MODULE ONLINE MO001/3/2015

APPLICATION OF FINANCIAL MANAGEMENT TECHNIQUES

MAC3702

Semester 1 and 2

Department of Management Accounting

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BAR CODE

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With kind regards

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PART 1, TOPIC 1 – ADVANCED ANALYSIS OF INFORMATION

INTRODUCTION

Various stakeholders, like management, investors and other interested parties, make decisions about an organisation based on the financial information available. After widespread wildcat strikes in the South African mining industry in 2012, Anglo American Platinum (Amplats) announced its decision to close some of its shafts and retrench approximately 14 000 workers in 2013. The mining company attributed its decision to a loss of 306 000 ounces in production during 2012, which was the equivalent of R4,6 billion in revenue (City Press, 2013). Amplats' management, trade unions and the Department of Mineral Resources engaged early in 2013 to find ways to reverse the mining company's decision and thereby avert pending retrenchments.

All the concerned parties would need financial information about Amplats to make sustainable strategic decisions. When evaluating the financial position of Amplats, these stakeholders should analyse the company's financial statements in order to identify current strengths and weaknesses and to provide appropriate measures to enhance those strengths and correct any weaknesses. You would remember that International Accounting Standard IAS 1 prescribes that financial statements should "…provide information about the financial position, financial performance and cash flows of an entity that is useful to a wide range of users in making economic decisions". The stakeholders can take comfort from the fact that International Financial Reporting Standards (IFRS) require that "financial statements should fairly present the state of affairs of the company and the results of operations for the financial year".

In MAC2602, we introduced you to the sources and limitations of financial information and explored some basic comparisons and ratios. In this module, we will introduce you to some advanced ratios and look at some uses of non-financial performance indicators.

LEARNING OUTCOMES

After studying this topic, you should be able to

- calculate and interpret a wide variety of commonly used financial ratios
- carry out a Du Pont analysis
- describe the limitations of ratio analysis

- describe key non-financial indicators, including environmental, social and governance (ESG) aspects that can be used to identify and monitor business risks
- identify businesses in difficulty by means of suitable ratios and indicators

ASSUMED PRIOR KNOWLEDGE

In your MAC2602 module, you mastered the following learning outcomes which relate to this topic:

- defined and identified the sources and limitations of financial information
- explained the objectives of financial analysis
- calculated, analysed and interpreted growth rates and different ratios

Please refer to your second year guide if you want to refresh your knowledge.

For another perspective, you may also refer to the following sections in the prescribed Skae et al textbook:

Section	Heading
8.1	*Financial reports*
8.2	*Objectives and users of financial statements analysis*
8.3	*Techniques used in financial statement analysis*
8.3.1	*Comparative financial statements*
8.3.2	*Indexed financial statements*
8.3.3	*Common size statements*

Note:
Although we covered some ratios in MAC2602, we will include most of section "8.3.4 *Ratio analysis"* from the Skae et al textbook as required reading later on in this study unit as it is very important.

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THIS TOPIC CONSISTS OF THE FOLLOWING STUDY UNIT:

STUDY UNIT	TITLE
STUDY UNIT 1	ADVANCED ANALYSIS OF INFORMATION

STUDY UNIT 1 ADVANCED ANALYSIS OF INFORMATION

1. Introduction

In this study unit, we will describe various advanced techniques used in financial analysis, calculate and interpret commonly used financial ratios and carry out a Du Pont analysis.

This study unit is based on **selected sections** from the following chapters of the prescribed Skae et al textbook:

- Chapter 1
- Chapter 2
- Chapter 8

2. Ratio analysis

Financial ratios allow us to compare the financial position and performance of different companies. When we analyse the financial statements of a company, we will gain valuable information to assist us in the decision making process. We can then use this information for

- internal decision-making purposes for a business and to plan and control business activities
- obtaining external finance to expand business processes (both internal and external investors)
- investment decisions (both internally and for external investors)
- to assist in the valuation of business

We can divide the ratios commonly used by analysts to assess the various aspects of an organisation's financial health fall into the following categories:

- profitability ratios and returns
- liquidity ratios
- asset management ratios
- debt management ratios
- market value ratios

Now study the following sections in Skae et al, chapter 8, and attempt the activities:

Section	Heading
8.3.4	*Ratio analysis*
8.3.5	*Du Pont analysis*
8.3.6	*Limitations of ratio analysis*

In MAC2602, you have covered most of the popular ratios discussed here. These are basic ratios, and you should always be able to calculate them. However, you should be aware of the limitations of ratios when comparing different organisations.

When calculating the receivable days (debtors' collection period) and payable days (creditors' payment period) you need to remember to adjust your local credit sales and local credit purchases to be **VAT inclusive**. Although this is not explained in your prescribed text book you can refer to your MAC2602 guide for further explanation. Keep this in mind when you calculate your cash operating or business cycle as described in study unit 8.

In MAC2602 you also covered the receivable days also referred to as the debtor's collection period. Remember that although it is not covered in your text book that you need to adjust your local credit sales to be VAT inclusive. You also learned in MAC2602 that when you calculate the payable days or creditors' payment period you need to adjust your credit purchases to be inclusive of VAT. This matter is also not covered in your prescribed text book.

You will remember that we used the Du Pont analysis to calculate return on assets (ROA) in MAC2602. In this module, however, we expand its use further to also calculate return on equity (ROE).

The Du Pont makes the following assumptions:

- The inefficient use of assets will provide a lower ROA, resulting in a lower ROE. If the company is financed through equity only, ROA = ROE.
- The company could increase its low ROE by taking up debt.
- However, an increase in debt is coupled with an increase in interest payments, which reduces profit margins and thereby lowers ROE.

Note:
When there is debt, we must multiply the ROA by the **equity multiplier** to calculate the ROE. The equity multiplier is defined as the number of times that the total assets of the organisation exceed its equity.

You will recall that when you calculate the ROA that there are three different definitions of earnings when computing this ratio. When we use the ROA in the Du Pont formula we use the net profit figure. This is also referred to as the earnings attributable to ordinary shareholders.

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Activity 1.1

Information for Tayob Manufacturing Ltd at 31 December 20x2:

	R'000
Total assets	315,5
Equity	192,0
Sales	536,0
Earnings before interest and tax	48,6
Interest	18,0
Earnings before tax	30,6
Tax	8,6
Earnings attributable to ordinary shareholders	22,0

REQUIRED

a. Using the three components of the Du Pont analysis, calculate the ROE for Tayob Manufacturing Ltd.

b. Comment on the equity multiplier effect on the ROA.

Solution to Activity 1.1

a. Calculate ROE using Du Pont analysis

$$\text{ROE} = \text{ROA} \times \text{Equity multiplier} \times$$

$$= \frac{\text{Net profit after tax}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Equity}}$$

$$= \frac{22}{536} \times \frac{536}{315,5} \times \frac{315,5}{192}$$

$$= 4,10\% \times 1,699 \times 1,643$$

$$= \mathbf{11,45\%}$$

b. Comment on the equity multiplier effect on the ROA

$$\text{ROE} = \text{ROA} \times \text{Equity multiplier}$$

$$= \frac{\text{Net profit after tax}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Equity}}$$

$$\text{ROE} = \frac{22}{315,5} \times \frac{315,5}{192}$$

$$= 6,97\% \times 1,643$$

$$= \mathbf{11,45\%}$$

By taking on debt the company managed to increase the ROA from 6,97% to 11,45%. 39% of the company's assets are financed through debt ((R315,5 – R192)/R315,5).

Note:

When calculating the Du Pont ratio, we use the net profit after tax figure (in the ROA) as we want to arrive at the ROE, which means we want the return **after** interest and taxation.

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Activity 1.2

Use the following financial information for JJ Ltd:

JJ Ltd.

Statement of financial position at 31 December 2X13

	2X13 R'000
Assets	
Non-current assets	**1 421 000**
Property, plant and equipment	563 000
Other intangible assets	130 000
Goodwill	269 000
Deferred expenditure	12 000
Investments in associates	50 000
Long-term financial assets	397 000
Current assets	**398 000**
Inventory	45 000
Trade receivables	87 000
Cash	266 000
Total assets	**1 819 000**

JJ Ltd

Statement of financial position at 31 December 2X13 (continued)

		R'000
Equity and liabilities		
Total equity		**1 220 000**
Shareholder's equity	710 000	
Issued preference shares	100 000	
Non-controlling interests	410 000	
Non-current liabilities		**172 000**
Debentures	22 000	
Long-term loans	140 000	
Deferred taxation	10 000	
Current liabilities		**427 000**
Dividends payable	31 000	
Trade payables and accrued expenses	263 000	
Short-term debt	16 000	
Bank overdraft	51 000	
Tax payable	66 000	
Total equity and liabilities		**1 819 000**

JJ Ltd

Statement of profit or loss and other comprehensive income for the year ended 31 December 2X13

	2X13
	R'000
Turnover	948 000
Less: Cost of sales	(316 000)
Gross profit	632 000
Less: Operating cost	(381 000)
Distribution cost	161 000
Administrative cost	183 000
Other operating expenses	37 000
Operating profit	251 000
Finance income	14 000
Profit before interest and tax expenses	265 000
Less: Finance expenses	(7 000)
Profit before tax	258 000
Taxation	(69 000)
Profit after tax	189 000
Unusual item	41 000
Profit for the year	**230 000**
Attributable to	
Preference shareholders of JJ Ltd	10 000
Ordinary shareholders of JJ Ltd	107 000
Non-controlling interest in subsidiaries	113 000
	230 000

Additional information

		2X13 R'000
1.1	**Depreciation for the year**	
	- Property, plant and equipment	2 000
	- Other intangible assets	23 000
1.2	Increase in provision for doubtful debts charged against income	1 000
1.3	Interest on short-term debt and bank overdraft	4 000
1.4	Ordinary dividends paid	52 000
1.5	**Long-term financial assets**	**397 000**
	Long-term loans	57 000
	Trade investments	40 000
	Listed investments	44 000
	Unlisted investments	246 000
	Shares in unconsolidated subsidiaries	10 000
1.6	**Finance income**	**14 000**
	Interest received	10 000
	Listed investments	1 000
	Unlisted investments	1 000
	Unconsolidated subsidiaries	2 000
	Associate companies	-

1.7 Interest is earned on long-term loans and trade investments.

1.8 The unusual item relates to Broad-Based Black Economic Empowerment Scheme costs

1.9 All purchases and sales are on credit and occur evenly throughout the year.

1.10 Assume a tax rate of 28%.

REQUIRED

Determine the following ratios for JJ Ltd for 20X3: (Round your answer to two decimal places).

		Average for the industry
a.	return on equity	13,48%
b.	return on assets	14,74%
c.	financial leverage effect	To be calculated
d.	return on other assets	6,25%
e.	return on operating assets	17,25%

Compare your answer for each ratio to the average for the industry and comment on your comparison.

Solution to Activity 1.2

Amounts that must be disregarded for the purposes of the financial analysis:

Assets (and therefore equity) adjustment	**R'000**
Goodwill	269 000
Deferred expenditure	12 000
Adjustment	**281 000**

Unusual item

The unusual item has to be disregarded in relation to any income.

Outstanding journal entries

None

Post balance sheet events

None

Note:

For the ratio calculation purposes we ignored the R'000 as it has a zero effect on the final calculated percentage. Remember that this is only applicable when you calculate ratios.

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a. Return on equity (ROE)

$$\text{ROE} = \frac{\text{net profit before extraordinary item less preference dividend}}{\text{ordinary equity per balance sheet less goodwill}}\%$$

$$= \frac{\text{R189 000 - R113 000 - R10 000}}{\text{R710 000 - R281 000}}\%$$

$$= 15{,}39\%$$

The return on equity is better than the current average for the industry. The shareholders receive a better return on their investments than the norm for the industry.

b. Return on assets (ROA)

$$\text{ROA} = \frac{\text{earnings before interest and after tax}}{\text{total assets (adjusted value)}}\%$$

$$= \frac{\text{R189 000} + (\text{R7 000 x } 0{,}72)}{\text{R1819 000 - R281000}}\%$$

$$= \frac{\text{R194 040}}{\text{R1538 000}}\%$$

$$= 12{,}62\%$$

The return on assets is lower than the current average for the industry. The assets therefore generate lower returns than the norm for the industry.

Note:

We used earnings before interest and after tax (EBIAT) for this calculation. Remember, this is the most correct approach when determining ROA because the finance costs are excluded but we still recognise that tax has been paid. We therefore used the amount of profit after tax in the statement of profit and loss and other comprehensive income for the year ended 31 December 2X13 and added back the finance cost after tax.

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c. Financial leverage effect

Total leverage effect = ROE − ROA

= 15,39% − 12,62%

= 2,77%

Total leverage effect for industry = ROE − ROA

= 13,48% − 14,74%

= − 1,26%

The total financial leverage effect for the company is positive. This implies that the ordinary shareholders receive a higher percentage return on their investment in the company without having to acquire additional equity. In other words, the inclusion of the debt in the capital structure has been to the advantage of the shareholders.

The financial leverage effect is also higher than the average for the industry. This implies that the ordinary shareholders receive a lower percentage return on their investment as the companies are too highly geared. In this case, the excessive debt has been to the disadvantage of shareholders.

d. Return on other assets

$$\text{Return on other assets} = \frac{\text{finance income}}{\text{long-term investments}}\%$$

$$= \frac{R14\,000}{R397\,000 + R50\,000}\%$$

$$= 3{,}13\%$$

The return on other assets is worse than the current average for the industry. Therefore, the company should look for investment products that will generate a higher return.

e. Return on operating assets (ROOA)

$$\text{Return on operating assets} = \frac{\text{operating profit}}{\text{operating assets}}\%$$

$$= \frac{\text{R251000}}{\text{R563000} + \text{R130 000} + \text{R398 000}}\%$$

$$= 23{,}01\%$$

The company's return on operating assets is better than the current average for the industry. Therefore, the assets employed in the operating process generate better returns than the norm for the industry.

Note:

The most important aspect of financial ratio analysis is the **interpretation of the calculated ratios**. Simply stating the movement of a certain ratio from one year to the next is insufficient, as the question may require you to explain **why** this has happened and **what impact** this is likely to have, as well as **what remedial action** may be required to address the issue at hand.

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Activity 1.3

The table below reflects some ratios calculated for JJ Ltd and the corresponding averages for the industry.

Ratios	JJ Ltd	Average for the industry
Current ratio	0,93:1	1,27:1
Acid-test ratio	0,83:1	0,75:1
Debt settlement period	1,55 years	3,54 years
Debtors' collection period	0,87 months	1,51 months
Creditors' payment period	7,14 months	1,51 months
Stock turnover period	1,29 months	1,21 months
Business cycle	To be calculated	1,21 months

REQUIRED

a. Determine the business cycle of JJ Ltd.

b. Compare the ratios of JJ Ltd to the averages for the industry and comment on them.

Solution to Activity 1.3

a. Business cycle of JJ Ltd

	Months
Debtors' collection period	0,87
Plus: Stock turnover period	1,29
Less: Creditors' payment period	-7,14
Business cycle	**-4,98**

b. Comparing the ratios

Ratio	**JJ Ltd**	**Average for the industry**	**Comment**
Current ratio	0,93:1	0,27:1	The current ratio for JJ Ltd is worse than the average for the industry. The current ratio indicates the ability of the company to pay current liabilities from current assets.
Acid-test ratio	0,83:1	0,75:1	The acid-test ratio for JJ Ltd is better than the average for the industry. The acid-test ratio indicates the ability of the company to pay current liabilities from "quick" assets. On average, the inventory holding of the industry is also higher than JJ Ltd.
Debt settlement period	1,55 years	3,54 years	The debt settlement period for JJ Ltd is better than the average for the industry. Debt is therefore settled quicker than the norm for the industry.

Ratio	JJ Ltd	Average for the industry	Comment
Debtors' collection period	0,87 months	1,51 months	The debtors' collection period for JJ Ltd is better than the average for the industry. The debt is collected in less than a month.
Creditors' payment period	7,14 months	1,51 months	JJ Ltd takes much longer than the industry to pay their creditors. This will have a positive impact on their cash flow, but it is very risky as they might lose their credit terms and interest might be charged by some suppliers or some suppliers will refuse to do business with them.
Stock turnover period	1,29 months	1,21 months	The stock turnover period for JJ Ltd is worse than the average for the industry despite holding lower than average inventories. The ratio is almost in line with that of the industry and indicates days' stock in hand. JJ Ltd should focus on strategies to improve this.
Business cycle	-4,98 months	1,21 months	The business cycle is negative due to the excessively long time to pay creditors.

Note:

In the exams you might be asked to calculate the business cycle without receiving the input data. You have to be able to calculate the three inputs required for the business cycle formula.

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3. Business risk and non-financial information

Evaluating a company involves more than merely calculating financial ratios. The stakeholders of the company should consider various other factors.

Now study the following sections in Skae et al, chapters 1, 2 and 8, and attempt the activity:

Section	Heading
1.1	*Financial management*
1.2	*Goal of an entity*
1.3	*Business model or value creation model of an entity*
1.4	*Stakeholders of an entity*
1.5	*Risk and return of investors*
1.7.2	*Sustainability and responsible investment in the capital markets*
2.6.2	*Measurement of performance and reporting against strategic objectives*
8.3.7	*Business risk analysis*
8.6	*The balanced scorecard*

Activity 1.4

You have heard that a division of Mzi Manufacturing Ltd operates in the footwear industry. This division runs its manufacturing activities at a plant a few kilometres from Alexandra, Johannesburg. However, Mzi Manufacturing Ltd is reviewing several projects which will diversify its business interests and thereby increase its market share.

REQUIRED

Identify and describe ways in in which Mzi Manufacturing Ltd could generally

a. reduce its environmental impact

b. improve its social impact

Solution to Activity 1.4

a. Environmental impact

Mzi Manufacturing Ltd could reduce their environmental impact by:

- using renewable energy for its manufacturing activities
- going green in the following ways:
  - using recycled material for packaging and avoiding the use of plastic containers or materials which are difficult and costly to recycle
  - making greater use of electronic media for marketing (less paper-based media)
  - using energy-efficient lighting, for example LED

b. Social impact

- sourcing its raw materials locally
- improving its B-BBEE (broad-based black economic empowerment) compliance rating, for instance equipping their black employees (including women and those with disabilities) with core and critical skills, engaging in social and economic development activities around Alexandra
- avoiding child labour practices
- complying with all safety, health and environmental (SHE) regulation

(Source: *SAICA Part II Financial management*)

4. Failure prediction (businesses in difficulty)

Apart from the normal liquidity and solvency ratios, there are additional tools we can use to help us identify businesses in difficulty.

Now study the following section in Skae et al, chapter 8, and attempt the activity:

Section	Heading
8.4	*Failure prediction*

Activity 1.5

You are a financial analyst working for African Analyst Solutions. Your task is to review the financials of a number of companies. One of the companies that you are analysing has a Z-score rating of 3,05.

REQUIRED

What does this Z-score tell us about the future of the company?

Solution to Activity 1.5

A calculated Z-score of more than 2,99 indicates that there is a low risk of failure. It is therefore safe to invest in the company.

5. Summary

In this study unit, you learnt to

- calculate and interpret a wide variety of commonly used financial ratios
- carry out a Du Pont analysis
- describe the limitations of ratio analysis
- describe key non-financial indicators, including environmental, social and governance (ESG) aspects that can be used to identify and monitor business risks
- identify businesses in difficulty by means of suitable ratios and indicators

In the next study unit, we will consider the difference between business and financial risk as well as systematic and unsystematic risk. We will also look at the capital structure theory and the leverage effect of debt funding.

6. Self-assessment questions

After working through the relevant sections in the textbook and the material provided in this study unit, you should now be able to answer the following self-assessment questions.

QUESTION 1

Answer practice question 8-1 (a) in the Skae et al textbook.

SOLUTION TO QUESTION 1

Find the solution to practice question 8-1 (a) immediately after the question in the textbook.

Note:
Providing calculations alone is not sufficient. You should interpret the results to earn marks.

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QUESTION 2

Answer practice question 8-1 (b) in the Skae et al textbook.

SOLUTION TO QUESTION 2

Find the solution to practice question 8-1 (b) immediately after the question in the textbook.

QUESTION 3

a. Explain the concept of the net asset value (NAV) of an organisation. (2)

b. Mbalula Sports Ltd issued 2 000 000 shares at R21 per share when it opened its business three years ago. Currently these shares trade at R53. What is the value of the equity of this business? (2)

c. Mbalula Sports Ltd has a debt ratio of 63%. With valid reasons, please indicate if you would consider investing in this company. (5)

d. Contrast current and non-current assets in the statement of financial position (balance sheet). (2)

e. Briefly discuss why analysts often compute a company's earnings before interest, tax, depreciation and amortisation (EBITDA) when valuing its operations. (3)

f. Briefly describe the main components of the statement of cash flows. Also list two examples of the sources and uses of cash. (6)

SOLUTION TO QUESTION 3

a. NAV

Creditors have a preferential claim on the assets of a company (Companies Act, 2008). This implies that a company will sell its assets and settle all outstanding debt on liquidation. Thus, the NAV represents the residual interest of the owners in the assets after meeting all the obligations of the company, that is equity = total assets – total liabilities.

b. Market capitalisation

Market capitalisation = 2 000 000 shares x R53 = R106 million.

The share market price represents the value that the market attaches to a share.

c. Debt ratio

Mbalula Sports Ltd uses both debt and equity to finance its assets, with 63% of assets financed using debt. The debt ratio is quite high, implying high financial gearing which increases the financial risk – the risk that the entity will not be able to fulfil its financial obligations (finance charges and capital amounts) when due. However, financial leverage increases returns to shareholders (tax deduction lowers operating costs and thereby increases earnings) as long as the entity can still service its debt (low potential for bankruptcy). Depending on an individual's appetite for risk, one could decide not to invest in Mbalula Sports Ltd, citing a high financial risk.

Note:

In this scenario, limited information is available for making a conclusive decision, as data on market factors, liquidity, interest cover, operations, profitability, etc. would have shed more light on this investment decision. There is no right or wrong answer for this type of question, but you should learn to motivate your answer and to apply the financial principles to the particular case.

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d. Non-current versus current assets

- IFRS prescribes that **assets** should be presented in order of increased liquidity, starting with the least liquid asset.
- The **non-current assets** are those assets of a more permanent nature (e.g. property, plant and equipment) which are not expected to be liquidated within the next financial year or during normal trade operations.
- In contrast, **current assets** are regularly liquidated in the normal course of the operations of the organisation (e.g. inventories and trade and other receivables).

e. EBITDA

- In finance, cash flows supersede net income when determining the value of an investment because cash is needed to continue normal business operations, for instance, purchasing assets, paying operating expenses, etc.
- We consider only operating cash flows though and exclude those that do not flow from normal operations (normal = manufacturing and sale of inventory).
- However, you should appreciate that not all operating costs are cash flows. Depreciation and amortisation expenses are non-cash items.
- EBITDA provides an indication of the cash flows that are generated by normal operations.

f. Statement of cash flow

The statement of cash flows shows how the organisation's investment decisions (uses of cash) and financing decisions (sources of cash) have affected its liquidity (cash flow) position. The statement comprises the following four major areas:

Cash flows from operating activities

Operating cash flows arise from the organisation's daily activities, for example production and sale of goods and services.

Investment cash flows

These relate to the purchase or sale of property, plant and equipment or investments in other businesses through shares.

Financing cash flows

These occur when an organisation issues debt or shares, pays dividends or repays loans.

Change in cash and cash equivalents

This section summarises all cash inflows and outflows from the three activities above, to determine their effect on an organisation's liquidity. The effect is expressed as the change in the cash and cash equivalents account from one year to the next.

The following are examples of the sources and uses of cash:

- repurchase of own shares - uses cash
- interest payment – uses cash
- raising borrowings – provides cash
- disposal of an asset – provides cash

QUESTION 4

Use the information included in activity 1.2 and the additional information below to do a failure prediction for JJ Ltd for 20X3 by means of the K-score model.

	R'000
Adjusted value of total assets for 20X2	1 089 000
Inflation adjustment for fixed assets for 20X3	200 000
Additional depreciation on inflation adjustment for fixed assets for 20X3	70 000

SOLUTION TO QUESTION 4

Calculating the values required for substitution in the K-score formula

(1) **Total outside financing**

	R'000
Long-term financing	172 000
Short-term financing	427 000
Total outside financing	**599 000**

Note:

You should exclude preference shares and minority interest when calculating this ratio.

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(2) **Total assets**

	R'000
Total assets per statement of financial position	1 819 000
Less: Adjustment required	(281 000)
Goodwill	269 000
Deferred expenditure	12 000
Total adjusted assets	**1 538 000**

(3) **Average total adjusted assets**

$$\text{Average total adjusted assets} = \frac{R1538\,000 + R1089\,000}{2}$$

$$= R1\ 313\ 500$$

(4) **Net cash flow for the year**

	R'000
Profit after tax	189 000
Plus: Non-cash expenses	26 000
- Depreciation on property, plant and equipment	2 000
- Depreciation on other intangible assets	23 000
- Increase in provision for doubtful debts	1 000
Cash flow for the year	**215 000**

(5) **Inflation adjusted total assets**

	R'000
Total adjusted assets (see calc 2)	1 538 000
Plus: Inflation adjustment	200 000
Less: Depreciation on inflation adjustment	(70 000)
Inflation adjusted total assets	**1 668 000**

Application of k-score model

Calculating "a" to "f" to substitute into the formula

a. $= \dfrac{\text{total outside finance}}{\text{total assets}}\%$

$= \dfrac{R599\,000}{R1538\,000}\%$

$= 38{,}95\%$

b. $= \dfrac{\text{profit before interest and tax expenses}}{\text{average total assets}}\%$

$= \dfrac{R265\,000}{R1313\,500}\%$

$= 20{,}18\%$

c. $= \dfrac{\text{total current assets and listed investments}}{\text{total current liabilities}}\%$

$= \dfrac{R398\,000 + R44\,000}{R427\,000}$

$= 1{,}04$

d. $= \dfrac{\text{profit after tax}}{\text{average total assets}}\%$

$= \dfrac{R189\,000}{R1313\,500}\%$

$= 14{,}39\%$

e. $= \dfrac{\text{net cash flow}}{\text{average total assets}}\%$

$= \dfrac{R215\,000}{R1313\,500}\%$

$= 16{,}37\%$

f. = $\frac{\text{inventories}}{\text{inflation adjusted total assets}}\%$

= $\frac{R45\,000}{R1\,668\,000}\%$

= 2,70%

K = -0,01662a + 0,0111b + 0,0529c + 0,086d + 0,0174e + 0,01071f + 0,06881

= -0,01662(38,95%) + 0,0111(20,18%) + 0,0529(1,04) + 0,086(14,39%) + 0,0174(16,37%) + 0,01071(2,70%) + 0,06881

= 1,25177

Conclusion

A K-score of more than 0,2 is regarded as relatively safe. The positive score of 1,25177 indicate that there is currently no indication of future failure. This is subject to the fact that the internal and external factors impacting the business remain relatively constant.

PART 2 – CAPITAL STRUCTURE

One of the main objectives of a financial manager is to contribute to the creation of long-term sustainable wealth for the shareholders and other stakeholders of the organisation. When valuing an organisation (i.e. determining owners' wealth) which will be dealt with later in the module, we find that risk-free cash flow and growth are the main determinants of the monetary value of an organisation. The capital structure of an organisation influences both its financial risk and its free cash flow. This in turn influences the fund providers' (the owners' and debt providers') required rate of return.

In part 2, we discuss the two main drivers of an organisation's capital structure, namely the required returns demanded by the capital providers and the cost associated with the identified sources of funding.

PART 2, TOPIC 2 – REQUIRED RETURNS

INTRODUCTION

In topic 1, you learnt that the stakeholders of an organisation are also interested in various non-financial indicators such as production performance and customer satisfaction and financial ratios because these can help them assess the business and financial risk of the organisation. In this topic, we will examine the relationship between risk and return further with reference to capital structure, portfolio theory and the Capital Asset Pricing Model (CAPM).

When you consider all the debate around the liquidation of 1Time Airlines in 2012 and the Gauteng toll-road issue, you will realise how important it is to obtain and structure adequate debt levels to refinance aircraft cost efficiently or to finance improvements to freeways (new national roads). You are probably familiar with the old adage that "one should not put one's eggs in one basket". The concern is that if one dropped the basket, one could lose all the eggs, which would mean no breakfast for the family for that particular day. Portfolio theory deals with strategies to avoid or minimise such outcomes when it comes to your investments. Recall the case of Fidentia, where investors (some of them pensioners) lost all their money because they had invested all their hard-earned savings in one company. We will address some of these issues in this topic.

Topic 2 will conclude with sources and forms of finance that would suit the organisation's desired capital structure and ensure optimal cost of capital. Finance represents the lifeblood that enables a business to grow, expand and thrive, or sometimes, merely survive. Raising finance is therefore very important for any organisation.

LEARNING OUTCOMES

After studying this topic, you should be able to

- explain the advantages and disadvantages of debt finance in terms of financial risk and increased return to shareholders
- demonstrate how to determine the optimal capital structure by means of calculations
- explain the mechanics of the traditional capital structure theory versus that of the Miller and Modigliani theory
- describe the background to portfolio theory
- explain the difference between systematic and unsystematic risk
- evaluate whether the diversification of a portfolio resulted in a reduction of risk (for two assets only)
- explain the derivation and rationale of the securities market line (SML)
- use the CAPM to calculate cost of equity
- calculate the theoretical ex-rights price as well as the value of a right
- evaluate the suitability of different forms of finance for financing different types of assets for different intended purposes
- perform appropriate calculations for various financing options, while considering taxation and other relevant factors, and make recommendations (with specific focus on loan versus lease options)

ASSUMED PRIOR KNOWLEDGE

In your MAC2602 module, you mastered the following basic learning outcomes which relate to this topic:

- explained the theory of capital structure and target capital structure
- analysed the capital structure of an organisation
- explained the concept "cost of capital"
- identified risk factors that can affect the cost of selected forms of financing
- identified the main sources of financing
- explained the basic workings of capital and money markets
- identified possible financial markets
- explained the use of long and short-term financing

- identified long and short-term forms or options of finance
- identified the most appropriate financing instrument relating to equity or debt
- explained the characteristics, advantages and disadvantages of these instruments
- identified other forms of financing

Please refer to your second year guide if you want to refresh your knowledge.

For another perspective, you may also refer to the following sections in the prescribed Skae et al textbook:

Section	Heading
4.1	*Debt advantage*
4.2	*Debt disadvantage*
4.3	*Financial gearing*
7.2	*Classification of different forms of finance*
7.3.1	*Obtaining equity funds*
7.3.2	*Stock market listing*
7.4	*Preference shares*
7.5	*Debt*

THIS TOPIC CONSISTS OF THE FOLLOWING STUDY UNITS:

STUDY UNIT TITLE

STUDY UNIT 2 RISK AND RETURN

STUDY UNIT 3 SOURCES AND FORMS OF LONG-TERM FINANCING

STUDY UNIT 2 RISK AND RETURN

1. Introduction

In MAC2602, we introduced you to the concept of capital structure. Capital structure is important in achieving the key objective of an enterprise, namely to optimise the long-term sustainable wealth and well-being of its owners and stakeholders.

In this study unit, we will examine the relationship between risk and return with reference to capital structure and portfolio theory. You will learn how to determine the optimal capital structure of an organisation, differentiate between systematic and unsystematic risk and apply the Capital Asset Pricing Model (CAPM).

When we look at risk and return, it is important to consider the relationship between them. Suppose you are lucky enough to have some spare cash despite the current economic climate. What should you do with it? Assuming you can withstand the urge to spend it all on luxuries, you have a number of options:

- Keeping it under your bed may not be wise, for obvious reasons.
- You could use it to repay debt.
- Investing the cash in a bank savings account could offer some benefits. Firstly, it would be relatively safe. (There is a very small risk that you would not able to recover your initial investment). Secondly, it should be available on short notice, should you need it for an emergency. Thirdly, it is fairly certain that you will earn some level of return – interest at a predetermined level in this case (to compensate you for the effect of inflation, which would otherwise reduce the value of your spare cash).

But, suppose you choose to invest your money elsewhere, such as in your cousin's corner shop? What then? You would arguably run a higher risk of not recovering your initial investment. It is also unlikely that the money would be repaid on demand. You would also run the risk of not earning a level of return – despite your cousin's promises.

The lesson? When facing a higher risk, a rational investor should require and expect a higher rate of return on their investment. If this is unlikely, the investment would probably not be worthwhile.

This study unit is based on **selected sections** from the following chapters in the prescribed Skae et al textbook:

- Chapter 4
- Chapter 5

2. Debt and financial leverage – various theories

In MAC2602, we introduced you to the potential benefit that debt funding might provide to the equity owners of an organisation. We explored elementary scenarios to demonstrate this principle (the benefit from leverage). We will now delve deeper into some of the more well-known theories that underlie this area. We will explain the mechanics of the traditional theory, compare it to the mechanics of the Miller and Modigliani theory and show how a shareholder can benefit through arbitrage.

Now study the following sections in the prescribed Skae et al textbook, after which you should complete the activities:

Section	Heading
4.3	*Financial gearing*
4.4	*Debt as part of the capital structure*
4.5	*Compensating providers of capital*
4.6	*Traditional capital structure theory*
4.7	*The Miller and Modigliani theory*
4.9	*Optimal capital structure – traditional world*

Let's start with an activity to see if you can determine the optimal structure of an enterprise.

Activity 2.1

Answer question 4-1 of the example questions at the end of chapter 4 of Skae et al (Company A).

Solution to activity 2.1

Find the solution immediately after the question.

Note:
You will notice that the cost of debt increased to 16% where the debt:equity ratio = 60%:40% as the cost of debt increase by 6% once the D:E ratio exceeds 50:50.

The optimal capital structure is where the **WACC is least**, namely 18,4%.

*****

Now let's see if you can distinguish between the traditional theory and the theory of Miller and Modigliani.

Activity 2.2

Answer question 4-5(b) of the practice questions at the end of chapter 4 in Skae et al (Rosina Ltd).

Solution to activity 2.2

Find the solution immediately after the question.

Notes:

① Please note the assumptions of the Miller and Modigliani theory, especially those relating to taxation.

② The two graphs illustrate the different assumptions clearly.

*****

3. Portfolio management

Investors would expect any investment, like property, shares, bonds or unit trusts, to grow in value and to provide them with regular income (such as dividends or interest). Should the latter not materialise, the base strategy would be to preserve capital with the hope of evaluating and adjusting their investment strategies for the future. In real life, some investors manage to preserve their capital and earn decent returns from their investments, but sometimes they lose all their capital, like the Fidentia investors.

The total risk that investors face involves the risk associated with business operations (organisation-specific risk, also called unsystematic risk) and the risk faced by all individuals and entities who have invested in the stock market (also known as market or systematic risk).

Portfolio theory seeks to explore investment strategies that would mitigate the risk of loss of capital and/or reduced expected returns. The cornerstone of such strategies is the concept of diversification. However, systematic risk cannot be eliminated by diversification, as all market participants are subjected to the same risks. In an efficiently managed portfolio, where unsystematic risk has been eliminated by diversification (theoretically), total risk equates to systematic (market) risk.

Now study the following sections in the prescribed Skae et al textbook and complete the activity:

Section	Heading
5.1	*Background to portfolio theory*
5.2	*The concept of risk and return*
5.3	*Portfolio risk and return (excluding 5.3.2 The efficient frontier)*
5.4	*Diversification*

Activity 2.3

Answer question 5-1 (a) in the practice questions at the end of chapter 5 of Skae et al (an investor).

Solution to activity 2.3

Find the solution immediately after the question.

4. The Securities Market Line (SML) and the Capital Asset Pricing Model (CAPM)

The notions of systematic risk and risk-free investments led to the development of the SML and the CAPM. CAPM is used as a model for calculating the required rate of return from an investor perspective.

Now study the following sections in the prescribed Skae et al textbook and complete the activity:

Section	Heading
5.5	*The securities market line (SML)*
5.6	*The capital asset pricing model (CAPM)* (only up to "Equity versus asset betas")
5.7	*CAPM applications* (exclude 5.7.2 and 5.7.3)

Notes:

① The SML equates systematic risk (measured by the beta coefficient) to the returns on the asset or portfolio. The market (JSE) has a beta of 1,0 (a perfect correlation with its own returns). An asset or portfolio with a beta of 1,0 matches the market in terms of systematic risk and the associated returns. An asset or portfolio with a beta of 0,75 is less risky than the market in terms of systematic risk, and an asset or portfolio with a beta of 1,1 is more risky than the market by the same measure.

② Since the rate of return that the investor requires is paid by the company, it translates into the cost of equity. The CAPM is used to estimate the cost of equity for a company with an equity component in its capital structure.

*****

Note on Example 1: Calculating the beta coefficient

① When working through this example please note that you need to swop the headings for the information that relates to the return of Kwnagena Limited's stock and return on the JSE index over a five year period. The Y Variable: Stock Return should be included above the second column and the X Variable: Market return should be included above the third column.

*****

Note on Example 2: Calculating the beta coefficient (solution (i))

① Include the following steps in the solution for Arjent

$$\text{Arjent} = \frac{5 \times 0{,}3 \times 4}{4 \times 4}$$

② Include the following steps in the solution for Mercury

$$\text{Mercury} = \frac{7 \times 0{,}6 \times 4}{4 \times 4}$$

You will note for both Arjent and Mercury that the 4 on top of the line cancels out with the 4 on the bottom of the line.

*****

Activity 2.4

Answer question 5-1 (b) – (e) in the practice questions at the end chapter 5 of Skae et al (an investor).

Solution to activity 2.4

Find the solution immediately after the question.

5. Summary

In this study unit, you learnt to

- explain the advantages and disadvantages of debt finance in terms of financial risk and increased return to shareholders
- demonstrate how to determine the optimal capital structure by means of calculations
- explain the mechanics of the traditional capital structure theory versus that of the Miller and Modigliani theory
- describe the background to portfolio theory
- explain the difference between systematic and unsystematic risk
- evaluate whether the diversification of a portfolio resulted in a reduction of risk (for two assets only)
- explain the derivation and rationale of the SML
- use the CAPM to calculate cost of equity

In the next study unit, we will consider sources and forms of long-term finance and its implications for taxation.

6. Self-assessment questions

After working through the relevant sections in the textbook and the material provided in this study unit, you should now be able to answer the selected practise questions in the prescribed Skae textbook at the end of chapters 4 and 5.

QUESTION 1

Answer practise question 4-3 in the Skae et al textbook on (Zambezi (Pty) Ltd).

SOLUTION TO QUETION 1

Find the solution to practise question 4-3 after the question.

QUESTION 2

Answer practise question 5-4 in the Skae et al textbook(United Brew Limited).

SOLUTION TO QUESTION 2

Find the solution to practise question 5-4 after the question.

QUESTION 3

Answer practise question 5-6 in the Skae et al textbook (ABC (Pty) Ltd).

SOLUTION TO QUESTION 3

Find the solution to practise question 5-6 after the question.

STUDY UNIT 3 SOURCES AND FORMS OF LONG-TERM FINANCE

1. Introduction

In MAC2602, we introduced you to the two main capital markets, namely equity markets and debt (or bond) markets. You also learnt about some of the common forms of financing available in these markets.

In this study unit, we investigate some additional forms of financing available. We also consider the relative advantages and disadvantages of each of the common sources of finance. The type of financing also affects the tax deductibility of the payments and interest, which in turn affects the net after tax cost of the financing.

This study unit is based on **selected sections** from chapter 7 in the Skae et al prescribed textbook.

2. Sources of finance

We will briefly recap your MAC2602 knowledge of the different forms of finance and their advantages and disadvantages. We will also look at rights issues as a form of equity finance.

Now study the following sections in chapter 7 and complete the activity:

Section	Heading
7.2	*Classification of different forms of finance*
7.3	*Equity as a source of finance*
7.4	*Preference shares*
7.5	*Debt* (only 7.5.1 and 7.5.2)
7.8	*Overview of sources and forms of finance*

Annexure A in Chapter 7, contains a handy summary of all sources of finance and their uses. If you want to refer to it, only focus on those sources of finance that we have covered in MAC2602 and MAC3702 up to now. We will discuss the other sources of finance in later MAC modules.

We provide some additional guidance on the various forms of finance below:

① Make sure you understand the dual role of stock markets – firstly as primary markets, but also as secondary markets. As a **primary** market, the role of the stock market is to assist companies to obtain **new** funding and investments, while as a **secondary** market it facilitates the transfer (buying and selling) of shares and other securities **between** investors.

Note:
The words "stocks" and "securities" are used interchangeably.

*****

② Underwriting refers to the process by which investment banks raise investment capital from investors on behalf of organisations. A syndicate of banks underwrites the transaction, which means they have taken on the risk of distributing the securities. Should they not be able to find enough investors, they will have to hold some securities themselves. For example, company X wants to raise new equity finance to the value of R100 million. Investment bank B underwrites it. After the subscription period ends, other investors have only subscribed for new shares to the value of R93 million. Investment bank B now needs to take up R7 million worth of new shares in company X.

③ There are two main sources of debt – finance institutions, such as banks, and private investors. Finance institutions usually offer bank loans, while private investors often invest in debentures offered by the company. There is a **secondary** market for debentures, which means that these securities can be **traded** among investors after the initial issue by the company.

Note:
It is important that you understand the reasons, advantages and disadvantages of each form of finance as it has a bearing on the final decision regarding the type of financing to acquire. We cover this in section 3.

*****

Activity 3.1

Afric Ltd has recently decided to issue rights in order to raise additional capital. The company is offering its current shareholders the right to subscribe to one new share at a price of R1,90 each

for every four shares currently held. The total number of shares in issue (before the rights issue) is 100 million shares. The current share price is R2,30.

REQUIRED

Calculate the theoretical ex-rights price as well as the value of a right.

Solution to activity 3.1

Theoretical ex-rights price = $(\frac{1}{N+1})$ x ((N x cum rights price) + issue price)

Where N = number of shares required to buy one new share

Using the formula above:

= $(\frac{1}{N+1})$ x ((N x cum rights price) + issue price)

= $(\frac{1}{4+1})$ x ((4 x R2,30) + R1,90)

= R2,22

The value of a right is R2,22 – R1,90 = R0,32 per new share.

Notes:

① The principle is that the current market value of the company's equity (100m shares x R2,30 = R230m) is increased by the value of the cash injection (the value of all the rights taken up at the issue price = (100m shares ÷ 4) x R1,90 = R47,5m). The market value per share after the rights issue is therefore the combined value (R230m + R47,5m = R277,5m) divided by the new total number of shares in issue (100m shares + 25m shares = 125m shares). R277,5m ÷ 125m shares = R2,22 per share. This is a **theoretical** ex-rights price **assuming all else stays unchanged**.

② Existing shareholders would therefore be prepared to pay R1,90 to obtain an additional share. (It is a good discount compared to the current trading price of R2,30). If they sold it for R2,22 on the day that the new shares were listed, they would make a cash profit of R0,32 per

share. Their remaining four shares would trade at R2,22 and have a total value of R8,88. If they added their cash profit of R0,32 to the value of their remaining investment of R8,88, their total wealth would be R9,20. That equals the value of their four shares before the rights issue (4 x R2,30 = R9,20). Hopefully the JSE would react positively to the news of the rights issue (to fund a project that would increase the value of the company over time) and the shares would trade for more than R2,22, thereby increasing all the shareholders' wealth.

*****

3. Criteria for deciding on the form of financing

When an organisation is financially sound, it has access to various forms of financing. The financial manager should consider various factors when deciding which finance to apply for. The providers of the financing also have criteria which an organisation has to meet before they would consider extending the finance.

Now study the following sections in the prescribed Skae et al textbook and complete the activity:

Section	Heading
7.1	*Introduction*
7.5.3	*Advantages and disadvantages of debt compared to equity*
7.7	*Criteria applied by providers of finance/investors*
7.9	*The financing decision*

The impact that the source of financing has on cost, control and risk is usually the most important criterion.

Activity 3.2

Thorn Tree Ltd, a company that specialises in landscaping and garden services, decided to expand their business by adding a new team to the existing four teams.

Thorn Tree Ltd has enough garden tools and equipment for the new team to be functional, but they have to invest in an additional vehicle.

They received a number of quotes on vehicles and decided to purchase a light commercial vehicle at the cost of R235 000.

The dealership assisted Thorn Tree Ltd to apply for some finance options for the purchase of the vehicle at CT Bank.

The bank does not provide unsecured loans. Thorn Tree Ltd would like to finance the vehicle over a period of five years. The normal finance rate for small businesses with a good financial status is prime plus two.

REQUIRED

Describe the criteria the bank will use when considering the loan application. Hint: Use the PARTS acronym.

Solution to activity 3.2

P – Purpose: why does the company want to borrow funds?
The company wants to borrow funds to expand their business by investing in an additional vehicle that can be used on daily basis.

A – Amount: how much does the company wish to borrow?
R235 000

R – Repayment: how will the company repay its debt?
Through monthly instalments

T – Term: what is the term of the loan?
60 months

S – Security: can the company provide any security, such as assets, against the loan?
Yes, they could use the new vehicle as security for the loan.

4. The lease or borrow decision

When we consider which form of finance to obtain, we compare the effective after-tax cost of the finance and usually settle for the finance with the lowest after-tax cost (unless other conditions are too strenuous). If the organisation considers debt financing, it is important to remember that the

type of debt financing obtained would affect the income tax deductibility of the interest and lease payments as well as any wear and tear allowances that may by claimed on the assets.

Now study the following sections in chapter 7 and complete the activities:

Section	Heading
7.11	*Determine the most cost-effective form of finance*
7.13	*The lease or buy decision*
7.14	*Cheap finance*

When comparing the leasing option to the borrow option, we consider the following aspects:

	Borrow option	Lease option
Discount rate	After-tax cost of debt	After-tax cost of debt
Cash outflows	Total annual instalment	Total lease payment
Cash inflows	Tax benefit of interest portion Tax benefit of wear and tear deduction	Tax benefit of total lease payment

Note:
The amounts allowed as deductions when calculating the organisations' tax liability are in effect a refund and therefore constitutes a cash inflow.

*****

When considering the borrow option, you will note that the annual instalments and the tax benefit of the interest portion of these instalments, discounted at the after-tax cost of debt, will be equal to the initial capital borrowed. This is the case if the organisation borrows at its existing borrowing rate (which is used when calculating the discount). You may therefore encounter examples where the solution simply shows the initial capital borrowed as a single cash outflow at the start of the period. This is an alternative presentation and is quite correct. See the next activity.

Activity 3.3

A capital amount of R500 000 is borrowed over a period of three years. The interest rate is 10%, and the taxation rate is 30%.

REQUIRED

Determine the present value of the cash flows if

a. interest is paid annually, and the capital amount is settled at the end of three years

b. the loan is repaid in three equal instalments

Solution to activity 3.3

a. Interest paid annually, and capital settled at the end of three years

	0	**1**	**2**	**3**
	Rand	**Rand**	**Rand**	**Rand**
Interest ①		(50 000)	(50 000)	(50 000)
Tax benefit – interest x 30%		15 000	15 000	15 000
Capital redeemed				(500 000)
	0	**(35 000)**	**(35 000)**	**(535 000)**

Net present value at 7% ② (R500 000)

① R500 000 x 10% = R50 000

② After tax interest rate = interest rate x (1 – tax rate)
= 10% x (1 – 0,3)

b. Loan repaid in three equal instalments

	0	**1**	**2**	**3**
	Rand	**Rand**	**Rand**	**Rand**
Instalment ③		(201 057,40)	(201 057,40)	(201 057,40)
Interest portion ④		(50 000,00)	(34 894,26)	(18 277,95)
Capital portion ⑤		(151 057,40)	(166 163,14)	(182 779,45)
Tax benefit – interest x 30%		15 000,00	10 468,28	5 483,38
	0	(186 057,40)	(190 589,12)	(195 574,02)

③ The instalment is calculated as follows:

Calculator type	**SHARP EL-738**		**Hp10BII**	
	Key in	**Display will read**	**Key in**	**Display will read**
Clear all registers	2ndF CA	0.0000	2ndF C ALL	1 P/YR 0.0000
Number of periods	3 N	3.0000	3 N	3.0000
Interest rate	10 I/Y	10.000	10 I/YR	10.000
Payments	500 000 +/- PV	-500 000	500 000 +/- PMT	-500 000
Calculate the payments	COMP PMT	201 057.40	PMT	201 057.40

④ and ⑤ – amortisation table:

Year	**Outstanding capital (beginning) (rand) A**	**Interest for period (rand) B**	**Instalments (rand) C**	**Capital portion (rand) D**	**Outstanding capital (end) (rand) E**
Calculations		**(A x 10%)**	**(See ③)**	**(C – D)**	**(A – D)**
1	500 000,00	50 000,00	201 057,40	151 057,40	348 942,60
2	348 942,60	34 894,26	201 057,40	166 163,14	182 779,46
3	182 779,46	18 277,95	201 057,40	182 779,46	0,00

Net present value at 7% [interest rate x (1 – tax rate)]: (R500 000)

Note:

Regardless of how the interest is charged and the capital repaid, the net present value of the after-tax cash flows will equal the initial capital outlay (or amount borrowed) as long as the money is borrowed at the organisation's borrowing rate.

*****

Activity 3.4

Answer practise question 7-2 in the Skae et al textbook.

Solution to activity 3.4

Find the solution to practise question 7-2 after the question.

Notes:

① Did you notice that for the borrowing option (the loan), the initial outlay is only entered as an outflow of R2,4 million without entering the interest payments and tax deduction of the interest for each year? That is allowed, as the loan is entered into at the same rate as that which is used by the company to evaluate their debt financing, namely 20% (before tax).

② For the loan option, the wear and tear allowance of the tax benefit and the maintenance expense after tax are included, as these are cash flows that **differ** from those under the lease options.

*****

Activity 3.5

Answer practise question 7-5 in the Skae et al textbook (Noble House (Pty) Ltd).

Solution to activity 3.5

Find the solution to practise question 7-5 after the question.

5. Summary

In this study unit, you learnt to

- calculate the theoretical ex-rights price as well as the value of a right
- evaluate the suitability of different forms of finance for financing different types of assets for different intended purposes
- perform appropriate calculations for various financing options while considering taxation and other relevant factors, and make recommendations, with specific focus on loan versus lease options.

Notes:

① We prefer and recommend that you present your discounted cash flow calculation in tables in the format presented in question 7-6, that is the cash flow for each year separately in each column, and the types of cash flows in the rows.

② Outflows are indicated in brackets (xxx) and inflows without brackets.

*****

Example:

	0	**1**	**2**
Initial outlay			
Interest payment			
Etc.			
Etc.			
Net cash flow			

NPV @ 10% = R(xxx)

OR

Internal rate of return (IRR) = yy%

*****

In the next topic and two study units, we will investigate how the effective after-tax cost of various listed financing instruments is calculated in order to complete the calculation of the weighted average cost of capital.

6. Self-assessment questions

After working through the relevant sections in the textbook and the material provided in this study unit, you should now be able to answer the selected practise questions in the prescribed Skae textbook at the end of chapter 7.

QUESTION 1

Answer practise question 7-4 (b) in the Skae et al textbook (Union Cape manufacturing (Pty) Ltd).

SOLUTION TO QUESTION 1

Find the solution to practise question 7-4 (b) after the question.

QUESTION 2

Answer practise question 7-6 in the Skae et al textbook (Same information as Noble House (Pty) Ltd).

SOLUTION TO QUESTION 2

Find the solution to practise question 7-6 after the question.

PART2, TOPIC 3 – WEIGHTED AVERAGE COST OF CAPITAL

INTRODUCTION

In topic 2 on required returns, you learnt about the effect that various risks have on the rate of return required by providers of equity and debt capital to the organisation. Each investor or lender will require a specific return on their investment or loan – linked to the specific perceived risk attached to the investment or loan. The weighted average cost of capital (WACC) is a rate, expressed as a percentage, which combines these disparate required rates of return (for loans and investments) according to the portion (weighting) that each instrument has of the total capital into an **average** rate of return, required by the investors or lenders of the organisation as a **whole**.

The weighting is based on the market value of the sources of the funds. It implies that you should be able to determine the market value of various sources of listed (or traded) and unlisted instruments in order to complete the WACC calculation.

In MAC2602, you learnt how to value some of the simple financing instruments to calculate the after-tax cost of debt on a simplified basis as well as the WACC. In this module, we will expand the financing decisions to include more complex instruments and additional valuation methods for private equity (equity that is not publicly traded).

LEARNING OUTCOMES

After studying this topic, you should be able to

- identify and explain the various drivers of value for different sources of finance
- determine the fair value of different types of preference shares using a discounted cash flow method
- select a suitable valuation approach, methodology, method or model for the valuation of ordinary private equity, based on the information available, and explain your reasoning
- determine the fair value of ordinary equity using the following valuation methodologies/methods/models:
    - a methodology based on the price of recent investments
    - a methodology based on net assets

    - a method based on a trailing P/E multiple (but be aware of current and forward P/E multiples)
    - a method based on a market price multiple
    - Gordon's dividend growth model
- identify the factors that require adjustment concerning the value of a similar listed equity share and that of a private equity share
- identify the factors that require adjustment in arriving at sustainable (or maintainable) earnings
- calculate the required after-tax return for various listed instruments when the market value is given
- calculate the required rate of return of other debt funding
- calculate the WACC of an organisation based on a variety of funding

ASSUMED PRIOR KNOWLEDGE

In your MAC2602 module, you mastered the following learning outcomes:

- applied time value of money concepts to present and future cash flow streams
- discounted cash flows to determine net present values
- calculated the effective cost of different forms of financing (yield to maturity, dividend growth model and CAPM)
- performed elementary valuations of certain forms of financing
- calculated the WACC

Please refer to your second year guide if you want to refresh your knowledge.

For another perspective, you may also refer to the following sections in the prescribed Skae et al textbook:

Section	Heading
3.1	*Time value of money*
3.4	*Present value of shares*
3.5	*Present value of debt*

THIS TOPIC CONSISTS OF THE FOLLOWING STUDY UNIT:

STUDY UNIT TITLE

STUDY UNIT 4 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

STUDY UNIT 4 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

1. Introduction

For the purposes of this study unit, we perform valuations of various sources of finance in order to obtain the relative weights of each form of finance within the calculation of the WACC. (We might also use target weights, as explained later).

Valuation is fundamentally the act whereby value is determined. In the present context, this value is normally described as the market value, or to use a more appropriate term, the **fair value**

If the cost of debt or equity is not given, we can also use the market values and cash flow streams of certain financing instruments to obtain the cost of the financing. With regards to equity financing, we have already introduced you to Gordon's dividend growth model and the capital asset pricing model (CAPM) for determining the cost of equity.

This study unit is based on **selected sections** from the following chapters in the Skae et al prescribed textbook:

- Chapter 10
- Chapter 11
- Chapter 4

You should refer to selected sections of chapter 7 as well for calculating the effective cost of certain forms of debt financing (covered in study unit 3).

2. Valuation of preference shares and hybrid debt instruments

In MAC2602, we introduced you to discounted cash flow methods and techniques for valuing simple bonds and debentures. We will now investigate how the principles used in those methods and techniques apply to more complex forms of finance. Equity valuations will be covered later on in this study unit.

2.1 Underlying theory

The sections you are going to study next will sketch the necessary background and explain the underlying theory relating to the valuation of preference shares and debt.

Now study the following theoretical sections in Skae et al, chapter 10:

Section	Heading
10.1	*Reasons for undertaking valuations of preference shares or debt*
10.2	*The discounted cash flow method*

2.2 Valuation of preference shares and hybrid debt instruments

You have now worked through the background information and should understand the interaction of the various drivers of value when using a discounted cash flow method. We will now explore the valuation of preference shares and debt using this method.

Now study the following sections in Skae et al, chapter 10, excluding the indicated subsections, and then complete the activities:

Section	Heading	Exclusions
10.3	*Valuation of preference shares*	10.3.3 *Tax treatment and valuation inputs* – exclude the portion under the heading *Hybrid instruments for income tax purposes* (study the rest) ①
10.4	*Valuation of debt*	10.4.3 *Tax treatment and valuation inputs* ② 10.4.4 *Valuing bonds* – exclude part (b) of the example/activity ② (study the rest) 10.4.5 *Valuing convertible debt*

Notes:

① For the purposes of this module, we ignore the income tax classification of "hybrid instruments" – that is, we ignore sections 8E and 8F of the Income Tax Act.

② The preferred treatment when valuing debt is to discount the expected after-tax cash flows using an after-tax rate. However, due to the complexities introduced by section 24J of the Income Tax Act, we use the simplified approach of valuing debt by discounting pre-tax cash

flows using a pre-tax rate for the purposes of this module. (In many circumstances, this should provide the same fair value).

*****

Activity 4.1

The directors of Comp Soft (Pty) Ltd are considering financing options to finance a current project. According to the feasibility study, the project will be in its operational phase within the next five years.

The directors have investigated a number of financing options and now need to decide between the following two options:

Option 1

Issuing 1 000 000 redeemable preference shares of R1 each. The shares carry a variable dividend equal to the prime interest rate less 1%, payable annually in arrears. The market rate of return on similar shares is 8%. (You may ignore section 8E of the Income Tax Act). These shares are redeemable at the end of five years from the date of issue. The current prime rate is equal to 8,5%.

Option 2

Issuing unsecured bonds with a total nominal value of R1 million paying a 8,5% fixed coupon annually in arrears. The bond will mature in five years' time. A market-related interest rate on bonds with similar risk is equal to 10%.

REQUIRED

Determine the current fair value of both the finance options and advise management on which finance option they should choose based on your calculations.

Solution to activity 4.1

Alternative 1

Option 1

YEAR		0	1	2	3	4	5
		Rand	Rand	Rand	Rand	Rand	Rand
Initial amount received		1 000 000					
Expected dividend ①			(75 000)	(75 000)	(75 000)	(75 000)	(75 000)
Redeemable capital							(1 000 000)
Cash flow for period		1 000 000	(75 000)	(75 000)	(75 000)	(75 000)	(1 075 000)
Fair rate of return ③	8,00%	1,000	0,926	0,857	0,794	0,735	0,681
Net present value	**19 525**	1 000 000	(69 450)	(64 275)	(59 550)	(55 125)	(732 075)

Option 2

YEAR		0	1	2	3	4	5
		Rand	Rand	Rand	Rand	Rand	Rand
Initial amount received		1 000 000					
Coupons ②			(85 000)	(85 000)	(85 000)	(85 000)	(85 000)
Amount redeemed							(1 000 000)
Cash flow for period		1 000 000	(85 000)	(85 000)	(85 000)	(85 000)	(1 085 000)
Fair rate of return ④	10,00%	1,000	0,909	0,826	0,751	0,683	0,621
Net present value	**56 850**	1 000 000	(77 265)	(70 210)	(63 835)	(58 055)	(673 785)

① Expected dividend = R1 x 1 000 000 x (8.5% - 1%)
= R75 000

② Annual coupon = R1 000 000 x (11,80% x 0,72)
= R1 000 000 x 8,5%
= R85 000

③ PV factor formula = $\frac{1}{(1+i)^n}$

④ After tax interest rate = 13,89% x 0,72

= 10,9%

Alternative 2

Option 1

Present value of dividends = R75 000 x $\frac{1-\frac{1}{(1+i)^n}}{i}$

= R75 000 x $\frac{1-\frac{1}{(1+0,08)^5}}{0,08}$

= R75 000 x 3,993

= R299 475

Present value of capital portion = R1 x 1 000 000 x $\frac{1}{(1+i)^n}$

= R1 x 1 000 000 x $\frac{1}{(1+0,08)^5}$

= R1 000 000 x 0,681

= R681 000

Total NPV of cash outflows = Present value of dividends + Present value of capital

= R299 475 + R681 000

= R980 475

Total NPV = Cash inflow – cash outflow

= R1 000 000 – R980 475

= R19 535

Option 2

Present value of coupons = R85 000 x $\frac{1 - \frac{1}{(1+i)^n}}{i}$

= R85 000 x $\frac{1 - \frac{1}{(1+0,1)^5}}{0,01}$

= R85 000 x 3,79

= R322 150

Present value of capital = R1 000 000 x $\frac{1}{(1+i)^n}$

= R1 000 000 x $\frac{1}{(1+0,1)^5}$

= R1 000 000 x 0,621

= R621 000

Total NPV of cash outflow = Present value of dividends + Present value of capital

= R322 150 + R621 000

= R943 150

Total NPV = Cash inflow – cash outflow

= R1 000 000 – R943 150

= R55 850

Alternative 3

Option 1

Input in calculator

CF0	1 000 000
CF1	(75 000)
CF2	(75 000)
CF3	(75 000)
CF4	(75 000)
CF5	(1 075 000)
I /yR	8%
Comp NPV	19 964

Option 2

Input in calculator

CF0	1 000 000
CF1	(85 000)
CF2	(85 000)
CF3	(85 000)
CF4	(85 000)
CF5	(1 085 000)
I /yR	10%
Comp NPV	56 862

If we compare the fair value of the preference shares to the fair value of the debt from the calculations above, it is evident that it is cheaper to issue the bonds.
We therefore advise the directors to issue the bonds and not the preference shares.

Notes:

① We are comparing the total cash flows. Therefore we choose the option with the **highest** amount of net-inflow.

② You were required to advise management. Remember not to end your answer at the calculations, but to proceed to a motivated recommendation.

③ You will see the final answer differs slightly. This is due to rounding differences.

*****

Activity 4.2

Refer to the example in subsection 10.3.5 of the Skae et al textbook.

REQUIRED

Use a spread sheet program and attempt to use the formulas function to arrive at the same answer as the textbook.

Solution to activity 4.2

The screenshot below was taken from Microsoft Excel® [1]:

[1] Microsoft and Excel are registered trademarks of the Microsoft Corporation, registered in the US and other countries.

	A	B	C	D	E	F	G	H
1		Year:	0	1	2	3	4	5
2			(issue date)					
3				R	R	R	R	R
4	Expected dividend			-63 000	-63 000	-63 000	-63 000	-63 000
5	Redeem capital							-1 000 000
6				-63 000	-63 000	-63 000	-63 000	-1 063 000
7								
8	Fair rate of return		7.50%					
9								
10			R					
11	Net present cost		-951 449					
12								
13	Or alternatively, using discount factors			0.9302	0.8653	0.8050	0.7488	0.6966
14								
15	Net present cost		-951 449	-58 605	-54 516	-50 713	-47 174	-740 442
16								
17	Or, using factors rounded to 4 decimal points:			0.9302	0.8653	0.805	0.7488	0.6966
18								
19	(Same as in the Vigario example)		-951 492	-58 603	-54 514	-50 715	-47 174	-740 486

(Source: Skae and De Graaf, 2012 – used with permission)

This result was obtained using the following formulas:

	A	C	D	E	F	G	H
1	Year:	0	1	2	3	4	5
2		(issue date)					
3			R	R	R	R	R
4	Expected dividend		=-((70%*9%)*1000000*1)	=D4	=E4	=F4	=G4
5	Redeem capital						=-1000000*1
6			=SUM(D4:D5)	=SUM(E4:E5)	=SUM(F4:F5)	=SUM(G4:G5)	=SUM(H4:H5)
7							
8	Fair rate of return	0.075					
9							
10		R					
11	Net present cost	=NPV(C8,D6,E6,F6,G6,H6)					
12							
13	Or alternatively, using discount factors		=1/(1+$C$8)^D1	=1/(1+$C$8)^E1	=1/(1+$C$8)^F1	=1/(1+$C$8)^G1	=1/(1+$C$8)^H1
14							
15	Net present cost	=SUM(D15:H15)	=D6*D13	=E6*E13	=F6*F13	=G6*G13	=H6*H13
16							
17	Or, using factors rounded to 4 decimal points		=ROUND(1/(1+$C$8)^D1,4)	=ROUND(1/(1+$C$8)^E1,4)	=ROUND(1/(1+$C$8)^F1,4)	=ROUND(1/(1+$C$8)^G1,4)	=ROUND(1/(1+$C$8)^H1,4)
18							
19	(Same as in the Vigario example)	=SUM(D19:H19)	=D6*D17	=E6*E17	=F6*F17	=G6*G17	=H6*H17

(Source: Skae and De Graaf, 2012 – used with permission)

Microsoft Excel® tips:

① Instead of displaying the solution to the formulas, you can display the formulas by simultaneously pressing <Ctrl> and <~>. (To turn off this feature, repeat the same step).

② When entering formulas, you can save time by using absolute references, that is, using the "$" sign before a column and row reference in order to fix a certain cell's position in a formula and then "dragging" that cell across in order to copy it. For example, we used an absolute reference when referring to cell C8 (by typing $C$8) within the formula contained in cell D13. We then "dragged" cell C8 to the right, using the "+" panhandle, in order to copy it across row 13.

③ Refer to your AIN2601 study guide for more spreadsheet tips.

3. Valuation of ordinary equity (non-listed)

Ordinary equity is the primary source of the initial funding for an organisation. Without the owners investing some of their own money in the start-up capital, debt providers will not be providing the rest of the required funding. Later expansion of the organisation will require further funding. Whether this is sourced from debt or equity depends on the target capital structure and the market value of the existing debt and equity of the organisation. This section will focus on the valuation theory of ordinary private equity and then explore different methodologies, methods and models used in such an evaluation.

Note:
Private equity refers to the owners' own capital invested in business organisations that are not listed on a securities exchange, that is unincorporated businesses (e.g. sole traders), partnerships and private companies (as well as close corporations, which are still operating but are no longer allowed as new forms of business). Later study units will deal with the valuations of listed shares.

*****

3.1 Background and underlying theory

The sections you are going to study next build on the concepts introduced in MAC2602. The sections below further explain valuation theory.

Now study the following theoretical sections in Skae et al, chapter 11:

Section	Heading
11.1	*Some of the intricacies of value*
11.2	*Reasons for undertaking business and equity valuations*
11.3	*Underlying valuation theory*
11.4	*Factors affecting the value of a business or equity interest*

Note:
Some of the sections you studied above refer to issues involving listed equity. We require you to be aware of these issues, as the valuation of private equity in some methodologies start with the value of a similar listed organisation. You should therefore have an understanding of the factors affecting listed shares as well.

*****

3.2 Valuation of ordinary equity

Having worked through the underlying valuation theory, we will now explore certain valuation methodologies, methods and models that could be used to determine the fair value of ordinary equity.

Study the following sections in Skae et al, chapter 11, excluding the indicated areas, and then complete the activities:

Section	Heading	Exclusions
11.5	*Other valuation matters*	11.5.2.4 *Black Economic Empowerment (BEE) lock-in discount*
11.6.1	*Price of recent investment*	
11.6.2	*Earnings multiples*①	11.6.2.6 *Valuation method based on an EV/EBITDA multiple*
11.6.3	*Market price multiples*	
11.6.4	*The Gordon Dividend Growth Model*	
11.6.7	*Net assets*	

Notes:

① For the purposes of this module and in the context of earnings multiples, we focus on a valuation method based on a **trailing** price/earnings (P/E) multiple. However, you should be aware that multiples could also be expressed as **current** or **forward** multiples. Furthermore, you should be aware that there are other available earnings multiples that we can use for valuations, such as the enterprise value (EV) or the earnings before interest, tax, depreciation and amortisation (EBITDA) multiple (both covered in later modules).

② Section 11.6.5 "Models based on Free Cash Flow will be covered in the study unit on valuations for mergers and acquisitions.

*****

Activity 4.3

Answer the required parts (a)(iii) and (c) of practice question 11-2 in the Skae et al textbook (PreFab (Pty) Ltd).

Solution to activity 4.3

Find the solution to parts (a)(iii) and (c) after practice question 11-2 in Skae et al.

Activity 4.4

The following information relates to a South African based company. The company recently paid a dividend of R1 500 000 to its shareholders.

The company expect the annual growth in ordinary dividends to be as follows:

Year 1	15%
Year 2	10%
Year 3	8%
Year 4 and onwards	6%

One of the shareholders who own 10% of the company wants to sell his shares, and you are interested in buying the shares on offer. The fair rate of return for similar companies is 16%.

REQUIRED

Calculate the price you would be willing to pay for the 10% (minority) shareholding of the company. (Round your answer to the nearest rand).

Solution to activity 4.4

Step 1 Determining value of company using the fair rate of return provided

YEAR			**0**	**1**	**2**	**3**
			Rand	**Rand**	**Rand**	**Rand**
Expected dividend to be paid						
YEAR 1	1 500 000 x 1,15			1 725 000		
YEAR 2	1 725 000 x 1,10				1 897 500	
YEAR 3	1 897 500 x 1,08					2 049 300
Gordon's dividend growth model year 4 and onward ①						21 722 580
			0	1 725 000	1 897 500	23 771 880
Fair rate of return ②		16,00%		0,862	0,743	0,641
Net present value		**18 134 568**	0	1 486 950	1 409 843	15 237 775

Calculation

① $P_3 = \frac{D_4}{k_e - g}$

$= \frac{R2\,049\,300 \times 1{,}06}{16\% - 6\%}$

$= \frac{R2\,172\,258}{10\%}$

= R21 722 580

② Calculate the Present value factor by making use of the following formula:

$$\text{PV factor} = \frac{1}{(1+i)^n}$$

Alternative method

Input in calculation

CF0	0
CF1	1 725 000
CF2	1 897 500
CF3	23 771 880
IR	16%
Calc PV	18 126 858

Step 2 Determine pro rata shareholding

10% shareholding	=	R18 134 568 x 10%	OR	=	R18 126 858 x 10%
	=	R1 813 457		=	R1 812 686

Step 3 Adjustment for minority holding

Apply a 12% # discount	=	R1 813 457 x 88%	OR	=	R1 812 686 x 88%
	=	R1 595 842 x 88%		=	R1 595 164

Conclusion

You should offer the seller no more than R1 595 842 / R1 595 164 to purchase his 10% minority shares.

Note #:

We did not provide you with the size of the minority discount adjustment, but left it to your own judgement. As long as you used a reasonable adjustment, the marker will mark the discount rate you used in your calculations.

*****

4. Cost of capital and the weighted cost of capital

We introduced you to the concepts "cost of capital" and "WACC" in MAC2602. In this study unit, we will explore these concepts further and illustrate them with practical examples of calculating WACC.

Now study the following sections in the prescribed Skae et al textbook and complete the activity:

Section	Heading
4.10	*Cost of capital*
4.11	*The weighted average cost of capital*

Notes:

- Some questions might indicate that a portion of the bank overdraft is considered part of the capital structure. In this case, you should include the portion of the bank overdraft in your WACC calculation Refer to study unit 8 for more detail.

- Refer to study unit 3 on sources and forms of long-term finance to recap how to calculate the effective after-tax cost of certain forms of financing where tax allowances on the assets come into play. If the capital structure contains this type of funding, you should use yield to maturity (YTM) to calculate the effective after-tax cost of the financing. (For the purposes of MAC3702, we will use YTM and internal rate of return (IRR) interchangeably, as they incorporate the same time value of money principles).

- The valuation of ordinary equity covers all of the financing provided by issued shares, non-distributable reserves, retained income and other distributable reserves. The ordinary shareholder is entitled to all of these. Don't add the reserves to the value of the ordinary equity, as it will be double counting.

- Take taxation into account in the case of a long-term loan.

- Make sure you understand how the market values of the equity, preference shares and long-term loan are calculated.

*****

Now let's make sure you can calculate the WACC for a company with various elements in its structure.

Activity 4.5

Answer practice question 4-3 at the end of chapter 4 in the Skae et al textbook (Zambezi (Pty) Ltd).

Solution to activity 4.5

Find the solution immediately after practice question 4-3 in the Skae et al textbook.

Activity 4.6

Now let's see if you can remember how to calculate the after-tax cost of a loan by means of the IRR method.

Answer practice question 7-5 (b) at the end of chapter 7 in the Skae et al textbook (Noble House (Pty) Ltd).

Solution to activity 4.6

Find the solution immediately after practice question 7-5 in the Skae et al textbook.

Note:
Take note of the calculation of cash flows, tax savings and IRR by means of interpolation.

*****

5. Summary

In this study unit, you learnt to

- identify and explain the various drivers of value for different sources of finance
- determine the fair value of different types of preference shares using a discounted cash flow method
- select a suitable valuation approach, methodology, method or model for the valuation of ordinary private equity, based on information available, and explain your reasoning
- determine the fair value of ordinary equity using the following valuation methodologies/ methods/models:
    - a methodology based on the price of recent investments
    - a methodology based on net assets

  - a method based on a trailing P/E multiple (while being aware of current and forward P/E multiples)
  - a method based on a market price multiple
  - Gordon's dividend growth model
- identify the factors that require adjustment concerning the value of a similar listed equity share and that of a private equity share
- identify the factors that require adjustment in arriving at sustainable (or maintainable) earnings
- calculate the required after-tax return for various listed instruments (when the market value is given)
- calculate the required return of other debt funding
- calculate the WACC of an organisation based on a variety of funding

In the next topic, we will discuss how the organisation should evaluate long-term investments.

6. Self-assessment questions

After working through all the relevant sections in the textbook and the guidance and activities provided in this study unit, you should now be able to answer the following self-assessment questions:

QUESTION 1

Finesse Footwear Limited ("Finesse Footwear" or "the company") is a company operating in the footwear industry.

The company's directors are currently considering several projects, which will expand the range of Finesse Footwear's business activities. The directors would like to use discounted cash flow techniques in their evaluation of these projects, but certain variables still have to be calculated.

The following is an extract from the statement of financial position as at the previous financial year-end, 31 December 20X2:

EQUITY AND LIABILITIES

	Notes	R'000
Share capital and reserves		
Ordinary share capital and premium	①	6 000
Other reserves		3 240
Redeemable preference shares	②	2 000
Interest-bearing liabilities	③	6 447
TOTAL EQUITY AND LIABILITIES		17 687

Except for increases in reserves and the details provided below, no changes were made to the share capital appearing in the statement of financial position above.

Additional information

① Finesse Footwear has an authorised ordinary share capital of 10 million shares, of which 5 million have been issued. A large block of ordinary shares were recently traded between non-connected parties at a price of R3,00 per share. The company's project analyst has estimated the fair rate of return on ordinary capital at 21% (an annual percentage rate [APR]) and the growth rate at 10% per annum. The last declared dividend was 30 cents per share.

② The redeemable preference shares were issued at a par value of R10 per share a few years ago. (There are 200 000 shares in issue). These shares are redeemable at a premium of 15% in three years' time, and they carry a non-cumulative dividend that is payable semi-annually (six months before the company's financial year-end and on the company's financial year-end). The semi-annual dividend is calculated at 6% of the par value. A fair rate of return for similar preference shares with a similar risk-profile currently equals 13% (APR). Due to pressure on cash flow in the current year, the directors expect that all dividends will be declared and paid, except for dividends in the final redemption year. (Section 8E of the Income Tax Act does not apply).

③ The principal amounts on the interest-bearing liabilities have to be repaid in two tranches: in 20X5 and in 20X6.

REQUIRED

Marks

a. Determine the fair value of the ordinary shares on 1 January 20X3 and determine if the share price of R3 per share is reasonable. 4

b. Determine the fair value of the redeemable preference shares on 1 January 20X3. 5

c. Briefly discuss any potential problem areas and possible remedies linked to Finesse Footwear's current sources of finance and its future plans. 5

(Source: *MAC4861,* University of South Africa – simplified and shortened)

SOLUTION TO QUESTION 1

(a) Calculating a fair value using Gordon's dividend growth model

Marks

Fair value of ordinary shares: $P_0 = \frac{D_1}{k_e - g}$ 1

$P_0 = \frac{30 \text{ cents x } 1{,}1}{21\% - 10\%}$ 1

$P_0 = \frac{33}{11\%}$

R3 per share

Fair value of ordinary shares 1 Jan 20X3

Number of shares x price of recent investment

	R	
5 000 000 x R3,00	15 000 000	1

The fair value of the ordinary shares on 1 January 20X3 is equal to R15 million.

The shares traded at the same price as the fair value of the shares. Therefore, the shares were traded at a reasonable price. 1

(b) Fair value of redeemable preference shares

	31-Dec-X2 / 01-Jan-X3	30-Jun-X3	31-Dec-X3	30-Jun-X4	31-Dec-X4	30-Jun-X5	31-Dec-X5	Marks
Six-monthly intervals	0	1	2	3	4	5	6	
Preference dividend		(120 000)	(120 000)	(120 000)	(120 000)			1
(6% x R10 x 200 000)						0	0	1
Redeemed (R10 x 200 000 x 1,15)							(2 300 000)	1
	0	(120 000)	(120 000)	(120 000)	(120 000)	0	(2 300 000)	
Discount rate = 13%/2 = **6,5%** for a 6 month interval (13% per annum)								1
		0,9390	0,8817	0,8278	0,7773	0,7299	0,6853	
Discounted value	0	(112 676)	(105 799)	(99 342)	(93 279)	0	(1 576 268)	
Fair value **(1 987 364)**								(factors or calculator steps shown) 1

Note: The non-cumulative dividend is not expected to be paid for period 5 and 6.

Input in calculator:

CF0	0
CF1	-120 000
CF2	-120 000
CF3	-120 000
CF4	-120 000
CF5	0
CF6	-2 300 000
I/YR	6.5%
Calc PV	1 987 364

The fair value of the redeemable preference shares on 1 January 20X3 is equal to R1 987 364.

(c) Potential problem areas and possible remedies

Problem areas	**Marks**	**Remedies**	**Marks**
Cash outflows relating to existing sources of finance (redemption of preference shares and repayment of loan) coincides or are closely spaced (e.g. 2015 and 2016), and therefore exposes the company to significant cash flow pressure during this time.	1	Management should consider refinancing options in advance.	1
		When refinancing, you should stagger the repayment terms or the timing of main cash outflows.	1
The company intends to increase its range of business activities, which may affect the existing business risk and timing of cash flows.	1	The company should determine an appropriate target capital structure by considering its current and new business activities. When investigating new sources and forms of finance, consider this target structure.	1

QUESTION 2

After having completed a due diligence investigation into Jacks & Jacks (Pty) Ltd, a private equity company, you are satisfied with the following figures and assumptions:

Latest dividend: R10 000 000

Expected growth in dividends:

- Year 1: 30%
- Year 2: 25%
- Year 3: 20%
- Year 4: 15%
- Year 5 and thereafter: 10% per annum

CAPM parameters (refer to chapter 5, section 5.6) for a listed company, Jills & Jills Holdings Ltd, with a similar size and risk profile are as follows:

- The risk-free rate equals 14%.
- The market rate of return for the particular industry equals 25%.
- The beta of Jills & Jills Holdings Ltd is 1,1.

An adjustment of 2 percentage points to required return of Jills & Jills Holdings Ltd according to the CAPM is sufficient to account for the lack of tradability of Jacks & Jacks (Pty) Ltd.

REQUIRED

a. If the present value of the future (individual) dividends method is used, which one of the following should be the discount rate?

   i. the dividend yield

   ii. the dividend yield, less growth

   iii. the earnings yield, less growth

   iv. the fair rate of return on equity

   v. the WACC

b. Calculate the value of a minority shareholding of 5% in Jacks & Jacks Ltd independent of present JSE share prices.

SOLUTION TO QUESTION 2

a. The fair rate of return on equity should be used as the discount rate.

The fair rate of return on equity is used in this instance as you were provided with information of specific dividends that accrue to shareholders for the first four years. Using only one dividend amount and one discount rate would not achieve the correct valuation. We cannot use the WACC, as this valuation is not concerned with value attributable to debt providers.

b. Independent valuation

Calculating a fair rate of return (r) using the CAPM

$r = F + b (M - F)$

$K_e = Rf + B(Rm – Rf)$

Hence:

$r = [14 + 1,1 (25 - 14)] + 2$

$= [14 + 1,1 (11)] + 2$

$= 26,1 + 2$

$= 28,1$ for Jills & Jills Holdings Ltd (listed)

A fair rate of return for Jacks & Jacks (Pty) Ltd, after **increasing** the required return with 2% for lack of tradability, would be 28,1%.

Calculating expected dividends

End of:

Year 1:	10 000 000 (1,30)	= 13 000 000
Year 2:	13 000 000 (1,25)	= 16 250 000
Year 3:	16 250 000 (1,20)	= 19 500 000
Year 4:	19 500 000 (1,15)	= 22 425 000
Year 5 ①:	22 425 000 (1,10)	= 24 667 500

Calculating present value at the **beginning** of year 5 (see note ①), using Gordon's dividend growth model for a growing perpetuity

$P_0 = D_1/(r - g)$

Therefore:

$P_4 = D_5/(r - g)$

$= 24\ 667\ 500/(0,281 - 0,10)$

$= 24\ 667\ 500/(0,181)$

$= 136\ 284\ 530$

Note ①:

The value of a perpetuity is per definition always given at the **beginning** of the year (= end of the previous year) (in this case P_4), even though the next payment is receivable at the **end** of the coming year (namely P_5).

*****

Calculating present values

Year-end	Dividend Rand	Factor @ 28,1% ②	Present value Rand
1	13 000 000	0,7806	10 147 800
2	16 250 000	0,6094	9 902 750
3	19 500 000	0,4757	9 276 150
4	22 425 000	0,3714	8 328 645
4 ①	136 284 530	0,3714	50 616 074
		PV	**88 271 419**

Notes:

① In terms of time value of money principles, the end of year 4 is the same as the beginning of year 5.

② Calculate the factor at 28,1% with the aid of a financial calculator or the formulas given in chapter 3 of Skae et al. The above factor was calculated by dividing 1 continuously by 1,281 using the formula $P = (1 + i)^{-n} = 1/(1 + i)^n$.

*****

In practice, you would of course also consider the earnings yield, price earnings ratio, free cash flow, pay-out ratio, quality of the earnings, effect of inflation and intrinsic value.

The value of a 100% interest in Jacks & Jacks Holdings Ltd equals R88 271 419.

Because we are calculating a minority shareholding, we should factor in a discount. You may regard 10% as a reasonable minority discount.

(R88 271 419 x 5% x 90% = R3 972 214)

Therefore, the value of a 5% interest in Jacks & Jacks Holdings Ltd equals R3 972 214, or approximately R3 972 000.

Note:
You may use the information available to decide on a discount percentage that is relevant for the specific minority interest calculated. You will not receive a mark for the percentage chosen, but for the fact that you applied the minority interest discount principle.

*****

QUESTION 3

Answer practise question 4-1 in the Skae et al textbook (Shingalana Ltd).

SOLUTION TO QUESTION 3

Find the solution to practise question 4-1 after the question.

QUESTION 4

Answer practise question 4-2 in the Skae et al textbook (Nzinga & Dulamo Inc).

SOLUTION TO QUESTION 4

Find the solution to practise question 4-2 after the question.

QUESTION 5

Answer practise question 4-7 in the Skae et al textbook (Wishbone (Pty) Ltd).

SOLUTION TO QUESTION 5

Find the solution to practise question 4-7 after the question.

PART 3 – LONG-TERM INVESTMENTS

In part 2, we discussed capital structure and in the previous topic (topic 3), we emphasised the importance of WACC. In this part, we will concentrate on what the organisation does with the capital (long-term finances) it has sourced. Long-term investments can consist of investing in the organisation's own plants and infrastructure (capital budgeting) or of buying or taking over another existing entity (mergers and acquisitions). These are very important decisions for an organisation, and the financial manager plays a key role in advising management on the final decision.

Shortcomings in an organisation's capital budgeting processes can have serious consequences for its delivery of services and goods to its customers. The power failures ("load shedding") in South Africa during 2008 which could largely be attributed to insufficient maintenance and lack of power generating capacity of electricity plants, the Gauteng tollgate issue (on-going as at Aug 2013) and the failure of 1Time Airlines (Nov 2012) have all highlighted the importance of long-term capital budgeting. However, capital budgeting is just as applicable to small businesses and SMEs when budgeting for plant, machinery, vehicles, office buildings and new outlets.

Sometimes it is more beneficial to purchase equity in an existing business than to buy new assets in order to expand the business. The financial press offers many examples of companies that have merged or have been taken over. Both mergers and acquisitions have far-reaching consequences for the concerned organisations' employees and society in general. Examples are Momentum and Metropolitan (Dec 2010), Walmart and Massmart (finally approved in March 2012) and Independent News & Media South Africa (Pty) Ltd (INMSA) taken over by Sekunjalo Independent Media (Pty) Ltd (Sekunjalo Media) (approved in July 2013).

In part 3, you will learn to appraise long-term investment opportunities by applying advanced capital budgeting techniques. You will also learn to perform preliminary valuations for mergers and acquisitions using discounted cash flow techniques and to identify various non-financial (e.g. operational, environmental, social and governance) issues and risks affecting these investments.

PART 3, TOPIC 4 – ORGANIC GROWTH (CAPITAL BUDGETING)

INTRODUCTION

The first topic of part 3 will focus on organic growth, which is when the organisation grows gradually by reinvesting some of its profits and growing its existing customer base it (excludes buying another business, which we will cover in the topic on mergers and acquisitions). We have already exposed you to some capital budgeting techniques in MAC2602 module. In this topic, you will learn more about using advanced capital budgeting techniques to evaluate capital projects. You will learn to apply the various techniques to arrive at a preliminary investment decision based on the information available and to identify various issues affecting the capital budgeting options and the final decision.

LEARNING OUTCOMES

After studying this topic, you should be able to

- deal with capital rationing by means of the net present value index (NPVI)
- handle differing project lives by means of the equivalent annual annuity
- calculate the discounted payback period, the internal rate of return (IRR) and the modified rate of return (MRR)
- discuss the advantages of the net present value (NPV) method versus the IRR method
- calculate the nominal and real discount rate
- identify whether to use the nominal or real discount rate, based on the nature of the cash flow inputs
- correctly account for the tax payable, based on taxable income and recoupments as well as wear and tear and scrapping allowance, and the timing thereof
- evaluate an investment decision and determine whether an existing capital asset should be replaced, kept (i.e. continue current operations) or abandoned without replacing it with a new asset
- take qualitative factors into account
- discuss sustainability issues as part of the appraisal decision

ASSUMED PRIOR KNOWLEDGE

This topic relies heavily on your knowledge of the time value of money, which was dealt with extensively in MAC2602. If you get stuck, please refer back to this topic in your MAC2602 study guide and/or consult chapter 3 of the prescribed Skae et al textbook.

In your MAC2602 module, you mastered the following learning outcomes, which relate specifically to this topic:

- discussed the purpose and importance of capital investment decisions
- classified projects into types of expenditure and types of projects
- determined relevant cash flows for the capital budget of a project
- listed and defined traditional capital budgeting techniques
- listed and defined discounted cash flow capital budgeting techniques
- applied the capital budgeting techniques in the evaluation of different projects, asset acquisitions and investment decisions

Please refer to your second year guide if you want to refresh your knowledge.

For another perspective, you may also refer to the following sections in the prescribed Skae et al textbook:

Section	Heading
6.3.1	*Payback period method*
6.3.3	*Net present value (NPV)* (only up to the key concepts and terminology)
6.3.6	*Internal rate of return (IRR)*
6.4.2	*Relevant costs and revenues*
6.4.3	*Opportunity costs and revenues*
6.4.5	*Changes in working capital requirments*
6.4.6	*The financing of the project*

THIS TOPIC CONSISTS OF THE FOLLOWING STUDY UNIT:

STUDY UNIT	TITLE
STUDY UNIT 5	ADVANCED CAPITAL BUDGETING

STUDY UNIT 5 ADVANCED CAPITAL BUDGETING

1. Introduction

In MAC2602, we introduced you to basic capital budgeting and discussed various traditional and discounted cash flow techniques. Capital budgeting involves planning for longer term projects that stretch over more than one year. Part of the problem that management faces in this type of decision is that projects may have different investment options and may also differ in lifespan. Add to that the effect of taxation and inflation, and you will agree that the management team requires a specialist to advise them.

Millions if not billions of rand have been allocated incorrectly to projects in the past because inflation adjusted cash flows have been discounted at real rates of return and after-tax cash flows have been discounted at before-tax rates of return. There were also instances where the selling price of an existing machine was set off against the cost of a new machine with an unequal life. In even worse decisions, qualitative factors (for example environmental concerns) were ignored when evaluating capital projects.

In this study unit, you will learn about advanced capital budgeting techniques that can be used to evaluate capital projects. You will also learn how to provide for the effect of taxation and inflation and make the optimal decision when confronted with capital rationing. Lastly, you will learn to apply these various techniques to arrive at a preliminary investment decision based on the information available. You will also be required to apply your knowledge of Microsoft Excel to solve capital budgeting problems with the aid of a spreadsheet.

This study unit is based on **selected sections** from the following chapter in the prescribed Skae et al textbook:

- Chapter 6

Note:
If you use a financial calculator to calculate NPVs or IRRs, you still need to present your answer in tables, displaying the different cash flow items for each year and indicating the values you used for the various inputs on your calculator, for example Cf1, I or PMT. You will not earn any marks by merely presenting a final answer.

*****

2. Growth, WACC, capital budgeting and financing

Let's first reinforce what you learnt in MAC2602 before we look at certain issues in capital budgeting and advanced techniques later on in this study unit.

Review the following sections in the Skae et al textbook and complete the activity:

Section	Heading
	Appendix A at end of chapter 4: *Determining growth*
6.1	*Capital budgeting*
6.2	*Correct WACC to be used*

Notes:

① It is important to note that financing costs are excluded when calculating the NPV for the investment decision, but included when calculating the NPV for the financing decision.

② For the investment decision, cash flows are discounted at the WACC, while for the financing decision; cash flows are discounted at the after-tax cost of debt.

③ Depreciation is not a cash flow and therefore it is added back. On the other hand, wear and tear that the South African Revenue Services allow on assets is included as deduction from the taxable income from the project (this usually differs from the accounting depreciation and therefore results in deferred tax).

*****

Activity 5.1

A company has the following long-term ratios:

- ploughback ratio (b) = 60%
- return on investment (r) = 5%

REQUIRED

Calculate the potential internal long-term growth of the company.

Solution to activity 5.1

Refer to appendix at the end of chapter 4 in the Skae et al textbook.

g = br
= 60% x 5%
= 3%

Notes:

① It is easier to remember that potential growth equals ploughback multiplied by the return on investment (i.e. g = br) before you go into the details in the textbook.

② You could have substituted 0,6 for 60% and 0,05 for 5%.

③ The result is that the company can only grow by 3% in the long term, which is the percentage of earnings if not paid out as dividends (i.e. the ploughback) multiplied by the return that is generated thereon (i.e. the return on investment). Management would use this measure to decide whether or not they need to obtain additional capital for expansion.

*****

Activity 5.2

Now let's see if you can distinguish between NPV and IRR.

REQUIRED

Answer practice question 6-2(a) in the Skae et al textbook (Capstar Ltd).

Solution to activity 5.2

Find the solution to practise question 6-2(a) after the question.

3. Advanced techniques in capital budgeting

In this section, we will discuss important concepts, such as capital rationing, differing project lives and advanced investment appraisal techniques.

3.1 Capital rationing

In most cases, organisations will not have enough funding to undertake all the projects that will generate a positive NPV. Therefore, they would have to carefully consider which projects to undertake. This is dealt with under the concept of capital rationing.

Now study the following sections in the Skae et al textbook and complete the activity:

Section	Heading
6.3.3	*Net Present Value (NPV)*
6.3.4	*Net Present Value Index (NPVI)*

Note:

Distinguish between the following concepts when considering questions on capital rationing:

- dependent and independent events
- mutually exclusive events
- single-period and multi-period rationing (multi-period rationing falls outside the scope of MAC3702)
- divisible and indivisible projects

*****

When you work through examples 1 and 2 of section 6.3.4 make sure that you note the consequences of the figures calculated.

Notes for examples 1 and 2 of section 6.3.4:

① Note that investments A and B cannot be chosen, because investment A + investment B = R50 000 + R30 000 = R80 000 > R50 000 (the capital rationing constant).

② Note that investments A and C can also not be chosen, because investments A + C = R50 000 + R20 000 = R70 000 > R50 000 (the capital rationing constant).

③ Note that investments B and C can be chosen, because investment B + investment C = R30 000 + R20 000 = R50 000 (the capital rationing constant).

④ Note that investment A can be chosen on its own, because investment A = R50 000 (the capital rationing constant). However, its return (R4 422) is less than that of investments B and C combined (R5 000).

⑤ Note that investment B can be chosen on its own, because investment B = R30 000 < R50 000 (the capital rationing constant). However, its return (R3 563) is less than that of investments B and C combined (R5 000).

⑥ Note that investment C can be chosen on its own, because investment C = R20 000 < R50 000 (the capital rationing constant). However, its return (R1 437) is less than that of investments B and C combined (R5 000).

Therefore, the optimal combination of returns that fall within the available capital is that of investments B and C combined.

*****

Activity 5.3

Mabula (Pty) Ltd has R1 500 000 available for investment and must choose between the following two divisible projects:

Year	Cash flow for project A (rand)	Cash flow for project B (rand)
0	(1 000 000)	(1 200 000)
1	250 000	400 000
2	300 000	400 000
3	350 000	400 000
4	420 000	400 000
5	450 000	400 000

You can assume that the target WACC is calculated at 12%.

REQUIRED

Determine in which projects the management of Mabula should invest the R1 500 000.

Solution to activity 5.3

Project A

Year	Cash flow in rand	Discount factor	Present value in rand
0	(1 000 000)	1,000	(1 000 000)
1	250 000	0,893	223 250
2	300 000	0,797	239 100
3	350 000	0,712	249 200
4	420 000	0,636	267 120
5	450 000	0,567	255 150
		NPV	**233 820**

NPVI (or PI) = 1 233 820 / 1 000 000 = **1,23 (highest)**

ALTERNATIVE (using a financial calculator HP10BII

-1 000 000	CF0
250 000	CF1
300 000	CF2
350 000	CF3
420 000	CF4
450 000	CF5
12	I/YR
NPV	233 755

NPVI (or PI) = 1 233 755 / 1 000 000 = **1,23 (highest)**

Project B

Year	Cash flow in rand	Discount factor	Present value in rand	
0	(1 200 000)	1,000	(1 200 000)	
1	400 000	0,893	357 200	
2	400 000	0,797	318 800	
3	400 000	0,712	284 800	
4	400 000	0,636	254 400	
5	400 000	0,567	226 800	
		NPV	**242 000**	**(highest)**

NPVI (or PI) = 1 442 000 / 1 200 000 or 1 241 910 / 1 200 000
= **1,20** = **1,20**

ALTERNATIVE (using a financial calculator HP10BII)

-1 200 000	CF0
400 000	CF1
400 000	CF2
400 000	CF3
400 000	CF4
400 000	CF5
12	I/YR
NPV	241 910

NPVI (or PI) = 1 441 910 / 1 200 000 = **1,20**

Projects A and B have contradicting measurements. Based on NPV alone, project B should be selected, as it has the highest NPV. However, the amounts to be invested in each project differ, and we therefore calculate the NPVI as well. Based on NPVI, project A should be selected, as it has the higher NPVI.

The projects are divisible (can be expanded, contracted or combined until a total investment amount of R1 500 000 is reached); therefore, we should compare further combinations:

1. 1,5 of project A = NPV of 1,5 x 233 820 = **R350 730 (highest)**
2. 1,25 of project B = NPV of 1,25 x 242 000 = R302 500
3. 1 of project A and 5/12 of project B = NPV of (1 x 233 820) + (5/12 x 242 000) = R334 653
4. 1 of project B and 3/10 of project A = NPV of (3/10 x 233 820) + (1 x 242 000) = R312 146

Conclusion

The management of Mabula (Pty) Ltd should invest the R1,5 million in one and a half of project A, as this will achieve the highest NPV.

Note - Guidelines for single-period capital rationing

① When considering mutually exclusive, indivisible projects, select the project with the highest NPV (project B = R242 000).

② If considering mutually exclusive, divisible projects, select multiples or fractions of the project with the highest NPVI (1,5 of project A = R350 730).

③ If considering independent projects, rank according to NPVI from highest to lowest and accept projects until the capital budget is depleted.

④ In all cases, only consider projects with positive NPVs or ones with an IRR that is greater than the hurdle rate.

*****

The next activity will provide you with more practice.

Activity 5.4

Gold Exploration (Pty) Ltd is investigating various independent projects in which they would like to invest during the next financial year. The target WACC for the company is 12%, and they have R50 million to invest. The cost accountant has prepared the following project summary for presentation to the board of directors:

	A	B	C	D	E
	Rm	**Rm**	**Rm**	**Rm**	**Rm**
Investment	(50)	(20)	(20)	(20)	(10)
NPV	4,545	2,0	2,2	2,727	1,4545
IRR (%)	20	21	14,84	25	26
NPVI (PI)	?	?	?	?	?

REQUIRED

Prepare an analysis based on NPV, IRR and PI rankings and advise the directors on the project(s) that would optimise the company's investment(s).

(Source: Prof D Stangeland, University of Manitoba (adjusted))

Solution to activity 5.4

Step 1 Determining if all projects are NPV positive

All the projects have positive NPVs, therefore, all can be considered in the analysis.

Step 2 Calculating the NPVI or PI

Capital rationing for a single period applies. We cannot accept all NPV positive projects.

The projects' initial investment amounts as well as their NPVs differ. Therefore, we need to calculate the NPVIs and rank them in terms of profitability.

	A	B	C	D	E
	Rm	**Rm**	**Rm**	**Rm**	**Rm**
Investment	(50)	(20)	(20)	(20)	(10)
NPV	4,545	2,000	2,200	2,7270	1,4545
NPVI (PI) [(Inv + NPV) / Inv]	1,0909	1,100	1,1100	1,1360	1,145

Step 3 Ranking projects and allocating investment funds

i. Rank in terms of NPV

	Investment required Rm	**NPV Rm**	**Funds remaining Rm**	**Total NPV Generated Rm**
Available			50	
A	50	4,5450	0	4,5450
D	20	2,7270		
C	20	2,2000		
B	20	2,0000		
E	10	1,4545		
				4,5450

ii. Rank in terms of IRR (%)

	Investment required Rm	**NPV Rm**	**IRR (%)**	**Funds remaining Rm**	**Total NPV Generated Rm**
Available				50	
E	10	1,4545	26	40	1,4545
D	20	2,7270	25	20	2,7270
B	20	2,0000	21	-	2,0000
A	50	4,5450	20		
C	20	2,2000	14,84		
					6,1815

iii. Rank in terms of NPVI (PI)

	Investment required Rm	NPV	NPVI (PI)	Funds remaining Rm	NPV Rm	Total Generated
Available				50		
E	10	1,4545	1,1450	40		1,4545
D	20	2,7270	1,1360	20		2,7270
C	20	2,2000	1,1100	-		2,2000
B	20	2,0000	1,1000			
A	50	4,5450	1,0909			
						6,3815
						(highest)

Recommendation

It is recommended that Gold Exploration invest in projects E, D and C, as this will generate the highest NPV for a total investment of R50 million.

Note:
The objective is to achieve the highest combined NPV. Where projects require different investment amounts, a ranking based on NPVI (PI) will achieve the optimum result. We provided rankings (i) and (ii) to prove to you that the optimum result is achieved with ranking (iii) when using the NPVI.

*****

3.2 Projects with unequal lives

Another common problem is when management has to consider profitable projects that have differing lives (or life cycles).

Now study the following sections in the Skae et al textbook and complete the activity:

Section	Heading
6.3.5	*Different project life cycles*

Notes:

Please note the following regarding the relationship between replacement chains and equivalent annual income:

① The replacement chain merely takes the annual equivalent and makes it a perpetuity at the discount rate, e.g. R238 / 12% = R1 981.

② Basically this method tries to determine the maximum NPV per limiting factor in cases where time is the limiting factor.

*****

Now let's see if you can evaluate two projects with different life cycles.

Activity 5.5

The following information is available for projects A and B:

Year	Cash flow for project A (rand)	Cash flow for project B (rand)
0	(1 000 000)	(1 000 000)
1	330 000	250 000
2	360 000	260 000
3	390 000	280 000
4	420 000	300 000
5	450 000	310 000
6		320 000
7		330 000
8		350 000

You can assume that the target WACC is calculated at 16%.

REQUIRED

Which project seems to be the better alternative to invest in? Ignore qualitative factors.

Solution to activity 5.5

Step 1 Calculating the NPV of each project

Project A

Year	Cash flow for project A (rand)	Discount factor	Present value (rand)
0	(1 000 000)	1,000	(1 000 000)
1	330 000	0,862	284 460
2	360 000	0,743	267 480
3	390 000	0,641	249 990
4	420 000	0,552	231 840
5	450 000	0,476	214 200
NPV @ 16 %			**247 970**
PV (annuity) @ 16%		3,274	

Project B

Year	Cash flow for project B (rand)	Discount factor	Present value (rand)	
0	(1 000 000)	1,000	(1 000 000)	
1	250 000	0,862	215 500	
2	260 000	0,743	193 180	
3	280 000	0,641	179 480	
4	300 000	0,552	165 600	
5	310 000	0,476	147 560	
6	320 000	0,410	131 200	
7	330 000	0,354	116 820	
8	350 000	0,305	106 750	
NPV @ 16 %			**256 090**	**(highest)**
PV (annuity) @ 16%		4,344		

Step 2 Calculating the NPV to infinity (∞) for each project

NPV to ∞ for project A = $\frac{\text{R247 970}}{\text{3,274 x 0,16}}$

= R473 369,73 **(highest)**

NPV to ∞ for project B = $\frac{\text{R256 090}}{\text{4,344 x 0,16}}$

= R368 453,61

Step 3 Calculating the equivalent annual income

Project A = R247 970 ÷ 3,274 = R75 739,16 **(highest)**

Project B = R256 090 ÷ 4,344 = R58 952,58

Note:

"∞" is the mathematical symbol for "infinity"; “eternity” or in perpetuity.

*****

Conclusion

If your decision was based on the NPVs of the projects, it is evident that you would choose project B, as it has a higher NPV. However, when you have to choose between projects with different life cycles, you will have to compare the NPV to infinity (∞) for decision-making purposes. Alternatively, you will come to the same conclusion using the equivalent annual income method.

It is therefore evident that project A has a higher NPV to infinity. Management will therefore choose project A because it has a shorter life cycle.

3.3 Advanced investment evaluation techniques

In this section, we will explore some variations on techniques that you have already encountered in MAC2602, namely the payback period and the IRR.

Now study the following sections in the Skae et al textbook and complete the activity:

Section	Heading
6.3.2	*Discounted payback period*
6.3.6	*Internal rate of return (IRR)*
6.3.7	*Comparative example of NPV and IRR*
6.3.8	*Modified internal rate of return (MIRR)*

Notes:

① The NPV method assumes that all cash flows are re-invested at WACC.

② The IRR method makes the erroneous assumption that all cash flows are re-invested at the IRR.

③ The MIRR method calculates the future value of all intermediate cash flows to the end of the project at a re-investment rate equal to WACC.

④ The NPV method results in a rand value, while the IRR and MIRR methods result in a percentage.

*****

Activity 5.6

You are part of the management team of Nkonki Trucking (Pty) Ltd that needs to decide in which project to invest for the next five years.

The following cash flow information is available for the two different projects:

Year	Cash flow for project A (rand)	Cash flow for project B (rand)
0	(15 000 000)	(15 000 000)
1	-	7 500 000
2	6 500 000	6 000 000
3	8 000 000	4 000 000
4	9 000 000	3 000 000

WACC for both the projects was determined at 14%.

REQUIRED

Advise your management team in which project the company should invest by taking the IRR, NPV and MIRR into account. Do all calculations with the help of the financial functions available in MS Excel.

Solution to activity 5.6

Calculating the NPV and IRR of projects A and B

Year	Cash flow for project A (rand)	Cash flow for project B (rand)
0	(15 000 000)	(15 000 000)
1	-	7 500 000
2	6 500 000	6 000 000
3	8 000 000	4 000 000
4	9 000 000	3 000 000
NPV	**730 034**	**671 879**
IRR	**15,8107%**	**16,5672%**

Formulas in MS Excel

Columns and rows	A	B	C	D	E	F
1						
2		WACC	14%		WACC	14%
3						
4		Year	Cash flow for project A Rand		Year	Cash flow for project B Rand
5		0	(15 000 000)		0	(15 000 000)
6		1	-		1	7 500 000
7		2	6 500 000		2	6 000 000
8		3	8 000 000		3	4 000 000
9		4	9 000 000		4	3 000 000
10						
11						
12		NPV - Excel	=C6+NPV(C2,C7,C8,C9,C10)		NPV - Excel	=F6+NPV(F2,F7,F8,F9,F10)
13						
14		IRR - Excel	=IRR(C6:C10,0)		IRR - Excel	=IRR(F6:F10,0)
15						

Project A - future value of inflows (year 4)

Years	Cash flow	Future value factor @ 14%	Future value (year 4)
1	-	1,4815	-
2	6 500 000	1,2996	8 447 400
3	8 000 000	1,1400	9 120 000
4	9 000 000	1,0000	9 000 000
Future value at 14%			**26 567 400**

Project B - future value of inflows (year 4)

Years	Cash flow	Future value factor @14%	Future value (year 4)
1	7 500 000	1,4815	11 111 250
2	6 000 000	1,2996	7 797 600
3	4 000 000	1,1400	4 560 000
4	3 000 000	1,0000	3 000 000

Future value at 14%	**26 468 850**

Calculating the NPV and MIRR

Year	Cash flow for project A (rand)	Cash flow for project B (rand)
0	(15 000 000)	(15 000 000)
1	-	-
2	-	-
3	-	-
4	**26 567 400**	**26 468 850**
NPV - Excel	**730 034**	**671 879**
MIRR	**15,3624%**	**15,2553%**

Same as initial NPV based on individual years

Formulas in MS Excel

Columns and rows	A	B	C	D	E	F
1						
2		WACC	14%		WACC	14%
3						
4		Year	Cash flow for project A (rand)		Year	Cash flow for project B (rand)
5						
6		0	(15 000 000)		0	(15 000 000)
7		1			1	
8		2			2	
9		3			3	
10		4	26 567 400		4	26 468 850
11						
12		NPV - Excel	=C6+NPV(C2,C7,C8,C9,C10)		NPV - Excel	=F6+NPV(F2,F7,F8,F9,F10)
13						
14		MIRR - Excel	=IRR(C6:C10,0)		IRR - Excel	=IRR(F6:F10,0)
15						

Summary of calculations

	Project A	Project B
NPV – MS Excel	R730 034	R671 879
IRR	15,8107%	16,5672%
MIRR	15,3624%	15,2553%

Conclusion

Although project B has the higher IRR, project A has the higher NPV and MIRR. I therefore recommend that you invest in project A.

Note:

The NPV method is theoretically the more sound and conservative method, and you should usually rather base your decisions on this than on the IRR. Remember, the IRR assumes that the project cash flows are reinvested at the IRR rate (15,81% or 16,57% in this question) and not at the WACC rate (14%). Project B had large cash flows at the start of the project, which were earning returns equal to the IRR rate up to the end of the project. This caused its IRR to be higher than that of project A. If you based your investment decision on the project with the higher IRR, you would not have achieved the highest possible NPV. Remember that we can add value to the organisation by increasing the NPV of its future cash flows. You will learn more about this in topic 5 (discounted free cash flow valuations for equity).

*****

4. Inflation and taxation

In MAC2602, you learnt which elements of incremental cash inflows and outflows to incorporate in the NPV calculation. We will now investigate what the impact of inflation is and where taxation payments (or credits) occur after the period in which the transaction originated.

Now study the following section in chapter 6 and attempt the activities:

Section	Heading
6.4	*The investment decision*

Notes:

① Inflation adjusted cash flows (i.e. where inflation is included in the cash flows) should be discounted at a nominal rate of return.

② Real cash flows on the other hand (i.e. cash flows that are not adjusted for inflation) should be discounted at a real rate of return.

③ The difference in the NPV answers is due to the rounding of the PV factors.

④ The nominal rate of return is sometimes known as the money rate of return.

⑤ Distinguish between general inflation, synchronised inflation and differential inflation.

⑥ You can assume that the WACC provided in questions is in nominal terms (unless expressly stated otherwise).

*****

Activity 5.7

The following information is available:

Real rate of return: 12%
Inflation: 6,5%

REQUIRED

Calculate the nominal rate (round your answer to two decimals).

Solution to activity 5.7

Nominal rate = [(1 + R)(1 + i)] – 1
= [(1 + 0,12)(1 + 0,065)] – 1
= 19,28%

Activity 5.8

The following information is available:

Nominal rate: 15%
Inflation: 5%

REQUIRED

Calculate the real rate of return (round your answer to two decimals).

Solution to activity 5.8

Nominal rate	=	[(1 + R)(1 + i)] – 1
0,15	=	[(1 + x)(1 + 0,05)] – 1
1,15	=	[(1 + x)(1,05)]
1,15	=	1,05 + 1,05x
0,10	=	1,05x
x	=	9,52%
Real rate of return	=	9,52%

Activity 5.9

SAA Plats (Pty) Ltd is currently considering an investment in a capital project. An initial capital investment R12,5 million is required. The following information is available in real terms:

Year	Revenue (rand)	Expenses (rand)
1	7 500 000	750 000
2	6 000 000	575 000
3	5 000 000	475 000
4	4 000 000	375 000
Differential inflation per year	7,5%	6,5%

REQUIRED

Advise management as to whether they should invest in this project. The company's target WACC is 26,85%.

Solution to activity 5.9

		Cash flow after inflation				
		0	1	2	3	4
Year	Calculation	(rand)	(rand)	(rand)	(rand)	(rand)
0	(12 500 000)	(12 500 000)				
1	7 500 000 x 1,075		8 062 500			
	750 000 x 1,065		(798 750)			
2	6 000 000 x $1,075^2$			6 933 750		
	575 000 x $1,065^2$			(652 179)		
3	5 000 000 x $1,075^3$				6 211 484	
	475 000 x $1,065^3$				(573 776)	
4	4 000 000 x $1,075^4$					5 341 877
	375 000 x $1,065^4$					(482 425)
		(12 500 000)	7 263 750	6 281 571	5 637 708	4 859 452
WACC (nominal rate of return) @ 26,85%		1,0000	0,7883	0,6215	0,4899	0,3862
		(12 500 000)	5 726 014	3 903 996	2 761 913	1 876 720
NPV						**1 768 643**

Conclusion

Management should invest in the project, as the NPV is positive.

5. Keep, buy or abandon

Capital investment decisions are not always about choosing between various options for a new machine or plant. In many instances, management must decide between keeping existing machines, buying new ones and, in extreme cases, abandoning operational machines without replacing them.

Now study the following section in chapter 6 and attempt the activities:

Section	Heading
6.5	*The keep versus replacement decision*

Activity 5.10

Now let's see if you can demonstrate your ability to do a capital budgeting evaluation when comparing the acquisition of a new machine with keeping the existing machine.

REQUIRED

Answer practice question 6-1 in the Skae et al textbook (Mr Kumalo's).

Solution to activity 5.10

Find the solution to practise question 6-1 after the question.

Notes:

① Check that the taxable income and taxation have opposite signs.

② Wear and tear has a negative sign because it decreases taxable income.

③ In the case of the existing machine, the current selling price of R49 900 is forfeited, therefore reducing inflows by R49 900 and resulting in a negative inflow or opportunity cost.

④ **When calculating the tax** of the existing machine, the **scrapping ALLOWANCE** of R100 is **forfeited**, therefore increasing the taxable income (accompanied by a positive sign). This results in an increase in tax payment and represents an **opportunity COST**.

Compare the above to example 2 in the "Keep versus replacement decision" (section 6.5 of the textbook) where the **tax RECOUPMENT** of R10 000 was **avoided**, therefore decreasing the taxable income (accompanied by a negative sign) and decreasing the tax payment. This represents an **opportunity BENEFIT**.

*****

Activity 5.11

Now let's see if you can demonstrate your ability to do a capital budgeting evaluation with the aid of an Excel spreadsheet.

REQUIRED

Answer practice question 6-1 in the Skae et al textbook, but this time with the aid of a Microsoft Excel spreadsheet (Mr Kumalo's).

Solution to activity 5.11

Compare your answer to the solution to practise question 6-1 after the question.

Note:
Be careful that you do not omit a negative sign in the formulas, for example when calculating tax on taxable income.

*****

6. Qualitative (non-financial) factors

Management cannot base the final decision on the results of financial analyses alone. They should also consider other non-financial factors. Consider some of the scenarios below:

- Imagine you are buying or building a holiday home near the beach. What other factors besides the economic ones would you consider? Why is it important to consider those factors?

- The same would apply when a hospital considers the installation of a MR (magnetic resonance) X-ray device. They would have to consider technical aspects like quality and the risk of obsolescence or outdated technology as well as possible technological advancement.

- When a company considers replacing a labour intensive operation by implementing a capital-intensive mechanical scheme, factors like labour relations and labour unions would have to be considered as well. Take a diamond mine, for example, that has been using labour intensive methods to dig for diamonds. What factors should the mine consider when converting to a mechanised operation?

Now study the following section in chapter 6 and attempt the activity:

Section	Heading
6.8	*Qualitative factors*

Activity 5.12

Think of some other factors that you should consider when evaluating a decision by Eskom to choose between a coal and nuclear power plant.

Solution to activity 5.12

Consider the following factors:

- the availability of adequate funding
- the availability and price of coal
- the technical knowhow to construct and maintain a nuclear reactor
- the availability of water to cool the reactor
- carbon emissions and global warming
- other green objectives
- the future demand for electricity
- the risk of nuclear contamination
- the availability of skilled staff

Note:
Always consider qualitative factors as well before making a final decision.

*****

7. Summary

In this study unit, you learnt to

- deal with capital rationing by means of the NPVI
- handle differing project lives by means of the equivalent annual annuity
- calculate the discounted payback period, the IRR and the MRR

- discuss the advantages of the NPV method versus the IRR method
- calculate the nominal and real discount rate
- identify whether to use the nominal or real discount rate based on the nature of the cash flow inputs
- correctly account for the tax payable based on taxable income and the recoupment of wear and tear and scrapping allowance as well as the timing thereof
- evaluate an investment decision and determine whether an existing capital asset should be replaced, kept (continue current operations) or abandoned (without replacing it with a new asset)
- take qualitative factors into account
- discuss sustainability issues as part of the appraisal decision

In the next study unit, we will discuss business and legal aspects under the new topic, "Mergers and acquisitions".

8. Self-assessment questions

After working through the relevant sections in the textbook and the material provided in this study unit, you should now be able to answer the practice questions in the prescribed Skae et al textbook at the end of chapter 6. The solutions to these questions appear at the end of the individual questions.

QUESTION 1

Answer the rest of practise question 6-2 in the Skae et al textbook (the part on Capstar Ltd).

SOLUTION TO QUESTION 1

Find the solution to practise question 6-2 after the question.

QUESTION 2

Answer practise question 6-3 in the Skae et al textbook (Paradis Ltd). You may exclude part (d).

SOLUTION TO QUESTION 2

Find the solution to practise question 6-3 after the question.

QUESTION 3

Answer practise question 6-4 in the Skae et al textbook (Trident Ltd).

SOLUTION TO QUESTION 3

Find the solution to practise question 6-4 after the question.

PART 3, TOPIC 5 – MERGERS AND ACQUISITIONS (M&As)

INTRODUCTION

As discussed in topic 4, the traditional method of growth is organic growth, where a company grows its existing business through the use of its own internal resources, as opposed to buying another business in order to achieve growth. Pick n Pay achieves its growth by constructing its supermarkets or renting retail space in shopping malls owned largely by pension funds. In the current highly competitive environment, organic growth often proves to be a slow growth strategy. In order to achieve rapid growth, companies often resort to either merging with an existing company, or purchasing another company outright. Examples of M&As that took place in South Africa in recent years include the following:

- China Investment Corporation (CIC) acquired a 25% stake in Shanduka Group in 2011.
- Nippon Telegraph and Telephone Corporation of Japan (NTT) acquired 100% of Dimension Data in 2010.
- Walmart acquired Massmart in 2012.
- Richtrau (Pty) Ltd and Avusa Ltd merged in 2012.

With many CEOs claiming that M&As will accelerate the growth of their organisations beyond that which could be obtained organically **and** could generate significant synergies, it is not surprising at all that vast sums of money are invested in M&As every year.

In this regard, however, recent economic events – including the global economic crisis since 2008 and the on-going European debt crisis since 2009 – have undeniably put a damper on global M&A activity. Amongst other things, these events had a strong **negative** effect on both investor sentiment and the availability of cheap debt finance from banking institutions.

Yet, Forbes Magazine pegs 2013 as the year in which global M&A activity will make a comeback – not because the economic crises are over (far from it), but indeed as a result of some of the **other** effects of these events: business organisations have started to stockpile cash, and inflated valuations have normalised in 2012

For the purposes of this module, the topic of M&As represents the culmination of several previous topics. As such, you will have to combine your knowledge of many preceding management accounting study units, as well as some of your knowledge from other subjects, including your

knowledge of the valuation of instruments, discounted cash flows, calculation of earnings per share (EPS) and of several Acts, including the Companies Act 71 of 2008.

LEARNING OUTCOMES

After studying this topic, you should be able to

- differentiate between the various forms of M&As
- understand the reasons for M&As
- explain why M&As sometimes fail
- identify the various regulatory mechanisms for M&As
- determine the fair value of a business organisation or an equity shareholding using the free cash flow model
- consider the correct valuation method depending on whether the minimum, maximum or fair value is determined
- describe what is meant by synergies between different business entities, and reflect on which synergies to include in a valuation when determining the **fair value** of a business organisation or an equity shareholding
- identify various forms of funding available for M&As
- calculate and discuss the effects of M&As and the method of funding on key financial ratios

Note:
In topic 3 of MAC3702 you have already learnt to apply the following valuation methodologies, methods, or models to equity instruments (shares):

- the price of recent investment
- the value of net assets
- a trailing P/E multiple
- a market price multiple
- Gordon's dividend growth model

We can use all of these methods to do a valuation of a target company in a M&A. Some of the activities and questions in this topic will include these methodologies in addition to a discounted cash flow valuation.

*****

ASSUMED PRIOR KNOWLEDGE

Most of the learning outcomes covered in this topic were not covered in previous modules; therefore you should pay careful attention when working through the contents of this topic.

THIS TOPIC CONSISTS OF THE FOLLOWING STUDY UNITS:

STUDY UNIT	TITLE
STUDY UNIT 6	BUSINESS AND LEGAL ASPECTS
STUDY UNIT 7	ELEMENTARY PRICING (VALUATION) AND FINANCING ISSUES

STUDY UNIT 6 BUSINESS AND LEGAL ASPECTS

1. Introduction

When we mention M&As, most students immediately think of the accounting requirements for business combinations. Although the accounting part is very important, it is only performed once numerous other activities have taken place. These other "upfront" activities are the most important and can make or break a merger or acquisition.

In the case of a **merger**, both parties must first agree that the merger would be beneficial for them before it can take place. They must also agree on the terms and conditions of the merger. (It is like a marriage proposal). Both companies have to be valued, the old companies wound up and a new entity formed. Shareholdings by shareholders of the old companies are computed and finalised.

In the case of an **acquisition**, the parties must agree on many issues ranging from leadership, operational issues, the size of the stake to be acquired by the acquiring company, etc. The acquiring company must value the target company using a host of valuation methodologies and establish a range within which the purchase price is likely to fall. It is important to note that the amount that the acquiring company ultimately pays may fall outside the range suggested by the valuations. Other non-financial factors play a role in the negotiation of a final price. Facebook paid $1 billion for the photo sharing application, Instagram. Analysts believe Facebook paid a premium to prevent other companies from buying this application.

This study unit does not deal with the accounting aspects of M&As (see your financial accounting module for more information on this) nor does it deal with issues pertaining to valuations (see study unit 7). However, this information serves as a background to the topic on M&As.

This study unit is based on **selected sections** from chapter 12 in the prescribed Skae et al textbook.

2. Forms of M&As

An **acquisition or takeover** takes place when the acquiring company purchases a **controlling interest** in the target company. When Barclays PLC acquired ABSA in 2005, analysts noted that this was the return of Barclays to Africa's biggest economy after its exit in 1986 due to anti-apartheid protests. Although Barclays Capital was already present in South Africa within the

merchant banking arena, Barclays lacked a presence within retail banking. Hence Barclays acquired a retail banking business by buying ABSA.

A **merger** is similar to a takeover, except that an **entirely new company is formed**. The shareholders of both companies surrender their shareholding in the companies to be merged, and a new company is formed, giving the shareholders an interest in the combined entity. The merger of Allied Building Society, Volkskas Co-operative Limited and United Building Society in 1991 to form the Amalgamated Banks of South Africa (ABSA) is a case in point. The former financial institutions ceased to exist as legal entities.

Now study the following section in Skae et al, chapter 12, and attempt the activity:

Section	Heading
12.1.1	*Forms of mergers and acquisitions*

Activity 6.1

You are faced with the following scenarios:

a. Two second hand motor dealerships, Big Wheels (Pty) Ltd and Big Deals (Pty) Ltd, are currently negotiating with each other. The two owners of the second hand motor dealerships would like to form a new company, Wheel Deals (Pty) Ltd. The two owners will each have a 50% shareholding in the new company, and the old dealerships will rebrand to the new company brand. All assets and liabilities of both companies will transfer to the new company.

b. Two second hand motor dealerships, Big Wheels (Pty) Ltd and Big Deals (Pty) Ltd, are currently negotiating with each other. Big Wheels (Pty) Ltd will buy Big Deals (Pty) Ltd from the owner at the market value price, as the owner of Big Deals (Pty) Ltd wants to retire as soon as the business is sold. Both dealerships will trade under the Big Wheels (Pty) Ltd brand. All assets and liabilities of Big Deals (Pty) Ltd will transfer to Big Wheels (Pty) Ltd.

c. The owners of a well-known swim school franchise, All4Swim (Pty) Ltd, are currently negotiating with the owner of another swim school, SwimSwim CC, to buy her swim school and to market it under the All4Swim (Pty) Ltd brand. The owner of SwimSwim CC will still teach kids to swim and earn a salary from the owners of All4Swim (Pty) Ltd. However, she will have no voting power in the new structure. The assets and liabilities of SwimSwim CC will transfer to All4Swim (Pty) Ltd.

REQUIRED

For each of the scenarios described above, indicate whether it is a takeover or a merger and supply reasons for your answer.

Solution to activity 6.1

Scenario a

Merger

- A new company was formed, and the shareholders of both companies are now shareholders in the new combined company.
- Both Big Wheels (Pty) Ltd and Big Deals (Pty) Ltd were wound up, and the assets and liabilities were transferred to the new company.
- Both companies are now trading under the new brand, Wheel Deals (Pty) Ltd.

Scenario b

Takeover

- Big Wheels (Pty) Ltd purchased a controlling interest in Big Deals (Pty) Ltd.
- The previous owner of Big Deals (Pty) Ltd has no equity interest in Big Wheels (Pty) Ltd.
- Both the companies are now trading under the Big Wheels (Pty) Ltd brand.

Scenario c

Takeover

- All4Swim (Pty) Ltd purchased a controlling interest in SwimSwim CC.
- Both entities now trade under All4Swim (Pty) Ltd.
- The owner of SwimSwim CC has no shares in All4Swim (Pty) Ltd.

3. Reasons for takeovers and mergers

Companies are often faced with challenges when seeking to grow their product portfolios across a number of geographic markets or to expand their product range. Reasons to seek growth opportunities vary from company to company, but the most common include the following:

- **Market new products** arising from the company's innovation strategies.
- **Increase the production capacity** of the company in order to achieve economies of scale and hence lower unit costs. Lowering unit cost enables the company to become more competitive and thereby achieve flexibility in its pricing strategy.
- **Increase shareholder value** through higher profits and free cash flow. Sustainable increases in profits and cash often raise investors' expectations for more profits and cash in future and hence raise the share price. (Google is a good example of how a company can increase its profit through acquisitions, for instance its acquisition of You Tube in 2006).
- Achieve **market dominance** in the sector in which the company operates. Market dominance enables the company to have a price monopoly. When coupled with economies of scale, the company would be able to increase its profits and cash substantially. (SAB's acquisition of Miller) Note that regulatory oversight is required in order to protect consumers' interests before a large merger will be allowed.
- Pressure from shareholders to **find profitable opportunities for unused cash** holdings. In 2012, Microsoft was forced to pay a huge premium to acquire Skype after pressure from shareholders to find investment opportunities outside its traditional product portfolio (software).
- A **risk reduction strategy to diversify product markets**. Companies often compensate for slower growth in traditional geographic markets by developing new products in new markets with a growing demand (e.g. Nokia's move to enter the Chinese market with its low cost Lumia range of cell phones to counter declining sales in Europe). We also addressed portfolio diversification in study unit 2.
- **Senior management's ambitions or egos** may contribute to firm growth. Founder managers of firms who still occupy the role of chief executive officer (CEO) may be motivated to grow the firm in order to "conquer the markets". (A case in point could be Lakshmi Mittal, who founded the steel giant, ArcelorMittal, and Raymond Ackerman who founded Pick n Pay).

The **form** that a merger or acquisition takes is often driven by the **strategic intent** of the instigating company. Microsoft acquired Skype in order to integrate the live video application within its messenger communication platforms. China Investment Corporation (CIC) acquired a stake in Shanduka because of the latter's activities in coal mining. (China has a huge appetite for coal to fuel its coal-fired power stations in its emerging towns and cities).

Now study the following theoretical section in Skae et al, chapter 12:

Section	Heading
12.1.2	*Reasons for takeovers and mergers*

Notes:

① In MAC3702, you should be able to list and discuss the reasons for M&As. In later MAC modules, you will be required to identify these from longer case studies.

② Synergy and cost savings are two of the important reasons for M&A activities. The effects of these two aspects feature prominently in the valuation exercises that are done for M&As. You will learn more about this later in the topic.

*****

4. Why mergers sometimes fail

A marriage between two consenting adults often fails and ends up in divorce. Reasons for a failed marriage could include differences in handling financial affairs, managing the day-to-day tasks of the household, etc. A merger between two companies often fails because of similar reasons. The merger between Daimler Benz (AG) and Chrysler Corporation to form DaimlerChrysler AG in 1998 subsequently failed in 2007, and the Chrysler business unit was sold to Cerberus Capital Management for US$6 billion in May 2007. Reasons for the failed merger ranged from failure to integrate the two manufacturing technologies, perceptions that the transaction in practice operated as a takeover and that touted synergies did not materialise.

Now study the following theoretical section in Skae et al, chapter 12:

Section	Heading
12.1.3	*Why mergers sometimes fail*

5. Legal implications

The legal aspects of **M&As** need to be overcome before the transaction can become a reality. Where a merger or acquisition transaction involves a foreign party, national interests often dominate other issues of competing parties. In the ArcelorMittal merger (French-Indian) there were problems in convincing the French legislature that the merger was in the best interest of France. Lakshmi Mittal (the CEO of Mittal) had to address the French legislature to convince the French that the merger was in the best interest of France. Walmart's acquisition of Massmart (RSA) was a challenging affair with protests, court actions from worker unions and state departments, whom expressed concerns about the merger.

Now study the following theoretical section in Skae et al, chapter 12:

Section	Heading
12.1.4	*Legal implications*

6. Summary

In this study unit, you learnt to

- differentiate between the various forms of M&As
- understand the reasons for M&As
- explain why M&As sometimes fail
- identify the various regulatory mechanisms for M&As

In the next study unit, we will explore how to do a financial valuation for a M&A transaction, investigate the factors that influence this value and consider the financial impact of a M&A on the key ratios of the target company and the acquiring company.

7. Self-assessment theory review questions

After working through all the relevant sections in the textbook as well as the guidance and activities provided in this study unit, you should now be able to attempt the following self-assessment questions:

a. Explain the difference between a merger and an acquisition (takeover). (12.1.1)

b. Briefly discuss five reasons for M&As and provide an example for each. (12.1.2)

c. Briefly discuss four reasons why M&As may fail in practice. (12.1.3)

d. List three regulatory bodies which might be involved in proposed M&As. (12.1.4)

Refer to the relevant sections in Skae et al for the answers to these.

STUDY UNIT 7 ELEMENTARY PRICING (VALUATION) AND FINANCING ISSUES

1. Introduction

In the previous study unit, we investigated the business and legal background to M&As. We will now focus on the financial impact of M&As. Valuations of business organisations within the context of M&As build on the concepts we introduced in study unit 4 (valuation of instruments).

For purposes of this study unit, we may ask you to determine the price of the target organisation, sometimes while considering the effect of synergies. In this regard, you may act as an appraiser on behalf of the target or the acquiring organisation, or otherwise as an independent appraiser. As a result, you may have to determine (1) a minimum price for the target organisation (normally to be considered by the target organisation's current owners), (2) a maximum bid price for the target organisation (payable by the acquiring organisation, without destroying value by overpaying), or (3) a fair value for the target organisation (normally when acting as an independent appraiser).

In order to determine value – however defined – you will have to employ a valuation methodology, method or model. We explored most of these in study unit 4, which dealt with the valuation of instruments. In this study unit, we will introduce you to a valuation model based on free cash flow. We will then introduce the concept of synergies and discuss other factors that influence the price (valuation) and the acceptance or rejection of the offer.

This study unit is based on **selected sections** from the following chapters in the prescribed Skae et al textbook:

- Chapter 11
- Chapter 12

2. Valuation model based on free cash flow (available to the business organisation)

In MAC2602, we introduced you to investment decisions, which assessed capital investments for the purposes of an organisation's organic growth (internal growth). Study unit 5 expanded on the techniques available for appraising organic investment opportunities. You are therefore familiar with the technique of discounting future cash inflows and outflows.

In study unit 4 of this module, you further explored the valuation of instruments using several methodologies, methods and models. Although the aim was primarily to determine the value of the organisation's own (internal) capital for the purposes of calculating its WACC, it also paved the way for assessing **external** opportunities, such as investing in **external debt, preference shares** or **equity** as investments.

The sections you are going to study next will sketch the necessary background and explain the underlying theory relating to the valuation of a specific external growth opportunity, namely investing in a target organisation by means of a M&A. In this regard, we will also introduce a valuation model based on free cash flow – that is, free cash flow available to the business organisation.

Now study the following sections in Skae et al, chapter 11, excluding the indicated areas, and then attempt the activities included in the chapter:

Section	Heading	Exclusions
11.4.5 #	*Level of control*	
11.4.6 #	*Share publicly traded on a securities exchange*	
11.5.2 #	*Valuation premium and discounts* (including the example)	Exclude any sections referring to BEE discounts and part (b) of the example.
11.6.5	*Models based on Free Cash Flow*	11.6.5.1(f) Study the first part of (f), but exclude "Exit multiples" and "The McKinsey Convergence Value-Driver formula" Exclude 11.6.5.2

Note:

These sections also formed part of your reading for study unit 4, but we repeat them here to emphasize their applicability to discounted cash flow (DCF) valuations (not only to the multiples methods).

*****

Activity 7.1

Answer practice question 11-2 (b) in the prescribed Skae et al textbook.

Solution to activity 7.1

Find the solution to practice question 11-2 (b) at the end of the question.

3. M&A valuation considerations

As pointed out in the introduction to this study unit, we can use various valuation methods to determine the range within which a possible value or bid could fall. Common valuation methodologies include, but are not limited, to the following:

- net asset based valuations
- dividend based valuations
- earnings based valuations
- cash flow based valuations

When considering the ranges of the bid offer, you have to take into account from whose viewpoint the valuation is done. This has implications for the valuation method. Another important valuation aspect for M&As is the treatment of synergistic benefits. Many years ago the renowned author, Igor Ansoff, eloquently captured the meaning of synergies between different organisations, calling it the "2 + 2 = 5 effect" (1965:72). In this equation, the extra "1" is due to the efficiencies generated when two previously separate organisations work together. In the previous study unit, you learnt that synergy was one of the reasons for entering into a M&A transaction.

Now study the following section in Skae et al, chapter 12:

Section	Heading
12.2	*Valuation considerations*

Even though synergies between different organisations often remain elusive, they could be quantified in principle by means of a number of valuation methodologies, methods or models. Nevertheless, when valuing synergy, we normally apply a discounted cash flow method, as illustrated in the activity below.

When we determine the:

- **Minimum value** of the target organisation, we usually disregard all synergies.
- **Maximum value**, all specific (unique) synergies that may exist between a specific target and a specific acquiring organisation are usually quantified and included in the maximum price.
- **Fair value** of the target organisation, we only quantify and include synergies that could exist in general (also with other acquiring organisations) in the fair value. Therefore we disregard unique synergies here.

Activity 7.2

Bidder Ltd ("Bidder") is seeking accelerated growth through the acquisition of compatible external business organisations. In this regard, a committee of Bidder, tasked with identifying suitable candidates for acquisition, has suggested the purchase of Target Ltd ("Target"), a company in a different but compatible industry.

In the case of a merger between Target and Bidder, we can expect the following specific synergies and related costs:

- 50 employees of Target would immediately be made redundant at an after-tax① retrenchment cost of R1,2 million.
- Annual post-tax① wage savings at current prices are expected to be R750 000, while future wage increases are expected to be *double* the inflation rate for next year and *equal* to inflation for the following years②.
- Some land and buildings of Target would be sold for R800 000 (after tax)① and do not need to be replaced (the combined entity will have sufficient office space).
- Fixed advertising and distribution cost savings of R150 000 (before tax) would apply for next year and for each year thereafter④.
- Legal and other acquisition-related costs at present value are expected to amount to R3 million (after tax)①.

The following additional information is available:

- WACC of Target has been estimated at 18%.
- Income tax rate is 28%.

- Current rate of inflation is 5% per annum and it is expected to remain at approximately this level in the foreseeable future.
- Unless otherwise mentioned, all fixed expenses are expected to grow by inflation only.
- The intrinsic equity value of Target has been estimated at R20 million (this value has been determined using an income approach and **excludes** all possible synergies).
- If a company other than Bidder were to acquire Target, it is expected that only 40% of the net synergy benefit will be realised.

REQUIRED **Marks**

a. Calculate the value of all specific synergies between Bidder and Target, net of associated costs. (10)

b. Determine the minimum selling price which Target is likely to consider. (1)

c. Determine a maximum bid price which Bidder may offer without destroying its existing shareholders' value. (1)

d. Determine the fair market value of Target. (2)

e. Critically discuss reasons why Bidder should consider offering **less** than the maximum bid price for Target determined in *c*, and recommend a more suitable bid price. (5)

(Source: University of South Africa, TOE408W – simplified and adjusted)

Solution to activity 7.2

a. Present value of synergies and related costs

	Year 0	Year 1	Marks
Wage savings and associated costs	**R**	**R**	
• Employees: retrenchment cost ①	(1 200 000)		(1)
• Wage savings for year 1 (R750 000 x (1+ (2 x 5%))		825 000	(1)
• Wage savings for years **after** year 1:			
Applying Gordon's dividend growth model ②			
P_0 = Cf_1/(WACC-g), adjusted for the appropriate year:			
P_1 = Cf_2/(WACC-g)			
= R825 000 calculated above ③ x (1,00 + 0,05)		6 663 462	(2)
(18% – 5%)			(1)
Land and buildings ①	800 000		(1)
Advertising and distribution			
Applying Gordon's dividend growth model			
P_0 = Cf_1/(WACC-g)			
= R150 000 ④ x (1 – 28%)	830 769		(1)
(18% – 5%)			(1)
Legal and other costs ①	(3 000 000)		(1)
Totals	(2 569 231)	7 488 462	
Discount factors (for a rate of 18%)	1,000	0,847	(1)
(Mark awarded for using discount factors or financial calculator – calculations shown)			
Discounted values	(2 569 231)	6 342 727	
Total present value of specific synergies after associated costs	**3 773 496**		

(Figures may not total correctly due to rounding).

Notes:

① These figures are already after tax and in present term value.

② We can apply Gordon's dividend growth model only where **constant** growth is expected (in this case, growth equal to inflation from year 2).

③ This is an after-tax figure.

④ We do not increase the R150 000 by inflation here, as it already represents the saving in one year's time (Cf_1).

*****

b. Minimum selling price

This is likely to equal the intrinsic value of Target (excluding all possible synergies): R20 million. (1)

c. Maximum bid price

This will equal the intrinsic value of Target, plus the value of all specific synergies (net of associated cost): (R20 000 000 + R3 773 496, calculated in a = R23 773 496. (1)

d. Fair market value of Target

This will equal the intrinsic value of Target, plus the net value of synergies obtainable in general – that is, by **more than one** potential acquiring company: (R20 000 000 + (3 773 496 x 40%)) = R21 509 398. (2)

Note:

The other 60% of the synergies will **only be realised** if Bidder is the acquiring company. It is therefore excluded when a fair market value (any acquiring company) is determined.

*****

e. Critical discussion

Bidder should seriously consider offering **less** than the maximum bid price (R23 773 496) for Target, for the following reasons:

- Any other bidder is likely to offer no more than the fair market value of R21 509 398 determined in *d*, since no synergies above the 40%-level would be available to it. (1)
- The specific synergies between Bidder and Target relate mainly to the reduction in **duplicated** facilities and staff. (1)
- Since Bidder will contribute to this benefit (for example, when the combined entity uses **its** facilities or staff, the specific synergy benefit should be **shared**. (1)
- If Bidder pays the maximum price of R23 773 496 determined in part *c*, including the full price of all net synergies, it would be paying for the full synergy benefit available to Target's shareholders, and none of the specific synergy benefits would accrue to Bidder's existing shareholders. (1)

Suitable bid price recommendation

The eventual bid price will be a matter of negotiation, but it is recommended that Bidder bids less than the maximum price (R23 773 496 from *c*), perhaps starting at the minimum price (R20 million from *b*). However, the eventual bid price is likely to end up close to the fair market value (R21 509 398 from *d*). (1)

Note:
Remember to make a final recommendation and to refer to your calculations to substantiate it.

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4. Financial effects of acquisition and method of funding on key financial measures

Within the context of a merger or acquisition, the various parties, especially shareholders, are interested in their financial standing before and after the merger or acquisition. The following financial measures are often monitored:

- dividend per share (DPS)
- earnings per share (EPS)
- price earnings ratio (P/E)

- share price
- market to book ratio
- return on equity (ROE)

The shareholders would like their financial standing, as measured by the above measures, to improve or be preserved. They may tolerate short-term deteriorations in the above measures if they are convinced that management's future business strategies would improve the financial position of the combined entity.

The method used to settle the purchase price also affects these measures. Each mode of financing has its advantages and disadvantages and also depends on the financial position of the acquiring company. If the acquisition is financed by issuing shares in the acquiring company (the "sellers" become shareholders of the now enlarged "purchaser"), it will result in additional shares being issued. We will then have to account for the possible dilution of earnings. Facebook paid cash for Instagram because it had huge cash resources that it could not utilise otherwise in profitable investments. Most transactions incorporate a mixture of cash and shares to settle the purchase price.

Now study the following sections in Skae et al, chapter 12:

Section	Heading
12.3	*Financial effects of acquisition*
12.4	*Funding for mergers and acquisitions*

Activity 7.3

Assume that companies A Ltd and B Ltd agree to a takeover, with A Ltd, the surviving company, acquiring all the issued shares of B Ltd in a one-to-one exchange of shares in A Ltd. The exchange ratio was determined by the companies' market price per share.

The following information is available before the transaction details are known:

	A Ltd	**B Ltd**
Total earnings	R100 000	R40 000
Number of shares	60 000	50 000
P/E ratio	7,2	15,0
Market price per share	1 200c	1 200c
EPS	166,7c	80,0c

REQUIRED

Calculate the effect on the EPS after the takeover has taken place.

Solution to activity 7.3

Shares to be issued to B Ltd

Market value of B Ltd shares = 50 000 x R12 = R600 000.
New shares in A Ltd to be issued = R600 000 ÷ R12 = 50 000.

Since the exchange takes place on a one-to-one basis, A Ltd should issue an additional 50 000 shares to the shareholders of B Ltd, increasing its issued shares to 110 000. As the business of A Ltd and B Ltd will be combined, their theoretical combined earnings should be R140 000.

The effect of the absorption after the merger has taken place

	Shares of A Ltd owned after the absorption	EPS Before takeover	EPS After takeover	
Shareholders of A	60 000	166,7c	127,3c	①
Shareholders of B	50 000	80,0c	127,3c	
	110 000			

Note ①

Calculation of EPS after take over = R140 000 / 110 000

= 127,3 cents

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The EPS of A Ltd's shareholders declined by 39,4c per share, whereas those of B Ltd's shareholders increased by 47,3c per share.

On the basis of the new EPS of A Ltd, it is clear that A Ltd's original shareholders' EPS have been diluted. They might not find this acceptable and consequently might insist on another ratio of exchange of shares or even cancel the transaction.

Activity 7.4

Fast Ltd made an offer to the shareholders of Quick Ltd on the basis of 4 shares in Fast Ltd for every 5 shares held in Quick Ltd. The relevant financial information based on the latest financial statements and market movements are as follows:

	Fast Ltd	**Quick Ltd**
Shares in issue ('000)	200 000	60 000
Earnings after tax (R'000)	840 000	168 000
Dividend payout ratio	30%	40%
Net asset value (R'000)	6 400 000	1 020 000
Price per share (cent)	5 124	3 920
Debt: equity ratio	2:1	0,8:1

Both companies have paid dividends consistently in the past.

REQUIRED

a. What is the total number of shares that Fast Ltd will issue to the shareholders of Quick Ltd?

b. What is the value placed on one Quick Ltd share as suggested by the offer of Fast Ltd?

c. Advise the shareholders of Quick Ltd whether or not they should proceed with the negotiations. Note any issues that they should address during the negotiation process.

d. Should Fast Ltd offer an additional R1 per Quick Ltd share in cash, over and above the share exchange? Will this influence your initial recommendation?

Solution to activity 7.4

a. The total number of shares issued to Quick Ltd will be = 60 000 000 ÷ 5 x 4

= **48 000 shares** in Fast Ltd.

b. The suggested purchase price per Quick Ltd share is (5 124 x 4) ÷ 5 = **4 099,20 cent.**

c. Recommendation

Note:
Answer the question from the viewpoint of a Quick Ltd shareholder. Compare their previous position (5 shares in Quick Ltd) with their proposed new position (4 shares in the combined Fast Ltd).

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	Combined Fast Ltd	**Quick Ltd**
EPS in cent	1 008 000 000 / 248 000 000	168 000 000 / 60 000 000
	= 406,45	**= 280**
Total dividends (earnings x payout ratio)	302 400 000	67 200 000
DPS in cent (dividend/number of shares)	302 400 000 / 248 000 000	67 200 000 / 60 000 000
	= 121,94	**= 112**
NAV (cent)	7 420 000 000 / 248 000 000	1 020 000 000 / 60 000 000
	= 2 991,94	**= 1 700**

Market value of Quick Ltd (60 000 x R40,992)	2 459 520	
Market value of Fast Ltd before transaction (200 000 x R51,24)	10 248 000	
Market value of combined entity	12 707 520	
Number of shares of combined entity	248 000 000	
Fast Ltd price per share (combined entity) (cents)	5 124	
P/E ratio [price/EPS]	5 124	3 920
	406,45	280
	= 12,6 times	**= 14,0 times**
Earnings (cents)	406,45 x 4	280 x 5
	= 1 625,8	**= 1 400**
Dividends (cents)	(406,45 x 30%) x 4	(280 x 40%) x 5
	121,94 x 4	5112 x 5
	= 487,76	**= 560**
Net asset value (cents)	2 991,94 x 4	1 700 x 5
	= 11 967,76	**= 8 500**
Cash value if shares are disposed of (cents)	5 124 x 4	3 920 x 5
	= 20 496	**= 19 600**

On the basis of increased earnings, book and cash value, we recommend that they proceed and accept the offer from Fast Ltd.

Other factors to consider:

- Fast Ltd has a much higher risk as a result of its dividend to earnings ratio of 2:1, and this is reflected in its lower P/E ratio of 12,2 before the transaction (10 248 ÷ 840 000).
- What are the respective future growth rates of the companies?
- At what date will the transaction take place?

d. Will an additional R1 influence your initial recommendation?

- additional R5 for every 4 shares
- revised cash values (R204,96 vs. R196)
- Recommend to proceed as in *c* above.

5. Summary

In this study unit, you learnt to

- determine the fair value of a business organisation or an equity shareholding using the free cash flow model
- consider the correct valuation method depending on whether the minimum, maximum or fair value is determined
- describe what is meant by synergies between different business entities and reflect on which synergies to include in a valuation when determining the **fair value** of a business organisation or an equity shareholding
- identify various forms of funding available for M&As
- discuss the effects of M&As and the method of funding based on key financial ratios

6. Self-assessment questions

After working through all the relevant sections in the textbook as well as the guidance and activities provided in this study unit, you should now be able to attempt the following self-assessment questions.

QUESTION 1

Answer practice question 12-2 in the Skae et al textbook (Astra Ltd).

SOLUTION TO QUESTION 1

Find the solution to practice question 12-2 after the question.

QUESTION 2

Answer practice question 12-6 in the Skae et al textbook (Elisa Ltd).

SOLUTION TO QUESTION 2

Find the solution to practice question 12-6 after the question.

QUESTION 3

Answer practice question 12-7 in the Skae et al textbook (Doc Ltd).

SOLUTION TO QUESTION 3

Find the solution to practice question 12-7 after the question.

QUESTION 4

You are presented with the following abridged balance sheets of Indaka Ltd and Global Ltd:

	Indaka Ltd	**Global Ltd**
	Rm	**Rm**
ASSETS		
Non-current assets		
Property, plant and equipment	775	375
Investments	100	125
50 million shares in Global	100	-
50 million shares in Indaka	-	125
Total assets	875	500
EQUITY AND LIABILITIES		
Total equity	875	500
Issued capital (ordinary shares of R1 each)	500	250
Retained earnings	375	250
	875	500

Additional information

1. The companies have decided to merge by means of the incorporation of a new company, Zenzele Ltd.

2. Zenzele Ltd will take over the property, plant and equipment (PPE) assets at the following market values for similarly aged assets, which are regarded as fair:

	Rm
Indaka Ltd	825
Global Ltd	450

3. Non-current assets do not include any goodwill.

4. The goodwill payable by Zenzele Ltd for Indaka Ltd and Global Ltd was calculated on the basis of the following information:

	Indaka Ltd	**Global Ltd**
Anticipated future net income per annum	R113,280 million	R87,890 million
Fair rate of return on operating assets	10%	15%
Anticipated duration of super profits	3 years	3 years

5. The purchase price will be settled by issuing ordinary shares of R2 each in Zenzele Ltd. Zenzele Ltd will not take over inter-company shareholdings.

REQUIRED

Calculate how many shares must be issued to the shareholders of Indaka Ltd (excluding Global Ltd) and Global Ltd (excluding Indaka Ltd).

SOLUTION TO QUESTION 4

			Indaka Ltd		Global Ltd
			Rm		Rm
(i)	**Assets taken over**				
	PPE assets		825,000		450,000
	Goodwill (calculation ii)		76,550		46,550
			901,550		496,550
(ii)	**Goodwill**				
	Anticipated profits		113,280		87,890
	Fair return on assets				
	I (10% of R825 million)		(82,500)		
	G (15% of R450 million)				(67,500)
	Super profits		30 780		20 390
	Annuity factor for 3 years	(10%)	2,487	(15%)	2,283
			76,550		46,550

(iii) % cross shareholdings

Global holds 50 million shares in Indaka, that has 500 million issued shares = 10% = 1/10
Indaka holds 50 million shares in Global, that has 250 million issued shares = 20% = 1/5

(iv) Total value of each company (including the investment in the other company)

Indaka Limited = $901{,}550 + \frac{1}{5}G$ and G Limited = $496{,}550 + \frac{1}{10}I$

$= 901{,}550 + \frac{1}{5}\left(496{,}550 + \frac{1}{10}I\right)$

$= 901{,}550 + 99{,}310 + \frac{1}{50}I$

$\frac{49}{50}I$ = 1 000,860 million

Indaka Limited = R1 021,285 million

$\therefore$ G Limited = $496{,}550 + \frac{1}{10}(1\,021{,}285)$

= R598,678 million

(v) Number of shares issued to other shareholders in each company

Indaka Ltd $\left[1\ 021{,}285 - \left(\frac{1}{10} \text{ x } 1\ 021{,}285\right)\right] \div 2 = 459{,}578 \text{ million}$

Global Ltd $\left[598{,}678 - \left(\frac{1}{5} \text{ x } 598{,}678\right)\right] \div 2 = 239{,}471 \text{ million}$

Reasonability Check:

Total shares issued by Zenzele Ltd = 459,578 + 239,471 = 699,049 million.

Value of total issue = 699,049 x R2 = R1 398,098 million.

Total value of assets and goodwill taken over into Zenzele Ltd = 901,550 + 496,550 = R1 398,1 million (small rounding).

PART 4 – THE TREASURY FUNCTION

INTRODUCTION

The treasury and financial control functions are two main components of financial management.

The treasury function manages the relationship between the organisation and the financial stakeholders, which include equity owners, tax authorities, banks and other providers of finance. On the other hand, the financial control function manages the relationship with other stakeholders, such as customers, suppliers and employees.

To fulfil the treasury function, you require an understanding of several areas, including how to obtain financing, how to manage working capital and cash, how foreign exchange markets work and what currency risk, interest rates and interest rate risk entail.

Note:
We have already covered the sourcing of long-term financing in part 2 on capital structure. In part 4, we will focus on short-term funding as part of working capital and cash management.

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PART 4, TOPIC 6 – CASH MANAGEMENT

INTRODUCTION

In this topic, we will focus on the roles and structure of the treasury department and further aspects surrounding cash management. The treasury department has to ensure that the organisation has sufficient funds available to settle short-term commitments and where there is that excess cash, to invest it optimally. The distribution of profits to owners (dividends, in the case of a company) also plays a role in determining the amount of cash available.

Every organisation requires liquid resources/cash flow to conduct day-to-day operations. Cash flow is required to pay suppliers, salaries and wages when obligations fall due. Short-term financial strategy involves planning to ensure adequate cash flow. This is determined through sound working capital management and effective working capital financing, both which are critical to the short and long-term success of the organisation. Even a profitable organisation could fail without efficient working capital management. You learnt about most of these concepts in MAC2602. In MAC3702, we will focus on options for investing excess cash.

Shareholders (or other owners in a business) invest in the business in pursuit of an attractive return on their investment. This could be achieved by returning profits to the owners through a stable dividend policy, or by investing profits in capital projects in pursuit of higher profits and a higher share value. We will investigate the various dividend policies that businesses can pursue.

LEARNING OUTCOMES

After studying this topic, you should be able to

- discuss the roles of the treasury function
- recommend an appropriate structure for a treasury department, either as a centralised or decentralised function
- evaluate the advantages and disadvantages of operating the treasury function as a cost or profit centre
- differentiate between aggressive and conservative working capital financing policies and identify the benefits and risks of each approach

- propose suitable actions to manage the organisation's working capital and to improve cash flow
- list sources of short-term financing as well as options for investing excess short-term cash
- evaluate the impact that changes in the credit policy have on the levels of working capital and on profitability
- explain the impact that the dividend decision has on financing and investment decisions
- discuss factors to be considered when establishing a dividend policy
- discuss whether the amount of dividends received is relevant to shareholders
- describe alternative methods for distributing profits to owners

ASSUMED PRIOR KNOWLEDGE

In your MAC2602 studies, you mastered the following learning outcomes:

- defined and explained working capital, net working capital and working capital management
- discussed strategies for monitoring and managing each component of working capital
- calculated the effective cost of forfeited discounts
- prepared basic cash flow forecasts
- defined the concepts of working capital policy and the working capital cycle
- calculated the weighted cost of different financing options
- calculated the cash conversion cycle

Please refer to your second year guide if you want to refresh your knowledge.

For another perspective, you may also refer to the following sections in the prescribed Skae et al textbook:

Section	Heading
9.1	*Levels of working capital*
9.1.1	*Permanent working capital*
9.1.2	*Temporary working capital*
9.1.3	*Net working capital*
9.3.2	*Cash operating cycle/business cycle*
9.4.1	*Credit decisions and trade-offs*
9.4.3	*Collection policy*
9.5	*Inventory management*

Note:

We dealt with the preparation of cash budgets and forecasts in the budgeting topic in MAC2601. For revision purposes, we provide a question on this at the end of the study unit.

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THIS TOPIC CONSISTS OF THE FOLLOWING STUDY UNIT:

STUDY UNIT	TITLE
STUDY UNIT 8	TREASURY FUNCTION

STUDY UNIT 8 TREASURY FUNCTION

1. Introduction

In this study unit, we will firstly focus on the role of the treasury function in managing the finances of the organisation and on the optimal structure for the treasury function under different conditions. Secondly, we will discuss effective cash and working capital management, and lastly we will consider the impact that the dividend policy (profit distribution) has on the owners and the cash resources of the organisation.

This study unit is based on **selected sections** from the following chapters in the prescribed Skae et al textbook:

- Chapter 9
- Chapter 14

2. The role of the treasury function

The key tasks of the treasury function, as presented in Figure 1, influence all three levels of decision making within the organisation:

1. **strategic** decisions, such as dividend policy, capital structure of the organisation and raising funds
2. **tactical** decisions, such as cash and risk management, including the decision to hedge currency or interest rate risk
3. **operational** decisions, such as the investment of surplus funds

The treasury function or department is responsible for the five areas of corporate finance as presented below in Figure 1.

Figure 1 The role of the treasury function

Source: Author, 2013

The treasury function could be managed as a **cost** or a **profit centre.** In a *cost centre*, managers will be rewarded for keeping financing and transaction costs within a specified budget. Alternatively, when we treat the treasury function as a *profit centre*, we recognise that revenues could be earned, for example by taking advantage of changes in exchange rates. This could motivate staff and increase their awareness of financial markets and opportunities or pitfalls that exist. However, appropriate treasury policies should be in place to guide risk-taking behaviour. We take a look at treasury policies in the next section.

3. Treasury policy

The treasury policy is consistent with the establishment of strategies and objectives for corporate finance. Every treasury department should have a treasury policy to provide guidance on investment, financing, cash management and risk management decisions. This includes the role

and responsibility of the treasury function, dealing limits and risks requiring authorisation from management.

Guidance on risks should include the following:

- risk identification and assessment methodology (refer to your MAC2602 study guide for relevant definitions)
- levels of risk that are unacceptable and require mitigating action plans
- guidelines for risk responses, or mitigating action plans to reduce risk (These include avoidance and risk reduction methods, such as internal controls or the transfer of risk)
- reporting guidelines, including guidelines for measuring treasury's performance

The treasury policy will be influenced by the decision to centralise or decentralise the treasury function, because it will influence the treasury function's decision-making ability and the execution of these decisions. We discuss this in more detail in the next section.

4. Decision to centralise the treasury function or department

Large multinational organisations with subsidiaries and associates in various countries need to decide whether or not to have a centralised treasury function. When the treasury function is centralised, it acts as a bank ensuring that cash is available for individual operating units, that excess cash is invested and that related risks are managed appropriately. The treasury department (treasurer) requires specialist skills to manage and assess the full range of available capital instruments, investments and methods to manage risk effectively. It will be beneficial if the treasurer maintains a close relationship with the organisation's bank, as they acquire knowledge of all markets and available capital instruments. Let's now investigate the advantages of a centralised versus a decentralised treasury function or department.

4.1 Advantages of a centralised treasury function

- Specialised expertise regarding financial markets, taxation and transfer pricing is concentrated, and decisions about hedging currency risk are made in the best interest of the organisation (the entire group of companies), bearing in mind that any decisions made are lawful especially if there are foreign exchange and taxation requirements.

- Centralised cash management avoids having surplus cash in some bank accounts and overdrafts in others. The treasurer will require access and visibility to all bank accounts across the group of companies.
- The organisation will have greater opportunities for short-term investment and larger volumes of cash available to negotiate or obtain higher interest accounts. (The larger the amount to be invested, the higher the potential for earning higher interest rates on the investment).
- Borrowing can be arranged in bulk at lower interest rates than for smaller individual borrowings. The group might have a better risk profile than an individual company and therefore obtain lower interest rates on loans and overdrafts. The group might also be able to offer better security for loans than individual companies.
- It will be more effective to manage foreign currency risk in a group of companies. A central function can better identify opportunities for interest rate swaps, where it is possible to match the income of one operating unit in a specific currency with the expenditure of another operating unit in the same currency. For example, one business unit might export goods in dollars, while another might import equipment payable in dollars. These currency streams can be matched to eliminate the need for currency contracts and the accompanying costs.
- Organisations will often hold a capital reserve aligned with the risk management policy for precautionary purposes. The reserve for a group of companies could be smaller than when held separately by numerous individual operating units.
- Standardised procedures and risk management strategies could be better introduced and monitored.

(Adapted from CIMA)

4.2 Advantages of a decentralised treasury function

- A decentralised function will be more responsive to the needs of individual operating units.
- Sources of finance can be matched to local assets.
- The managers of operating units can make quicker, more effective decisions, as they will have a closer relationship with the decentralised function (their "own" treasurer) without delays due to time differences, procedures etc.
- Each region might have distinct tax and regulatory requirements, different financing conditions and distinct currency issues which require the local knowledge of a decentralised treasury function.

(Adapted from CIMA)

5. Working capital management policy and financing

Working capital, also known as short-term financial management, refers to the management of the current assets and liabilities as well as the way in which related functions are performed within the organisation and the way in which working capital is financed. These are some of the key functions of the financial managers of business units, as they impact the available cash in the organisation directly. The financial managers of the business units will work closely with the treasurer in this regard.

The working capital cycle can be depicted as follows:

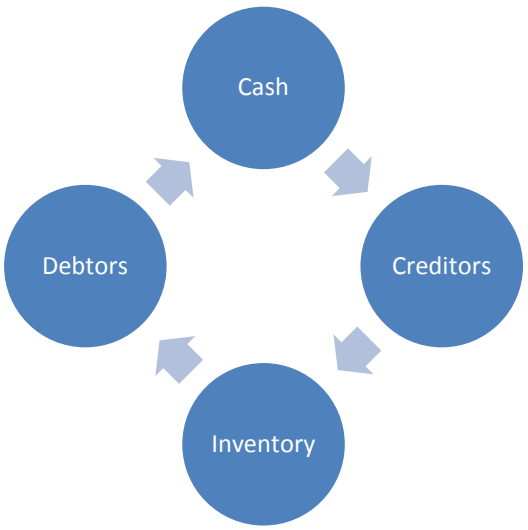

Figure 2 Working capital cycle
Source: Author, 2013

Working capital management requires smart financial planning, and most organisations will have target levels for current assets and current ratios. (Please refer to study unit 1 for ratio analysis).

These target levels will be defined in a working capital management policy. As discussed in MAC2602, an organisation may adopt a **conservative** policy (describing working capital target levels) whereby the organisation holds high levels of working capital, which could include generous payment terms for debtors to increase demand or maintaining high levels of inventory to ensure availability. Alternatively, the organisation may adopt an **aggressive** policy, whereby debt is collected quickly, inventory is limited and creditor payments are delayed to invest surplus cash and reduce financing costs.

Various factors influence the target levels of working capital, including trade discounts received and provided, inventory holding cost, inflation rates, industry requirements, the seasonality of operations as well as demand and changes in turnover.

Now study the following sections in Skae et al, chapter 9:

Section	Heading
9.1	*Levels of working capital*
9.2	*Hedging or matching finance*

The working capital policy (including the target levels of working capital) must balance the return generated from the investment in working capital with the associated risks. You can determine whether the working capital is managed effectively by analysing the net working capital. An **overinvestment** in current assets is not cost effective, as it may earn an inadequate return on investment and the inventory holding cost could be exorbitant.

Indications of an overinvestment in current assets include the following:

- significant levels of working capital
- low inventory turnover ratios
- poor liquidity ratios
- credit repayment terms that are shorter than debtor collection terms
- unusually high bank overdrafts

In the same way, an **underinvestment** in current assets could have a negative impact and result in out-of-stock situations (giving rise to opportunity costs and customer dissatisfaction) or an inability to pay suppliers, salaries and wages when these payments are due.

A lack of cash or liquidity is also referred to as **overtrading**. Signs of this include rapid expansion coupled with deteriorating current and quick (or acid-test) ratios. This could threaten the ability of the organisation to continue as a going concern Therefore, the profitability of an organisation is no guarantee for success when its working capital is managed poorly.

In your AIN1501 and AIN2601 modules, you also learnt that IT systems often play a crucial part in working capital management. Examples of these include the following:

- enterprise resource planning (ERP) systems, for determining inventory levels, managing supplier and production orders, etc.

- customer relationship management (CRM) systems, for managing customer orders etc.
- spreadsheet software to assist with various calculations and forecasts
- management information systems (MISs) for generating reports and graphs
- internet tools and cloud-based solutions for communicating with customers and suppliers and enabling e-commerce

Note:

The use of long-term financing options to finance working capital (conservative approach) could limit the organisation's ability to gain finance for more profitable growth opportunities.

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Activity 8.1

The following information is available for Umthente and Indaka for the period ending 30 June 20X4:

	Umthente (R)	**Indaka (R)**
Current assets	300 000	600 000
Fixed assets	400 000	400 000
Total assets	**700 000**	**1 000 000**
Financing decision		
Current liabilities (8%)	400 000	100 000
Long-term debt (11%)	100 000	400 000
Equity	200 000	500 000
Total liability and equity	**700 000**	**1 000 000**
Income and expenses		
Earnings before interest and tax	122 000	194 000
Interest	(15 000)	(46 000)
Taxes	(29 960)	(41 440)
Net income	**77 040**	**106 560**

REQUIRED

a. Calculate the following financial indicators:

i. current ratio

ii. net working capital

iii. rate of return on equity

b. Based on the above calculations, identify which company has an aggressive financing policy and which company has a conservative financing policy. Motivate your answer.

Solution to activity 8.1

a. Ratios

	Umthente		**Indaka**
i Current ratio			
$= \frac{\text{current assets}}{\text{current liabilities}}$			
$= \frac{R300\,000}{R400\,000}$		$= \frac{R600\,000}{R100\,000}$	
= 0,75 : 1		= 6 : 1	
ii Net working capital			
= current assets – current liabilities			
= R300 000 – R400 000		= R600 000 – R100 000	
= (R100 000)		= R500 000	
iii Rate of return on equity			
$= \frac{\text{net income}}{\text{equity}}\%$			
$= \frac{R77\,040}{R200\,000}\%$		$= \frac{R106\,560}{R500\,000}\%$	
= 38,52%		= 21,31%	

b. **Umthente** has an **aggressive financing policy**, as its current liabilities finance all the current assets and a portion of the long-term assets. The net working capital is also negative.

Indaka has a **conservative financing policy**, as its current liabilities only finance a portion of the current assets and none of the long-term assets. The working capital is high, which might be a concern, as they might be overinvesting in current assets.

6. Cash management

We will now focus on the cash management function. Cash can be regarded as the lifeblood of the organisation. It is important not to have too much cash on hand, since the interest earned on cash is low. However, there should also not be a cash shortage, as borrowing in excess of the available overdraft or at short notice incurs higher interest charges The treasury function relies heavily on accurate forecasts from the financial managers of the business unit.

When the treasurer receives the various cash flow forecasts from the business units (BUs), it is consolidated, as the shortfall (need for overdraft) of one BU can be met by the surplus cash of another BU. Consolidating the cash requirements saves transaction and borrowing costs. Based on the net cash requirement of the business, the treasurer will determine:

- if the current overdraft facility is sufficient
- if additional short-term borrowing is required
- if excess cash can be invested

The cash requirement is also evaluated in terms of timelines so that amounts can be borrowed or invested for the required periods.

Examples of short-term finance and investment options include the following:

Short-term finance	**Short-term investments**
overdraft	call account
short-term loan	Short term notice deposits for example 32-day notice deposits
commercial paper	treasury bills
	bankers' acceptance (BA)
	negotiable certificates of deposit (NCD)

Note:

In MAC2601, compiling the cash flow forecast is part of the budgeting topic.

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Now study the following sections in Skae et al, chapter 9:

Section	Heading
9.3	*Cash management* (see Note for detail)

Note:

Section	Heading
9.3.5	*The Baumol model for cash management.*
9.3.6	*The Miller-Orr model*

These two sections should serve **as background** to help you understand how organisations go about determining how much cash to keep in their bank account and when to liquidate short-term investments or to invest excess cash. You do **NOT** need to know how the formulae work or how to apply them.

*****

Other strategies to reduce the duration of the cash flow cycle (i.e. ways to improve cash flow) could include the following:

- entering into sale and lease back agreements
- employing cost cutting measures
- selling assets that are not part of the core operations or are not earning sufficient returns
- improving financial control (could include tightening of the budget and more rigorous comparisons of budget versus actual figures)

Activity 8.2

Should the following organisations be investing excess cash?

1. Joe's Bakery is a small retailer with a large number of daily customers who mostly pay cash. However, raw materials are typically purchased on credit.

2. Mielie en Graanverspreiders Ltd is a wholesaler, which supplies raw materials to numerous bakeries, including Joe's Bakery. Most sales and purchases are credit based.
3. Fresh (Pty) Ltd is a newly established local retailer hoping to compete with bigger wholesalers that supply raw materials to bakeries. This organisation understands that sales and purchases will be credit based, but is concerned because it has a limited credit record with the bank.

Solution to activity 8.2

1. An organisation like Joe's Bakery has cash which could be invested for fixed terms until creditors are payable. This ensures best returns on cash on hand.
2. It is critical for this organisation to coordinate its cash flow. Short-term borrowings may be required from time to time. It is important to be aware that the return on cash investments will not be more than the cost of short-term borrowings. Hence, the company must guard against investing cash for fixed periods (e.g. 30 days) at the expense of having to use an overdraft.
3. Fresh (Pty) Ltd may soon be cash strapped if the cash operating cycle becomes too long and debtor payments are not collected before creditor payments become due. Fresh (Pty) Ltd may find it difficult to find short-term borrowings, like a bank overdraft. Managing debtors and creditors and their expectations will be critical in this regard.

Activity 8.3

Answer practice question 9-4 (f) in the Skae et al textbook (Buyers Incorporated Limited).
(You may ignore the VAT effect on the credit sales and credit purchases).

Solution to activity 8.3

Find the solution to practice question 9-4 (f) immediately after the question.

Note:
The increase in cash is calculated as follows:

Increase in cash	=	increase in total sales x net profit % ① x Profit retained ②
	=	(R705 550 – R613 450) x 5,4% x 60%
	=	R92 100 x 5,4% x 60%
	=	R2 984

① See calculation (a)(i) of question.

② Profit retained = $\frac{\text{earnings per share (EPS) less dividend per share (DPS)}}{\text{earnings per share (EPS)}}$ %

(See calculation (b) of the question for the calculation of EPS and DPS).

When planning to increase the operating activities (i.e. production and sales), the organisation should always calculate the impact on the working capital requirements. Otherwise, it could find itself in a position of overtrading (increased investment in debtors and inventory without increased supplier credit and/or overdraft facilities). Overtrading could lead to liquidation.

*****

7. The impact of the credit policy on working capital and profitability

The management of accounts receivable and payable was covered in depth in MAC2602. Inventory management is covered in MAC2601 and MAC3701. In this section, we want to focus once more on the management of accounts receivable, as it has a huge impact on the cash cycle. The textbook provides some revision of concepts already dealt with as well as some additional insights, including debtors' factoring as a source of short-term financing.

Now study the following section in Skae et al, chapter 9, and attempt the activity:

Section	Heading	Inclusions
9.4	*Debtors' management*	*9.4.4 Evaluating credit on a Net Present Value (NPV) approach*

A change in the credit policy of the organisation has significant long-term implications for the level of accounts receivable (debtors) that should be funded. Traditionally, the **holding cost** of investment in debtors was calculated using the overdraft rate. However, modern thinking suggests that if a conservative working capital financing policy is favoured (part of the working capital are deemed "permanent" and are funded by the organisation's long-term optimal mix of equity and debt finance), then the **holding cost** of the investment in debtors should be measured by the weighted average cost of capital (WACC), as in the case of any other investment decision. Other authors propose that an appropriate rate would be lower than WACC, as the risk attached to the net current assets are less than that attached to the other assets of the business.

Note:

Your textbook follows the WACC approach. However, you might find that other questions or textbooks still use the overdraft rate. However, we calculate the effect that a change in credit policy has on cash flow in the same way, irrespective of the rate that is used to calculate the holding cost. Simply use the financing rate provided in the question.

MAC3701 will use the incremental approach to evaluate the impact of a change in credit policy. In you post-graduate modules you will also encounter other methods, such as the NPV approach.

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Activity 8.4

Zenzele (Pty) Ltd is a computer company that distributes computer hardware to smaller retail companies. The following information relates to the current credit terms and other aspects of the company's business:

i. Credit sales for the year amounted to R25 750 000.
ii. A 3% discount was offered to debtors that paid within 10 days.
iii. Bad debt provision for the current year amounted to R2 300 000.
iv. Currently, 20% of debtors pay within 10 days, while the remaining debtors take 45 days on average to settle their accounts.

As many of the clients cannot afford to pay in cash or within the credit terms due to the current economic circumstances, the company decided to make changes to the current credit policy. The financial manager proposes to grant credit on 5/10 (5% discount for payment within 10 days) net 45 basis in future. The financial manager anticipates that 55% of current debtors will now make use of this option, whilst the remaining current debtors will pay within 50 days on average. Bad debt provision for existing customers will remain the same.

The following assumptions were also included in the proposal:

- Credit sales to new customers will increase with R2 500 000.
- 60% of new customers will pay within the discount period, while the remaining new customers will pay within 65 days.
- The increase in sales is expected to result in a R1 250 000 increase in inventory, and trade payables are likely to increase with R850 000.

- Bad debt will increase to R2 345 000 in total as a result of the new sales.

The contribution ratio is determined at 32%.
The applicable tax rate is 28%, and WACC is equal to 20%.

REQUIRED

Determine the impact of the new credit policy on the company's profitability and comment if the company should accept the new credit policy by means of the annual after-tax cash flow calculations.

Solution to activity 8.4

Calculation of annual cash flow before tax

(a) Comparison of Current vs New credit Terms

		Current credit sales & credit terms	**New credit terms**	
			Current credit sales	**Additional credit sales**
		A	**B**	**C**
Credit sales		R25 750 000	R25 750 000	R2 500 000
Discount rate		3%	5%	5%
Discount on % of credit sales		20%	55%	60%
Pay in	10 days	20%	55%	60%
	45 days	80%		
	50 days	-	45%	
	65 days	-		40%
Bad debt		R2 300 000	R2 300 000	R45 000
WACC	20%			
Contribution rate	32%			
Increase in inventory				R1 250 000
Increase in trade payables financing				R850 000

(b) Calculations

	Calculation	Current credit sales & credit terms	New credit terms		
			Current credit sales		Additional credit sales
		A	B		C
Contributions	1	R8 240 000	R8 240 000		R800 000
Discount	2	(R154 500)	(R708 125)		(R75 000)
Bad debt	3	(R2 300 000)	(R2 300 000)		(R45 000)
Contribution before holding cost		R5 785 500	R5 231 875		R680 000
Tax on contribution before holding cost	7	(R1 619 940)	(R1 464 925)		(R190 400)
After tax cost		R4 165 560	R3 766 950		R489 600
Holding cost (after tax cost)		(R536 164)	(R395 068)		(R123 836)
Debtor holding cost	4	(R536 164)	(R395 068)		(R43 836)
Inventory holding cost	5	–	–		(250 000)
Creditors – saving in holding cost	6	–	–		170 000
		R3 629 396	R3 371 882	+	R365 764
		R3 629 396		=	**R3 737 646**

Increase /(Decrease) in annual cash flow after tax
(new total less current total) **R108 250**

Note 7: Tax on contribution before holding cost

Contribution before holding cost	R5 785 500	R5 231 875	R680 000
x 28% tax	x 0.28	x 0.28	x 0.28
Tax on contribution before holding cost	**(R1 619 940)**	**(R1 464 925)**	**(R190 400)**

Additional notes on the impact of holding costs (opportunity cost) on credit terms

Due to the fact that more sales are made on credit with the new credit terms it takes longer for the cash to be available to make payments. As this is the case the company can consider the effect of the holding (opportunity) cost on the cash flow.

Remember that the holding cost is calculated by making use of the company's WACC and WACC is considered as an after tax cost, therefore the impact of direct tax is not calculated on the holding cost.

Companies do not always take the holding cost into consideration as it is not always significant enough to impact the decision. You do however need to calculate it for MAC3702 purposes and if you do decide not to include it based on the fact that it is insignificant, you do need to state your reasoning and show your calculation.

Calculations:

1	Contributions	=	credit sales x contribution rate
A and B		=	R25 750 000 x 32%
		=	R8 240 000
C		=	R2 500 000 x 32%
		=	R800 000
2	Discount	=	credit sales x % making use of credit x discount rate
A		=	R25 750 000 x 20% x 3%
		=	R154 500
B		=	R25 750 000 x 55% x 5%
		=	R708 125
C		=	R2 500 000 x 60% x 5%
		=	R75 000
3C	Bad debt increase	=	R2 345 000 – R2 300 000
		=	R45 000

4	Holding cost	=	(credit sales x percentage on 10 days/365 x WACC) + (credit sales x percentage on other days/365 x WACC)
A		=	(R25 750 000 x 20% x 10/365 x 20%) + (R25 750 000 x 80% x 45/365 x 20%)
		=	R536 164
B			(R25 750 000 x 55% x 10/365 x 20%) + (R25 750 000 x 45% x 50/365 x 20%)
		=	R395 068
C		=	(R2 500 000 x 60% x 10/365 x 20%) + (R2 500 000 x 40% x 65/365 x 20%)
		=	R43 8365
5C	Increase in inventory holding cost	=	increase in inventory x WACC
		=	R1 250 000 x 20%
		=	R250 000
6C	Increase in creditors	=	increase in trade payables x WACC
		=	R850 000 x 20%
		=	R170 000

Conclusion:

The company should accept the new credit policy, as it results in an increase of annual cash flow before tax.

Note:

An increase in creditor funding is interest free. Therefore, it results in a saving in the holding costs.

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Enrichment activity

Visit the following websites and read up on the companies' credit terms and policies:

www.wetherlys.co.za/page/credit
www.morkels.co.za (Choose the "Credit" tab).
www.coricraft.co.za (Choose the "Cori terms" tab, followed by the "Payment terms" tab).

8. The dividend decision

Owners require a return on their investment, whilst managers are more concerned with the on-going financing of the organisation. Shareholder value (the return) is increased by the dividends shareholders receive and capital growth on the value of their shares over time. Dividends (or distributions of profits to owners) are paid from surplus cash, which has a direct influence on the amount of money available to finance investment. Companies must strike a balance between providing shareholders with a satisfactory dividend return and investing retained earnings for future growth.

Note:
From now on we will use the terms "dividends" and "shareholders".

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The benefits of using retained earnings as a source of finance include the following:

- Funds are readily available.
- There are no issue costs for new shares or debt instruments.
- There is no risk of a change in control as with a new share issue.
- It is a good option for organisations that will struggle to obtain more debt financing or may default on debt repayments due to excessive levels of debt.

Now study the chapter 14 in the prescribed Skae et al textbook as well as the further guidance provided below. Then attempt the activities.

Miller and Modigliani (discussed in part 2 on capital structure) believe that the dividend decision is irrelevant in perfect capital markets, as investors are indifferent to returns in the form of dividends

or capital gains. However, as discussed before, perfect capital markets assume no taxes, no transaction costs and that perfect information are available to all shareholders.

Arguments against the Miller and Modigliani theory therefore include the following:

- Taxation rates are different for dividends and capital gains.
- Organisations will want to limit dividends in periods of financial constraint.
- Due to imperfect markets, the share price may be lower than expected, and shareholders will then want dividends to realise a return on investment.
- Transaction costs on the sale of shares affect the decision to realise capital gains.
- Perfect information is not always available to all shareholders, for example, they are not aware of future investment opportunities or planned actions by competitors.
- Most shareholders prefer a constant dividend because they perceive it to be less risky.

Setting a dividend policy is a complex matter which is affected by various factors, including statutory requirements, shareholder preferences, the cash position of the organisation and the effect of taxation. The "bid in the hand" theory also predicts that shareholders will usually require a higher rate of return from companies with a fluctuating dividend policy, as they perceive them to be more risky. In other words, assuming that all other things are equal, companies with a stable dividend policy will usually have a lower cost of capital relative to those with a fluctuating dividend policy.

Activity 8.5

Answer practice question 14-2 in the Skae et al textbook.

Solution to activity 8.5

Find the solution to practice question 14-2 immediately after the question.

Enrichment activity

Visit the websites of five JSE-listed companies of your choice and read up on their dividend policy and dividend payment history.

Alternatively, you may also visit the websites of the three companies listed below:

www.sasol.com (Choose the "Investor Centre" tab).
www.exxaro.com (Choose the "Investor" tab).
www.sabmiller.com (Choose the "Investors" tab).

9. Summary

In this study unit, you learnt to

- discuss the roles of the treasury function
- recommend an appropriate structure for a treasury department, either as a centralised or a decentralised function
- evaluate the advantages and disadvantages of operating the treasury function as a cost or profit centre
- differentiate between aggressive and conservative working capital financing policies and identify the benefits and risks of each approach
- propose suitable actions to manage the organisation's working capital and improve cash flow
- list sources of short-term financing as well as options for investing short-term excess cash resources
- evaluate the impact that changes in the credit policy will have on the levels of working capital and on profitability
- explain the impact of the dividend decision on financing and investment decisions
- discuss factors to be considered when establishing a dividend policy
- discuss whether the amount of dividends received is relevant to shareholders
- describe alternative methods for distributing profits to owners

In the next topic, we will focus on the role of the treasury function in managing foreign exchange and interest rate risks.

10. Self-assessment theory review questions

After working through the relevant sections in the textbook and the guidance and activities provided in this study unit, you should now be able to answer the following questions:

a. Discuss the five main roles of the treasury function. (Study guide – figure 1)

b. Describe four advantages of a centralised treasury function. (Study guide – section 4.1)

c. Describe four advantages of a decentralised treasury function. (Study guide – section 4.2)

d. Provide one reason each for operating the treasury function as a cost or a profit centre. (Study guide – section 3)

e. Contrast the conservative working capital financing policy with the aggressive policy. Study guide – section 3 and textbook – section 9.2.4).

f. List three short-term investment options. (Study guide – section 6)

g. Discuss three reasons why an organisation would rather retain its profits (cash) than paying it out as a dividend. . (Study guide – section 8)

h. Discuss whether the amount of dividends received is relevant to shareholders in a perfect and an imperfect market. (Textbook – sections 14.2 and 14.3)

i. Describe three alternative methods for distributing profits to owners. (Textbook – sections 14.4)

11. Self-assessment questions

After working through all the relevant sections in the textbook, guidance and activities provided by this study, you should now be able to attempt the following self-assessment questions.

QUESTION 1

Regardez Watches Limited manufactures and exports ladies watches. Their watches are mostly exported to Asian and European countries. The organisation has come under financial pressure due to a decrease in the demand for luxury goods amidst economic pressure and the recession in some of these countries.

This has placed increased stress on the company's working capital despite an effort to move closer towards a just-in-time inventory management system. Regardez does not have funds available from an overdraft.

The following is an extract of the financial information for the past three years:

	20X0	**20X1**	**20X2**
	R	**R**	**R**
Cash sales	15 200 670	14 500 500	8 500 700
Credit sales	12 800 130	14 000 300	19 300 000
Cost of sales	13 250 200	15 600 500	15 355 000
Raw materials (opening balance)	200 000	350 000	275 000
Depreciation included in cost of sales	1 250 000	1 300 000	1 500 000
Work in process (opening balance)	1 150 000	1 250 000	1 225 000
Cash purchases	6 000 100	7 500 350	4 000 000
Credit purchases	7 500 100	9 000 150	11 200 000
Raw materials (closing stock)	350 000	275 000	250 000
Work in process (closing stock)	1 250 000	1 225 000	1 095 000
Accounts payable	2 210 000	2 850 000	2 750 000
Accounts receivable	3 200 000	3 820 000	7 450 000

Additional information:

There were no finished goods in stock at year-end, as these had been shipped before then.

Regardez watches require material of the highest quality that has to be imported.

Price increases have been minimal over the years and can be ignored. Regardez only places orders for the purchase of raw materials after an order for the finished goods has been received.

The following is an extract of some of the issues discussed at the recent board meeting:

- Capital expenditure has been placed on hold indefinitely in an effort to reduce costs.
- Regardez currently invoices in the reporting currency of South African Rand (ZAR). The managing director has established that the volatility of the rand has caused some debtors to delay payments while waiting for the rand to weaken in comparison to their currency.
- She also believes that the working capital function should be managed in the countries where customers are based.

REQUIRED

a. Calculate the duration of the cash operating cycle (in days) for 20X1 and 20X2 20X2 (Assume 365 days in the year).

b. Provide the financial manager with an analysis of the data calculated in a. above and comment on the risks of an overly aggressive operating cycle.

SOLUTION TO QUESTION 1

a. Analysis of the cash flow problems of Regardez Watches Limited:

		20X2	**20X1**
		Number of days	
Raw materials stock holding	(250 000 /15 355 000) x 365	6	6
Less: Finance from suppliers	(2 750 000 / 11 200 000) x 365	(90)	(115)
Production time	(1 095 000 / 15 355 000) x 365	26	28
Credit given to customers	(7 450 000 / 19 300 000) x 365	141	100
		83	19

Note:

Depending on the details provided in the question, you could also have used averages to calculate the above ratios, for example average accounts payable (in the finance from suppliers ratio) or average accounts receivable (in the credit given to customers ratio).

*****

b. Analysis of the operating cycle

- The raw material stock holding is low and should probably be increased, as the material required for manufacturing the watches has to be imported. If inventory levels are too low, it could result in a loss of discounts for bulk purchases, loss of cost savings when purchase prices rise, or production delays if the required stock is not on hand.
- The credit period granted by suppliers is long, although it has improved from 20X1, and should probably be decreased. The risk of being overly aggressive could result in the deterioration of commercial relationships, loss of reliable suppliers, or a bad credit record.
- The production period could be reduced by improving expensive production techniques that reduce profitability.
- The credit period of customers is very high and has increased significantly from 20X1 to 20X2. It should be reduced. This could be achieved by providing discounts for early payments or by reducing the credit terms. Reducing the credit terms (credit period allowed) could result in a loss of clientele.

QUESTION 2

Schoenen Limited, a shoe retailer, is preparing its cash budget for the next three quarters. The following data have been extracted from the operational budgets:

Sales revenue	Quarter 1	R500 000
	Quarter 2	R450 000
	Quarter 3	R480 000
Direct material purchases	Quarter 1	R138 000
	Quarter 2	R151 200
	Quarter 3	R115 600

The following additional information is available:

- Schoenen sells 20% of its goods for cash. Of the remaining sales value, 70% is received within the same quarter as the sales, while 30% is received in the following quarter. It is estimated that trade receivables will be R125 000 at the beginning of quarter 1. The organisation enforces a very strict credit policy and do not anticipate to have any bad debt.

- 50% of payments for direct material purchases are made in the quarter of the purchases, with the remaining 50% in the quarter following the purchases. It is estimated that the amount owing for direct material purchases will be R60 000 at the beginning of quarter 1.

- Schoenen pays labour and overhead costs as they are incurred. It has been estimated that labour and overhead costs in total will be R303 600 per quarter. This figure includes depreciation of R19 600.

- Schoenen expects to repay a loan of R100 000 in quarter 3.

- The cash balance at the beginning of quarter 1 is estimated at R49 400 positive.

- Credit sales & credit purchases are Vat inclusive.

REQUIRED

Prepare a cash budget for each of the **three** quarters.

SOLUTION TO QUESTION 2

	Quarter 1	**Quarter 2**	**Quarter 3**
	R	**R**	**R**
Receipts			
Balance forward trade receivables	125 000		
20% cash sales	100 000	90 000	96 000
56% in same quarter	280 000	252 000	268 800
24% in quarter following sales		120 000	108 000
Total receipts	505 000	462 000	472 800
Payments			
Balance forward trade payables	60 000		
Materials 50% in same quarter	69 000	75 600	57 800
Materials 50% in next quarter		69 000	75 600
Labour and overheads	284 000	284 000	284 000
Loan repayment			100 000
Total payments	413 000	428 600	517 400

	Quarter 1	Quarter 2	Quarter 3
	R	R	R
Opening balance	49 400	141 400	174 800
Net cash flow	92 000	33 400	-44 600
Closing balance	141 400	174 800	130 200

(CIMA adapted)

QUESTION 3

Fancy Shoes Ltd reports the following financial data:

Net earnings	R6 000 000
Shares issued	2 000 000
Earnings per share	R6
Market price per share (ex-dividend)	R80
Expected dividend per share	R4

The company is considering a share repurchase, which is favoured by the main shareholders. If the shares are repurchased, the company would make a tender offer for 95 238 shares at a price of R84. Alternatively, the company could pay a dividend of R4, after the payment of which each share would sell for R80.

REQUIRED

a. Discuss the impact that the choice of dividend payment or share repurchase plan has on the wealth position of the company's shareholders. You may ignore the effect of taxation.

b. Describe five reasons why a company may want to repurchase it shares.

SOLUTION TO QUESTION 3

a. Ignoring taxes, the wealth position of the shareholders remains unchanged in this specific case, regardless of the alternative chosen. If the repurchase alternative is chosen, the share price after repurchase will be R84, and if the cash dividend alternative is chosen, the wealth position of all shareholders will be R84, consisting of a R80 share price, plus R4 in cash.

b. Reasons for share repurchases

- Tax considerations. There may be a tax advantage in respect of share repurchases, because taxes on capital gains income can be deferred until the stock (share) is sold.
- Financial restructuring. The company can gain the benefits of increased financial leverage through issuing debt and using the proceeds to repurchase its issued shares.
- Future corporate needs. Repurchased stock can be used for future acquisitions of other companies, executive stock options, exercising warrants and converting convertible securities.
- Disposition of excess cash. Funds that the company does not need can be invested for a good return and used to repurchase stock in the foreseeable future.
- Reduction of takeover risk. By increasing the price of the company's stock and concentrating ownership in the hands of a smaller number of investors.
- Low share price. The current share price is below the director's valuation.
- Future growth. There is an expectation of favourable future growth.

PART 4, TOPIC 7 – CURRENCY AND INTEREST RATE RISK MANAGEMENT

INTRODUCTION

In this topic, we will focus on the role of treasury in managing the organisation's currency and interest rate risks through basic hedging tools. The treasury manager needs to understand what factors affect the rate of exchange and interest rates.

LEARNING OUTCOMES

After working through this topic, you should be able to:

- describe the basic workings of foreign exchange rates and interest rates
- identify risks related to foreign exchange rates, interest rates, duration choices, refinancing and liquidity
- address risks related to foreign exchange, interest rates, duration choices, refinancing and liquidity using basic instruments and techniques

ASSUMED PRIOR KNOWLEDGE

We did not cover any of the learning outcomes for this topic in previous modules. Therefore, please pay careful attention when working through the contents of this topic.

THIS TOPIC CONSISTS OF THE FOLLOWING STUDY UNIT:

STUDY UNIT TITLE

STUDY UNIT 9 MANAGING CURRENCY AND INTEREST RATE RISKS

STUDY UNIT 9 MANAGING CURRENCY AND INTEREST RATE RISKS

1. Introduction

This study unit will focus on the role of the treasury function in managing and understanding the working of foreign exchange markets, currency risk as well as interest rates and interest rate risk.

This study unit is based on **selected sections** from the following chapters of the prescribed Skae et al textbook:

- Chapter 15
- Chapter 16

2. Currency risk and calculating exchange rates

When an organisation does a trade transaction with a supplier in another country, for example it imports a product a service, they will have to acquire foreign currency of the supplier's country by converting rand at the bank to settle the purchase transaction. On the other hand, if the organisation sells to a customer in a foreign country, for example it exports a product or services, they will have to sell the foreign currency proceeds they receive to the bank and receive rand in exchange. The foreign currency exchange rate is the conversion rate of currencies and depends on the supply and demand of the currency.

In this section, we will define currency risk, discuss the categories of currency risk and see how currencies are quoted in different markets.

Now study the following sections in the prescribed Skae et al textbook and attempt the activities:

Section	Heading
15.1	*Currency risk defined*
15.2	*Different currency quotes in different markets*

Activity 9.1

A local furniture store, Shaka (Pty) Ltd, imports furniture from an exclusive manufacturer in Europe. The last order was placed on 30 July 20X3 for furniture to the value of €250 000. The shipping terms are free on board (FOB), and the furniture was loaded on 6 August 20X3. The payments terms are 30 days from shipment date, and Shaka (Pty) Ltd makes use of forward exchange contracts (FEC) to hedge against fluctuations in the foreign currency exchange rate.

The following rates are available:

Date	Bank selling rate	Bank buying rate
30 July 20X3	13,0097	13,9916
6 August 20X3	13,0765	13,0605
5 September 20X3	13,5570	13,5411
Forward rate (30 days) on 6 August 20X3	13,1582	

REQUIRED

a. Calculate the rand amount due on the date of the transaction.

b. Assume that no forward cover was taken out to hedge the exchange rate risk. Calculate the foreign currency gain or loss between the transaction date and the payment date.

c. Determine if it would have been to the benefit of the company had they taken out the forward cover.

d. Calculate the mid-rate on 5 September 20X3.

Solution to activity 9.1

a. The transaction date is 6 August, because the shipping terms are FOB. Therefore, the rand amount is determined by means of the bank selling rate on 6 August 20X3 (Shaka (Pty) Ltd is buying currency (EURO) from the bank and therefore the correct rate to use is the bank selling rate).

Rand amount on date of transaction = €250 000 x R13,0765
= R3 269 125

b. Foreign currency gain / loss = €250 000 x (R13,0765 – R13,5570)
= R120 125 loss (the exchange rate deteriorated i.e. the rand was trading weaker against the EURO)

c. Effect of forward cover = €250 000 x (R13,5570 – R13,1582)
= R99 700 gain

Yes, it would have been to the benefit of the company to take out the forward cover, as the spot exchange rate on 5 September 20X3 (R13,5570) is higher than the forward exchange contract (FEC) rate (R13,1582).

d. Mid-rate = $\frac{\text{buying rate} + \text{selling rate}}{2}$

= $\frac{13{,}5570 + 13{,}5411}{2}$

= R13,5491 (rounded to nearest fourth decimal)

3. Theories and factors determining exchange rates

There is a direct relationship between currency and interest rates (called interest rate parity) as well as between currency and inflation rates (called purchase power parity).

Interest rates and the associated risks of a country influence direct foreign investment into the country. This, in turn, drives the supply and demand for a currency and therefore its value. **Interest rate parity** is usually used to calculate exchange rates expected in the **short term**, while **purchase power parity** is used to calculate expected exchange rates in the **medium** to **long term**.

Inflation affects the future value of any investment and therefore, it either drives or discourages investment in a specific country. The effect that inflation rate differences between two countries have on their currency exchange rates is called purchase power parity.

Now study the following sections in the prescribed Skae et al textbook and attempt the activities:

Section	Heading
15.3	*Theories for determining forward exchange rates*
15.4	*Factors influencing exchange rates*

Activity 9.2

The following information is available in the South African currency market on 5 September 20X3.

	ZAR/£1
Spot rate	R16,0404
South African (borrowing) interest rate	8,5 % per annum
United Kingdom (borrowing) interest rate	1,5 % per annum
South African inflation rate	6,3% per annum
United Kingdom inflation rate	2,8% per annum

Assume there are 360 days in a year.

REQUIRED

a. Use the interest rate parity principle to determine the 60-day forward rate (round your answer to the nearest four decimals).

b. Use the purchasing power parity theory to determine the forward rate for 5 September 20X5 (round your answer to the nearest four decimals).

Solution to activity 9.2

a. Forward rate by means of the interest rate parity principle

$$\text{Forward rate} = \text{spot rate} \times \frac{1 + \text{interest rate in reference currency}}{1 + \text{interest rate in base currency}}$$

$$= R16{,}0404 \times \frac{1 + (0{,}085 \times \frac{60}{360})}{1 + (0{,}015 \times \frac{60}{360})}$$

$$= R16{,}0404 \times \frac{1{,}0142}{1{,}0025}$$

$$= R16{,}2271$$

b. Forward rate by means of the purchasing power parity theory

$$\text{Forward rate} = \text{spot rate} \times \frac{(1 + \text{inflation rate in reference currency})^2}{(1 + \text{inflation rate in reference currency})^2}$$

$$= R16{,}0404 \times \frac{(1{,}063)^2}{(1{,}028)^2}$$

$$= R16{,}0404 \times 1{,}0693$$

$$= R17{,}1512$$

Note:
Remember to adjust the interest or inflation rates for the period under consideration.

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Online enrichment activity

Search the internet for the "Big Mac index", which considers the price of a McDonald's hamburger between different countries as an informal method of measuring purchase power parity. This term may be protected by trademark. Remember that the index is merely an unofficial measure.

4. Hedging currency risk

An organisation will use hedging techniques to offset the risk of exposure to adverse movements in currency exchange. These hedging techniques include:

- money market hedges
- forward exchange contracts (FECs)
- foreign exchange futures contracts
- foreign exchange option contracts
- currency swaps

For the purposes of MAC3702, we will only focus on the first two hedging techniques. The others will be covered in later MAC modules.

Now study the following sections in the prescribed Skae et al textbook and attempt the activities:

Section	Heading
15.5	*Hedging of currency risk*
15.6	*Money-market hedges*
15.7	*Using forward exchange contracts (FECs) to hedge currency risk*

Activity 9.3

Ithunga (Pty) Ltd imported tiles from an overseas supplier. On 10 June 20X3 Ithunga (Pty) Ltd received an invoice to the amount of $250 000 payable on 18 September 20X3.

The following information is available:

	ZAR/USD
Spot rate (bank's selling rate in South Africa) on 10 June 20X3	R9,947
South African borrowing rate (for a 90-day borrowing period)	8,5% per annum
South African investment rate (for a 90-day borrowing period)	4,76% per annum
American borrowing rate (for a 90-day borrowing period)	3,25% per annum
American investment rate (for a 90-day borrowing period)	0,2733% (3 month maturity)

Assume there are 360 days in a year.

Ithunga (Pty) Ltd makes use of money market hedging to manage the risk related to foreign exchange rate fluctuations. Interest on borrowings and investments is determined and added to the borrowing/investment at the end of the term.

REQUIRED

Determine the following:

a. the rand amount of the payment on 18 September 20X3

b. the effective exchange rate applicable to the transaction on 18 September 20X3

Solution to activity 9.3

a. Rand amount payable

Rationale

Ithangu needs to borrow funds locally in rand on 10 June 20X3, convert it immediately to US$ and invest the converted proceeds in the United States to ensure that enough funds are available for the payment of $250 000 on 18 September 20X3. Therefore, we must determine how much Ithangu needs to invest on 10 June 20X3, based on a return of 0,2733% for 90 days, to ensure that $250 000 is available on 18 September 20X3.

Use the following inputs for your calculator to calculate the present value (PV):

FV = 250 000
n = 1 (interest added at end of period)
i = 0,2733% (maturity in 3 months, therefore no need to do a pro rata calculation of the rate)

COMP PV = 249 319

Now that you have calculated the PV of the investment required, we convert the $249 319 to rands on 10 June 20X3 by means of the spot rate for that day:

Rand amount = PV value on 10 June 20X3 x spot rate on 10 June 20X3
= $249 319 x R9,947
= R2 479 976

Therefore, Ithangu needs to borrow R2 479 976 from a local bank on 10 June 20X3 and convert it immediately to US$ at spot rate and invest abroad.

Next, we need to determine what the total amount of the South African borrowing will be on 18 September 20X3. Use the following inputs for your calculator to calculate the future value (FV):

PV = 2 479 976
n = 1 (interest added at end of period)
i = 8,5% x 90/360 (pro rata for 90 days)

COMP FV = 2 532 799

Therefore, the rand amount was calculated as R2 532 799 on 18 September 20X3.

b. Effective rate

The effective exchange rate "manufactured" on 18 September 20X3 is:
R2 532 799 / $250 000 = R10,13 / $1

Note:
You should pay careful attention to the periods for which the interest rates are provided. Even though the organisation in our example only wants to borrow or invest for 90 days, the interest rate may be provided on an annual basis or for another period (like the three months provided for the American investment rate in our example). Remember to work out a pro rata interest rate if necessary.

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5. Interest rates and interest rate risk

Interest rates measure the cost of borrowings, influence currency exchange rates and provide a guideline for the returns required by investors. You need to be aware of the factors influencing interest rates and the techniques that could be used to hedge or protect the organisation against changes in interest rates.

Now study the following theoretical sections in the prescribed Skae et al textbook and attempt the activities:

Section	Heading
16.1	*Interest rate risk defined*
16.2	*The interest rate mechanism and the different interest rate base rates*
16.3	*The capital, debt and money markets*
16.4	*The level of interest rates in the financial markets*

Online enrichment activity

a. Visit the website of the SA Reserve Bank at http://www.resbank.co.za/Pages/default.aspx and establish what the current repo rate is.

b. Visit the website of two commercial banks and compare their prime overdraft rates as well as the rates they offer for different products.

6. Hedging interest rate risk

As discussed in part 2 on capital structure, debt financing should constitute a major part of the capital structure of an organisation. As such, the interest payable will usually be a sizable amount on the statement of comprehensive income and the statement of cash flows. You should be aware of the various hedging techniques available to reduce interest rate risk, which include the following:

- trading in treasury bills, bankers' acceptances and negotiable certificates of deposit
- forward rate agreements
- interest rate future contracts
- interest rate option contracts
- interest rate swap agreements

For the purposes of MAC3702, we will only focus on the first two hedging techniques for managing interest rate risk. The others will be covered in later MAC modules.

Now study the following sections in the prescribed Skae et al textbook and attempt the activities:

Section	Heading
16.5	*Treasury Bills*
16.6	*Bankers' Acceptances*
16.7	*Negotiable Certificates of Deposit*
16.8	*Forward Rate Agreements*

Notes:

1. It is important that you understand the time value of money concepts underlying the valuation of money market instruments. You should also know how to operate your financial calculator to calculate the effective yield for the different cash flows. If in doubt, refer back to your MAC2602 study guide for the calculator instructions.

2. We should manage interest rate risks for borrowings as well as investments. In topic 6 on working capital, we discussed treasury bills, bankers' acceptances and negotiable certificates of deposit as short-term investment options. The related sections in the textbook covered under this heading explore how the treasurer should weigh his/her options depending on the movement in the interest rate.

Activity 9.4

Thabo has decided to invest his performance bonus of R300 000 in treasury bills. His offer price of R96,25 was successful and accepted on 2 June 20X3.

Market discount rates over the period of maturity were as follows:

02/06/20X3	15,15%
02/07/20X3	14,75%
02/08/20X3	14,15%

REQUIRED

Advise Thabo whether he should hold his investment until maturity, or whether he should trade before maturity. Assume there are 365 days in the year.

Solution to activity 9.4

Investment held until maturity (1 September 20X3 – 91 days)

Price paid for treasury bills	=	R300 000 x 0,9625
	=	R288 750
Value of treasury bills on maturity	=	R300 000
Discount (interest for the period)	=	R11 250
Effective yield	=	$\frac{\text{R11 250}}{\text{R288 750}}$ x $\frac{365}{91}$ x 100
	=	15,63%

If sold after **30** days (2 July 20X3) at a discount rate of 14,75%

Purchase price	=	R288 750
Selling price	=	R300 000 – (R300 000 x 14,75% x **61**/365)
	=	R292 605
Interest for the period	=	R292 605 – R288 750
	=	R3 855
Yield for the period held	=	$\frac{\text{R3 855}}{\text{R288 750}}$ x $\frac{365}{30}$ x 100
	=	16,24%

If sold after **61** days (2 Aug 20X3) at a discount rate of 14,15%

Purchase price	=	R288 750
Selling price	=	R300 000 – (R300 000 x 14,15% x **30**/365)
	=	R296 511
Interest for the period	=	R296 511 – R288 750
	=	R7 761
Yield for the period held	=	$\frac{\text{R7 761}}{\text{R288 750}} \times \frac{365}{61} \times 100$
	=	16,08%

Conclusion:

Thabo should trade his treasury bills on 02/07/20X3 as this gives the highest yield of 16,24%.

Note:

If Thabo sells his treasure bills before maturity, the buyer will earn the interest for the **remainder** of the period, and that will become the new owner's "discount". Thabo therefore only earns interest for the period that he has held the investment. The period for which he has held the investment, plus the period remaining (used to calculate the selling price) should always add up to 91 days.

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7. Summary

In this study unit, you learnt to:

- describe the basic workings of foreign exchange rates and interest rates
- identify risks related to foreign exchange rates, interest rates, duration choices, refinancing and liquidity
- address risks related to foreign exchange, interest rates, duration choices, refinancing and liquidity using basic instruments and techniques

8. Self-assessment theory review questions

After working through the relevant sections in the textbook and the guidance and activities provided in this study unit, you should be able to answer the following questions:

a. Describe the three components of currency risk and provide examples that illustrate each. (15.1.1 – 15.1.4)

b. Discuss six factors that influence exchange rates. (15.4)

c. What are the three base rates in South Africa, and which parties are involved in setting each? (16.2)

d. Discuss four general factors that impact the local interest rates. (16.4.1)

e. What are the three factors that affect the interest rate charged to a specific customer? (16.4.2)

f. Contrast the normal yield curve with the inverted yield curve. (16.4.3)

g. Briefly discuss three general strategies for minimising the organisation's interest rate risk (excluding financial instruments). (16.4.4)

9. Self-assessment question

After working through all the relevant sections in the textbook, guidance and activities provided in this study unit, you should now be able to attempt the following self-assessment questions.

QUESTION 1

Explain the benefits of internal hedging methods for managing foreign currency risk over external methods involving financial instruments.

SOLUTION TO QUESTION 1

Internal hedging arrangements are generally less expensive than external ones. The purchase of financial instruments generally involves professional fees and commissions.

In many circumstances, internal hedging arrangements can cost little or nothing to organise. For example, a company operating in the Euro zone that is forced to accept payments for sales in ZAR may hedge its exposure by importing materials that are priced in rand. Any devaluation of the rand will reduce the revenues, but also the costs.

Offsetting or matching currencies is a simple concept, which also makes internal hedging easier to understand.

Many financial instruments are extremely complicated and may be sold by financial institutions that have little incentive to explain the risks and rewards clearly to their non-expert clients.

Internal hedging can sometimes be used to ease economic exposure, which cannot always be achieved by means of financial instruments. Because costs and revenues will most likely move in the same direction, there is less risk of being undercut by an overseas competitor.

Financial instruments can be invaluable in dealing with very specific short-term exposures, such as a large receivable denominated in another currency, but derivatives cannot adequately deal with long-term fluctuations in costs or revenues.

(CIMA adapted)

QUESTION 2

Answer practice questions 15-1 to 15-4 at the end of chapter 15 in the prescribed Skae et al textbook.

SOLUTION TO QUESTION 2

Find the solutions to the questions after each question.

QUESTION 3

Indaka (Pty) Ltd has reviewed their current risk register and mitigating controls. They currently have a bank loan of R2 000 000, payable in five years' time. Interest is payable annually at a rate of prime plus 1,5%. In the light of the current prime rate (8,5%) and the risk that the interest rate will increase in the near future, they have decided that it would be to their benefit to enter into a forward rate agreement (FRA) at 10% for the next 12 months on 1 September 20X3.

REQUIRED

Comment on the effectiveness of the FRA at 31 August 20X4 if the following movements occur in the prime rate:

a. prime increases to 9,5%

b. prime decreases to 8%

SOLUTION TO QUESTION 3

a. Prime increases to 9,5%

When prime increases to 9,5%, the normal borrowing rate will be equal to 9,5% + 1,5% = 11%. The rate locked into the FRA equals 10%. Indaka (Pty) Ltd will make the following cash settlements on 31 August 20X4:

FRA receipt (third party)	R2 000 000 x (11% - 10%)	R20 000
Interest payment to the bank on the loan	R2 000 000 x 11%	(R220 000)
		(R200 000)

Therefore, the effective interest rate for the period is $= \frac{\text{R200 000}}{\text{R2 000 000}}$

$= 10\%$

b. Prime decreases to 8%

When the prime rate decreases to 8%, the normal lending rate will be equal to 8% + 1,5% = 9,5%. The rate locked into the FRA equals 10%. Indaka (Pty) Ltd will make the following cash settlements on 31 August 20X4:

FRA payment (third party)	R2 000 000 x (9,5% - 10%)	(R10 000)
Interest payment to the bank on the loan	R2 000 000 x 9,5%	(R190 000)
		(R200 000)

Therefore, the effective interest rate for the period is $= \frac{\text{R200 000}}{\text{R2 000 000}}$

$= 10\%$

Conclusion:

Although there is some movement in the prime rate, the effective interest rate is consistent and equal to the fixed interest rate as per the agreement. The company therefore mitigated the risk of increased lending rates by entering into a FRA. However, when the prime rate decreased (their fears of an increase did not materialise), they were paying a higher effective rate. That is the "cost" of certainty.

Note:
Remember to calculate pro rata interest charges for periods less than one year.

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