and presentation of financial data, whereas the financial manager evaluates the accountant's statements, develops additional data and makes decisions based on subsequent analyses.

2. Who are the key participants in the transactions of financial institutions? Who are the net suppliers of funds and who are the net demanders of funds?

The key participants in financial transactions are individuals, businesses, and governments. These parties participate both as suppliers and demanders of funds. Individuals are net suppliers, which means that they save more dollars than they borrow, while both businesses and governments are net demanders since they borrow more than they save. One could say that individuals provide the excess funds required by businesses and governments.

3. Who are the key participants in the transactions of financial institutions? What relationship exists between financial institutions and financial markets?

Financial markets provide a forum in which suppliers of funds and demanders of loans and investments can transact business directly.

Financial institutions and financial markets are not independent of each other. It is quite common to find financial institutions actively participating in both the money market and the capital market as both suppliers and demanders of funds. Financial institutions often channel their investments and obtain needed financing through the financial markets. This relationship exists since these institutions must use the structure of the financial marketplace to find a supplier of funds.

4. Discuss the suggestion that the threat of a hostile takeover can motivate management to act in the best interests of the firm's owners.

A hostile takeover is the acquisition of the firm (the target) by another firm or group (the acquirer) that is not supported by management. Hostile takeovers typically occur when the acquirer feels that the target firm is being poorly managed, and, as a result, is undervalued in the marketplace. The acquirer believes that by acquiring the target at its current low price and restructuring its management (by firing and replacing them), operations and financing, it can enhance the firm's value.

5. Discuss the role of the primary and secondary segments of the financial markets.

The primary market is where securities are initially issued, and is the only market where the issuer is directly involved in the transaction. The secondary market is where pre-owned securities can be traded.

6. Explain what the two primary activities of the financial manager are that relate to the firm's balance sheet.

The two key activities of the financial manager as related to the firm's balance sheet are:



- Making investment decisions: Determining both the most efficient level and the best mix of assets; and
- Making financing decisions: Establishing and maintaining the proper mix of short- and long-term financing and raising needed financing in the most economical fashion.

Making investment decisions concerns the asset side of the balance sheet (current and fixed assets). Making financing decisions deals with the funding or financing side of the balance sheet (current liabilities, long-term debt, and shareholders' equity).

7. What is the goal of the firm and therefore of all managers and employees? Discuss how the achievement of this goal is measured.

The goal of the firm, and therefore all managers, is to maximise shareholder wealth. This goal is measured by share price; an increasing price per share of common shares relative to the stock market as a whole indicates achievement of this goal.



## Unit 12

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### Regulation of markets

#### Learning outcomes

Upon completion of this unit students will be able to:



Outcomes

- *Explain* the need for statutory regulation.
- *Describe* the different forms of statutory regulation.
- *Explain* the role of central or reserve banks.
- *Understand* the functions of a central or reserve bank.
- *Explain* the role of a stock exchange.
- *Describe* the functions of a stock exchange.

## Activity 5.3



### Activity

1. For your country:
  - a. List and describe the main participants in the regulation of financial institutions.
  - b. Establish if the central bank is independent.
  - c. List and describe the listing requirements for the principle stock exchange.
2. For the organisation that you are involved with, does it comply with best practice corporate governance guidelines in your country?
3. What actions did the regulatory authorities take in your country as a result of the recent global financial crisis?

## Activity 5.4



### Activity

1. The following are examples of companies that are listed on more than one stock exchange – BHP Billiton (United Kingdom and Australia), Investec Bank (South Africa and United Kingdom), Rio Tinto Group (United Kingdom and Australia) and Unilever (United Kingdom and Netherlands). These are generally called dual-listed companies. List the reasons why companies might adopt this dual listing.

## Activity 5.3 Feedback

Your responses will depend on the organisation you choose.

## Activity 5.4 Feedback

1. Reasons why companies might adopt a dual listing.
  - Tax – there may be capital gains tax or tax issues related to dividends.
  - National pride – a company wish to keep a presence in a smaller stock exchange as it is seen as an important national symbol but may wish to list in a larger exchange to access capital.
  - Investors – investors in the country of origin may be prevented from owning shares in the company should it list solely in another jurisdiction.
  - May not require regulatory (anti-competition) consent and also may not require foreign investment approval.

# Unit 13

## Financial mathematics



### Outcomes

Upon completion of this unit students will be able to:

- *Understand* the importance of the time value of money in decision-making.
- *Calculate* both simple and compound interest.
- *Understand* the concept of future value and present value, their calculation for single amounts, and the relationship between them.
- *Calculate* the future value and the present value of both an ordinary annuity and an annuity due, and the present value of a perpetuity.
- *Calculate* both the future value and the present value of a mixed stream of cash flows.
- *Understand* the effect that compounding interest more frequently than annually has on future value and the effective annual rate of interest.



## Activity 5.5



### Activity

1. Calculate the future value of \$4,600 received today if it is deposited at 9 per cent for three years.
2. Calculate the present value of \$89,000 to be received in 15 years, assuming an opportunity cost of 14 per cent.
3. John has deposited \$33,000 today in an account which will earn 5 per cent semi-annually. He plans to leave the funds in this account for seven years earning interest. If the goal of this deposit is to cover a future obligation of \$70,000, what recommendation would you make to John?
4. Eco Limited is preparing a five-year plan. Today, sales are \$1,000,000. If the growth rate in sales is projected to be 10 per cent over the next five years, what will the dollar amount of sales be in year five?
5. Fred has inherited \$6,000. He would like to use this money to go on a cruise with Wilma costing \$7,000 for their 10th anniversary celebration which will take place in two years from now. Will Fred have enough money to buy the gift if he deposits his money in an account paying 8 per cent compounded semi-annually?
6. Kay and Arthur are newlyweds and have just purchased a flat for \$70,000. Since the flat is very small, they hope to move into a single-family house in five years. How much will their flat be worth in five years if house prices are expected to rise by 8 per cent per annum?
7. Calculate the future value of an annuity of \$5,000 each year for eight years, deposited at 6 per cent.
8. Calculate the present value of an annuity of \$3,900 each year for four years, assuming an opportunity cost of 10 per cent.

## Activity 5.5 Feedback

1. Calculate the future value of \$4,600 received today if it is deposited at 9 per cent for three years.  

$$FV = \$4,600 \times (1.09)^3 = \$4,600 (1.295) = \$5,957$$
2. Calculate the present value of \$89,000 to be received in 15 years, assuming an opportunity cost of 14 per cent.  

$$PV = \$89,000 \times (1/(1.14)^{15}) = \$89,000 \times 0.14 = \$12,460$$
3. John has deposited \$33,000 today in an account which will earn 5 per cent semi-annually. He plans to leave the funds in this account for seven years earning interest. If the goal of this deposit is to cover a future obligation of \$70,000, what recommendation would you make to John?  

$$FV = \$33,000 \times (1.05)^{14} = \$33,000 (1.980) = \$65,340$$

John will only have \$65,340 at the end of seven years under the stated arrangement. He must find an account with a higher interest rate or deposit a larger sum today.

4. Eco Limited is preparing a five-year plan. Today, sales are \$1,000,000. If the growth rate in sales is projected to be 10 per cent over the next five years, what will the dollar amount of sales be in year five?

$$FV = \$1,000,000 \times (1.10)^5 = \$1,000,000 (1.611) = \$1,611,000$$

5. Fred has inherited \$6,000. He would like to use this money to go on a cruise with Wilma costing \$7,000 for their 10th anniversary celebration which will take place two years from now. Will Fred have enough money to buy the gift if he deposits his money in an account paying 8 per cent compounded semi-annually?

$$n = 2, m = 2, i = 8\%$$

$$FV = PV(1+i/m)^{n \times m} = 6,000 \times (1.04)^4 = \$6,000 (1.170) = \$7,020$$

Yes, Fred will have enough money to afford the cruise.

6. Kay and Arthur are newlyweds and have just purchased a flat for \$70,000. Since the flat is very small, they hope to move into a single-family house in five years. How much will their flat be worth in five years if inflation is expected to be 8 per cent?

$$PV = \$70,000, i = 8\%, n = 5$$

$$FV = \$70,000 \times (1.08)^5 = \$70,000 (1.469) = \$102,830.$$

7. Calculate the future value of an annuity of \$5,000 each year for eight years, deposited at 6 per cent.

$$FV_{oa} = PMT [(1 + i)^n - 1] / i$$

$$FV = 5,000[(1+0.06)^8 - 1/0.06] = \$5,000 (9.897) = \$49,485$$

8. Calculate the present value of an annuity of \$3,900 each year for four years, assuming an opportunity cost of 10 per cent.

$$PV_{oa} = PMT [1 - (1 / (1 + i)^n)] / i$$

$$PV = \$3,900((1 - (1/(1.1)^4))/0.1) = \$3,900 (3.170) = \$12,363$$

## Module 6

### Introduction

This module contains two main topics. First, the concept of risk and return, and in particular how to assess these and their measurement.

Secondly, the introduction to the two main ways to fund an organisation – bonds and shares. In this introduction we will discuss the valuation of these two sources of funds.

Upon completion of this module students will be able to:



#### Outcomes

- *Demonstrate* knowledge and understanding of risk and return and how these are applied in decision-making.
- *Demonstrate* knowledge and understanding of bonds and their valuation.
- *Demonstrate* knowledge and understanding of shares and their valuation.

## Unit 14

### Understanding risk and return

Upon completion of this unit students will be able to:



#### Outcomes

- *Understand* the meaning and fundamentals of risk, return, and risk preferences.
- *Describe* procedures for assessing and measuring the risk of a single asset.
- *Discuss* the measurement of return and standard deviation for a portfolio and the concept of correlation.
- *Explain* the capital asset pricing model (CAPM) and its relationship to the security market line (SML).

## Activity 6.1



### Activity

1. What is risk in the context of financial decision-making?
2. Define return, and describe how to find the rate of return on an investment.
3. Explain how the range is used in assessing risk.
4. What relationship exists between the size of the standard deviation and the degree of asset risk?
5. What risk does beta measure?
6. Given the following information about the two assets A and B, determine which asset is preferred.

	A	B
Initial investment	\$5,000	\$5,000
Annual rate of return		
Pessimistic	9%	7%
Most likely	11	11
Optimistic	13	15
Range	4	8

7. Assuming the following returns and corresponding probabilities for asset A, compute its expected return and standard deviation.

Asset A	
Rate of Return	Probability
10%	50%
15	30
20	20

8. Carter Furniture must choose between two asset purchases. The annual rate of return and related probabilities given below summarise the firm's analysis.

Asset A		Asset B	
Rate of return	Probability	Rate of return	Probability
10%	30%	5%	40%
15	40	15	20
20	30	25	40

### Required:

- a. Calculate the expected rate of return.
  - b. Calculate the standard deviation of the expected return.
  - c. Explain which asset Carter should select.
9. How are total risk, non-diversifiable risk and diversifiable risk related? Why is non-diversifiable risk the only relevant risk?
  10. Russell Limited wants to determine the required return on a share



portfolio with a beta coefficient of 0.5. Assuming the risk-free rate of 6 per cent and the market return of 12 per cent, calculate the required rate of return.

11. Assuming a risk-free rate of 8 per cent and a market return of 12 per cent, would a wise investor acquire a security with a Beta of 1.5 and a rate of return of 14 per cent given these facts?
12. Mr. Thomas is considering investment in a project with beta coefficient of 1.75. What would you recommend him to do if this investment has an 11.5 per cent rate of return, risk-free rate is 5.5 per cent, and the rate of return on the market portfolio of assets is 8.5 per cent?

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## Activity 6.1 Feedback

1. What is risk in the context of financial decision-making?

**Risk** is defined as the chance of financial loss, as measured by the variability of expected returns associated with a given asset. A decision-maker should evaluate an investment by measuring the chance of loss, or risk, and comparing the expected risk to the expected return. Some assets are considered risk-free; the most common examples are United States Treasury issues.

2. Define return, and describe how to find the rate of return on an investment.

The return on an investment (total gain or loss) is the change in value plus any cash distributions over a defined time period. It is expressed as a percentage of the beginning-of-the-period investment.

3. Explain how the range is used in assessing risk.

The range is found by subtracting the pessimistic outcome from the optimistic outcome. The larger the range, the more variability of risk associated with the asset.

4. What relationship exists between the size of the standard deviation and the degree of asset risk?

The standard deviation of a distribution of asset returns is an absolute measure of dispersion of risk about the mean or expected value. A higher standard deviation indicates a greater project risk. With a larger standard deviation, the distribution is more dispersed and the outcomes have a higher variability, resulting in higher risk.

5. What risk does beta measure?

Beta measures non-diversifiable risk. It is an index of the degree of movement of an asset's return in response to a change in the market return. The beta coefficient for an asset can be found by plotting the asset's historical returns relative to the returns for the market. By using statistical techniques, the "characteristic line" is fit to the data points. The slope of this line is beta. Beta coefficients for actively



traded stocks are published in Value Line Investment Survey and in brokerage reports.

6. Asset A is preferred because it has a lower range for the same expected return of 11%,  $A = (9\% + 11\% + 13\%) / 3$ ;  $B = (7\% + 11\% + 15\%) / 3$ .

7.

E	P	EP	$-(E - EP)^2 P$
10%	50%	5.0	$(10 - 13.5)^2 0.50 = 6.125$
15	30	4.5	$(15 - 13.5)^2 0.30 = 0.675$
20	20	4.0	$(20 - 13.5)^2 0.20 = 8.450$
13.5%			15.25%

Standard deviation =  $\sqrt{15.25} = 3.91\%$

8.

a.

Asset A	Asset B
Return $\times$ Pr	Return $\times$ Pr
$10\% \times 0.30 = 3\%$	$5\% \times 0.40 = 2\%$
$15 \times 0.40 = 6$	$15 \times 0.20 = 3$
$20 \times 0.30 = 6$	$25 \times 0.40 = 10$

Expected Return = 15%    Expected Return = 15%

b. Asset A

$$(10\% - 15\%)^2 \times 0.30 = 7.5\%$$

$$(15\% - 15\%)^2 \times 0.40 = 0\%$$

$$(20\% - 15\%)^2 \times 0.30 = 7.5\%$$

$$\underline{\hspace{1cm}} \quad 15\%$$

Standard deviation of A = 3.87%

Asset B

$$(5\% - 15\%)^2 \times 0.40 = 40\%$$

$$(15\% - 15\%)^2 \times 0.20 = 0\%$$

$$(25\% - 15\%)^2 \times 0.40 = 40\%$$

$$\underline{\hspace{1cm}} \quad 80\%$$

Standard deviation of B = 8.94%

c. Asset A; for 15% rate of return and lesser risk.

9. The total risk of a security is the combination of non-diversifiable risk and diversifiable risk. Diversifiable risk refers to the portion of an asset's risk attributable to firm-specific, random events (such as strikes, litigation or loss of key contracts) that can be eliminated by diversification. Non-diversifiable risk is attributable to market factors

affecting all firms (war, inflation, political events). Some argue that non-diversifiable risk is the only relevant risk because diversifiable risk can be eliminated by creating a portfolio of assets which are not perfectly positively correlated.

10. Russell Limited wants to determine the required return on a share portfolio with a beta coefficient of 0.5. Assuming the risk-free rate of 6 per cent and the market return of 12 per cent, calculate the required rate of return.

$$\begin{aligned} K &= RF + b(K_m - RF) \\ &= 0.06 + 0.5(0.12 - 0.06) = 0.09 = 9\% \end{aligned}$$

The company should expect at least 9 per cent return on the share portfolio.

11. Assuming a risk-free rate of 8 per cent and a market return of 12 per cent, would a wise investor acquire a security with a beta of 1.5 and a rate of return of 14 per cent given these facts?

$$\begin{aligned} K &= RF + b(K_m - RF) \\ &= 0.08 + 1.5(0.12 - 0.08) = 0.14 = 14\% \end{aligned}$$

Yes, a security with a beta of 1.5 should yield 14 per cent rate of return.

12. Mr. Thomas is considering investment in a project with beta coefficient of 1.75. What would you recommend him to do if this investment has an 11.5 per cent rate of return, risk-free rate is 5.5 per cent, and the rate of return on the market portfolio of assets is 8.5 per cent?

$$\begin{aligned} K &= RF + b(K_m - RF) \\ &= 0.055 + 1.75(0.085 - 0.055) = 0.108 = 10.8\% \end{aligned}$$

Mr. Thomas should invest in the project because the project's actual rate of return (11.5 per cent) is greater than the project's required rate of return (10.8 per cent).

# Unit 15

## Bonds and shares

### Learning outcomes



#### Outcomes

Upon completion of this unit students will be able to:

- *Discuss* the general features, quotations, ratings, popular types, and international issues of corporate bonds.
- *Understand* the key inputs and basic model used in the valuation process.
- *Apply* the basic valuation model to bonds and describe the impact of required return and time to maturity on bond values.
- *Explain* yield to maturity (YTM), its calculation, and the procedure used to value bonds that pay interest semi-annually.
- *Differentiate* between debt and equity capital.
- *Discuss* the rights, characteristics, and features of both common and preferred shares.
- *Understand* the basic common share valuation using zero growth, constant growth, and variable growth models.
- *Understand* the composition of hybrid securities.

## Activity 6.2



### Activity

1. What basic procedure is used to value a bond that pays annual interest? Semi-annual interest?
2. What relationship between the required return and the coupon interest rate will cause a bond to sell at a discount? At a premium? At its face value?
3. If the required return on a bond differs from its coupon interest rate, describe the behaviour of the bond value over time as the bond moves towards maturity.
4. As a risk-averse investor, would you prefer bonds with short or long periods until maturity? Why?
5. What is a bond's yield to maturity?
6. You are provided with the following table of information regarding three bonds:

Bond	Par Value (\$)	Annual Coupon Interest Rate (%)	Years to Maturity	Required Return (%)
L	1000	9	5	6
M	100	10	8	10
N	500	18	17	15

### Required:

- a. Calculate the current value of Bond L.
  - b. What will happen to the value/price of Bond L as the bond approaches maturity?
  - c. Calculate the current value of Bond M.
  - d. Calculate the current value of Bond M if the time of maturity is six years.
  - e. Calculate the current value of Bond N.
  - f. What will happen to value/price of Bond N as the bond approaches maturity?
7. How Packing Company has an issue of \$1,000 par value bonds with a 14 per cent coupon interest rate outstanding. The issue pays interest semi-annually and has 10 years remaining to its maturity date. Bonds of similar risk are currently selling to yield a 12 per cent rate of return. What is the value of these How Packing Company bonds?
  8. To expand its business, the Kingdom Company would like to issue a bond with par value of \$1,000, coupon rate of 10 per cent, and maturity of 10 years from now. What is the value of the bond if the required rate of return is:
    - a. 8 per cent?
    - b. 10 per cent?
    - c. 12 per cent?



9. What are the key differences between debt (bond) and equity (share) capital?
10. What claims do preference shareholders have with respect to distribution of earnings (dividends) and assets?
11. Describe, compare and contrast the following ordinary share dividend valuation models:
  - a. Zero growth
  - b. Constant growth
  - c. Variable growth
12. The board of directors of the NCC has declared \$5.00 common share dividend and accepted a plan to freeze the dividend at \$5 per year indefinitely. What is the value of the NCC's common shares if the required rate of interest is 15 per cent?
13. Kitchen Things has recently sold 1,000 shares of \$6.75 preferred shares. What is the value of the share assuming 10 per cent required rate of return?
14. In response to the stock market's reaction to its dividend policy, the Paper Company has decided to increase its dividend payment at a rate of 4 per cent per year. The firm's most recent dividend is \$3.25 and the required rate of interest is 9 per cent. What is the maximum you would be willing to pay for a share?
15. The Heating Company has been very successful in the past four years. Over these years, it paid a common share dividend of \$4 in the first year, \$4.20 in the second year, \$4.41 in the third year, and its most recent dividend was \$4.63. The company wishes to continue this dividend growth indefinitely. What is the value of the company's shares if the required rate of return is 12 per cent?
16. The National Company paid \$2.00 per share in common share dividends last year. The company's policy is to allow its dividend to grow at 5 per cent for four years and then the rate of growth changes to 3 per cent per year from year five and on. What is the value of the shares if the required rate of return is 8 per cent?

## Activity 6.2 Feedback

1. What basic procedure is used to value a bond that pays annual interest? Semi-annual interest?

The basic bond valuation equation for a bond that pays annual interest is:

$$V_0 = I \times \left[ \sum_{t=1}^n \frac{1}{(1 + k_d)^t} \right] + M \times \left[ \frac{1}{(1 + k_d)^n} \right]$$

Where:

- $V_0$  = value of a bond that pays annual interest

- $I$  = interest
- $n$  = years to maturity
- $M$  = dollar par value
- $k_d$  = required return on the bond.

To find the value of bonds paying interest semi-annually, the basic bond valuation equation is adjusted as follows to account for the more frequent payment of interest:

- The annual interest must be converted to semi-annual interest by dividing by two.
- The number of years to maturity must be multiplied by two.
- The required return must be converted to a semi-annual rate by dividing it by two.

2. What relationship between the required return and the coupon interest rate will cause a bond to sell at a discount? At a premium? At its face value?

A bond sells at a discount when the required return exceeds the coupon rate. A bond sells at a premium when the required return is less than the coupon rate. A bond sells at par value when the required return equals the coupon rate. The coupon rate is generally a fixed rate of interest, whereas the required return fluctuates with shifts in the cost of long-term funds due to economic conditions and/or risk of the issuing firm. The disparity between the required rate and the coupon rate will cause the bond to be sold at a discount or premium.

3. If the required return on a bond differs from its coupon interest rate, describe the behaviour of the bond value over time as the bond moves towards maturity.

If the required return on a bond is constant until maturity and different from the coupon interest rate, the bond's value approaches its \$1,000 par value as the time to maturity declines.

4. As a risk-averse investor, would you prefer bonds with short or long periods until maturity? Why?

To protect against the impact of rising interest rates, a risk-averse investor would prefer bonds with short periods until maturity. The responsiveness of the bond's market value to interest rate fluctuations is an increasing function of the time to maturity.

5. What is a bond's yield to maturity?

The yield-to-maturity (YTM) on a bond is the rate investors earn if they buy the bond at a specific price and hold it until maturity. The trial-and-error approach to calculating the YTM requires finding the value of the bond at various rates to determine the rate causing the calculated bond value to equal its current value. The approximate approach for calculating YTM uses the following equation:

$$\text{Approximate Yield} = \frac{I + [(M - B_0)/n]}{(M + B_0)/2}$$



Where:

- I = annual interest
- M = maturity value
- $B_0$  = market value
- n = periods to maturity.

6.

- a. Calculate the current value of Bond L.

$$\$90(4.212) + \$1,000(0.747) = \$1,126.08$$

- b. What will happen to the value/price of Bond L as the bond approaches maturity?

The bond price will decrease and come closer to par.

- c. Calculate the current value of Bond M.

Annual coupon interest rate = required rate of return

Therefore, value = par value = \$100

- d. Calculate the current value of Bond M if the time of maturity is six years.

The bond is at par, or \$100, because the annual coupon interest rate is equal to the required rate of return.

- e. Calculate the current value of Bond N.

$$\$90(6.047) + \$500(0.093) = \$590.73$$

- f. What will happen to value/price of Bond N as the bond approaches maturity?

The bond price will decrease and come closer to par.

7.  $B = \$70(11.470) + \$1,000(.312) = \$1,114.90$

8. Coupon payment =  $1,000 \times 0.10 = \$100$

a.  $B = 100(PVIFA_{8\%, 10}) + 1,000(PVIF_{8\%, 10})$   
 $= 100(6.710) + 1,000(0.463) = \$1,134.00$

- b.  $B = \$1,000$  since coupon rate and required rate of return are equal.

c.  $B = 100(PVIFA_{12\%, 10}) + 1,000(PVIF_{12\%, 10})$   
 $= 100(5.650) + 1,000(0.322) = \$887$

9. Equity capital is permanent capital representing ownership, while debt capital represents a loan that must be repaid at some future date. The holders of equity capital receive a claim on the income and assets of the firm that is secondary to the claims of the firm's creditors. Suppliers of debt must receive all interest owed before any distribution to equity holders, and in liquidation all unpaid debts must be satisfied before any distribution to the firm's owners. Equity capital is perpetual while debt has a specified maturity date. Both income from debt (interest) and income from equity (dividends) are taxed as ordinary income. To the corporation, debt interest is a tax-deductible expense while dividends are not.



10. The claims of preferred shareholders are senior to those of the common shareholders with respect to the distribution of both earnings and assets.
- 11.
- a. The zero growth model of common stock valuation assumes a constant, non-growing dividend stream. The stock is valued as a perpetuity and discounted at a rate  $k_s$ :

$$P_0 = \frac{P_0}{k_s}$$

- b. The constant growth model of common stock valuation, also-called the Gordon model, assumes that dividends will grow at a constant rate,  $g$ . The stock is valued as the present value of the constantly growing cash flow stream:

$$P_0 = \frac{D_1}{k_s - g}$$

- c. The variable growth model of common stock valuation assumes that dividends grow at a variable rate. The stock with a single shift in the growth rate is valued as the present value of the dividend stream during the initial growth phase plus the present value of the price of stock at the end of the initial growth phase:

$$P_0 = \sum_{t=1}^N \frac{D_0 \times (1 + g_1)^t}{(1 + k_s)^t} + \left( \frac{1}{(1 + k_s)^N} \times \frac{D_{N+1}}{(k_s - g_2)} \right)$$

12.  $P = D/k = 5/0.15 = \$33.33$

13.  $P = D/k = 6.75/0.10 = \$67.50$

14.  $P = D_1/(k - g) = 3.25(1 + 0.04)/(0.09 - 0.04) = \$67.60$

15.  $FVIF_{g, 3} = 4.63/4.00 = 1.158$   $g = 5\%$

$P = D_5/(k - g) = 4.63 (1 + 0.05)/(0.12 - 0.05) = \$69.46$

16.

t	D <sub>0</sub>	FVIF <sub>5%,t</sub>	D <sub>t</sub>	PVIF <sub>8%,t</sub>	PV
1	\$2.00	1.050	\$2.10	0.926	\$1.94
2	2.00	1.102	2.20	0.857	1.89
3	2.00	1.158	2.32	0.794	1.84
4	2.00	1.216	2.43	0.735	1.79
					P1 = \$7.46

$D_5 = 2.43 (1 + 0.03) = \$2.50$

$$P_2 = \frac{2.50}{0.08 - 0.03} \times \frac{1}{(1 + 0.08)^4} = \$36.75$$

Value of share =  $\$36.75 + \$7.46 = \$44.21$

# Module 7

## Introduction

This module contains three main topics. First, the concept of cost of capital, and, in particular, how to calculate the component elements of a firm's cost of capital given their capital structure.

Secondly, using the cost of capital concept, how do firms assess capital investment opportunities? Various techniques are introduced to assist managers to assess whether projects will enhance shareholder wealth.

Finally the management of short and long-term funds are discussed with reference to the efficient management of both sources.

Upon completion of this module students will be able to:



### Outcomes

- *Demonstrate* knowledge and understanding of the cost of capital and how it is calculated.
- *Demonstrate* knowledge and understanding of capital investment procedures and the various evaluation techniques that can be used to assess whether or not a capital project should be undertaken.
- *Demonstrate* knowledge and understanding of the source and cost of short-term funding together with an appreciation of the issues relating to raising equity.
- *Demonstrate* knowledge and understanding of the role of intermediate financial institutions.

# Unit 16

## Cost of Capital

### Learning outcomes



#### Outcomes

Upon completion of this unit students will be able to:

- *Discuss* the general features, quotations, ratings, popular types, and international issues of corporate bonds.
- *Understand* the key inputs and basic model used in the valuation process.
- *Apply* the basic valuation model to bonds and describe the impact of required return and time to maturity on bond values.
- *Explain* yield to maturity (YTM), its calculation, and the procedure used to value bonds that pay interest semi-annually.
- *Differentiate* between debt and equity capital.
- *Discuss* the rights, characteristics, and features of both common and preferred shares.
- *Understand* the basic common share valuation using zero growth, constant growth, and variable growth models.
- *Understand* the composition of hybrid securities.



## Activity 7.1



### Activity

1. What is the cost of capital? What role does it play in making long-term investment decisions?
2. Why is the cost of capital measured on an after-tax basis? Why is the use of a weighted average cost rather than the cost of specific funds recommended?
3. How is the before-tax cost of debt converted into the after-tax cost?
4. Calculate the after-tax cost of debt if the before-tax cost of debt for a firm is 11 per cent and it has a 35 per cent marginal tax rate.
5. A firm has issued 10 per cent preferred share, which sold for \$100 per share par value. The cost of issuing and selling the stock was \$2 per share. The firm's marginal tax rate is 40 per cent. Calculate the cost of the preferred share.
6. A firm has a beta of 1.2. The market return equals 14 per cent and the risk-free rate of return equals 6 per cent. Calculate the cost of common equity.
7. A firm has common share with a market price of \$25 per share and an expected dividend of \$2 per share at the end of the coming year. The growth rate in dividends has been 5 per cent. Calculate the cost of the firm's common equity.
8. A firm has common shares with a market price of \$55 per share and an expected dividend of \$2.81 per share at the end of the coming year. The dividends paid on the shares over the past five years are as follows:

Year	Dividend
1	\$2.00
2	2.14
3	2.29
4	2.45
5	2.62

- a. Calculate the cost of the firm's common equity.
9. A firm has determined its cost of each source of capital and optimal capital structure, which is composed of the following sources and target market value proportions:

Source of Capital	Target Market Proportions	After-Tax Cost
Long-term debt	40%	6%
Preferred stock	10	11
Common stock equity	50	15

- a. Calculate the weighted average cost of capital.

10. Promo Limited has compiled the following financial data:

Source of Capital	Book Value	Market Value	Cost
Long-term debt	\$10,000,000	\$8,500,000	5.0%
Preferred shares	\$1,000,000	\$1,500,000	14.0
Common equity	\$9,000,000	\$15,000,000	20.0
Total	\$20,000,000	\$25,000,000	

- Calculate the weighted average cost of capital using book value weights.
- Calculate the weighted average cost of capital using market value weights.

## Activity 7.1 Feedback

- What is the cost of capital? What role does it play in making long-term investment decisions?

The cost of capital is the rate of return a firm must earn on its investment in order to maintain the market value of its stock. The cost of capital provides a benchmark against which the potential rate of return on an investment is compared.

- Why is the cost of capital measured on an after-tax basis? Why is the use of a weighted average cost rather than the cost of specific funds recommended?

The cost of capital is measured on an after-tax basis in order to be consistent with the capital budgeting framework. The only component of the cost of capital that actually requires a tax adjustment is the cost of debt, since interest on debt is treated as a tax-deductible expenditure. Measuring the cost of debt on an after-tax basis reduces the cost.

The use of the weighted average cost of capital is recommended over the cost of the source of funds to be used for the project. The interrelatedness of financing decisions assuming the presence of a target capital structure is reflected in the weighted average cost of capital.

- How is the before-tax cost of debt converted into the after-tax cost?

The before-tax cost is converted to an after-tax debt cost ( $k_i$ ) by using the following equation:  $k_i = k_d \times (1 - t)$  where  $t$  is the firm's tax rate.

- Calculate the after-tax cost of debt if the before-tax cost of debt for a firm is 11 per cent and it has a 35 per cent marginal tax rate.

$$11\% (1 - 0.35) = 7.15\%$$

- A firm has issued 10 per cent preferred share, which sold for \$100 per share par value. The cost of issuing and selling the stock was \$2



per share. The firm's marginal tax rate is 40 per cent. Calculate the cost of the preferred share.

$$\$10 / (\$100 - \$2) = 10.2\%$$

6. A firm has a beta of 1.2. The market return equals 14 per cent and the risk-free rate of return equals 6 per cent. Calculate the cost of common equity.

$$6\% + 1.2(14\% - 6\%) = 6\% + 9.6\% = 15.6\%$$

7. A firm has common share with a market price of \$25 per share and an expected dividend of \$2 per share at the end of the coming year. The growth rate in dividends has been 5%. Calculate the cost of the firm's common equity.

$$(\$2 / \$25) + 5\% = 8\% + 5\% = 13\%$$

8. Calculate the cost of the firm's common equity.

a. Dividend growth =  $(\$2.14 - \$2.00) / \$2.00 = 7\%$

So, the cost of equity =  $(\$2.81 / \$55) + 7\% = 5.1\% + 7\% = 12.1\%$

9. Calculate the weighted average cost of capital.

a.  $WACC = (6\% \times 0.4) + (11\% \times 0.1) + (15\% \times 0.5)$   
 $= 2.4 + 1.1 + 7.5 = 11\%$

10.

- a. Calculate the weighted average cost of capital using book value weights.

Long-term debt	50%
Preferred stock	5
Common stock equity	<u>45</u>
	100%

$$k_a = (0.5)(5) + (0.05)(14) + (0.45)(20) = 2.5 + 0.7 + 9 = 12.2\%$$

- b. Calculate the weighted average cost of capital using market value weights.

Long-term debt	34%
Preferred stock	6
Common stock equity	<u>60</u>
	100%

$$k_a = (0.34)(5) + (0.06)(14) + (0.60)(20) = 1.7 + 0.84 + 12 = 14.5\%$$

# Unit 17

## Capital Investment

### Learning outcomes



#### Outcomes

Upon completion of this unit students will be able to:

- *Understand* the importance of capital budgeting in decision-making.
- *Understand* the motives for key capital expenditure and the steps in the capital budgeting process.
- *Explain* the different types of investment projects.
- *Explain* the evaluation techniques of investment proposals.
- *Understand* the importance of the concept and calculation of net present value and internal rate of return in decision making.
- *Explain* the advantages and disadvantages of the payback method and accounting rate of return as techniques for initial screening of two or more competing projects.

## Activity 7.2



### Activity

1. What is capital investment (budgeting)? Do all capital expenditures involve non-current assets? Explain.
2. What weaknesses are commonly associated with the use of the payback period to evaluate a proposed investment?
3. What are the acceptance criteria for NPV? How do they relate to the firm's market value?
4. Do the NPV and IRR always agree with respect to accept-reject decisions? With respect to ranking decisions? Explain.
5. State the decision criteria applied when using the accounting rate of return, profitability index and discounted payback period methods to evaluate capital expenditure projects. What are the major limitations in using these methods to evaluate capital expenditure projects?
6. New Limited has a five-year maximum acceptable payback period. The firm is considering the purchase of a new machine and must choose between two alternatives. The first machine requires an initial investment of \$14,000 and generates after-tax net cash inflows of \$3,000 for each of the next seven years. The second machine requires an initial investment of \$21,000 and provides an annual cash inflow after taxes of \$4,000 for 20 years.
  - a. Determine the payback period for each machine.
  - b. Comment on the acceptability of the machines, assuming they are independent projects.
  - c. Which machine should the firm accept? Why?
  - d. Do the machines in this problem illustrate any of the weaknesses of using payback? Discuss.
7. Given the information in the following table and 15 per cent cost of capital:
  - a. Calculate the net present value.
  - b. Explain whether or not the project should be accepted.

Operating Cash Inflows				
\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Yr1	Yr2	Yr3	Yr4	Yr5
\$2,500 (Initial outlay)				

8. A project requires an initial outlay of \$100,000 and it will generate cash inflows of \$25,000 in Year 1, \$10,000 in Year 2, \$50,000 in Year 3, \$10,000 in Year 4, \$10,000 in Year 5 and \$60,000 in Year 6. The firm's cost of capital is 15%.
  - a. Calculate the net present value.
  - b. Explain whether or not the project should be accepted.



9. Tungsten Oil Company is considering investing in a new exploration project. The firm's cost of capital is 12% and the project is expected to have an initial after tax cost of \$5,000,000. Furthermore, the project is expected to provide after-tax operating cash flows of \$2,500,000 in year 1, \$2,300,000 in year 2, \$2,200,000 in year 3 and (\$1,300,000) in year 4.
- Calculate the project's NPV.
  - Calculate the project's IRR.
  - Should the firm make the investment?

---

## Activity 7.2 Feedback

1. What is capital investment (budgeting)? Do all capital expenditures involve non-current assets? Explain.

Capital budgeting is the process used to evaluate and select long-term investments consistent with the goal of owner wealth maximisation. Capital expenditures are outlays made by the firm that are expected to produce benefits over the long term (a period greater than one year). Not all capital expenditures are made for fixed assets. An expenditure made for an advertising campaign may have long-term benefits.

2. What weaknesses are commonly associated with the use of the payback period to evaluate a proposed investment?

The weaknesses of using the payback period are:

- no explicit consideration of shareholders' wealth
- failure to take fully into account the time factor of money
- failure to consider returns beyond the payback period and, hence, overall profitability of projects.

3. What are the acceptance criteria for NPV? How do they relate to the firm's market value?

Acceptance criterion for the net present value method is if  $NPV > 0$ , accept; if  $NPV < 0$ , reject. If the firm undertakes projects with a positive NPV, the market value of the firm should increase by the amount of the NPV.

4. Do the NPV and IRR always agree with respect to accept-reject decisions? With respect to ranking decisions? Explain.

The NPV and IRR always provide consistent accept/reject decisions. These measures, however, may not agree with respect to ranking the projects. The NPV may conflict with the IRR due to different cash flow characteristics of the projects. The greater the difference between timing and magnitude of cash inflows, the more likely it is that rankings will conflict.

5. State the decision criteria applied when using the accounting rate of return, profitability index and discounted payback period methods to



evaluate capital expenditure projects. What are the major limitations in using these methods to evaluate capital expenditure projects?

The decision criterion applied, when using the accounting rate of return, is that a project is accepted if the accounting rate of return exceeds a predetermined reference rate of return. The decision criteria, when applying the profitability index, are that acceptable projects with a positive NPV will have a PI greater than 1.0, and projects with a negative NPV will have a PI of less than 1.0. The decision criterion, when applying the discounted payback period (DPP), is to compare it against an acceptable maximum period. Where the projects are mutually exclusive, the project with the shortest DPP is preferred. A major limitation of the accounting rate of return is that it fails to consider cash flows and the time value of money. By averaging the annual profits, future profits count as much as current profits. With mutually exclusive projects, the profitability index can provide an incorrect ranking. The DPP lacks the simplicity of the payback period, and for mutually exclusive projects it may provide inconsistent rankings.

6.
  - a. Machine 1:  $\$14,000 / \$3,000 = 4$  years, 8 months  
Machine 2:  $\$21,000 / \$4,000 = 5$  years, 3 months
  - b. Only Machine 1 has a payback faster than five years and is acceptable.
  - c. The firm will accept the first machine because the payback period of four years, eight months is less than the five-year maximum payback required by the firm.
  - d. Machine 2 has returns which last 20 years while Machine 1 has only seven years of returns. Payback cannot consider this difference; it ignores all cash inflows beyond the payback period.
7.
  - a.  $NPV = 1,000 (PVIFA_{15\%,5}) - 2,500$   
 $= 1,000 (3.352) - 2,500 = \$852$
  - b. Since  $NPV > 0$ , the project should be accepted

8.

a.

Year	CF	PVIF 15%,t	PV
1	\$25,000	0.870	\$21,750
2	10,000	0.756	7,560
3	50,000	0.658	32,900
4	10,000	0.572	5,720
5	10,000	0.497	4,970
6	60,000	0.432	25,920
			<u>\$98,820</u>

$$\text{NPV} = 98,820 - 100,000 = -\$1,180 < 0$$

b. Since  $\text{NPV} < 0$ , the project should be rejected.

9.

Time	Cash Flow	PVIF (12%)	PV of CF
0	\$(5,000,000)	1.0000	\$(5,000,000)
1	\$2,500,000	0.8929	\$2,232,143
2	\$2,300,000	0.7972	\$1,833,546
3	\$2,000,000	0.7118	\$1,423,560
4	\$(1,300,000)	0.6355	\$(826,174)
		NPV	\$(336,924)
		IRR	6.80%

No the firm should not accept the project.

## Unit 18

### Short and Long-Term Finance

#### Learning outcomes



#### Outcomes

Upon completion of this unit students will be able to:

- *Understand* short-term financial management, net working capital, and the related trade-off between profitability and risk.
- *Describe* the cash conversion cycle, its funding requirements, and the key strategies for managing it.
- *Discuss* inventory management.
- *Describe* the procedures for quantitatively considering cash discount changes.
- *Understand* the management of receipts and disbursements.
- *Understand* the role of intermediate financial institutions.

## Activity 7.3



### Activity

For your particular country produce a list of financial intermediaries, e.g. names of prominent banks, investment companies, insurance companies and pension funds.

Obtain the Annual Report of a bank or other financial institution. Review the Statement of Financial Position and the accompanying Notes and identify the similarities and differences to a chosen manufacturing or service related company's Statement of Financial Position.

For the manufacturing or service related company chosen in 2 above, establish the following:

- a. the type of accounts that are included in Working Capital.
- b. calculate the operating cycle (OC) and cash conversion cycle (CCC) and give your opinion on whether you consider these to be good or bad.
- c. the relative mix of debt and equity and has this changed substantially from the previous year.

## Activity 7.4



### Activity

1. Why is short-term financial management one of the most important and time-consuming activities for a manager?
2. What is the difference between the firm's operating cycle and its cash conversion cycle?
3. Why is it important for a firm to minimise the length of its cash conversion cycle?
4. What are the likely viewpoints of the finance manager, marketing manager, manufacturing manager and purchasing manager about the levels of the various types of inventory?
5. What risks do ordinary shareholders take that other suppliers of long-term capital do not?
6. Fishing Products Limited is analysing the performance of its cash management. On average, the firm holds inventory 65 days, pays its suppliers in 35 days, and collects its receivables in 15 days. The firm has a current annual outlay of \$1,960,000 on operating cycle investments. The company currently pays 10% for its negotiated financing. (Assume a 360-day year.)
  - a. Calculate the firm's cash conversion cycle.
  - b. Calculate the firm's operating cycle.
  - c. Calculate the daily expenditure and the firm's annual savings if the operating cycle is reduced by 15 days.



7. Cooper Limited uses 800 units of a product per year on a continuous basis. The product has carrying costs of \$50 per unit per year and order costs of \$300 per order. It takes 30 days to receive a shipment after an order is placed and the firm requires a safety stock of five days usage in inventory.
  - a. Calculate the economic order quantity (EOQ).
8. Shapes Farm uses 12,600 baskets a year for apple shipment. Determine the optimum order quantity of baskets assuming the order costs per order is \$600 and it costs \$2 to carry a unit of basket in inventory per period.

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## Activity 7.3 Feedback

Your responses will depend on the organisation you choose.

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## Activity 7.4 Feedback

1. Why is short-term financial management one of the most important and time-consuming activities for a manager?

Short-term financial management, the management of the firm's current assets and liabilities, is one of the manager's most important functions. Managing these accounts wisely results in a balance between profitability and risk that has a positive impact on the firm's value. Therefore, managing these current balance sheet accounts to achieve an appropriate balance between profitability and risk takes a large amount of a manager's time.
2. What is the difference between the firm's operating cycle and its cash conversion cycle?

A firm's operating cycle is the period when a firm has its money tied up in inventory and accounts receivable until cash is collected from the sale of the finished product. It is calculated by adding the average age of inventory (AAI) to the average collection period (ACP). The cash conversion cycle (CCC) is the number of days in the firm's operating cycle (OC) minus the average payment period (APP) for inputs to production. The CCC takes into account the time at which payment is made for material; this spontaneous form of financing partially or fully offsets the need for negotiated financing while resources are tied up in the operating cycle.
3. Why is it important for a firm to minimise the length of its cash conversion cycle?

The longer the cash conversion cycle the greater the amount of investment tied up in low-return assets. Any extension of the cycle can result in higher costs and lower profits.

4. What are the likely viewpoints of the finance manager, marketing manager, manufacturing manager and purchasing manager about the levels of the various types of inventory?

Financial managers will tend to want to keep inventory levels low to reduce financing costs. Marketing managers will tend to want large finished goods inventories. Manufacturing managers will tend to want high raw materials and finished goods inventories. The purchasing manager may favour high raw materials inventories if quantity discounts are available for large purchases.

Inventory is an investment because managers must purchase the raw materials and make expenditures for the production of the product such as paying labour costs. Until cash is received through the sale of the finished goods the cash expended for creation of the inventory, in any of its forms, is an investment by the firm.

5. What risks do ordinary shareholders take that other suppliers of long-term capital do not?

Common shareholders are the true owners of the firm, since they invest in the firm only upon the expectation of future returns. They are not guaranteed any return, but merely get what is left over after all the other claims have been satisfied. Since the common shareholders receive only what is left over after all other claims are satisfied, they are placed in an uncertain or risky position with respect to returns on invested capital. As a result of this risky position, they expect to be compensated in terms of both dividends and capital gains of sufficient quantity to justify the risk they take.

6.

- a.  $CCC = 65 + 15 - 35 = 45$
- b.  $OC = 65 + 15 = 80$
- c.  $\text{Daily expenditure} = \$1,960,000/360 = \$5,444.44$   
 $\text{Annual savings} = \$5,444.44 \times 15 \times 0.10 = \$8,167$

7.  $EOQ = \sqrt{(2 \times 800 \times \$300)/50} = 98 \text{ units}$

a.  $EOQ = \sqrt{(2 \times 12,600 \times \$600)/2} = 2,750 \text{ units}$



**[Add institute name here]**

**Accounting and Finance**

# Assignment 1

Semester x 20xx



Assignment

<b>Date issued:</b>	xxxxxx 20xx		
<b>Due date and time:</b>	xxxxxxxx 20xx at xxxpm		
<b>Delivery:</b>	Post to xxxxxxxx, or bring to class on xxxxx 20xx.		
<b>Total marks:</b>	100 marks		
<b>Weighting:</b>	25% of final course grade		
<b>Instructions:</b>	<ul style="list-style-type: none"><li>• Complete this cover sheet and attach it to your assignment.</li><li>• Where applicable, show details of your workings.</li><li>• This is an individual assignment and must be your own work.</li><li>• Collusion, copying or plagiarism may result in disciplinary action</li><li>• We advise that you keep a copy of this assignment.</li></ul>		
<b>Student Name:</b>			
<b>Student ID No:</b>			
<b>Lecturer:</b>	xxxxx	Course ID: xxxx	Sem x, 20xx
<b>Student declaration:</b>	I confirm that: <ul style="list-style-type: none"><li>• This is an original assessment and is entirely my own work.</li><li>• This assignment has not previously been submitted as assessed work for any academic course.</li></ul>		
<b>Student signature:</b>			
<b>ID No:</b>			
<b>Date of signature:</b>			



## Instructions

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**Instructions:** Answer **ALL** questions.  
Read each question carefully.  
Answer only what is asked for.  
Please type your responses or write clearly.

**Summary of  
assignment:**

Question	Type/Topic	Marks
1	Discussion Questions	10
2	Relevant Costs	10
3	Activity Based Costing	18
4	Cost-Volume-Profit Analysis	7
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6	Flexible Budgets — Variances	15
7	Performance Measurement	10
8	Balanced Scorecard	14
TOTAL		100



## Question 1

### Discussion questions

(10 marks)

- a. Explain why the balanced scorecard differs from company to company. Identify the appropriate personnel responsible for the implementation of the balanced scorecard.

**5 marks**

- b. Dunn and Evans started the DE Restaurant in 2007. They rented a building, bought equipment, and hired two employees to work full time at a fixed monthly salary. Utilities and other operating charges remain fairly constant during each month.

During the past two years, the business has grown with average sales increasing 1% a month. This situation pleases both Dunn and Evans, but they do not understand how sales can grow by 1% a month while profits are increasing at an even faster pace. They are afraid that one day they will wake up to increasing sales but decreasing profits.

Explain why the profits have increased at a faster rate than sales.

**5 marks**

---

## Question 2

### Relevant costs: Make or buy

(10 marks)

Custom Bicycles has been manufacturing its own wheels for its bikes. The company is currently operating at 100% capacity, and variable manufacturing overhead is charged to production at the rate of 30% of direct labour cost. The direct materials and direct labour cost per unit to make the wheels are \$1.50 and \$1.80, respectively. Normal production is 200,000 wheels per year.

A supplier offers to make the wheels at a price of \$4 each. If the bicycle company accepts this offer, all variable manufacturing costs will be eliminated, but the \$42,000 of fixed manufacturing overhead currently being charged to the wheels will have to be absorbed by other products.

- a. Prepare an analysis for the decision to make or buy the wheels and recommend whether Custom Bicycles should buy the wheels from the outside supplier.

**8 marks**

- b. What other factors should Custom Bicycles consider in making the decision to manufacture or buy the wheels?

**2 marks**



## Question 3

### Activity-based costing

(18 marks)

Able Fancy Cake Company manufactures and sells three flavours of small cakes: chocolate, apple, and cream. The batch size for the cakes is limited to 1,000 cakes per batch based on the size of the ovens and cake moulds owned by the company. Based on budgetary projections, the information listed below is available:

	Chocolate	Apple	Cream
Projected sales in units	500,000	800,000	600,000
PER CAKE data:			
Selling price	\$0.80	\$0.75	\$0.60
Direct materials	\$0.20	\$0.15	\$0.14
Direct labour	\$0.04	\$0.02	\$0.02
Hours per 1000-cake batch:			
Direct labour hours	2	1	1
Oven hours	1	1	1
Packaging hours	0.5	0.5	0.5

Total overhead costs and activity levels for the year are estimated as follows:

Activity	Overhead costs	Activity levels
Direct labour		2,400 hours
Oven	\$210,000	1,900 oven hours
Packaging	\$150,000	950 packaging hours

- a. Use activity based costing (ABC) for the chocolate cake, to calculate the estimated overhead costs per thousand cakes and the estimated operating profit per thousand cakes.

**8 marks**

- b. Using a traditional costing system (with direct labour hours as the overhead allocation base), for the chocolate cake, calculate the estimated overhead costs per thousand cakes and the estimated operating profit per thousand cakes.

**6 marks**

- c. Explain the difference between the profits obtained from the traditional costing system and the ABC system. In doing so, briefly explain which system provides a better estimate of profitability and why.

**4 marks**

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## Question 4

### Cost-volume-profit analysis

(7 marks)

Miller Limited sells car batteries to service stations for an average price of \$30 each. The variable cost of each battery is \$20 and monthly fixed manufacturing costs total \$10,000. Other monthly fixed costs of the company total \$8,000.

- a. Determine the breakeven point and the margin of safety, both in number of batteries and in dollars. Assume sales total \$60,000.

**4 marks**

- b. Determine the breakeven level in number of batteries, assuming variable costs increase by 20%.

**2 marks**

- c. Determine the breakeven level in number of batteries, assuming the selling price goes up by 10%, fixed manufacturing costs decline by 10%, and other fixed costs decline by \$100.

**1 mark**



## Question 5

### Standard costing — variances

(16 marks)

Wilson's Woollens manufactures jackets and other wool clothing. A certain designed ski jacket requires the following:

Direct materials standard:                      2 square metres at \$13.50 per metre

Direct manufacturing labour                      1.5 hours at \$20.00 per hour  
standard:

During the third quarter, the company made 1,500 jackets and used 3,150 metres of fabric costing \$39,375. Direct labour totalled 2,100 hours for \$45,150.

The company's chief financial officer is interested to know how actual production costs compared against standard costs during the third quarter and asks you to provide a variance analysis report.

Prepare a variance analysis report for the chief financial officer for the standard cost variances for direct materials and direct labour, indicating whether the variances are favourable or unfavourable with possible reasons for each of the variances.

**16 marks**

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## Question 6

### Flexible budgets — variances

(15 marks)

Different managers in Gates Limited require varying degrees of managerial accounting information. Because of the need to comply with the managers' requests, four different variances for manufacturing overhead are calculated each month. The information for the September overhead expenditure is as follows:

Budgeted output units	3,200 units
Budgeted fixed manufacturing overhead	\$20,000
Budgeted variable manufacturing overhead	\$5 per direct labour hour
Budgeted direct manufacturing labour hours	2 hours per unit
Actual fixed manufacturing costs incurred	\$26,000
Actual direct manufacturing labour hours used	7,200 direct labour hours
Actual variable manufacturing costs incurred	\$35,600
Actual units manufactured	3,400 units

Prepare a variance report for variable and fixed overhead costs explaining the possible reasons for the variances.

**15 marks**



## Question 7

### Performance measurement

(10 marks)

Kaiser Tool Company allows its divisions to operate as autonomous units. The operating data for 2010 follow:

	Drills (\$)	Hammers (\$)	Saws (\$)
Revenues	2,250,000	500,000	4,800,000
Accounts receivable	800,000	152,500	1,435,000
Operating assets	1,000,000	400,000	1,750,000
Net operating income	220,000	60,000	480,000
Taxable income	165,000	90,000	385,000

- a. Calculate the return on investment for each division and identify the division manager that is doing best with a brief explanation.

**6 marks**

- b. Identify and briefly explain other factors that should be included when evaluating the managers.

**4 marks**



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## Question 8

### Balanced scorecard

(14 marks)

Para Water (PW) is a manufacturer of bottled water. PW has been experiencing increased competition from other manufacturers. In an effort to improve performance, management intends to create a balanced scorecard. In a meeting, several measures were suggested by various managers to deal with the issue of declining profitability.

In the meeting, management has identified a key problem. Customers are taking too long to pay their invoices, and the company has an abnormal amount of bad debts. If this problem were solved, the company would have far more cash to invest in plant improvements. Investigation has revealed that much of the problem with late payments and unpaid invoices is apparently due to disputes about incorrect charges on the customer invoices. Incorrect charges usually occur because sales clerks enter data incorrectly on the sales orders.

In order to develop the balanced scorecard to deal with the identified problem, managers have suggested the following performance measures:

- Total sales revenue
- Sales to total assets
- Customer satisfaction with accuracy of customer invoices from monthly customer survey
- Customer wait time for service
- Average age of accounts receivable
- Written-off accounts receivable as a percentage of sales
- Percentage of customer invoices containing errors
- Percentage of employees who have attended the company's cultural diversity workshop
- Total profit
- Profit per employee
- Percentage of sales clerks trained to correctly enter data on sales orders



- a. Create an integrated balanced scorecard using only the performance measures suggested by the managers. You do not have to use all the measures, but build a balanced scorecard that reveals the action plan for dealing with the problems with accounts receivable.

**5 marks**

- b. Briefly describe the company's action plan to resolve the problem.

**1 mark**

- c. Link each of the perspectives to achieve the desired outcome and briefly explain how the company is able to determine if the action plan is being effective.

**8 marks**

# Assignment 1 — Solutions

Semester x 20xx



Assignment

<b>Date issued:</b>	xxxxxx 20xx		
<b>Due date and time:</b>	xxxxxxxx 20xx at xxxpm		
<b>Delivery:</b>	Post to xxxxxxxx, or bring to class on xxxxx 20xx.		
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<b>Weighting:</b>	25% of final course grade		
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7	Performance Measurement	10
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TOTAL		100

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## Question 1

### Discussion questions

(10 marks)

- a. A company's Balanced Scorecard should be derived from√ and support its strategy√. Since different companies have different strategies, their Balanced Scorecards should be different√. Successful implementation requires the commitment of the entire organisation√.
- b. The fixed cost per meal served is decreasing with increased volumes, while the contribution margin per meal served remains constant. Apparently, most of the restaurant's expenses are fixed√. Therefore, as sales pass the breakeven point the profit will increase even faster√ because the fixed expenses have already been covered√. This allows sales to cover only variable expenses before contributing to the profit margin√, thereby causing it to increase at a faster rate√.

√ = 1 mark, total 10 marks



## Question 2

### Relevant costs: Make or buy

(10 marks)

Custom Bicycles

a.

	MAKE	BUY
Direct materials ( $200,000 \times \$1.50$ )	√\$300,000	-0-
Direct labour ( $200,000 \times \$1.80$ )	√360,000	-0-
Variable manufacturing costs	√108,000	-0-
	(\$360,000 × 30%)	
Purchase price ( $200,000 \times \$4$ )	-0-	√800,000
<b>Total annual cost</b>	<b>√\$768,000</b>	<b>√\$800,000</b>

The wheels should continue to be manufactured by Custom Bicycles√.  
The company's net income would decrease \$32,000 by purchasing the wheels√.

√ = 1 mark: total 8 marks

b. Other factors that could be considered include:

- Quality
- Availability
- Continuity of supply
- Delivery time
- Availability of resources

(Identify and discuss)

½ mark for each factor identified plus ½ for a comment:

total 2 marks

## Question 3

### Activity-based costing

(18 marks)

Able Fancy Cake

Estimated overhead costs and activity levels:

= packaging overhead	packaging hours
= \$150,000	950 hours
= \$157.89	per packaging hour✓

- a. To calculate the estimated overhead costs for a batch of Chocolate cakes (using the ABC system), first calculate the activity-cost-driver rate for the oven activity.

Activity-cost-driver rate	= oven overhead	oven hours
	= \$210,000	1,900 hours
	= \$110.53	per oven hour✓

Then calculate the overhead for a 1,000 cake batch by multiplying the number of activity hours per batch by the appropriate activity-cost-driver rate for each of the relevant overhead activities and sum to get the total overhead for the batch.

$$(1 \times \$110.53) + (0.5 \times \$157.89) = \$189.48✓$$

To calculate the estimated operating profit for a batch of chocolate cakes (using the ABC system), subtract the costs from the revenues:

Revenue	= 1,000 * \$0.80	= \$ 800.00✓
Direct Material	= 1,000 * \$0.20	= (\$200.00)✓
Direct Labour	= 1,000 * \$0.04 x 2 hrs	= (\$ 80.00)✓
Overhead		= (\$189.48)✓
Operating Profit		= \$ 330.52✓

✓ = 1 mark, total 8 marks

- b. To calculate the estimated overhead costs for a batch of chocolate cakes (using the traditional system), first calculate the overhead rate per direct labour hour.

Overhead per direct labour hour:

= Total Overhead	Total Direct Labour Hours
= \$ 360,000	2,400 hours
= \$ 150.00	per direct labour hour



Since it takes two direct labour hours per 1,000 chocolate cakes, the overhead is \$300.00✓

To calculate the estimated operating profit for a batch of chocolate cakes (using the traditional system), subtract the costs from the revenues:

Revenue	= 1,000 * \$0.80	= \$ 800.00✓
Direct Material	= 1,000 * \$.020	= (\$200.00)✓
Direct Labour	= 1,000 * \$.04 x 2hrs	= (\$ 80.00)✓
Overhead		= (\$300.00)✓
Operating Profit		= \$ 220.00✓

✓ = 1 mark, total 6 marks

- c. Traditional system: Operating profit per batch of chocolate cakes is \$220.00.✓

ABC system: Operating profit per batch of chocolate cakes is \$330.52.✓

Because the products do not all require the same proportionate shares of the direct labour resources✓, the allocation of the total overhead on that basis is not as accurate as using the ABC system. The ABC system allocates the overhead based on activity levels for the specific categories as well as activity usage by the product lines.✓

✓ = 1 mark, total 4 marks



## Question 4

### Cost-volume-profit analysis

(7 marks)

- a. N = Breakeven units

$$\$30N - \$20N - \$10,000 - \$8,000 = 0$$

$$\$10N - \$18,000 = 0$$

$$N = \$18,000 / \$10 = 1,800 \text{ batteries (BEP in units)} \checkmark$$

$$\text{BEP (dollars)} = 1800 \times 30 = \$54,000 \checkmark$$

$$\text{Margin of safety (in dollars)} = \$60,000 - (\$30 \times 1,800) = \$6,000 \checkmark$$

$$\text{Margin of safety (in units)} = 2000 - 1800 = 200 \text{ batteries} \checkmark$$

$\checkmark = 1 \text{ mark, total 4 marks}$

- b. N = Breakeven units

$$\$30N - \$24N - \$10,000 - \$8,000 = 0$$

$$\$6N - \$18,000 = 0$$

$$N = \$18,000 / \$6 = 3,000 \text{ batteries} \checkmark \checkmark$$

$\checkmark = 1 \text{ mark, total 3 marks}$

- c. N = Breakeven units

$$\$33N - \$20N - \$9,000 - \$7,900 = 0$$

$$\$13N - \$16,900 = 0 \quad N = \$16,900 / \$13 = 1,300 \text{ batteries} \checkmark$$

$\checkmark = 1 \text{ mark, total 1 mark}$



## Question 5

### Standard costing — variances

(16 marks)

Wilson's Woollens

#### Direct materials variances:

Actual unit cost =  $\$39,375 / 3,150$  square metres =  $\$12.50$  per square metre✓

Price variance =  $3,150 \times (\$13.50 - \$12.50) = \$3,150$  favourable✓

Usage variance =  $\$13.50 \times [3,150 - (1,500 \times 2)]$   
=  $\$2,025$  unfavourable✓

Reasons:

Price variance favourable because of:

- general decrease in price level (deflation)
- lesser quality material acquired at a cheaper price
- purchasing manager proactive in negotiating prices and securing good deals
- standard price has been incorrectly stated.

*(1 mark for each possible reason: maximum 2 marks)*

Efficiency Variance unfavourable because of:

- lesser quality materials therefore used more than the standard
- incorrect standard quantity

*(1 mark for each possible reason: maximum 2 marks)*

#### Direct manufacturing labour variances:

Actual labour rate =  $\$45,150 / 2,100 = \$21.50$  per hour✓

Price variance =  $2,100 \times (\$21.50 - \$20.00) = \$3,150$  unfavourable✓

Efficiency variance =  $\$20.00 \times (2,100 - (1,500 \times 1.5))$   
=  $\$3,000$  favourable✓

Reasons:

Price Variance unfavourable:

- increase in wages
- shortage of labour so new labour purchased at a higher price
- incorrect standard rate

*(1 mark for each possible reason: maximum 2 marks)*

Efficiency Variance favourable:

- Skilled workers
- Incorrect standards
- Well maintained machines

*(1 mark for each possible reason: maximum 2 marks)*

✓ = **1 mark, total 16 marks**



## Question 6

### Flexible budgets — variances

(15 marks)

Gates Limited

Variable overhead spending variance =  $\$35,600 - (7,200 \times \$5\checkmark) = \$400$   
favourable $\checkmark$

- Cost of items in variable overhead declined $\checkmark$
- Quantity of items in variable overhead used has been lesser $\checkmark$

Variable overhead efficiency variance =  $\$5 \times (7,200 - 6,800^*) =$   
 $\$2,000$ unfavourable $\checkmark$

$^*3,400 \text{ units} \times 2 \text{ hours} = 6,800 \text{ hours}\checkmark$

- Used more direct labour hours than should have as per standard $\checkmark$
- Unskilled labour, $\checkmark$
- poor supervision of labour, $\checkmark$
- poorly maintained plant $\checkmark$

Fixed overhead spending variance =  $\$26,000 - \$20,000 = \$6,000$   
unfavourable $\checkmark$

- Cost of fixed overhead items increased $\checkmark$

Fixed overhead production-volume variance =  $\$20,000 - (3,400 \times 2 \times$   
 $\$3.125^*) = \$1,250$  favourable $\checkmark$

$^*\$20,000 / (3,200 \text{ units} \times 2 \text{ hours}) = \$3.125\checkmark$

- produced more than the denominator volume $\checkmark$

$\checkmark = 1 \text{ mark}$ , total **15 marks**

## Question 7

### Performance measurement

(10 marks)

Kaiser Tool Company

a. Use of ROI as a performance measure✓:

- Drills =  $220,000/1,000,000 = 0.22 = 22\%$ ✓
- Hammers =  $60,000/400,000 = 0.15 = 15\%$ ✓
- Saws =  $480,000/1,750,000 = 0.274 = 27.4\%$ ✓

Saws' manager had the best performance✓ because he / she had the highest return on investment✓, which offset his second-best return on sales.

✓ = **1 mark, total 6 marks**

b. Residual income✓ should be considered and non-controllable factors such as the age of the assets✓, also do the divisions have to comply with company policy in owning or leasing their equipment (inconsistency will lead to different operating assets values) and hence different ROI✓.

- Also non-financial measures✓ need to be considered.
- Any other valid comments should be given credit.

✓ = **1 mark, total 4 marks**

## Question 8

### Balanced scorecard

(14 marks)

Para Water

a.

Financial:

- Total profit✓
- Average age of accounts receivable✓

Customer:

- Customer satisfaction with accuracy of charge account bills✓

Internal Processes:

- Percentage of charge account bills containing errors✓

Learning and Growth:

- Percentage of sales clerks trained to correctly enter data on charge✓

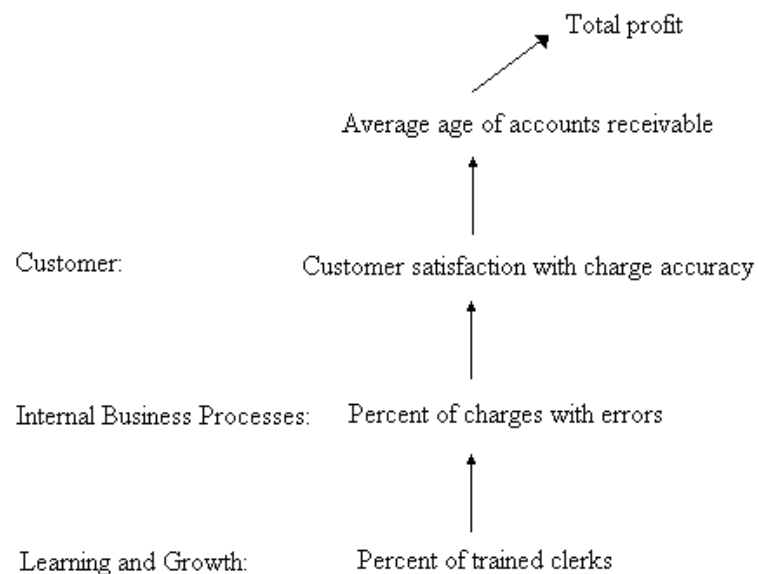
✓ = 1 mark, total 5 marks

b. Action Plan – train sales clerks on data entry on sales orders✓

✓ = 1 mark, total 1 mark

c. Causal Link

b. Financial:



The percentage increase in trained sales clerks should reduce errors, that should increase accuracy of invoices, resulting in increase in

customer satisfaction that should see a reduction in the age of accounts receivable and bad debts with a resultant increase in total profits√√.

If the above does not happen then it suggests that the action plan is not effective√.

*(5 for causal link; 2 for explanation; 1 for assessing.)*

**√ = 1 mark, total 8 marks**

# Assignment 2

Semester **x**, 20**xx**



Assignment

<b>Date issued:</b>	xxxxxx 20xx		
<b>Due date and time:</b>	xxxxxxxx 20xx at xxxpm		
<b>Delivery:</b>	Post to xxxxxxxx, or bring to class on xxxxx 20xx.		
<b>Total marks:</b>	100 marks		
<b>Weighting:</b>	25% of final course grade		
<b>Instructions:</b>	<ul style="list-style-type: none"> <li>• Complete this cover sheet and attach it to your assignment.</li> <li>• Where applicable, show details of your workings.</li> <li>• This is an individual assignment and must be your own work.</li> <li>• Collusion, copying or plagiarism may result in disciplinary action</li> <li>• We advise that you keep a copy of this assignment.</li> </ul>		
<b>Student Name:</b>			
<b>Student ID No:</b>			
<b>Lecturer:</b>	xxxxx	Course ID: xxxx	Sem x, 20xx
<b>Student declaration:</b>	<p>I confirm that:</p> <ul style="list-style-type: none"> <li>• This is an original assessment and is entirely my own work.</li> <li>• This assignment has not previously been submitted as assessed work for any academic course.</li> </ul>		
<b>Student signature:</b>			
<b>ID No:</b>			
<b>Date of signature:</b>			



## Instructions

The purpose of this assignment is to provide you with experience in answering a number of questions based on the Management Accounting Modules in this course.

**Instructions:** Answer **ALL** questions.  
Read each question carefully.  
Answer only what is asked for.  
Please type your responses or write clearly.

Summary of  
assignment:

Question	Type/Topic	Marks
1	Business Finance Environment	20
2	Time Value of Money	21
3	Capital Budgeting	30
4	Working Capital Management	10
5	Long-Term Financing	5
6	Risk and Return	14
TOTAL		100



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## Question 1

### Business finance environment

(20 marks)

- a. A telecommunication company has recently launched a new mobile phone network. The project was financed through a series of bank loans arranged by the company's finance manager. Identify two primary activities of the finance manager in this situation and briefly explain how those activities are related to the firm's balance sheet.

**6 marks**

- b. Finance can be classified into two major areas of study: financial services and managerial finance. Briefly describe the differences between the two.

**4 marks**

- c. Suppose you have been offered a job as a financial advisor for a group of risk-averse investors. How would you differentiate risk-averse investors from other types of investors? Briefly explain your answer. Would you recommend a project with a relatively large dispersion of expected returns to more risk-averse investors or to less risk-averse investors? Explain why.

**5 marks**

- d. What is the principal-agent relationship in the context of a business organisation? Briefly explain how this relationship can lead to the agency problem.

**5 marks**

## Question 2

### Time value of money

(21 marks)

- a. Mr. Mighty has \$15,000 to deposit in King Bank today at 5.1% interest compounded annually.
  - i. Determine the balance of his savings account at the end of five years and at the end of ten years, respectively.

**2 marks**
  - ii. Use your findings in part (i) to calculate the amount of interest earned in the first five years and the next five years, respectively. Briefly explain why the amounts of interest earned in each succeeding five-year period are similar or different.

**4 marks**
- b. You have just started a new job. Based on your salary, you plan to make a deposit of \$17,000 at the end of each year in a savings account that pays a fixed interest rate of 8% compounded annually. Suppose you are able to buy a small apartment at the end of six years for a guaranteed price of \$129,000. Determine whether you will have enough money to buy the apartment at the end of six-year period. Briefly explain your answer.

**5 marks**
- c. You have just agreed to sell your car to your friend. You are given an option of either receiving a total of \$75,000 today or being paid \$13,000 at the end of each year for the next 8 years. If you can earn 9% interest rate compounded annually from your bank, which option should you take? Briefly explain your answer.

**5 marks**
- d. BVO Manufacturing Company has the option of making an investment in a new machine that will cost \$150,000 today. It is estimated that this investment will provide the net cash inflows to the company over the next four years as shown in the following table.

End of Year	Net Cash Inflows
1	\$35,000
2	\$50,000
3	\$40,000
4	\$60,000

Should the company make this investment if it requires a minimum annual rate of return of 11% compounded annually? Show your workings.

5 marks

## Question 3

### Capital budgeting techniques

(30 marks)

Alberta Limited is considering two mutually exclusive projects. The relevant cash flows for each project are shown in the table below.

	Project Ajax	Project Eden
Initial Investment	\$55,000	\$60,000
Year	Net Cash Inflows	
1	\$22,000	\$35,000
2	\$22,000	\$25,000
3	\$22,000	\$20,000
4	\$22,000	\$15,000

- a. Define the terms “mutually exclusive projects” and “independent projects”.

4 marks

- b. Determine the payback period of each project. If the company has the maximum acceptable payback period of three years, which project(s) should the company invest in? Explain why.

7 marks

- c. Suppose the company has a cost of capital of 12%. Determine the Net Present Value (NPV) of each project. Which project is preferred in this situation and why?

7 marks

- d. The finance manager at Alberta Limited is considering using the following equation to determine the risk-adjusted discount rate for each project.

$$(RADR_j)$$

$$(RADR_j) = R_F + [b_j \times (k_m - R_F)]$$

Where:

$$R_F = \text{Risk-free rate of return}$$

$$b_j = \text{Beta for project } j$$

$$k_m = \text{Cost of capital.}$$

Suppose the risk-free rate ( $R_f$ ) observed in the market is 8% and the market rate of return ( $k_m$ ) is 14%. The beta ( $b_j$ ), which is a measure of risk, for project Ajax is 0.75 and the beta for project Eden is 2.0. Determine the risk-adjusted net present value for each project. Which project is preferred in this situation and why?

**8 marks**

- e. Compare your investment decision made in part (c) to that made in part (d). Briefly explain why they are similar or different.

**4 marks**



## Question 4

### Working capital management

(10 marks)

Serco Industries is concerned about managing cash in an efficient manner. The average age of inventories is 75 days and accounts receivable are collected in 45 days. Accounts payable are paid approximately 30 days after they arise. All calculations are based on a 365-day year. The firm spends \$40 million on operating cycle investments each year, at a constant rate.

- a. Determine the firm's operating cycle, cash conversion cycle and the amount of financing required to support the firm's cash conversion cycle.

**6 marks**

- b. Explain why a financial manager must pay attention to the firm's cash conversion cycle. Discuss how the firm's financial manager might be able to efficiently manage the firm's cash conversion cycle.

**4 marks**

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## Question 5

### Long-term financing

(5 marks)

Ordinary shareholders are suppliers of long-term capital for the firm.  
What risks do ordinary shareholders take that other suppliers of long-term capital do not?

Explain how those risks affect the cost of equity financing for the firm.

**5 marks**

## Question 6

### Risk and return

(14 marks)

Slender Limited must choose between two asset purchases. The annual rate of return and the related probabilities given in the following table summarise the firm's analysis so far on these alternatives.

Project A			Project B	
Rate of Return	Probability		Rate of Return	Probability
-10%	0.01		10%	0.05
10%	0.04		15%	0.10
20%	0.05		20%	0.10
30%	0.10		25%	0.15
40%	0.15		30%	0.20
50%	0.30		35%	0.15
60%	0.15		40%	0.10
70%	0.10		45%	0.10
80%	0.05		50%	0.05
90%	0.04			
100%	0.01			

- a. For each project, calculate:
  - i. The range of possible returns
  - ii. The expected value of return
  - iii. The standard deviation of the returns

**6 marks**

- b. Construct a bar chart of each distribution of rates of return.

**4 marks**

- c. Which project would you consider to be the least risky?  
Explain your answer.

**4 marks**



## Assignment 2 — Solutions

Semester x, 20xx



Assignment

<b>Date issued:</b>	xxxxxx 20xx		
<b>Due date and time:</b>	xxxxxxxx 20xx at xxxpm		
<b>Delivery:</b>	Post to xxxxxxxx, or bring to class on xxxxx 20xx.		
<b>Total marks:</b>	100 marks		
<b>Weighting:</b>	25% of final course grade		
<b>Instructions:</b>	<ul style="list-style-type: none"> <li>• Complete this cover sheet and attach it to your assignment.</li> <li>• Where applicable, show details of your workings.</li> <li>• This is an individual assignment and must be your own work.</li> <li>• Collusion, copying or plagiarism may result in disciplinary action</li> <li>• We advise that you keep a copy of this assignment.</li> </ul>		
<b>Student Name:</b>			
<b>Student ID No:</b>			
<b>Lecturer:</b>	xxxxx	Course ID: xxxx	Sem x, 20xx
<b>Student declaration:</b>	<p>I confirm that:</p> <ul style="list-style-type: none"> <li>• This is an original assessment and is entirely my own work.</li> <li>• This assignment has not previously been submitted as assessed work for any academic course.</li> </ul>		
<b>Student signature:</b>			
<b>ID No:</b>			
<b>Date of signature:</b>			



## Instructions

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assignment:

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4	Working Capital Management	10
5	Long-Term Financing	5
6	Risk and Return	14
TOTAL		100

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## Question 1

### Business finance environment

(20 marks)

- a. A telecommunication company has recently launched a new mobile phone network. The project was financed through a series of bank loans arranged by the company's finance manager. Identify two primary activities of the finance manager in this situation and briefly explain how those activities are related to the firm's balance sheet.

The two primary activities of the financial manager in relation to the firm's balance sheet are:

- i. Making investment decision, which is the launch of new mobile phone network in this case. Launching a new project increase the company's assets, so the investment decision concerns the asset side of the balance sheet.
- ii. Making financing decisions, which is the borrowing from banks in this case. This decision increases the company's debts and hence it deals with the liabilities side of the balance sheet.

*(Marking criteria: 1 mark for identifying each activity correctly, 2 marks for a brief explanation of each activity)*

**6 marks**

- b. Finance can be classified into two major areas of study: financial services and managerial finance. Briefly describe the differences between the two.

Financial services are concerned with the advice on financial products to individuals, business and government.

Managerial finance is concerned with the duties of the financial manager in the business firm. In other words, it is concerned with the management of the firm's funds within the firm. The duties of the financial manager may include capital budgeting, financial forecasting, credit administration, investment analysis, and funds procurement for the firm.

*(Marking criteria: 2 marks for a brief description of each)*

**4 marks**



- c. Suppose you have been offered a job as a financial advisor for a group of risk-averse investors. How would you differentiate risk-averse investors from other types of investors? Briefly explain your answer. Would you recommend a project with a relatively large dispersion of expected returns to more risk-averse investors or to less risk-averse investors? Explain why.

Different types of investors have different risk preferences. The risk preference of the risk-averse investors is that they required higher expected returns to compensate them for taking greater risk. Risk-averse investors seek to avoid risk and as a result they tend to be conservative rather than aggressive when accepting risk for their investment.

A project with a relatively large dispersion of returns is considered a risky project. So, this project should be recommended to less risk-averse investors.

*(Marking criteria: 3 marks for how to differentiate risk-averse investors with reasonable explanation, 1 mark for project recommendation and 1 mark for the explanation)*

**5 marks**

- d. What is the principal-agent relationship in the context of a business organisation? Briefly explain how this relationship can lead to the agency problem.

Owners (principal) of the firm hire financial managers (agents) to manage the firm for the owners' benefit.

In theory, financial managers would agree with the goal of owner wealth maximisation. In practice, however, managers may place personal goals ahead of corporate goals. This conflict is called the agency problem.

*(Marking criteria: 2 marks for describing the relationship and 3 marks for the explanation)*

**5 marks**

## Question 2

### Time value of money

(21 marks)

- a. Mr Mighty has \$15,000 to deposit in King Bank today at 5.1% interest compounded annually.
- i. Determine the balance of his savings account at the end of five years and at the end of ten years, respectively.

Future value at the end of five years:

$$\begin{aligned}FV_5 &= \$15,000 \times (1.051)^5 \\&= \$15,000 \times 1.282371 \\&= \$19,235.56\end{aligned}$$

Future value at the end of ten years:

$$\begin{aligned}FV_{10} &= \$15,000 \times (1.051)^{10} \\&= \$15,000 \times 1.644475 \\&= \$24,667.12\end{aligned}$$

(Marking criteria: 1 mark for each future value)

**2 marks**

- ii. Use your findings in part (i) to calculate the amount of interest earned in the first five years and the next five years, respectively. Briefly explain why the amounts of interest earned in each succeeding five-year period are similar or different.

The amount of interest earned in the first five years:

$$\begin{aligned}FV_5 - PV &= \$19,235.56 - \$15,000 \\&= \$4,235.56\end{aligned}$$

The amount of interest earned in the next five years:

$$\begin{aligned}FV_{10} - FV_5 &= \$24,667.12 - \$19,235.56 \\&= \$5,431.56\end{aligned}$$

The increasing change in interest earned is due to compounding, the earning of interest on previous interest earned. The longer the



savings period is, the larger the total amount of interest collected will be. The amount of interest earned increases in each succeeding five-year period is due to the greater length of time that the principal sum of \$15,000 is deposited. The incremental interest earned per five-year period increases with each subsequent five-year period, because every time interest is paid it is being paid on both the principal and all previous interest payments. The greater the previous interest earned, the greater the impact of compounding

*(Marking criteria: 1 mark for each of the correct answer, 2 marks for the explanation)*

**4 marks**

- b. You have just started a new job. Based on your salary, you plan to make a deposit of \$17,000 at the end of each year in a savings account that pays a fixed interest rate of 8% compounded annually. Suppose you are able to buy a small apartment at the end of six years for a guaranteed price of \$129,000. Determine whether you will have enough money to buy the apartment at the end of six-year period. Briefly explain your answer.

*(Marking criteria: 3 marks for calculation, 2 marks for explaining whether you can accumulate enough money to buy the house)*

**5 marks**

Using the formula for the future value of an ordinary annuity to find how much you can accumulate your bonus until the end of the next six-year period.

$$\begin{aligned}
 FVA_n &= PMT \times \frac{1}{i} \times [(1+i)^n - 1] \\
 &= \$17,000 \times \frac{1}{0.08} \times [(1.08)^6 - 1] \\
 &= \$124,710.79
 \end{aligned}$$

By depositing \$17,000 regularly at the end of each year, you will have \$124,710.79 at the end of six years. However, this amount is not enough for you to buy the apartment worth \$129,000 at the end of six years.

Alternatively, you can find the present value of bonuses as follows:

$$\begin{aligned}
 PVA_n &= PMT \times \frac{1}{i} \times \left[ 1 - \frac{1}{(1+i)^n} \right] \\
 &= \$17,000 \times \frac{1}{0.08} \times \left[ 1 - \frac{1}{(1.08)^6} \right] \\
 &= \$78,588.95
 \end{aligned}$$

Then compare this amount to the present value of the house price.

$$\begin{aligned} PV &= \frac{FV_n}{(1+i)^n} \\ &= \frac{\$129,000}{(1.08)^6} \\ &= \$81,291.88 \end{aligned}$$

The present value of the house price at the end of six-year period is \$81,291.88, which is greater than the present value of bonus of \$78,588.95.

Both methods arrive at the same conclusion. That is, the amount of bonus is not enough to finance the apartment.

- c. You have just agreed to sell your car to your friend. You are given an option of either receiving a total of \$75,000 today or being paid \$13,000 at the end of each year for the next 8 years. If you can earn 9% interest rate compounded annually from your bank, which option should you take? Briefly explain your answer.

*(Marking criteria: 3 marks for calculation, 2 marks for explaining which alternatives to choose)*

**5 marks**

The easiest way to answer this question is to find the present value of \$13,000 which will be paid at the end of the following eight years. This can be found by using the present value of an ordinary annuity formula.

$$\begin{aligned} PVA_n &= PMT \times \frac{1}{i} \times \left[ 1 - \frac{1}{(1+i)^n} \right] \\ &= \$13,000 \times \frac{1}{0.09} \times \left[ 1 - \frac{1}{(1.09)^8} \right] \\ &= \$71,952.65 \end{aligned}$$

The present value of an ordinary annuity is \$71,952.65 which is less than \$75,000. Therefore, it is better off to take the total amount today.

Alternatively, the two options can be compared by finding the future values of both cash flows. The future value of \$75,000 is:

$$\begin{aligned} FV_n &= PV \times (1+i)^n \\ &= \$75,000 \times (1.09)^8 \\ &= \$149,442.2 \end{aligned}$$



The future value of \$13,000 to be received at the end of the following eight years is:

$$\begin{aligned}
 FVA_n &= PMT \times \frac{1}{i} \times [(1+i)^n - 1] \\
 &= \$13,000 \times \frac{1}{0.09} \times [(1.09)^8 - 1] \\
 &= \$143,370.2
 \end{aligned}$$

Clearly, the \$13,000 annuity yields smaller future value. It is better off to take the total payment of \$75,000 today.

Note that both methods of calculation arrive at the same conclusion.

- d. BVO Manufacturing Company has the option of making an investment in a new machine that will cost \$150,000 today. It is estimated that this investment will provide the net cash inflows to the company over the next four years as shown in the following table.

End of Year	Net Cash Inflows
1	\$35,000
2	\$50,000
3	\$40,000
4	\$60,000

Should the company make this investment if it requires a minimum annual rate of return of 11% compounded annually? Show your workings.

(Marking criteria: 4 marks for the correct present value of each year, 1 mark for a brief explanation)

**4 marks**

End of Year	CF <sub>t</sub>	PVIF	PV(CF <sub>t</sub> )
1	\$35,000	0.9009	\$31,531.53
2	\$50,000	0.8116	\$40,581.12
3	\$40,000	0.7312	\$29,247.66
4	\$60,000	0.6587	\$39,523.86
Total			\$140,884.17

The company should not make an investment in the new product because the present value of net cash inflows of \$140,884.17 is less than the cost of investment of \$150,000.

(Marking criteria: 4 marks for the correct present value of each year, 1 mark for a brief explanation)

**5 marks**



## Question 3

### Capital budgeting techniques

(30 marks)

Alberta Limited is considering two mutually exclusive projects. The relevant cash flows for each project are shown in the table below.

	Project Ajax	Project Eden
Initial Investment	\$55,000	\$60,000
Year	Net Cash Inflows	
1	\$22,000	\$35,000
2	\$22,000	\$25,000
3	\$22,000	\$20,000
4	\$22,000	\$15,000

- a. Define the terms “mutually exclusive projects” and “independent projects”.

Mutually exclusive projects are projects that compete with one another, so that the acceptance of one eliminates the others from further consideration.

Independent projects are projects with cash flows that are unrelated or independent of one another. The acceptance of one does not eliminate the others from further consideration.

(Marking criteria: 2 marks for each of the definitions)

**4 marks**

- b. Determine the payback period of each project. If the company has the maximum acceptable payback period of three years, which project(s) should the company invest in? Explain why.

$$\text{Payback period of project Ajax} = \frac{\$55,000}{\$22,000} = 2.5 \text{ years}$$

Payback period of project Eden

Year	Project B	
	Cash Inflows	Balance
0		-\$60,000
1	\$35,000	-\$25,000
2	\$25,000	\$0
3	\$20,000	
4	\$15,000	

Payback period of project Eden is two years.



Project Eden must be chosen in this case. The reasons for this are as follows: (i) the two projects are mutually exclusive, so only one project can be selected even though Project Ajax's payback period is less than the maximum acceptable payback period. (ii) Project Eden has a shorter payback period than the other. It should be noted that the shorter the payback period leads to a quicker recovery of the initial investment and the lower risk exposure of the project.

*(Marking criteria: 2 marks for the payback of each project, 1 mark for the correct project selection, 2 marks for the reasonable explanation)*

**7 marks**

- c. Suppose the company has a cost of capital of 12%. Determine the Net Present Value (NPV) of each project. Which project is preferred in this situation and why?

Project Ajax:

$$\begin{aligned}
 PVA_n &= PMT \times \frac{1}{i} \times \left[ 1 - \frac{1}{(1+i)^n} \right] \\
 &= \$22,000 \times \frac{1}{0.12} \times \left[ 1 - \frac{1}{(1.12)^4} \right] \\
 &= \$66,821.69 \\
 NPV &= \$66,821.69 - \$55,000 \\
 &= \$11,821.69
 \end{aligned}$$

Project Eden:

Year	Net Cash Inflows	Present Value
1	\$35,000	\$31,250.00
2	\$25,000	\$19,929.85
3	\$20,000	\$14,235.60
4	\$15,000	\$9,532.77
<b>Sum</b>		<b>\$74,948.22</b>

$$\begin{aligned}
 NPV &= \$74,948.22 - \$60,000 \\
 &= \$14,948.22
 \end{aligned}$$

The NPV of project Eden is greater than the NPV of project Ajax, so project Eden is preferred.

*(Marking criteria: 3 marks for the NPV of each project and 1 mark for explaining the investment decision)*

**7 marks**

- d. The finance manager at Alberta Limited is considering using the following equation to determine the risk-adjusted discount rate for each project.

$(RADR_j)$

$$RADR_j = R_F + [b_j \times (k_m - R_F)]$$

Where:

$R_F$  = Risk-free rate of return

$b_j$  = Beta for project j

$k_m$  = Cost of capital

Suppose the risk-free rate ( $R_F$ ) observed in the market is 8% and the market rate of return ( $k_m$ ) is 14%. The beta ( $b_j$ ), which is a measure of risk, for project Ajax is 0.75 and the beta for project Eden is 2.0. Determine the risk-adjusted net present value for each project. Which project is preferred in this situation and why?

The risk-adjusted discount rate (RADR) for each project:

$$\begin{aligned} RADR_{\text{Alberta}} &= 0.08 + [0.75 \times (0.14 - 0.08)] \\ &= 0.125 = 12.5\% \end{aligned}$$

$$\begin{aligned} RADR_{\text{Edena}} &= 0.08 + [2.0 \times (0.14 - 0.08)] \\ &= 0.20 = 20\% \end{aligned}$$

Project Ajax's risk-adjusted NPV:

$$\begin{aligned} PVA_n &= PMT \times \frac{1}{i} \times \left[ 1 - \frac{1}{(1+i)^n} \right] \\ &= \$22,000 \times \frac{1}{0.125} \times \left[ 1 - \frac{1}{(1.125)^4} \right] \\ &= \$66,124.07 \\ NPV &= \$66,124.07 - \$55,000 \\ &= \$11,124.07 \end{aligned}$$



Project Eden's risk-adjusted NPV:

Year	Net Cash Inflows	Present Value
1	\$35,000	\$29,166.67
2	\$25,000	\$17,361.11
3	\$20,000	\$11,574.07
4	\$15,000	\$7,233.80
<b>Sum</b>		<b>\$65,335.65</b>

$$\begin{aligned}
 NPV &= \$65,335.65 - \$60,000 \\
 &= \$5,335.65
 \end{aligned}$$

The risk-adjusted NPV of project Ajax is greater than the risk-adjusted NPV of project Eden, therefore, project Ajax is preferred in this situation.

*(Marking criteria: 1 mark for the RADR of each project, 2 marks for the risk-adjusted NPV of each project and 2 marks for explaining the investment decision.)*

**8 marks**

- e. Compare your investment decision made in part (c) to that made in part (d). Briefly explain why they are similar or different.

In part (c), the NPVs were calculated without accounting for risk. This led to the acceptance of project Eden due to its NPV is greater than that of project Ajax. On the other hand, risk was accounted for in part (d) by means of calculating the risk-adjusted discounted rate. This rate can accommodate the trade-off between risk and return in the sense that the higher the risk, the higher the required rate of return. Project Eden is considered riskier as its beta is greater than that of project Ajax. In order to account for the risk difference between the two projects, the discount rate (the required rate of return) for project Eden must be higher than that of project Ajax. By using the risk-adjusted discount rate to calculate the NPV for each project, the resulting risk-adjusted NPVs in part (d) revealed that project Ajax is preferred. The investment decisions made in part (c) and (d) differ due to the fact that the former did not account for risk while the latter took risk into consideration. The risk-adjusted NPV is preferred as it is considered more appropriate and more closely related to the real world situation.

*(Marking criteria: Mark ranges from 4 for a very clear and reasonable explanation to 0 for irrelevant and totally unclear.)*

**4 marks**

## Question 4

### Working capital management

(10 marks)

Serco Industries is concerned about managing cash in an efficient manner. The average age of inventories is 75 days and accounts receivable are collected in 45 days. Accounts payable are paid approximately 30 days after they arise. All calculations are based on a 365-day year. The firm spends \$40 million on operating cycle investments each year, at a constant rate.

**Required:**

- a. Determine the firm's operating cycle, cash conversion cycle and the amount of financing required to support the firm's cash conversion cycle.

$$\begin{aligned} OC &= AAI + ACP \\ &= 75 + 45 \\ &= 120 \text{ days} \end{aligned}$$

$$\begin{aligned} CCC &= OC - APP \\ &= 120 - 30 \\ &= 90 \text{ days} \end{aligned}$$

$$\begin{aligned} \text{daily operating exp expenditure} &= \frac{\text{total outlays}}{365 \text{ days}} \\ &= \frac{\$40,000,000}{365 \text{ days}} \\ &= \$109,589.04 \end{aligned}$$

$$\begin{aligned} \text{amount of financing required} &= \text{Daily operating expenditure} \times CCC \\ &= \$109,589.04 \times 90 \\ &= \$9,863,013.70 \end{aligned}$$

(Marking criteria: 2 marks for OC, 2 marks for CCC, and 2 marks for the amount of financing required.)

**6 marks**



- b. Explain why a financial manager must pay attention to the firm's cash conversion cycle. Discuss how the firm's financial manager might be able to efficiently manage the firm's cash conversion cycle.

This is because cash conversion cycle indicates the amount of time a firm's resources are tied up in low return assets. The longer the cash conversion cycle the greater the amount of investment tied up. Any extension of the cycle can result in higher costs and lower profits.

Turnover inventory (reducing AAI) as quickly as possible without stock-outs that result in lost sales. Collect accounts receivable (reducing ACP) as quickly as possible without losing sales from high-pressure collection techniques. Pay accounts payable (lengthening APP) as slowly as possible without damaging the firm's credit rating. Or, a combination of these can reduce the cash conversion cycle.

*(Marking criteria: 1 mark for explaining the importance of CCC, 1 mark for each of the following suggestions: reducing AAI, reducing ACP, lengthening APP.)*

**4 marks**

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## Question 5

### Long-term financing

(5 marks)

Ordinary shareholders are suppliers of long-term capital for the firm. What risks do ordinary shareholders take that other suppliers of long-term capital do not?

Explain how those risks affect the cost of equity financing for the firm.

Ordinary shareholders are the true owners of the firm, since they invest in the firm only upon the expectation of future returns. They are not guaranteed any return, but merely get what is left over after all the other claims have been satisfied. Since the ordinary shareholders receive only what is left over after all other claims are satisfied, they are placed in a quite uncertain or risky position with respect to returns on invested capital.

As a result of this risky position, they expect to be compensated in terms of both dividends and capital gains of sufficient quantity to justify the risk they take. Hence, cost of equity is considered relatively higher than the costs of other forms of financing.

*(Marking criteria: 2 marks for the correct description of shareholders' risks, 3 marks for the reasonable explanation.)*

**5 marks**



## Question 6

### Risk and return

(14 marks)

Slender Limited

a. Calculations:

Project A

i. Range:  $1.00 - (-0.10) = 1.10$

ii. Expected return:  $\bar{k} = \sum_{i=1}^n k_i \times P_{ri}$

Rate of Return $k_i$	Probability $P_{ri}$	Weighted Value $k_i \times P_{ri}$	Expected Return $\bar{k} = \sum_{i=1}^n k_i \times P_{ri}$
-0.10	0.01	-0.001	
0.10	0.04	0.004	
0.20	0.05	0.010	
0.30	0.10	0.030	
0.40	0.15	0.060	
0.45	0.30	0.135	
0.50	0.15	0.075	
0.60	0.10	0.060	
0.70	0.05	0.035	
0.80	0.04	0.032	
1.00	0.01	0.010	
	1.00		0.450

iii. Standard Deviation:  $\sigma = \sqrt{\sum_{i=1}^n (k_i - \bar{k})^2 \times P_{ri}}$

$k_i$	$\bar{k}$	$k_i - \bar{k}$	$(k_i - \bar{k})^2$	$P_{ri}$	$(k_i - \bar{k})^2 \times P_{ri}$
-0.10	0.450	-0.550	0.3025	0.01	0.003025
0.10	0.450	-0.350	0.1225	0.04	0.004900
0.20	0.450	-0.250	0.0625	0.05	0.003125
0.30	0.450	-0.150	0.0225	0.10	0.002250
0.40	0.450	-0.050	0.0025	0.15	0.000375
0.45	0.450	0.000	0.0000	0.30	0.000000



$k_i$	$\bar{k}$	$k_i - \bar{k}$	$(k_i - \bar{k})^2$	$P_{ri}$	$(k_i - \bar{k})^2 \times P_{ri}$
0.50	0.450	0.050	0.0025	0.15	0.000375
0.60	0.450	0.150	0.0225	0.10	0.002250
0.70	0.450	0.250	0.0625	0.05	0.003125
0.80	0.450	0.350	0.1225	0.04	0.004900
1.00	0.450	0.550	0.3025	0.01	0.003025
					0.027350

$$\sigma_{\text{Project 257}} = \sqrt{0.027350} = 0.165378$$

### Project B

i. Range:  $0.50 - 0.10 = 0.40$

$$\bar{k} = \sum_{i=1}^n k_i \times P_{ri}$$

ii. Expected return:

Rate of Return $k_i$	Probability $P_{ri}$	Weighted Value $k_i \times P_{ri}$	Expected Return $\bar{k} = \sum_{i=1}^n k_i \times P_{ri}$
0.10	0.05	0.0050	
0.15	0.10	0.0150	
0.20	0.10	0.0200	
0.25	0.15	0.0375	
0.30	0.20	0.0600	
0.35	0.15	0.0525	
0.40	0.10	0.0400	
0.45	0.10	0.0450	
0.50	0.05	0.0250	
		1.00	0.300

iii. Standard Deviation:

$$\sigma = \sqrt{\sum_{i=1}^n (k_i - \bar{k})^2 \times P_{ri}}$$

$k_i$	$\bar{k}$	$k_i - \bar{k}$	$(k_i - \bar{k})^2$	$P_{ri}$	$(k_i - \bar{k})^2 \times P_{ri}$
0.10	0.300	-0.20	0.0400	0.05	0.002000
0.15	0.300	-0.15	0.0225	0.10	0.002250
0.20	0.300	-0.10	0.0100	0.10	0.001000
0.25	0.300	-0.05	0.0025	0.15	0.000375
0.30	0.300	0.00	0.0000	0.20	0.000000
0.35	0.300	0.05	0.0025	0.15	0.000375
0.40	0.300	0.10	0.0100	0.10	0.001000



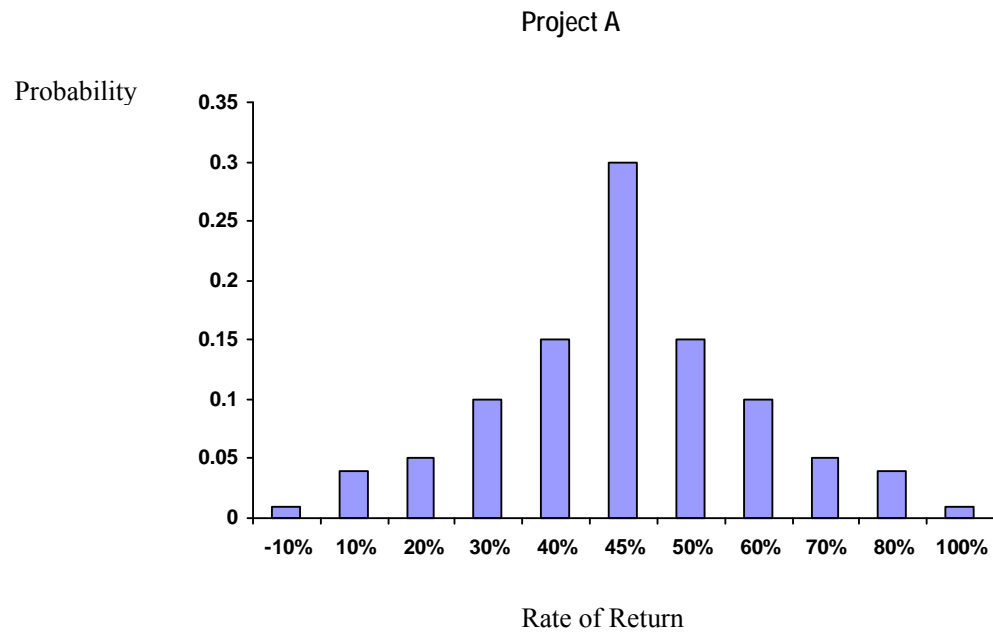
$k_i$	$\bar{k}$	$k_i - \bar{k}$	$(k_i - \bar{k})^2$	$P_{ri}$	$(k_i - \bar{k})^2 \times P_{ri}$
0.45	0.300	0.15	0.0225	0.10	0.002250
0.50	0.300	0.20	0.0400	0.05	0.002000
					0.011250

$$\sigma_{\text{Project 432}} = \sqrt{0.011250} = 0.106066$$

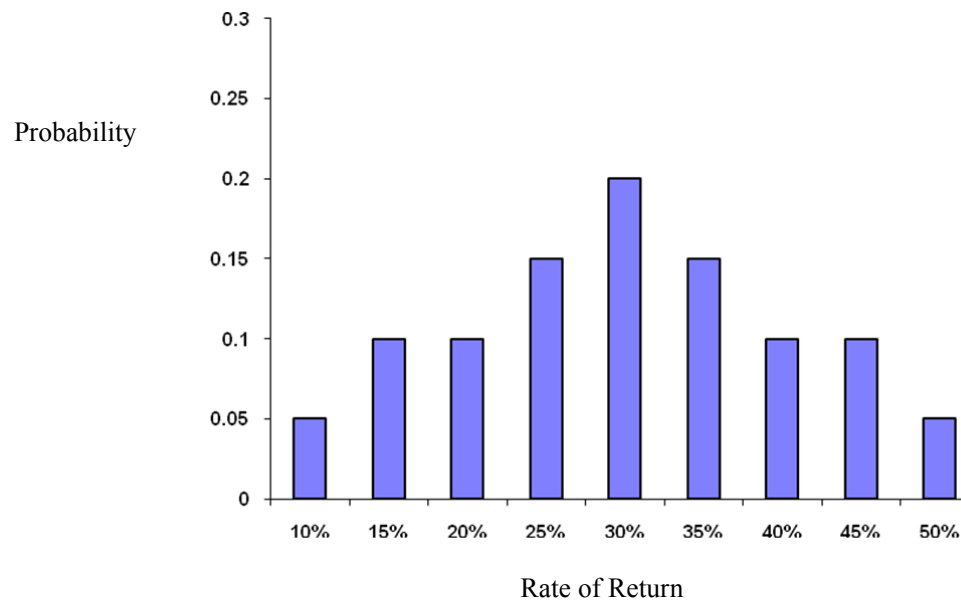
(Marking Criteria: 2 marks for the range for each project; 2 marks for the expected value for each project; 2 marks for the standard deviation for each project)

**6 marks**

b. Bar Charts



Project B



(Marking criteria: 2 marks for each bar chart for each project.)

**4 marks**

c. Summary Statistics

	Project A	Project B
Range	1.100	0.400
Expected Return ( $\bar{k}$ )	0.450	0.300
Standard Deviation ( $\sigma_k$ )	0.165	0.106

Since Projects A and B have differing expected values, the standard deviation should be the criterion by which the risk of the asset is judged. Since Project B has a smaller standard deviation, it is the opportunity with lower risk.

(Marking criteria: 1 mark for the summary for each project; 1 mark for identifying that standard deviation should be used to assess the relative risk; 2 marks for a conclusion and reason.)

**4 marks**



# C9 Accounting and Finance Exam Questions



**[Add institute name here]**

**Accounting and Finance**

**Date:** xxxxxx 20xx

**Start time:** xxxxpm

**Time allowed:** 3 hours, plus 10 minutes reading time

**Total marks:** 100 marks

**Weighting:** 50% of course

**Instructions:** Answer ALL questions.  
 Answer the questions directly in the answer booklet provided.  
 Read each question carefully.  
 Answer only what is asked for.  
 Please write clearly.

**Summary of paper:**

Question	Type/Topic	Marks
1	Budgeting	20
2	Cost-volume-profit	15
3	Absorption and Variable Costing	7
4	Activity-Based Costing	13
5	Investment Proposal	20
6	Cost of Capital	20
7	Managing Working Capital	5
TOTAL		100

## Question 1

### Budgeting

(20 marks)

On 26 April 20xx Tom Andrews submitted the master budget below for the sales division of Dunbar Ltd for the month of May, 20xx.

On 5 June 20xx he completed the budget below and submitted it to the company Chief Financial Officer (CFO).

	Master	Actual	Variances
Sales units	24,000	30,000	F
	\$000	\$000	
Variable costs			
Sales commissions	7,200	8,400	U
Travel expenses	15,600	18,300	U
Free samples given out	2,400	3,100	U
Total variable costs	25,200	29,800	U
Fixed costs			
Advertising	3,600	4,200	U
Rent	3,000	3,000	
Salaries	5,000	4,400	F
Vehicle depreciation	1,000	1,000	
Total fixed costs	12,600	12,600	
Total costs	37,800	42,400	U

F = favourable

U = unfavourable

On Monday 14 June 20xxx Tom was called into the CFO's office. The CFO began by praising Tom's division for the positive sales performance, but then angrily stated that he had let the costs for the month get out of control. Tom left the meeting really upset and feeling that something was not quite right. He has come to you for advice and assistance in responding to the CFO.

**Required:**

- a. On the attached sheet (Appendix 1) compile a flexed budget with variances.

**13 marks**

- b. Draft a response to the CFO, stating why you have compiled a flexed budget and what this reveals about the performance of the sales division for the month of May 2010.

**7 marks**



## Question 2

### Cost-Volume-Profit

(15 marks)

Michael Parkinson has decided to operate a small bakery making pies. The product is to be sold to restaurants and cafes. Michael has obtained the following information:

- The cost of baking equipment is \$5,000, and the equipment is expected to last for five years, after which the equipment has no re-sale value. The maximum daily output of the equipment is 500 pies.
- He rents a small factory. The rental per week is \$100.
- Other fixed costs amount to \$7,500 per annum that includes maintenance, electricity and office overheads.
- Michael will work full time in his new business, and therefore he has to give up his job at a bakery for which he gets \$750 per week. He will draw the same amount of salary from the new business.
- Based on the market information, Michael believes the pie can be sold at \$1.50 each and that he should be able to sell an average of 8,000 pies every month.
- Material costs for the pie amount to \$0.35 per pie.
- Other variable costs including gas, sauce and packing, are \$0.15 per pie.

**Required:**

- a. Calculate the contribution margin for the pie.  
**3 marks**
- b. Calculate the annual breakeven units and dollars.  
**3 marks**
- c. Calculate the profit (before tax) for the first year if Michael would be able to get if he manages to sell an average of 8,000 units per month.  
**3 marks**
- d. Michael expects to make \$60,000 profit after tax (the tax rate is 35%) in the first year to finance his business expansion. How many pies must he sell in a year to achieve the profit target?  
**3 marks**
- e. Michael was asked to submit a quote for providing pies to a restaurant at a special price of \$0.80 each. In return for the special price, the restaurant will guarantee Michael an annual purchase of not less than 12,000 units. Advise Michael whether he should accept the order. Justify your reason.  
**3 marks**

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## Question 3

### Absorption and Variable Costing

(7 marks)

Burns Company sells its products for \$66 each. The current production level is 25,000 units, although only 20,000 units are anticipated to be sold.

**Unit manufacturing costs are:**

Direct materials	\$12.00
Direct manufacturing labour	\$18.00
Variable manufacturing costs	\$9.00
Total fixed manufacturing costs	\$180,000

**Marketing expenses:**

\$6.00 per unit, plus \$60,000 per year

**Required:**

- a. Prepare an income statement using absorption costing.

**3 marks**

- b. Prepare an income statement using variable costing.

**4 marks**



## Question 4

### Activity-based Costing

(13 marks)

The Doors Manufacturing Company produces two types of entry doors: Deluxe and Standard. The assignment basis for support costs has been direct labour dollars. For 2010, the company compiled the following data for the two products:

	<u>Deluxe</u>	<u>Standard</u>
Sales	50,000 units	400,000 units
Sales price per unit	\$650.00	\$475.00
Direct material and labour costs per unit	\$180.00	\$130.00
Manufacturing support costs per unit	\$ 80.00	\$120.00

Last year, the company purchased an expensive robotics system to allow for more decorative door products in the deluxe product line. The company's Chief Financial Officer suggested that an ABC analysis could be valuable to help evaluate a product mix and promotion strategy for the next sales campaign. She obtained the following ABC information for 2010:

Activity	Cost Drive	Cost	Total	Deluxe	Standard
Setups	Setups	\$ 500,000	500	400	100
Machine-related	Machine hrs	\$44,000,000	600,000	300,000	300,000
Packing	shipments	\$ 5,000,000	250,000	50,000	200,000

#### Required:

- Using the current system, calculate the estimated total cost of manufacturing one unit for each type of door and the profit per unit for each type of door.  
**2 marks**
- Using the current system, estimated manufacturing overhead costs per unit are less for the deluxe door (\$80 per unit) than the standard door (\$120 per unit). What is a likely explanation for this?  
**1 mark**
- Using the activity-based costing data presented above, calculate the revised estimated total cost to manufacture one unit of each type of entry door.  
**7 marks**
- Is the deluxe door as profitable as the original data estimated? Why or why not?  
**3 marks**



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## Question 5

### Investment Proposal

(20 marks)

To cater for additional customer demand, King Manufacturing (KM) is considering buying a new machine, which will improve work efficiency, as well as offering new products to customers. The machine will cost \$250,000. John Hamilton, director of KM expects the machine will be sold for \$50,000 at the end of the fourth year, when it will be replaced with a new model. The following is a projection of the additional income from the machine for the next four years:

Year 1	\$80,000
Year 2	\$90,000
Year 3	\$65,000
Year 4	\$55,000

KM has sufficient cash flow to finance the purchase of the machine. However, the directors also consider investing the money elsewhere which promises an annual return of 13%.

**Required:**

- a. You are required to calculate the following three investment appraisal measures for this project:
- Accounting Rate of Return (ARR);
  - Payback Period (PP); and
  - Net Present Value (NPV).

**9 marks**

- b. Write a memorandum to John Hamilton, and explain to him what ARR, PP and NPV are, as well as the decision rule for each, together with your recommendation whether KM should purchase the new machine.

**11 marks**



## Question 6

### Cost of capital

(20 marks)

- a. Cactus Manufacturing has 50% of debt and 50% of equity in its capital structure. The firm is in the process of analysing its investment decision-making procedures. During the past month, two mutually exclusive projects have been evaluated by the firm; Projects North and South. A summary of the project analysis along with the investment decision is provided as follows:

Basic variables	Project North	Project South
Cost	\$100,000	\$100,000
Life	20 years	20 years
IRR	7%	12%
<i>Least-Cost Financing:</i>		
Source	Debt	Equity
Cost (After Tax)	6%	14%
<i>Investment Decision:</i>		
Action	Accept	Reject
Reason	7% IRR > 6% cost	12% IRR < 14% cost

**Required:**

Evaluate the appropriateness of the firm's decision-making procedures and recommend improvements to its procedures. Explain if the acceptance of Project North and rejection of Project South is in the best interest of the firm's owners.

**9 marks**

- b. Quick Lift Limited is going to raise new capital by using bonds, preference shares and ordinary shares. If the capital is raised successfully, the market value of each capital component that the firm targets in its capital structure will be as shown in the table below:

Source of Capital	Market Value
Bonds	\$2,500,000
Preference shares	\$1,500,000
Ordinary shares	\$2,000,000

The current tax rate of the company is 30%. The table below summarises all the relevant information regarding the firm's capital raising.

	Bonds	Preference Shares	Ordinary Shares
Face or par value		\$10.00	\$1.00
Underpricing per share		\$0.50	\$0.05
Market interest rate	7.69%		
Promised annual dividend		8.00%	
Projected dividend next year			\$0.12 per share
Dividend growth rate			4.00%
Flotation cost		\$0.40 per share	\$0.07 per share
Life	10 years	infinite	infinite

**Required:**

Calculate the cost of each source of finance and the weighted average cost of capital (WACC). Explain how the company can reduce this weighted average cost of capital, assuming that there is no cost of financial distress.

**11 marks**



## Question 7

### Managing working capital

(5 marks)

Select ONE of the components of working capital below and discuss how to effectively manage this item as a way of managing net working capital:

- Cash/cash at bank
- Accounts Receivable
- Inventory

**5 marks**

# Appendix 1

**STUDENT ID Number** \_\_\_\_\_

## Question 1

Budget of Dunbar Ltd Sales Division for the month of May 20xx.

	Master	Actual	Master/ actual Variances	Flexed	Flexed/ actual Variances \$	F/U
Sales units	24,000	30,000	F			
	\$000	\$000				
Variable costs						
Sales commissions	7,200	8,400	U			
Travel expenses	15,600	18,300	U			
Free samples given out	2,400	3,100	U			
Total variable costs	25,200	29,800	U			
Fixed costs						
Advertising	3,600	4,200	U			
Rent	3,000	3,000				
Salaries	5,000	4,400	F			
Vehicle depreciation	1,000	1,000				
Total fixed costs	12,600	12,600				
Total costs	37,800	42,400	U			

F = favourable

U = unfavourable



## Appendix 2

### Discount Table

Present value of \$1 received in n periods of time

Period	8%	9%	10%	11%	12%	13%	14%	15%
1	0.926	0.917	0.909	0.901	0.893	0.885	0.877	0.870
2	0.857	0.842	0.826	0.812	0.797	0.783	0.769	0.756
3	0.794	0.772	0.751	0.731	0.712	0.693	0.675	0.658
4	0.735	0.708	0.683	0.659	0.636	0.613	0.592	0.572
5	0.681	0.650	0.621	0.593	0.567	0.543	0.519	0.497
6	0.630	0.596	0.564	0.535	0.507	0.480	0.456	0.432
7	0.583	0.547	0.513	0.482	0.452	0.425	0.400	0.376
8	0.540	0.502	0.467	0.434	0.404	0.376	0.351	0.327
9	0.500	0.460	0.424	0.391	0.361	0.333	0.308	0.284
10	0.463	0.422	0.386	0.352	0.322	0.295	0.270	0.247

# C9 Accounting and Finance Exam Answers



**[Add institute name here]**

**Accounting and Finance**

**Date:** xxxxxx 20xx

**Start time:** xxxxpm

**Time allowed:** 3 hours, plus 10 minutes reading time

**Total marks:** 100 marks

**Weighting:** 50% of course

**Instructions:** Answer ALL questions.  
Answer the questions directly in the answer booklet provided.  
Read each question carefully.  
Answer only what is asked for.  
Please write clearly.

**Summary of paper:**

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2	Cost-volume-profit	15
3	Absorption and Variable Costing	7
4	Activity-Based Costing	13
5	Investment Proposal	20
6	Cost of Capital	20
7	Managing Working Capital	5
TOTAL		100



## Question 1

### Budgeting

(20 marks)

a. Budget of Dunbar Ltd Sales Division for the month of May 20xx.

	Master	Actual	Master/actual Variances	Flexed	Flexed/actual Variances \$	F/U
Sales units	24,000	30,000	F	30,000✓	-	-✓
	\$000	\$000				
Variable costs						
Sales commissions	7,200	8,400	U	9,000✓	600✓	F✓
Travel expenses	15,600	18,300	U	19,500✓	1,200✓	F✓
Free samples given out	2,400	3,100	U	3,000✓	100✓	U✓
Total variable costs	25,200	29,800	U	31,500✓	1,700✓	F✓
Fixed costs						
Advertising	3,600	4,200	U	3,600✓	600✓	U✓
Rent	3,000	3,000		3,000✓		
Salaries	5,000	4,400	F	5,000✓	600✓	F✓
Vehicle depreciation	1,000	1,000		1,000✓		
Total fixed costs	12,600	12,600		12,600✓		
Total costs	37,800	42,400	U	44,100✓	1,700✓	F✓

✓ = ½ mark, total **13 marks**

b.

- Master budget is evaluating Tom's actual performance against budgeted volume.
- The increase in volume has increased variable costs.
- Flexed budget is compiled based on the adjusted volume – no volume variance – and so the flexed budget variable figures are adjusted for volume.
- Flexed budget indicates that the issue Tom had was caused by an initial volume variance.
- New variances show that Tom has kept his costs well under control, given the increase in sales.
- Variable costs are 6% under budget and this is favourable
- Fixed costs are, in total equal to budget
- Total costs are 4 % under budget and this is favourable.

*Points in the response – any of the above points worth 1 mark each up to a maximum of*

**7 marks**



## Question 2

### Cost-Volume-Profit

(15 marks)

**Required:**

a.

Workings

Fixed Costs	
Equipment depreciation	1,000.00
Rent (52 x 100)	5,200.00
Others	7,500.00
Salary for Michael	39,000.00
Total fixed costs	52,700.00

Variable Costs	
Materials	0.35
Other variable costs	0.15
Total variable costs	0.50

Contribution margin	
Selling price	1.50
Less: Variable costs	0.50
	1.00

**3 marks**

b.

Breakeven unit	
Fixed costs/contribution margin per unit	
(\$52,700/\$1.00) =	52,700 units

Breakeven dollars	
Sale price x breakeven unit	
(52,700 x \$1.50) =	\$79,050

**3 marks**



c.

Income Statement	
Sale units = $8,000 \times 12 =$	96,000
Sales revenue	144,000
Less: Variable costs ( $96,000 \times 0.50$ )	48,000
Contribution margin	96,000
Less: Fixed overheads	52,700
Profit before tax	43,300

**3 marks**

d.

Targeted profit before tax		
$(\$60,000 / (1-35\%))$	92,307.69	
Units required to achieve the targeted profit		
$(\text{Fixed costs} + \text{Targeted profit}) / \text{Contribution margin per unit}$		
$(\$52,700 + \$92,307.69) / \$1 =$	145,008	

**3 marks**

e.

The contribution margin for this order is \$3,600 ( $12,000 \text{ units} \times \$0.30$ ).

**1 mark**

Total units produced are 108,000 in a year ( $96,000 + 12,000$ ). It is within the annual production limit of 182,500 ( $500 \times 365$ ).

**1 mark**

Michael should accept the order since it makes a contribution margin of \$3,600 and that the business has the capacity to produce it.

**1 mark**

## Question 3

### Absorption and Variable Costing

(7 marks)

- a. Absorption-costing income statement:

Sales (20,000 × \$66)	\$1,320,000
Cost of goods sold (20,000 × \$46.20*)	<u>924,000</u> ✓
Gross margin	396,000✓
Marketing:	
Variable (20,000 × \$6)	\$120,000✓
Fixed	<u>60,000</u> ✓
	<u>180,000</u> ✓
Operating income	<u>\$216,000</u> ✓

\* \$12.00 + \$18.00 + \$9.00 + (\$180,000/25,000) = \$46.20

✓ = ½ mark, total 3 marks

- b. Variable-costing income statement:

Sales (20,000 × \$66)	\$1,320,000✓
Variable costs:	
Cost of goods sold (20,000 × \$39*)	\$780,000✓
Marketing (20,000 × \$6)	120,000 900,000✓
Contribution margin✓	420,000✓
Fixed costs:	
Manufacturing	\$180,000✓
Marketing	60,000✓ 240,000
Operating income	\$180,000✓

\* \$12.00 + \$18.00 + \$9.00 = \$39

✓ = ½ mark, total 4 marks



## Question 4

### Activity-based costing

(13 marks)

**Required:**

a.

- Currently estimated deluxe-entry door total cost per unit is \$260 = \$180 + \$80.✓
- Currently estimated standard-entry door total cost per unit is \$250 = \$130 + \$120.✓
- Currently estimated deluxe-entry door profit per unit is \$390 = \$650 - \$260. ½✓
- Currently estimated standard-entry door profit per unit is \$225 = \$475 - \$250. ½✓

✓ = ½ mark, total 2 marks

- b. Support manufacturing costs are currently allocated based on direct labour dollars. Because the deluxe doors are manufactured using the new robotics system, it appears that less direct labour is needed to manufacture each unit in the deluxe product line.✓

**1 mark**

c.

- Manufacturing overhead cost driver rates:
- Setup activity is \$1,000/setup = \$500,000/500 setups.✓
- Machine-related activity is \$73.33/machine hour = \$44,000,000/600,000 machine hours.✓
- Packing activity is \$20/shipment = \$5,000,000/250,000 shipments.✓
- Revised overhead costs per unit:
- Deluxe-entry door is \$468 per unit =  $[(\$1,000 \times 400) + (\$73.33 \times 300,000) + (\$20 \times 50,000)] / 50,000$  units.✓
- Standard-entry door is \$65.25 per unit =  $[(\$1,000 \times 100) + (\$73.33 \times 300,000) + (\$20 \times 200,000)] / 400,000$  units.✓
- Revised total cost per unit for the deluxe-entry door is \$648.00 = \$180.00 + \$468.00.✓
- Revised total cost per unit for the standard-entry door is \$195.25 = \$130.00 + \$65.25.✓

**7 marks**

- d. No, the deluxe door is not as profitable as originally estimated because the deluxe door requires a disproportionate share of the overhead activities (the robotics system) and thus, more of the overhead costs are assigned to the deluxe door when using an ABC system. ✓
- Revised profit per unit for the deluxe-entry door is \$2.00 =  
\$650.00 - \$648.00. ½ ✓
  - Revised profit per unit for the standard-entry door is \$279.75 =  
\$475.00 - \$195.25. ½ ✓
  - Currently estimated deluxe-entry door profit per unit is \$390 =  
\$650 - \$260. ½ ✓
  - Currently estimated standard-entry door profit per unit is \$225 =  
\$475 - \$250. ½ ✓

**3 marks**



## Question 5

### Investment Proposal

(20 marks)

**Required:**

a.

Accounting Rate of Return	
Average profit	
Year 1	80,000
Year 2	90,000
Year 3	65,000
Year 4	<u>55,000</u>
Total	290,000
Less: Depreciation	<u>200,000</u>
Total profit	<u>90,000</u>
Average profit	<u>22,500</u>
Average investment	
Initial investment	250,000
Residual value	<u>50,000</u>
	<u>300,000</u>
$(\$300,000/2) =$	<u>150,000</u>
$ARR = (\$22,500/\$150,000) \times 100$	<u>15.0%</u>

(Marking criteria: 1 mark for the average profit, 1 mark for average investment, plus 1 mark for the ARR.)

**3 marks**

Payback Period	
Cash inflows	
Year 1	80,000
Year 2	90,000
Year 3	65,000
Year 4	55,000

Total profit for the first 3 years amounts to \$235,000, leaving \$15,000 to be recouped in the fourth year. So the payback is 3 years +  $(\$15,000/\$55,000) = 3.27$  years

**2 marks**

Net Present Value				
<i>Outflows</i>				(250,000)✓
<i>Inflows</i>				
Year 1	80,000	0.885	70,800✓	
Year 2	90,000	0.783	70,470✓	
Year 3	65,000	0.693	45,045✓	
Year 4	105,000	0.613	64,365✓	<u>250,680</u> ✓
				<u>680</u> ✓✓

✓ = ½ mark, total 4 marks

b. Explanation for each following:

- **ARR** – 15% per annum. That is the average return the business will get based on average investment. The decision rule associated with ARR varies among entities. 15% return is considered low for this project, given the risk involved.

**2 marks**

- **Payback** – is 3.27 years. It means it will take KM 3.27 years to recoup the initial outlay with net cash inflows. Decision rule with PP varies among entities. Given the fact that the useful life of the machine is only four years, the PP of 3.27 years is considered unsatisfactory.

**2 marks**



- **NPV** – has a small positive cash flow of \$680. The total future cash inflows over the life of the project are greater than the initial investment. The decision rule is the project should go ahead if the NPV is positive.

**2 marks**

- Recommendation is based on discussion above.

**2 marks**

- Memorandum format

**1 mark**

- Writing

**2 marks**



## Question 6

### Cost of capital (20 marks)

a. Cactus Manufacturing

The firm is basing its decision on the cost to finance a particular project rather than the firm's combined cost of capital. This decision-making method is considered inappropriate as it may lead to erroneous accept/reject decisions. The firm should use its overall cost of capital as a criterion as it provides better decisions. This is because it takes into consideration the long run interrelationship of financing decisions.

Since the firm's capital structure consists of both debt and equity, the more appropriate approach is to calculate the firm's overall weighted average cost of financing (or WACC) and then compare this number to the rates of return offered by each project. The firm should select the project that provides the rate of return greater than the firm's WACC. The firm's weighted average cost of capital in this case would be  $0.5 \times 6\% + 0.5 \times 14\% = 10\%$ . With this cost, the company would have rejected project North that provides the IRR of 7% and would have accepted the project South yielding the IRR of 12%.

It is obvious that project South yielding 12% IRR is considered better than project North that provides only a 7% of IRR, but the company rejected the former and accepted the latter. The decision made by the firm is not considered as in the best interest of the firm's owners as the firm is not undertaking an investment that maximises the firm's value. By using a specific cost of capital, either debt or equity alone, to evaluate investment opportunities is clearly not in the best interest of the firm's shareholders.

*(Marking criteria: 3 marks for the evaluation on the appropriateness of the firm's decision-making procedures, 3 marks for the recommendation for the more appropriate method, 3 marks for the explanation about the owner's interest.)*

**9 marks**

b. Quick Lift

After-tax cost of debt:

$$k_i = k_d \times (1 - T) = 7.69\% \times (1 - 0.30) = 5.38\%$$

Cost of preference shares:

$$D_p = 8\% \times \$10 = \$0.80$$

$$N_p = \$10.00 - \$0.50 - \$0.40 = \$9.10$$



$$k_p = \frac{D_p}{N_p} = \frac{\$0.80}{\$9.10} = 8.79\%$$

Cost of new ordinary shares:

$$N_n = \$1.00 - \$0.05 - \$0.07 = \$0.88$$

$$k_n = \frac{D_1}{N_n} + g = \frac{\$0.12}{\$0.88} + 0.04 = 17.64\%$$

Source of capital	Market value	Weight	After-tax cost	Weighted Cost
Long-term debt	\$2,500,000	0.42	5.38%	2.2596%
Preference shares	\$1,500,000	0.25	8.79%	2.1975%
Ordinary shares	\$2,000,000	0.33	17.64%	5.8212%
Total	\$6,000,000	1.00		10.28%

The company weighted average cost of capital is 10.28%. In order to reduce the firm's WACC, the firm should replace ordinary shares, which are the most expensive, by preference shares, which are cheaper, or even by bonds, which are the cheapest, if there is no probability of financial distress.

*(Marking criteria: 2 marks for after-tax cost of debt, 2 marks for cost of preference shares, 2 marks for ordinary shares, 2 marks for WACC, 3 marks for the explanation.)*

**11 marks**

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## Question 7

### Managing working capital

(5 marks)

Discussion on what the item is ✓ and how to effectively manage this item as a way of managing net working capital: ✓✓✓✓

- Cash/cash at bank
- Accounts Receivable
- Inventory

**5 marks**