MO 001/3/2016

Principles of strategy, risk and financial management techniques

MAC2602

Semesters 1 & 2

Department of Management Accounting

Content of this MO

BAR CODE

APPENDIX A

Administrative and General Information

IMPORTANT INFORMATION:

This appendix contains important information about your module.

CONTENTS (Appendix A)

Page

1 INTRODUCTION

Dear Student

We are pleased to welcome you to this module and hope that you will find it both interesting and rewarding. We shall do our best to make your study of this module fulfilling and successful. You will be well on your way to success if you start studying early during the semester and resolve to do the assignments in an accountable manner.

Tutorial matter

You will receive a number of tutorial letters during the semester. A tutorial letter is our way of communicating with you about teaching, learning and assessment.

MO001 (Appendix A) contains important information about the scheme of work, resources and assignments for this module. We urge you to read it carefully and to keep it at hand when working through the study material, preparing the assignments and the examination and addressing questions to your lecturers.

Please read ***Appendix A*** as it gives you an idea of generally important information when studying at a distance education institution and within a particular College.

In ***Appendix A***, you will find the assignments as well as instructions on the preparation and submission of the assignments. It also provides all the information you need with regard to the prescribed study material and other resources and how to obtain it. Please study this information carefully and make sure that you obtain all the necessary material.

We have also included certain general and administrative information about this module. Please work through this appendix carefully.

Right from the start we would like to point out that **you should read all the communications** you receive during the semester **immediately and carefully**, as they always contain important and, sometimes, urgent information.

2 PURPOSE OF AND OUTCOMES FOR THE MODULE

2.1 Purpose

This module serves as an introduction to strategy, financial management, financing, managing and investing of funds and risk management.

This module is primarily intended for people who are interested in qualifying as registered chartered accountants (SAICA) or management accountants (CIMA). This module will enable students to develop the necessary competencies prescribed by these professional bodies.

Pre-requisite: FAC1502 & Co-requisite: (either BNU1501 or QMI1500 or DSC1630)

The purpose of this module is to equip students with knowledge and understanding regarding management accounting principles. Theories, methods, techniques and skills relevant to financial management are introduced and applied in topics such as:

- Enterprise strategy and strategic financial management – creating an understanding of the role of strategic management and factors influencing such strategy.
- Risk management – define and explain risk, risk frameworks, approaches and identification, risk assessment and reporting.
- Managing and investing of funds – analysis of financial information, analysing and managing working capital, capital investments and capital budgeting techniques.
- Financial management, financing and the cost of capital – time value of money concepts and solving time value of money problems, sources and forms of finance, theory of capital structure and the calculation of the cost of capital.

2.2 Outcomes

After completing this module, students must be able to demonstrate:

- knowledge and comprehension of the concepts relating to strategy, the stakeholders and factors influencing such a strategy and how the organisation's strategy is developed and the ability to apply this knowledge in basic scenarios;
- knowledge and comprehension of the role of the financial manager, the impact of the time value of money, various sources of financing, the capital structure and be able to calculate the weighted average cost of capital;
- an ability to analyse financial information in order to assist in the management of the long and short term funds of an organisation and to apply selected capital budgeting techniques to elementary investment decisions;
- an awareness of frameworks, procedures, processes and reporting mechanisms that are part of the organisation's effective risk management plan. Students must be able to identify different categories and types of risks from an analysis of basic scenarios and suggest elementary risk responses.

3 LECTURER(S) AND CONTACT DETAILS

3.1 Lecturers

The lecturers responsible for this module are as follows:

Lecturer: M Lötter (Mrs)
Building and office number: Samuel Pauw Building, Room 4 - 47
Telephone number: 012 429 4321

Lecturer: N Smit (Miss)
Building and office number: Samuel Pauw Building, Room 4 - 46
Telephone number: 012 429 4179

E-mail: 1st Semester: MAC2602-16-S1@unisa.ac.za
2nd Semester: MAC2602-16-S2@unisa.ac.za

E-mail and telephone numbers are included above and any correspondence (e.g. letters) should be addressed to:

The Module leader (MAC2602)
Department of Management Accounting
Samuel Pauw Building
PO Box 392
UNISA
0003

PLEASE NOTE: Letters to lecturers should not be enclosed with or inserted into assignments.

3.2 Department

The Department of Management Accounting is situated in Pretoria at the main campus on the fourth floor of the Samuel Pauw building.

Enquiries that are not of an administrative nature **but** are **about the content of this module** should be directed to the lecturers. Please have your study material available when you contact your lecturers.

3.3 University

If you need to contact the University about matters not related to the content of this module, please consult the publication *myStudies @ Unisa* which you received with your study material. This booklet contains information on how to contact the University (e.g. to whom you can write for different enquiries, important telephone and fax numbers, addresses and details of the times that certain facilities are open).

How you contact Unisa?

Unisa website (http://www.unisa.ac.za & http://mobi.unisa.ac.za)

All study-related information is now available on the new Unisa corporate website in both web and mobi formats.

***my*Unisa** (https://my.unisa.ac.za/portal & https://my.unisa.ac.za/portal/pda)

Students can access their own information via the *my*Unisa website or mobi site.

E-mail (info@unisa.ac.za)

Students may send an e-mail to info@unisa.ac.za for information on how to contact specific divisions at Unisa via e-mail.

SMS (**32695** - only for students in South Africa)

Students may send an SMS to 32695 for more information on how to contact specific divisions at Unisa via SMS. The sender will receive an auto response SMS with the various SMS options. The cost to the student per SMS is R1,00.

Fax (012 429 4150)

Students will be able to fax their enquiries to 012 429 4150, where after it will be distributed to and processed by the relevant department.

How to contact the College of Accounting Studies (CAS) Student Information Hub:

Tel no: 012 429 4211

Or

E-mail addresses:

- CASenquiries-Postgraduate@unisa.ac.za
- CASenquiries-Undergraduate@unisa.ac.za
- CASenquiries-CTA@unisa.ac.za

4 MODULE-RELATED RESOURCES

PLEASE NOTE: Your lecturers cannot help you with missing study material. Please contact despatch@unisa.ac.za or send a sms to 43579 for study material.

This is an online module. All the resources for this module are available on the myUnisa module webpage. For your convenience the main content is also available in this MO001 document.

4.1 Prescribed books

There are no prescribed books for this module.

4.2 Recommended books

There are no recommended books for this module.

4.3 Electronic Reserves (e-Reserves)

There are no electronic reserves for this module.

5 STUDENT SUPPORT SERVICES FOR THE MODULE

For information on the various student support systems and services available at Unisa (e.g. student counselling, tutorial classes and language support), please consult the publication *myStudies@Unisa* that you received with your study material.

CONTACT WITH FELLOW STUDENTS

5.1 Study groups

It is advisable to have contact with fellow students. One way to do this is to form study groups. The addresses of students in your area may be obtained from the following department:

Directorate: Student Administration and Registration
PO Box 392
Unisa
0003

5.2 E- Tutors

Unisa offers online tutorials (e-tutoring) to students registered for the module MAC2602.
Once you have been registered for the module, you will be allocated to a group of students with whom you will be interacting during the tuition period as well as an e-tutor who will be your tutorial facilitator. You will receive a sms informing you about your group, the name of your e-tutor and instructions on how to log onto MyUnisa in order to receive further information on the e-tutoring process.

Online tutorials are conducted by qualified e-tutors who are appointed by Unisa and are offered free of charge. All you need to be able to participate in e-tutoring is a computer with internet connection. If you live close to a Unisa regional centre or a Telecentre contracted with Unisa, please feel free to visit any of these to access the internet. It is the role of the e-tutor to guide you through your study material during this interaction process. For you to get the most out of online tutoring, you need to participate in the online discussions that the e-tutor will be facilitating.

6 MODULE-SPECIFIC STUDY PLAN

Read the information on general time management and planning skills contained in the *my Studies @ Unisa* brochure.

Plan your studies properly so as to achieve specific study goals at predetermined dates. This avoids a haphazard approach to your studies and the use of ineffective study techniques.

Suggested study programme for 2016

First priority - Compulsory assignment 01 (to gain admission to the examination and contributing 25% towards your year-mark)

Study the following topics in the study material:

- Topic 1 – Development of the organisation's strategy (Strategy and strategic planning),
- Topic 2 – Introduction to financial management and
- Topic 3 – Time value of money.
- Topic 4 – Sources and forms of finance,
- Topic 5 – Capital structure and the cost of capital,
- Topic 6 – Analysis of financial information and
- Topic 7 – Analysing and managing working capital.

Complete and submit the compulsory assignment number 01 (included in annexure A for semester 1 and annexure C for semester 2), before the due date. This is a multiple choice questions (MCQ) assignment.

Second Priority – Assignment 02 (contributing 75% towards your year-mark)

- Topic 1 – 7 as for assignment 1,
- Topic 8 – Capital investments and capital budgeting techniques,
- Topic 9 – Risk theory and approaches to risk management,
- Topic 10 – Risk identification and documentation and
- Topic 11– Risk assessment, the management of risk and risk reporting.

Complete and submit assignment 02 (included in annexure B for semester 1 and annexure D for semester 2), before the due date. This is a written assignment.

Important: See guidelines on how to submit written assignments electronically via my unisa under Frequently asked questions page 13 to 15 of this Appendix.

Please note that it is the policy of this department not to mark the whole assignment. Depending on the length and difficulty of the assignment, ONLY ONE OR TWO QUESTIONS OR PARTS OF QUESTIONS MAY BE MARKED.

To assist learners, a study programme is provided. This programme indicates the dates on which certain sections of the study material as well as assignments should be completed. The study program is based on the assumption that learners devote more or less 4 hours of study to each topic.

We are convinced that, if you adhere to this programme, you should have no difficulty in mastering the subject. It is very important that the subject matter covered in the topics should be mastered and not just skimmed. If you happen to register late or fall behind with this programme, extra effort on your part will be necessary.

PLEASE NOTE: Learning only the solutions to the assignments off by heart is not enough to help pass the exam. You also need to focus on the self-assessments provided in the study material.

Suggested study programme: Semester 1

Date	Topics from the study material	Due date
29/01/2016 to 16/03/2016	Topic 1 – Development of the organisation's strategy Topic 2 – Introduction to financial management Topic 3 – Time value of money Topic 4 – Sources and forms of finance Topic 5 – Capital structure and the cost of capital Topic 6 – Analysis of financial information Topic 7 – Analysing and managing working capital	**16/03/2016**
17/03/2016 to 06/04/2016	Topic 8 – Capital investments and capital budgeting techniques Topic 9 – Risk theory and approaches to risk management Topic 10 – Risk identification and documentation Topic 11– Risk assessment, the management of risk and risk reporting	**06/04/2016**

Suggested study programme: Semester 2

Date	Topics from the study material	Due date
10/07/2016 to 24/08/2016	Topic 1 – Development of the organisation's strategy Topic 2 – Introduction to financial management Topic 3 – Time value of money Topic 4 – Sources and forms of finance Topic 5 – Capital structure and the cost of capital Topic 6 – Analysis of financial information Topic 7 – Analysing and managing working capital	**24/08/2016**
25/08/2016 to 14/09/2016	Topic 8 – Capital investments and capital budgeting techniques Topic 9 – Risk theory and approaches to risk management Topic 10 – Risk identification and documentation Topic 11– Risk assessment, the management of risk and risk reporting	**14/09/2016**

7 ASSESSMENT

Please note: Although students may work together when preparing assignments, each student should write and submit his or her own individual assignment. In other words, you should submit your own ideas in your own words. It is unacceptable for students to submit identical assignments on the basis that they worked together. That is copying (a form of plagiarism) and none of these assignments will be marked. Furthermore, you may be penalised or subjected to disciplinary proceedings by the University.

7.1 Assessment plan

Formative assessment:

Assignments are seen as part of the learning material for this module. Before you complete an assignment, work through the relevant topics in your study material. Pay specific attention to the learning outcomes provided at the start of each topic and make sure that you are able to complete the activities and self-assessment questions provided in each topic before attempting the assignment. Discuss the work with fellow students or tutors. You are then actively engaged in learning. Assignments and tutorial letters form an integral part of your tutorial matter and must be studied for examination purposes.

Plagiarism: Plagiarism is the act of taking words, ideas and thoughts of others and passing them off as your own. It is a form of theft which involves a number of dishonest academic activities.

The Disciplinary Code for Students is given to all students at registration. Students are advised to study the Code.

Compulsory assignments

Submission of compulsory **assignment 01** will earn you admission to the examination. The mark you earn for compulsory assignment 01 will contribute **25%** towards your year mark, which comprises 20% of your final mark.

Admission to the examination will therefore only be **obtained by submitting compulsory assignment 01** and the marks obtained for it will contribute towards your year mark.

Assignment 02 is a written assignment that contributes **75%** towards your year mark, which comprises 20% of your final mark.

You will undoubtedly realise the importance of commencing your study programme timeously so that you can earn a good year mark, by submitting the **two** assignments.

Please refer to the *myStudies @Unisa* brochure on how to use and complete a mark-reading sheet. This assignment will not be marked if it is not completed on a mark reading sheet. Assignment 02 for both semesters is a written assignment.

PLEASE NOTE: Enquiries about assignments (e.g. whether or not the University has received your assignment or the date on which an assignment was returned to you) must be e-mailed to Assign@unisa.ac.za

Year mark:

The **mark obtained** for compulsory assignment 01 counts 5% and the **mark obtained** for assignment 02 counts 15%, giving a year mark out of 20% towards the final mark.

How it is calculated?

Students require a combined final mark of 50% to pass a module. This final mark is calculated as follows: **5%** for assignment 01 and **15%** for assignment 02 + **80% x mark obtained in the examination.**

The division between the year mark and the examination mark.

If a student fails the examination with less than 40%, the year mark will not be used to pass the student.

How it will work in practice?

The marks you obtain for the compulsory assignments 01 and 02 will be your year mark, contributing towards a possible maximum of 20% of your final mark in the examination. A sub minimum of 40% in the examination is however required, before the year mark will be taken into account towards your final mark.

Your year mark will be taken into account as follows:

- mark (%) for compulsory assignment 01: 25% of year mark (5% of final mark)
- mark (%) for compulsory assignment 02: 75% of year mark (15% of final mark)

The year mark will contribute 20% towards your **final mark**. The mark you obtain in the examination will count 80% and your year mark will count 20%. If you earn 75% for compulsory assignment 01, 65% for compulsory assignment 02, and 48% for the examination, your final mark will be 41,10% i.e. [(75% x 0,05) + (65% x 0,15) x 20%) + 38,40% (48% x 80%)]

7.2 Unique assignment numbers and due dates

Assignments are numbered consecutively per module, starting from 01.

Your answers in respect of the assignments should be addressed to Unisa (not to the lecturer concerned) and should reach the University not later than the dates specified below. (Refer to the study programme in par. 6).

All assignments have their own unique assignment number.

Please indicate the provided unique number on your mark reading sheet. Failure to do so will result in no admission to the exam.

Assignment number	Due date – First Semester	Due date – Second Semester
01 *(Compulsory for admission to the examination and part of year mark)*	16/03/2016	24/08/2016
02 *(Contributes to your year mark*)	06/04/2016	14/09/2016

7.3 Submission of assignments

Students may submit written assignments and assignments completed on mark-reading sheets **either** by post **or** Mobile MCQ submission **or** electronically via myUnisa. Assignments may **not** be submitted by fax or e-mail.

Note that it will be wise to submit assignments electronically via *my*Unisa a day or two before the due date as the system is often overloaded on the due date. If the system gives an error message, please wait a while and try again until your assignment is accepted.

For detailed information on assignments, please refer to the *myStudies@Unisa* brochure, which you received with your study package.

To submit an assignment via *my*Unisa:

- Go to *my*Unisa.
- Log in with your student number and password.
- Select the module.
- Click on assignments in the menu on the left-hand side of the screen.
- Click on the assignment number you wish to submit.
- Follow the instructions

Receipt of assignments after the due date disrupts the marking programme and the uncontrolled submission of assignments furthermore creates administrative problems. You are requested to carefully note the under mentioned requirements and suggestions and to adhere strictly to them:

1. **NO EXTENSION OF TIME WILL BE GIVEN FOR THE SUBMISSION OF ANY OF THESE ASSIGNMENTS, AS SOLUTIONS WILL BE FORWARDED AUTOMATICALLY TO ALL STUDENTS SHORTLY AFTER THE DUE DATES.**
2. **NO CORRESPONDENCE OR TELEPHONE CONVERSATION WILL BE CONDUCTED REGARDING THE LATE SUBMISSION OF ASSIGNMENTS.**
3. **ASSIGNMENTS RECEIVED AFTER THE DUE DATE WILL NOT BE MARKED.**

7.4 Assignments

The assignments for 2016 are provided in the addendum as annexures A to B for the first semester and annexures C to D for the second semester.

You will receive the correct answers automatically for multiple-choice questions. However, solutions to compulsory assignments will be sent to all students registered for this module in a follow-up tutorial letter, and not only to those students who submitted the assignments.

As soon as you have received the solutions, please check your answers. The assignments and the solutions to these assignments constitute an important part of your learning and should help you to be better prepared for the next assignment and the examination.

Please note: Enquiries about assignments (e.g. whether or not the University has received your assignment or the date on which an assignment was returned to you) must be addressed via e-mail (assign@unisa.ac.za) or via sms (43584). You might also find information on myUnisa. To go to the myUnisa website, start at the main Unisa website, http://www.unisa.ac.za, and then click on the 'login to myUnisa' link under the myUnisa heading on the screen. This should take you to the myUnisa website. You can also go there directly by typing in http://my.unisa.ac.za.

Assignments for MAC2602 are supplied in paragraph 10 of this appendix (Appendix A). Assignments are also available on the myUnisa module site.

8 EXAMINATION

To be admitted to the MAC2602 exam you need to submit the compulsory assignment 1 which will also count 25% (maximum) towards your year mark and earn you entry to the exam.
You also need to submit assignment 2 (not compulsory) that will count 75% (maximum) towards your year mark.

8.1 Examination period

This module is offered in a semester period of more or less fifteen weeks. This means that if you are registered for the first semester, you will write the examination in May/June 2016 and the supplementary examination will be written in October/November 2016. If you are registered for the second semester you will write the examination in October/November 2016 and the supplementary examination will be written in May/June 2017.

During the semester of the module, the Examination Section will provide you with information regarding the examination in general, examination venues, examination dates and examination times.

Date: May/June (First semester) and October/November (Second semester)
Duration: Two hours per module
Marks: 100
Covers the whole syllabus (Topics 1 to 11)
Could be summatively assessed using multiple-choice questions and/ or written questions.

Calculator policy:

Candidates may only use silent, electronic, battery driven pocket calculators subject to the following conditions:

- Calculators must be cordless and may not have print-out facilities or alpha keys
- Any financial calculator will be allowed
- The calculator function on mobile telephones or any electronic device (i.e. laptops and/or any Smart Phone) may not be used
- Candidates may not share a calculator with another candidate in the examination room.

8.2 Examination papers

Previous examination papers are available to students on myUnisa as well as in the exam tutorial letter which you will receive nearer to the exam.

8.3 The importance of a positive study method

Examination statistics have proved that those learners who prepare their work thoroughly and who complete all the assignments have a better chance of obtaining a pass in the examination than those learners who are content with doing no more than the minimum work.

Only after you have acquired the necessary knowledge should you read through the assignment for the first time, work out the solutions under examination conditions and submit your answers to us so that they will reach the University on or before the due date of the assignment (not after the due date).

The assignment should in effect constitute your first revision of the work which you have studied. In other words, the assignment should not serve as a check list of the work to be studied for the completion of the assignment, but should, when the assignment is attempted, serve as a test of the knowledge you have acquired by studying the work.

When you receive the solutions and compare the suggested solutions with your own, you are provided with an opportunity of revising the work for a second time. If you persevere with such a rigid program of study you will reap the benefit of sustained practice in answering questions and will undoubtedly enjoy success in the examination.

8.4 Tutorial letter with information on the examination

To help you in your preparation for the examination, you will receive a tutorial letter that will explain the format of the examination paper and will contain an old examination paper.

9 FREQUENTLY ASKED QUESTIONS

Please refer to the *myStudies @ Unisa* brochure as it contains an A-Z guide of the most relevant study information.

FAQ for MAC2602

What calculator can I use in the exam?

You may use any financial calculator, as long as it is a non-programmable calculator. Remember that your answer using a calculator may differ from manual calculations. This is due to rounding. In the study material we refer to the Sharp EL-748 and the HP10bII financial calculators. If you use another make or model, you should study the manual thereof for instructions. We cannot give instructions for all the different makes and models of financial calculators. (Also see the calculator policy as stated under Examination above).

Do I have to know all the formulae in the study material or will they be given in the exam paper?

No they are not given in the exam paper, you will have to know them.

Are the factor tables A to D provided in the exams?

Yes they are at the back of your exam paper.

What is important to study for the exam, are there sections that I can leave out?

No, all sections are examinable. Our exam covers the whole syllabus, therefore it is not advisable to leave out any sections of the study material.

What tips can you give me for the exam?

We as lecturers are not allowed to give exam tips to students. It is unethical and not fair to other students that have not spoken to us.

I have not received my study material yet?

You need to call the Despatch department, on +27 12 429 4950 or send a sms to 43579 or send an e-mail to despatch@unisa.ac.za. You can also find your study material in electronic format on *my*Unisa.

I've found a mistake in the study material?

Although we have put in our best effort to have our study material free of errors we will gladly correct any that might have slipped through. Please contact us so that we can amend it.

What is expected from me in the answering of questions that require define, describe, examine etc.?

Please refer back to the "Introduction and overview" section at the beginning of Appendix B on p. xii. Examples of some of the action words that you will come across in the examination and/or in assignments together with their meanings are explained there.

How do I submit my written assignments online?

GUIDELINES ON HOW TO COMPLETE AND SUBMIT WRITTEN ASSIGNMENTS ONLINE BY MEANS OF MYUNISA

The **only acceptable file format for written assignments is** PDF (various PDF writers)

All written assignment MUST be uploaded in **PDF** format. Any other format is not compatible with the onscreen marking tool and therefore it is VERY IMPORTANT that you upload your assignment only in PDF.

DO NOT upload any written assignments in Microsoft Word, Microsoft Excel, Microsoft OneNote or any other possible format available.

DO NOT upload pages as photo images.

DO NOT upload assignments as read only or password protected pdf documents. The onscreen marking tool will not be able to open these assignments for marking purposes and you will receive 0% for the assignment.

(i) Assignments completed **manually**:

Scan the assignment and save it on your computer as a pdf document before it can be uploaded.

- Scan the documents as ONE single document and not all the pages individually.

- **DO NOT** scan the assignment upside down. Open the scanned document on your computer and make sure it is not upside down.

Once you have scanned it in and saved it on your computer as a pdf document you will be able to upload it on myUnisa.

(ii) Assignments completed **in Excel**:

- Make sure that you convert the file to a pdf format first and save it on your computer as a pdf document.
- Once you have converted it CHECK that the questions follow in a logical pattern and that your answers were not cut off in the middle of a sentence or calculation. This will happen if your excel calculations did not fit onto one page. **DO NOT** upload any assignments where a part of the question follows at the end of the pdf document. Therefore, please make sure that all the pages are converted and that the last page do not only have part of a sentence or calculation on it.
- Ensure that you formulas are typed out and that you did not use the formula bar to type in the formula because then only the answer is displayed in the cell without the formula and the substitution of the figures used in the calculation. Marks are awarded for formulas and the substitution of the correct figures into the formulas, not only for final answers. If your answer is correct but it is not supported by a detailed formula and substitution of the correct figures into the formula, you will not receive all the marks for that question.
- If your computer software cannot convert the assignment to a pdf document you will need to print the "excel" assignment and scan it in. Then follow the procedures under "Assignments completed manually".

(iii) Assignments completed **in Word**:

- Make sure that you convert the file to a pdf format first and save the pdf file on your computer as a pdf document.
- If your computer software cannot convert the assignment to a pdf document you will need to print the "word" assignment and scan it in. Then follow the procedures under "Assignments completed manually".

IN ORDER TO SUBMIT WRITTEN ASSIGNMENTS ONLINE, YOU MUST:

- **Create** a separate subdirectory for MAC2602, Assignment 02 on your computer where you can save all your assignment files for MAC2602.
- **Submit** this **one single PDF file** on myUnisa (*See instructions below).

DO NOT upload or submit any assignment other than the correct pdf assignment for the correct module.

DO NOT submit the individual assignment pages on myUnisa. myUnisa will only accept the first page uploaded and you will not be able to submit all the other pages of your assignment. You may only upload a **single PDF file** on myUnisa.

*** HOW TO SUBMIT ASSIGNMENT 02 (WRITTEN ASSIGNMENTS) VIA MYUNISA:**

- Go to www.unisa.ac.za
- Go to myUnisa
- Enter your student number and password

- Select your module from the orange strip - **MAC2602**
- Click on “Assignments”
- Find the MAC2602 course code in the Course column
- Find the corresponding number of the assignment, i.e. 2 in the Ass.No. column
- Click on the Submit link in the Action column next to the assignment number
- Click on the Browse button next to File Name
- In the Choose File dialog box, select the file you want to upload e.g. MAC2602 Assignment 2.pdf, and then click OK
- Select the correct file format from the File Format drop-down list (pdf)
- Click on the Continue button.
- Verify that you are uploading the **correct** file to MAC2602. If the wrong details, e.g. file name, appear on the screen, click Back to restart the file upload process.
- Click on the Continue button to submit your assignment file. If you do not click Continue, no submission action will take place. Large files will take longer to upload than small files. Please be patient after you have clicked Continue.
- **The assignment submission report is your proof that your assignment was submitted. You must print this page for your record purposes.**
- Click on the Return to Assignment List button to go back to the Assignment overview screen.

DO NOT wait till the due date if you want to submit your assignment online via myUnisa. The web server may experience high traffic volumes and it may result in late submission of your assignment.
Please DO NOT click the ‘RESUBMIT’ button unless you want to submit the assignment again from the beginning! When you click that button it immediately cancels your previous submission.

YOU SHOULD ALWAYS TAKE COGNISANCE OF THE FOLLOWING GENERAL ADVICE*:*

- Keep an electronic backup of your assignment that you have submitted, as well as the original assignment if you have done it manually.
- Keep your online submission receipt number or a print screen of your submission receipt as proof of online submission. If you did not receive confirmation that your assignment was submitted successfully then your assignment wasn’t submitted. Please submit your assignment again until you receive confirmation that your assignment was submitted successfully.
- **DO NOT** resubmit your assignment online on myUnisa. Make sure that you uploaded the CORRECT assignment on the CORRECT module BEFORE you click the submit button the first time. (This is similar to dropping a package in the post box – what is done is done.) Do not call or e-mail the lecturers with requests to resubmit your assignment.
- **DO NOT** wait until the last day to submit your assignments online on myUnisa. The servers can’t handle the volume of students and big files being uploaded at once and then you may perhaps not be able to upload your assignment before the deadline.
- **DO NOT** email or fax your assignment **to your lecturers or the Assignment Section** at Unisa. If you have submitted your assignment electronically (through myUnisa) AND manually (either via post or the drop box at Unisa) you will create problems with your assignments as the system might cancel all your assignments and none of that specific assignment will be marked. You will receive 0% as the system might pick up that you have

not submitted the assignment. **Only use one method** to hand in your assignment. Preferably online in myUnisa.

10 ASSIGNMENTS FOR 2016

ADDENDUM A: COMPULSORY ASSIGNMENT 01/2016 FOR THE FIRST SEMESTER

ADDENDUM B: COMPULSORY ASSIGNMENT 02/2016 FOR THE FIRST SEMESTER

ADDENDUM C: COMPULSORY ASSIGNMENT 01/2016 FOR THE SECOND SEMESTER

ADDENDUM D: COMPULSORY ASSIGNMENT 02/2016 FOR THE SECOND SEMESTER

ADDENDUM E: ERRATA APPENDIX C

ADDENDUM A: COMPULSORY ASSIGNMENT 01/2016 FOR THE FIRST SEMESTER

DUE DATE: 16 MARCH 2016

Before attempting this assignment, you should be fully conversant with the contents of topics 1 to 7.

The assignment contains 20 multiple choice questions which have to be answered on an assignment **mark-reading sheet OR via *my*Unisa**.

Submission of this assignment is important to gain admission to the examination. Marks awarded for this assignment contributes 25% towards your year mark which comprises 20% towards your final mark.

The unique number for this assignment is:

MAC2602 - Unique number – 687839

How to use and complete an assignment mark-reading sheet:

1. All the information on a mark-reading sheet must be filled in with a HB pencil.

2. Do not use a pen to fill in the mark-reading sheet.

3. Do not attach a barcode label to the mark-reading sheet.

4. Use only the orange mark-reading sheet that you received with your study material.

5. For more details regarding the completion of the mark-reading sheet, we refer you to the brochure *myStudies @ Unisa*.

COMPULSORY ASSIGNMENT 01/2016 FOR THE FIRST SEMESTER

THIS ASSIGNMENT MUST BE COMPLETED EITHER THROUGH MYUNISA OR ON A MARK-READING SHEET [DUE DATE 16 MARCH 2016]

MULTIPLE CHOICE QUESTIONS (60 marks) Unique number – 687839

Set your calculator on four decimal places for this assignment.

1. The mission statement is devised by the organisation's board of directors as a tool that guides the priorities that direct an organisation's behaviour. Which other benefits of a mission statement are there?

   (a) It provides an indication about the direction an organisation should take.
   (b) It enables communication of a common culture through the organisation.
   (c) It discloses the operating performance of the organisation.
   (d) It describes information with regards to the organisation.
   (e) It is developing corporate values for the organisation.

   1) Statements (a), (b) and (c)
   2) Statements (a), (b) and (d)
   3) Statements (b), (c) and (e)
   4) Statements (a), (c) and (d) (3)

2. The load shedding of electricity usage by ESKOM has a negative impact on the production of Company Y. ESKOM can be referred to as a key stakeholder of Company Y and therefore the choice of strategies are being influenced by the significance of the relationship between Company Y and ESKOM. The significance of the relationship is the _____ ESKOM.

   1) level of interest of …
   2) dependency on …
   3) conditions in …
   4) degree of power of … (3)

3. Choose the correct definition/explanation of "capital structure" from the list of definitions below.

   1) It is the money the organisation has on hand (including petty cash, unbanked payments received) as well as the money in the bank (including cheque accounts or short-term deposits).
   2) It is the term used to describe the annual return or compensation earned on an investment.
   3) It refers to the controlling of balances included in the current assets and current liabilities, the way the related functions within the organisation are performed and the way working capital is financed.
   4) It is the manner in which an organisation's assets are financed. It is normally expressed in percentages of each type of capital used by the organisation, such as debt and equity. (3)

4. The risk of entry by potential competitors forms part of Porter's five forces that shape industry competition. Select the factors which determine the strength of rivalry among current competitors.

   (a) The presence of global customers
   (b) Absence of switching costs
   (c) The growth rate of the industry
   (d) The competitive structure of the industry
   (e) The amount of overhead costs

   1) Statements (a), (b) and (c)
   2) Statements (a), (b), (c) and (d)
   3) Statements (b) and (d)
   4) Statements (b), (c), (d) and (e) (3)

5. What was the traditional historical overall objective of a business?

   1) Sustainability
   2) Capital growth
   3) Maximisation of profit
   4) All of the above (3)

6. After the shift in the role of financial managers from being scorekeepers, the main focus of the financial manager became _____?

   1) the acquiring of funds as well as the use of these funds by applying general management principles.
   2) the planning, organising and control of the financial activities of a business.
   3) the management and control of money and money-related operations within a business.
   4) to contribute with his/her financial knowledge and skills towards the long-term creation of sustainable wealth for the owners/investors of the business. (3)

7. Which ONE of the following statements is a correct description of agency theory?

   Agency theory is:
   1) the conflict between the self-interest of the managers/agents and their task to maximise long-term wealth for the shareholders (owners).
   2) the appointment of managers by the shareholders to run the company on a day-to-day basis.
   3) the transfer of ownership through the sale of shares.
   4) the risk that the goals of agents (managers) may be different from those of the shareholders. (3)

8. You inherited money and want to invest it at the best return. After visiting a few banks for advice, you have two options. The first option offers a rate of 3% compounded 4 monthly and the second option offers a rate of 5% compounded bi-annually. Which option with its matching effective annual rate is the best option?

   1) Option 1 with 12,49%
   2) Option 2 with 10,25%
   3) Option 1 with 9,27%
   4) Option 2 with 10,00% (3)

9. Mr T has started his own photography business. He has a very good camera that will still be fine for the next two years. At the end of the second year, he wants to buy a better camera for R75 000. He can invest his money at a compounded interest rate of 12% per annum. How much should he invest per month for the next two years in order to have the required amount at the end of two years?

   [Use the mathematical formula to calculate the amount and round the final answer to the nearest rand. The financial calculator calculation will present different alternatives due to rounding.]

   1) R2 781
   2) R634
   3) R2 948
   4) R3 108 (3)

10. Which of the following statements regarding the relationship between Table C and Table D are TRUE?

    a) A factor in Table D, for an investment made at the end of the period, cannot be converted to a factor relating to an investment made at the beginning of the period.
    b) The initial amount in Table C is invested at the beginning of the period, whereas the initial amount in Table D is invested at the end of each period.
    c) Table C shows the future value of R1 (a single amount) after *n* years and Table D shows the future value of R1 per period (annuity), received for *n* years.
    d) The factor of R1 at 6% in Table D (*n* = 4) for an investment made at the beginning of the period converted to an investment made at the end of the period, is equal to the sum of the factors of year 1 to 4 in Table C at 6%.

    1) Statements (a), (b) and (c)
    2) Statements (a), (b) and (d)
    3) Statements (a), (c) and (d)
    4) Statements (b), (c) and (d) (3)

11. Which ONE of the following statements refers to the term extrapolation?

    1) Calculates the periodic payments for a loan based on constant payments and a constant interest rate.
    2) Determines a rate that falls between two of the tabulated rates, for example between 8% and 10%.
    3) The calculation used to determine an actual rate where this actual rate lies outside two specific rates.
    4) Used to calculate the present value of a future amount by using a discount rate. (3)

12. Which ONE of the alternatives is represented by this $\left[\left(\frac{(1+i)^{n+1}-1}{i}\right)-1\right]$ formula?

    1) Present value of R1 per period (annuity) where the investment is made at the end of the period.
    2) Future value of R1 per period (annuity) where the investment is paid in advance.
    3) Future value of R1 per period (annuity) where the investment is made at the end of the period.
    4) Present value of R1 per period (annuity) where the investment is paid in advance. (3)

13. Which ONE of the following is an example of raising money internally?

1) Borrow money from creditors.
2) The company generates money by selling an ownership interest.
3) Bonds can be sold directly to investors.
4) Save retained cash flows and reinvest it in the organisation. (3)

14. Which of the following considerations are TRUE when an organisation needs to raise capital?

a) Debt holders run the highest risk of their capital not being repaid.
b) Debt tends to have a finite life while equity tends to be part of the organisation for life.
c) Equity financing is relatively more expensive than debt financing.
d) Holders of ordinary shares do not control the organisation as they have no voting rights.
e) Interest payable on debt is deductible as a business expense for normal tax purposes.

1) Statements (a), (c) and (e)
2) Statements (a), (b) and (e)
3) Statements (b), (c) and (e)
4) Statements (b), (c) and (d) (3)

15. A target capital structure is the point where the mix of the two capital components achieves the lowest average cost of long-term financing for the organisation. LiLo Ltd has a target capital structure of (D:E) 20 000 000:30 000 000. LiLo needs to raise R20 million for a project and wants to uphold the target capital structure. How will the capital structure look after the new project?

1) (D:E) 20 000 000:30 000 000
2) (D:E) 10 000 000:10 000 000
3) (D:E) 30 000 000:40 000 000
4) (D:E) 28 000 000:42 000 000 (3)

16. The yield to maturity (YTM) percentage is _____.

1) the effective required return (cost) for equity instruments.
2) the effective after-tax cost of debt financing.
3) the internal rate of return (IRR) that will discount all cash flows to zero.
4) also called the effective rate of return. (3)

17. Little Ox Ltd is financed with 300 million ordinary shares with an issue price of R10 (market share price is R20) each and with 2 million, 15% debentures at a current market value of R200 500 000. Calculate the weighted average cost of capital (WACC) of Little Ox Ltd if k_e = 18% and k_d = 15% (before tax). [Use the formula method.]

1) 17,56%
2) 17,77%
3) 15,18%
4) 17,99% (3)

18. The ratios used in ratio analysis can be grouped into different classifications. Which ONE of the following is not one of the classifications?

    1) Liquidity
    2) Financial investment
    3) Solvency and financial/capital structure
    4) Profitability and performance (3)

19. In managing inventory, keeping too much inventory results in the following:

    a) Systems to manage/control the inventory
    b) Higher suppliers' bills
    c) Customer dissatisfaction because of higher costs.
    d) Physical stores/infrastructure required to maintain the inventories in good condition
    e) Holding and ordering costs

    1) Statements (a), (c) and (e)
    2) Statements (a), (b) and (d)
    3) Statements (b), (d) and (e)
    4) Statements (a), (d) and (e) (3)

20. The aggressive working capital investment policy is _____.

    1) a policy kept by an organisation to keep working capital in a balance
    2) when a low level of net working capital is kept compared to total assets
    3) established where sales vary througout the year (in seasonal businesses)
    4) where the investment in working capital is high compared to all assets (3)

Total [60]

ADDENDUM B: COMPULSORY WRITTEN ASSIGNMENT 02/2016 FOR THE FIRST SEMESTER

DUE DATE: 6 APRIL 2016 (No extension of time will be given for submission of this assignment)

Before attempting this assignment, you should be fully conversant with the all the contents of MAC2602.

Marks awarded for this assignment contributes 75% towards your year mark of 20% and 15% towards your final mark.

This assignment contains longer type questions.

Please remember to indicate the unique number on your assignment cover, the unique number for this assignment is:

MAC2602 - Unique number – 780546

Important: See guidelines on how to submit written assignments electronically via my unisa under Frequently asked questions page 12 to 14 of this Tutorial letter.

COMPULSORY ASSIGNMENT 02/2016 FOR THE FIRST SEMESTER

THIS ASSIGNMENT MUST BE COMPLETED IN FULL AND SUBMITTED TO REACH THE UNIVERSITY BEFORE OR ON THE DUE DATE OF 6 APRIL 2016.

LONGER TYPE QUESTIONS (100 marks) (120 minutes) Unique number – 780546

Set your calculator on four decimal places for this assignment.

QUESTION 1 (28 marks)
[This question consists of two parts, Part A and Part B.]

PART A

The EEF-J company is in process of applying to be listed on the Johannesburg Stock Exchange (JSE). They have 30 million equity shares in issue. Their current financial statements for the year ended April 2016 has just been approved by the directors. An extract of information from the financial statements is provided to you:

	R'000
Current assets	25 850
Current liabilities	4 556
Total assets	29 800
Total liabilities	9 540
Retained earnings	2 100
Net profit for the year	8 588
Taxation for the year	1 222
Revenue	40 520

In the year ended April 2012, they had a qualified audit report. Thereafter they have improved the internal control procedures and received satisfactory audit reports for the following years.

Mr JJM, the financial manager, approached you as trainee financial manager to assist him in the process of listing the EEF-J company on the JSE.

REQUIRED:

a) Name and briefly explain the process that takes place when a company applies to be listed for the first time. (2)

b) List four of the JSE listing requirements. Apply the financial information of the EEF-J company and determine whether the company will comply with each requirement or not. (10)

c) Provide a conclusion as to whether the EFF-J company complies with the JSE listing requirements as well as a recommendation of what could be done in the instance of not complying. (3)
[15]

PART B

The EEF-J company raised capital by the issuing of shares. To ensure that they attain their target capital structure, they decided to make use of debt financing for their new expansion project. The bond that they are interested in has the following details:

Par value	R16 500 000
Current market value	R12 600 000
Annual interest	14%
Company tax rate	28%
Redeemable after 6 years	Par value

Mr JJM, the financial manager, asked you as trainee financial manager, the following questions regarding the debt financing.

REQUIRED:

a) Which process should EEF-J follow before they can issue corporate bonds? (2)

b) Explain what the "effective cost of finance" entails. (3)

c) Mr JJM wants to know how the new bond will affect their cash flows over the period of the debt. (Ignore the effective interest and taxation. Only indicate the specific in- and outflows regarding the bond for each of the years 0 to 6). (4)

d) Calculate the after-tax cost of the new bond by using your financial calculator. Show detailed inputs. (4)
[13]

<u>QUESTION 2</u> (25 marks)

A cattle farming business, Bhrama Ltd, already owns a number of farms in the Zeesim area. They are in the business of buying and breeding cattle and then selling cattle to various butcheries. They are currently listed on the stock exchange. They are considering expanding the business by acquiring more farms in the Rodsee area. Bhrama Ltd is a leader it the cattle farming business.

The following information for the financial year ended 29 February 2016 is provided to you:

Gross profit	R606 424 000
Net profit	R360 796 000
Gross profit margin	61,35%
Current assets	R1 379 568 000
Non-current assets (including value of farms purchased)	R1 620 984 000
Total liabilities	R1 444 541 000
Long-term debt (including current portion)	R659 900 000
Retained earnings	R56 011

- The company has an issued share capital of 150 million ordinary shares.
- The current (2016) market price per share is 1 400 cents.
- The dividend per share is 10 cents.

REQUIRED:

a) Explain the importance of strategic information of a business. (3)

b) List seven kinds of information that can be included in strategic information and link each kind to the specific information regarding Bhrama Ltd provided in the question. (7)

c) Calculate the following ratios for the year 2016:

i. Net profit margin. Explain what the ratio indicate and whether you reckon the calculated ratio is good or bad with a motivation. (4)

ii. Asset turnover (industry average 0,50). Explain what the ratio indicate and whether you reckon the calculated ratio is good or bad with a motivation. (4)

iii. Debt to equity ratio (based on market value) (3)

iv. Earnings per share (2)

v. Dividend yield (2)

[Round your final answers to two decimals in the case of a percentage or to the nearest rand in the case of values.] [25]

QUESTION 3 (17 marks)

Lovin'-it Ltd imports handcrafted gifts. They purchase an average of R1 000 000 stock from a supplier in India on an annual basis. The credit terms of the supplier is 3/10 net 50. The cost of other short-term financing options has an effective annual rate of 19%. The current tax rate is 28%.

You may ignore the effect of foreign exchange variances.

REQUIRED:

a) Name and briefly explain two advantages and two disadvantages of trade accounts payable. (4)

b) Calculate the value of discount received from the supplier in India if all purchases are paid within the discount period. How should it be accounted for (disclosed) in Lovin'-it Ltd's statement of profit or loss and other comprehensive income? (4)

c) Calculate the effective annual rate of utilising the full credit period. (6)

d) Advise Lovin'-it Ltd of the best financing option (should they make use of the discount offered or not)? Motivate your advice by referring to relevant calculations. (3)

[Work to four decimals and round only your final answer to two decimals.]

[17]

QUESTION 4 (20 marks)

The Rain-from-Spain company is an innovative manufacturing and rental studio that offers a fresh approach to events infrastructure. They manufacture and rent modern furniture and accessories for events. They also illuminate items thereby creating a unique atmosphere in any venue. One of the directors, Mr AB, made a suggestion (option 1) to buy a new manufacturing machine at a cost of R650 000. Depreciation is calculated on a straight-line basis on the cost of the machine over its useful life of 3 years. Mr AB has compiled the following cash flow table.

Cash flows:	Year 1	Year 2	Year 3
Net cash in/(outflow)[Excluding depreciation and after tax]	R247 867	R273 067	R363 067
Factor at 15%	0,870	0,756	0,658
Present value (rounded to the nearest rand)	R 215 644	R206 439	R238 898

The second director, Mr JP, made a suggestion (option 2) that they can rather invest the R650 000 at a specific interest rate at the bank. He said that they then would have R870 000 at the end of 3 years.

These two investment options are mutually exclusive. Management's target rate for investment projects is set at 16%.

REQUIRED:

a) Determine the internal rate of return (IRR) should the company buy the new manufacturing machine as suggested by Mr AB (option 1). Interpolate between 15% and 18%. (9)

b) Use the mathematical formulae method and information given with regard to Mr JP's investment suggestion (option 2) to determine the effective interest rate of his suggestion. Which of the two investment option's should be chosen? Motivate your conclusion regarding the best option by referring to your calculations in (a) and (b) and relevant evaluation criteria. (5)
[Work to four decimals and round only your final answer to two decimals.]

c) Calculate the accounting rate of return (ARR) for the investment in the manufacturing machine (option 1). Use the ARR of buying the machine as calculated as well as evaluation criteria to explain to management why the new manufacturing machine option should be the best choice. (6)
[20]

QUESTION 5 (10 marks)

This question consists of five multiple-choice questions. Each question must be considered independently, except where specific reference is made to information in another question. Each question has only one correct answer, and the marks per question (5.1 – 5.5) are indicated in brackets after each question.

Please answer the five questions by listing the question numbers below one another, from 5.1 – 5.5, with your corresponding answer next to it, for example:

5.1 (a)
5.2 (b)

The questions are as follows:

5.1 The directors of a consulting company realised that stakeholders have varying degrees of influence over the strategic choices that their company makes. Which ONE of the following alternatives does NOT relate to reasons why key stakeholders have an influence on the choice over future strategies?

a) dependency
b) degrees of power
c) level of interest
d) maturity of the organisation (2)

5.2 The Poetry Company arranged a break-away weekend for management to brainstorm on their strategic planning and way forward. They approached you to explain the SWOT analysis approach to strategic planning to them. Which ONE of the following statements is FALSE and should therefore not be included in your explanation?

a) In SWOT analysis, the situational analysis should cover the organisation and its environment currently, as well as how the environment may develop in the future.
b) Strategy formulation is the process when decisions are evaluated to achieve the organisation's strategic objectives.
c) Strategy achievement programmes (implementation) entails putting the strategy into action or making the strategy work as intended by developing detailed plans.
d) Strategy evaluation is the final step at the end of the year when performance is measured to determine the success of the implementation of the detailed plans (2)

5.3 The Pearl Company has done an intensive exercise to identify and evaluate the risks in the company. They have appointed a risk management team to monitor the effectiveness of the risk management process. Which ONE of the following combinations of methods is available to the risk management team to monitor the effectiveness of the risk management process?

a) Scenario management, loss management, key risk indicators, risk and control self-assessments completed by management
b) Risk assessment, risk responses, results of audit reviews
c) Risk reporting, residual risk assessment, documentation of risk
d) Risk description, inherent risk rating, risk categorisation (2)

5.4 The CARE-full Company has a low risk appetite. Management are in the process of formulating risk responses to their inherent risk ratings. Which combination of the risk responses below can be linked to financial, credit risk?

1) Board approved limits, monitoring of results, lending procedures
2) Uninterruptable power supply, system testing
3) Member surveys, increased marketing
4) Human resource development and training plans
5) Underwriting of loans, semi-annual loan reviews

a) Statements (2) and (5)
b) Statements (1) and (4)
c) Statements (2) and (3)
d) Statements (1) and (5) (2)

5.5 The MMdoc Company is compiling a risk register. Which combination of data should NOT BE included in a risk register?

a) Description and date when risk was identified
b) Risk factors, internal and external perspectives
c) Root cause analysis and risk responses as well as the target/implementation date
d) Inherent- and residual risk rating, interdependencies with other risks

(2)
[10]

Total [100]

ADDENDUM C: COMPULSORY ASSIGNMENT 01/2016 FOR THE SECOND SEMESTER

DUE DATE: 24 AUGUST 2016

Before attempting this assignment, you should be fully conversant with the contents of topics 1 to 7.

This assignment contains 20 multiple choice questions which have to be answered on an assignment **mark-reading sheet OR via *my*Unisa**.

Submission of this assignment is important to gain admission to the examination. Marks awarded for this assignment contributes 25% towards your year mark which comprises 20% towards your final mark.

The unique number for this assignment is:

MAC2602 - Unique number – 868158

How to use and complete an assignment mark-reading sheet:

5. All the information on a mark-reading sheet must be filled in with a HB pencil.

6. Do not use a pen to fill in the mark-reading sheet.

7. Do not attach a barcode label to the mark-reading sheet.

8. Use only the orange mark-reading sheet that you received with your study material.

5. For more details regarding the completion of the mark-reading sheet, we refer you to the brochure *myStudies @ Unisa*.

COMPULSORY ASSIGNMENT 01/2016 FOR THE SECOND SEMESTER

THIS ASSIGNMENT MUST BE COMPLETED EITHER THROUGH MYUNISA OR ON A MARK-READING SHEET [DUE DATE 24 AUGUST 2016]

MULTIPLE CHOICE QUESTIONS (60 marks) [Unique number 868158]

Set your calculator on four decimal places for this assignment.

1. There are different competitive strategies that an organisation can follow to achieve their long-term goals. Which ONE the following defines the differentiation strategy?

   1) Minimised expenses and better selling prices than competitors.
   2) Excellent quality products to increase value to the customer.
   3) Emphasise strong market abilities and create products perceived as uniquely creative, attractive and well-designed.
   4) Standard no frills high volume products at better prices than competitors. (3)

2. Which four stakeholder groups are all connected through their relationship with the company?

   1) Employees, Customers, Suppliers, Shareholders
   2) Shareholders, Government, Employees, Banks
   3) Local authorities, Customers, Suppliers, Banks
   4) Suppliers, Customers, Banks and lenders, Shareholders (3)

3. Human resource policies are part of the influential factors in the internal environment when a company's strategy is developed. Which ONE of the following is an example of this factor?

   1) All employees will be dressed in red shirts on the company teambuilding day.
   2) The employees are invited to an informative session where policies and laws will be discussed.
   3) Employees should adhere to specific rules of the company.
   4) Some employees received bonuses for their good work. (3)

4. Which ONE of the following statements is NOT a benefit of using the SWOT analysis for strategic planning?

   1) protecting against external threats
   2) amending internal weaknesses
   3) identification of core competencies of the organisation and building on those strengths
   4) monitoring of their overall external environment – factors are identified and analysed into strengths and weaknesses (3)

5. Nowadays it is important that a business should have "satisfying the needs of all stakeholders" as an objective. A construction company uses water in some of their processes. In accordance with their overall objective, they have decided to filter the water after usage and to reuse it in their processes. Which overall objective is this an example of?

1) Short-term profit maximisation for owners
2) Corporate governance
3) Sustainable long-term wealth creation
4) Long-term owner/investor value maximisation (3)

6. Which inputs do strategic management decisions require from the finance function?

a) Inputs regarding Human Resource (HR) policies and salary packages.
b) Inputs regarding financial planning issues.
c) Inputs regarding investment appraisal.
d) Inputs regarding the company's products adhering to governmental standards.
e) Inputs regarding financial market operations.

1) Statements (a), (b) and (c)
2) Statements (b), (c) and (d)
3) Statements (c), (d) and (e)
4) Statements (b), (c) and (e) (3)

7. There are five types of profit companies provided for in the Companies Act of 2008. Which ONE of the following is NOT one of the five types?

1) state-owned company
2) private company
3) personal liability company
4) public benefit company (3)

8. You will be saving different amounts (unequal amounts) of your annual bonus every year. Over a period of 6 years, the money that you will have invested is as follows: R3 400, R5 500, R1 200, R3 300, R4 400, R2 300. The investment will earn 12% annually compounded interest. Determine the present value of these unequal payments.
[Round your answer to the nearest rand.]

1) R10 183
2) R15 718
3) R14 034
4) R14 472 (3)

9. Mrs SS borrowed R10 000 from a small loans company at a monthly rate of 2,2%. The loan must be repaid in six equal semi-annually instalments. How much would she need to pay as the periodic annuity instalment?

1) R5 164
2) R6 011
3) R2 515
4) R3 498 (3)

10. An annuity is a stream of equal payments at equal intervals of time in the future. Which ONE of the following is TRUE with regard to an ordinary annuity?

    1) An example is dividend payments on ordinary shares, where the dividend pay-out is not static.
    2) An annuity where the payments fall due at the beginning of each payment interval (period).
    3) An annuity where the payments take place at the end of each year or period (payment interval) at the same time that interest is calculated.
    4) The repayment of an amount owing in fixed instalments (payments). (3)

11. Which of the following statements regarding compounding are FALSE?

    a) It refers to the calculation of interest on a principal (initial) amount and adding that interest to the principal for investment in the following period.
    b) Repayments on loans from banks and housing bonds are usually based on compounded interest.
    c) Money invested at compounded interest increases quicker in value, which is why compounded interest is preferred over simple interest.
    d) When we borrow or invest money at a compounded interest rate, the interest due at the beginning of each year, is added to the amount of the original loan or investment (the principal amount).
    e) The interest is not paid at the end of the period in which it accrues. In the next period(s), interest is earned on the capital re-invested.

    1) Statements (b) and (e)
    2) Statements (a), (b) and (d)
    3) Statements (b), (c) and (e)
    4) Statements (d) and (e) (3)

12. You are given this factor from Table B: 3,274. In which ONE of the following time-value-of money problems should this factor be used?

    1) A specific amount to be invested annually at the end of each year for five years at 16% compound interest per annum. Use this factor to calculate the present value.
    2) A person would like to invest a specific amount at the end of each year at an annual compound interest rate of 16%. Use this factor to determine the value after five years.
    3) Invest an amount at an annual compound interest rate of 16% in order to receive Rx after five years. Use this factor to determine the value now.
    4) Someone would like to invest a specific amount at an annual compound interest rate of 15%. Use this factor to determine the value after 5 years. (3)

13. Which ONE of the following statements correctly describes what is meant by secondary market transactions?

    1) The buyers of shares offered to the public by the issuing organisation pay an amount for the share certificates that give them (the shareholders) part ownership in the organisation.
    2) Holders of an organisation's securities can subsequently sell equity and debt securities to other investors.
    3) Bonds with maturities of longer than one year are sold directly to investors.
    4) Capital is raised in this type of market transaction and money flows from the investors to the organisation. (3)

14. Sky-above Ltd had 2 000 ordinary shares in issue. The total market value of the existing shares was R32 000. Sky-above issued 300 new ordinary shares to new investors at a market price of R16 each. What is the percentage of control of the original shareholders after the issue of the new shares?

1) 13,04%
2) 15,00%
3) 86,96%
4) 90,91% (3)

15. Capital structure is the manner in which an organisation's non-current assets are financed. It can also be explained as _____.

1) the mix of equity and long-term debt that determines which percentage of the organisation's cash flow is attributable to owners/investors and which percentage is attributable to lenders.
2) a cross (hybrid) between equity and debt, depending on the terms of issue.
3) a mix of equity and short-term debt of an organisation that will affect the risk and value of the organisation.
4) the owners/investors that are required to take on debt financing as well in order to fund all the long-term assets of the new business. (3)

16. Which ONE of the following is TRUE regarding the criticisms against the dividend growth model?

1) The valuation formula should be restated to calculate the expected rate that investors will require (k_e).
2) The constant growth model is based on the return that the investor is prepared to accept on the investment.
3) The expected growth rate in dividends is predicted by the shareholders.
4) The expected growth rate in dividends and future dividends are uncertain. (3)

17. Which ONE of the following formulas is NOT used to calculate the weighted average cost of capital (WACC)?

1) $k_e \text{ x } \frac{k_e}{v_e + v_d} + k_d \text{ x } \frac{k_d}{v_e + v_d}$
2) (k_e x Equity funding %) + (k_d x Debt funding %)
3) $k_e \text{ x } \frac{v_e}{v_e + v_d} + k_d \text{ x } \frac{v_d}{v_e + v_d}$
4) $\frac{k_e v_e + k_d v_d}{v_e + v_d}$ (3)

18. Growth rate refers to the increase or decrease from one period to another. Calculate the growth rate for revenue of R980 million (previous period: R780 million) and for operating cost of R23 million (previous period: R55 million).

    1) Revenue 25,64% decline, Operating cost 58,18% growth
    2) Revenue 25,64% growth, Operating cost 58,18% decline
    3) Revenue 20,41% growth, Operating cost 139,13% decline
    4) Revenue 20,41% decline, Operating cost 139,13% growth (3)

19. The cost of financing trade accounts change when discounts are offered. What is the rule of when to take up discount that is offered by the supplier?

    1) It should be compared to the cost of other long-term financing sources.
    2) The nominal annual percentage cost equation should take the effect of compounding into account.
    3) The effective cost of discount forgone should be weighed against the organisation's regular cost of short-term funding.
    4) If the organisation’s regular cost of short-term funding (such as the overdraft rate) is lower, it is not cost-effective to take the discount. (3)

20. Which ONE of the following is TRUE with regard to the conservative financing policy?

    1) When temporary working capital is low, the total funding will mainly consist of short-term deposits.
    2) The organisation makes use of more long-term financing.
    3) Excess money will be invested in long-term instruments.
    4) Long-term financing is only used to support the peaks of the temporary working capital. (3)

Total [60]

ADDENDUM D: COMPULSORY WRITTEN ASSIGNMENT 02/2016 FOR THE SECOND SEMESTER

DUE DATE: 14 SEPTEMBER 2016 (No extension of time will be given for submission of this assignment)

Before attempting this assignment, you should be fully conversant with the all the contents of MAC2602.

Marks awarded for this assignment contributes 75% towards your year mark and 15% towards your final mark.

This assignment contains longer type questions.

Please remember to indicate the unique number on your assignment cover, the unique number for this assignment is:

MAC2602 - Unique number – 739537

COMPULSORY ASSIGNMENT 02/2016 FOR THE SECOND SEMESTER

THIS ASSIGNMENT MUST BE COMPLETED IN FULL AND SUBMITTED TO REACH THE UNIVERSITY BEFORE OR ON THE DUE DATE OF 14 SEPTEMBER 2016.

LONGER TYPE QUESTIONS (100 marks) (120 minutes)[Unique number 739537]

Set your calculator on four decimal places for this assignment.

QUESTION 1 (22 marks)
[This question consists of two parts, Part A and Part B]

The financial director of Anti-hi-Jade Ltd, a security company that specialises in the protection of women on roads, wants to acquire a new satellite security system at a cost of R200 million. They need to make decisions regarding the way of financing the new system. The company has a debt:equity ratio (D:E) of 30:70.

In a financial meeting, they identified a few possible forms of financing: issuing of new share capital, corporate bonds, debentures, bank overdraft, sale and leaseback, banker's acceptance, debtor finance (factoring) or instalment sale agreement.

The following information regarding the current situation (before the new satellite security system is taken into account) of Anti-hi-Jade Ltd is available:

Total assets	R1 000 million
Equity	R700 million
Debt	R300 million
Interest rate	9%
Company tax rate	28%
Earnings before interest and tax (EBIT)	R160 million

The new system will increase the earnings before interest and tax (EBIT) with R25 million.

REQUIRED:

PART A

a) Compare financing by means of equity versus financing by means of debt by focusing on the following aspects: taxation, risk and return, initial costs involved as well as capital repayments. Present your answer in a table as follows:

Equity financing versus debt financing:

EQUITY	DEBT
Taxation:	
Risk and return:	
Initial costs involved:	
Capital repayments:	

(4)

b) Which form of financing should Anti-hi-Jade Ltd use, debt or equity? Why? (2)

c) Indicate at least six types of debt instruments that are available for Anti-hi-Jade Ltd to use. Supply a short motivation about the appropriateness or not of each instrument. Present your answer in a table as follows:

Debt instruments and their appropriateness or inappropriateness for Anti-hi-Jade Ltd:

For example 1. Corporate bonds:	
2.	
3.	
4.	
5.	
6.	
7.	

(6)
[12]

PART B

Anti-hi-Jade Ltd strives to increase the returns for equity holders. How will the return on equity (ROE) be affected when the satellite security system is funded by 100% debt? Present the information in the following two tables and then explain the effect of debt funding.

Current financial leverage situation **(interest on debt = 9%)(given)**	
Total assets 1 000:Equity 700 :Debt 300	
Capital structure = D:E =	?:?
Earnings before interest and tax (EBIT)	?
Interest (9% x R ?)	(?)
Profit before tax	?
Income tax expense	(?)
Net profit	**?**
Return on equity (ROE) Formula = ?	$= \frac{?}{?} \times \frac{100}{1}$ = ? %

New system funded with **no equity and 100% debt (interest on debt = 9%)**	
Total assets 1 200:Equity 700 :Debt ?	
Capital structure = D:E =	? : ?
Earnings before interest and tax (EBIT)	?
Interest (9% x R ?)	(?)
Profit before tax	?
Income tax expense	(?)
Net profit	**?**
Return on equity (ROE) Formula = ?	$= \frac{?}{?} \times \frac{100}{1}$ = ? %

[10]

QUESTION 2 (27 marks)

Beta-pharm, a medicine company, asked you to assist them in the financial analysis of their financial information.

The following selective information for the year ended 2016 is provided to you:

	2016 R'000	2015 R'000
Revenue	298 005	215 960
Net operating profit /(loss)	93 955	15 018
Operating costs	(57 200)	(56 630)
Earnings before interest and tax (EBIT)	97 509	17 338
Interest expense	(14 998)	(9 566)
Net profit	59 408	5 440
Trade and other receivables	25 669	15 440
Total current liabilities	34 915	8 066
Total current assets	88 428	44 220
Total Assets	251 918	209 029
Interest-bearing borrowings	105 000	90 392

- The company has an issued share capital of 100 000 000 ordinary shares.
- The current market price per share is 350 cents (2015: 300 cents).
- The dividend per share is 11 cents (2015: 4 cents).
- The revenue and operating profit/(loss) figures for 2014 is R 210 million and R51 million respectively and for 2013 it is R 235 million and R25 million respectively.

REQUIRED:

a) Name six different techniques that can be applied in financial analysis. (3)
b) Describe briefly how indexed financial statements are compiled. (2)
c) Calculate the indexed figures of the revenue and operating costs. Use 2013 as base year. (4)

d) Calculate the following ratios for the years 2016 and 2015:

i. Operating profit margin. Explain what this ratio indicates and give detailed reasons for the change between 2015 and 2016. (5)
ii. Current ratio. Explain what this ratio indicates and give detailed reasons for the change between 2015 and 2016. (5)
iii. Interest cover. Does the change in this ratio from 2015 to 2016 make it safer for Beta-pharm to acquire additional long-term debt or not? (4)
iv. Total assets to total debt ratio (based on book values).What does a high total assets to total debt ratio mean for the investors in the company? (4)

[Work to four decimals and round your final answer to two decimals.]

[27]

QUESTION 3 (18 marks)

Two office furniture trading companies, Wood-ex and Pine-ex, sell all their furniture on credit. The revenue for the year ending July 2016 was R15 million for Wood-ex and R14 million for Pine-ex.

The debtors ageing schedule of both companies is supplied as at the end of July 2016. Both organisations have approximately the same (rand) balance for accounts receivable.
The credit terms offered to the customers of Wood-ex are: 2/10 net 30. The credit terms offered to the customers of Pine-ex are: 3/30 net 45. Value added tax (VAT) is 14% for both companies.

	Wood-ex	
Days outstanding	**Balance of the account**	**Percentage of total balance**
0 - 10	1 255 010	46%
11 - 30	450 335	17%
31 - 60	958 556	35%
60 +	65 225	2%
	2 729 126	100%

	Pine-ex	
Days outstanding	**Balance of the account**	**Percentage of total balance**
0 - 20	501 003	18%
21 - 30	2 006 001	73%
31 - 45	201 055	7%
45 +	62 936	2%
	2 770 995	100%

REQUIRED:

a) Analyse and interpret the ageing schedules for both companies separately. (5)

b) Discuss the possible issues of Wood-ex and Pine-ex by referring to the four different areas of the credit policy. (8)

c) Calculate the receivable days for both companies by using months and discuss your findings.(5)

[18]

QUESTION 4 (23 marks)

The Motor-grand-Car company is a company selling customised racing cars for use in various racing competitions. They use machine CTC to customise each car for a specific client.

The financial manager did some research on a new type of machine that will decrease the overall expenses (material and fixed costs). The cost of this new machine HTB is R950 million.

The financial manager has compiled the following cash flow table.

	Machine	
	CTC- current	HTB- new
	R'000	R'000
Cost price	60 000	950 000
Book value - Current	36 000	-
Tax value - Current	?	-
Market value – Current	25 000	-
Realisable value at end of useful life	NIL	NIL
Useful life:		
- Original	5 years	3 years
- Remaining	3 years	-
	R'000	R'000
Annual expenses (material and fixed costs)	R1 795 000	R1 750 000
Annual production and sales:		
- Maximum sales (number of cars)	30 000	30 000
- Selling price (per car)	R75 000	R75 000
Annual wear and tear allowance for taxation purposes at 25% on the straightline method.	R ?	R ?
Annual depreciation calculated on the straightline method on the cost of the machine over its useful life (included in fixed costs)	R ?	R ?

Additional information:

1. The rate of company taxation is 28%. VAT can be ignored.
2. Management requires a return of 14% on capital projects.
3. Assume that all cash flows occur at the end of the year concerned, except initial capital outlays which occur at the beginning of the year.

REQUIRED:

Determine whether machine CTC should be replaced by machine HTB by:

(i) Calculate the net present value (NPV) of retaining the existing CTC machine. Show detailed tables of cash flows and taxation in order to calculate the NPV. (12)

(ii) Calculate the net present value (NPV) of the new HTB machine. Show detailed tables of cash flows and taxation in order to calculate the NPV. (9)

(iii) Give your conclusion and motivation, based on your calculations in (i) and (ii) above and evaluation criteria, on whether the existing machine CTC should be replaced by the new machine HTB. (2)

[Work to four decimals and round your final answer to the nearest rand.]

[23]

QUESTION 5 (10 marks)

This question consists of five multiple-choice questions. Each question must be considered independently, except where specific reference is made to information in another question. Each question has only one correct answer, and the marks per question (5.1 – 5.5) are indicated in brackets after each question.

Please answer the five questions by listing the question numbers below one another, from 5.1 – 5.5, with your corresponding answer next to it, for example:

5.1 (a)
5.2 (b)

The questions are as follows:

5.1 There are three generally accepted competitive strategies that are available to organisations in order to achieve their long-term goals: cost leadership-, differentiation- and pricing strategies. Which ONE of the following explanations best describes "selective pricing"?

a) By setting a low selling price for a product or service in order to gain market share.
b) By setting high selling prices for unique products, thereby maximising short-term profits.
c) By setting the selling price for a product or service on the perceived value to the customer.
d) By setting different selling prices for the same product or service in different markets. (2)

5.2 Porter's Five Forces Model assumes that the competitive environment within an industry depends on five forces that have an impact on the organisation's success, namely, threat of new entrants, threat of substitute products or services, bargaining power of suppliers and bargaining power of buyers and the strength of rivalry among existing competitors. Which of the following statements refer to the "barriers to exit"?

1) Substantial investment in non-current assets
2) Customer switching costs
3) Penalty clauses in supplier contracts
4) Absence of switching costs
5) Potential upswing in economic conditions

a) Statements (1), (2) and (5)
b) Statements (1), (3) and (5)
c) Statements (2), (3) and (4)
d) Statements (1), (4) and (5) (2)

5.3 One of the eight inter-related components of the enterprise risk management (ERM) programme is control activities. Which ONE of the following statements correctly describes the responsible parties for control activities?

a) The board is ultimately responsible. Management and the risk management department will usually do the assessments and provide feedback to the board or a sub-committee thereof.
b) The board is approving and monitoring the annual risk management plan.
c) The board should ensure continuous risk monitoring by management and the risk management department. The board does this by approving and monitoring the annual risk management plan.
d) Board of directors (the board) and the internal control committee. (2)

5.4 The most important financial risk is that the organisation will not be able to continue to function as a going concern. The OLZ Company is in process of researching hedging techniques. Which financial risk does OLZ want to condense?

a) Credit risk
b) Interest rate risk
c) Investment risk
d) Product risk (2)

5.5 Risk reporting is concerned with periodic reports to the stakeholders and the board of directors. Which ONE of the following is NOT included in risk reporting?

a) results from the internal audit committee
b) a review of management's responses to significant risks and the risk strategy
c) results from the monitoring of risk responses and significant residual risks that exist
d) results of audit reviews to assess the adequacy and effectiveness of the risk management process and mitigating action plans to reduce risks to an acceptable level (2)

[10]

Total [100]

ADDENDUM: ERRATA APPENDIX C.

APPENDIX C: Due to unreadable printing in the shaded areas Page 202 - 203, 205, 208 – 211 should be replaced with the following:

LIKELIHOOD/PROBABILITY		
ASSESSMENT	**MEASUREMENT**	**DESCRIPTION**
extreme	**5**	expected to occur
very high	**4**	will probably occur
medium	**3**	can occur at some time and may be difficult to control
Low	**2**	not expected to occur
negligible	**1**	may occur only in exceptional circumstances

IMPACT/CONSEQUENCE		
ASSESSMENT	**MEASUREMENT**	**DESCRIPTION**
extreme	**5**	impact or consequence of the risk will threaten the survival or viability of the organisation
very high	**4**	will have a significant impact on the achievement of organisation objectives or threaten the continued operation of the organisation
medium	**3**	will have a moderate impact on the achievement of organisation objectives
Low	**2**	will threaten efficiency or effectiveness of some aspects of the organisation
negligible	**1**	limited effect and the impact or consequence of the risk can be dealt with by routine operations

Source: CIMA (2009)

FIGURE 26.1: Risk assessments with the likelihood and impact matrix

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green

Feedback on activity 26.1

Various images of risk rating matrices are available on the internet. The following is an illustrative example of a risk-rating matrix with the calculated values (results of the risk assessments) in brackets:

IMPACT	LIKELIHOOD				
	Negligible (1)	Low (2)	Medium (3)	Very high (4)	Extreme (5)
Extreme (5)	medium (5)	medium (10)	high (15)	critical (20)	critical (25)
Very high (4)	low (4)	medium (8)	medium (12)	high (16)	critical (20)
Medium (3)	low (3)	medium (6)	medium (9)	medium (12)	high (15)
Low (2)	negligible (2)	low (4)	medium (6)	medium (8)	medium (10)
Negligible (1)	negligible (1)	negligible (2)	low (3)	low (4)	medium (5)

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green
	Negligible	usually represented by the colour blue or no colour

Feedback on activity 26.2

Calculation of inherent risk ratings:

a. new technologies to be introduced by a competitor: 4 x 5 = 20
b. inefficient or wasteful contracts: 3 x 4 = 12
c. a fluctuation in currencies: 3 x 1 = 3

The following represents selected fields of the risk register after taking the above information into account.

RISK OBJECTIVE / CATEGORY	RISK TYPE	RISK DESCRIPTION	INHERENT RISK RATING
Strategic risk	Technological risk	New technologies to be introduced.	20
Operational risk	Business risk	Inefficient or wasteful contracts can be entered into on behalf of the organisation.	12
Financial risk	Currency risk	Fluctuation in currencies can have a negative effect on the price of imported raw materials.	3

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green

Activity 27.2

Consider the following risks and the corresponding inherent risk ratings and formulate suitable risk responses if you assume that the organisation's risk appetite is low:

RISK CATEGORY	RISK TYPE	RISK DESCRIPTION	INHERENT RISK RATING	RISK RESPONSES
Strategic risk	Technological risk	New technologies to be introduced.	**20**	
Operational risk	Business risk	Inefficient or wasteful contracts are entered into on behalf of the organisation.	**12**	
Financial risk	Currency risk	Fluctuation in currencies can have a negative effect on the price of imported raw materials.	**3**	

Feedback on activity 27.2

The risk responses below were introduced to align the residual risk ratings with the organisation's risk appetite (refer to study unit 22, section 5), which is low, for these types of risks.

RISK CATEGORY	RISK TYPE	RISK DESCRIPTION	INHERENT RISK RATING	RISK RESPONSE
Strategic risk	Technological risk	New technologies to be introduced.	**20**	i. Obtain the rights to incorporate the new technology into the current products.
Operational risk	Business risk	Inefficient or wasteful contracts can be entered into on behalf of the organisation.	**12**	i. Draft a policy and procedure document for contract management; ii. Have the board approve a delegation of authority; and iii. Appoint a lawyer to review and sign-off on all contracts.
Financial risk	Currency risk	Fluctuation in currencies can have a negative effect on the price of imported raw materials.	**3**	i. Accept the risk.

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green

Feedback on activity 27.3

Calculation of residual risk ratings:

1. New technologies: 4 x 1 = 4.
2. Inefficient or wasteful contracts: 1 x 4 = 4.
3. A fluctuation in currencies: 3 x 1 = 3.

The following diagram represents selected fields of the risk register after taking the information above into account.

Risk category	Risk type	Risk description	Inherent risk rating	Risk response	Residual risk rating
Strategic risk	Technological risk	New technologies to be introduced.	**20**	i. Obtain the rights to incorporate the new technology into the current products.	**4**
Operational risk	Business risk	Inefficient or wasteful contracts can be entered into on behalf of the organisation.	**12**	i. Draft a policy and procedure document for contract management; ii. Have the Board approve a delegation of authority; and iii. Appoint a lawyer to review and sign-off on all contracts.	**4**
Financial risk	Currency risk	Fluctuation in currencies can have a negative effect on the price of imported raw materials.	**3**	i. Accept the risk.	**3**

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green
	Negligible	usually represented by the colour blue or no colour

APPENDIX B

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IMPORTANT INFORMATION:

This appendix contains the first part of the module content.

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CONTENTS

CONTENTS OF APPENDIX C

INTRODUCTION AND OVERVIEW

WELCOME

A sincere welcome to you as a registered student of the module MAC2602. It was Chris Corrigan who said:

> *"I'm a firm believer that to really understand a business takes years, not months. As an investment analyst you think you understand a business from the outside, but the reality is that, once you are inside, you can go on learning for five or ten years."*

We trust that studying PRINCIPLES OF STRATEGY, RISK & FINANCIAL MANAGEMENT TECHNIQUES will not only be stimulating, but will provide new knowledge, insight and practical skills for not only the next five or ten years, but a very long time after that.

The management accounting environment is changing and so do the skills and competencies that are required from chartered accountants and management accountants. It is your responsibility as a student to ensure – after the successful completion of this module – that you keep up-to-date with the latest developments in the relevant field.

We leave you with the inspirational words of a truly learned man:

> *"I learned that courage was not the absence of fear, but the triumph over it. The brave man is not he who does not feel afraid, but he who conquers that fear."*
>
> *Nelson Mandela*

Before starting your studies, it is important that you take note of the important aspects, which follow below.

GENERAL OBJECTIVES OF THIS MODULE

This module serves as an introduction to strategy, financial management, financing, managing and investing of funds and risk management.

This module is primarily intended for students who are interested in qualifying as registered chartered accountants (SAICA) or management accountants (CIMA). This module will enable students to develop the necessary competencies prescribed by these professional bodies.

The purpose of the module is to provide students with an overview of organisational strategy and strategic planning. Furthermore, the module will create an understanding of the role of strategic financial management in achieving the organisation's long-term sustainable goals. The module will develop basic skills with regard to time value of money principles, sources and forms of financing, the cost of capital as well as selected techniques to be applied with regard to the managing and investing of long and short-term funds. Lastly, the module will also introduce students to risk frameworks, approaches and risk identification and management.

PRE-REQUISITES

It is assumed that students have the following knowledge and understanding:

- They have reading and comprehension skills to enable them to read questions and case studies, comprehend the content thereof, and follow a logical thought process. Further, students must be capable of applying basic principles they have been exposed to in the tutorial matter to questions or elementary case studies and formulate an opinion or recommendation, or draw a conclusion from this application.
- Students have knowledge of basic accounting concepts, principles and procedures as indicated by successful completion of the prerequisite module stipulated in the admission requirements.
- Students have knowledge of elementary quantitative methods or quantitative modelling or introductory financial mathematics as indicated by successful completion of the prerequisite module stipulated in the admission requirements.

STRUCTURE OF THIS STUDY MATERIAL

The module is structured as four distinct parts, each containing one or more topics. A topic is the main study area within a part, and each topic is divided further into study units. You will find the outcomes, which you are required to achieve for each topic in this material at the beginning of each topic. Self-assessment activities are provided at the end of each study unit so that you can assess whether you have mastered the learning outcomes.

The parts of the module are described below:

PART 1 – STRATEGY AND STRATEGIC PLANNING

(Topic 1)

The purpose of part 1 is to provide an introduction to the development of the organisation's strategy and the factors influencing such a strategy.

PART 2 – INTRODUCTION TO FINANCIAL MANAGEMENT, FINANCING AND THE COST OF CAPITAL

(Topics 2–5)

The purpose of part 2 is to serve as introduction to financial management, financing and the cost of capital.

PART 3 – MANAGING AND INVESTING FUNDS

(Topics 6–8)

The purpose of part 3 is to teach you how an organisation can manage its funds, the analysis of financial information and apply ratio analysis. We also deal with capital budgeting techniques used when investing funds.

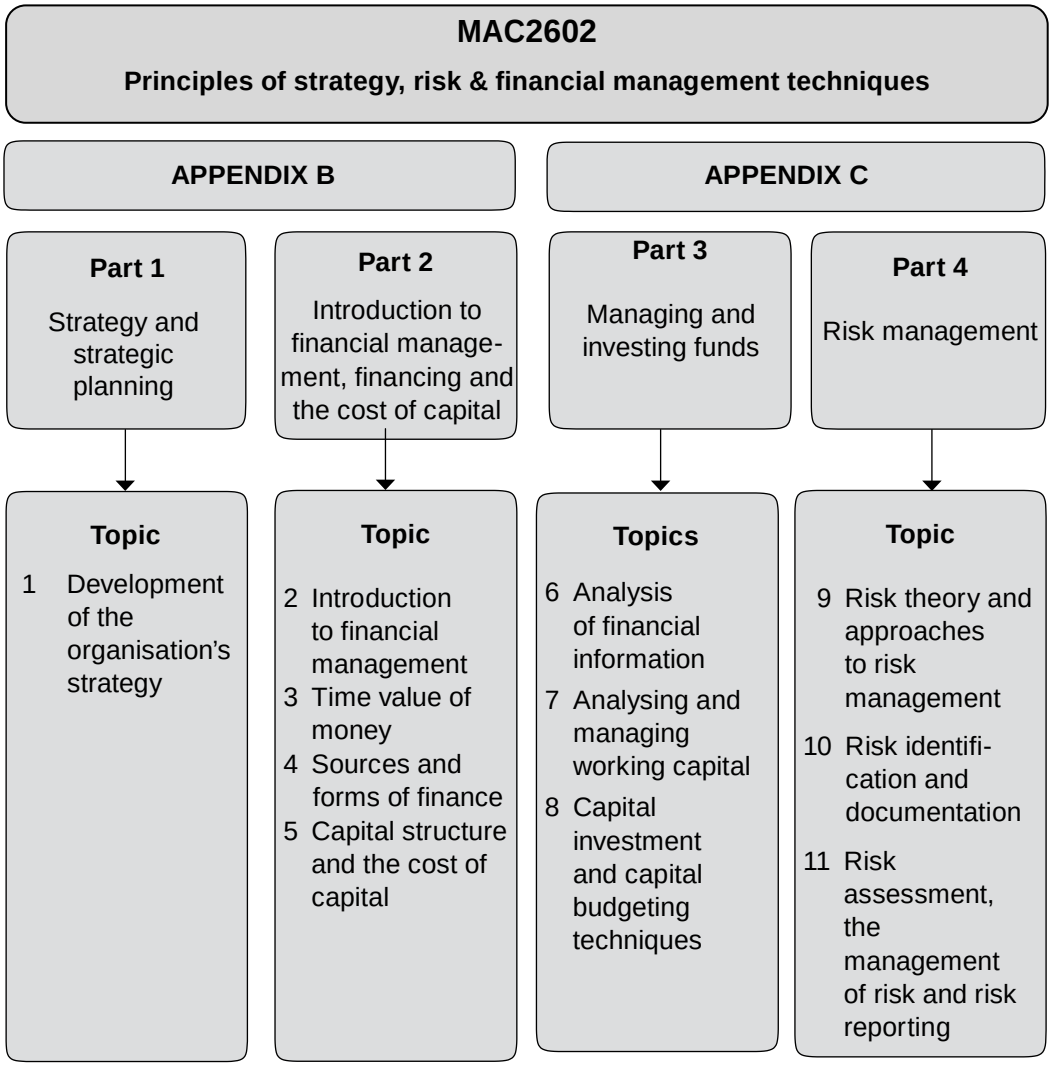
PART 4 – RISK MANAGEMENT

(Topics 9–11)

The purpose of part 4 is to define risk and to explain risk management. This includes risk identification, risk assessment, addressing the risk and risk reporting.

CONTENT – MAC2602 (Diagram 1)

Diagram 1 below contains a schematic presentation of the content of the MAC2602 module.



STUDY MATERIAL AND RESOURCES

Prescribed study material

The prescribed study material for this module is:

- MAC2602 – MO001
- tutorial letters issued during the semester

myunisa resources

Please make use of myUnisa (https://my.unisa.ac.za) as it contains further resources to help you master this module. The following resources are available on myUnisa:

- this MO001 document – MAC2602
- tutorial letters issued during the semester
- previous examination papers

- discussion forum where problem areas are discussed
- announcements
- other resources

Supplementary literature/additional reading

You can use the bibliography at the end of each topic for additional resources if you want to read more on specific topics for self-enrichment.

ASSIGNMENTS

Assignments, with the necessary instructions, are set out in Appendix A of this document. Your assignment questions should be submitted for marking by the due dates.

It is in your own interest to answer and submit as many assignments as possible, since:

- they form an integral, major part of your studies
- you will not be allowed admission to the examination without submitting the compulsory assignment
- they facilitate preparation for the examination
- assignments, as indicated in Appendix A, are taken into account when calculating your year mark; the higher your year mark, the better chance you have of succeeding in this module

CRITICAL SUCCESS FACTORS

Our aim in designing this document was to give you the best possible opportunity to master the knowledge, skills and values required by the discipline and the demands of professional practice.

To ensure that you are successful in your studies, we would advise you to do the following:

- Start as early as possible on your studies. We have found that students who start early
- have time to reflect on their studies and formulate their own informed opinions.
- Use your time sensibly.
- Work systematically through the contents of the study material and other tutorial letters.
- Set realistic goals.
- Believe in yourself.

We designed this module using the South African Qualifications Authority (SAQA) guidelines with regard to the notional hours (time you will need to work through the course material successfully). You will need at least 120 hours to read, practice and study all study material, do your assignments and prepare for the examination. We prepared a guideline time allocation table for you on the next page.

Research has shown that students, who complete their assignments diligently, are more likely to pass their examinations than those who do the minimum.

You will not be able to pass this module successfully if you only try to memorise detail. We suggest that you allow yourself enough time to read through the study material, use

different techniques to summarise the content, spend time reflecting on the issues and principles involved and practice the required calculations.

USING THIS MO001

When commencing your studies, we recommend that you prepare a schedule that allocates time to each study unit, leaving sufficient time for revision closer to the examination (see schedule below).

When studying a new topic, it is recommended that you:

- read the introductory paragraph of the topic in Appendix B and C of this MO001 to accustom you with the aim of the topic
- study the topic in detail using the Appendix B and C as the primary reference to your study material
- prepare summaries of key concepts, definitions and important information from your study material
- evaluate yourself continuously by working through the self-assessment activities provided in the Appendix B and C

STUDY PROGRAMME GUIDELINE

Part	Topic No	Topic	hours
1	1	Development of the organisation's strategy	10
2	2	Introduction to financial management	7
	3	Time value of money	17
	4	Sources and forms of finance	6
	5	Capital structure and the cost of capital	12
3	6	Analysis of financial information	11
	7	Analysing and managing working capital	4
	8	Capital investments and capital budgeting techniques	22
4	9	Risk theory and approaches to risk management	3
	10	Risk identification and documentation	3
	11	Risk assessment, the management of risk and risk reporting	3
Assignments			20
Examination			2
Total hours			120

TEACHING STRATEGY

The focus of our teaching role is to facilitate your learning experiences towards achieving the specific assessment criteria. Furthermore, these learning experiences are designed with the aim of enabling you to master the learning content at a predetermined competence level.

Meaning of words

Throughout this module we communicate learning outcomes and self-assessment criteria phrased in terms of what you should be able to do. This process involves the use of action words, which are typically verbs or phrases containing verbs, describing what the student is expected to do in the learning activity. It is our objective to ensure that the words we use to

indicate a requirement clearly state what you have to do, and you should also ensure that you clearly understand the requirements that are conveyed by the range of words that we will use in the study material for this module.

We list below (in alphabetical order) examples of some of the action words that you will come across in this module, together with their meanings for the purposes of this module.

ACTION	DESCRIPTION
Apply	Make use of in a practical sense; use where relevant or appropriate.
Calculate	Ascertain by mathematical procedure/exact reckoning.
Compare	Examine in order to observe resemblances, relationships and differences.
Complete	Finish/add what is required.
Define	State precisely the meaning/scope/total character; make clear (especially the outline); give a concise description of the distinguishing features.
Describe	Give clearly the distinguishing details or essential characteristics.
Determine	Decide; come to a conclusion/make a decision include reasoning.
Discuss	Examine/consider the opposing arguments.
Draft	Prepare a preliminary version.
Evaluate	Make judgments on basis of given criteria.
Examine	Investigate carefully/in detail.
Explain	Set out the meaning of something; clarify the meaning, provide supporting evidence; argue the truth of something.
Identify	Establish by consideration, select, recognise.
List	Record/item, record/itemise names or things belonging to a class.
Mention/Name/ State	Specify by name; cite names, characteristics, items, elements or facts.
Motivate	Cite facts/reasons as support for a viewpoint or argument and conclude.
Organise	Arrange in an orderly structure/sequence; place into classes/groups according to certain criteria.
Prepare	Make ready/complete; make something ready on the basis of previous study.
ecord	Put in writing; set down for reference and retention.
Summarise	Give a condensed version; state the key aspects.

CONCLUSION

We trust that the preceding sections will assist you in approaching your MAC2602 studies methodically and with a greater understanding.

MAC2602 is not just one of those modules you pass, tick off as part of your degree requirements and continue – these skills are for life! Having these skills will give you a competitive advantage in the market place.

Enjoy your studies and remember the words of Vince Lombardi:

> "The price of success is hard work, dedication to the job at hand, and the determination that whether we win or lose, we have applied the best of ourselves to the task at hand."

We trust that you will enjoy the MAC2602 journey with us. We wish you the best in your studies!

Regards,

Your MAC2602 lecturers

VERY IMPORTANT NOTE

You should not dispose of your study material and other study material such as tutorial letters once you have passed this module. You may need to refer back to it in your next studies, as the principles covered in this module will not be repeated in future modules! In modules following this one, it will be assumed that you have achieved all the learning outcomes specified in the study material.

MODULE PURPOSE

This module is primarily intended for students who are interested in qualifying as registered chartered accountants (SAICA) or management accountants (CIMA). This module will enable students to develop the necessary competencies prescribed by these professional bodies.

The purpose of the module is to provide students with an overview of organisational strategy and strategic planning. Furthermore, the module will create an understanding of the role of strategic financial management in achieving the organisation's long-term sustainable goals. The module will develop basic skills with regard to time value of money principles, sources and forms of financing, the cost of capital as well as selected techniques to be applied with regard to the managing and investing of long and short-term funds. Lastly, the module will also introduce students to risk frameworks, approaches and risk identification and management.

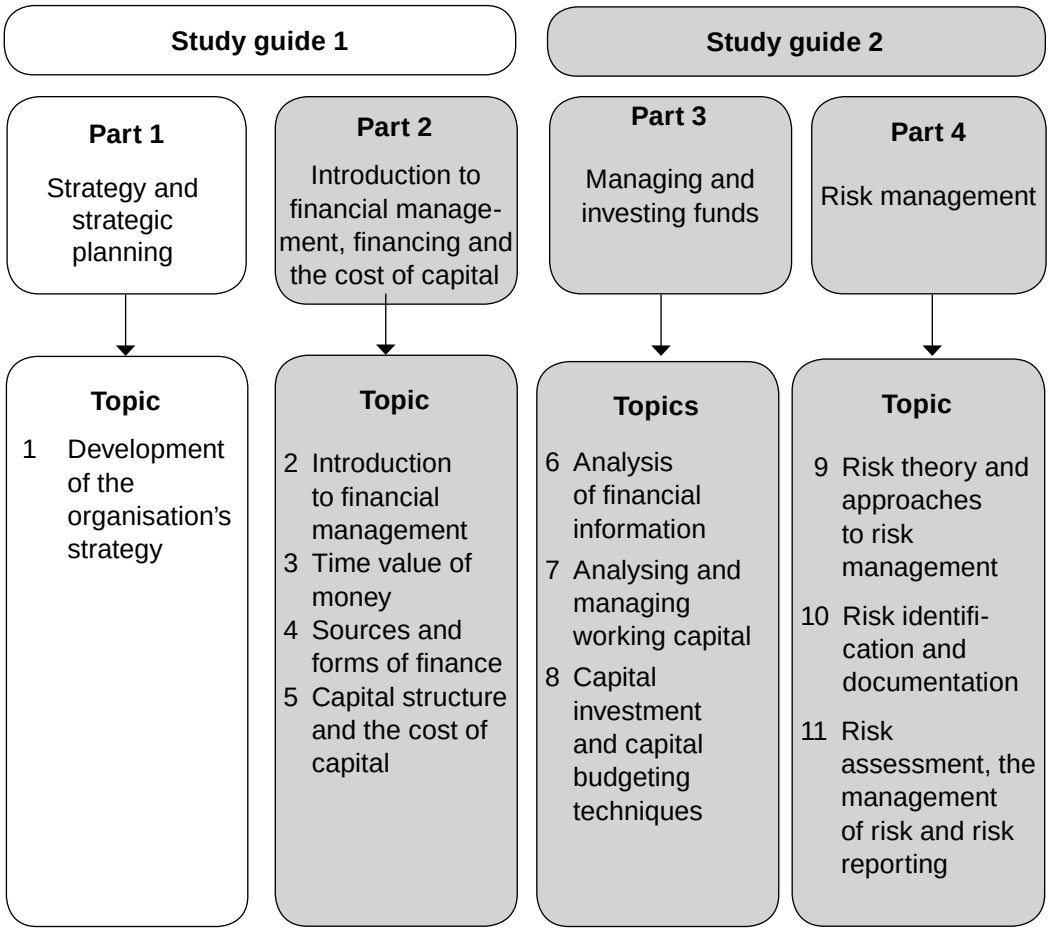
Part 1 Strategy and strategic planning
Part 2 Introduction to financial management, financing and the cost of capital
Part 3 Managing and investing funds
Part 4 Risk management

PART 1

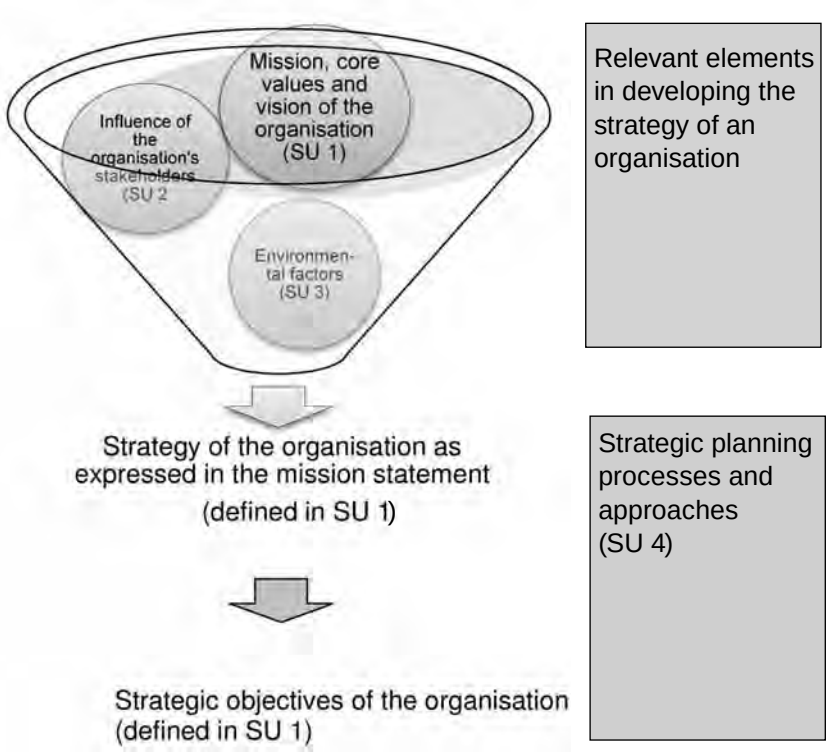
Strategy and strategic planning

PURPOSE

The purpose of part 1 is to provide an introduction to the development of the organisation's strategy and the factors influencing such a strategy.



Many comprehensive books are available on the development of strategy and strategic planning, with various leading scholars in the field having different views and approaches. In this part of the study guide, we do not attempt to discuss all the different viewpoints and approaches. The content of this part of the guide has been written as an **introductory section** to expose you, a future registered chartered accountant (SAICA) or registered management accountant (CIMA), to the development of strategy and selected strategic planning processes and approaches. The next mind map will lay out the topic's components and study units.



Source: Author, 2012

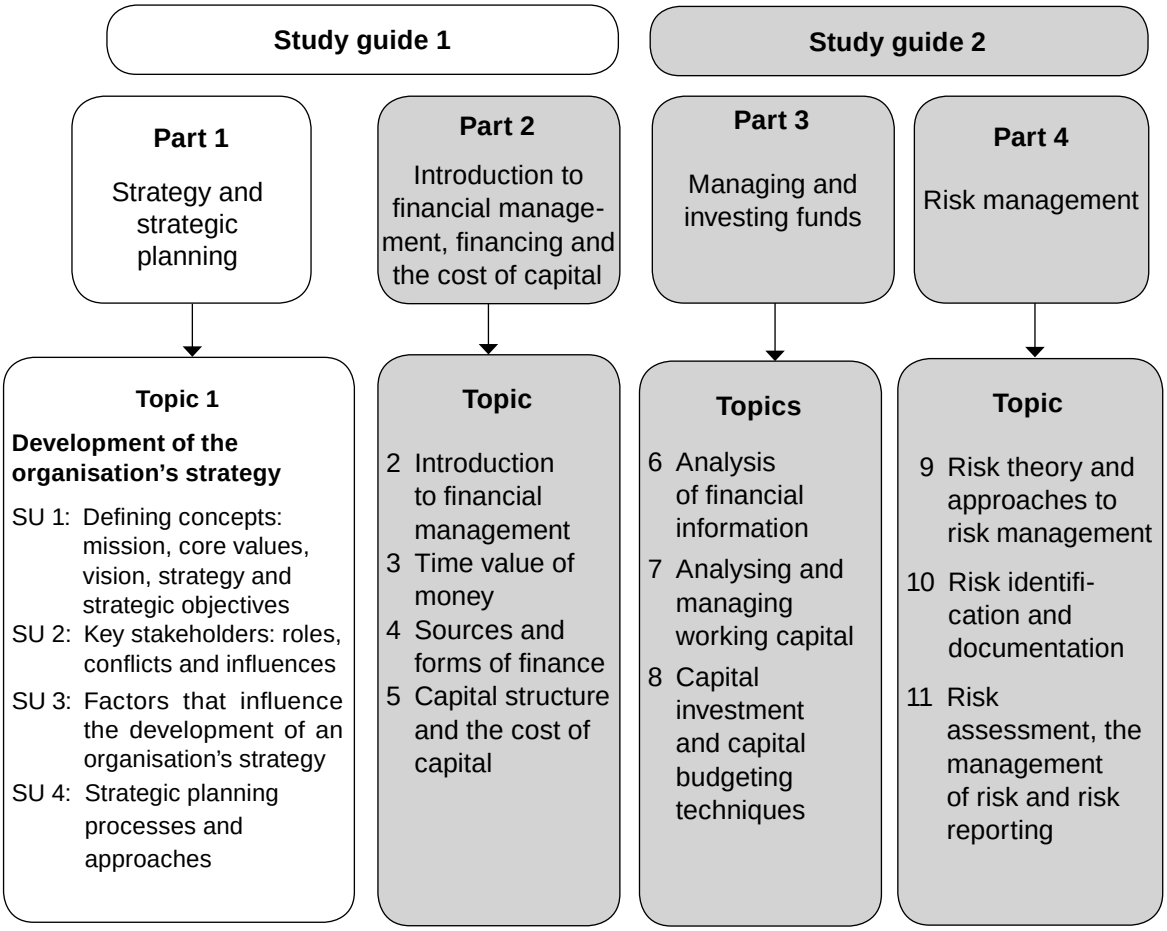
FIGURE 1: Overview of the content of part 1 of this study guide (with references to the relevant study units)

Development of the organisation's strategy

LEARNING OUTCOMES

After studying this topic, you should be able to:

- define and explain concepts relevant to the development of organisation strategy
- distinguish between the roles and influences of different key stakeholders of an organisation
- explain why there is conflict between different stakeholders
- identify and describe the organisation's internal and external environment
- define and describe a typical strategic planning process and critical components of a successful strategic plan
- describe and apply different strategic planning approaches (SWOT, Porter's five forces, etc)



INTRODUCTION

We are sure that, on a personal level, you have thought about or have been asked questions about yourself, such as, who are you really, what are your dreams for the future and how you intend reaching that dream. In finding answers to questions like these, you will no

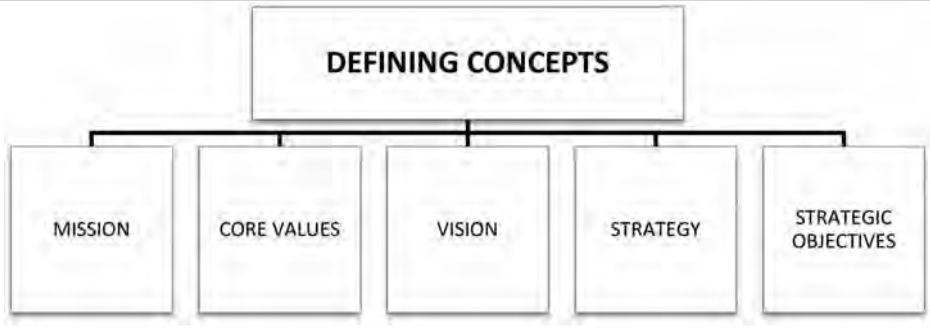
doubt also decide on a plan or course of action, to reach your dreams. Your action plan to reach your dream is your game plan or strategy.

For an organisation to be successful, the same applies, obviously just on a more formal basis. An organisation therefore has to have a plan on the table (strategic plan) on how it intends to reach its dream.

STUDY UNIT 1

Defining concepts: mission, core values, vision, strategy and strategic objectives

In this study unit



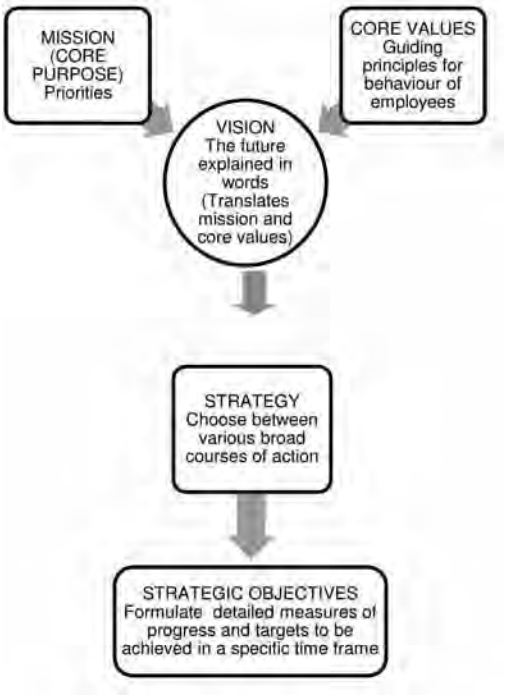
1 Introduction

An organisation has to know what it does/why it exists (mission statement), it needs a dream for the future (vision) and employees have to know what behaviour (core values) is expected from them in dealing with the stakeholders of the organisation to reach its dream. Courses of action (strategies) are chosen to realise the vision. All these elements need to be taken into account – and aligned to one another – to make the dream of success come true.

In this study unit, a short discussion of each of the elements and how it is aligned with each other is provided.

2 Concepts

Figure 1.1 below is a graphical layout of how the different concepts fit together in developing the organisation's strategies and strategic objectives.



Source: Author, 2012

FIGURE 1.1: Visual layout of the connection between concepts

We will now discuss each of these concepts individually.

2.1 Mission

MISSION STATEMENT

A mission statement defines the core purpose of the organisation, by broadly stating the reason(s) why the organisation exists.

A mission statement may be a short sentence or a whole page. The mission statement is a wide statement that does not contain figures (targets) or a time limit for achievement. It is rarely changed as not to lose its force and become just a slogan. The mission statement is devised by the organisation's top management (board) in consultation with management consultants as a tool that guides the priorities that direct an organisation's behaviour, as personified by the actions of its directors and employees.

An effective mission statement should have certain characteristics, namely:

- It should inspire change within the organisation although the mission statement itself does not change.
- It should be long-term in nature, as it will not change.
- It should be easy to understand and easily communicated.

The benefits of a mission statement can be summarised as follows:

- It describes what the organisation is about.
- It reveals the area in which the organisation is operating.

- It provides a guiding philosophy about the direction an organisation should take.
- It enables communication of a common culture through the whole organisation.

Examples of mission statements can be found on the websites of almost all the large organisations (companies) in South Africa. We searched the internet to obtain examples of mission statements. We chose one of the leading clothing, footwear and textiles retailing groups in Southern Africa, namely the Edcon group which include stores such as Edgars, Jet, Boardmans and Prato (http://www.edcon.co.za).

Let us also look at the mission statement of a large manufacturing company in order to compare the mission statements of a retail company with that of a manufacturing company.

We accessed the internet and found the mission statement of South African Breweries (SAB) on their website http://www.sablimited.co.za/sablimited/content/en/sab-vision-and-values.

You can see from the mentioned examples that a mission statement can be a short sentence or a whole page. You should also note that the mission statement is a wide statement that does not contain figures (targets) or a time limit for achievement.

2.2 Core values

CORE VALUES

Core values are the principles that guide an organisation by describing how every employee is expected to behave.

The core values of an organisation should therefore be visible in the day-to-day behaviour of all the employees. Because core values reflect what the organisation stands for, independent of the current environment, they do not change over time, but remain the same.

It is important that leaders strive to set an example and that their words and actions mirror the values that they set for the organisation. The Chief Executive Officer (CEO) sets an example for employees' behaviour. By constantly communicating these values through actions, core values become part of the culture in the organisation. The core values are also reflected in the manner in which corporate governance is exercised in the organisation.

The group values extracted from the Edcon and SAB websites serves as an example. Their values are as follows:

2.3 Vision

VISION STATEMENT

The vision statement defines where the organisation wants to go in the future.

The vision statement gives a clear picture in words of what the organisation wants to become ultimately in the future. It represents an ideal picture/state of the future.

A vision statement should not reflect an extension of the CEO's ego, but present a clear view of the future's opportunities and challenges. The word "industry foresight" better explains a realistic vision statement that is based on insights into trends in regulation, demographics, lifestyles and technology.

Activity 1.1

Use the internet to search the website of at least one service and one manufacturing organisation (company) of your choice. Select their mission, values and vision and compare it with the characteristics and example presented in the discussion regarding those concepts.

REQUIRED

In your opinion:

a. Does their mission define the core purpose of the organisation?
b. Do their core values supply the principles of how every employee should behave?
c. Does their vision define where the organisation wants to go in the future?

Feedback on activity 1.1

Do you notice how the different industries/markets have an impact on the mission, values and vision? You will learn more about this in later study units.

2.4 Strategy

The term "strategy" has different meanings for different people, making one definition almost impossible. We have therefore provided a simple definition of strategy, followed by a discussion of the elements of strategy.

STRATEGY

Strategy is about choosing long-term activities to achieve the purpose set out in the mission statement and ultimately moving towards realising the vision.

Elements of strategy can be identified as follows:

- The choice of activities is important since it should be sufficiently different from that of competitors that could lead to a distinctive place in the market and provide a competitive advantage. Successful strategies can be developed when activities are chosen which focus on the key strengths of the organisation. This distinguishes the organisation from others in the same industry.
- Trade-offs are made when choosing specific actions as opposed to other actions. It necessitates that a decision also has to be made about which activities not to choose.
- The activities that are chosen should fit one another in order to lead to success.
- There can be a change in strategies due to major structural changes in the local or global industry and advancements in technology. These changes can bring about new opportunities that can be incorporated by modifying the existing strategy. Strategy should however not be constantly reinvented.
- The formulation of strategy involves both conceptual and analytical thought processes and should display a broad conceptual knowledge of the operating environment of the organisation.
- The strategies take the organisation's core values into account.

NOTE

In study unit 4 we will delve into more detail regarding the process of setting the organisation's strategy!

TABLE 1.1: Three generally accepted competitive strategies that are available to organisations in order to achieve their long-term goals:

Cost leadership strategy

Aims to supply standard, no frills, high volume products or services at better prices than competitors.

Stresses that facilities are efficient for their purpose and engage in cost reductions in the manufacturing process. Minimises expenses (eg research and development, selling and advertising). An example is Shoprite.

Differentiation strategy

Aims to create products or services perceived as uniquely attractive, creative and well-designed.

Aim to gain a reputation for the excellent quality of their products/services, good corporate image, and first-rate marketing channels. Emphasises strong market abilities. An example is Woolworths.

Pricing strategies

Price skimming:
By setting high selling prices for unique products, thereby maximising short-term profits.

Selective pricing:
By setting different selling prices for the same product or service in different markets.

Market pricing:
By setting the selling price for a product or service on the perceived value to the customer.

Predatory (penetration) pricing:
By setting a low selling price for a product or service in order to gain market share.

The cost leadership strategy focuses on the cost of products (to produce products at the lowest cost). The differentiation strategy focuses on producing unique quality products, and pricing strategies focus on the price of products or services.

The four different pricing strategies depend on the type of product or service as well as the specific market for the product or service. These pricing strategies make use of opportunities in the market to affect the profitability of the organisation and differentiate the product and the organisation in the market.

NOTE

You will learn more about the costing and pricing of products in MAC2601 and MAC3701

2.5 Strategic objectives

As illustrated in figure 1.1, the setting of strategic objectives follows from the mission statement. The mission statement only states the core purpose of why the organisation exists and guides the priorities of the organisation's behaviour, which is vague and has no time limits for achievement. Therefore, strategies are only broadly identified in the mission statement.

STRATEGIC OBJECTIVES

Strategic objectives clearly formulate measures of progress and targets to be achieved in a specific time frame.

A strategic objective has the following characteristics:

- It is a precise formulation of the goals to be achieved.
- It contains a measure for progress towards the attainment of the attribute.
- It contains a target to be achieved.
- It contains a time-frame in which the target is to be achieved.

Strategic objectives should meet the following criteria, referred to by the acronym SMART:

- **S**pecific in what is to be achieved
- **M**easurable, specified as a quantity
- **A**ttainable
- **R**elevant to the mission
- **T**ime-bound with a completion date

Activity 1.2

Assume that you are the financial manager of a large public company that operates a chain of supermarkets in South Africa. The mission of the company is to be one of the largest in the industry in order to meet the needs of all their stakeholders. Identify specific strategic objectives that you will set out to achieve. Make sure that these objectives display the four distinctive characteristics, stipulate the resources to be used as well as the policies to govern the acquisition and use of resources.

Feedback on activity 1.2

Set objectives such as:

The company will become:

- one of the five largest supermarket chains in South Africa (specific attribute) by:
  - gaining at least 50% (target)
  - of the market share (measure)
  - within the next five years (time-frame)

- This will require an increase in the current market share of 30%, to 50% and will be achieved by:
  - taking over 20 existing supermarkets of competitors in rural areas (resources), aggressive marketing and
  - cutting costs by bulk buying from suppliers (policy).

3 Summary

In this study unit, we defined various important concepts. The mission statement sets out the core purpose of the organisation. The mission statement therefore inspires corporate strategy and strategic objectives by indicating the organisation's priorities. The core values represent the way in which things are done as demonstrated through the behaviour of all employees of the organisation. Core values should be linked to the organisation's purpose and reinforce the corporate strategy. The vision statement serves to translate the mission and values to strategy and strategic objectives.

These concepts form the basis for the development of the strategy and setting of strategic objectives of an organisation, as indicated in figure 1.1.

In the next study unit we will focus on the stakeholders that may influence the organisation's strategies.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. What is described in an organisation's mission?
b. What are the benefits of a mission statement?
c. Does a change of the environment generally require a change in core values?
d. How can core values become part of an organisation's culture?
e. What is described in an organisation's vision statement?
f. What is the link between vision statement and strategy?
g. Define strategy.
h. List three competitive strategies that can be used to compete in the market.
i. Distinguish between cost leadership and differentiation strategy.
j. Identify and describe four pricing strategies.
k. List the characteristics of strategic objectives.
l. List the criteria that strategic objectives should meet.

STUDY UNIT 2

Key stakeholders: roles, conflicts and influences

In this study unit

1 Introduction

In the previous study unit, you were introduced to various important concepts like a mission statement, core values and vision statement, which are the basic building blocks for developing the strategy of an organisation.

In this study unit, we will introduce you to the key stakeholders and conflicts that may arise between different stakeholders. We will also explain how key stakeholders can have an influence on the development of an organisation's strategy. You will notice that this is the second circle, slightly to the left in figure 1, which is found at the introduction to this part)

2 Definition of stakeholders

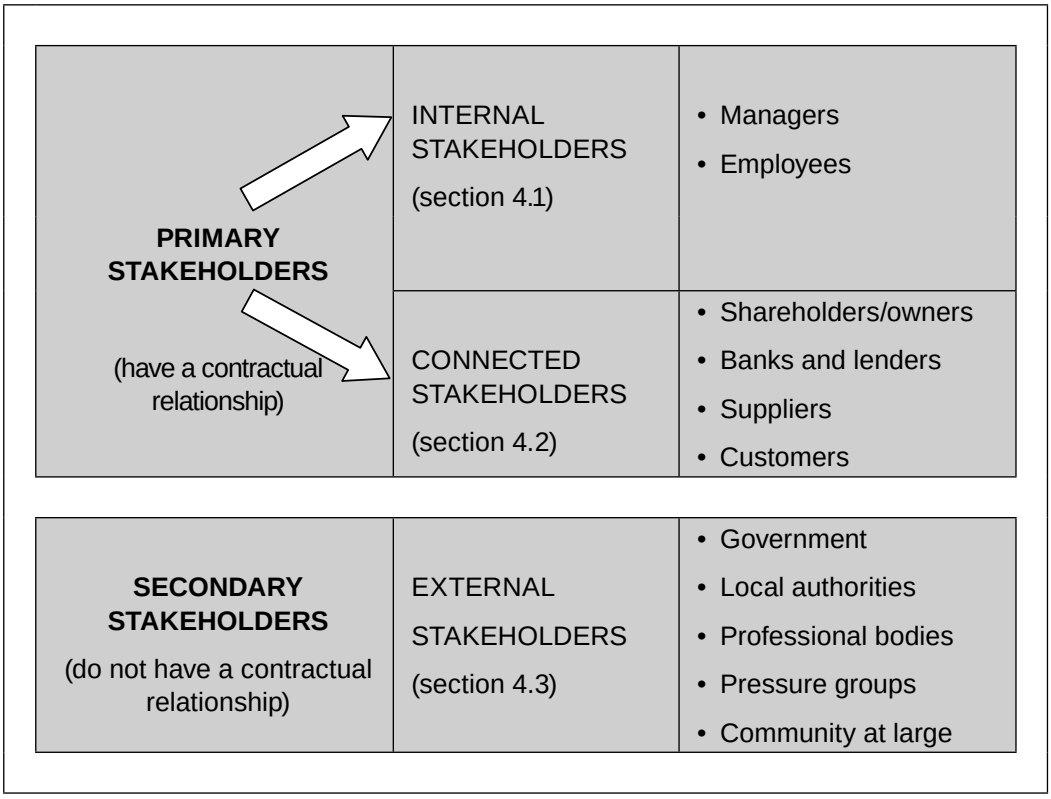
STAKEHOLDERS

Stakeholders are those persons and organisations that are affected by the activities of the organisation and therefore have an interest in the strategy of an organisation. Stakeholders include staff, shareholders, creditors, suppliers, customers, government, local authorities, professional bodies, pressure groups and the community at large.

3 Classification of stakeholders

A classification of stakeholders can be made based on whether the group has a contractual relationship with the organisation or not. Stakeholders can therefore be classified either as primary stakeholders (that have a contractual relationship) or as secondary stakeholders (that do not have a contractual relationship).

Primary stakeholders can further be divided between internal and connected stakeholders while secondary stakeholders are all external stakeholders. A visual layout of the classification of stakeholders is given in figure 2.1 below:



Source: Author, 2012

FIGURE 2.1: Classification of stakeholders

4 Roles of the stakeholders

4.1 Internal stakeholders

Internal stakeholders will have a strong influence on how the organisation is managed because, as the managers and employees, they are intimately involved with the organisation. Their interests will mainly be issues concerned with the growth and continued existence of the organisation because that will have an effect on their jobs/careers. The effect on their jobs/careers could be promotion, money/salaries, benefits and job satisfaction. In certain remote locations, like mines, employers are also responsible for providing housing and other services to employees. This may affect their quality of life.

If the expectations of managers or employees are not met, their response could be resignation, industrial action, or ignoring the goals of shareholders. This means that they will follow their own goals at the expense of organisation goals. An example is a strike by employees (that are dissatisfied with the remuneration offered by the organisation) in order to negotiate better wages.

4.2 Connected stakeholders

Shareholders, banks and lenders, suppliers and customers are connected stakeholders. Each of these groups is connected to the organisation through the relationship they have with the organisation. The individual groups will be interested in the objectives of the organisation in as far as the organisation objectives affect their own respective goals.

Shareholders/owners are the people who have invested their money in an organisation to increase their wealth and earn income from the investment. The interest of shareholders will revolve around the risk attached to their investment in the organisation and the increase in their wealth. The returns required by shareholders could spur the organisation to implement cost cutting exercises (like retrenchments) or shareholders could provide more funds (if they receive satisfactory returns) to invest in expansion projects which could result in more jobs.

If their expectations are not met, shareholders can respond by selling their shares and investing elsewhere. Shareholders who own more than 50% of the shares in an organisation (majority shareholders) may even decide to sell their shares to rival organisations, enabling the rival organisations to take over the organisation. Majority shareholders can even remove and replace the current management. You will learn more about the rights of shareholders in your auditing modules.

Banks and lenders are interested in the cash flows of the organisations to which they extended loans. They are concerned with the security of loans and the compliance to the loan agreements. If they are not satisfied, they can deny credit or charge higher interest rates.

Suppliers are interested in the purchase strategy of the organisation. Suppliers want to ensure that they earn profit from the sales to the organisation and that they are paid for the goods they have supplied. If the organisation fulfils these expectations, suppliers will want to ensure a long-term relationship with the organisation. If the organisation does not, they can end their relationship by not supplying goods to the organisation. If the organisation is not paying for goods as agreed, suppliers may refuse to supply goods until payment is received or they may even file court action for non-payment.

Customers have an interest in the organisation's product market strategy. Customers want the goods to be supplied to them as promised by the organisation. This usually involves the agreed type, quality, quantity and time of supply. Customers often expect to receive future benefits if they are loyal to the organisation. If customers are not satisfied with the goods, they may buy the products elsewhere or they may sue the organisation to recover losses made because of incorrect or substandard goods supplied to them by the organisation.

4.3 External stakeholders

The government, local authorities, professional bodies, pressure groups and the community at large are external stakeholders. Each one of the external stakeholders has different expectations, only two of which are discussed in more detail below:

The government is interested in the number of people that the organisation employs, the training that is provided to the employees and the tax that it will derive from the earnings of the employees and the organisation. The government can influence the organisation by increasing taxes, regulating certain aspects of the organisation and even taking legal action if the organisation does not comply with their regulations.

Pressure groups and interest groups are groups such as workers unions, those for human rights and consumer rights, groups against pollution, the local community, and so forth. These groups act on behalf of people/the environment whose rights are adversely affected by the organisation. The pressure groups can take direct action against the organisation if they feel that the rights which they are protecting are violated. This can result in bad publicity that can harm the public image of an organisation and threaten its existence. An example is the Consumer Protector that acts on behalf of consumers in cases where their rights are denied. The Consumer Protector forces the organisation to adhere to the consumer's rights.

5 Possible conflicts between the expectations of the different types of stakeholders

In the discussion above, we illustrated how the interests of stakeholders in the activities of an organisation are dependent on the type of stakeholder.

Shareholders/owners expect a specific return on their investment while employees expect security of their jobs and job satisfaction. An example where conflict between the expectations of different stakeholders can arise, is when an organisation chooses to use a capital-intensive production process to enhance its competitiveness in the industry and increase its profits for shareholders/owners (shareholders'/owners' interests are prioritised by the organisation). People employed to work in the old labour intensive process will have to be retrained or retrenched (laid off). They will be against the new production process.

The conflict between the expectations of the shareholders/owners and that of the employees can make the implementation of the organisation's strategy – to enhance its competitiveness – difficult. Another example is when concerns about the health and safety of employees and people in the surrounding communities, may lead organisations to spend money on containing smoke and recycling used water. This expenditure will reduce the returns of the shareholders while the expectations regarding safety and health of the employees, pressure groups, local authorities and communities at large, are met.

From the discussion above, you can see that the expectations of the different stakeholder groups may be in conflict with each other and influence the strategic choices of an organisation. The situation becomes even more complicated when some individuals are part of more than one stakeholder group. An example of this kind of complicated conflict is when employees are also shareholders or employees are also customers and/or members of pressure groups such as workers' unions.

6 The influence of different stakeholders on development of organisation strategy

The threat of conflict between the expectations of different stakeholder groups will always have to be taken into account, because it can have a definite influence on the development of the organisation's strategy.

At any given time, an organisation may be influenced more than usual by a specific type of stakeholder due to specific circumstances. This specific type of stakeholder will then be referred to as a key stakeholder.

The influence of key stakeholders can be due to the organisation's dependency on its relationship with that specific type of stakeholder. The dependency can, for instance, be because of cash flow problems when the organisation will depend on its bankers. Although the dependency on specific stakeholders may differ at specific points in time, the organisation always depends on its customers.

Different stakeholder groups also have different degrees of power over the organisation. Great care should be taken of the relationship with those stakeholder groups with the most power and it should be managed well. An example of such a relationship is that which the organisation has with a major customer.

The level of interest that a stakeholder group has in the organisation will also determine its ability to influence the strategy of the organisation. Large institutional shareholders are an example of a stakeholder group with a high level of interest in the organisation.

The significance of the relationship with different stakeholder groups (whether it is because of dependency, their power, or level of interest) should be taken into careful consideration when future strategies are considered.

Because of their connection with and expectations of the organisation, stakeholders have varying degrees of influence over the strategic choices that an organisation makes. These influences include shaping strategic decisions, limiting choices by exerting physical or ethical constraints, and influencing the priority of options under discussion.

Over and above the influence on the choice of strategy, stakeholders can also have an influence on the successful implementation of strategy.

Activity 2.1

Can you identify which specific external stakeholder group can influence the strategy of an organisation by any of the following actions?

a. a ban on smoking in public areas
b. an increase in the tax on liquor
c. an increase in health and safety regulations
d. black economic empowerment (BEE) legislation
e. economic policy that increase or decrease interest rates on borrowed money

Feedback on activity 2.1

All of the above actions are examples of how **government** can have an influence on the strategy of organisations.

Activity 2.2

Identify four **connected** stakeholder groups and supply your own example of the role of each group in influencing the strategy of an organisation.

Feedback on activity 2.2

Refer to section 4.2 and supply your own example for each group.

Activity 2.3

Consider the following scenarios:

a. Customers demand that no products should be tested on animals.
b. The National Union of Mineworkers (NUM) demands that mineworkers' working conditions and their safety must be improved.
c. Banks and retirement funds hold 56,32% shares of Shoprite Holdings Ltd.

Identify the **key stakeholders** in each scenario and explain **how** the **significance** of the relationship between the organisation and the identified key stakeholder can influence the organisation's strategy development.

Feedback on activity 2.3

Scenario a. The customers – the significance of relationship is the organisation's dependency on its customers. The organisation should put a high priority on satisfying the demands of their customers when developing their strategy. The organisation can, for instance, put in their mission statement that they will only supply products that were not tested on animals.

Scenario b. Pressure group – the significance of relationship is the degree of power of the workers' union on the organisation's strategy development. The organisation should implement improvement of the working conditions and safety of their workers as part of their strategy development. The mission statement should contain a specific commitment to create good and safe working conditions for their employees.

Scenario c. Major shareholders – the significance of relationship is the level of interest of major shareholders. The organisation should develop its strategy in such a way that their major shareholders will realise the expected return on their investment in the organisation. In order to ensure this, the organisation should follow a strategy that will enhance the wealth of their shareholders.

7 Summary

In this study unit, we identified different stakeholder groups and explained their different roles. We discussed possible conflict between the groups and the influence that each group can have on the development of the strategy of an organisation.

In the next study unit, we will focus on factors in the business environment that may have an influence on the development of an organisation's strategy.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. Define which persons/groups would be included in the term “stakeholders”.

b. Based on the contractual relationship between an organisation and its stakeholders, name the two broad types in which stakeholders can be classified.

c. Identify four groups of connected stakeholders that are interested in an organisation as far as the organisation objectives affect their own respective goals.

d. Name two groups of external stakeholders over which the organisation has no control.

e. What is the main reason for possible conflict between stakeholders?

STUDY UNIT 3

Factors that influence the development of an organisation's strategy

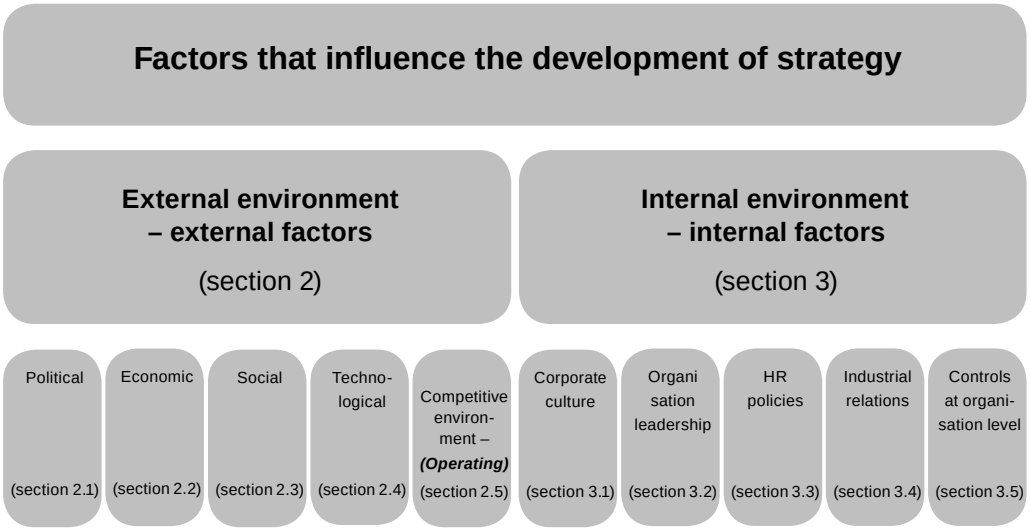
In this study unit

1 Introduction

In the previous study unit, we identified stakeholder groups and discussed their influence on the development of the organisation's strategy.

In this study unit, we will identify and discuss factors that influence the development of an organisation's strategy (represented by the lower circle to the right in the big picture of the development of strategy, in figure 1 (at the introduction to this part).

The figure below provides an overview of the factors that influence the development of strategy in the organisation. You will notice that the "environment" can be divided into the external and internal environment, each of which has various factors that could have an influence on strategy development.



Source: Author, 2012

FIGURE 3.1: An overview of factors in the business environment influencing strategy development

2 Influence of factors in the external environment

Organisations operate in a business environment that is continually changing. The business environment includes all the factors which fall outside the control of management but which can influence the success of the strategies of the organisation.

The five main external environmental factors (forces) that we are going to refer to are political, economic, social, technological and competitive, as indicated in figure 3.1 above. These factors represent most of the challenges that organisations may encounter when trying to attract or acquire resources and when marketing their products and services.

Based on the discussion above, you will agree that the changes that occur within the external environment should be taken into account when the strategy of the organisation is planned. It is also important to take into account the fact that these forces in the external environment are constantly changing (are dynamic) and they are also interactive.

2.1 Political (including legal) environment

Political environmental factors can have either positive or negative effects on the profitability of an organisation. Factors that can have a negative effect are those factors that limit profits; such as restrictions placed on organisations through laws and legislation (legal factors). Examples are fair-trade laws, export restrictions, tax laws, and minimum wage legislation. At any given time, the political climate influences the types of legislation, which in turn influences corporate spending. Examples of this would be taxes on certain luxury goods or taxes on capital gains.

Apart from the laws enacted by the government, the general political climate also influences business and consumer confidence and spending patterns. Examples of important factors are timing of local or general elections, the potential of unrest and whether a specific party or leader is deemed “business friendly”. In countries that experience an unstable political environment and a lack of information, governmental influences are of utmost interest to the operations of organisations.

2.2 Economic environment

The economy has a significant influence on the feasibility of an organisation’s strategy. Economic factors such as inflation, interest rates, tax rates and tax laws, disposable income, unemployment, trends in gross national product and business cycles, need to be assessed as it can have an influence on the organisation. For example, if numerous organisations sustain losses over a few business cycles, their management may have to lay off some of their workers as a means to lower expenses. The reduction in the workforce of an organisation will result in increased unemployment, which in turn, will negatively affect the disposable income as well as the tax base of the local economy.

2.3 Social environment (sustainability and ethics)

The social responsibility of an organisation can be explained as the obligation of management to take actions that protect and improve both the welfare of society as a whole as well as the interests of the organisation and its owners. In recent years, there have been quite a few ethical issues relating to corporate behaviour that have influenced social views globally.

The number of financial scandals in America around 2002, such as Enron, has negatively affected the public’s opinion of corporate strategy regarding decisions that have an effect on shareholder and employee interests. The financial crisis in 2008, caused by slack banking practices, has also damaged societies’ view of the financial services sector. Stakeholders

and more specifically shareholders, now demand transparency about the strategy and actions taken by the directors of organisations to enable them to make informed decisions about investment choices.

Another example of the influence of the social environment is the exposure of unethical and unlawful actions of organisations such as collusion to fix prices. An example is the exposure of the Tiger Brands Group with regard to the fixing of bread prices in South Africa. The phone-hacking scandal in the UK by a newspaper had enraged the public and resulted in New Corp Limited paying damages to people whose cell phones were hacked.

As society became more health conscious and aware of the health risks caused by irresponsible production processes, they demand that organisations comply with their social responsibility towards people's health by taking the necessary precautions with regard to the level of pollution caused.

Companies are held accountable by societies for environmental damages such as that caused by the BP Deepwater Horizon oil spill in 2010. BP had to pay for the cleanup as well as compensate coastal societies for loss of business due to the polluted sea. Mining companies have to pay for the rehabilitation of the mine dumps after the mines close. Societies also demand that organisations plough back some of their profits into schools for local communities, bursaries for further training, and so forth.

2.4 Technological environment

Technological factors are the scientific improvements that affect the competitive position of the organisation. Keeping up with the development of new technologies decreases the probability of products becoming out of date and it also encourages innovation. Advancements in technology can have an impact on or influence the organisation's strategy in a number of ways. For example, new technologies can change the demand for a product, enable the production of new products, cause existing manufacturing processes to become outdated, or reduce costs to a lower level than those of competitors.

Activity 3.1

The following are examples of how factors in the external environment can have a negative effect on the profits of organisations and therefore should be considered in the development of strategy. Link each example to the specific external environment from which it originates.

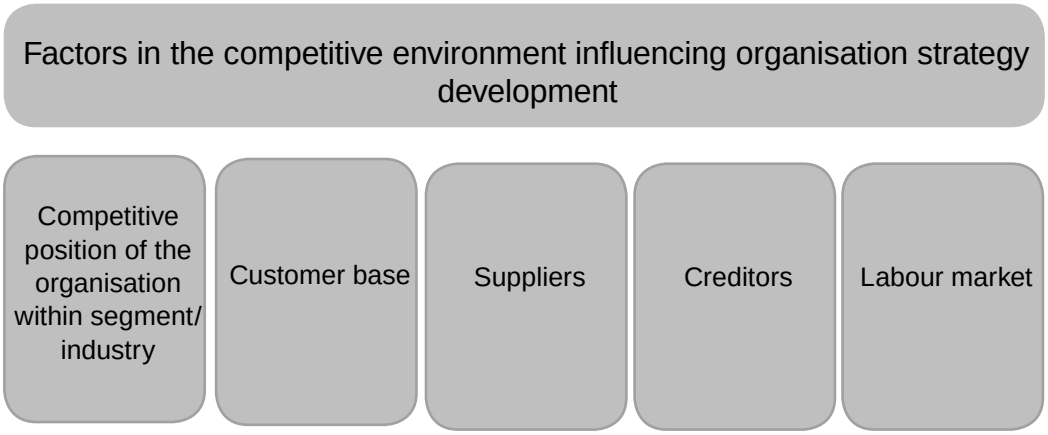
a. an increase in the inflation rate
b. exposure of unethical behaviour of organisations
c. an increase in minimum wages
d. advances in the use of alternative energy resources
e. demands from consumers regarding the use of bio-degradable (environmentally friendly) packaging materials

Feedback on activity 3.1

a. economic environment
b. social environment
c. political environment
d. technological environment
e. social environment

2.5 Competitive environment (operating)

You will remember that we identified the competitive environment as the last external environmental factor influencing strategy development (figure 3.1). In the following figure, we have extended the competitive environment to illustrate the factors that are part thereof.



Source: Author, 2012

FIGURE 3.2: Factors in external competitive environment influencing strategy development

2.5.1 Competitive position

Every business has competitors that provide similar products or services within their segment/industry or professional discipline. They play a role in the overall industry by delivering goods and services of high quality at competitive prices. Having competition is good because it gives consumers choices and presents an opportunity to establish a niche (specialised) market. The number of competitors, the strength of the competition, as well as barriers to entry, all have an impact on strategy development.

In order to understand the competitive position of the organisation, an analysis of its competitors can be done to understand their weaknesses and then to exploit it. An example of such an exploitable weakness is a video shop that charges a fee for the late return of videos. Customers can be influenced to change to another video shop that does not charge fees for late returns. Another strategy to gain the market share of a competitor is to buy the business unit belonging to the competitor. For example, an organisation can buy the majority of shares of a rival organisation as a way to increase their market share.

The purpose of doing a competitor analysis is to:

- Study the market, trends and patterns.
- Predict and forecast an organisation's demand and supply.
- Formulate a strategy.
- Increase the market share.
- Develop a strategy for organisation growth.
- Plan for diversification and expansion.
- Study forthcoming trends in the industry.

2.5.2 Customer base

Customers or clients are an essential part of any organisation. An organisation must be able to manage their marketing and production to make sure that their customers' demands

are met. Organisations that change to adopt to their customers' demands will benefit from growing customer loyalty and improved sales.

2.5.3 Suppliers

A supplier's role is similar to that of a creditor in that the organisation is depending on a third party. An organisation can buy parts, services or other tangible goods from their suppliers. These are then used to create or improve their product or service. The security of supply is very important to the organisation as they will lose money if the needed material, parts or services are not delivered in time, are not of the right quality, and are not at favourable prices.

The strength of the bargaining power of suppliers has an effect on their ability to raise their prices to the organisation. Suppliers that only have a few competitors are likely to be more powerful, if each individual purchase forms only a small amount of their organisation's sales or if there are no good alternatives for their product or service. If a supplier does not plan well or has problems with their production, it could ruin the sales of the organisation to which they supply goods or services.

2.5.4 Creditors

Just like a consumer, organisations purchase goods and services. Since it is likely that they will get discounts or other incentives when buying in bulk, they usually buy on credit. The amount of credit and the terms offered also play an important role in managing the relationships with creditors (suppliers). An organisation with the right credit resources may experience power and prestige in local markets. Improved prestige can provide a better negotiating position with other suppliers, creditors and distributors.

2.5.5 Labour market

Just as customers are a key element of organisation success, so are the employees that an organisation hires to represent their interests. Having quality human resources is very important. The lack of skilled people can cripple an organisation and foster a negative customer experience, which could lead to customer dissatisfaction.

All competitors obtain their employees from the same labour market that provides skilled and unskilled workers. Where the labour market does not have a sufficient supply of workers with specific scarce skills, fierce competition takes place between organisations for these employees. Investing in training and other drivers of job satisfaction are important so that organisations can retain high quality employees.

Activity 3.2

Link each of the activities below to the specific factor in the competitive environment that it relates to.

a. doing market research to determine customer satisfaction
b. predictions and forecasting of future demand and supply of the organisation
c. recruitment of employees that fit the culture of the organisation
d. building good relationships with the organisations that supply raw material as input in the production process
e. determination of future employee needs

f. drawing up of a credit policy whereby organisations that supply products will be paid on time
g. conducting exit interviews with employees that quit
h. conducting market research on the trends and patterns in the market for a specific product

Feedback on activity 3.2

a. customer base
b. competitive position
c. labour market
d. suppliers
e. labour market
f. creditors
g. labour market
h. competitive position

3 Influence of factors in the internal environment

As illustrated in figure 3.1, the factors in the internal environment of the organisation include corporate culture, organisation leadership, human resource policies, industrial relations and controls at organisation level such as the code of conduct. We will discuss each of these factors in the subparagraphs that follow.

3.1 Corporate culture

CORPORATE CULTURE

Corporate culture entails employees' shared beliefs, values and symbols (see also core values).

It guides individual actions and behaviour at the unconscious level. Corporate culture can be seen as the glue that holds everyone together or the compass providing direction that creates a common ground for teamwork. It presents a language for interpreting issues and events, thereby reducing uncertainty.

The value of corporate culture lies in understanding the organisation's culture and how this culture can support the organisation's strategy and strategic objectives. The strengths of an organisation's corporate culture can be used to promote the drive towards success.

Since corporate culture drives perceptions, attitudes and behaviour which have an effect on business results, organisations should look for a culture-fit when appointing new employees. Skills can be acquired, but it is not easy to change a person's attitude or behaviour. An example is an organisation that places a high value on their customers' satisfaction and loyalty. They should appoint people that will fit in with the culture of "the customer comes first".

3.2 Organisation leadership

An organisation's leadership includes executives and managers who run the daily operations of the organisation.

Leaders should effectively manage the organisation's resources and look for ways to improve the organisation by inspiring their employees to do their best work. Leadership should provide the vision, direction and purpose for growth of the organisation.

3.3 Human resource policies

HUMAN RESOURCES

The term human resources (HR) refers to the workforce (employees) of an organisation.

HR is also the name of the function within an organisation that is responsible for implementing strategies and policies relating to the management of the employees (human resources). Over time the function of human resources has changed as management demanded a quantitative as well as a strategic approach to workforce management in order to gain a competitive advantage.

Human resource policies refer to formal decisions, established by an organisation, in order to support their administrative personnel functions, resource planning, employee relations and performance management. HR policies provide an organisation with a tool to manage risk by staying up to date with current trends in employment standards and legislation.

Each organisation has a different set of circumstances and develops an individual set of human resource policies. These policies should be set in such a manner as to support the organisation's vision and their main objective.

Since there are certain requirements for diversity, ethics, training and labour laws to be adhered to, organisations should be aware that these requirements should be incorporated into their HR policy and it may have an influence on their strategy development. For example, in order to dismiss an employee in accordance with employment law requirements, it will normally be necessary to meet provisions within employment contracts and collective bargaining agreements with trade unions.

3.4 Industrial relations (labour relations)

INDUSTRIAL RELATIONS

Industrial relations deal with the employment relationship (workplace relationships).

Industrial relations specifically refer to the management of certain events such as workplace conflict and the role of organised labour (trade unions).

3.5 Controls at organisation level (such as code of conduct)

The code of conduct sets out the disciplinary procedure of an organisation, the nature of offences and disciplinary actions to be followed. The main purpose of a code of conduct is to create sound labour relations and thereby prevent conflict in the workplace. Conflict

in the workplace can seriously affect the performance of employees and therefore influence strategy development.

Other internal controls, such as performance agreements and policies, will set out specific rules that should be adhered to.

Activity 3.3

The following are examples of strategies that can have a positive effect on the profits of organisations. Link each example to the specific factor in the internal environment that it relates to.

a. The employees of Centex petrol stations treat all customers as "Number 1".
b. The employees of Save Supermarkets are loyal and consider themselves as being part of a happy family. There is no conflict between the employees and management and employees do not join in disruptive actions of trade unions.
c. Bestbank has policies that support their employee relations. Their employees know that they are treated according to the newest trends in employment standards and legislation and will support the vision of the organisation so that Bestbank can gain a competitive advantage over other banks.
d. The managers of Yourown pharmacies always look for ways to improve their service to their customers and inspire their employees to do their best work.
e. All employees at Super Stores are required to sign a code of conduct when they are appointed. This prevents conflict between employees as well as employees and management and creates sound labour relations that have a positive effect on the performance of employees.

Feedback on activity 3.3

a. corporate culture
b. industrial relations
c. HR policies
d. organisation leadership
e. organisation level controls

4 Summary

In this study unit, we discussed factors in the organisation's environment that may influence its strategy development. The environment was divided into the external and internal environment, with five main factors identified under each.

After having worked through this study unit, we are sure that you will agree that many environmental factors exist that could influence the development of the strategy of the organisation. As a way of considering various factors, management often makes use of analytical models that separate these factors into groups in order to make analysis of the environment easier. Examples of such models are SWOT analysis and Porter's Five Forces Model. We will discuss these models in the next study unit that deals with strategic planning processes and approaches.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. Identify four external environmental factors and give a short explanation of how each can have an influence on an organisation's strategy development.

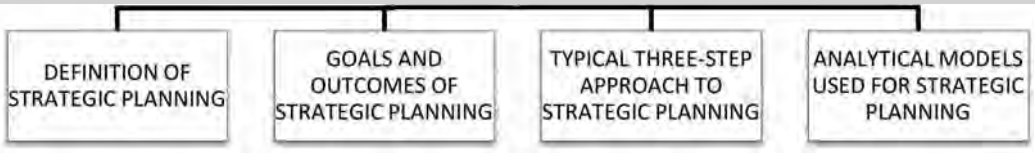
b. Identify five factors in the competitive environment and explain how they can influence strategy development.

c. Identify the main internal environmental factors and give a short explanation of how each can have an influence on an organisation's strategy development.

STUDY UNIT 4

Strategic planning processes and approaches

In this study unit



1 Introduction

In the previous three study units, we discussed the elements that have an influence on the development of the strategy of an organisation, namely the mission, core values and vision of the organisation, as well as the influence of stakeholders and environmental factors. In figure 1, the diagrammatic overview of part 1, these elements are represented by the three circles.

In this study unit, we will focus on the strategic planning process that includes selected basic approaches and analytical models. In the big picture in figure 1, this is the content of the rectangle next to the arrows.

2 Definition of strategic planning

STRATEGIC PLANNING

Strategic planning is the process of defining the organisation's strategy and making decisions about the allocation of its resources to follow this strategy. The allocation of resources includes the organisation's capital and people.

Based on the definition above, strategic planning is the process that determines the strategic plan (future course) of an organisation, typically for three to five years (long-term), but sometimes for up to 20 years, depending on the industry in which the organisation operates.

An organisation needs to know exactly what its current position is and then determine where it wants to go and how it plans to get there (See steps 1, 2 and 3 in figure 4.1). The outcome of this process is called the "strategic plan".

Although strategic planning can be used successfully to plan an organisation's longer-term direction, it cannot reliably predict how the market will react, or the problems that will come up in the future. The strategic plan will have to be adjusted and improved to enable the organisation to survive and succeed in the ever-changing business environment.

3 Goals and outcomes of strategic planning

A principal goal when drafting a strategic plan is to develop it in such a way that it can be easily turned into action plans. An action plan must be changeable into day-to-day tasks and projects that employees can identify with and can follow to achieve the plans. The part of the strategic plan that should be executed during the next financial year normally becomes the targets and objectives of the budget. You will learn more about Budgeting in MAC2601 and MAC3701.

It therefore follows that the choice of words as well as the simplicity thereof are both very important aspects to ensure that the strategic plan makes sense to the employees who have to carry it out. The use of conceptual terms that allow for different interpretations by different employees should not be part of a strategic plan.

Typically, organisations have several goals at the same time that can be dealt with in the following ways:

Goal congruency – has to do with how well different goals blend with each other. Does goal "X" go well together with goal "Z"? Do they match to form an integrated strategy? The goals of one part of the organisation (division or business unit) should combine well with goals of other parts of the organisation. An organisation may harmonise goals so that they do not undermine each other or are in conflict with other goals.

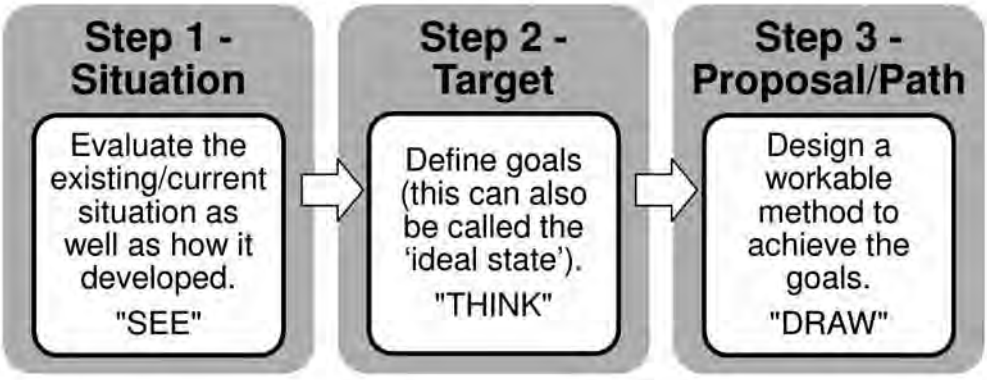
Goal hierarchy – has to do with the inclusion of one or more goals within other goal(s). A recommended method is to have short-, medium-, and long-term goals. In such a model, one can expect to attain short-term goals with relative ease as they stand just slightly above one's reach. At the other end, long-term goals appear very difficult and almost impossible to attain.

Goal sequencing – entails that one goal is used as a method of obtaining the next goal. Typical to goal sequencing a person or group starts by attaining the uncomplicated short-term goals. They then step up to attain the medium-term goals. After achieving that, they attempt to achieve the long-term goals. This method can generate a "goal stairway".

The strategic planning process can be formal or informal, as long as the outcome of the process is specific strategic objectives of the organisation as well as methods to achieve them. The top management of the organisation, with or without consultants, usually go away for a few days on a "lekgothla" or "break-away" to develop or revise the strategic plan.

4 Typical three-step approach to strategic planning

There are many approaches to strategic planning but a three-step process is typical, as illustrated in the following figure:



Source: Author, 2012

FIGURE 4.1: Typical three-step strategic planning approach

The above approach is also called "*See-Think-Draw*":

1. **See** – determine and evaluate the current situation
2. **Think** – define goals
3. **Draw** – map a plan to achieve the goals

Strategic planning is a process in which various decisions must be made, which include:

i. The strategic objectives of the organisation must be set.
ii. The resources to be used to attain the objectives must be stipulated.
iii. The policies that are to govern the acquisition and use of the resources must be decided (controls at organisation level; see study unit 3, section 3 regarding the internal environment).

5 Analytical models used for strategic planning

Different analytical models can be used to perform strategic planning in organisations. We will discuss two, namely SWOT analysis and Porter's five forces model because they are used frequently.

5.1 SWOT analysis

SWOT ANALYSIS

The SWOT analysis approach is to identify and analyse internal and external factors, that are of strategic importance, and classify them into strengths, weaknesses, opportunities and threats.

From the definition above, you would no doubt have realised that **SWOT is an acronym for Strengths, Weaknesses, Opportunities and Threats**. By definition, Strengths (S) and Weaknesses (W) are related to internal factors over which the organisation have some measure of control and Opportunities (O) and Threats (T) are related to external factors over which the organisation have essentially no control.

NOTE

The key purpose of SWOT analysis is to create an organisation-specific business model that has identified the strategies that will synchronise the capacity and means of the organisation with the competitive environment in which the organisation operates.

5.1.1 An overview of SWOT analysis

SWOT analysis is the best-known instrument for the analysis of the overall strategic position of an organisation and its environment. SWOT analysis is one of the most useful instruments for strategic planning, because it views all constructive and unconstructive internal and external factors that can have an effect on the success of the organisation. It is a strong instrument, but it is subjective and should be used only as a guide, and not as an instruction.

A consistent study of the environment in which the organisation operates helps in forecasting (predicting) changing trends and the incorporation of these in the decision-making process of the organisation.

5.1.2 Defining strengths, weaknesses, opportunities and threats

TABLE 4.1: An overview of the internal factors (Strengths and Weaknesses) and examples of each

INTERNAL FACTORS	
STRENGHTS	WEAKNESSES
• Strenghts are the virtues which enable the organisation to attain its mission. • Strengths are the foundation on which success can be built and sustained. It is the beneficial aspects of the capabilities of the organisation – what the organisation has expertise in. • Strengths can be tangible or intangible. • Examples of strengths are: – human competencies (the qualities and behaviour of the employees, individually and also as a team), – committed employees, – process capabilities, – huge financial resources, – products and services (specific products or an extensive product line), – no debt.	• Weaknesses are the virtues that restrain the organisation from fully realising its mission and achieving its potential. • Weaknesses negatively influence the growth and success of the organisation. • Weaknesses are those factors which do not meet the organisation's required standards. • Weaknesses are controllable and should be reduced and removed for instance – new machinery can be purchased to overcome the problem of obsolete machinery. • Examples of weaknesses: – insufficient research and development facilities, – high employee turnover, – narrow product range, – huge debts, – complex decision-making process, – poor decision-making, – depreciating machinery, – extensive wastage of raw materials

TABLE 4.2: An overview of the external factors (Opportunities and Threats) and examples of each

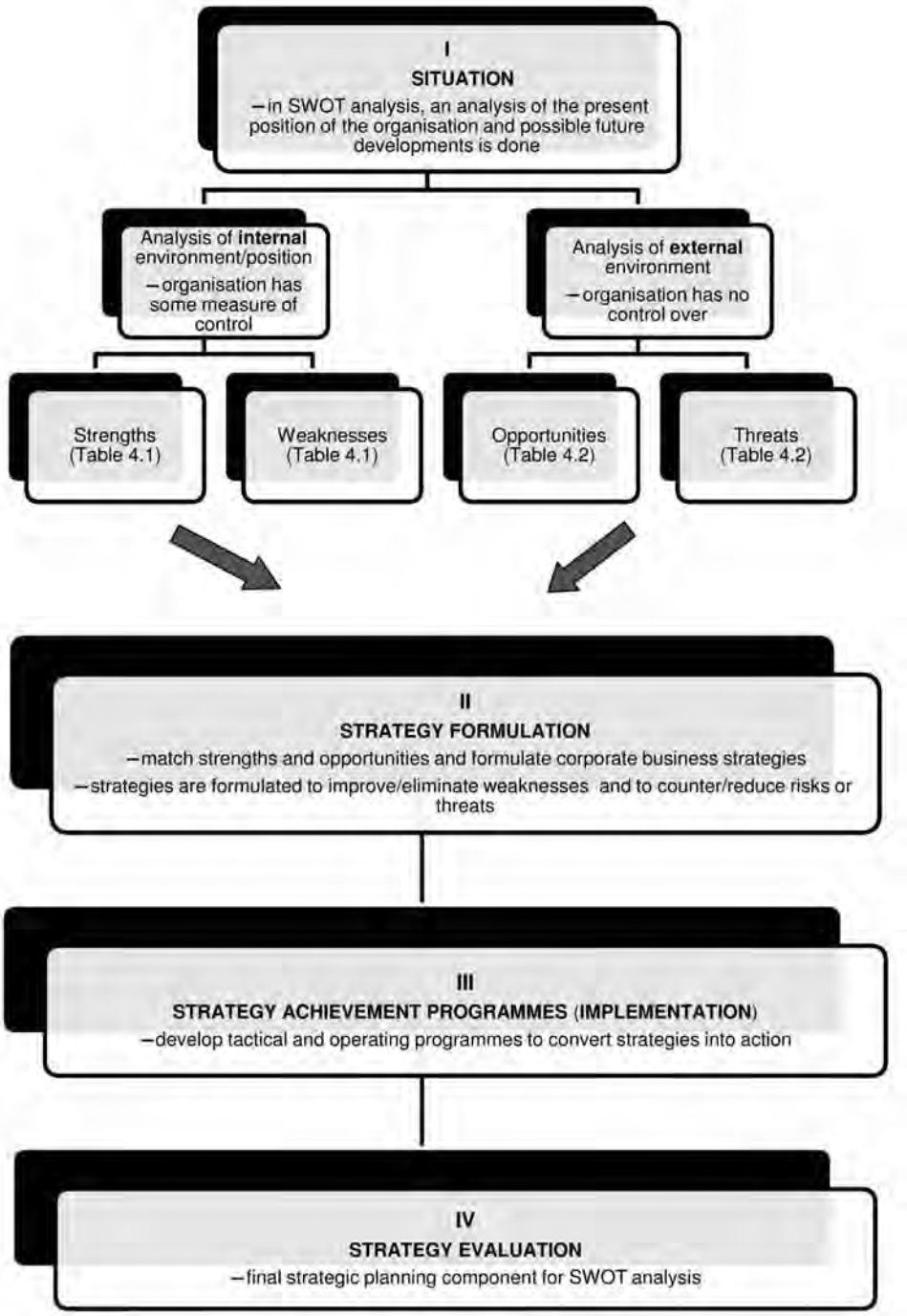
EXTERNAL FACTORS	
OPPORTUNIES	THREATS
• Opportunities typically arise from circumstances in the external evironment that the organisation can use to enhance their profits. • Organisations can obtain a competitive advantage by recognising and grasping opportunities as they arise. • Opportunities arise from: the market, competition, industry, government and technology. • Opportunities are often challenging, for example: The selection of the targets that will best serve the clients, while still getting desired results, is a difficult task. • An example of an opportunity: – the increase in demand for telecommunications, together with deregulation, is a great opportunity for new organisations to enter the telecom sector and compete with existing organisations.	• Threats arise when circumstances in the external environment jeopordise the success and profitability of the organisation. • Threats cannot be controlled. A threat jeopordises the stability and survival of an organisation. • When threats combine with the weaknesses, they compound the vulnerability of the organisation. • Examples of threats are: – strikes by workers in the industry, – unrest due to trade union action, – technology that change frequently, – increasing competition that results in excess capacity, – price wars among competitors, – decreasing profits in the industry.

Benefits from using SWOT analysis for strategic planning are:

- identification of core competencies of the organisation and building on those strengths
- correcting internal weaknesses
- protecting against external threats
- monitoring of their overall external environment – they recognise and take advantage of new opportunities quicker than what their competitors do

The SWOT analysis approach to strategic planning

To simplify the development of a strategic plan by using SWOT analysis, we have summarised the approach in figure 4.2. You will notice that the process consists of four main components (numbered I–IV) and indicated in the figure in bold capital letters.



Source: Author, 2012

FIGURE 4.2: Summary of the strategic planning process using SWOT analysis

I. **SITUATIONAL ANALYSIS** – From figure 4.2, you will see that an analysis of the organisation and its environment, known as a situational analysis is the first step in the SWOT strategic planning process. This agrees to step 1 of the typical three-step approach to strategic planning illustrated in figure 4.1.

   In SWOT analysis, the situational analysis should cover the organisation and its environment currently, as well as how the environment may develop in the future. This entails the process of collecting and scrutinising information as well as analysing

the environment (external and internal environment) that may have an influence on the organisation. When an organisation's managers develop its future strategy, they must consider environmental factors.

An organisation's ability to compete and survive in the long-term will depend on how well the managers have learnt to identify environmental factors and to estimate the extent or degree of each of the factor's impact on the corporate strategy.

As part of the situational analysis, you will see that internal factors are identified and analysed into strengths and weaknesses. Similarly, external factors are identified and analysed into opportunities or threats that can have an influence on the strategy development of an organisation.

Not all of these factors will be of crucial importance. However, customers and competition will usually be of crucial importance when analysing external environmental influences. Customer strategy should be formulated by thinking about changes in the market environment, how these could influence groupings of customers, and whether those customer groupings are the ones the organisation wishes to serve.

II. **STRATEGY FORMULATION –** This is the process when decisions are made on the best course of action to achieve the organisation's strategic objectives. (Refer to study unit 1 section 2.5 and figure 1, the diagrammatic overview of part 1).

III. **STRATEGY ACHIEVEMENT PROGRAMMES (IMPLEMENTATION) –** This entails putting the strategy into action or making the strategy work as intended by developing detailed plans. It may include redesigning the organisation structure, distribution of resources as budgeted for and managing its human resources.

IV. **STRATEGY EVALUATION –** This is the final step at the end of the year when performance is measured to determine the success of the implementation of the detailed plans. This can be done in conjunction with the planning session for the following year. Corrective action can be taken by adjusting plans or incorporating new plans to attain the strategic objectives.

Activity 4.1

The following are examples of either strengths or weaknesses. Group together all possible strengths and all possible weaknesses.

a. high wastage of raw material
b. low debt
c. employees that are committed
d. obsolete machinery
e. huge financial resources
f. skilled workers
g. high employee turnover

Feedback on activity 4.1

Strengths:	Weaknesses:
low debt	high wastage of raw material
employees that are committed	obsolete machinery
huge financial resources	high employee turnover
skilled workers	

Activity 4.2

The following are examples of either opportunities or threats. Group together all possible opportunities and all possible threats.

a. a strike by workers in the industry
b. costly changes in technology
c. increased demand for the organisation's products
d. excellent security of supply
e. strong competitors in the market
f. low interest rates
g. high tax rates
h. increased competition
i. increased minimum wages

Feedback on activity 4.2

Opportunities:	Threats:
increased demand for the organisation's products	a strike by workers in the industry
reliable suppliers	costly changes in technology
low interest rates	high tax rates
	increased competition
	increased minimum wages
	strong competitors in the market

5.2 Porter's Five Forces Model

Porter's Five Forces Model assumes that the **competitive environment** within an industry depends on five forces that has an impact on the organisation's success, namely, threat of new entrants, threat of substitute products or services, bargaining power of suppliers and bargaining power of buyers and the strength of rivalry among existing competitors. This is presented in figure 4.3 below:

Source: Porter (2008:4)

FIGURE 4.3: The Five Forces That Shape Industry Competition

The model proposes that the five forces should be used as a basis for identifying the competitive strengths and weaknesses that the organisation is facing from within, as well as the opportunities and threats that the organisation is facing from its competitive environment.

The five forces referred to above are very important with regard to strategy formulation. The potential influence of these forces differs from industry to industry. Together these forces determine the profitability of the industry. They influence the prices that can be charged as well as the cost that can be endured. It also affects the size of the investment that is required to compete in the industry. Managers should use the five forces framework to assist them in determining the competitive structure of their industry before making strategic decisions.

We will now discuss the five forces represented in the model.

5.2.1 Risk of entry by potential competitors (threat of new entrants)

Potential competitors entail the organisations that are not competing in the industry at present but that have the potential to do so. The entry of new competitors enlarge the capacity of the industry, it creates a competition for market share, and lowers the current costs for customers. The threat of entry by potential competitors is regarded as being a function of barriers to entry.

BARRIERS TO ENTRY

Barriers to entry are factors that prevent new players to enter a specific industry or market. These factors refer to the position of the current players, for example, if they have good economies of scale, customers are loyal to their brand and they have a well-established distribution channel.

TABLE 4.3: Barriers to entry

Barriers to entry
• Economies of scale • Brand loyalty • Government regulations • Customer switching costs • Absolute cost advantage • Established distribution channels (ease of distribution) • Strong capital base

- **Strength of rivalry among current competitors**

The competition for market share between organisations in an industry is called rivalry. Intense rivalry among well-known organisations causes a great threat to profitability due to pressure on prices.

TABLE 4.4: Factors determining the strength of rivalry

Factors determing the strength of rivalry
• Demand conditions • The competitive structure of the industry • The amount of fixed costs • The presence of global customers • Absence of swithching costs • The growth rate of industry • Extent of exit barriers

BARRIERS TO EXIT

Barriers to exit are factors that prevent an organisation from leaving (exiting) the market for a specific product. If the cost of exiting is higher than the cost (losses) of remaining in the market, the organisation will be prohibited from exiting and will still be competing for market share.

TABLE 4.5: Barriers to exit

Barriers to exit
• Substantial investment in non-current assets • High retrenchment costs • Penalty clauses in supplier contracts • Penalty clauses in rental agreements • Potential upswing in economic conditions

5.2.2 Bargaining power of buyers

"Buyers" refer to the final consumers of the product or the organisations that deliver the industry's product to the final consumers. Bargaining power of buyers entail the potential that buyers have to bargain down the prices charged by the organisations in the industry. It also refers to the potential of buyers to raise the organisation's cost by demanding a higher quality product or service.

Buyers that have strong bargaining power can diminish profits in an industry by demanding that organisations charge lower prices. They have sufficient information about the market and the product and they purchase in large quantities. They also focus on high-quality products.

5.2.3 Bargaining power of suppliers

"Suppliers" refer to the organisations that supply inputs to the industry. The bargaining power of suppliers refer to the potential that suppliers have to raise the prices of inputs (such as raw material or services) or the cost of an industry in a number of other ways.

Strong suppliers can diminish industry profits by raising the cost to organisations. The products of strong suppliers have only a few alternatives or substitutes since it is exceptional or inimitable. The existence of strong suppliers results in high switching cost (it is expensive for the organisation to adapt its production set-up to accommodate a different supplier's product). Their product forms a significant part of or input to the buyer's (organisation's) product. The buyers are not important to strong suppliers.

5.2.4 Threat of substitute products

SUBSTITUTE PRODUCTS

Substitute products refer to alternative products having the capability of effectively satisfying customers' needs (for example, plastic bottles instead of glass bottles).

Substitutes pose an upper limit (ceiling) on the possible returns of an industry by setting a limit on the price that those organisations can charge for their product in an industry. The fewer close substitutes a product has, the greater is the chance for the organisations in the industry to raise their product prices and earn higher profits (supposing that other factors are equal).

The power of the five forces varies from industry to industry. Whichever the industry, these forces affect the profitability because they affect the prices charged, the costs and the capital investment that is essential for an organisation to survive in the industry. Porter's five forces model also helps in making strategic decisions because managers use it to analyse the industry's competitive structure.

Activity 4.3

From the list below, select only those factors that serve as barriers to entry:

- brand loyalty
- established distribution channels (ease in distribution for current competitor, meaning that new entrants will have to set up their own, distribution channels)
- extent of exit barriers
- absolute cost advantage
- government regulations
- competitive structure of the industry
- customer switching costs
- strong capital base

Feedback on activity 4.3

Factors that serve as barriers to entry in an industry:

- brand loyalty
- established distribution channels
- absolute cost advantage
- government regulations

- customer switching costs
- strong capital base

Activity 4.4

Which of the following statements relate to Porter's five forces model? Select all that apply.

a. The forces in the competitive environment within an industry affect the organisation's success.
b. Together these forces determine the profitability of the industry because they influence the prices that can be charged and the cost that can be endured. It also affects the size of the investment that is required to compete in the industry.
c. Managers should use the five forces framework to assist them in determining the competitive structure of their industry before making strategic decisions.
d. It identifies core competencies of the organisation and build on those strengths.

Feedback on activity 4.4

Statements a, b and c relate to Porter's five forces model.

Statement d relates to SWOT analysis.

Activity 4.5

Evaluate the following list of statements and identify which statements are correct.

a. The threat of entry by potential competitors is regarded as being a function of barriers to entry.
b. The competition for market share between organisations in an industry is called rivalry.
c. Intense rivalry among well-known organisations causes a great threat to profitability due to pressure on prices.
d. Bargaining power of buyers entail the potential that buyers have to bargain down the prices charged by the organisations in the industry. It also refers to the potential of buyers to raise the organisation's cost by demanding a higher quality product or service.
e. The bargaining power of suppliers refer to the potential that suppliers have to raise the prices of inputs (such as raw material or services) or the cost of an industry in a number of other ways.
f. Substitute products refer to alternative products having the capability of effectively satisfying customers' needs.
g. Porter's five forces model helps in making strategic decisions, because managers use it to analyse the industry's competitive structure.

Feedback on activity 4.5

All the statements are correct.

6 Summary

In this study unit, we defined strategic planning as the process of considering an organisation's future course. The goals of strategic planning were discussed and it was stressed that an organisation should coordinate goals so that they do not conflict with each other. We then discussed the various approaches to strategic planning. Lastly, the two analytical models, namely SWOT analysis and Porter's five forces, were discussed in detail.

In the next part, we will focus on financial management, financing and the cost of capital.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. Explain the meaning of strategic planning and name the three possible key questions strategic planning can be expected to deal with.
b. Explain the terms goal congruency, goal hierarchy and goal sequencing.
c. List the two factors in the external environmental analysis that will always be of crucial importance for SWOT analysis.
d. What is the main goal of drafting a strategic plan?

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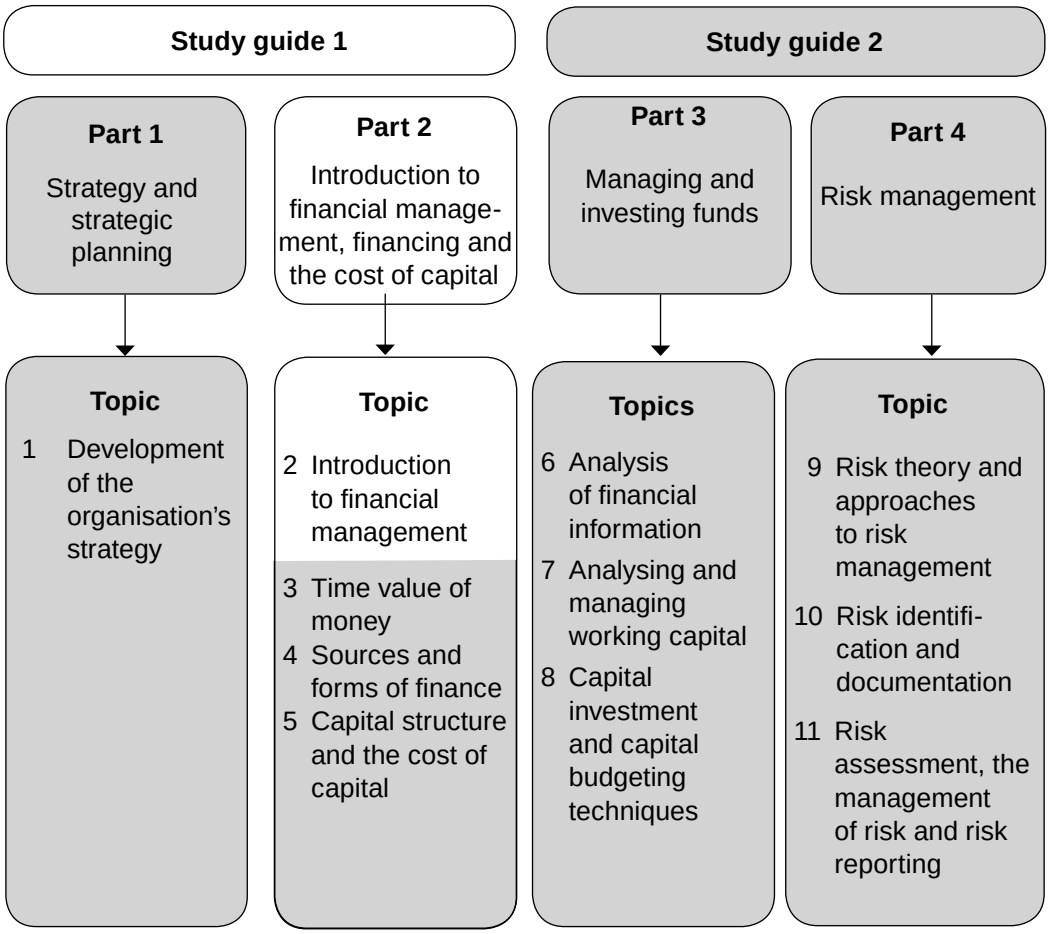
PART 2

Introduction to financial management, financing and the cost of capital

PURPOSE

The purpose of part 2 is to serve as introduction to financial management, financing and the cost of capital.

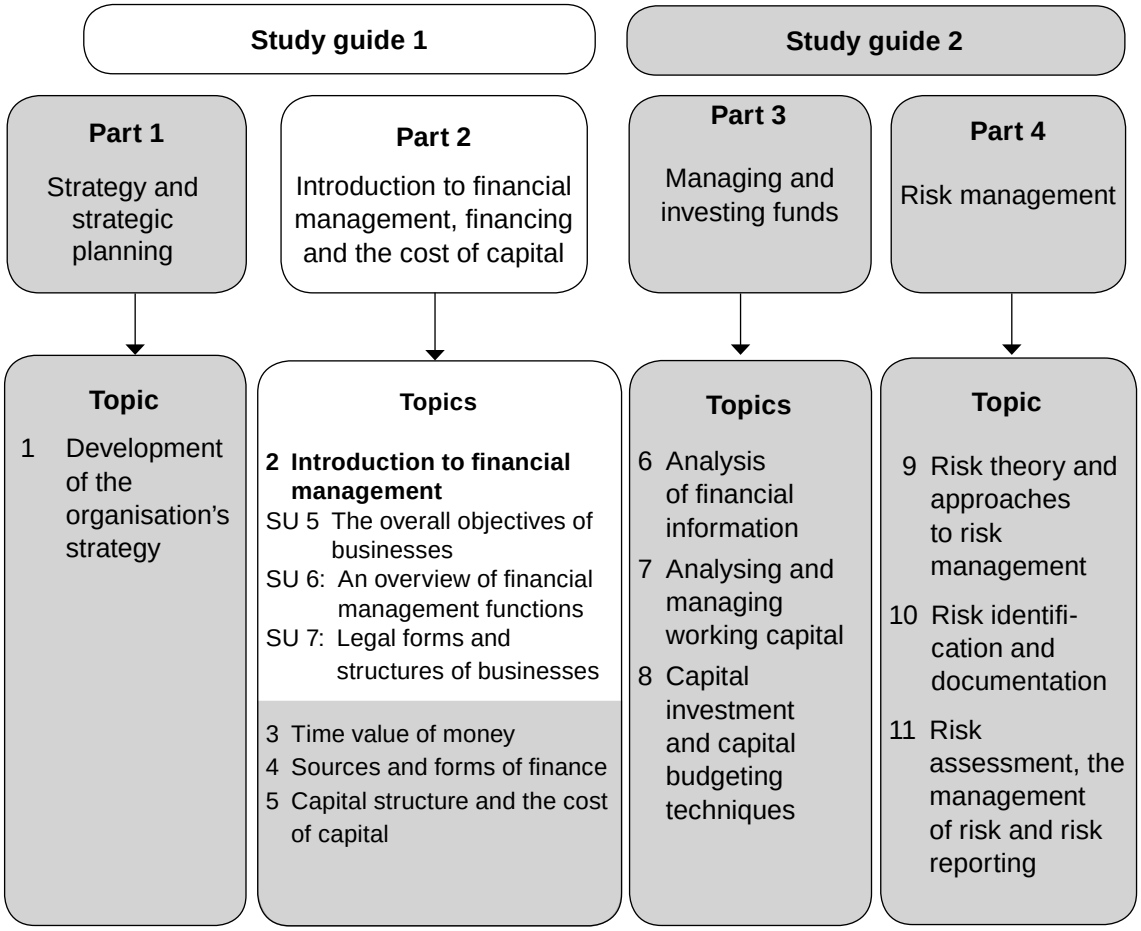


Introduction to financial management

LEARNING OUTCOMES

After studying this topic, you should be able to:

- describe the traditional overall objective of businesses and identify the criticisms against it
- explain the current change in focus in the overall objective of businesses
- discuss the traditional function of financial management
- explain the change in focus in financial management
- define the concepts of strategic financial management and financial management
- evaluate the different legal forms available to businesses
- discuss the factors that might influence the structure of the organisation



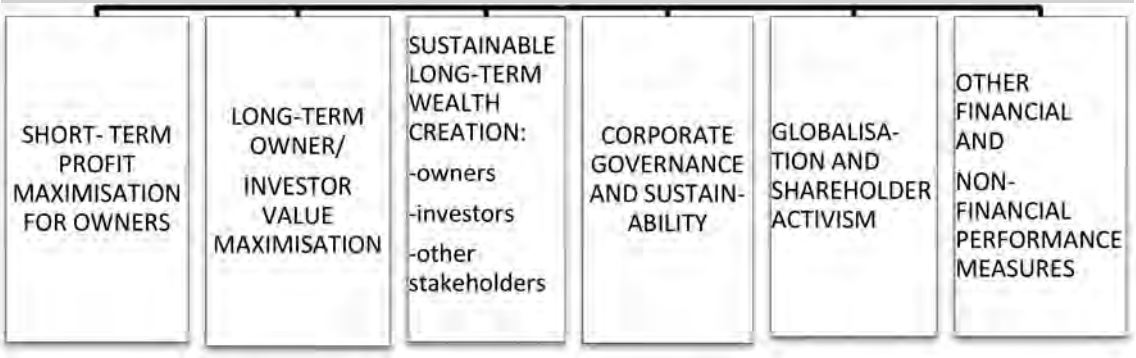
INTRODUCTION

In this topic, we will start with a discussion on the overall objectives of businesses and how that has changed due to pressure from groups (stakeholders) other than the owners of the businesses. The role of the financial manager is to support the business in achieving its overall objectives and strategies. We will discuss in broad terms how the financial manager can assist in various roles and functions. This is followed by a discussion on factors to consider when deciding on the legal form when starting a business. Hand-in-hand with the legal form is the organisational structure of the business. We briefly discuss the factors that influence the structure and how that would change over time as the business matures.

STUDY UNIT 5

The overall objectives of businesses

In this study unit



1 Introduction

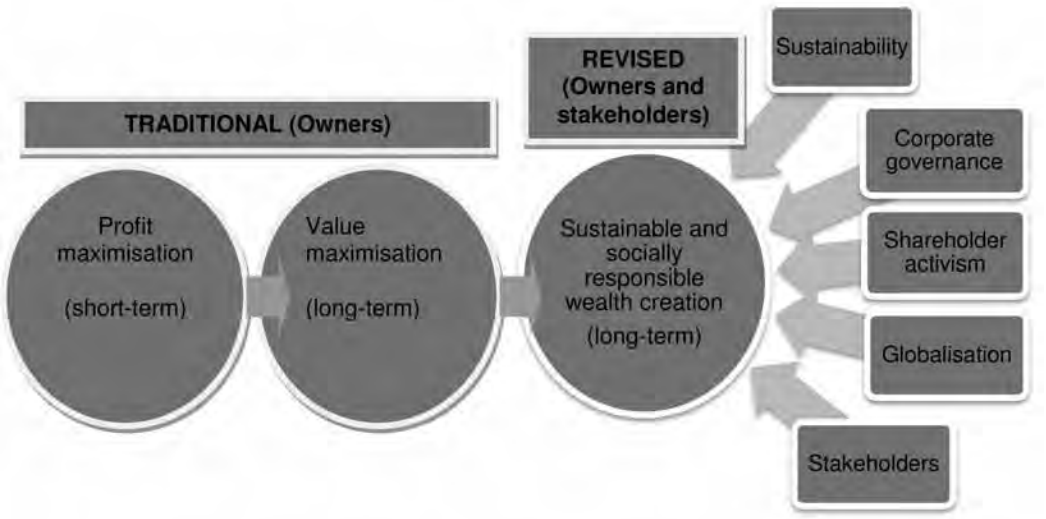
You will recall that we identified and discussed various elements that are relevant to, or influence the development of the strategy of an organisation, in part 1 of this guide. We also identified and discussed processes and approaches used in strategic planning. We highlighted how changes in the organisation's environment may necessitate adaptations to the proposed plans of management.

NOTE

While it was explained earlier in this study guide that the term "organisation" includes a range of organisations, some of which pursue profits and others that are non-profit organisations (NPOs), this topic only discusses organisations that pursue profits. We will refer to the term businesses.

In order to understand how financial managers (you) can best serve the business employing you, you need to understand what the overall objectives of businesses are. We will also discuss factors that influence business objectives.

The following figure illustrates an overview of the content of this study unit – The development of the overall objectives of businesses.



Source: Author, 2012

FIGURE 5.1: The development in the overall objectives of businesses

2 Short-term profit maximisation for owners

Traditionally, the overall objective of a business was the maximisation of profit to the exclusion of everything else. This overall objective originated from traditional economic theory, a theory formulated from the business' point of view.

PROFITABILITY

Profitability is the term used to describe the annual return or compensation earned on an investment.

The profitability of a business is therefore of importance to its owners and other potential investors. The profitability of an investment is measured based mainly on accounting profit or various ratios based on this profit, for example, return on assets, earnings per share (EPS) and so on. These ratios are discussed in part 4 of this module, namely "Managing of funds".

The practice of measuring annual profitability based only on accounting and financial indicators (ie EPS) has been found to have drawbacks, because short-term profit measures:

- Ignore risk – as risk increases, a higher return would be required.
- Do not distinguish between profit earned and cash flows generated – a distinction required by an investor and other finance providers.
- Are an annual measure (measured over a relatively short period of time – usually one year) whereas owners are interested in financial returns across a number of years.
- Are only a financial summary of the effects of the economic activity of the past financial year and do not reflect the strategic behaviour employed to achieve it.
- Encourage short-term returns at the expense of the development of the business in the long term. An example of the latter is where product- and/or staff development cost are cut to improve the profit for the year (short-term objective). Due to these cost cuts, the business will show a higher profit for the current period but it can be at the expense of the long-term development of the business. Another example is that cuts in product development costs can lead to the products becoming obsolete in future, with no new products developed to keep the organisation profitable in the long term.

- Can be manipulated by the use of creative accounting. Creative accounting is the use of loopholes in financial regulations in order to gain an advantage or to present financial figures in a misleadingly favourable light. Errors, omissions and misstatements are examples of forms of creative accounting.

From the discussion above, we can therefore conclude that, regardless of the way profit is measured, "profit" is a short-term indicator that does not take the long-term overall objectives of business owners into account.

Activity 5.1

Give reasons why profit measures are regarded as short-term measures.

Feedback on activity 5.1

- It is measured over a short period – usually one year.
- The results of these measures can be improved in the short term by compromising the long-term growth of the business.
- It does not take the long-term objectives of owners – to get financial returns over a number of years **–** into account.

3 Long-term owner/investor value maximisation

In order to address the problems encountered with the short-term profit maximisation as the overall objective of a business, the overall objective was amended to the *maximisation of owner/investor value* – a long-term objective.

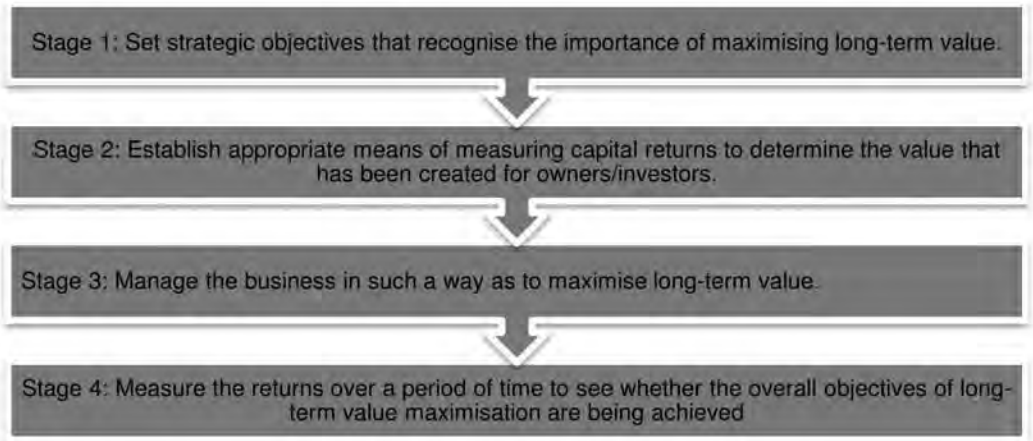
Smart businesses, their owners and managers, realised that it is foolhardy to sacrifice long-term growth for short-term profit maximisation. The focus shifted to long-term value creation and value maximisation.

The change in focus to long-term value maximisation means that owners are more interested in capital growth in their investment than achieving maximum accounting profit in any one financial year.

CAPITAL GROWTH

Capital growth is the growth of an investment in a business. It means that the investment can be sold after a few years for more than it was bought for.

The creation of long-term owner/investor value involves a process that is divided into four stages, illustrated in the following figure:



Source: Author, 2012

FIGURE 5.2: Process of creating long-term owner/investor value

The trading price of shares in listed companies is published in newspapers and is an indication of the value of a shareholder's investment in a specific company. The value of non-listed businesses (private companies, close corporations, partnerships and sole proprietorships) are more difficult to determine.

Activity 5.2

Describe in your own words what is meant by "maximisation of long-term owner/investor value" as the overall objective of a business and its managers.

Feedback on activity 5.2

It means that the managers should take action and make decisions to achieve the overall objective of the business that increase the value of the owners' investments, thereby maximising the value of the owners' investment in the business in the long term. Any actions that increase profits in the short term, but are detrimental to long-term growth, are not entertained.

Activity 5.3

Explain in four steps how managers can plan to achieve the business objective of owner/investor long-term value maximisation.

Feedback on activity 5.3

You can refer to the four stages as illustrated in figure 5.2.

4 Sustainable long-term wealth creation (owners/investors and other stakeholders)

Recently, more emphasis has been placed on businesses' ability to maximise the value of owners/investors in a *sustainable* way. In addition to shareholders/owners, a business has other stakeholders that include employees, customers, suppliers, the community and environmental activists. When trying to achieve the overall objective of a business, namely owner/investor value maximisation, other factors such as interests of other stakeholder groups, the level of risk and ethical conduct need to be considered.

Let us remind you that owners/investors and other stakeholders have different priorities. Owners/investors are concerned about increasing the market value of their investment and cash returns while other stakeholders are concerned about jobs, taxes, the environment, and so on. The necessity of finding a balance between the conflicting needs of all the stakeholders recently became very important.

Owners of businesses face bad publicity when actions are taken that benefit owners in the short-term to the detriment of other stakeholders affected by these actions. Public pressure has resulted in owners scaling down their expectations of value maximisation at all cost. For example, owners now accept that money has to be spent on preventing pollution, training employees, providing health care (ie HIV/AIDS programmes) and complying to employment equity requirements.

Nowadays, shareholders are also more aware of the corporate social responsibilities of businesses and they expect that the company in which they invest should state and execute its corporate social responsibilities.

It is therefore important to satisfy the *needs of all stakeholders* as opposed to only the needs of owners, because when all stakeholders benefit, the value of the business will be maximised and sustainable wealth creation for all stakeholders will be achieved. To understand what sustainable wealth means, the term sustainability needs to be defined:

SUSTAINABILITY FOR HUMANS

Sustainability for humans is the potential for long-term maintenance of well-being which has environmental and social dimensions.

SUSTAINABILITY FOR BUSINESSES

Sustainability for a business means that all their products, processes and manufacturing activities meet customer needs, while at the same time treating the environment in such a manner that it does not decrease the ability of future generations to meet their own needs.

This entails that products, processes and activities should be designed and executed in such a way that current environmental concerns (eg the use of renewable resources) are taken into account while still maintaining a profit. A business should use sustainable development and distribution methods to influence the environment, growth of the business and society. Sustainable development within a business can create value for its investors, customers and the environment.

NOTE

It is important that businesses decrease or eliminate the harmful impact on the environment made by chemicals, harmful materials and waste that is a result of their manufacturing processes.

A common example of a sustainable business initiative is the aim to become paperless. Another sustainable business practice is to review processes with the goal to recycle or eliminate waste. The use of non-renewable resources, such as coal and oil for generating energy, should also be minimised and be replaced by alternative renewable resources such as bio-fuel and wind energy (this also helps in "reducing the carbon footprint"). Other "green" initiatives can include saving materials through remanufacturing or converting harmful gases into clean energy and improving fuel economy.

Businesses should always consider the potential environmental impacts of their products and the processes used to manufacture it to ensure the sustainability of the business.

5 Corporate governance and sustainability

A concept that is closely related to sustainability is that of corporate governance. Before illustrating selected developments relevant to sustainability and corporate governance, the term corporate governance needs to be defined:

CORPORATE GOVERNANCE

Corporate governance is a set of processes, customs, policies, laws and institutions affecting the way that a business is managed. It also includes the relationships among the many stakeholders involved and the goals of the business.

In South Africa, corporate governance is guided by the King III report and Code. Although it addresses companies, the spirit of it should be adhered to by all businesses. Application of the King III report and Code may be mandated by law or regulation, such as by the Listing Requirements of the JSE.

A *recommendation* of the King III report is that the statutory financial information and sustainability information be combined in an "Integrated Report" to be prepared annually by all South African companies. The guidelines for the Integrated Report, as recommended by King III, are presented in the Framework for Integrated Reporting and the Integrated Report Discussion Paper (IRC SA, 2011).

This Integrated Report should:

- have sufficient information to record how the company has affected the economic life of the community in which it operated, both positively and negatively
- include forward-looking information on how it can improve the positive effects and reverse the negative effects

Companies are therefore required to report to stakeholders on the strategies and actions – and how the company plans to add value for all stakeholders. The King Report requires that companies apply a stakeholder-inclusive approach to corporate governance. *Companies should communicate effectively with their stakeholders and take their aims and concerns*

into account in its decision-making. This will lead to effective stakeholder relationships that are regarded as essential to the process of integrated reporting.

A shift in focus from the historical primary objective of maximising the value of owners/ investors is therefore required towards sustainability and the inclusion of all stakeholders in order to create sustainable wealth.

It is the viewpoint of the International Federation of Accountants (IFAC) that "sustainable development and the sustainability of organisations have become mainstream issues for politicians, consumers and business leaders".

Sustainability issues are forcing businesses to change the way they think. Long-term sustainable value creation requires that businesses direct their strategies and operations towards the achievement of sustainable environmental, economic and social performance and incorporating wider stakeholder issues and perspectives into their decision-making.

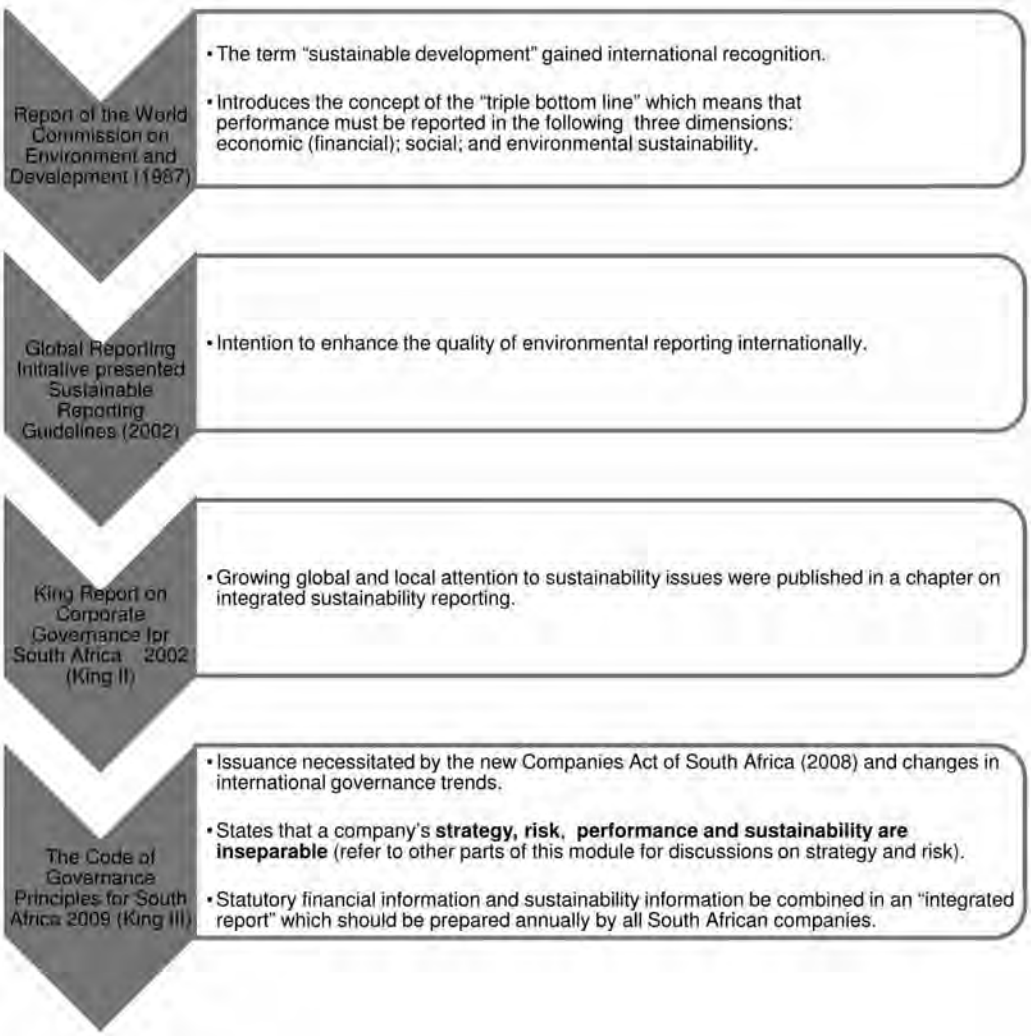
Sustainability issues are usually reported in terms of the following guidelines:

- Global Reporting Initiative Third Generation (GRI G3)
- United Nations Principles for Responsible Investment
- Equator Principles (for the financial industry)

The JSE also launched an index for companies complying with criteria set to measure their socially responsible behaviour. Companies that pass the criteria requirements are listed in the JSE's Socially Responsible Investment (SRI) index. Investors that wish to invest in companies that demonstrate good socially responsible behaviour, can invest in companies listed in this index.

In addition, the Code for Responsible Investing in South Africa (CRISA) sets out principles that encourages institutional investors (such as pension funds) to fulfil their executive investments analysis/activities in line with promoting sound governance and ensuring responsible investing.

You will learn more about corporate governance in your Auditing modules. The next figure illustrates the historical development of sustainability and corporate governance.



Source: Author, 2012

FIGURE 5.3: Selected developments in sustainability and corporate governance

Activity 5.4

Describe in your own words how "sustainable long-term wealth creation" and "corporate governance and sustainability" can contribute to the overall objective of a business, namely long-term owner/investor value maximisation.

Feedback on activity 5.4

Refer to sections 4 and 5 on "sustainable long-term wealth creation" and "corporate governance and sustainability" and explain in your own words.

You should:

- describe the concepts sustainability and corporate governance
- conclude with the argument that if all stakeholders benefit, the value of the business will be maximised and sustainable wealth creation for all stakeholders will be achieved

6 Globalisation and shareholder activism

Globalisation:

Globalisation and advances in technology have hugely changed the competitive environment in which businesses operate. The competitive environment currently includes multinational companies such as “Wal-Mart” which may be more profitable to invest in rather than local South African companies such as “Massmart” (trading under various store names including Game, Makro and Builders Warehouse). The internet and multinational companies have opened up the choices of investors and customers. This led to greater competition for services and products as well as international competition for the money that potential shareholders are planning to invest.

Nowadays, shareholders have access to information regarding the returns that overseas companies deliver. They can sell the shares they have in low return companies and put their investment in companies that deliver a higher return because of the improved information and a greater choice of companies internationally. Companies should therefore offer competitive rates of return in order to attract shareholder investment and demonstrate that they can create sustainable wealth for investors.

NOTE

You will learn more about measuring the returns for shareholders/investors later on in this module.

Shareholder activism:

In the past, shareholders tended to passively accept the profits and dividends that the company paid. Over time, this has changed due to shareholder activism. Majority shareholders have become more assertive and they require that their needs be given priority, otherwise they can sell their shares and invest in another company which regards their needs as a priority.

Activity 5.5

As financial manager, would you approve the following decisions?

- Pay workers only the minimum wage required by law.
- Pump untreated wastewater into the nearby river.
- Approve salary increases for managers whilst other employees receive none.
- Allow untreated toxic gases to be pumped into the air.
- Save cost by cutting spending on safety equipment.

Feedback on activity 5.5

No, you should not. Motivate by referring to the definition of sustainability.

7 Other financial (profit-based) and non-financial (value-based) performance measures

We already discussed the past practice of only using profit maximisation, a short-term measure as the overall objective of companies – and it was found to have drawbacks. A mixture of (financial) profit-based and (non-financial) value-based measures will therefore be more appropriate.

The *Integrated Report* requires that these non-financial measures also be communicated to stakeholders. Examples are injury-free working hours, demographics of the workforce, and so on. The Integrated Report of Gold Fields (December 2010:142), for instance, has a section "Managing our people effectively and respectfully". In this section, they provide useful statistics regarding their human resources, including the percentage of historically disadvantaged employees in South Africa, average training hours per employee, employee turnover, the minimum wage ratio and the ratio of basic salary of men to women.

A tool that can be used to overcome the shortcomings of profit-based measures is "*value-based management*" (VBM). This is an approach whereby an organisation aligns the control of the business with the interests of the owners/investors, while also taking care of the effect on the other stakeholders. It involves managing all the aspects of the business in such a way as to create and maximise the long-term sustainable value of owners/investors.

Another handy tool, which you may have encountered in previous topics, is the *balanced scorecard*. It reports performance measures across four dimensions:

- financial
- customer
- internal business processes
- learning and growth

NOTE

You will learn more about non-financial performance measurement in later MAC modules.

8 Summary

In this study unit, we discussed the overall objectives of businesses with a profit motive and explained that short-term profit maximisation was traditionally regarded as the overall objective. The drawbacks of conventional profit-based measures were then discussed.

The shift towards long-term shareholder value maximisation and the more recent focus on sustainable wealth creation were explained by pointing out that a balance needs to be found between the conflicting needs of all the stakeholders in order for sustainable (long-term maintainable) wealth to be created. The concepts of sustainability and corporate governance were explained, as well as how they relate to financial management and the overall objective of a profit-seeking business. We concluded this study unit with a short description of other financial and non-financial performance measures to illustrate how all stakeholders' demands can be addressed.

The next study unit will provide an overview of the function of financial management to serve as a basis for the remainder of the study guide.

Self-assessment activity

After having worked through the study unit, determine if you are able to answer the following questions:

a. Name the traditional historical overall objective of a business.

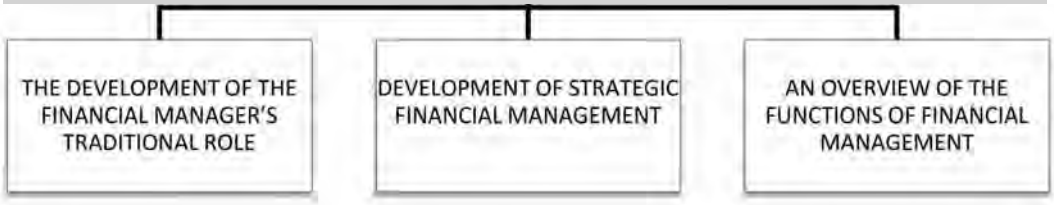
b. Explain why profit maximisation should not be the only overall objective for a business.

c. Give reasons why the overall objectives of organisations should include objectives relating to sustainable wealth creation.

STUDY UNIT 6

An overview of financial management functions

In this study unit



1 Introduction

In the previous study unit, we discussed the development in the overall objectives of businesses, which has developed from short-term profit maximisation to long-term owner/ investor value maximisation, including sustainable long-term wealth creation and other financial and non-financial objectives.

In this study unit, we will firstly discuss the development of the financial manager's traditional role. Then we will discuss the development of strategic financial management as well as the change in focus thereof. Lastly, we will present an overview of the functions of financial management.

2 The development of the financial manager's traditional role

Initially financial management entailed the making of observations from historical financial data supplied in the financial statements and a description of these observations. Financial management was regarded an outcome of accounting and lacked a clear theoretical framework. As financial management developed as a discipline, economic theories influenced it and it became more analytical.

The efficient allocation of scarce resources is one of the most important economic theories that influenced the development of financial management. The theory of efficient allocation of scarce resources was applied to practical business situations and this lead to the development of decision-making tools for management. The scarce resource in this case is the savings (or funds) of individuals and organisations. The decision-making tools that were developed took into account the effect of time as well as the risks inherent to financial decision-making.

The link that financial management has with accounting is the financial statements that supply historical accounting information. Investors use this accounting information together with other information to place a value on a business. Accounting information, however, has shortcomings because it does not fully reflect the economic reality. This is because

accounting practices were developed as a reporting mechanism. Management has to give account to the owners of the business regarding what they have done with the business' funds during the last reporting period (agency theory – more on this later). Financial managers will therefore analyse and interpret accounting data with a view towards the future so that it is useful for financial management decisions.

Traditional financial management therefore needs to be defined:

TRADITIONAL FINANCIAL MANAGEMENT

Traditional financial management is the management and control of money and money-related operations within a business. Financial management therefore includes planning, organising and controlling the financial activities of a business. The financial activities include the acquiring of funds as well as the use of these funds by applying general management principles.

As indicated in the above definition, traditionally, the primary focus of financial management was ONLY on financing decisions and investment decisions.

Source: Correia, 2011, adapted

FIGURE 6.1: The traditional role of the financial manager with regard to investment and financing decisions

3 Development of strategic financial management

Recent and current research has however indicated that the function of financial management is transforming and evolving to a broader business-partnering role, which includes the following decision-support functions:

- direct involvement in the development and implementation of strategy
- managing business risk
- managing business performance

NOTE

These roles are discussed in more detail in other parts of this module at an introductory level and will be expanded upon in later MAC modules.

Due to the shift in focus in financial management, the activities of financial managers have transformed from scorekeepers, sketched in figure 6.1 above, to business partners who contribute to business performance.

Strategic management decisions require an input from the finance function, especially with regard to financial planning issues, investment appraisal and financial market operations. The main focus of the financial manager is to contribute with his/her financial knowledge and skills towards the long-term creation of sustainable wealth for the owners/investors of the business.

Strategic financial management can therefore be defined as:

STRATEGIC FINANCIAL MANAGEMENT

"The identification of possible strategies capable of maximising an organisation's net present value, the allocation of scarce capital resources among the competing opportunities and the implementation and monitoring of the chosen strategy so as to achieve stated objectives" (CIMA Official Terminology, 2005).

Activity 6.1

Do you regard the following statement as confirmation that the focus of financial management has changed?

Financial managers should be able to perform activities to support and drive the development of sustainable organisational success. Their roles should include: being creators, enablers, preservers and reporters of sustainable value.

Feedback on activity 6.1

Yes, refer to section 3.

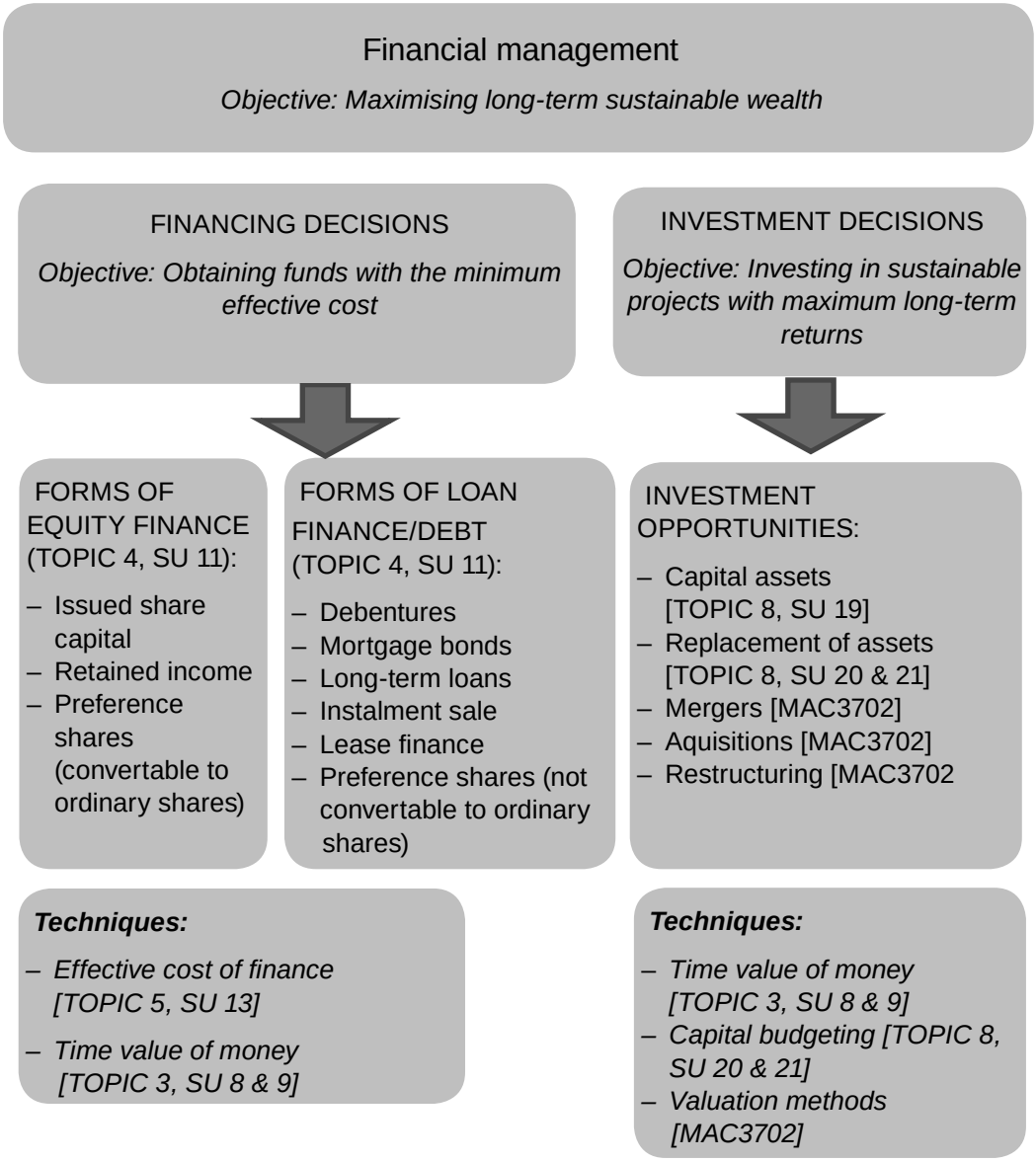
4 An overview of the functions of financial management

Organisations (profit-seeking and otherwise) generally have finance departments that are responsible for the financial management functions. The head of the finance department is usually the financial director or chief financial officer (CFO). The term financial management refers to the responsibilities of the CFO. These activities include borrowing money, purchasing assets, selling shares, paying dividends, keeping accounting records as well as other activities. This is the reason why the accounting function is usually located within the finance department of a company.

After having discussed the role of the financial manager, it is important to give you an overview of financial management topics and how it will be presented in the rest of this module.

NOTE

You should take note that this module only deals with financial management techniques at an introductory level. The financial management knowledge and insight gained through the content of this module will in other words form the foundation for more advanced applications in the third-year MAC3702 module.



Source: Vigario, 2012, adapted

FIGURE 6.2: An overview of financial management

5 Summary

In this study unit, we discussed the development of financial management from making observations based on historical data to the traditional function of analysing and interpreting data to form the basis for financing and investment decisions.

We explained that the financial management function has been evolving to a broader business-partnering role that includes decision support. As a result, the financial management function is extending to include direct involvement in the formulation and implementation of strategy, managing business risk as well as business performance.

In the next study unit, we will discuss factors that play a role in deciding on the legal form of the business and how to structure the organisation.

Self-assessment activity

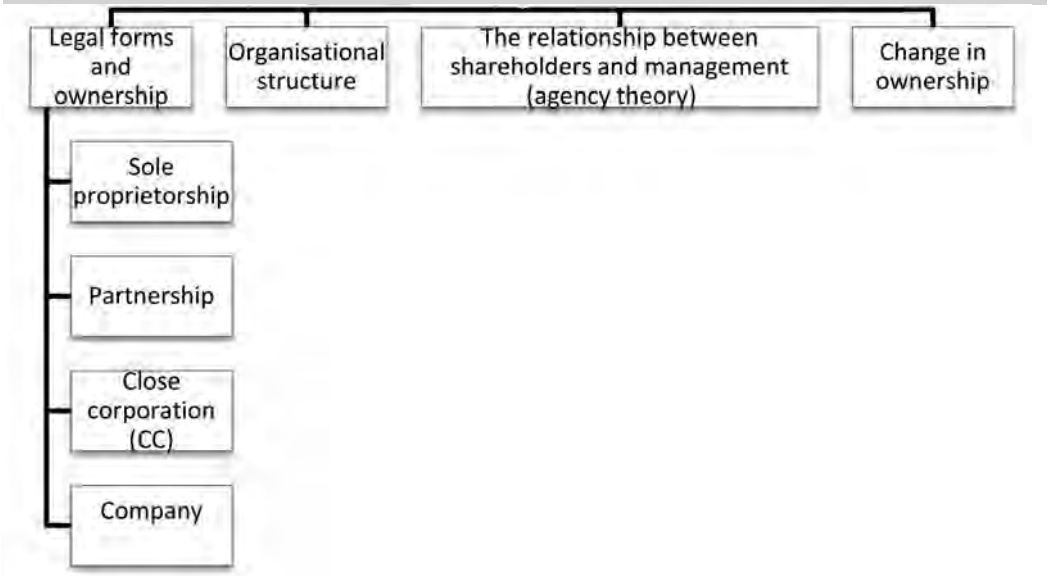
After having worked through the study unit, determine if you are able to answer the following questions:

a. Define financial management.
b. Name one discipline from which financial management has derived theories.
c. Name one theory that was adapted from another discipline.
d. Name two aspects that the decision-making tools of financial management take into account.
e. Describe the traditional responsibilities of financial management.
f. Describe what the broader business-partnering role of financial management entails.
g. What kind of inputs does strategic management decisions require from the finance function?

STUDY UNIT 7

Legal forms and structures of businesses

In this study unit



1 Introduction

In the previous study unit, we discussed the major areas of responsibilities of the financial manager on a day-to-day basis. Another task that the financial manager or practicing accountant performs on an ad hoc basis is to provide advice on the most appropriate legal form that a new business should take. We will now discuss different legal forms of businesses and forms of ownership.

2 Legal forms and ownership

It is important to classify businesses in terms of the form of ownership, because the form of ownership has many legal and tax implications that will have an influence on financial management decisions. We will therefore explain the most common forms of ownership from the form that is least regulated to the form that is most regulated. (We will only focus on those organisations that pursue profit.)

In South Africa, businesses can take one of the following legal forms:

- sole proprietorship
- partnership
- close corporation (CC) *(no new CC's can be formed)*
- various classes of companies

We will now discuss each briefly as you might already have encountered this in your supporting courses.

2.1 Sole proprietorship

SOLE PROPRIETORSHIP

Sole proprietorship is where a business is formed by a single individual who is the owner of that organisation. It is unincorporated, meaning the owner and the business is treated as the same legal persona.

- This is the least regulated and easiest type of business to start. Any person who conducts legal business activities can establish himself/herself as a sole proprietor by getting a trading licence and opening the doors of the business.
- The profit of the business is regarded as that of the owner. No legal distinction exists between the personal income of the owner and the income he/she derives from the profit of the business. The owner will therefore have to pay tax on this income (taxable profit of the organisation and any other personal income earned) according to personal income tax scales (for individuals) that are based on a sliding scale for different income brackets. The principle of sliding scales is that the more you earn, the higher the tax rate. Personal tax rates range from approximately 18% to 40%. (Take note that the South African Revenue Services (SARS) may change these scales every year in the annual budget.)
- A sole proprietor as a business form has unlimited liability. This means that according to law (legally), the owner is personally responsible for all the debts incurred by his/her business. Due to the unlimited nature of the liability, creditors can have access to the owners' personal assets for the payment of debts of the organisation. The owner's personal estate may be declared insolvent where the organisation fails and the debts exceed the assets.
- The main disadvantage of a sole proprietorship is that the organisation ceases to exist when the owner dies. The continued existence of the organisation is therefore restricted to the lifespan of the owner.
- A second disadvantage is that individuals usually have limited funds available. If the owner cannot obtain further finance to fund business activities and expansion, the organisation's operation and growth can be negatively affected.
- Selling the business might be difficult if there is no willing buyer.

2.2 Partnership

PARTNERSHIP

Partnership is where a business is formed by between two (2) and 20 individuals or organisations. It is unincorporated. Partners are severally and jointly responsible for all the debts of the partnership.

- When two or more persons or organisations (limited to 20) come together to start a business, a partnership can be formed.
- A partnership agreement, which can be an informal oral agreement or a written agreement, will set out how the partners will divide the profits and losses.
- The formation of a partnership is easy and inexpensive because no specific act or law regulates it.
- As with a sole proprietorship, the profit-share of each partner will be taxed in the hands of the partner, at tax rates ranging between 18% and 40%, depending on the total personal income of that partner.

- A partnership has unlimited liability, which means that partners are jointly and individually responsible for the debts of the partnership. In effect, each individual partner is responsible for the actions and debts incurred for the business by all the other partners.
- The disadvantages of partnerships as a legal form of business are the same as that of a sole proprietorship. A partnership also ceases to exist when a partner wishes to sell or dies. As with a sole proprietorship, the continued existence of a partnership can also be limited.
- Ownership by a partner is not easily transferable because a new partnership must be formed when a partner wants to exit the partnership.
- In a partnership, the funds available for the activities of the business are limited to the combined funding of the partners.
- However, a partnership has the advantage of combining the resources (financial, technical skills and management expertise) of all the individual partners.

It is not unusual for a business to start as a sole proprietorship or partnership and then change to a corporate form at some point when it needs to raise more cash in order to grow. Apple Computer is an example of such a company that started as a sole proprietorship and after several years changed to become a company.

Activity 7.1

Can you identify four disadvantages of sole proprietorships and partnerships as legal forms of business? To what single central problem do you think these will add up to?

Feedback on activity 7.1

i. The organisation has a limited life.
ii. There may be difficulty in transferring ownership.
iii. The funds that can be raised are limited to the funding of the owner(s).
iv. Owners have unlimited liability for business debts.

These disadvantages will make it difficult for the organisation to raise additional funds, which could seriously limit the growth of the organisation.

2.3 Close corporation (CC)

CLOSE CORPORATION

A close corporation (CC) is a business that is formed as a legal person that exists separate from its owners. A maximum of ten owners, called members, which must be natural persons, are allowed.

It is important to note that the Companies Act, Act 71 of 2008, that came into operation on 1 May 2011, **prohibits the registering of NEW CCs**. Existing CCs can continue to exist and can convert into companies by following a relatively simple procedure.

Close corporations as a legal organisation *eventually will disappear* as they convert into private companies (discussed after this). However, since not all existing CCs will convert

to companies after 1 May 2011, they will still be part of the business environment for some time to come. We therefore provide information on this business form.

The Close Corporation Act 69 of 1984 governs close corporations as a form of business and sets out formalities such as registration of a founding statement at the Companies and Intellectual Property Registration Office of South Africa (CIPRO). On 1 May 2011 CIPRO was replaced by the Companies and Intellectual Property Commission (CIPC).

- The close corporation as a legal form of business has been introduced in South Africa to provide a less expensive and simpler legal form for the entrepreneur or a few participants.
- It retains the concept of limited liability enjoyed by companies.
- It also retains the concept of continuity of ownership enjoyed by companies.
- The close corporation also has to produce financial statements, but it has not been required that these be audited. In terms of the new Companies Act, a close corporation may now also be required to be audited if it falls within the category of regulations passed by the minister, stipulating the organisations requiring an audit.
- The investment by the member/s in the close corporation is known as the "member's contribution/s" or "member's interest", which may be transferred to a new member if the other members are willing to allow it. This ensures the continued existence of the organisation.
- Close corporations are similar to partnerships in that the owners are also often the managers of the organisation and have a proportional interest in the organisation. However, a close corporation differs from a partnership in that the close corporation does not cease to exist when a member sells his/her interest.
- According to the Income Tax Act, the close corporation is taxed as an organisation apart from the members at the same tax rate as companies.
- Similar to a company, members enjoy limited liability unless it can be proven that they acted fraudulently or recklessly. The abbreviation "CC" has to appear at the end of the name of the organisation.
- This limited liability, as opposed to the joint and individual liability as in partnerships, removed the exposure to personal liability for debts of the organisation in the case of failure of the organisation.

The advantages regarding close corporations explain why close corporations as a business form were so attractive for small business enterprises.

Activity 7.2

How would you explain the attractiveness that a close corporation as a business form had for small business enterprises in the past (before 1 May 2011)?

Feedback on activity 7.2

Before 1 May 2011, the close corporation provided a relatively inexpensive and simple legal form of business for the entrepreneur or a few participants, while at the same time offering the benefits of limited liability and continuity of ownership. The limited liability of the members, the unlimited life of the business and the fact that ownership could be transferred if the members permitted it, addressed the needs of the entrepreneur, or a small number of participants.

2.4 Company

COMPANY

A company is a business form that is a legal organisation distinct from its "owners". "Owners" are referred to as shareholders and can be one or more individuals or organisations.

According to the Companies Act – Act 71 of 2008 – that came into operation on 1 May 2011, all companies fall into one of two broad categories, namely profit companies and non-profit companies (NPCs).

2.4.1 Non-profit companies

- It must have an objective to further some "public benefit" or relating to one or more cultural or social activities, or communal or group activities.
- It must be incorporated by three or more persons.
- All the income and assets must be utilised for the determined objective and no income or assets of the company may be transferred to its directors, members, officers or incorporators. These parties may, however, be paid a reasonable remuneration for their services.

2.4.2 Profit companies

These are companies that are incorporated for the purpose of financial gain for its shareholders. Profit companies are further subdivided into five types:

- private company (Pty) Ltd
- public company (Ltd)
- state-owned company (SOC)
- external company (foreign companies, incorporated outside the Republic of South Africa)
- personal liability company (Inc)

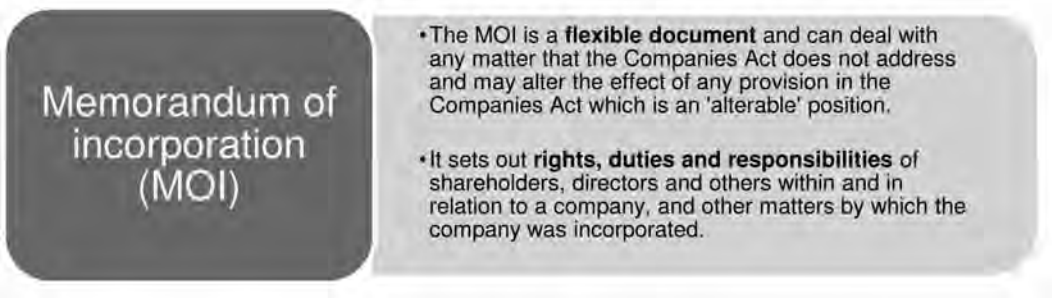
Because the formation of and activities of a company are regulated by the Companies Act, it is **much more complicated and expensive** to form a company than any other form of business. The registration of a company (incorporation) must be made at the Companies and Intellectual Property Commission (CIPC).

NOTE

CIPC replaced the Companies and Intellectual Property Registration Office (CIPRO) on 1 May 2011. The new commission will act independently with a focus on the registration of companies and intellectual property.

A company is incorporated by the lodging of the following main forms:

- Notice of Incorporation
- Memorandum of Incorporation (MOI)



Source: Author, 2012

FIGURE 7.1: Information contained in the memorandum of incorporation

Unlike sole proprietorships and partnerships, a company is a **legal organisation**, or legal "person" that is **separate from the "owners"**. Despite the fact that it is more expensive to form and maintain a company legally, the advantage of it being a legal organisation separate from the owners, make this very suitable for larger enterprises.

We will now focus on some of the characteristics of the first two types of profit companies, namely private and public companies.

Note that in your Auditing modules you will learn about the Companies Act in much more detail.

Characteristics of a PRIVATE company	Characteristics of a PUBLIC company
• They are now subject to **fewer disclosure and transparency** requirements than before. (Old Companies Act of 1973) • A private company is **prohibited from offering its shares to the public** and the transferability of its shares are restricted. • It **may have more than 50 shareholders.** • The name of a private company must end with the expression "Proprietary Limited" or its abbreviation **"(Pty) Ltd"**. • The board of a private company must **comprise at least one director,** or any other minimum number as stipulated in its MOI. Each incorporator is a first director of the company.	• Their MOI permits them to **offer shares to the public** but restricts, limits or negates their right of pre-emption (first right). • The name of a public company must end with the word "Limited" or its abbreviation, **"Ltd"**. • A public company must have **at least three directors.**

Source: CIPC, 2012 (adapted http://www.cipc.co.za/Companies_Reg.aspx)

FIGURE 7.2: Characteristics of private and public companies

- The limited liability means that a company can buy, sell and do transactions in its own name like any other actual person. Since it has many of the constitutional rights and duties of an actual person, a company can own property, enter into contracts, borrow money, be a partner in a partnership – and even own shares in another company.
- Should the company fail the creditors bear the risk of not being paid because they do not have access to the personal assets of shareholders. This fact will encourage investment, since shareholders have the advantage of unlimited gains but losses are limited to the amount they have invested in the company. You should note that where a company borrows money, the company has to provide sufficient surety for the loan. If the company has sufficient surety, as would have to be the case in a public company, the shareholders would have limited responsibility for the company debt – they can only lose what they have invested in buying the shares.
- In private companies, the lender would often require the shareholders, who are often also involved in management, not just to provide company assets as surety, but also to sign personal surety for the loan. The shareholder would then be at risk to whatever the amount of surety signed, not just the money invested in the shares of the company.
- When compared with other forms of organisations, at first glance, companies appear to be the better form to raise cash mainly because of the limited liability of the shareholders, the unlimited life of the organisation and the relative ease with which ownership can be transferred. However, the type of company would affect this viewpoint.
- The company is a separate tax organisation. The liability for taxation by companies is based on the taxable income. This is calculated by taking taxable revenue and deducting allowable expenses according to current tax legislation. The corporate tax rate in South Africa for 2012 was 28%, but it may change from year to year. Other taxes in addition to or in the place of corporate tax as well as specific deductions apply in certain circumstances. These taxes fall outside the scope of this module, but you should note that these taxes may have the effect that a much higher or lower effective tax rate is paid by companies than the 28% mentioned. Due to the competitive environment in which countries compete for investments globally, some countries may lower company tax rates to attract investment. Other countries may allow certain tax deductions to encourage certain behaviour, for example, deductions may be allowed to encourage investments in operating assets, or plant and equipment, or for research and development expenses.

Activity 7.3

Partners in a partnership are busy considering whether they should rather trade as a company. Name the advantages that should be taken into account when evaluating the option to change the form of the organisation to a company (change the form of ownership).

Feedback on activity 7.3

Advantages of trading as a company (private or public):

- There is an improved access to equity and debt capital in order to stimulate growth.
- The limited liability of the shareholders ensures that shareholders are not responsible for the debts of the company (in case of public companies).
- The unlimited life of the company ensures that investors can keep their shares as a long-term investment.

- In a public company, the relative ease with which ownership can be transferred will provide better liquidity to investors (in case of companies listed on the JSE).
- If the partners are paying tax on their partnership income at 40% and the expectation is there that the company would effectively pay the corporate rate of 28%, trading as a company could have tax advantages.

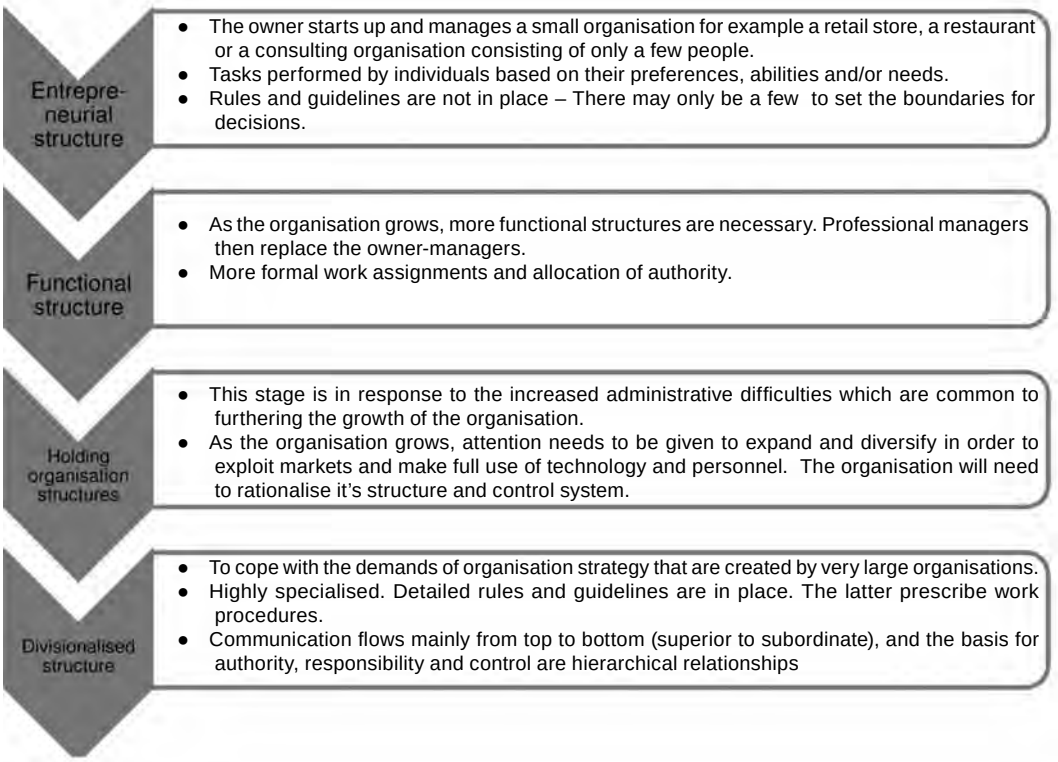
3 Organisational structure

Once the initial legal form of the business has been decided on, the financial manager should also provide advice on the suitable organisational structure of the business.

ORGANISATIONAL STRUCTURE

The structure of a business can be defined as organisational arrangements, systems for gathering together human, physical, financial, and information resources at all levels of the system.

The structure of a business is closely linked to the implementation of the business' strategy and growth over time. Research has established that an organisation's structure usually evolves through four stages, which are normal growth processes, illustrated in the following figure:

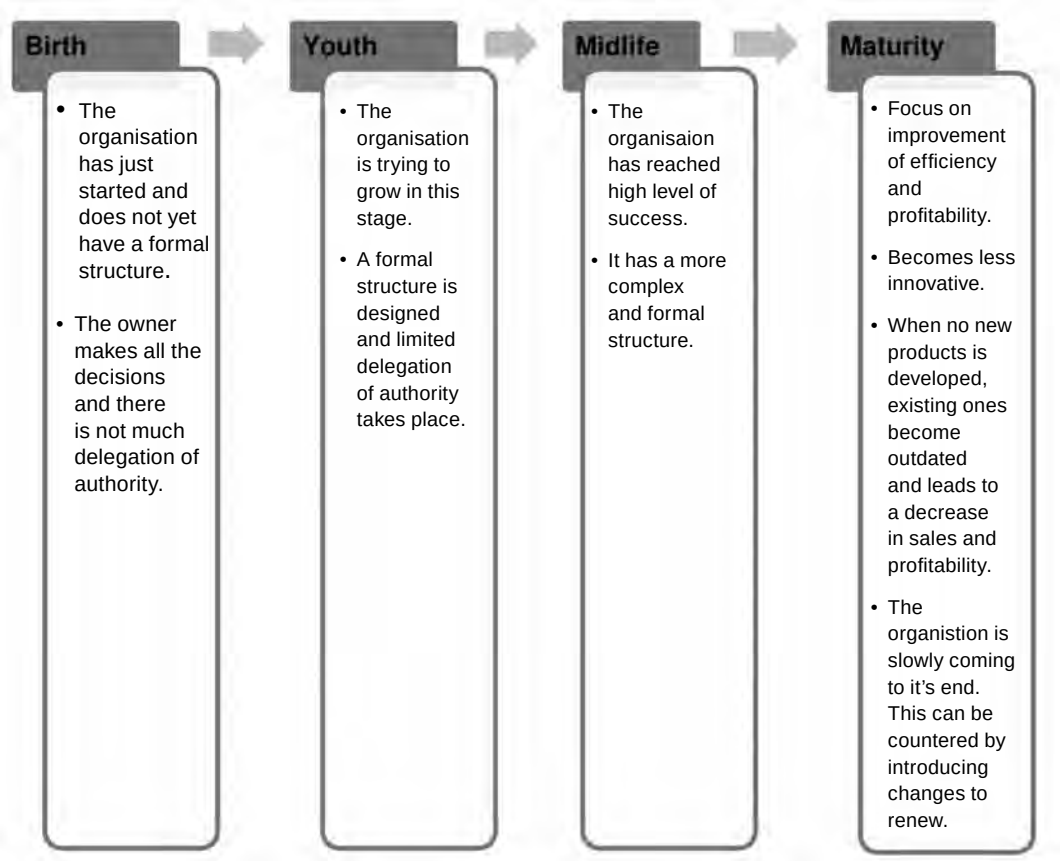


Source: Woodward (1980), adapted by author

FIGURE 7.3: Four stages of growth in the structure of an organisation

From figure 7.3, it is clear that the stages through which an organisation's structure changes are normal and are directly related to the growth of a business. These changes in structure must in turn be accommodated by adjustments in the strategy and even changes in the legal form of the organisation. For example, a sole proprietorship might change to a small private company and if the business is really successful, it might change to a public company with shares being offered to the public and a listing on JSE Limited.

Just like humans, organisations have the tendency to move through stages also known as its life-cycle. Each of the stages has characteristics that affect the structure of the organisation. The stages are birth, youth, midlife, and maturity as illustrated in figure 7.4 below.



Source: Author, 2012

FIGURE 7.4: Life-cycle of the organisation

An organisation does not have to proceed through all four stages in sequence. It may pass over a phase, or it may revert back to a previous phase. It can also try to alter its position in the life-cycle by means of changing its structure. Part of the organisation's strategy should be to continually investigate and capitalise on opportunities to regenerate products and processes.

The implication of the life-cycle concept is that there is a relationship between the size and age of an organisation. As organisations grow older, they tend to become bigger. Therefore, the structural changes that an organisation goes through as it gets larger and the changes it goes through as it moves through the life-cycle, are corresponding. It is clear that, the older and bigger the organisation gets, the more a need develops for more structure, more specialisation of jobs, and more systems. The result will be a move from an informal (organic) structure to a highly formal (mechanistic) structure.

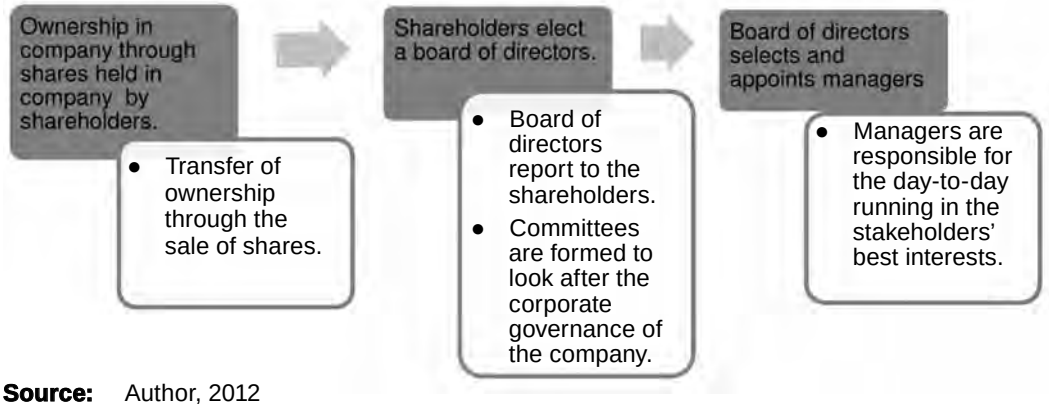
Organisational structuring is an ongoing process. A simple structure is generally needed for simple strategies while complex structures are necessary when organisation strategies involve complicated interactions.

In MAC3701 you will learn more about exercising control in centralised versus decentralised (divisionalised) organisations and related performance measures.

4 The relationship between shareholders and management (agency theory)

An important aspect to bear in mind when selecting a company as legal form for the business is the relationship between the shareholders (owners) of the company and the managers of the company which the shareholders appoint to run the company on a day-to-day basis.

The following figure summarises the theoretical relationship between the various parties in a company. While the structures would certainly apply in public companies, in many private companies, some of these relationships may be combined, for example, a majority shareholder would quite likely be a director – and may also be a manager.



Source: Author, 2012

FIGURE 7.5: Summary of relationships between parties in a company

As illustrated in figure 7.5, ownership is separated from the day-to-day running of a public company. This is called "separation of ownership and control". In private companies, the size of the company would determine whether this would apply or not.

The managers are supposed to manage the company in the best interests of the shareholders. Therefore, they are seen as agents for the shareholders. The risk exists that the goals of managers may be different from those of the shareholders. An example of where management are motivated by self-interest instead of promoting the best interest of the shareholders is when managers structure very large salary packages for themselves or incur expensive travel for so-called "business" trips that were actually private holiday trips.

Conflict can therefore develop between the self-interest of the agents (managers) and their task to maximise long-term wealth for the shareholders (owners). This conflict is known as **"agency theory"**. Because shareholders only have periodical chances to determine whether the managers run the organisation in their best interest, shareholders can discourage managers from pursuing their own interests by developing suitable incentives for managers such as performance bonuses – and use this to monitor their behaviour. You will learn more about performance management and share incentive schemes in MAC2601 and MAC3701.

5 Change in ownership

When a company wants to expand, it can be done by acquiring long-term operating assets – also called organic growth or internal expansion. Another path to follow in order to expand is by acquiring the control of shares and assets in another company. This is called a take-over or external expansion.

TAKE-OVER

Take-over is the term used when referring to the transfer of control of a company from one group of shareholders to another group of shareholders.

In the case of a take-over, the existing shareholders are entirely or largely replaced by new shareholders. The organisation who takes over obtains full control over the company's policy formulation and management. Buyouts, take-overs and restructuring are ways by which the ownership of a company can be restructured. These concepts will be discussed in detail in MAC3702.

6 Summary

In this study unit, we explained the factors to consider when deciding on the legal forms of an organisation, the structure, the relationship between shareholders and management and a change in ownership. We also discussed how the growth of the business necessitates changes in its organisational structure. Lastly, we explained the very important concept of agency theory.

Once the legal form and structure of the business has been decided upon, you need to consider how much funding is required (the size of the investment) and how it will be financed (sources of finance).

Since the objective of financing decisions is to obtain funds with the minimum cost, you will need to calculate the cost of the different financing options. In order to do this, you require knowledge of the time value of money. Similarly, when investing money, you need to know how to calculate the effective returns from the different options. In the next topic we will explain time value of money concepts and illustrate selected calculations.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. Which is the least regulated and easiest type of business to start?
b. Describe what a sole proprietorship entails.
c. List three characteristics of non-profit companies.
d. Identify the five types of profit companies as provided for in the Companies Act of 2008.
e. List three fundamental differences between public and private companies.
f. Define the concept "business structure."
g. List the four stages of growth in the structure of an organisation.
h. Describe what "agency theory" entails.

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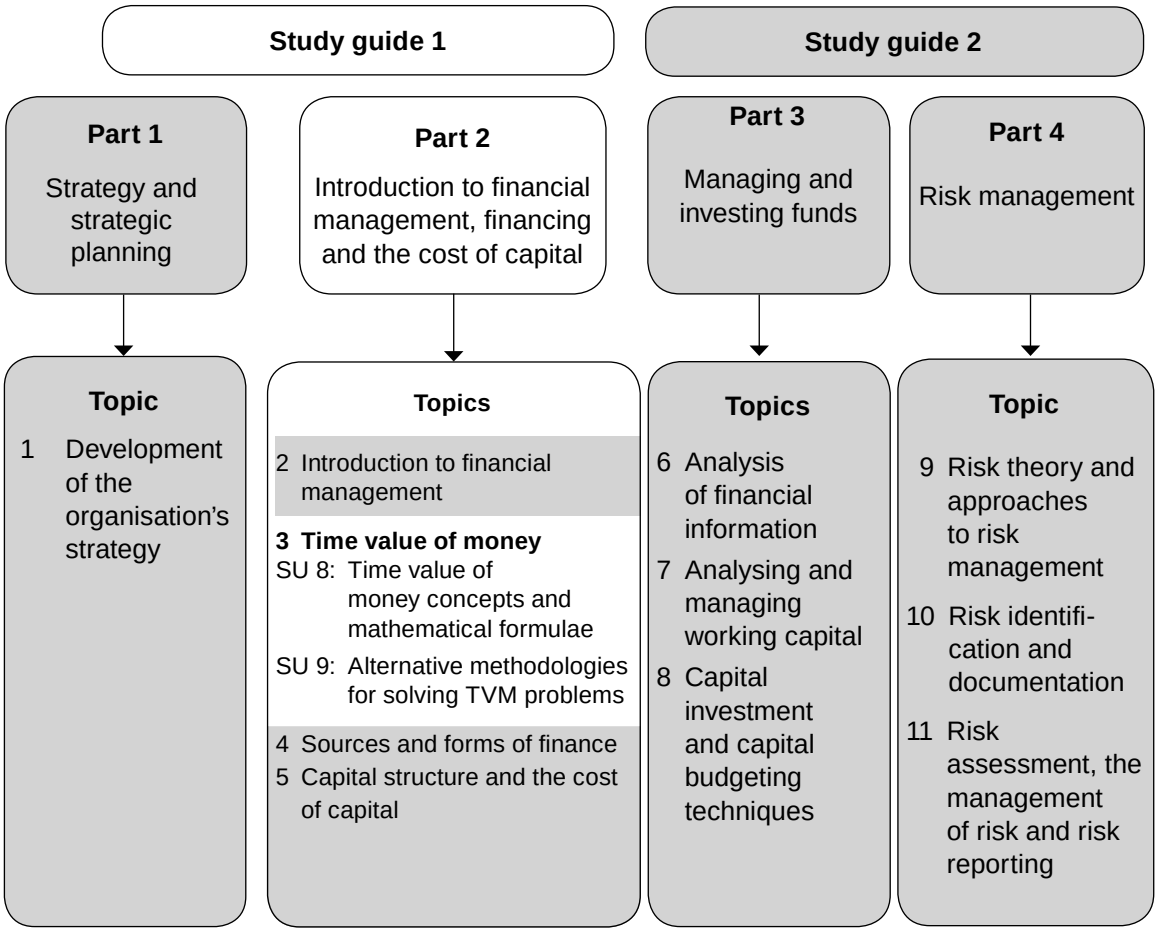
Time value of money

LEARNING OUTCOMES

After studying this topic, you should be able to:

- define the concepts related to the time value of money
- calculate the future and present value of various types of cash flows
- calculate simple and compound interest
- calculate effective annual, nominal and periodic interest rates
- use mathematical formulae, factor tables, and a financial calculator to calculate future and present values of single amounts, annuities, perpetuities and unequal payments
- determine the applicable interest rate by using interpolation



INTRODUCTION

In the previous topic we discussed the functions of financial management, including its direct involvement in the formulation and implementation of strategy, the management of business risk and business performance.

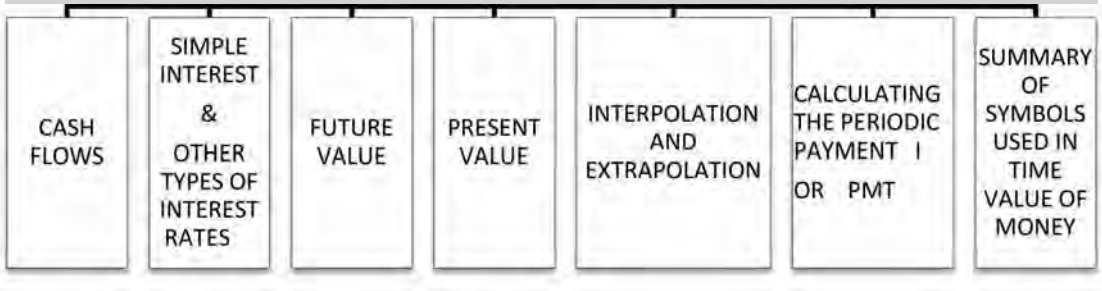
The main objectives of financing decisions are to obtain funds at the lowest cost or to invest funds at the highest return. Calculation of the effective cost of alternative financing options is necessary in order to compare options and to select the option with the lowest effective financing cost. At the other end of the scale, calculating the returns on alternative investment options is necessary in order to compare options and to select the option with the highest return.

In this topic, we will explain the concepts related to the time value of money (TVM) and illustrate selected calculations that you will need to understand and apply when you calculate the cost of capital (cost of the different sources of finance), or compare investment options and carry out free cash flow valuations. You will learn more about these topics later on in this module guide.

STUDY UNIT 8

Time value of money concepts and mathematical formulae

In this study unit



1 Introduction

We will now introduce you to the basic concepts used in time value of money (TVM). We will start by explaining the basic mathematical principles, expressed as formulae. We will demonstrate how you should apply these formulae to solve problems with the aid of your pocket calculator. Please note that you must be able to solve these problems with your pocket calculator, because this will demonstrate that you really understand the principles explained in this study unit.

The opportunity to earn a return (interest) on funds that you have invested means that a rand received today is worth more than a rand received at some date in the future. If R1 000 is received today, it can be invested and earn interest. The interest earned will result in the investment being worth more after a year than merely receiving R1 000 a year from now. This is a core principle of finance, and is called the time value of money.

The time value of money is important, because the majority of business decisions boils down to a trade-off between spending or borrowing money today and receiving or paying back money in the future. Financial managers use the time value of money principle as tool to determine how much money an organisation must earn in the future to justify today's expenditures on new investments.

NOTE

In this topic we will use the concepts *borrowed* and *invested* as well as *interest paid* and *interest (or return) earned* interchangeably. The TVM principles (mathematical calculations) apply equally, whether you are working with funds borrowed or funds invested. The amounts paid by one party are the amounts received by the other party.

2 Cash flows

CASH FLOW

Cash flow is any receipt or payment of money that occurs at a specific point in time. It includes capital and interest.

A cash flow consists of two components:

Firstly, it comprises the actual **receipt or payment** of money. This differs from the accounting concepts of "income" and "expense" These accounting concepts arise from the fundamental principle of accounting, in which accounting entries are detached from the associated cash flows and recognised in accounting periods that may differ from those in which the actual cash-flows occur (for example, the accrual of employee leave entitlement or the depreciation of equipment). The associated cash flow (in this instance the payment of accrued leave) may not occur if leave is taken in a later period; alternatively, it may be paid out in a later accounting period.

Secondly, there is a **defined point in time** at which the cash flow occurs. Because of the time laps between the receipt or payment of money and the defined future point in time, interest can be earned or should be paid. This is why it is essential to apply the time value of money.

Cash flows form the basis of time value of money calculations and are either **single cash flows, annuities** or **unequal cash flows**. The types of cash flows that we are talking about here are the actual payments made or received, either once off or periodically. The repayment of an amount owing in fixed instalments (payments) also uses the annuity formulae.

The next diagram will illustrate the various types of cash flows.

KEY TERMS:

SINGLE CASH FLOWS	**A single cash flow is a once-off (non-repetitive) cash inflow or outflow.** Examples are an initial investment or once off repayment of borrowed money.
ANNUITIES	**An annuity is a stream of equal payments at equal intervals of time in the future.** **ORDINARY ANNUITY** An ordinary annuity is an annuity where the payments take place at the end of each year or period (payment interval) at the same time that interest is calculated. **PERPETUITY** A perpetuity is an annuity where the payments continue forever. **ANNUITY DUE** An annuity where the payments fall due at the beginning of each payment interval (period) is an annuity due. The last payment of an annuity due is one payment before the end of the term. An example is the monthly rent for a house.
UNEQUAL CASH FLOWS	**Unequal cash flows can occur repetitively at the end of each year or period (payment interval).** An example is dividend payments on ordinary shares, where the dividend payout is not static.

3 Simple interest

INTEREST

Interest is the price paid for borrowed money or received for money invested.

If you borrowed R1 000 from the bank for two years, you will have to pay the bank for the use of the money. In other words, you have to compensate the bank (lender) for their being unable to use this money. The percentage agreed on between the borrower and lender is the interest rate.

In this section we will discuss the following two types of interest rates that apply in the time value of money calculations – simple interest and compound interest. Nominal and effective interest will be covered later.

SIMPLE INTEREST

Simple interest is the interest calculated on the principal only for the entire term.

Simple interest means accruing the SAME amount of interest each year based on the same PRINCIPAL amount. Interest is not earned on accrued interest.

Key terms: Principle, Duration, Interest

The amount of money originally borrowed (or invested) is called the **PRINCIPAL (P)** and the period of time for which it is borrowed (or invested) is the **DURATION (n)** of the loan (or investment). **INTEREST (i)** is calculated as a percentage of the principal per year.

For example, if the interest rate is 15%, then 15% of R1 000 = R150 interest accrues per year until the loan and interest are repaid. The value of the loan obligation at the end of two years (at a specific date in the future) will be:

Principal amount	R1 000
plus the interest for the two years (R1 000 × 0,15 × 2)	R 300
Future value	R1 300

Similar to the above example, you can make an investment and receive (accrue) interest on this investment, which is only payable when you withdraw the investment. Say you invest R6 000 at 13% simple interest for three years. The amount that you will receive at the end of the three years (the value of your investment after three years) will be:

Principal amount	R6 000
plus the interest accrued for the three years (R6 000 × 0,13 × 3)	R2 340
Future value	R8 340

These examples illustrate the calculation of the interest amount by multiplying the principal amount with the simple interest rate and the time in days, months or years.

Should you be required to determine the initial or principal amount to invest, if invested at a 13% simple interest rate, which will yield a future value (accumulated sum) of R8 340 after three years, you can change the formula as follows:

Principal amount	=	Future value – interest
P	=	R8 340 – (P × i × n)
P	=	R8 340 – (P × 0,13 × 3)
P + (P × 0,13 × 3)	=	R8 340
1,39P	=	R8 340
P	=	R8 340 ÷ 1,39
P	=	R6 000

NOTE

Interest (i) is used in its decimal format, that is, 13% is 0,13 in mathematical formulae.

However, when entering the interest rate into your financial calculator (as we will illustrate in the next study unit), it is entered as an integer or whole number, that is "13".

Activity 8.1

Your mother wants to deposit R2 000 in a bank account that earns 10% simple interest per year (annum). You are required to determine the value of your mother's investment at the end of the three-year period.

Feedback on activity 8.1

The value of the investment will be:

Principal amount	R2 000
plus the interest for the three years (R2 000 × 0,10 × 3)	R 600
	R2 600

OR

Year	Interest calculation	Interest	Balance
1	R2 000 × 0,10	R200	R2 200
2	R2 000 × 0,10	R200	R2 400
3	R2 000 × 0,10	R200	**R2 600**

From the interest column, you will see that the amount of annual interest is the same as simple interest, which is interest payable on the principal (capital portion) ONLY.

4 Compound interest (annually)

COMPOUNDING

Compounding refers to the calculation of interest on a principal (initial) amount and adding that interest to the principal for investment in the following period. The interest is therefore not paid at the end of the period in which it accrues. In the next period(s), interest is earned on the interest re-invested.

When we borrow or invest money at a compound interest rate, the interest due at the end of each year, is added to the amount of the original loan or investment (the principal amount). The following year's interest is then calculated on the new balance consisting of the principal and the interest portion that was added. It therefore refers to interest that is earned on interest or **capitalised interest**.

Money invested at compound interest increases quicker in value, which is why compound interest is preferred over simple interest. For example, repayments on loans from banks and housing bonds are usually based on compound interest. The pay-out value of savings, such as life assurance policies and pension funds, are also to some extent derived from the compound interest earned over the years.

Activity 8.2

Compound interest (single payment)

Consider the same information as for simple interest in activity 8.1, but now interest is at 10% per year compounded yearly (annually).

You are required to determine the value of your mother's investment at the end of the three-year period.

Feedback on activity 8.2

The end value of the investment of the single amount will be:

Year	Interest calculation	Interest	Balance
1	R2 000 × 0,10	R200	R2 200
2	R2 200 × 0,10	R220	R2 420
3	R2 420 × 0,10	R242	**R2 662**

The future value of the investment has grown to R2 662 (using compound interest) as opposed to only R2 600 as per activity 8.1 (using simple interest).

NOTE

From the interest column, you can see that the annual interest earned increases. Compound interest is when interest is payable on BOTH capital and accumulated interest. It assumes reinvestment of the interest receivable at the end of the year, at the same interest rate.

5 Future value

FUTURE VALUE

The future value is the amount that an investment will be worth at a future date if invested at a particular simple or compound interest rate.

In time value of money calculations, the future value is usually abbreviated as FV. The periods (n) refers to the number of times that interest is compounded.

We also refer to the future value as the maturity value or the accumulated sum of an investment after a certain number of periods.

5.1 Future value (single payment)

The mathematical formula used for calculating the future value of one payment (single cash flow) for one year or 1 period is:

FUTURE VALUE (SINGLE PAYMENT – 1 PERIOD)

$$FV = PV(1 + i)$$

The mathematical formula used for calculating the future value of one payment for multiple years or periods (using compound interest) is:

FUTURE VALUE (SINGLE PAYMENT – MULTIPLE PERIODS)

$$FV = PV(1 + i)^n$$

Where FV = Future value
PV = Present value
i = Interest rate
n = Number of years/periods

NOTE

In mathematics, the superscript n (^{n}), is the power function. It means a number must be multiplied with itself n times. For example, 2^3 is $2 \times 2 \times 2 = 8$.

The above formula is extremely important, so please make sure that you fully understand it.

If PV is assumed to be R1, in the mathematical formula **$PV(1 + i)^n$,** the part of the mathematical formula in brackets is called the **FV factor of R1 received/paid now, after n years**. Table C, at the end of this topic, presents the future value of R1 received or paid now, after n years (a range of periods "n" and at a range of interest rates "i". In the next study unit you will see that we can replace $(1 + i)^n$ with the applicable FV factor from Table C, instead of calculating it mathematically.

One can also easily solve time value of money problems (questions) with the use of a financial calculator (as discussed in the next study unit). Although we will show the steps for the financial calculator in the next study unit, we want you to understand the concepts involved and not just read the final answer from the calculator.

Activity 8.3

Future value (single payment)

If you invest R6 000 now at 13% compound interest over a three-year period, what will the amount be that you will receive at the end of the three years? Use the mathematical formula and pocket calculator.

[Work to four decimal places and round your final answer to the nearest rand.]

Feedback on activity 8.3

FV = $PV(1 + i)^n$
= $R6\,000(1 + 0{,}13)^3$
= R6 000 × 1,4429
= R8 657,3820
= R8 657 (rounded to the nearest rand)

Year	Interest calculation	Interest	Balance
1	R6 000 × 0,13	R780	R6 780
2	R6 780 × 0,13	R881	R7 661
3	R7 661 × 0,13	R996	**R8 657**

Where $(1 + i)^n$ *= (1,13 × 1,13 × 1,13) = 1,4429*

5.2 Future value (ordinary annuity)

The mathematical formula used for calculating the future value of an ordinary annuity (using compound interest) is:

Key formula: FUTURE VALUE (ORDINARY ANNUITY)

$$FV_{annuity} = I \times \left[\frac{(1+i)^n - 1}{i}\right]$$

Where:
I = Annuity amount or payment
i = Interest rate
n = Number of years or periods

Activity 8.4

Future value (ordinary annuity)

A person would like to invest R5 000 at the **end** of **each year** at an annual compound interest rate of 14%. You are required to determine the value of the investment after four years by using a:

i. mathematical formula
ii. pocket calculator

[Work to four decimal places and round your final answer to the nearest rand.]

Feedback on activity 8.4

i. Mathematical formula:

$$\text{FV annuity} = \text{I} \times \left[\frac{(1+i)^n - 1}{i}\right]$$

$$= \text{R } 5\,000 \times \left[\frac{(1+0{,}14)^4 - 1}{0{,}14}\right]$$

$$= \text{R}5\,000 \times \left[\frac{(1{,}14)^4 - 1}{0{,}14}\right]$$

$$= \text{R}5\,000 \times \left[\frac{(1{,}6890 - 1)}{0{,}14}\right]$$

$$= \text{R}5\,000 \times \left[\frac{0{,}6890}{0{,}14}\right]$$

$$= \text{R}5\,000 \times 4{,}9211$$

$$= \text{R}24\,605{,}72$$

$$= \text{R}24\,606 \quad \text{(rounded to the nearest rand)}$$

ii. Pocket calculator

Required calculator steps:	Display
Key in **1.14 2ndF y^x 4 =**	1,6890
Deduct 1	0,6890
Divide by 0,14	4,9211
Multiply with 5 000	24 605,72

NOTE

(a) You will notice from the above, that we are in effect applying the mathematical formula in the various steps; this means that the formula and pocket calculator approach are actually identical.

(b) If I is assumed to be R1, in the mathematical formula

$$\text{I} \times \left[\frac{(1+i)^n - 1}{i}\right]$$

the part of the mathematical formula in brackets is called the **FV factor of R1 received/ paid for n years at the end each year**. Table D, at the end of this topic, presents the future value of R1 invested at the end of EACH year for a range of periods "n" and at a range of interest rates "i". In the next study unit you will see that we can replace

$$\left[\frac{(1+i)^n - 1}{i}\right]$$

with the applicable FV factor from Table D, instead of calculating it mathematically.

(c) The future value of an annuity is the sum of the future values of each individual payment (PMT's) or cash flows (CF's).

5.3 Future value (annuity due/annuity in advance)

The mathematical formula used for calculating the future value of an annuity due (using compound interest) is:

Key formula: FUTURE VALUE (ANNUITY DUE)

$$FV \text{ annuity due} = I \times \left[\frac{(1+i)^{n+1} - 1}{i} - 1 \right]$$

Where: I = Annuity amount or payment

NOTE

This formula differs from the FV formula for an ordinary annuity (as presented in activity 8.4) only in that – 1 is subtracted (to recognise the first payment that is paid now) and 1 is added to the number of periods (n + 1) since the first payment was made at the beginning of the year and was already accounted for when 1 was subtracted.

Formula: ordinary annuity	Formula: annuity due
$FV \text{ annuity} = I \times \left[\frac{(1+i)^{n} - 1}{i} \right]$	$FV_A(due) = I \times \left[\frac{(1+i)^{n+1} - 1}{i} - 1 \right]$

Activity 8.5

Future value (annuity due/annuity in advance)

You intend to establish a savings account for your child's university education when he enters high school. You will make payments of R5 000 each into this account at the beginning of each year and you will earn compound interest of 8% per annum on your investment. You are required to calculate the future value of the annuity due after five years when your child will have finished his high school education by using a:

i. mathematical formula

ii. pocket calculator

[Work to four decimal places and round your final answer to the nearest rand.]

Feedback on activity 8.5

i. Mathematical formulae

$$\text{FV annuity due} = \text{R5 000} \times \left[\frac{(1+0{,}08)^{5+1}-1}{0{,}08} - 1\right]$$

$$= \text{R5 000} \times \left[\frac{(1+0{,}08)^{6}-1}{0{,}08} - 1\right]$$

$$= \text{R5 000} \times \left[\frac{(1{,}5869-1)}{0{,}08} - 1\right]$$

$$= \text{R5 000} \times \left[\frac{(0{,}5869}{0{,}08} - 1\right]$$

$$= \text{R5 000} \times (7{,}3359 - 1)$$

$$= \text{R5 000} \times 6{,}3359$$

$$= \text{R31 679,6452}$$

$$= \text{R31 680 (rounded to the nearest rand)}$$

NOTE

Since repetitive equal cash flows are made at the beginning of each of the five years the mathematical formula is equal to the sum of the future values of all payments (PMT's) or cash flows (CF's) (single amounts).

Years:	**1**		**2**		**3**		**4**		**5**
FV =	$FV_{pmt\ 1}$	+	$FV_{pmt\ 2}$	+	$FV_{pmt\ 3}$	+	$FV_{pmt\ 4}$	+	$FV_{pmt\ 5}$
FV =	$FV_{CF\ 1}$	+	$FV_{CF\ 2}$	+	$FV_{CF\ 3}$	+	$FV_{CF\ 4}$	+	$FV_{CF\ 5}$
FV =	$PV(1+i)^1$	+	$PV(1+i)^2$	+	$PV(1+i)^3$	+	$PV(1+i)^4$	+	$PV(1+i)^5$

$= \text{R5 000}(1{,}08)^1 + \text{R5 000}(1{,}08)^2 + \text{R5 000}(1{,}08)^3 + \text{R5 000}(1{,}08)^4 + \text{R5 000}(1{,}08)^5$

= R5 000(1,08) + R5 000(1,1664) + R5 000(1,2597) + R5 000(1,3605) + R5 000(1,4693)

= R5 400 + R5 832 + R6 298,5000 + R6 802,5000 + R7 346,5000

= R31 679,5000

= R31 680

ii. Pocket calculator

Required calculator steps:	Display
Key in **1.08 2ndF y^x 6 =**	1,5869
Deduct 1	0,5869
Divide by 0,08	7,3359
Subtract 1	6,3359
Multiply with 5 000	31 679,6452

= R31 680 (rounded to the nearest rand)

6 Present value

DISCOUNTING

Discounting is the process used to determine the original investment (principal) amount by discounting the future value, which resulted from the compounding of interest, back to the present value. (Discounting is thus used to determine the present value of an investment.)

Discounting is therefore the inverse of compounding. This method determines the current value of an investment when the future value is available.

PRESENT VALUE

The present value is the current value of future cash flows, determined by application of the discount rate (discounting).

In calculations, the present value is abbreviated as PV. The phenomenon where a smaller amount will be accepted today for the settlement of a larger amount due in future is called discounting back to the present value. Discounting addresses the question of what an amount, receivable or payable at a specific time in the future, is worth today.

6.1 Present value (single payment)

The mathematical formula used for calculating present value of a single amount is:

Key formula: PRESENT VALUE (SINGLE PAYMENT)

$$PV = \left[\frac{FV}{(1+i)^n}\right]$$

Where FV = Future value
PV = Present value
i = Interest rate
n = Number of years or periods

You can also derive the PV formula from the FV formula:

$FV = PV(1 + i)^n$

Divide by $(1 + i)^n$ on both sides: $= \left[\frac{FV}{(1+i)^n}\right] = \left[\frac{PV(1+i)^n}{(1+i)^n}\right]$

$$PV = \left[\frac{FV}{(1+i)^n}\right]$$

NOTE

This is a very important formula, so please, make sure that you fully understand it.

Note that if FV is assumed to be R1, the mathematical formula, $\left[\frac{1}{(1+i)^n}\right]$

is called the **PV factor of R1 received or paid after n years**. Table A, at the end of this topic, presents the present value of R1 invested ONCE for a range of periods and at a range of interest rates. In the next study unit you will see that we can replace

$$\left[\frac{1}{(1+i)^n}\right]$$

with the applicable PV factor from Table A, instead of calculating it mathematically.

Activity 8.6

Present value (single payment)

In five years from now, you want to buy a car to the value of R180 000. What is the amount that you must invest now (today) at 10% compound interest per annum in order to reach your goal of R180 000 at the end of the five-year period?

[Work to four decimal places and round your final answer to the nearest rand.]

Feedback on activity 8.6

$$PV = \left[\frac{FV}{(1+i)^n}\right]$$

$$= \left[\frac{R180\,000}{(1+0{,}10)^5}\right]$$

$$= \left[\frac{R180\,000}{1{,}6105}\right]$$

= R111 767
(rounded to the nearest Rand)

Where $(1 + i)^n$ = *(1,10 × 1,10 × 1,10 × 1,10 × 1,10) = 1,6105*

Year	Beginning balance	Interest R	Closing balance R
5	180 000 ÷ 1,10 = 163 636,36	16 363,64	180 000,00
4	163 636,36 ÷ 1,10 = 148 760,58	14 875,78	163 636,36
3	148 760,58 ÷ 1,10 = 135 236,89	13 523,69	148 760,58
2	135 236,89 ÷ 1,10 = 122 942,62	12 294,27	135 236,89
1	122 942,62 ÷ 1,10 = 111 766,01	11 176,61	122 942,62

The amount that you must invest now is the PV of the future cash flows, determined by the application of the discount rate, calculated to be R111 767.

6.2 Present value (ordinary annuity)

The mathematical formula used for calculating the present value of an ordinary annuity is:

Key formula: PRESENT VALUE (ORDINARY ANNUITY)

$$\text{PV annuity} = I \times \left[\frac{1 - \frac{1}{(1+i)^n}}{i} \right]$$

Where: I = Annuity amount or payment

Activity 8.7

Present value (ordinary annuity)

An amount of R10 000 is to be invested annually at the end of each year for five years at 10% compound interest per annum. Determine the present value of this annuity.

[Work to four decimal places and round your final answer to the nearest rand.]

Feedback on activity 8.7

$$= \text{R10 000 x } \left[\frac{1 - \frac{1}{(1+0{,}10)^5}}{0{,}10} \right]$$

$$= \text{R10 000 x } \left[\frac{1 - \frac{1}{(1{,}10)^5}}{0{,}10} \right]$$

$$= \text{R10 000 x } \left[\frac{1 - \frac{1}{1{,}6105}}{0{,}10} \right]$$

$$= \text{R10 000 x } \left[\frac{1 - 0{,}6209}{0{,}10} \right]$$

$$= \text{R10 000 x } \left[\frac{0{,}3791}{0{,}10} \right]$$

= R10 000 x 3,7907

= R37 907,48

= R37 908 (rounded to the nearest rand)

NOTE

The present value of an annuity is the sum of the present values of each payment (PMT's) or cash flows (CF's).

Therefore, the present value of an annuity is the amount of money that must be invested now, at i percent, so that n equal periodic payments may be withdrawn without any money left over at the end of the term of n periods.

Since repetitive equal cash flows are made at the end of each of the following five years the mathematical formula is equal to:

Years: 1 2 3 4 5

$PV = PV_{pmt\ 1} + PV_{pmt\ 2} + PV_{pmt\ 3} + PV_{pmt\ 4} + PV_{pmt\ 5}$

$PV = PV_{CF\ 1} + PV_{CF\ 2} + PV_{CF\ 3} + PV_{CF\ 4} + PV_{CF\ 5}$

$$PV = \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right]$$

$$= \left[\frac{10000}{(1+0{,}10)^1}\right] + \left[\frac{10000}{(1+0{,}10)^2}\right] + \left[\frac{10000}{(1+0{,}10)^3}\right] + \left[\frac{10000}{(1+0{,}10)^4}\right] + \left[\frac{10000}{(1+0{,}10)^5}\right]$$

$$= \left[\frac{10000}{(1{,}1000)}\right] + \left[\frac{10000}{(1{,}2100)}\right] + \left[\frac{10000}{(1{,}3310)}\right] + \left[\frac{10000}{(1{,}4641)}\right] + \left[\frac{10000}{(1{,}6105)}\right]$$

= 9 090,91 + 8 264,46 + 7 513,15 + 6 830,14 + 6 209,21

= R37 907,87

= R37 908 (rounded to the nearest rand)

NOTE

Note that if I is assumed to be R1, the mathematical formula, $\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]$

is called the **PV factor of R1 per annum received or paid at the end of the year for n years**. Table B, at the end of this topic, shows the present value of R1 invested at the end of EACH year (annuity) for a range of periods and at a range of interest rates. In the next study unit you will see that we can replace

$$\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]$$

with the applicable PV factor (annuity) from Table B, instead of calculating it mathematically.

6.3 Present value (perpetuity)

PERPETUITY

A perpetuity means that the cash flow will be received or paid periodically at certain time intervals into infinity, since there is no termination date. Another example of a perpetuity would be a non-redeemable preference share paying a fixed dividend.

The formula used for calculating the present value of a perpetuity (PV_P) is:

Key formula: PRESENT VALUE (PERPETUITY)

$$PV_P = \frac{I}{i}$$

Where:

I = investment or payment per period = annuity amount

i = interest rate or required return (expressed as a decimal)

Activity 8.8

Present value (perpetuity)

You have invested an amount of money at 8% compound interest and will receive R2 000 annually indefinitely. What is the present value (PV) of the amount you invested?

[Work to four decimal places and round your final answer to the nearest rand.]

Feedback on activity 8.8

$$PV_P = \frac{I}{i}$$

$$= \frac{2\,000}{0{,}08}$$

$$= R25\,000$$

6.4 Present value (annuity due/annuity in advance)

The formula used for the present value of an annuity **due** is:

Key formula: PRESENT VALUE (ANNUITY DUE)

$$PV_A(due) = I \times \left[\frac{1 - \frac{1}{(1+i)^{n-1}}}{i} + 1 \right]$$

NOTE

This formula differs from the PV formula for an ordinary annuity (as presented in activity 8.7) only in that + 1 is added (to recognise the first payment that is paid now) and 1 is subtracted from the number of periods (n – 1) because the first payment was already accounted for when 1 was added.

Formula: ordinary annuity	Formula: annuity due
PV annuity = I x $\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]$	PV_A(due) = I x $\left[\frac{1-\frac{1}{(1+i)^{n-1}}}{i}+1\right]$

Activity 8.9

Present value (annuity due/annuity in advance)

You decided to rent out your house for five years. You will receive five payments from the tenants, R100 000 now and R100 000 at the beginning of year 2, 3, 4 and year 5. You are required to calculate the present value of the annuity due by using 10% as the discount rate.

[Work to four decimal places and round your final answer to the nearest rand.]

Feedback on activity 8.9

The present value of the rent that you will receive over the next five years is:

$$= \text{I x } \left[\frac{1-\frac{1}{(1+i)^{n-1}}}{i}+1\right]$$

$$= \text{R100 000 x } \left[\frac{1-\frac{1}{(1+0{,}10)^{5-1}}}{0{,}10}+1\right]$$

$$= \text{R100 000 x } \left[\frac{1-\frac{1}{(1+0{,}10)^{4}}}{0{,}10}+1\right]$$

$$= \text{R100 000 x } \left[\frac{1-\frac{1}{1{,}4641}}{0{,}10}+1\right]$$

$$= \quad R100\,000 \times \left[\frac{1 - 0{,}6830}{0{,}10} + 1\right]$$

$$= \quad R100\,000 \times \left[\frac{0{,}3170}{0{,}10} + 1\right]$$

$$= \quad R100\,000 \times [3{,}1699 + 1]$$

$$= \quad R100\,000 \times 4{,}1699$$

$$= \quad R416\,990$$

NOTE

Since repetitive equal cash flows are made at the beginning of each of five years the mathematical formula is equal to the sum of the present values of all payments (PMT's) or cash flows (CF's).

The first payment (at the beginning of the year) is regarded as received in year 0. This means that the first payment (cash flow) need not be discounted to present value as it is receivable now. The second payment (cash flow) is receivable at the beginning of year 2, which is regarded similar to a cash flow receivable at the end of year 1.

Years: **0** **1** **2** **3** **4**

$$PV = PV_{pmt\,1} + PV_{pmt\,2} + PV_{pmt\,3} + PV_{pmt\,4} + PV_{pmt\,5}$$

$$PV = PV_{CF\,1} + PV_{CF\,2} + PV_{CF\,3} + PV_{CF\,4} + PV_{CF\,5}$$

$$PV = \left[\frac{FV}{(1{,}000)}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right]$$

$$= \left[\frac{100\,000}{1{,}000}\right] + \left[\frac{100000}{(1+0{,}10)^1}\right] + \left[\frac{100\,000}{(1+0{,}10)^2}\right] + \left[\frac{100\,000}{(1+0{,}10)^3}\right] + \left[\frac{100\,000}{(1+0{,}10)^4}\right]$$

$$= \left[\frac{100\,000}{(1{,}000)}\right] + \left[\frac{100000}{1{,}1000}\right] + \left[\frac{100\,000}{(1{,}2100)}\right] + \left[\frac{100\,000}{(1{,}3310)}\right] + \left[\frac{100\,000}{(1{,}4641)}\right]$$

$$= \quad 100\,000 + 90\,909{,}09 + 82\,644{,}62 + 75\,131{,}48 + 68\,301{,}34$$

$$= \quad R416\,986{,}53$$

$$= \quad R416\,987$$

6.5 Present value (unequal payments)

In this scenario the future payments are not equal, so you cannot use the mathematical formula for the PV of an ordinary annuity formula. You can alternatively use the principle that the PV is the sum of the PV's of all the individual cash flows.

Activity 8.10

Present value (unequal payments)

You wish to make annual investments. You can afford to invest the following amounts at the end of each year, over the next four years.

Year 1	R15 000
Year 2	R10 000
Year 3	R 6 000
Year 4	R 5 000

The investment will earn 10% annually compounded interest. You are required to determine the present value of these unequal payments.

[Work to four decimal places and round your final answer to the nearest rand.]

Feedback on activity 8.10

$$PV = \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right]$$

$$= \left[\frac{15000}{(1+0{,}10)^1}\right] + \left[\frac{10000}{(1+0{,}10)^2}\right] + \left[\frac{6000}{(1+0{,}10)^3}\right] + \left[\frac{5000}{(1+0{,}10)^4}\right]$$

$$= \left[\frac{15000}{(1{,}1000)}\right] + \left[\frac{10000}{(1{,}2100)}\right] + \left[\frac{6000}{(1{,}3310)}\right] + \left[\frac{5000}{(1{,}4641)}\right]$$

$$= 13\,636{,}36 + 8\,264{,}46 + 4\,507{,}89 + 3\,415{,}07$$

$$= R29\,823{,}78$$

$$= R29\,824 \text{ (rounded to the nearest rand)}$$

7 Other types of interest rates

We apply nominal, periodic and effective interest rates in time value of money calculations where the compounding takes place more than once per year. We will now discuss each individually.

7.1 Nominal annual rate

NOMINAL ANNUAL RATE

In cases where interest is calculated more than once a year, the annual rate quoted is the nominal annual rate or nominal rate.

This is the rate that banks and other financial institutions normally quote. The nominal rate quoted to consumers, is also called the annual percentage rate (APR). When a credit card issuer quotes an annual rate of 16%, the APR is 16%.

Activity 8.11

You invested R2 000 at 14% interest per annum for three years. What is the nominal rate of your investment if …

a. interest is calculated half-yearly?
b. interest is calculated quarterly?
c. interest is calculated daily?

Feedback on activity 8.11

The nominal rate is 14% per annum in all three cases a to c.

7.2 Periodic rate

PERIODIC RATE

The periodic rate is the rate charged by a lender or paid by a borrower each period.

The periodic rate has a specified time interval, for example per day, per month, per quarter, per six-month period (bi-annually or half-yearly) or per year.

The formula to determine the periodic rate is:

Key formula: PERIODIC RATE

$$\text{Periodic rate } (i_{PER}) = \frac{i_{Nom}}{n}$$

Where n = the number of compounding periods per year
i_{Nom} = the nominal interest rate

From the above formula, restate as follows:

$$i_{Nom} = \text{periodic rate} \times n$$

NOTE

If interest is added (compounded) only ONCE per year (n = 1), the periodic rate is equal to the nominal rate.

Activity 8.12

A finance company provide loans at 3% per quarter (∴ periodic rate = 3%). Determine the nominal rate.

Feedback on activity 8.12

i_{Nom} = Periodic rate x number of compounding periods per year
= 3% x 4
= 12%

7.3 Effective interest rate (compounding more than once per year)

EFFECTIVE ANNUAL INTEREST RATE

Effective annual interest rate (EAR) refers to the annual rate, which derives the same result as the compound interest rate, at a given periodic rate, for a given number of compounding periods PER year. The effective annual rate is therefore the annual rate which, if compounded once a year, will give the same result as the interest per period compounded a number of times per year.

Effective interest rates are useful when comparing investment alternatives with different compounding periods.

For example, if the interest on Investment A is compounded bi-annually (every six months), the number of periods per year will be two (2). Therefore, if you are required to determine the future value of Investment A after three years, the number of periods will be 2 x 3 = 6. The same principle will apply if interest is compounded quarterly. For example, if interest on Investment B is calculated quarterly, the number of periods per year will be four (4) because there are four quarters (of three months each) per year. If you are required to determine the future value of Investment B after two years, the number of periods will be 4 x 2 = 8.

The formula used for calculating the effective interest rate is:

Key formula: EFFECTIVE INTEREST RATE

$$\text{Effective interest rate} = \left[1+\left(\frac{i}{n}\right)\right]^{n} - 1$$

Where: i = the nominal interest rate
n = number of compounding periods per annum

and $\left(\frac{i}{n}\right)$ = the periodic rate

Activity 8.13

You want to invest money in order to pay your university fees. Two options are available:

a. Use a special savings account that pays 1% interest compounded monthly
b. Use a premium savings account with a 12% quoted nominal interest rate per annum, compounded quarterly

Which option will you choose?

Feedback on activity 8.13

Firstly, you need to express the cost (interest) of each option as an EAR (effective annual rate) as follows:

Formula: Effective interest rate = $\left[1+\left(\frac{i}{n}\right)\right]^{n} - 1$

a. Special savings account: EAR = $(1 + 0{,}01)^{12} - 1{,}0$
= $(1{,}01)^{12} - 1{,}0$
= $1{,}1268 - 1{,}0$
= $0{,}1268$
= $12{,}68\%$

b. Premium savings account: EAR = $(1 + 0{,}03)^{4} - 1{,}0$
= $(1{,}03)^{4} - 1{,}0$
= $1{,}1255 - 1{,}0$
= $0{,}1255$
= $12{,}55\%$

NOTE

From the different EAR's you can see that the special savings account is slightly **more beneficial** than the premium savings account. Although both options have the same nominal rate of 12%, monthly interest is calculated on the special savings account as opposed to quarterly interest on the premium savings account. From this example you can see that the effective rate increases when the frequency of compounding increases.

Activity 8.14

The nominal interest rate on a loan is 15% per annum compounded four-monthly. Determine the effective annual cost of the loan by using the relevant formula.

Feedback on activity 8.14

Effective interest rate $= \left[1+\frac{i}{n}\right]^{n} - 1$

$= \left[1+\frac{0,15}{3}\right]^{3} - 1$

$= (1 + 0,05)^{3} - 1$

$= 1,1576 - 1$

$= 0,1576$

$\approx 15,76\%$

When the effective rate and the number of compounding periods per annum are available, you can use the following formula to determine the nominal rate:

Key formula: NOMINAL RATE

Nominal rate	$= n[(1 + i)^{1/n} - 1]$

Where i = effective interest rate, expressed as a percentage
n = number of periods **per annum** used to compound interest

Activity 8.15

The effective interest rate of a loan is 15% per annum. Interest is compounded every six months. Determine the nominal rate. [Use four decimal places (SETUP 0 0 4 or 2ndF DISP 4) in your calculation and round the final percentage off to two decimal places.]

Feedback on activity 8.15

Nominal rate $= n[(1 + i)^{1/n} - 1]$

$= 2[(1,15)^{½} - 1]$

$= 2(1,0724 - 1)$

$= 2(0,0724)$

$= 0,1448$

$= 14,48\%$

8 Interpolation and extrapolation

INTERPOLATION

Interpolation refers to the calculation used to determine an actual rate, where the actual rate lies between two specific rates.

The factor tables at the end of this study unit give pre-calculated factors for particular rates (%) and periods (n). Sometimes a rate must be determined that falls between two of the tabulated rates, for example between 5% and 6%. Interpolation is then required to find the rate between 5% and 6%.

Key formula: INTERPOLATION

$$a + \left[\frac{x-y}{x-z} x (b-a)\right]$$

Illustration:

You have calculated the present value of a future amount by using 5% as discount rate and determined a PV of R195.

You also calculated the present value of the same future amount by using 6% as discount rate and determined a PV of R180.

You, however, need to determine the discount rate used to derive at a PV of R190.

Calculation of the discount rate for PV of R190

a		*b*
5%	?%	6%
R195	R190	R180
x	*y*	*z*

Use the smallest discount rate (a = 5%)

+ (the corresponding PV of the smallest discount rate (x = R195), minus the PV of the unknown rate which lies between the two known rates (y = R190)

÷ (the corresponding PV of the smallest discount rate (x = R195), minus the corresponding PV of the highest discount rate (z = R180)

x the difference between the two known rates ($b - a$)

$$a + \left[\frac{x-y}{x-z} x (b-a)\right]$$

$$5\% + \left[\frac{195-190}{195-180} x (6\%-5\%)\right]$$

$5\% + \left[\frac{5}{15} \times 1\%\right]$

5% + 0,33%

= 5,33%

Activity 8.16

You have concluded the following instalment sale agreement:

	R
Cost price	5 000
Deposit	(1 000)
	4 000
Simple interest: 10% per annum for 2 years (R4 000 x 10% x 2)	800
	4 800
∴ Monthly payments over 2 years (R4 800 ÷ 24)	R200

Determine the effective annual cost (interest rate) of the R4 000 instalment sale agreement. Round the percentage rate to two decimal places.

Feedback on activity 8.16

Effective annual cost = $\left[1+\left(\frac{i}{n}\right)\right]^{n} - 1$

= $(1 + 0{,}015337①)^{12} - 1$

= $(1{,}015337①)^{12} - 1$

= $1{,}20039② - 1$

= 0,20039

≈ 20,039%

The effective annual rate is 20,04%.

Calculations:

① Periodic rate (as input in the effective annual cost formula above)

Present value = annuity x *present value of R1 per period factor for 24 periods*

Let present value of R1 per period factor for 24 periods = *Z*

∴ 4 000 = 200 x Z

200Z = 4 000

Z = (4 000 ÷ 200)

∴ Z = **20**

You will find that **20** lies between 1% (factor 21,243) and 2% (factor 18,914) on the 24-period horizontal row in Table B.

By interpolation, the periodic cost ① equals:

a		*b*
1%	?%	2%
21,243	20	18,914
x	*y*	*z*

$$a + \left[\frac{x-y}{x-z} x (b-a)\right]$$

$$= \quad 1\% + \left[\frac{21{,}243 - 20}{21{,}243 - 18{,}914} \times 1\%\right]$$

$$= \quad 1\% + \left[\frac{1{,}243}{2{,}329} \times 1\%\right]$$

$$= \quad 1\% + (0{,}5337 \times 1\%)$$

$$= \quad 1\% + 0{,}5337\%$$

$$= \quad 1{,}5337\%$$

② $(1 + 0{,}015337①)^{12}$

$(1{,}015337)^{12}$

$$= \quad 1{,}20039$$

EXTRAPOLATION

Extrapolation refers to the calculation used to determine an actual rate where this actual rate lies outside (not within) two specific rates.

Key formula: EXTRAPOLATION

$$b + \left[\frac{y-z}{x-y} x (b-a)\right]$$

Illustration:

You have calculated the present value of a future amount by using 5% as discount rate and determined a PV of R195.

You also calculated the present value of the same future amount by using 6% as discount rate and determined a PV of R180.

You, however, need to determine the discount rate to derive at a PV of R172.

Calculation of the discount rate for PV of R172

a	*b*	*c*
5%	6%	?%
R195	R180	R172
x	*y*	*z*

Use the discount rate that is just smaller than the unknown rate (b = 6%)

\+ (the corresponding PV of that rate (y = R180), minus the PV of the unknown rate that lies outside the two known rates (z = R172)

÷ (the corresponding PV of the smallest discount rate (x = R195), minus the corresponding PV of the next discount rate (y = R180)

x the difference between the two known rates ($b - a$).

$$b + \left[\frac{y-z}{x-y} x (b-a)\right]$$

$$6\% + \left[\frac{180-172}{195-180} x (6-5)\right]$$

$$6\% + \left[\frac{8}{15} x 1\right]$$

6% + 0,533%

= 6,53%

9 Calculating the periodic payment I or PMT

PERIODIC PAYMENT

The periodic payment I or PMT, is the amount of the annuity, namely the stream of equal amounts, invested per period or the equal periodic repayments of a loan.

Applying this definition to loans and the financial calculator function (in the next study unit), calculates the periodic payments (PMT) for a loan based on constant payments and a constant interest rate.

$$\text{PV annuity} = I \times \left[\frac{1 - \frac{1}{(1+i)^n}}{i}\right]$$

The **present value of an annuity formula** above can be restated to calculate the periodic payments I or PMT.

Steps to restate the formula in order to calculate I or PMT:

Making I the subject (periodic payment), one gets

$$\text{PV annuity} \times i = I \times \left[1 - \frac{1}{(1+i)^n}\right]$$

$$I = \frac{\text{PV annuity} \times i}{\left[1 - \frac{1}{(1+i)^n}\right]}$$

You can restate the **future value of an annuity** formula in a similar way in order to calculate the periodic payments or PMT.

$$\text{FV annuity} = I \times \left[\frac{(1+i)^n - 1}{i}\right]$$

Steps to restate the formula in order to calculate I or PMT:

Making I the subject (periodic payment), one gets

$$I = \frac{\text{FV annuity}}{\left[\frac{(1+i)^n - 1}{i}\right]}$$

NOTE

The applicable formula, from the two restated formulae above, that you will use to calculate I or PMT will depend on the information available:

i Should you know the PV of the investment, you will need to determine I or PMT by using the restated formula regarding the PV of annuity formula.

ii Should you know the FV of the investment, you will need to determine I or PMT by using the restated formula regarding the FV of annuity formula.

Activity 8.17 (amount invested per period, I)

You want to save money for an overseas trip that you intend to undertake in five years' time. The amount that you will need after five years to pay for the trip is R40 000. You can invest money at 8% compound interest per annum. How much should you invest every year in order to have the required amount after five years?

Feedback on activity 8.17

$$I = \frac{\text{FV annuity}}{\left[\frac{(1+i)^n - 1}{i}\right]}$$

$$= \frac{R40\,000}{\left[\frac{(1+0{,}08)^5 - 1}{0{,}08}\right]}$$

$$= \frac{R40\,000}{\left[\frac{(1{,}08)^5 - 1}{0{,}08}\right]}$$

$$= \frac{R40\,000}{\left[\frac{1{,}4693 - 1}{0{,}08}\right]}$$

$$= \frac{R40\,000}{\left[\frac{0{,}4693}{0{,}08}\right]}$$

$$= \frac{R40\,000}{5{,}8666}$$

= R6 818,2593

= R6 818 per year (rounded to the nearest rand)

Activity 8.18 (repayment of a loan PMT)

Your father borrowed R10 000 today by means of a loan from his bank. The annual interest rate on the loan is 10% per annum. The loan must be repaid in three equal annual instalments at the end of years 1, 2 and 3. How much will your father need to pay as the periodic annuity instalment?

Feedback on activity 8.18

$$I = \frac{\text{PV annuity x } i}{\left[1 - \frac{1}{(1+i)^n}\right]}$$

$$= \frac{\text{PV annuity} \times 0{,}10}{\left[1-\frac{1}{(1+0{,}10)^3}\right]}$$

$$= \frac{\text{R10 000} \times 0{,}10}{\left[1-\frac{1}{(1{,}10)^3}\right]}$$

$$= \frac{\text{R10 000} \times 0{,}10}{\left[1-\frac{1}{1{,}3310}\right]}$$

$$= \frac{1\,000}{1-0{,}7513}$$

$$= \frac{1\,000}{0{,}2487}$$

= R4 020,9087

= R4 021 (rounded to the nearest rand)

10 Summary of symbols used in time value of money

n	=	Number of periods or payments
i	=	Interest rate, expressed as a decimal (eg 5% = 0,05)
PV	=	Present value
FV	=	Future value
Pmt	=	Constant payment (I) per period

NOTE

The following formulae must be memorised. You should know them for examination purposes. You should be able to determine WHICH formula to use in each case, and in which order to solve the steps in the formulae with the use of your pocket calculator.

Symbol	Description	Formula	Initial cash flow	
			Beginning of period	End of period
S	Future value of **R1**	$(1 + i)^n$	x	
v^n	Present value of **R1**	$\frac{1}{(1+i)^n}$		x
$s_{\overline{n}\rceil}$	Future value of **R1 per period**	$\frac{(1+i)^n - 1}{i}$		x
$a_{\overline{n}\rceil}$	Present value of **R1 per period**	$\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]$		x
$\ddot{s}_{\overline{n}\rceil}$	Future value of **R1 per period** paid in advance	$\left[\frac{(1+i)^{n+1}-1}{i} - 1\right]$	x	
$\ddot{a}_{\overline{n}\rceil}$	Present value of **R1 per period** paid in advance	$\left[\frac{1-\frac{1}{(1+i)^{n-1}}}{i} + 1\right]$	x	

In the formulae: n = number of periods

i = effective interest rate, expressed as a decimal (eg 10% is expressed as 0,10)

NOTE

Did you notice that the formulae regarding annuities (per period) divides by "i" in each case?

The list above supply alternative symbols used in various text books. The symbols used in this module may differ from those used in other text books but the principles of how the values are calculated, are consistent.

11 Summary

In this study unit we defined what is meant by the time value of money. We explained single cash flows, various types of annuities and unequal cash flows. We presented mathematical formulae for the calculation of future and present values and illustrated the application of the formulae. We distinguished between nominal, periodic and effective interest rates. These are all time value of money concepts that you will need to understand and apply when you calculate the cost of capital (cost of different sources of finance), make finance or investment decisions, and so on.

We also illustrated the calculation of future values and present values by using mathematical formulae and your pocket calculator only. In the next study unit, we will present alternative methodologies, such as the use of factor tables and the use of a financial calculator to solve time value of money problems.

Self-assessment activity

After having worked through this study unit, determine if you are able to answer the following questions:

Match the following concepts to the correct definition:

1. the present value concept
2. the future value concept
3. compound interest
4. simple interest
5. the concept of discounting

Definition:

a. It is the amount that an investment will be worth at a future date if invested at a particular simple or compound interest rate.
b. It is the current value of future cash flows, determined by application of a discount rate.
c. It is the process used to determine the present value of an investment.
d. It is the interest on the principal investment for the entire term.
e. It is the calculation of interest and the addition of that interest to the principal for investment in the following period.

Feedback on question 1:
Statement (b) is correct.

Feedback on question 2:
Statement (a) is correct.

Feedback on question 3:
Statement (e) is correct.

Feedback on question 4:
Statement (d) is correct.

Feedback on question 5:
Statement (c) is correct.

Match the following concepts to the correct definition:

6. unequal cash flows
7. a single cash flow
8. an ordinary annuity
9. a perpetuity
10. an annuity due

Definition:

a. It is a non-repetitive cash inflow or outflow.

b. It is an annuity where the payments continue indefinitely.
c. It is the unequal cash flows that occur repetitively at the end of each payment interval.
d. It is an annuity where the payments fall due at the beginning of each period.
e. It is an annuity where the payments take place at the end of each payment interval.

Feedback on question 6:
Statement (c) is correct.

Feedback on question 7:
Statement (a) is correct.

Feedback on question 8:
Statement (e) is correct.

Feedback on question 9:
Statement (b) is correct.

Feedback on question 10:
Statement (d) is correct.

Which of the formulae listed below is the correct formula to use in order to calculate each of the following concepts?

11. the present value of a single amount?
12. the present value of an ordinary annuity?
13. the future value of an annuity due?
14. the future value of an ordinary annuity?
15. the present value an annuity due?

Formulae:

(a) $$I \times \left[\frac{1 - \frac{1}{(1+i)^{n-1}}}{i} + 1 \right]$$

(b) $$\left[\frac{FV}{(1+i)^n} \right]$$

(c) $$I \times \left[\frac{(1+i)^n - 1}{i} \right]$$

(d) $$I \times \left[\frac{(1+i)^{n+1} - 1}{i} \right] - 1$$

(e) $$I \times \left[\frac{1 - \frac{1}{(1+i)^n}}{i} \right]$$

Feedback on question 11:
Formula (b) is correct.

Feedback on question 12:
Formula (e) is correct.

Feedback on question 13:
Formula (d) is correct.

Feedback on question 14:
Formula (c) is correct.

Feedback on question 15:
Formula (a) is correct.

Which of the formulae listed below is the correct formula to use in order to calculate each of the following concepts?

16. the effective interest rate
17. the nominal interest rate
18. the periodic interest rate
19. the present value of a perpetuity
20. the effective interest rate by means of interpolation

Formulae:

(a) $n[(1 + i)^{1/n} - 1]$

(b) $\left[1+\frac{i}{n}\right]^{n} - 1$

(c) $\frac{i_{Nom}}{n}$

(d) $a + \left[\frac{x-y}{x-z} x\ (b-a)\right]$

(e) $\frac{I}{i}$

Feedback on question 16:
Formula (b) is correct.

Feedback on question 17:
Formula (a) is correct.

Feedback on question 18:
Formula (c) is correct.

Feedback on question 19:
Formula (e) is correct.

Feedback on question 20:
Formula (d) is correct.

STUDY UNIT 9

Alternative methodologies for solving TVM problems

In this study unit

1 Introduction

In the previous study unit we provided mathematical formulae for the calculation of future and present values and we showed you how to apply these formulae. In this study unit, we will introduce you to two additional methods that you can use to perform these calculations. We will start by explaining the use of factor tables and then go on to explain how to use a financial calculator.

2 The use of pre-calculated interest factor tables

The tables contain pre-calculated "factors" for useful combinations of compound/discount rate and time period.

NOTE

The mathematical formulae presented in the previous study unit are used to arrive at the pre-calculated factors that are presented in the tables. Note that the formulae correspond with those presented in the previous study unit. The only difference is that R1 is used as cash flow when calculating the factors instead of the actual amounts, which are used when applying the mathematical formulae in the previous study unit. See the references made in study unit 8 that link the mathematical formulae to the applicable tables. Present value mathematical formulae are linked to Table A and B and future value mathematical formulae are linked to Table C and Table D.

The required present or future value can be calculated by multiplying the <u>actual</u> rand value of the cash flow(s) that will be received/paid with the <u>applicable time value factor</u>.

The four basic factor tables are included at the end of this study unit:

Table A : Present value of R1 AFTER n years (cash flow occurs at END of period).
Table B : Present value of R1 per annum received FOR n years (cash flow occurs at END of period).

Table C : Future value of R1 AFTER n years (cash flow occurs at BEGINNING of period).
Table D : Future value of R1 per annum received FOR n years (cash flow occur at END of period).

The table below presents the mathematical formulae used to calculate the factors as presented in the pre-calculated tables.

Description	Formula for time value factor
TABLE A: Present value of R1	$\frac{1}{(1+i)^n}$
TABLE B: Present value of R1 per period (annuity)	$\left[\frac{1-\left(\frac{1}{(1+i)^n}\right)}{i}\right]$
TABLE C: Future value of R1	$(1+i)^n$
TABLE D: Future value of R1 per period (annuity)	$\frac{(1+i)^n-1}{i}$

NOTE

Perpetuities are not tabled. You should use the mathematical formula as presented in the previous study unit, namely: $PV_P = \frac{I}{i}$

Neither FV factors of annuities paid in advance nor PV factors of annuities paid in advance are tabled. For calculation of these factors you still need to use the mathematical formulae as presented in the previous study unit, namely:

Future value of R1 per period paid **in advance**

$$\left[\left(\frac{(1+i)^{n+1}-1}{i}\right)-1\right]$$

Present value of R1 per period paid **in advance**

$$\left[\left(\frac{1-\frac{1}{(1+i)^{n-1}}}{i}\right)+1\right]$$

2.1 Which time value factor to use?

Do you have to compute the future value or the present value?

- If future value, use future value factor.
- If present value, use a present value factor.

Do you have to compute an annuity or a single amount?

- If an annuity, use a R1 per period factor.
- If a single amount, use a R1 factor after n years.

2.2 The relationship between FV, PV and payments (I)

In all the time value of money calculations, we will use the following equations:

Single amounts

(1a) **FV** = present value of single amount x future value of R1 factor,

or

(Restate this equation in such a way that the present value of single amount is on the left side of the equation.) The equation will then be:

(1b) Present value of single amount $= \dfrac{\text{Future value}}{\text{Future value of R1 factor}}$

(2a) **PV** = future value of single amount x present value of R1 factor,

or

(Restate this equation in such a way that the future value of single amount is on the left side of the equation.) The equation will then be:

(2b) Future value of single amount $= \dfrac{\text{Present value}}{\text{Present value of R1 factor}}$

Annuities (I) or (PMT)

(3a) **FV** = annuity x future value of R1 per period factor,

or

(Restate this equation in such a way that the annuity amount is on the left side of the equation). The equation will then be:

(3b) Annuity $= \dfrac{\text{Future value}}{\text{Future value of R1 per period factor}}$

(4a) **PV** = annuity x present value of R1 per period factor,

or

(Restate this equation in such a way that the annuity amount is on the left side of the equation). The equation will then be:

(4b) Annuity $= \dfrac{\text{Present value}}{\text{Present value of R1 per period factor}}$

(4c) PV of perpetuity = $\frac{\text{Annuity or guaranteed annual return received or paid (I)}}{\text{Required rate of return (i)}}$

2.3 How will you solve problems?

Decide on the following:

What is required?
What is given?
Which equation is applicable?

Place the required on the left side of the equation and the given information on the right side of the equation that you are using and solve the problem.

2.4 The relationship between Table A and Table B (present values)

$$a_{\overline{n}|} = \sum_{1}^{n} v^n$$

The above mathematical statement means that the sum of individual factors in Table A is equal to the factor stated in Table B.

For example, according to Table B, the factor of R1 per annum for 4 years at 10% is 3,170.

According to Table A, the factors of R1 after n years at 10% are as follows:

Year	1	(n = 1)	0,909
	2	(n = 2)	0,826
	3	(n = 3)	0,751
	4	(n = 4)	0,683
Years	1–4		3,169

The difference is attributable to rounding.

2.5 The relationship between Table C and Table D (future values)

Note that the sum of individual factors in Table C is not equal to the factors in Table D. This is due to the fact that the initial amount in Table C is invested at the **beginning** of the period, whereas the initial amount in Table D is invested at the **end** of each period.

A factor in Table D, for an investment made at the **end** of the period, can however be converted to a factor relating to an investment made at the **beginning** of the period, as follows:

Factor Table D at 10% for three years (received at end)	3,3100
Factor for investment made at beginning of period (3,3100 x 1,10)	3,6410

This factor relating to an investment made at the beginning of the period is equal to the sum of the factors in Table C at 10%:

Year 1	1,1000
Year 2	1,2100
Year 3	1,3310
Total	3,6410

2.6 Reasonability check

When calculating factors, always check for reasonability:

- Future value of R1 factor (single) – always more than 1
- Present value of R1 factor (single) – always less than 1
- Future value of R1 per period factor – always more than the number of periods
- Present value of R1 per period factor – always less than the number of periods

3 The use of a financial calculator

This is the most commonly used method, because time value formulae are already programmed into the calculator.

NOTE

In order to enhance your own learning experience, we recommend that you **only** use a financial calculator where the question **does not stipulate another approach**.

We used a SHARP EL-738 and a Hp10BII financial calculator to do the calculations that follow in later activities.

It is your responsibility to study the accompanying manual of your financial calculator. Make sure you know how to operate your financial calculator. If you do not have the manual available you can go to the following links on the internet to obtain the manuals for the Hp10BII and SHARP EL738 respectively:

http://h10032.www1.hp.com/ctg/Manual/bpia5213.pdf, and

http://www.manualowl.com/p/Sharp/EL-738/Manual/114796

SECOND FUNCTIONS

SHARP EL-738: The 2ndF (second functions) key, is indicated on the SHARP EL-738 financial calculator (top left orange key).

Hp10BII: The orange key (called a ***shift annunciator*** in the manual) on the Hp10BII is the key to press first before you can use functions printed **in orange** on the bottom of the keys.

THIRD FUNCTIONS

SHARP EL-738: Only has second functions, NO third functions.

Hp10BII: The blue key (***shift annunciator***) on the Hp10BII is the key to press first before you can use functions printed **in blue** above the keys.

DECIMAL PLACES

We consistently use a comma (,) in all our study material to **INDICATE A DECIMAL PLACE**. However, a financial calculator does not allow for the keying in of a comma.

You need to use the full stop key (.) to enter a decimal place. In the **SHARP EL-738 and Hp10BII** explanations on how to use your financial calculator, when you see a comma **INDICATING A DECIMAL**, for instance an interest rate of 9,25% you need to enter 9.25%.

Preparing your financial calculator

It is important to execute the following steps each time at the start of an activity or calculation. These steps will clear the previous settings.

SHARP EL-738		**Hp10BII**	
Key in:	Display will read:	Key in:	Display will read:
Select NORMAL mode: MODE 0	Normal STAT 0 1	No preliminaries required.	
To clear all registers: 2ndF CA	0.0000	To clear all registers: 2ndF; C ALL	Ensure that 1 P _ YR appear on the screen unless if a different period is intended. – To change to 1 period per year: 1; 2ndF; P/YR Ensure that "BGN" does not appear on the screen unless intended. To clear: 2ndF BEG/END
(We used four decimal places in all the activities that follow) To set decimal places: SETUP 0 0 4	0.0000	To set decimal places: 2ndF DISP 4	0.0000

Always use four decimal places, unless the question specifically requires you to use a different setting.

4 Activities using all three methods

The first decision you need to make is to determine the appropriate **method to apply**. This will, in practice, normally involve the use of a financial calculator with pre-programmed formulae.

For the purposes of this module, the required method will be stated in the questions. You may **only** use a financial calculator if the question **does not stipulate another approach**

NOTE

In this module we will seldom require the use of a financial calculator. The aim of this part of the syllabus is to help you to develop an understanding of the concept "time value of

money", of the various types of interest rates and of the mechanics of applying the time value of money to practical examples. We will not achieve any of these aims if we simply teach you how to operate a financial calculator.

Calculation of future values:

Activity 9.1 – Future value – single present cash flow
Activity 9.2 – Future value – annuity
Activity 9.3 – Future value – annuity due

Calculation of present values:

Activity 9.4 – Present value – single future cash flow
Activity 9.5 – Present value – ordinary annuity
Activity 9.6 – Present value – perpetuity
Activity 9.7 – Present value – annuity due
Activity 9.8 – Present value – unequal amounts

Calculation of payment/instalment:

Activity 9.9 – Repayment of a loan (PMT)
Activity 9.10 – Amount to invest to reach FV (I)

Calculation of nominal and effective rates:

Activity 9.11 – Calculate the effective rate
Activity 9.12 – Calculate the nominal rate

Activity 9.1

Future value – single present cash flow

Someone would like to invest R5 000 at an annual compound interest rate of 14%. Determine the future value of the investment:

a. after 1 year
b. after 3 years

Use the following methods to determine the FV of the investment:

i. Mathematical formulae together with your pocket calculator
ii. factor tables method
iii. financial calculator

[Use four decimals and round your final answer to the nearest rand.]

Feedback on activity 9.1

a. Future value of R5 000 after 1 year

What is required? The FV of a single present cash flow needs to be calculated.

i. Mathematical formula:

Select the appropriate mathematical formula from study unit 8.

Future value = $PV(1 + i)^n$

= $R5\ 000\ (1 + 0{,}14)^1$

= R5 000 x 1,14

= R5 700

ii. Factor tables method:

Decide on the equation to be used.

Select equation (1a) **FV** = present value single amount x future value of R1 factor

FV = PV x future value of R1 factor

= R5 000 x 1,14①

= R5 700

① Table C at 14% after 1 year = 1,1400

iii. Financial calculator:

	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:	1 N	1.0000	1 N	1.0000
Interest rate:	14 I/Y	14.0000	14 I/YR	14.0000
Present value of initial outflow:	5000+/– PV	–5'000.0000	5000+/– PV	–5,000.0000
Calculate (compute) the present value of the outflow:	COMP FV	5'700.0000	FV	5,700.0000

The future value after one year is R5 700.

b. **Future value of R5 000 after 3 years**

i. Mathematical formula:

Select the appropriate mathematical formula from study unit 8.

Future value = $PV(1 + i)^n$

= $R5\ 000\ (1 + 0{,}14)^3$

= R5 000 x 1,4815

= R7 407,72

= R7 403 (rounded to the nearest rand)

ii. Factor tables method:

Decide on the equation to be used.

Select equation (1a) **FV** = present value single amount x future value of R1 factor

FV = PV x future value of R1 factor

= R5 000 x 1,4815①

= R7 407,5

① Table C at 14% after 3 years = 1,4815

iii. Financial calculator:

	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:	14 I/Y	14.0000	14 I/YR	14.0000
Present value of initial outflow:	5000+/– PV	–5'000.0000	5000+/– PV	–5,000.0000
Calculate (compute) the present value of the outflow:	COMP FV	7'407.7200	FV	7,407.7200

The future value after three years is R7 408 (rounded to the nearest rand).

NOTE

Limited rounding differences will be accommodated in the marking of questions, if the specific rounding requirements were not stipulated.

Activity 9.2

Future value – annuity

A person would like to invest R5 000 at the **end** of **each year** at an annual compound interest rate of 14%. Determine the value of the investment after four years.

Use the following methods to determine the FV of the investment:

i. mathematical formulae together with your pocket calculator
ii. factor tables method
iii. financial calculator

[Use four decimals and round your final answer to the nearest rand.]

Feedback on activity 9.2

Future value of R5 000 per year invested at the end of the year

What is required? The FV of an ordinary annuity needs to be calculated.

i. Mathematical formula:

Select the appropriate mathematical formula from study unit 8.

$$\text{FV annuity} = I \times \left[\frac{(1+i)^n - 1}{i}\right]$$

$$= \text{R5 000} \times \left[\frac{(1+0{,}14)^4 - 1}{0{,}14}\right]$$

$$= \text{R5 000} \times \left[\frac{(1{,}14)^4 - 1}{0{,}14}\right]$$

$$= \text{R5 000} \times \left[\frac{1{,}6890 - 1}{0{,}14}\right]$$

$$= \text{R5 000} \times \left[\frac{0{,}6890}{0{,}14}\right]$$

$$= \text{R5 000} \times 4{,}9211$$

$$= \text{R24 605,72}$$

$$= \text{R24 606 (rounded to the nearest rand)}$$

ii. Factor tables method:

Decide on the equation to be used.

Select equation (3a) **FV** = annuity x future value of R1 per period factor

FV = annuity x future value of R1 per period factor

= R5 000 x 4,9211①

= R24 605,50

= R24 606 (rounded to the nearest rand)

① Table D at 14% after 4 years = 4,9211

iii. Financial calculator:

	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:	4 N	4.0000	4 N	4.0000
Interest rate:	14 I/Y	14.0000	14 I/YR	14.0000
Present value of annuity/pmt:	5000+/– PMT	–5'000.0000	5000+/–PMT	–5,000.0000
Calculate (compute) the future value:	COMP FV	24'605.7200	FV	24,605.7200

The future value after three years is R24 606 (rounded to the nearest rand).

Activity 9.3

Future value annuity due

Use the same information as for activity 9.2. Assume that the R5 000 is invested at the **beginning** of each year (an annuity due).

Use the following methods to determine the FV of the investment:

i. mathematical formulae together with your pocket calculator
ii. factor tables method
iii. financial calculator

[Use four decimals and round your final answer to the nearest rand.]

Feedback on activity 9.3

Future value of R5 000 per year – invested at the <u>beginning</u> of the year

What is required? The FV of an annuity due needs to be calculated.

i. Mathematical formula:
Select the appropriate mathematical formula from study unit 8.

$$\text{FV annuity due} = \text{R5 000} \times \left[\frac{(1+0{,}14)^{4+1}-1}{0{,}14} - 1\right]$$

$$= \text{R5 000} \times \left[\frac{(1+0{,}14)^{5}-1}{0{,}14} - 1\right]$$

$$= R5\,000 \times \left[\frac{(1{,}9254 - 1}{0{,}14} - 1\right]$$

$$= R5\,000 \times \left[\frac{(0{,}9254}{0{,}14} - 1\right]$$

= R5 000 x (6,6101 – 1)

= R5 000 x 5,6101

= R28 050,3571

= R28 050 (rounded to the nearest rand)

ii. Factor tables method:

Decide on the equation to be used.

Select equation (3a) **FV** = annuity x future value of R1 per period factor invested at the beginning of the year.

FV = annuity x future value of R1 per period factor

= R5 000 x 5,6101①

= R28 050,50

① **Table D** represents investments made at the **end** of the period, therefore this factor must be converted to a factor that will apply to investments made at the **beginning** of the period.

Table D at 14% for (n + 1) = 5 years:	6,6101
Factor for investment made at beginning:	– 1,0000
	5,6101

OR

Factor: Table C after:	1 year	1,1400
	2 years	1,2996
	3 years	1,4815
	4 years	1,6890
	Total	5,6101

iii. Financial calculator:

	SHARP EL-738		Hp10BII	
	Key in: 2ndF BGN/END	Display will read: BGN	Key in: 2ndF Beg/End	Display will read:
Clear all registers:	2ndF CA	0.0000	2ndF C ALL	1 P/YR 0.0000
Number of periods:	4 N	4.0000	4 N	4.0000
Interest rate:	14 I/Y	14.0000	14 I/YR	14.0000
Present value of annuity/pmt:	5000+/– PMT	–5'000.0000	5000+/– PMT	–5,000.0000
Calculate (compute) the future value:	COMP FV	28'050.5208	FV	28,050.5208

The future value after four years is R28 051 (rounded to the nearest rand).

Activity 9.4

Present value of single future cash flow

Someone would like to invest a once off amount at an annual compound interest rate of 14% in order to receive R8 500 after four years. Determine the current amount that he should invest now in order to receive the amount of R8 500 after four years.

Use the following methods to determine the PV of the investment:

i. mathematical formulae together with your pocket calculator
ii. factor tables method
iii. financial calculator

[Use four decimals and round your final answer to the nearest rand.]

Feedback on activity 9.4

Present value of R8 500 after four (4) years

What is required? The PV of a single cash flow needs to be calculated.

i. Mathematical formula:

Select the appropriate mathematical formula from study unit 8.

$$PV = \left[\frac{FV}{(1+i)^n}\right]$$

$$= \left[\frac{R8\,500}{(1+0{,}14)^4}\right]$$

$$= \left[\frac{R8\,500}{(1{,}14)^4}\right]$$

$$= \left[\frac{R8\,500}{1{,}6890}\right]$$

$$= R5\ 032{,}5636$$

$$= R5\ 033 \text{ (rounded to the nearest rand)}$$

ii. Factor tables method:

Decide on the equation to be used.

Select equation (2a) **PV** = FV x present value of R1 factor.

PV = FV x present value of R1 factor

= R8 500 x 0,592①

= R5 032

① Table A at 14% after 4 years = 0,592

iii. Financial calculator:

	SHARP EL-738		**Hp10BII**	
	Key in:	Display will read:	Key in: 1 2ndF P/Y	Display will read: 1 0000
Clear all registers:	2ndF CA	0.0000	2ndF C ALL	1 P/YR 0.0000
Number of periods:	4 N	4.0000	4 N	4.0000
Interest rate:	14 I/Y	14.0000	14 I/YR	14.0000
Future value of cash flow:	8500+/– FV	–8'500.0000	8500+/– FV	–8,500.0000
Calculate (compute) the present value:	COMP PV	5'032.6824	PV	5,032.6824

The present value after four years is R5 033 (rounded to the nearest rand).

Activity 9.5

Present value of ordinary annuity

An amount of R1 000 is to be invested annually at the end of each year for three (3) years at 10% compound interest per annum.

Determine what the present value of this annuity will be at the beginning of the first year.

Use the following methods to determine the PV of the investment:

i. mathematical formulae together with your pocket calculator
ii. factor tables method
iii. financial calculator

[Use four decimals and round your final answer to the nearest rand.]

Feedback on activity 9.5

Present value of R1 000 annuity

What is required? The PV of an ordinary annuity needs to be calculated.

i. Mathematical formula:
   Select the appropriate mathematical formula from study unit 8.

PV annuity $= I \times \left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]$

$= R1\,000 \times \left[\frac{1-\frac{1}{(1+0{,}10)^3}}{0{,}10}\right]$

$= R1\,000 \times \left[\frac{1-\frac{1}{(1{,}10)^3}}{0{,}10}\right]$

$= R1\,000 \times \left[\frac{1-\frac{1}{1{,}3310}}{0{,}10}\right]$

$= R1\,000 \times \left[\frac{1-0{,}7513}{0{,}10}\right]$

$= R1\,000 \times \left[\frac{0{,}2487}{0{,}10}\right]$

$= R1\,000 \times 2{,}4869$

$= R2\,486{,}8520$

$= R2\,487$ (rounded to the nearest rand)

ii. Factor tables method:

Decide on the equation to be used.

Select equation (4a) **PV** = annuity x present value of R1 per period factor.

PV = annuity x present value of R1 per period factor

= R1 000 x 2,487①

= R2 487

① Table B at 10% for 3 years = 2,487

iii. Financial calculator:

NOTE

We use the term payment (PMT) when we refer to annuity situations that, according to the definition of annuities, involve equal payments that are the same for every period.

	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	10.0000	10 I/YR	10.0000
Payments:	1000+/– PMT	–1'000.0000	1000+/– PMT	–1,000.0000
Calculate (compute) the present value of the outflow:	COMP PV	2'486.8520	PV	2,486.8520

The present value after three years is R2 487 (rounded to the nearest rand).

Activity 9.6

Present value perpetuity

Your grandmother wants to establish a trust fund for you by investing an amount of money at 14% compounded annually. She wants you to receive R24 000 per year indefinitely from the trust fund. What is the present value of the amount that your grandmother will have to invest now?

Use the following methods to determine the PV of the investment:

i. mathematical formulae together with your pocket calculator
ii. equation and pocket calculator

[Use four decimals and round your final answer to the nearest rand.]

Feedback on activity 9.6

Present value of a R24 000 annuity received indefinitely

What is required?

The PV of a perpetuity needs to be calculated.

i. Mathematical formula:
Select the appropriate mathematical formula from study unit 8.

$$PV_P = \frac{I}{i}$$

$$PV_P = \frac{24\,000}{0{,}14}$$

$$= 171\,428{,}5714$$

ii. Equation method:
Decide on the equation to be used.
Select equation (4c).

$$\text{PV of perpetuity} = \frac{\text{Annuity or guaranteed annual return received or paid (I)}}{\text{Required rate of return (i)}}$$

$$= \frac{R24\,000}{14\%}$$

$$= \frac{R24\,000}{0{,}14}$$

$$= R171\,428{,}57$$

$$= R171\,429 \text{ (rounded to the nearest rand)}$$

Activity 9.7

PV annuity due

An amount of R6 000 is to be invested annually at the beginning of each year for three years at 10% compound interest per annum.

Determine what the present value of this annuity will be at the beginning of the first year.

Use the following methods to determine the PV of the investment:

i. mathematical formulae together with your pocket calculator

ii. factor tables method

iii. financial calculator

[Use four decimals and round your answer to the nearest rand.]

Feedback on activity 9.7

Present value of R6 000 annuity due

What is required? The PV of an annuity due needs to be calculated.

i. Mathematical formula:

Select the appropriate mathematical formula from study unit 8.

$$PV_A(due) = I \times \left[\frac{1 - \frac{1}{(1+i)^{n-1}}}{i} + 1 \right]$$

$$= R6\,000 \times \left[\frac{1 - \frac{1}{(1+0{,}10)^{3-1}}}{0{,}10} + 1 \right]$$

$$= R6\,000 \times \left[\frac{1 - \frac{1}{(1+0{,}10)^{2}}}{0{,}10} + 1 \right]$$

$$= R6\,000 \times \left[\frac{1 - \frac{1}{1{,}2100}}{0{,}10} + 1 \right]$$

$$= R6\,000 \times \left[\frac{1 - 0{,}8264}{0{,}10} + 1 \right]$$

$$= R6\,000 \times \left[\frac{0{,}1736}{0{,}10} + 1 \right]$$

$$= R6\,000 \times [1{,}7355 + 1]$$

$$= R6\,000 \times 2{,}7355$$

$$= R16\,413{,}22$$

$$= R16\,413 \text{ (rounded to nearest rand)}$$

NOTE

Since repetitive equal cash flows are made at the beginning of each of the three years the mathematical formula is equal to the sum of the present values of all payments (cash flows).

The first payment (at the beginning of the year) is regarded as received in year 0. This means that the first payment (cash-flow) need not be discounted to present value, because it is receivable now. The second payment (cash-flow) is receivable at the beginning of year 2, which is regarded as similar to a cash-flow receivable at the end of year 1.

Years: **0** **1** **2**

$PV = PV_{CF\,1} + PV_{CF\,2} + PV_{CF\,3}$

$$PV = \left[\frac{FV}{1{,}000}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right]$$

$$= \left[\frac{6\,000}{1{,}000}\right] + \left[\frac{6\,000}{(1+0{,}10)^1}\right] + \left[\frac{6\,000}{(1+0{,}10)^2}\right]$$

$$= \left[\frac{6\,000}{(1{,}000)}\right] + \left[\frac{6\,000}{1{,}100}\right] + \left[\frac{6\,000}{(1{,}21)}\right]$$

= 6 000 + 5 454,5455 + 4 958,6777

= R16 413,2232

= R16 413 (rounded to nearest rand)

ii. Factor tables method:

Decide on the equation to be used.

Select equation (4a) **PV** = annuity x present value of R1 per period factor.

NOTE

This is an annuity due (received/paid at the beginning of the period): Table B shows the PV factors of annuities received/paid at the end of the year for n years. You should adjust the factor from Table B as was explained by means of a note in the previous study unit (study unit 8), activity 8.9. Use the Table B factor of the previous period (n – 1) and add 1,000.

PV = annuity x present value of R1 per period factor (Table B)

= R6 000 x 2,736①

= R16 416 (the difference is due to rounding of the factors in the table to three decimals)

① Table B at 10% for **2** years = 1,736 **+ 1,000** = 2,736

iii. Financial calculator:

	SHARP EL-738		Hp10BII	
	Key in:2ndF BGN/END	Display will read: BGN	Key in: 2ndF Beg/End	Display will read: BEG
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	10.0000	10 I/YR	10.0000
Payments:	6000+/– PMT	–6'000.0000	6000+/– PMT	–6,000.0000
Calculate (compute) the present value of the outflow:	COMP PV	16'413.2231	PV	16,413.2231

The present value of the annuity due is R16 413 (rounded to the nearest rand). The slight difference of R3 is because of the rounding of the factors in Table B to three decimals.

An annuity due/payment of an equal amount per period for a number of years at the beginning of the period is regarded as similar to cash flows received at the beginning of each period. The present values of these cash flows, called net present value (**NPV**), can also be calculated by means of a financial calculator in the following way:

	SHARP EL-738		Hp10BII
Number of PMT's/cash flows = 3 of R6 000 at the <u>beginning</u> of each year Interest rate = 10%			
Key in:	Display will read:	Key in:	Display will read:
2ndF BGN/END	BGN 0.0000	2ndF Beg/End	Beg/End
Clear all registers first:			
CFi 2ndF CA	0.0000	2ndF C ALL	1 P/YR 0.0000
Enter data sets:			
6000 ENT	DATA SET:CF 0	6000 CF_j	CFLO/CF 6,000.0000
6000 ENT	DATA SET:CF 1	6000 CF_j	CFLO/CF 6,000.0000
6000 ENT	DATA SET:CF 2	6000 CF_j	CFLO/CF 6,000.0000
Clear cash flow registers:			
ON/C	0.0000		
2ndF CASH	RATE(I/Y) =		
2ndF CA	RATE(I/Y) = 0.0000		
Enter rate:			
(I/Y) 10 ENT	RATE(I/Y) = 10.0000	10 I/YR	10.0000
Use arrows to get to NPV and press COMP	NET-PV = 16'413,2231	2ndF NPV	16,413.2231

Rounded to the nearest rand = R16 413

OR

	SHARP EL-738		Hp10BII
Number of PMT's/cash flows = 3 of R6 000 at the beginning of each year Interest rate = 10%			
Key in:	Display will read:	Key in:	Display will read:
2ndF BGN/END	BGN 0.0000	2ndF Beg/End	Beg/End
Clear all registers first:			
CFi 2ndF CA	0.0000	2ndF C ALL	1 P/YR 0.0000
Enter data sets:			
6000 (x, y) 3 ENT	DATA SET:CF 0.0000	6000 INPUT 3 CF_j	CFLO/ N 3,000.0000
Clear cash flow registers:			
ON/C	0.0000		
2ndF CASH	RATE(I/Y) =		
2ndF CA	RATE(I/Y) = 0.0000		
Enter rate:			
I/Y 10 ENT	RATE(I/Y) = 10.0000	10 I/YR	10.0000
Use arrows to get to NPV			
and press COMP	NET-PV = 0.0000 16'413.2231	2ndF NPV	16,413.2231

Activity 9.8

PV unequal amounts

We use the term payment (PMT) when we refer to annuity situations which, according to the definition of annuities, involve equal payments that are the same for every period. However, when the payments are not equal (unequal payments), we rather use the term cash flow (CF) to refer to an uneven stream of cash flows.

Mrs Evelyn bakes cakes for a home industry. She has determined that she will receive the following cash flows from selling her cakes at the end of each year for the next four (4) years:

Year 1 : R1 000
Year 2 : R2 000
Year 3 : R2 500
Year 4 : R3 000

She wants to know the present value of her future income. Assume that she can earn 6% compound interest on the money if she invests each amount when she receives it.

Use the following methods to determine the PV of her future income:

i. mathematical formulae together with your pocket calculator

ii. factor tables method

iii. financial calculator

[Use four decimals and round your final answer to the nearest rand.]

Feedback on activity 9.8

i. Mathematical formulae

We cannot use the mathematical formula for an ordinary annuity or factor tables to determine the PV of unequal cash flows. However, we have already illustrated that we can calculate the PV's of all the future cash flows, add them together and arrive at the PV of the unequal cash flows. (Refer to activity 8.10 in the previous study unit – 8.)

Years: **1** **2** **3** **4**

$PV = PV_{pmt\ 1} + PV_{pmt\ 2} + PV_{pmt\ 3} + PV_{pmt\ 4}$

$PV = PV_{CF\ 1} + PV_{CF\ 2} + PV_{CF\ 3} + PV_{CF\ 4}$

$$PV = \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right] + \left[\frac{FV}{(1+i)^n}\right]$$

$$\left[\frac{1000}{(1+0{,}06)^1}\right] + \left[\frac{2000}{(1+0{,}06)^2}\right] + \left[\frac{2500}{(1+0{,}06)^3}\right] + \left[\frac{3000}{(1+0{,}06)^4}\right]$$

$$\left[\frac{1\,000}{1{,}06}\right] + \left[\frac{2000}{1{,}1236}\right] + \left[\frac{2500}{1{,}191}\right] + \left[\frac{3000}{1{,}2625}\right]$$

= 943,3962 + 1 779,9929 + 2 099,0764 + 2 376,2376

= R7 198,7031

= R7 199 (rounded to the nearest rand)

ii. Factor tables method:

When we use the PV factors to calculate the PV of each of the single future cash flows the equation is:

PV = Future value of single amount (cash flow) x present value of R1 factor (Table A)

Years:		**1**		**2**		**3**		**4**
PV	=	$PV_{CF\ 1}$	+	$PV_{CF\ 2}$	+	$PV_{CF\ 3}$	+	$PV_{CF\ 4}$
	=	(1 000 x 0,943)	+	(2 000 x 0,890)	+	(2 500 x 0,840)	+	(3 000 x 0,792)
		943	+	1 780	+	2 100	+	2 376
	=	R7 199						

iii. Financial calculator:

	SHARP EL-738		**Hp10BII**
Number of PMT's/cash flows = 4 unequal of R1 000, R2 000, R2 500 and R3 000 at the end of years 1–4 Interest rate = 6%			
Key in:	Display will read:	Key in:	Display will read:
Clear all registers first:			
CFi 2ndF CA	0.0000	2ndF C ALL	1 P/YR 0.0000
Enter data sets:			
0 ENT	DATA SET:CF 0	0 CF_j	CFLO/CF 0.0000
1000 ENT	DATA SET:CF 1	1000 CF_j	CFLO/CF 1,000.0000
2000 ENT	DATA SET:CF 2	2000 CF_j	CFLO/CF 2,000.0000
2500 ENT	DATA SET:CF 3	2500 CF_j	CFLO/CF 2,500.0000
3000 ENT	DATA SET:CF 4	3000 CF_j	CFLO/CF 3,000.0000
Clear cash flow registers:			
ON/C	0.0000		
2ndF CASH	RATE(I/Y) =		
2ndF CA	RATE(I/Y) = 0.0000		
Enter rate:			
(I/Y) 6 ENT	RATE(I/Y) = 6.0000	6 I/YR	6.0000
Use arrows to get to NPV and press COMP	NET-PV = 7'198.7183	2ndF NPV	7,198.7183

Rounded to the nearest rand = R7 199

Activity 9.9

Repayment of a loan (PMT)

A finance company has financed a R100 000 loan. The loan is repayable in equal instalments over 15 years, including capital and interest, and the finance company wants to earn interest at 18% per annum on its finance agreement.

Determine the annual instalment requirement.

i. Use the appropriate equation, factors from the tables and round off your final answer to the nearest rand.
ii. Test your answer by using a financial calculator.

Feedback on activity 9.9

Repayment of loan/annual instalment

i. Equation and factors from appropriate Table:

$$\text{Annuity} = \frac{\text{Present value}}{\text{Present value of R1 per period factor at 18\% for 15 years}}$$

$$= \frac{\text{R100 000}}{\text{5,092 (per Table B)}}$$

$$= \text{R19 639}$$

The annual instalment is R19 639.

ii. Financial calculator:

	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:	15 N	15.0000	15 N	15.0000
Interest rate:	18 I/Y	18.0000	18 I/YR	18.0000
Payments:	100000+/– PV	–100'000.0000	100 000+/– PMT	–100,000.0000
Calculate (compute) the payment:	COMP PMT	19'640.2783	PMT	19,640.2783

Rounded to the nearest rand = R19 640

Activity 9.10

Amount to invest (I) to reach FV

You will need R40 000 as a deposit on a car when you go to university at the end of the next five (5) years. How much will you need to invest annually at 12% compounded interest for the next five years in order to have the R40 000 as a deposit:

Determine the annual investment.

i. Use the appropriate equation, factors from the tables and round off your answer to the nearest rand.
ii. Test your answer by using a financial calculator.

Feedback on activity 9.10

i. Investment to reach a FV

$$\text{Annuity} = \frac{\text{Future value}}{\text{Future value of R1 per period factor}}$$

$$= \frac{\text{R40 000}}{\text{6,3528 (Table D)}}$$

$$= \text{R6 296,4362}$$

$$\approx \text{R6 296 per year}$$

ii. Financial calculator:

	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:	5 N	5.0000	5 N	5.0000
Interest rate:	12 I/Y	12.0000	12 I/YR	12.0000
Future value:	40000+/– FV	–40'000.0000	40 000 +/– FV	–40,000.0000
Calculate (compute) the payment:	COMP PMT	6'296.3893	PMT	6,296.3893

Rounded to the nearest rand = R6 296

Activity 9.11

Calculate effective interest rate

You see an advertisement from a bank that advertises a 12-month fixed deposit rate of 8,5% nominal. The advertisement states that you will earn interest monthly and the effective rate on this 12-month fixed deposit is 8,84%. Determine whether this effective interest rate is correct.

i. Use the appropriate formula.

ii. Test your answer by using a financial calculator.

Feedback on activity 9.11

i. Formula.

$$\text{Effective interest rate} = \left[1+\frac{i}{n}\right]^{n} - 1$$

$$= \left[1+\frac{0{,}085}{12}\right]^{12} - 1$$

$$= (1 + 0{,}0071)^{12} - 1$$

$$= (1{,}0071)^{12} - 1$$

$$= 1{,}0884 - 1$$

$$= 0{,}0884$$

$$= 8{,}84\%$$

ii. Financial calculator:

SHARP EL-738 **Hp10BII**

Number of periods = 12 (monthly = 12 per year) and nominal interest rate = 8,5%				
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
			12 2ndF P/YR	12.0000
	12 (x, y) 8.5 2ndF →EFF	8.8391	8.5 2ndF NOM%	8.5000
			2ndF EFF%	8.8391

Rounded to 8,84%

Activity 9.12

Calculate nominal interest rate

ZZC Bank offers a premium investment account that requires a minimum investment of R100 000. Interest is compounded quaterly. The effective interest rate is 6,14% per year. What is the nominal rate at which ZZC Bank can advertise this premium investment account?

i. Use the appropriate formula.

ii. Test your answer by using a financial calculator.

Feedback on activity 9.12

i. Formula:

Nominal rate $= n[(1 + i)^{1/n} - 1]$

$= 4[(1 + 0{,}0614)^{1/4} - 1]$

$= 4[(1{,}0614)^{1/4} - 1]$

$= 4[1{,}0150 - 1]$

$= 4 \times 0{,}0150$

$= 0{,}0600$

$= 6{,}00\%$

ii. Financial calculator:

SHARP EL-738 **Hp10BII**

Number of periods = 4 (quaterly = 4 per year) and effective interest rate = 6,14%				
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
	4 (x, y) 6.14 2ndF →APR	6.0035	4 2ndF P/YR	4.0000
			6.14 2ndF EFF%	6.1400
			2ndF NOM%	6.0035

Rounded to 6,00%

5 Inflation

Inflation has the effect of decreasing the purchasing power of money. When you invest money, you will receive the principal plus interest at the end of the investment period. As a result of inflation your money will, however, have less purchasing power than when you made the investment. Investors should therefore require a higher return on their investment to compensate for the decline in the purchasing power of their money. In other words, the required return should be higher than the expected inflation rate. When the effective interest rate earned on an investment is less than the inflation rate, the investor will lose wealth in terms of the purchasing power of the money that was invested. This is because the present value (purchasing power) of the future or maturity value will be less than the original amount invested.

We will not go into more detail here about inflation since it falls outside the scope of this course. You will learn more about inflation in MAC3702.

6 Summary

In this topic, we discussed the time value of money. We explained the different concepts related to the time value of money that you will need to understand and apply when you calculate the cost of capital (cost of different sources of finance), and when you make financing or investment decisions, and so forth. We also defined, explained and illustrated the calculation of different types of interest.

We illustrated the calculation of future values and present values by using three different methods. We followed a systematic approach to solving time value of money problems and illustrated this approach by means of activities.

In the next topic, we will discuss different sources and forms of finance.

Self-assessment activity

After having worked through this study unit, determine if you are able to answer the following questions:

Use the information below to answer questions 1 to 3:

Mrs Balls will save this year's bonus of R3 000 in a special savings account at an annual compound interest rate of 14%. She wants to determine what the amount in her special savings account will be after five (5) years.

1. Which one of the following equations should she use?

   (a) PV x future value of R1 factor

   (b) $$\frac{\text{Future value}}{\text{Future value of R1 factor}}$$

   (c) $$\frac{\text{Future value}}{\text{Future value of R1 per period factor}}$$

   (d) Future value of single amount x present value of R1 factor

   (e) Annuity x present value of R1 per period factor

   Feedback on question 1:

   Equation (a) is correct.

2. Which one of the following factors should she use in the equation?

   (a) 1,1400
   (b) 1,2996
   (c) 1,4815
   (d) 1,6890
   (e) 1,9254

   Feedback on question 2:

   Factor (e) is the correct factor to use.

3. What is the amount in her special savings account after five (5) years? Use the factor from the appropriate table and round your final answer to the nearest rand.

   (a) R3 420
   (b) R3 899
   (c) R5 776
   (d) R5 067
   (e) R4 445

Feedback on question 3:

Alternative (c) is correct.

Use the information below to answer questions 4 to 6:

You want make an investment now at an annual compound interest rate of 8% in order to receive R12 000 after three (3) years when you will need to pay a deposit to rent a flat. You need to determine the amount that you have to invest now.

4. Which one of the following equations should you use?

   (a) PV x future value of R1 factor

   (b) $\frac{\text{Future value}}{\text{Future value of R1 factor}}$

   (c) $\frac{\text{Future value}}{\text{Future value of R1 per period factor}}$

   (d) Future value of single amount x present value of R1 factor

   (e) Annuity x present value of R1 per period factor

   Feedback on question 4:

   Equation (d) is correct.

5. Which one of the following factors should you use in the equation?

   (a) 0,926

   (b) 0,857

   (c) 0,794

   (d) 0,735

   (e) 2,577

   Feedback on question 5:

   Alternative (c) is correct.

6. What is the amount that you will have to invest now? Use the factor from the appropriate table and round your final answer to the nearest rand.

   (a) R11 112

   (b) R10 284

   (c) R8 820

   (d) R4 657

   (e) R9 528

   Feedback on question 6:

   Alternative (e) is correct.

   Use the information below to answer questions 7 to 9:

   Your client wants to obtain a loan to finance a new vehicle. His bank offers him a loan to the value of R120 000 at 16% interest per annum, repayable in equal annual instalments over six (6) years, including capital and interest. Your client has asked you to calculate the amount of the instalment that he will have to pay each year.

7. Which one of the following equations should you use?

(a) $$\frac{\text{Present value}}{\text{Present value of R1 per period factor}}$$

(b) $$\frac{\text{Future value}}{\text{Future value of R1 factor}}$$

(c) $$\frac{\text{Future value}}{\text{Future value of R1 per period factor}}$$

(d) Future value of single amount x present value of R1 factor

(e) Annuity x present value of R1 per period factor

Feedback on question 7:

Equation (a) is correct.

8. Which one of the following factors should you use in the equation?

(a) 2,798

(b) 3,274

(c) 3,685

(d) 1,418

(e) 6,975

Feedback on question 8:

Alternative (c) is correct.

9. What is the amount of the annual instalment that your client will have to pay? Use the factor from the appropriate table and round your final answer to the nearest rand.

(a) R42 888

(b) R32 564

(c) R17 204

(d) R53 428

(e) R31 712

Feedback on question 9:

Alternative (b) is correct.

TABLE A
PRESENT VALUE OF R1 RECEIVED/PAID AFTER N YEARS

Formula: $\frac{1}{(1+i)^n}$

Year N	1%	2%	4%	6%	8%	10%	12%	14%	15%	16%	18%	20%	22%	24%	25%	26%	28%	30%	35%
1	0,990	0,980	0,962	0,943	0,926	0,909	0,893	0,877	0,870	0,862	0,847	0,833	0,820	0,806	0,800	0,794	0,781	0,769	0,741
2	0,980	0,961	0,925	0,890	0,857	0,826	0,797	0,769	0,756	0,743	0,718	0,694	0,672	0,650	0,640	0,630	0,610	0,592	0,549
3	0,971	0,942	0,889	0,840	0,794	0,751	0,712	0,675	0,658	0,641	0,609	0,579	0,551	0,524	0,512	0,500	0,477	0,455	0,406
4	0,961	0,924	0,855	0,792	0,735	0,683	0,636	0,592	0,572	0,552	0,516	0,482	0,451	0,423	0,410	0,397	0,373	0,350	0,301
5	0,951	0,906	0,822	0,747	0,681	0,621	0,567	0,519	0,497	0,476	0,437	0,402	0,370	0,341	0,328	0,315	0,291	0,269	0,223
6	0,942	0,888	0,790	0,705	0,630	0,564	0,507	0,456	0,432	0,410	0,370	0,335	0,303	0,275	0,262	0,250	0,227	0,207	0,165
7	0,933	0,871	0,760	0,665	0,583	0,513	0,452	0,400	0,376	0,354	0,314	0,279	0,249	0,222	0,210	0,198	0,178	0,159	0,122
8	0,923	0,853	0,731	0,627	0,540	0,467	0,404	0,351	0,327	0,305	0,266	0,233	0,204	0,179	0,168	0,157	0,139	0,123	0,091
9	0,914	0,837	0,703	0,592	0,500	0,424	0,361	0,308	0,284	0,263	0,225	0,194	0,167	0,144	0,134	0,125	0,108	0,094	0,067
10	0,905	0,820	0,676	0,558	0,463	0,386	0,322	0,270	0,247	0,227	0,191	0,162	0,137	0,116	0,107	0,099	0,085	0,073	0,050
11	0,896	0,804	0,650	0,527	0,429	0,350	0,287	0,237	0,215	0,195	0,162	0,135	0,112	0,094	0,086	0,079	0,066	0,056	0,037
12	0,887	0,788	0,625	0,497	0,397	0,319	0,257	0,208	0,187	0,168	0,137	0,112	0,092	0,076	0,069	0,062	0,052	0,043	0,027
13	0,879	0,773	0,601	0,469	0,368	0,290	0,229	0,182	0,163	0,145	0,116	0,093	0,075	0,061	0,055	0,050	0,040	0,033	0,020
14	0,870	0,758	0,577	0,442	0,340	0,263	0,205	0,160	0,141	0,125	0,099	0,078	0,062	0,049	0,044	0,039	0,032	0,025	0,015
15	0,861	0,743	0,555	0,417	0,315	0,239	0,183	0,140	0,123	0,108	0,084	0,065	0,051	0,040	0,035	0,031	0,025	0,020	0,011
16	0,853	0,728	0,534	0,394	0,292	0,218	0,163	0,123	0,107	0,093	0,071	0,054	0,042	0,032	0,028	0,025	0,019	0,015	0,008
17	0,844	0,714	0,513	0,371	0,270	0,198	0,146	0,108	0,093	0,080	0,060	0,045	0,034	0,026	0,023	0,020	0,015	0,012	0,006
18	0,836	0,700	0,494	0,350	0,250	0,180	0,130	0,095	0,081	0,069	0,051	0,038	0,028	0,021	0,018	0,016	0,012	0,009	0,005
19	0,828	0,686	0,475	0,331	0,232	0,164	0,116	0,083	0,070	0,060	0,043	0,031	0,023	0,017	0,014	0,012	0,009	0,007	0,003
20	0,820	0,673	0,456	0,312	0,215	0,149	0,104	0,073	0,061	0,051	0,037	0,026	0,019	0,014	0,012	0,010	0,007	0,005	0,002
21	0,811	0,660	0,439	0,294	0,199	0,135	0,093	0,064	0,053	0,044	0,031	0,022	0,015	0,011	0,009	0,008	0,006	0,004	0,002
22	0,803	0,647	0,422	0,268	0,184	0,123	0,083	0,056	0,046	0,038	0,026	0,018	0,013	0,009	0,007	0,006	0,004	0,003	0,001
23	0,795	0,634	0,406	0,262	0,170	0,112	0,074	0,049	0,040	0,033	0,022	0,015	0,010	0,007	0,006	0,005	0,003	0,002	0,001
24	0,788	0,622	0,390	0,247	0,158	0,102	0,066	0,043	0,035	0,028	0,019	0,013	0,008	0,006	0,005	0,004	0,003	0,002	0,001
25	0,780	0,610	0,375	0,233	0,146	0,092	0,059	0,038	0,030	0,024	0,016	0,010	0,007	0,005	0,004	0,003	0,002	0,001	0,001
26	0,772	0,598	0,361	0,220	0,135	0,084	0,053	0,033	0,026	0,021	0,014	0,009	0,006	0,004	0,003	0,002	0,002	0,001	
27	0,764	0,586	0,347	0,207	0,125	0,076	0,047	0,029	0,023	0,018	0,011	0,007	0,005	0,003	0,002	0,002	0,001	0,001	
28	0,757	0,574	0,333	0,196	0,116	0,069	0,042	0,026	0,020	0,016	0,010	0,006	0,004	0,002	0,002	0,002	0,001	0,001	
29	0,749	0,563	0,321	0,185	0,107	0,063	0,037	0,022	0,017	0,014	0,008	0,005	0,003	0,002	0,002	0,001	0,001	0,001	
30	0,742	0,552	0,308	0,174	0,099	0,057	0,033	0,020	0,015	0,012	0,007	0,004	0,003	0,002	0,001	0,001	0,001		
40	0,672	0,453	0,208	0,097	0,046	0,022	0,011	0,005	0,004	0,003	0,001	0,001							
50	0,608	0,372	0,141	0,054	0,021	0,009	0,003	0,001	0,001	0,001									

TABLE B:
PRESENT VALUE OF R1 PER ANNUM RECEIVED/PAID AT THE END OF THE YEAR FOR N YEARS

Formula: $\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]$

Year N	1%	2%	4%	6%	8%	10%	12%	14%	15%	16%	18%	20%	22%	24%	25%	26%	28%	30%	35%
1	0,990	0,980	0,962	0,943	0,926	0,909	0,893	0,877	0,870	0,862	0,847	0,833	0,820	0,806	0,800	0,794	0,781	0,769	0,741
2	1,970	1,942	1,886	1,833	1,783	1,736	1,690	1,647	1,626	1,605	1,566	1,528	1,492	1,457	1,440	1,424	1,392	1,361	1,289
3	2,941	2,884	2,775	2,673	2,577	2,487	2,402	2,322	2,283	2,246	2,174	2,106	2,042	1,981	1,952	1,923	1,868	1,816	1,696
4	3,902	3,808	3,630	3,465	3,312	3,170	3,037	2,914	2,855	2,798	2,690	2,589	2,494	2,404	2,362	2,320	2,241	2,166	1,997
5	4,853	4,713	4,452	4,212	3,993	3,791	3,605	3,433	3,352	3,274	3,127	2,991	2,864	2,745	2,689	2,635	2,532	2,436	2,220
6	5,795	5,601	5,242	4,917	4,623	4,355	4,111	3,889	3,784	3,685	3,498	3,326	3,167	3,020	2,951	2,885	2,759	2,643	2,385
7	6,728	6,472	6,002	5,582	5,206	4,868	4,564	4,288	4,160	4,039	3,812	3,605	3,416	3,242	3,161	3,083	2,937	2,802	2,508
8	7,652	7,325	6,733	6,210	5,747	5,335	4,968	4,639	4,487	4,344	4,078	3,837	3,619	3,421	3,329	3,241	3,076	2,925	2,598
9	8,566	8,162	7,435	6,802	6,247	5,759	5,328	4,946	4,772	4,607	4,303	4,031	3,786	3,566	3,463	3,366	3,184	3,019	2,665
10	9,471	8,983	8,111	7,360	6,710	6,145	5,650	5,216	5,019	4,833	4,494	4,192	3,923	3,682	3,571	3,465	3,269	3,092	2,715
11	10,368	9,787	8,760	7,887	7,139	6,495	5,937	5,453	5,234	5,029	4,656	4,327	4,035	3,776	3,656	3,544	3,335	3,147	2,752
12	11,255	10,575	9,385	8,384	7,536	6,814	6,194	5,660	5,421	5,197	4,793	4,439	4,127	3,851	3,725	3,606	3,387	3,190	2,779
13	12,134	11,343	9,986	9,853	7,904	7,103	6,424	5,842	5,583	5,342	4,910	4,533	4,203	3,912	3,780	3,656	3,427	3,223	2,799
14	13,004	12,106	10,563	9,295	8,244	7,367	6,628	6,002	5,724	5,468	5,008	4,611	4,265	3,962	3,824	3,695	3,459	3,249	2,814
15	13,865	12,849	11,118	9,712	8,559	7,606	6,811	6,142	5,847	5,575	5,092	4,675	4,315	4,001	3,859	3,726	3,483	3,268	2,825
16	14,718	13,578	11,652	10,106	8,851	7,824	6,974	6,265	5,954	5,669	5,162	4,730	4,357	4,033	3,887	3,751	3,503	3,283	2,834
17	15,562	14,292	12,166	10,477	9,122	8,022	7,120	6,373	6,047	5,749	5,222	4,775	4,391	4,059	3,910	3,771	3,518	3,295	2,840
18	16,398	14,992	12,659	10,828	9,372	8,201	7,250	6,467	6,128	5,818	5,273	4,812	4,419	4,080	3,928	3,786	3,529	3,304	2,844
19	17,226	15,678	13,134	11,158	9,604	8,365	7,366	6,550	6,198	5,877	5,316	4,844	4,442	4,097	3,942	3,799	3,539	3,311	2,848
20	18,046	16,351	13,590	11,470	9,818	8,514	7,469	6,623	6,259	5,929	5,353	4,870	4,460	4,110	3,954	3,808	3,546	3,316	2,850
21	18,857	17,011	14,029	11,764	10,017	8,649	7,562	6,687	6,312	5,973	5,384	4,891	4,476	4,121	3,963	3,816	3,551	3,320	2,852
22	19,660	17,658	14,451	12,042	10,201	8,772	7,645	6,743	6,359	6,011	5,410	4,909	4,488	4,130	3,970	3,822	3,556	3,323	2,853
23	20,456	18,292	14,857	12,303	10,371	8,883	7,718	6,792	6,399	6,044	5,432	4,925	4,499	4,137	3,976	3,827	3,559	3,325	2,854
24	21,243	18,914	15,247	12,550	10,529	8,985	7,784	6,835	6,434	6,073	5,451	4,937	4,507	4,143	3,981	3,831	3,562	3,327	2,855
25	22,023	19,523	15,622	12,783	10,675	9,077	7,843	6,873	6,464	6,097	5,467	4,948	4,514	4,147	3,985	3,834	3,654	3,329	2,856
26	22,795	20,121	15,983	13,003	10,810	9,161	7,896	6,906	6,491	6,118	5,480	4,956	4,520	4,151	3,988	3,837	3,566	3,330	2,856
27	23,560	20,707	16,330	13,211	10,935	9,237	7,943	6,935	6,514	6,136	5,492	4,964	4,524	4,154	3,990	3,839	3,567	3,331	2,856
28	24,316	21,281	16,663	13,406	11,051	9,307	7,984	6,961	6,534	6,152	5,502	4,970	4,528	4,157	3,992	3,840	3,568	3,331	2,857
29	25,066	21,844	16,984	13,591	11,158	9,370	8,022	6,983	6,551	6,166	5,510	4,975	4,531	4,159	3,994	3,841	3,569	3,332	2,857
30	25,808	22,396	17,292	13,765	11,258	9,427	8,055	7,003	6,566	6,177	5,517	4,979	4,534	4,160	3,995	3,842	3,569	3,332	2,857
40	32,835	27,355	19,793	15,046	11,925	9,779	8,244	7,105	6,642	6,234	5,548	4,997	4,544	4,166	3,999	3,846	3,571	3,333	2,857
50	39,196	31,424	21,482	15,762	12,234	9,915	8,304	7,133	6,661	6,246	5,554	4,999	4,545	4,167	4,000	3,846	3,571	3,333	

If you need to use a factor for annuities due (paid in advance or at the beginning of the period):

1. Look up the factor for periods n + 1
2. **Then** add one (the PV of R1 invested now is R1). Or use the mathematical formula.

TABLE C
FUTURE VALUE OF R1 RECEIVED NOW, AFTER N YEARS

Formula: $(1 + i)^n$

Year N	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%
1	1,0100	1,0200	1,0300	1,0400	1,0500	1,0600	1,0700	1,0800	1,0900	1,1000	1,1200	1,1400	1,1500	1,1600	1,1800	1,2000
2	1,0201	1,0404	1,0609	1,0816	1,1025	1,1236	1,1449	1,1664	1,1881	1,2100	1,2544	1,2996	1,3225	1,3456	1,3924	1,4400
3	1,0303	1,0612	1,0927	1,1249	1,1576	1,1910	1,2250	1,2597	1,2950	1,3310	1,4049	1,4815	1,5209	1,5609	1,6430	1,7280
4	1,0406	1,0824	1,1255	1,1699	1,2155	1,2625	1,3108	1,3605	1,4116	1,4641	1,5735	1,6890	1,7490	1,8106	1,9388	2,0736
5	1,0510	1,1041	1,1593	1,2167	1,2763	1,3382	1,4026	1,4693	1,5386	1,6105	1,7623	1,9254	2,0114	2,1003	2,2878	2,4883
6	1,0615	1,1262	1,1941	1,2653	1,3401	1,4185	1,5007	1,5869	1,6771	1,7716	1,9738	2,1950	2,3131	2,4364	2,6996	2,9860
7	1,0721	1,1487	1,2299	1,3159	1,4071	1,5036	1,6058	1,7138	1,8280	1,9487	2,2107	2,5023	2,6600	2,8262	3,1855	3,5832
8	1,0829	1,1717	1,2668	1,3686	1,4775	1,5938	1,7182	1,8509	1,9926	2,1436	2,4760	2,8526	3,0590	3,2784	3,7589	4,2998
9	1,0937	1,1951	1,3048	1,4233	1,5513	1,6895	1,8385	1,9990	2,1719	2,3579	2,7731	3,2519	3,5179	3,8030	4,4355	5,1598
10	1,1046	1,2190	1,3439	1,4802	1,6289	1,7908	1,9672	2,1589	2,3674	2,5937	3,1058	3,7072	4,0456	4,4114	5,2338	6,1917
11	1,1157	1,2434	1,3842	1,5395	1,7103	1,8983	2,1049	2,3316	2,5804	2,8531	3,4785	4,2262	4,6524	5,1173	6,1759	7,4301
12	1,1268	1,2682	1,4258	1,6010	1,7959	2,0122	2,2522	2,5182	2,8127	3,1384	3,8960	4,8179	5,3503	5,9360	7,2876	8,9161
13	1,1381	1,2936	1,4685	1,6651	1,8856	2,1329	2,4098	2,7196	3,0658	3,4523	4,3635	5,4924	6,1528	6,8858	8,5994	10,699
14	1,1495	1,3195	1,5126	1,7317	1,9799	2,2609	2,5785	2,9372	3,3417	3,7975	4,8871	6,2613	7,0757	7,9875	10,147	12,839
15	1,1610	1,3459	1,5580	1,8009	2,0789	2,3966	2,7590	3,1722	3,6425	4,1772	5,4736	7,1379	8,1371	9,2655	11,974	15,407
16	1,1726	1,3728	1,6047	1,8730	2,1829	2,5404	2,9522	3,4259	3,9703	4,5950	6,1304	8,1372	9,3576	10,748	14,129	18,488
17	1,1843	1,4002	1,6528	1,9479	2,2920	2,6928	3,1588	3,7000	4,3276	5,0545	6,8660	9,2765	10,761	12,468	16,672	22,186
18	1,1961	1,4282	1,7024	2,0258	2,4066	2,8543	3,3799	3,9960	4,7171	5,5599	7,6900	10,575	12,375	14,463	19,673	26,623
19	1,2081	1,4568	1,7535	2,1068	2,5270	3,0256	3,6165	4,3157	5,1417	6,1159	8,6128	12,056	14,232	16,777	23,214	31,948
20	1,2202	1,4859	1,8061	2,1911	2,6533	3,2071	3,8697	4,6610	5,6044	6,7275	9,6463	13,743	16,367	19,461	27,393	38,338
21	1,2324	1,5157	1,8603	2,2788	2,7860	3,3996	4,1406	5,0338	6,1088	7,4002	10,804	15,668	18,822	22,574	32,324	46,005
22	1,2447	1,5460	1,9161	2,3699	2,9253	3,6035	4,4304	5,4365	6,6586	8,1403	12,100	17,861	21,645	26,186	38,142	55,206
23	1,2572	1,5769	1,9736	2,4647	3,0715	3,8197	4,7405	5,8715	7,2579	8,9543	13,552	20,362	24,891	30,376	45,008	66,247
24	1,2697	1,6084	2,0328	2,5633	3,2251	4,0489	5,0724	6,3412	7,9111	9,8497	15,179	23,212	28,625	35,236	53,109	79,497
25	1,2824	1,6406	2,0938	2,6658	3,3864	4,2919	5,4274	6,8485	8,6231	10,835	17,000	26,462	32,919	40,874	62,669	95,396

TABLE D
FUTURE VALUE OF R1 PER ANNUM RECEIVED FOR N YEARS AT THE END OF EACH YEAR

Formula: $\frac{(1+i)^n - 1}{i}$

Year N	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%
1	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000
2	2,0100	2,0200	2,0300	2,0400	2,0500	2,0600	2,0700	2,0800	2,0900	2,1000	2,1200	2,1400	2,1500	2,1600	2,1800	2,2000
3	3,0301	3,0604	3,0909	3,1216	3,1525	3,1836	3,2149	3,2464	3,2781	3,3100	3,3744	3,4396	3,4725	3,5056	3,5724	3,6400
4	4,0604	4,1216	4,1836	4,2465	4,3101	4,3746	4,4399	4,5061	4,5731	4,6410	4,7793	4,9211	4,9934	5,0665	5,2154	5,3680
5	5,1010	5,2040	5,3091	5,4163	5,5256	5,6371	5,7507	5,8666	5,9847	6,1051	6,3528	6,6101	6,7424	6,8771	7,1542	7,4416
6	6,1520	6,3081	6,4684	6,6330	6,8019	6,9753	7,1533	7,3359	7,5233	7,7156	8,1152	8,5355	8,7537	8,9775	9,4420	9,9299
7	7,2135	7,4343	7,6625	7,8983	8,1420	8,3938	8,6540	8,9228	9,2004	9,4872	10,089	10,730	11,067	11,414	12,142	12,916
8	8,2857	8,5830	8,8923	9,2142	9,5491	9,8975	10,260	10,637	11,028	11,436	12,300	13,233	13,727	14,240	15,327	16,499
9	9,3685	9,7546	10,159	10,583	11,027	11,491	11,978	12,488	13,021	13,579	14,776	16,085	16,786	17,519	19,086	20,799
10	10,462	10,950	11,464	12,006	12,578	13,181	13,816	14,487	15,193	15,937	17,549	19,337	20,304	21,321	23,521	25,959
11	11,567	12,169	12,808	13,486	14,207	14,972	15,784	16,645	17,560	18,531	20,655	23,045	24,349	25,733	28,755	32,150
12	12,683	13,412	14,192	15,026	15,917	16,870	17,888	18,977	20,141	21,384	24,133	27,271	29,002	30,850	34,931	39,581
13	13,809	14,680	15,618	16,627	17,713	18,882	20,141	21,495	22,953	24,523	28,029	32,089	34,352	36,786	42,219	48,497
14	14,947	15,974	17,086	18,292	19,599	21,015	22,550	24,215	26,019	27,975	32,393	37,581	40,505	43,672	50,818	59,196
15	16,097	17,293	18,599	20,024	21,579	23,276	25,129	27,152	29,361	31,772	37,280	43,842	47,580	51,660	60,965	72,035
16	17,258	18,639	20,157	21,825	23,657	25,673	27,888	30,324	33,003	35,950	42,753	50,980	55,717	60,925	72,939	87,442
17	18,430	20,012	21,762	23,698	25,840	28,213	30,840	33,750	36,974	40,545	48,884	59,118	65,075	71,673	87,068	105,93
18	19,615	21,412	23,414	25,645	28,132	30,906	33,999	37,450	41,301	45,599	55,750	68,394	75,836	84,141	103,74	128,12
19	20,811	22,841	25,117	27,671	30,539	33,760	37,379	41,446	46,018	51,159	63,440	78,969	88,212	98,603	123,41	154,74
20	22,019	24,297	26,870	29,778	33,006	36,786	40,995	45,762	51,160	57,275	72,052	91,025	102,44	115,38	146,63	186,69
21	23,239	25,783	28,676	31,969	35,719	39,993	44,865	50,423	56,765	64,002	81,699	104,77	118,81	134,84	174,02	225,03
22	24,472	27,299	30,537	34,248	38,505	43,392	49,006	55,457	62,873	71,403	92,503	120,44	137,63	157,41	206,34	271,03
23	25,716	28,845	32,453	36,618	41,430	46,996	53,436	60,893	69,532	79,543	104,60	138,30	159,28	183,60	244,49	326,24
24	26,973	30,422	34,426	39,083	44,502	50,816	58,177	66,765	76,790	88,497	118,16	158,66	184,17	213,98	289,49	392,48
25	28,243	32,030	36,459	41,646	47,727	54,865	63,249	73,106	84,701	98,347	133,33	181,87	212,79	249,21	342,60	471,98

If you need to use a factor for annuities due (paid in advance or at the beginning of the period):

1. Look up the factor for periods n + 1 2. **Then** subtract ONE

Or look up factor for n and multiply with (1 + i)

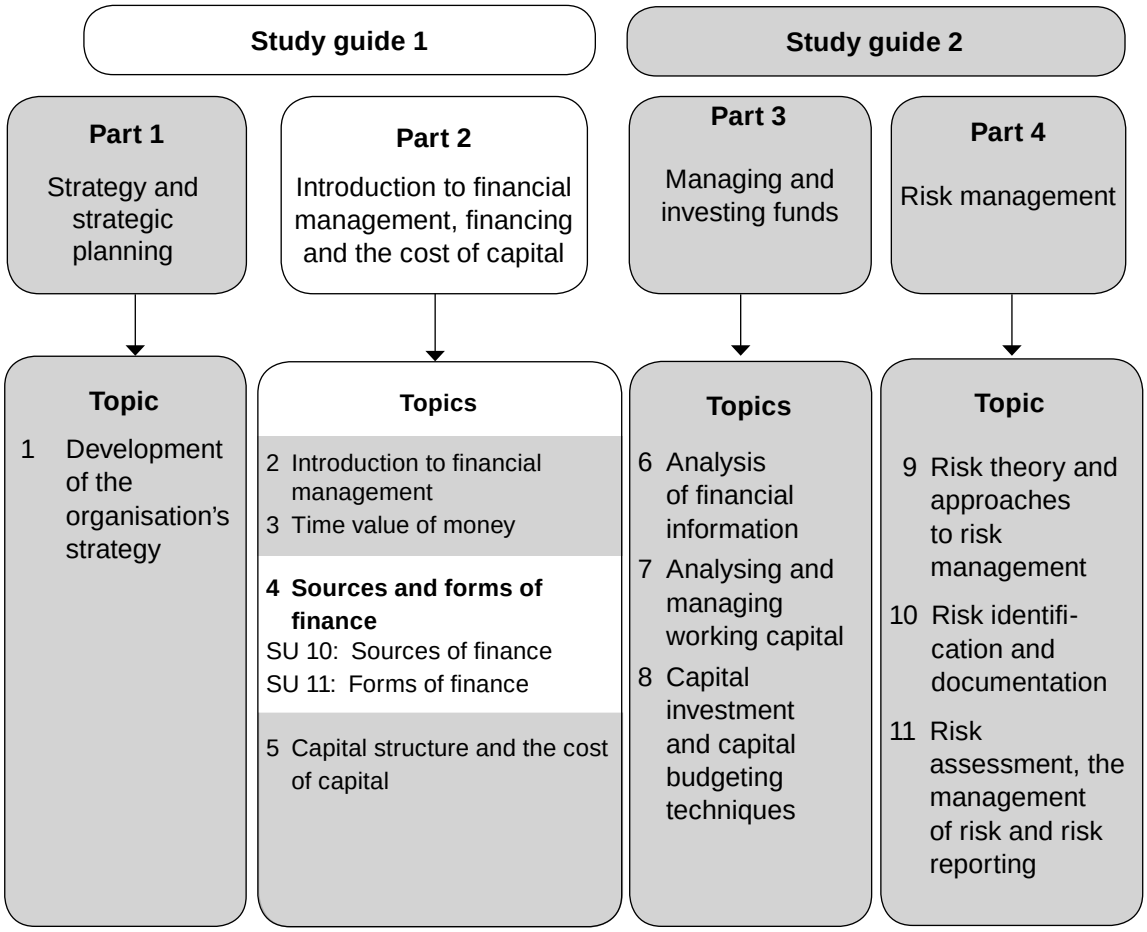
Or use the mathematical formula.

Sources and forms of finance

LEARNING OUTCOMES

After studying this topic, you should be able to:

- identify the main sources of financing
- explain the basic workings of capital and money markets
- identify possible financial markets
- explain the use of long- and short-term financing
- identify long- and short-term forms/options of finance
- identify the most appropriate financing instrument relating to equity or debt
- explain the characteristics, advantages and disadvantages of these instruments
- identify other forms of financing



INTRODUCTION

When we introduced you to financial management in topic 2, we explained the role of financial managers and gave specific attention to their role in financing and investment decisions in order to achieve the overall objective of financial management, namely creating long-term sustainable shareholder's wealth.

We will now discuss the sources and forms of finance that the entity's management can use when making financing decisions. The basic objective of these financing decisions is to obtain required funds from the appropriate market in the optimal mix between debt and equity as well as at the minimum cost. When financing decisions are made with these objectives in mind, the accountant will contribute to the creation of long-term sustainable shareholder's wealth.

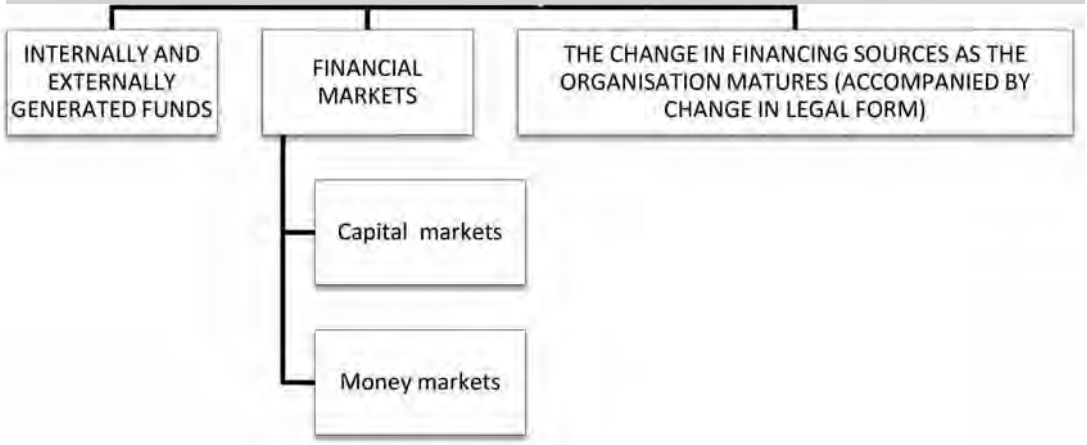
NOTE

The statutory aspects surrounding forms of finance, that is the Companies Act, the Close Corporations Act, King III, Listing Requirements and the Income Tax Act, will be dealt with in your Auditing and Taxation modules. We will not deal with detail aspects in this introductory topic.

STUDY UNIT 10

Sources of finance

In this study unit



1 Introduction

In this study unit, we will firstly identify possible financial markets (sources) where finance can be obtained. We will focus on capital and money markets and explain the basic workings of these two markets.

2 Background

All organisations need initial capital to start up with, which is required for purchasing the equipment, inventory, and so on. This is provided by the owners from:

- their own savings
- selling other investments
- increasing the bond on their fixed property
- retrenchment packages
- retirement lump sums

From your Financial Accounting (FAC) modules, you have learnt that these owner-provided funds are called equity or owners' interest (depending on the legal form of the business). If the initial owner-supplied funds were not enough, the owners would need additional financing from other sources. Similarly, when the entity wants to expand their operations by buying more equipment, opening additional branches or buying-out a competitor, they may need further financing.

We will discuss where this additional funding can be sourced from in more detail now.

3 Internally and externally generated funds

The financing function of an entity must raise funds in order to support the operations and investment programmes of the organisation.

An organisation can spend two kinds of money:

1. The first kind comes from **normal profits** (internally generated funds) which are the **day-to-day funds** used to support the organisation's **routine activities** (this is called **working capital or operating capital** which is discussed in detail in topic 7). For example, an organisation uses cash to purchase inventory. When the inventory is sold, the organisation receives cash or its debtors will increase if the inventory is sold on credit. When the debtors, who bought the inventory on credit, pay their accounts, the organisation will receive cash. At this point the cycle has been completed. The cash can then be used to purchase inventory again.
2. The second kind is **large amounts** that are **occasionally required** to get organisations **started** or to **support investment in major projects.** (This is discussed in detail in topic 8 dealing with capital investment and budgeting decisions.) These large amounts are raised **through financial markets** (externally generated) and are not wholly supported by operating funds. For example, an organisation needs money to change its current labour intensive production process to a capital-intensive process that uses new technology in order to stay competitive. In order to raise the necessary capital to fund this change, the organisation can offer new shares to the public.

Money can therefore be raised either internally or externally:

TABLE 10.1: Internal and external sources of funds

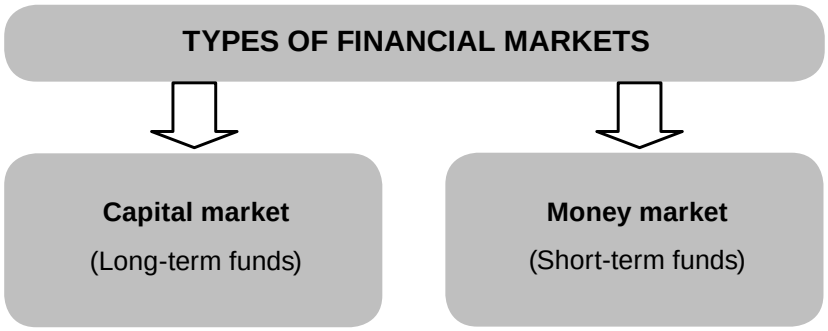
Raising money internally	• Most organisations raise money internally by retaining operating cash flows. This retained cash is saved and reinvested in the organisation on behalf of the organisation's owners/investors. This will support the growth of the organisation and support the organisation in its objective to create long-term sustainable wealth for its owners/investors
Raising money externally (financial markets)	• Debt financing is a method of raising money externally. This can be done by selling bonds/ debentures directly to investors or by borrowing money from commercial banks or other financial institutions or by borrowing from creditors. • Money raised externally can also be obtained from investors by selling an ownership interest. (Ownership interest can be a security such as ordinary shares, called equity, which is sold on the capital market).

A project is called “debt financed” if money is raised by borrowing. On the other hand, a project is called “equity financed” if money is raised from the sale of shares or from the organisation’s retained earnings.

4 Financial markets

Financial markets provide financing for organisations (demand) and turn the savings of investors (supply) into real investments. In practice, this means that organisations obtain funds from financial markets and then use it to finance operations and projects that are expected to be profitable. These profitable operations and projects will provide investors with better capital growth – a good return on their investment. Well-functioning financial markets therefore provide the rates of return that investors expect on their savings/investments.

Financial markets can be grouped as follows:



Source: Author, 2012

FIGURE 10.1: Types of financial markets

We will now discuss each market in more depth.

4.1 Capital (long-term) markets

CAPITAL

Capital is the money used to support or finance long-term (non-current) assets and projects and is displayed as equity (owners’ interest) and long-term debt on the statement of financial position.

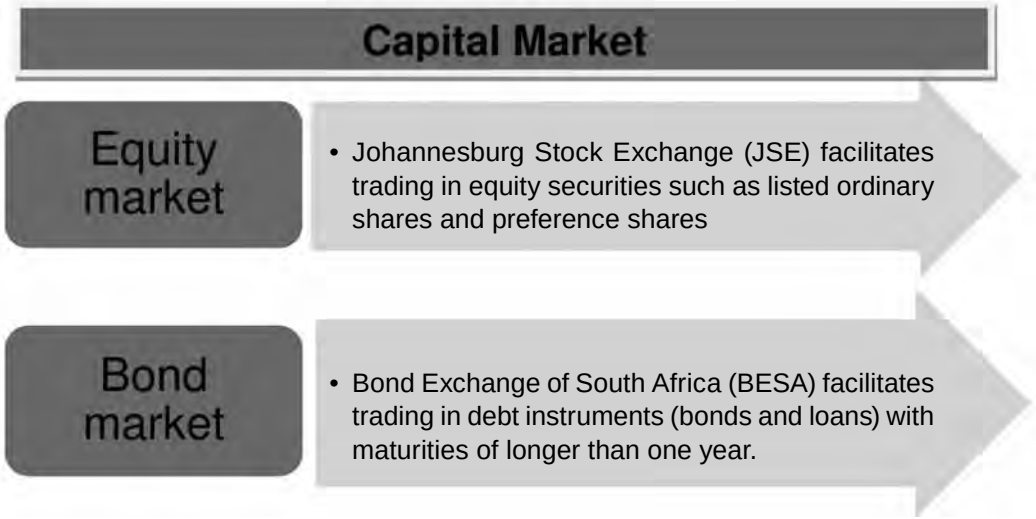
From the definition above, you will notice that capital is money or financing that is required for long periods (permanently). Main sources of capital (long-term financing sources) are equity, preference shares and debt.

CAPITAL MARKET

A capital market is a financial market in which equity and longer-term (longer than one year) debt securities are traded.

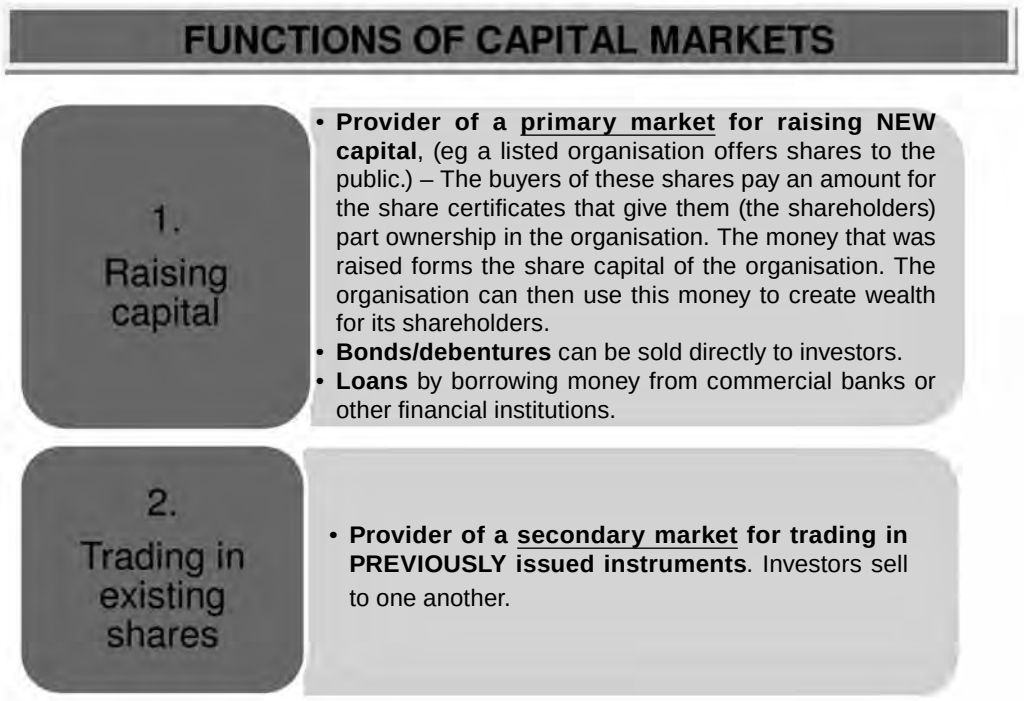
The definition of a capital market clearly indicates that it is a financial market for long-term financing instruments. Capital markets are also called securities markets and they trade in ordinary shares, preference shares and debt instruments (bonds and loans) that have terms of more than one year. Governments, large investors and organisations could borrow money for long-term activities or invest their surplus funds on the capital market. It is the market where the demand for and supply of long-term capital are met.

TABLE 10.2: The main divisions of the capital market



Two types of market transactions can be distinguished, namely primary market transactions and secondary market transactions. An explanation of each type is presented in the following table.

TABLE 10.3: The two main functions of capital markets



More information on the two types of market transactions is provided below.

TABLE 10.4: Types of market transactions

Primary market transactions	Secondary market transactions
• When equity and debt securities (such as bonds and long-term loans) are **initially sold** (floated) to investors, the capital is raised in a primary market transaction where **money flows from the investors to the organisation** and the organisation then invests the money to exploit investment opportunities such as expansion of the organisation or large capital projects.	• Holders of an organisation's securities can **subsequently sell these** equity **and debt securities to other investors**, resulting in a secondary market transaction. • The **majority of transactions** in the shares market are secondary and they do not generate cash for the organisation. • Management should nevertheless be aware of secondary share market transactions as it **sets the level of the organisation's share price** that will determine **how much can be raised by future issues** of shares. • It is also important that management is aware of the organisation's share price as **their compensation is often linked** to the share price of the organisation. • An **active secondary market** also makes an organisation's securities **more attractive to other investors**, thereby **increasing the price** of these securities.

Raising equity financing in the primary market takes two forms:

1. An Initial Public Offering (IPO) takes place when a company applies to be listed for the first time.
2. Subsequent shares can be listed for the first time to fund expansion projects.

NOTE

An IPO need not be viewed as simply a financial transaction. It should rather be viewed as a complex transformation from a private or unlisted public interest company to a publicly listed company. You will learn more about the workings of the capital markets as well as the JSE listing requirements in later MAC modules. It is sufficient to know at this stage that an organisation that wishes to be listed on the Main Board of the JSE should have:

- shareholders' equity of at least R25 million
- not less than 25 million equity shares
- a satisfactory audit report for the previous three years
- last audited profit before tax of at least R8 million

You can see from the above that only large, mature companies would be listed and obtain equity financing.

4.2 Money markets

MONEY MARKET

The money market is a financial market used mainly for raising short-term (of less than one year) finance.

The definition of the money market points out that it is a market for short-term financing. It is not confined to a specific location, such as the JSE and its subdivisions, but consists of large corporations and institutions such as merchant banks, commercial banks and non-bank financial institutions that borrow and lend amongst each other.

The money market is where the demand for and supply of short-term capital meets:

- For example, an organisation may need cash when it experiences a seasonal or short-term cash shortage due to a mismatch of payments and receipts of cash. A large amount of cash can for instance be required to pay suppliers (of inventory purchased previously). Funding may be needed to bridge the cash shortage until the inventory is sold and the cash received from debtors. (You will learn more about working capital management later on in this module.)

On the other hand, there may be investors and organisations that have surplus funds available for short periods. For example, another organisation has cash available since it is only supposed to pay its creditors in 60 days' time. Instead of keeping the cash in their bank account and earning a low interest rate thereon, the organisation can invest this surplus cash on the money market.

Provision of an organisation's short-term debt funding will typically take place through banks and other financial institutions, which will in turn trade the funds on the money market. The term money market includes the markets for trading in short-term inter-bank loans, short-term inter-company loans, short-term local authority debt instruments, bills of exchange, certificates of deposit and commercial paper. Money markets play an important role as it greatly influences the setting of interest rates for the rest of the economy.

Activity 10.1

Suppose you are the chief financial officer (CFO) of a large listed company. Which financial market would you access to obtain finance for large capital projects?

Feedback on activity 10.1

Since a large capital project needs

- a lot of capital
- over a number of years (long-term)

you will use the capital market to obtain financing for the project.

Activity 10.2

Suppose you are the CFO of Chicks Ltd. Which financial market would you use to obtain finance if the organisation does not have sufficient cash flow and cannot pay for certain operational transactions at month-end with its own funds?

Feedback on activity 10.2

Since the organisation needs the money for a short period, during which there is not enough cash flow to cover some of its operational cost, you will use the money market to obtain financing to cover operational costs.

5 Example – describing the change in financing sources as the organisation matures (accompanied by change in legal form)

In order to identify the most appropriate market as a potential source of finance, the size and stage of development of the organisation should be considered. Please refer to topic 2 again for a brief description of the different legal forms and the benefits/limitations of each. For illustration purposes, we will analyse the growth of a small neighbourhood business to a publicly listed company.

The ownership is initially entirely vested in the owner or sole proprietor (owner provided funds). If the owner wants to raise money for expansion, the sole proprietorship incorporates the business and becomes say, a private company – (Pty) Ltd. This legal form is also called a Limited Interest Company according to the new Companies Act, Act no 71 of 2008.

You will remember from topic 2 that it must have at least one shareholder and may not offer its shares to the general public. The owner of the private company therefore raises money for expansion by selling shares (a stake in the business) to other individual shareholders/ investors. The individual shareholders of the private company are usually also its directors and are closely involved in the running of the business. If the business plan for the expansion is acceptable, the business may also obtain bank loans. (You will learn more about compiling business plans in your third-year MAC module.)

As the organisation becomes even larger, an investment bank can also assist a large private company to obtain institutional investors (banks, retirement funds, asset managers, etc) by doing what is called a “private placement” of shares. Remember, at this stage the private company can still not sell shares to the general public! (Private placements are also done for large unlisted public companies.)

As the organisation continues to grow and more money is needed to pursue further growth opportunities, the owners need to raise the money by selling a substantial amount of shares to a large number of people. In order to do this, the private company has to complete the legal process to become a public company that can sell shares to the general public.

If the public company wants to change to a *listed* public company by completing an IPO, it needs the assistance of an investment bank. The bank will determine whether a market exists for the company’s shares as well as the likely price, at which a block of shares can be sold.

If the owner is satisfied with the estimated price, the investment bank starts to draw up a prospectus. This document supplies detailed information about the company's business and current financing. Since the purpose of the prospectus is disclosure, it has to inform all potential investors of the nature of the company and the risks involved. This must be done truly and accurately. If the company's success, for instance, depends on the granting of a patent or the success of a new technological process, these facts must be revealed in the prospectus. The prospectus has to be approved before the securities/shares that are described therein may be sold to the public.

The investment bank normally sources buyers, for example, institutional investors, before the securities are actually released and a percentage of the shares can be allotted to be marketed to individual small shareholders at the IPO stage.

The owner will normally retain a controlling share of the company's shares for himself. Since the IPO placed a value on the shares that have been sold, it would thereby have valued the shares that are still held by the owner. In the case of a successful IPO, the value at which the shares were valued, are greater than the carrying value thereof creating instant (unrealised) wealth for the owner. If a sufficient number of shares are taken up by the general public, the listing will be successful.

At this stage, the company is partly owned by the original owner(s) and the investors who purchased the shares through the IPO when the company went public. If any of these investors want to sell their shares, they have to do so through brokers and dealers who buy and sell shares on behalf of clients. For their hard work, they charge high commissions and fees to match buyers and sellers. The trading is facilitated by computers that match, bid and ask prices and volumes.

It is in the company's interest to make it easy for investors to trade in the secondary market (securities exchange), even if the company gains no monetary benefit from these trades. The reason is that, if there is an active market for the shares and they sell well due to the smooth operation of the secondary market, new issues of the company's shares will be easier to sell in the future when the company needs to raise more money in order to sustain growth.

A listed company can remain a listed company if the trading volume in the secondary market is high enough and if the company continues to meet the listing requirements of the JSE with regard to acceptable audit reports submitted on time, compliance with good corporate governance as recommended by King III, and so forth.

Enrichment activity 10.3

Go to the following website: http://www.fin24.com/Companies/ICT/Facebook-to-file-5-billion-IPO-20120201. Read the article "Facebook to file $5 billion IPO", as it is a good example of the extensive process required to become a listed public company with an initial public offering and some of the market reaction surrounding the announcement of the IPO.

Feedback on activity 10.3

The following *extract* from the case should provide you with some understanding of the large amounts of capital involved. Morgan Stanley is an investment bank

"Feb 01 2012 Reuters"

"New York – Facebook is expected to submit paperwork to regulators on Wednesday morning for a $5bn initial public offering and has selected Morgan Stanley and four other bookrunners to handle the mega-IPO, sources close to the deal told IFR.

The $5bn is a preliminary target and could be ramped up in coming months in response to investor demand, IFR added."

6 Summary

In this study unit, we discussed the main financial markets as sources of finance for an organisation, namely capital markets and money markets.

We defined capital and money markets and gave examples of each. The workings of capital and money markets were explained briefly as well as the functions of each. A distinction was made between raising money internally and externally as well as between primary and secondary market transactions.

We concluded with an illustration of how the most suitable market as potential source of finance changes based on the size and stage of development of an organisation. In the next study unit, we will identify different forms of finance that can be used to raise long-term and short-term capital.

Self-assessment activity

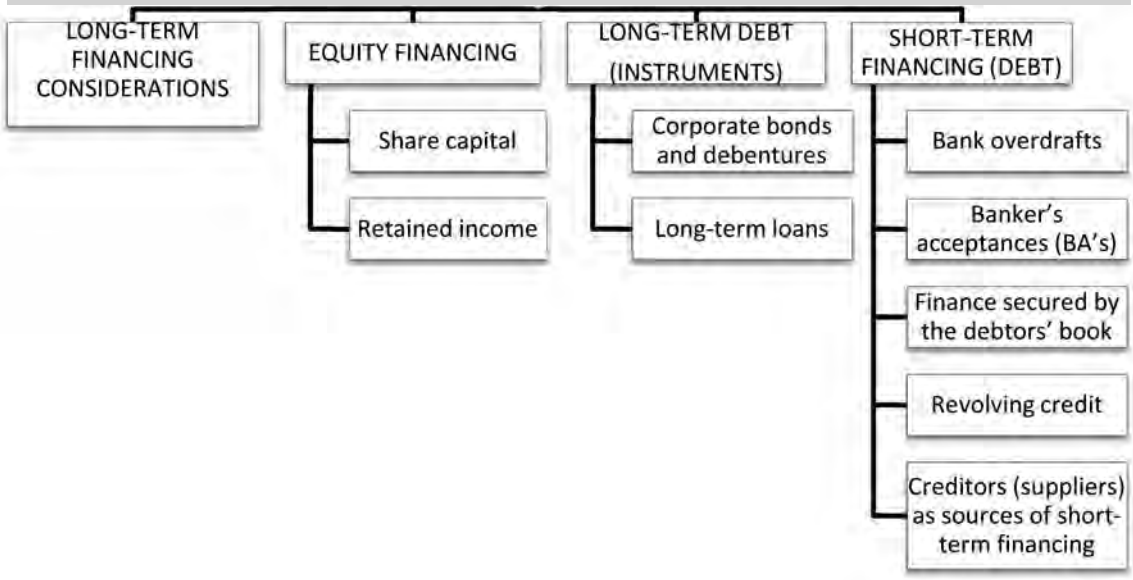
After having worked through this study unit, determine if you are able to answer the following questions:

a. Identify two financial markets as potential sources of finance.
b. Define what a capital market is and give an example of a capital market in South Africa.
c. Describe the two main functions of a capital market.
d. Name the two types of capital markets.
e. Define the money market and name the institutions that form part thereof.
f. Distinguish between money raised externally and money raised internally.
g. Explain what is meant by primary market transactions.
h. Explain what is meant by secondary market transactions.

STUDY UNIT 11

Forms of finance

In this study unit



1 Introduction

In the previous study unit, main sources of financing were described and examples presented thereof. A distinction was made between raising money internally and externally as well as between primary and secondary market transactions. We presented a brief explanation of the workings of capital and money markets as well as of the functions of each.

In this study unit, we will discuss different forms of long- and short-term financing and explain the use of different instruments.

2 Long-term financing considerations

As was mentioned in the previous study unit, long-term financing is used when acquiring long-term (non-current) assets. When an organisation needs to raise capital, it has two options – either equity or debt. The following should be considered:

1. Debt tends to have a finite life (it is repaid over time) whilst equity tends to be part of the organisation for life.
2. Equity holders control the organisation (have voting rights) while debt holders normally do not have control over the organisation. (They only have a measure of control in the case where the debt covenants give bondholders control.)
3. Dividends are not deductable for normal tax purposes as a business expense, whereas interest usually is.
4. In the case of liquidation, debt is repaid before equity. Equity holders therefore run the highest risk of their capital not being repaid. Ordinary shareholders are repaid last, if at all.

5. Due to the higher risk and the fact that dividends are not deductable for tax purposes, the return required by equity holders are higher than the interest charged by debt holders. Equity financing is therefore relatively more expensive than debt financing.

These issues are discussed in more detail in the next table.

TABLE 11.1: Debt versus equity financing

DEBT	EQUITY
Cost of debt (in the form of interest payments) are deductable from other taxable income, creating a cash saving (also called tax shield) for the company. This reduces the effective cost for the organisation paying interest.	Dividends (part of the required return of equity holders) are not deductable from other taxable income. The effective cost of equity is therefore higher.
Cost of debt is usually lower than the cost of equity because of the lower risk (capital repayment is more secure) to the lender.	Cost of equity may be high as shareholders expect higher returns on their investment in the shares than they could have earned elsewhere due to the risk they are taking (no guarantee the capital invested will be returned in case of liquidation or that it will grow).
The cost of obtaining some types of debt (eg long-term loans) is lower than issuing ordinary shares since there is no flotation cost involved.	The issuing of new listed shares is expensive due to flotation costs. Private placements of unlisted shares are also expensive due to the documentation and advisors' fees.
Debt requires capital repayment. The organisation must generate enough to pay the interest as well as the repayment of the capital. This can put strain on the liquidity of the organisation.	Ordinary share capital does not need to be repaid. It forms part of the organisation's permanent capital. No pressure will be placed on the organisation's liquidity when ordinary shares are issued.
The use of debt financing together with equity will reduce the overall average cost of capital of the organisation due to the leverage effect (you will learn about this in topic 5.) However, if too much debt is raised, the risk profile of the organisation will change. Finance providers will expect a greater return on their investment. This will be reflected in a higher average cost of capital. Raising too much debt can reduce the ability of the organisation to obtain more debt in the future.	One school of thought is that the raising of equity sends negative signals to investors as it may be perceived that the management is of the opinion that the organisation's shares are overvalued at current levels. This may result in a drop in the share price when the new issue is announced. On the other hand, it can be argued that the announcement of a new public issue to finance specific, well-motivated projects or expansions will improve the share price as it is indicative of managements' confidence in the business and that it can create wealth for the owners.

When deciding between financing through equity or debt, there is always the trade-off between risk and return. (The increase in risk is due to the interest payments that must be made on the debt regardless of whether there are profits or not, as well as the capital repayment.) This means that, as risk increases as result of a greater proportion of debt, an increase in return will be expected by equity holders. Debt providers themselves will also start to increase the interest rate and security required due to increased credit risk. You will learn more about this in topic 5 and later MAC modules.

3 Equity financing

Equity financing consists of share capital and retained income (internally generated funds).

3.1 Share capital

In order to reduce risk for shareholders and depending on the capital structure of the company at the time, shares can be packaged in different types for different risk categories of shareholders.

ORDINARY SHARE

A share is a security offered to investors that bestows ownership. Investors receive dividends as return on their investment as well as capital growth if the share price increases and they sell their shares.

ORDINARY PREFERENCE SHARE

An ordinary preference share is a security that pays a constant dividend into perpetuity (if not convertible or redeemable).

Table 11.2 describes the two main types of share capital (ordinary shares and ordinary preference shares) together with their main characteristics and Table 11.3 presents variations of ordinary preference shares with an explanation of the distinctions between the different types.

TABLE 11.2: Types of share capital

ORDINARY SHARES	ORDINARY PREFERENCE SHARES
– The **investors/ shareholders become the owners** of the organisation. – They have **voting rights** attached to each class of ordinary share. – Shareholders **receive dividends** as a return on their investment. This dividend can **fluctuate and is at the discretion** of the board of directors (subject to shareholders' approval). – As the share **price increase**, the shareholders also benefit. Their wealth therefore increases with both the dividend and **capital growth** of the share. – Ordinary shares are those shares that **bear the highest risk (repaid last in case of liquidation), but will gain the most benefit if the company shows growth**.	– Ordinary preference shares are a **hybrid form of financin**g. This means that it has a combination of characteristics of both equity and debt. It is a share, but its **dividend is expressed as a fixed percentage** of the capital amount. – The **dividend** for **ordinary preference** shares **can be passed**, if the company have insufficient cash. – The ordinary preference share is an example of a type of share with **less risk to the investor than ordinary shares**. In case of liquidation, preference shares are repaid from remaining funds **before ordinary shares**. – The preference shares are **non-redeemable** (unless stated otherwise). They are never repaid, unless liquidation occurs. The par value is classified as equity. – In the **case of arrear** cumulative preference dividends, the preference shareholders are **granted voting rights** that will give them a measure of control over the organisation.

TABLE 11.3: Variations of ordinary preference shares

Redeemable preference shares	– This type of preference shares are **issued with a redemption date**. – They differ from ordinary/normal preference shares in that it has to be **redeemed at a fixed maturity date**. Since it is redeemable, it is classified as debt instead of equity. – Eg "redeemable at 1 March 20x4" **or over a given period of time** (longer than three (3) years).
Convertible preference shares	– This preference shares are convertible and can be **exchanged for another financial asset, such as ordinary shares or debentures**, after a specific time or at a specific future date. Since it can be converted to ordinary shares, it is classified as equity instead of debt. – Eg, "15% convertible preference shares at R1 each, convertible into ordinary shares at 28 February 20x5 in the ratio of 1:1".
Participating preference shares	– Preference shares may also have the right to **participate in the ordinary dividends, bonuses or rights that are usually associated with ordinary shares**. These preference shares are therefore called participating preference shares. – The right to share in ordinary dividends usually entails **sharing if and when the dividend per ordinary share exceeds a certain amount.**

NOTE

Preference shares' dividends are not cumulative, unless so specified. This can apply to ordinary or any other type of preference share. If so specified, it means that **dividends that have not been paid** to preference shareholders due to the organisation having insufficient cash available in a period, will **accumulate** and be paid in future years. This cumulative preference dividend needs to be paid BEFORE any ordinary dividend can be declared and paid.

From 1 April 2012, Secondary Tax on Companies (STC) is replaced by Withholding Tax on Dividends. This is an income tax on local dividend payments to the investor, therefore **a tax due by shareholders**. The company that issued the shares do not pay tax on the dividends that were declared and paid but they withhold the tax due by shareholders and pay it over to the South African Revenue Services (SARS). The tax rate on the local dividend payment is 15% unless exemption has been received from SARS. According to the Income Tax Act, the following organisations are exempt (as receivers of the dividend):

- a company that is resident in South Africa
- the government, provincial government or municipality (of the Republic of South Africa)
- a public benefit organisation

NOTE

① You will learn more about taxation in your taxation modules.

② You should always make sure that you consult the latest applicable tax legislation as changes to the above dates or rates may be implemented.

- **Advantages to the organisation by issuing ordinary preference shares:**

1. An increase of the amount of ordinary preference shares (that is classified as equity) in the statement of financial position will reduce actual financial leverage, without bringing about dilution for the ordinary shareholders.
2. The control of the organisation will also not be affected (no dilution) when preference shares are issued as they have no voting rights (unless preference dividends are in arrears).

FINANCIAL LEVERAGE

Financial leverage is the extent to which debt and redeemable preference shares are used in the capital structure of an organisation. (An organisation that has a high percentage of debt and redeemable preference shares in its capital structure will be regarded as having a high degree of financial leverage).

DILUTION

Dilution occurs when new ordinary shares are issued or convertible securities converted to ordinary shares. The existing shareholders must then share the control of the organisation with more voting shareholders. The control (voting power) that the existing shareholders had over the organisation will therefore be diluted due to the increase in the number of shareholders.

Activity 11.1

Win-it Ltd had 1 000 shares in issue. The total market value of the existing shares was R100 000. Win-it then issued 100 new shares to new investors at R100 each for a total of R10 000.

Do you think that the control of the original shareholders will be affected by the selling of new shares?

Feedback on activity 11.1

$$= \left[\frac{\text{Original number of shareholders}}{\text{Original number of shares}}\right] \times \left[\frac{100}{1}\right]$$

$$= \left[\frac{1000}{1000}\right] \times \left[\frac{100}{1}\right]$$

= 100% shareholding by original shareholders

$$= \left[\frac{\text{Original number of shareholders}}{\text{Original number of shares} + \text{number of new shares}}\right] \times \left[\frac{100}{1}\right]$$

$$= \left[\frac{1\,000}{1\,000+100}\right] \times \left[\frac{100}{1}\right]$$

$$= \left[\frac{1\,000}{1100}\right] \times \left[\frac{100}{1}\right]$$

= 90,91% shareholding by original shareholders

The percentage control of the original shareholders has been diluted to 90,91% due to the issue of new shares. Control is an important issue for the controlling shareholders of a company when they consider new sources of finance.

3.2 Retained income

An organisation can also generate its own equity finance by deciding to retain a part of the profits each year. The result will be that only a part of the profit is distributed to owners in the form of dividends or drawings (if the legal form is not a company). Of importance, regarding this form of financing, is the extent of the retention. This will influence the decision on the size of the dividend that the organisation will pay. The CFO will carefully have to consider both decisions – whether to finance projects with retained profit (internally generated cash) as well as the size of dividends to be paid.

The issues which the financial manager will have to deal with, are the following:

- When an organisation has many potentially profitable projects, a decision has to be made whether to retain the funds to finance these projects instead of paying out the cash as a dividend distribution. If the cash is distributed as dividends, the organisation will need to raise additional finance (possibly at greater cost) in order to fund these profitable projects.
- It is however true that failure to pay dividends may cause the share price to decrease. This will happen because, if no dividends are paid, the shareholders will not receive their expected return on their investment. They will most probably sell their shares in order to invest in another organisation. The share price will decrease due to the oversupply of the shares on the market.

4 Long-term debt (Debt-related instruments)

Another way in which an organisation can raise long-term capital in the capital market is by issuing debt. Some of the different types of debt available on the capital market in South Africa are corporate bonds, debentures and long-term loans.

4.1 Corporate bonds and debentures

BOND/DEBENTURE

A bond/debenture is a long-term contract between the organisation that issues the bond/debenture (issuer or borrower), and the buyer thereof (lender of the money or investor). The main terms of this contract are the repayment conditions, security (if any) and the interest rate (called coupon rate) to be paid.

NOTE

Although corporate bonds are issued by large listed companies and debentures are mainly issued by finance companies, we will use the terms corporate bonds and debentures interchangeably in the rest of this study guide.

A company may issue bonds (or debentures) through a private placement with financial institutions or list a public issue on the bond exchange division of the JSE. There is therefore more than one lender/buyer per bond/debenture issue.

CREDIT RATING AGENCY

A credit rating agency is an organisation that provides international financial research on bonds and other debt instruments issued by business and government organisations. The agency ranks the creditworthiness of borrowers/issuers by using a standardised ratings scale. The payment history as well as financial heath (ability to pay future obligations) is taken into account in determining the credit rating.

NOTE

Moody's, Standard & Poor's and Fitch are considered the three largest credit ratings agencies. For example, Standard & Poor's ratings system assigns a rating from AAA to C. AAA presents the highest quality and lowest credit risk and C the lowest quality, usually in default with a low likelihood of recovering principal or interest.

- **Corporate bonds**: These bonds are not normally secured, but rated by a credit rating agency such as Moody's, Fitch IBCA or Standard and Poor's. The bonds of companies with a high credit rating are considered a low risk investment that attracts investors such as large pension funds. Low risk investments such as bonds of companies with

high credit ratings have lower interest rates since investors do not expect a higher return in order to compensate for the risk of their investment.

Public issues (issuing bonds directly to the capital market) have become popular due to demand factors and the current (2012) low interest rates. The benefit of the lower interest rate on bonds lies therein that the lower cost of debt reduces the company's cost of capital.

- **Debentures**: A contract exists between the issuers of debentures and the investors. This contract usually has a restrictive agreement that restricts the freedom of the management regarding the running of the organisation. Usually this restrictive clause controls the risk to which management may expose the organisation. It may for instance restrict the organisation from raising further loans.

  A debenture trust deed controls the terms and conditions of the contract. This trust deed is a contract between the issuing organisation and the trustees. This means that the trustees are the representatives of the debenture holders and their duty is to ensure the protection of the rights of debenture holders.

Bonds/debentures are usually issued at a fixed interest rate but this is not a requirement.

Bonds/debentures can be secured in terms of certain assets or be unsecured. When it is secured over a specific asset and the issuing organisation fails to pay (default on) interest or capital payments, the debenture holders can force the sale of the assets that were offered as security.

Bonds/debentures can be straight or convertible. Convertible bonds permit the bondholder (buyer/investor) to convert it into ordinary shares at a fixed price. Investors can therefore choose whether they want to keep the organisation's bond or change it to ordinary shares. Investors will take uncertainty and risk as well as the current price of the ordinary shares into account before making the choice to convert.

A conversion ratio is stated, defining the number of shares to be received at conversion, for example, a conversion ratio of 20 means that a bond can be exchanged for 20 ordinary shares. The conversion price is the price that is effectively paid per ordinary share by converting the bond into ordinary shares.

Activity 11.2

A R1 000 convertible bond with a conversion rate of 20 can be converted into 20 ordinary shares. (The bondholder has the choice at maturity date to receive the R1 000 or to convert (exchange) it to 20 ordinary shares.) The conversion price that is effectively paid per ordinary share will be R50 (R1 000 ÷ 20). At what price will it benefit the holder of the bond to convert it to ordinary shares (ignoring conversion costs).

Feedback on activity 11.2

When the market value of the specific ordinary shares rises above R50 each, the bondholder will benefit by converting to ordinary shares at an implied cost of R50 per share.

- **Advantages to the organisation of issuing corporate bonds/debentures**

Because corporate bonds/debentures present a lower risk to the lenders/investors (credit rated by agencies, security provided, debt covenants, risk spread between many investors), they require a lower return thereon. The issuance of corporate bonds therefore reduces an organisation's cost of debt financing and therefore the organisation's cost of capital.

4.2 Long-term loans

Bonds and debentures entail that there are many lenders of money to the organisation. As opposed thereto, long-term loans are normally negotiated directly between the borrowing organisation and a financial institution, for example, a bank, insurance company or pension fund (one lender). This is the reason it is often referred to as private debt. All the risk is borne by the single lender.

MORTGAGE LOAN

Mortgage loans are long-term loans raised against the value of property. The loan is normally secured over the value of the property offered as security.

The amount that can be raised will mainly depend on the purpose for which the loan is raised and the value of the property.

SALE AND LEASEBACK

Trading organisations who own fixed property at times find it more rewarding to sell the properties to a financial institution at a capital profit. A leaseback agreement for a reasonably long term is then entered into immediately to protect the trading organisation (which operates from this premises) – the period can sometimes be as long as 30 years.

Consequently, the working capital position of the organisation improves materially due to an immediate cash injection. (This is the equivalent of taking out a mortgage on the property.) The statement of financial position structure will now reflect a corresponding increase in a long-term debt obligation (the lease).

There is also a material disadvantage in that the possibility of capital appreciation in the value of the property is now forfeited to the new legal owner of the property.

The total effective cost connected with this financing may possibly be higher than financing the fixed asset by issuing corporate bonds.

BANK LOANS (TERM LOAN OR LINE OF CREDIT)

The loan may be a term loan (all the money advanced upfront and repayable over a fixed period) that relates to the specific financing requirement or the loan can be structured in the form of a line of credit (LOC) loan facility from which the company draws down as needed (the money is only advanced by the bank when the client needs it to make a payment to a supplier, etc) up to the maximum loan amount approved. The costs involved (apart from the repayment of the capital amount) are interest charges as well as a charge for the right to use the loan facility.

Medium and smaller companies mainly use bank loans for long-term financing. Key issues regarding bank loans are the interest rate charged (variable or fixed), period and timing of capital repayment and whether it is a loan or drawdown facility.

INSTALMENT SALE AGREEMENT (ISA)

An instalment sale agreement entails the granting of a loan to an organisation (buyer) by the supplier (seller) of assets such as machinery, equipment and vehicles itself (supplier credit), or granted by banks. The conditions, interest rate, instalment amount and frequency of payment as well as the period of the agreement are set out in the specific contract.

LEASE

A lease is a form of financing movable assets. Just like a loan, it can be structured in various ways. The lessor (granting the lease) remains the owner of the asset, while the lessee has the use of the asset. Lease payments are determined in such a way as to offer the lessor the cost of the asset plus a reasonable return thereon.

NOTE

You will learn more about the accounting treatment of Sale and Leaseback agreements, ISA and Leases in your Financial Accounting modules. IFRS prescribes how (where) these debt instruments (and related assets) are disclosed on the statement of financial position. The taxation treatment of the different financing options will be explained in detail in your Taxation modules. Later on in your MAC modules, you will learn more about how to make the optimal choice between these debt instruments to finance long-term assets.

- **Advantages to the organisation of using specific types of long-term loans:**

The cost of the different types of loans available to finance specific assets (projects) must firstly be calculated before a decision can be made on the type (mortgage loan, bank loan, instalment sale agreement or lease) that will have the lowest cost. When debt finance is obtained at the lowest cost, an organisation's cost of debt financing is reduced and therefore the organisation's cost of capital will be less. You will learn more about the cost of capital in topic 5.

5 Short-term financing (debt)

Organisations may experience the need for short-term financing due to the seasonal or cyclical nature of their operations. This is where money markets play an essential role in financing these short-term needs. There is no physical money market at a specific location; it consists of banks and financial institutions, which brings the supply and demand parties of short-term finance together.

Types of short-term debt instruments are bank overdrafts, banker's acceptances, debtor finance and revolving credit.

5.1 Bank overdrafts

BANK OVERDRAFT

A bank overdraft is the facility that allows an organisation to use more money than is available in its bank account.

The purpose of an overdraft is to serve as bridging finance to tide the organisation through its working capital cycle (explained in detail in topic 7). It is therefore a form of financing debt that is used to cover a temporary cash shortfall.

An overdraft is regarded as a short-term loan from a bank with a specified upper limit and interest is only paid on the money actually borrowed at any point in time. As the organisation receives funds, it is paid into the bank account and the overdraft decreases automatically.

Bank overdrafts are generally renegotiated annually but can be recalled on demand by the bank.

5.2 Banker's acceptances (BA's)

BANKER'S ACCEPTANCES

A banker's acceptance is created when the organisation sells a bill of exchange to the bank.

This bill of exchange should be paid/settled on a predetermined date, say 60 days later. The organisation (issuer) is committed to use the full amount for the agreed period, until maturity date. Although BA's are not as flexible as bank overdrafts, it normally cost less.

5.3 Finance secured by the debtors' book

It is possible that banks will provide short-term financing to an organisation against the security of the organisation's debtors. The amount of financing provided can be up to 75% of the value of the organisation's debtors.

FACTORING

Factoring is a form of debtors financing which results in improving the debtors' collection period. Instead of waiting for the debtors to pay, the factor will pay the agreed percentage of approved sales up front to the organisation. This is treated the same as an advance and is paid back to the factor at the end of the month. The process repeats for the new month.

A factoring agreement is drawn up and is described as a continuous agreement whereby the factor is compelled to take over (to buy) all approved claims of the organisation at the moment when the debt arises, with or without any possibility of recovery ("recourse") from the organisation which has sold these claims, depending on the terms of the agreement. In some cases, the factor would also take over the management of the organisation's debtors' book (function) against payment of a monthly fee.

The disadvantage of factoring is that it is a very expensive form of financing and it is recommended to be used only as a last resort.

5.4 Revolving credit

Normally an organisation must make fixed monthly payments on the credit agreement that it has with its credit provider.

REVOLVING CREDIT

Revolving credit allows the organisation to withdraw money up to the original credit limit (facility) once a certain percentage (20% to 30%) has been repaid and/or excess cash can be paid into the account and withdrawn again later when needed.

An example of revolving credit is the "access bond" that is provided by most commercial banks.

NOTE

Depending on the original debt agreement to which the revolving credit clause is added, this might also be classified as long-term debt. However, when it is used in the place of a money market instrument for investing excess cash, it should be short-term.

5.5 Creditors (suppliers) as sources of short-term financing

The greater part of the current assets of an organisation comprises goods that were bought from suppliers. Not all suppliers require immediate payment for these goods. Suppliers that offer credit terms to the organisation to which it sells their goods, become their creditors. The extent to which the suppliers offer credit terms (trade credit) will determine the creditors' contribution to the financing of working capital.

Trade creditors are a spontaneous form of financing, because it arises from ordinary business transactions and is regarded as having no cost associated with it. However, when settlement discount is offered by creditors for early payment, this discount presents an opportunity cost if it is foregone. It is also logical that a supplier that offers extended credit builds a cost for this extended credit into the pricing structure of the goods or services. (The working of trade credit will be discussed in detail in part 3, dealing with managing funds.)

Activity 11.3

The CEO of Ndobele Ltd, a medium-sized, non-listed organisation, asked you as CFO to recommend appropriate instruments to finance a long-term project that was identified as profitable. The project will require new machinery. The company has a very low debt ratio and has decided to finance the project with debt financing.

You have identified the following possible forms of finance for consideration: corporate bonds, debentures, bank loan, bank overdraft, banker's acceptance, debtor finance (factoring), revolving credit, creditors, instalment sale agreement, lease or sale and leaseback.

REQUIRED

List all the debt instruments available with a recommendation to use or not, as well as a motivation for your recommendation as being an appropriate/ inappropriate instrument.

Feedback on activity 11.3

Your recommendation should be presented as follows:

Corporate bonds	Not recommended, as an organisation needs a strong credit rating by a credit rating agency in order to issue corporate bonds. Only large listed organisations obtain corporate bonds by private placement with financial institutions or by making a public offering.
Debentures	Not recommended, as debentures may have a restrictive agreement that restricts the organisation from obtaining further loans for other projects.
Bank loan	**Recommended,** as it is repayable over a fixed period that relates to the specific financing requirement.
Bank overdraft	Not recommended, as an overdraft is normally only used to serve as bridging finance.
Banker's acceptance	Not recommended, as a banker's acceptance should be paid on a predetermined date, normally 60 days later and are therefore only suitable for short-term projects.
Debtor finance (factoring)	Not recommended, as debtors credit is short term financing to an organisation against the security of the organisation's debtors and therefore only suitable for short-term projects.
Revolving credit	Not recommended, as it is normally only applied to some home loans or short-term loans.
Creditors	Not recommended, as trade credit is used to manage working capital and not to finance long-term projects.
Instalment sale agreement	**Recommended**, as it is repayable over a fixed period that relates to the specific financing requirement.
Lease	**Recommended**, as a lease is a form of financing movable assets.
Sale and leaseback	Not recommended, as it is normally only used with regard to fixed property.

6 Summary

In this study unit, we discussed the role of long- and short-term financing. Two categories of financing, namely equity and debt, were highlighted. The instruments available for each of these two categories were listed. The main characteristics, advantages and disadvantages

of the categories as well as their respective financing instruments were briefly highlighted in order to identify the most suitable form of financing.

Self-assessment activity

After having worked through this study unit, determine if you are able to answer the following questions:

a. List the two main categories of long-term financing.
b. List the types of equity financing.
c. Explain the advantages and disadvantages of financing through the issuing of ordinary shares.
d. Distinguish between redeemable and convertible preference shares.
e. List the advantages of issuing preference shares.
f. List types of long-term debt that can be used to obtain finance.
g. Compare financing by means of debt to financing by means of equity.
h. List the kinds of short-term debt instruments that can be obtained on the money market to supply in the short-term financial needs of an organisation.

References and additional reading

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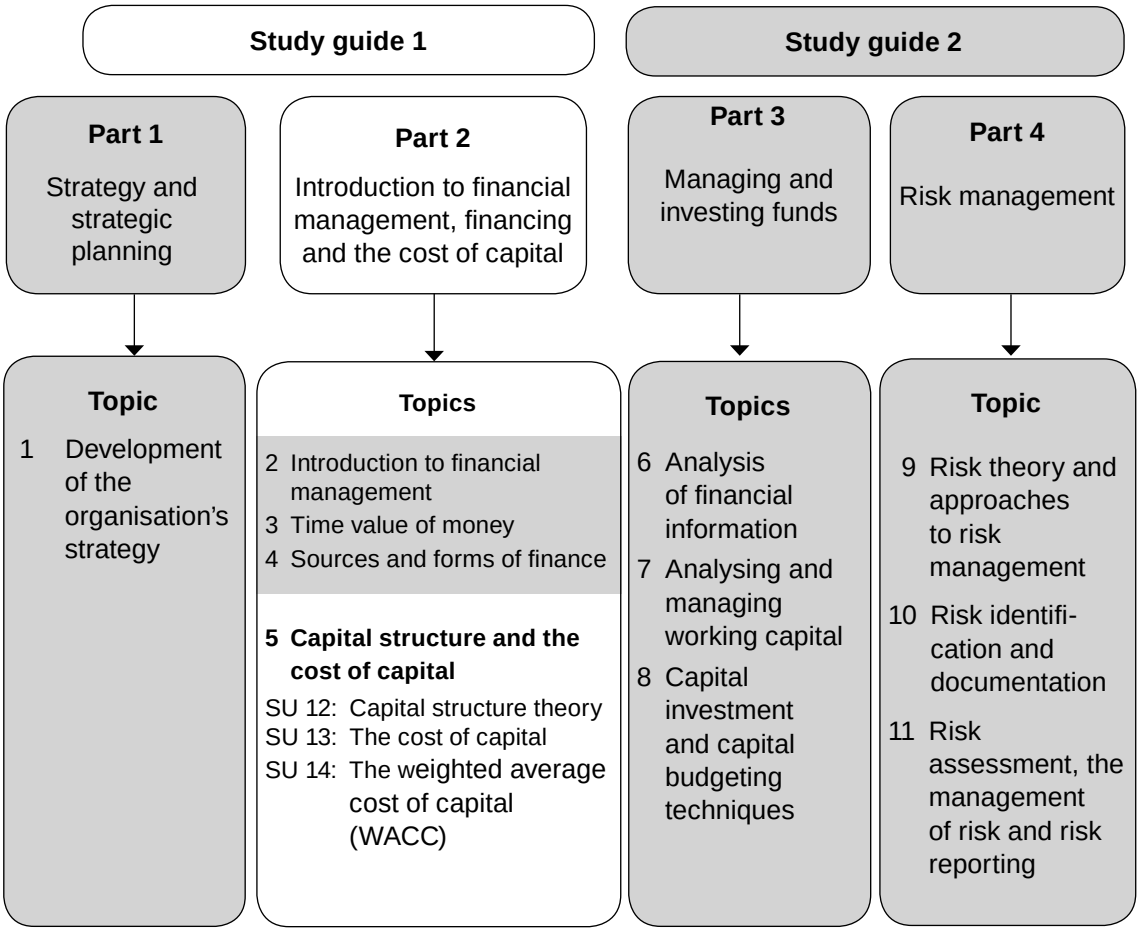
Capital structure and the cost of capital

LEARNING OUTCOMES

After studying this topic, you should be able to:

- explain the theory of capital structure and the target capital structure
- analyse the capital structure of an organisation
- explain the concept “cost of capital”
- identify risk factors that can affect the cost of selected forms of financing
- calculate the effective cost of different forms of financing
- perform elementary valuations of certain forms of financing
- calculate the weighted average cost of capital



INTRODUCTION

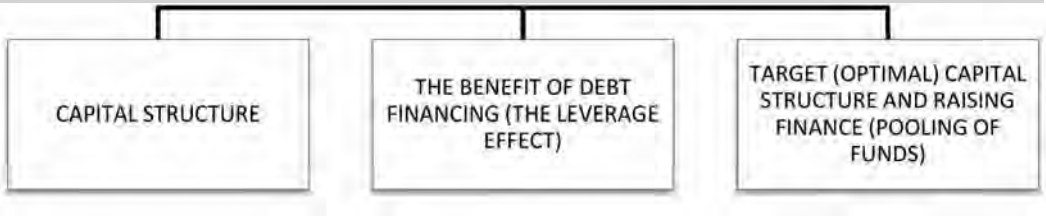
In the previous topics, you have learnt about the basic objective of financing decisions, namely to obtain financing from the appropriate market at the minimum cost. You have also learned about the various sources and forms of financing that can be accessed for financing and what the benefits and drawbacks of each are. In this topic, you will learn that financing should also be obtained in the optimal mix between equity and debt in order to lower the overall average cost of financing for the organisation.

The theory of capital structure will be explained, as the optimal capital structure is important in achieving the key objective of a company, that is, maximising the long-term sustainable wealth of the owners/investors. You will also learn how to calculate the effective cost of the different forms of finance and how to calculate the WACC.

STUDY UNIT 12

Capital structure theory

In this study unit



1 Introduction

In the previous topic, we discussed capital and money markets as sources of finance as well as the different forms of finance available for long-term and short-term financing. We explained the importance of financing being obtained at a minimum cost. Due to the difference in cost of the various forms of finance, obtaining finance in the right proportions from the different sources is a very relevant issue.

2 Capital structure

We already explained that long-term assets/expansion need to be financed by long-term funds, as the cash to repay the financiers would only be generated over the long-term by these assets. It follows then that large amounts of money (capital) that are needed for use over the long-term to finance the infrastructure of the business, large projects or expansion of an organisation, are raised through the capital (equity and bond) markets. A project is debt financed if the money was raised by borrowing (issuing debt in the form of bonds/ debentures or obtaining long-term loans) and equity financed if the money was raised from the sale of shares or from the organisation's retained earnings.

CAPITAL STRUCTURE

Capital structure is the manner in which an organisation's non-current assets are financed. Capital structure is normally expressed in percentages of each type of capital used by the organisation, that is, the proportion of debt versus equity.

You have learned that the following forms of long-term financing are available:

- **Debt** is borrowed money, raised through loans or the sale/issue of bonds/debentures. Periodic interest is incurred and the capital is repaid over the term (eg a long-term loan) or at the end of the term (eg bonds/debentures). These forms of financing will form the debt part of the capital structure of the organisation. A convertible (to equity) debenture is a hybrid and is classified in parts between equity and debt, depending on the terms of issue.

- **Equity** is money raised from the sale/issue of ordinary shares or from retained earnings. New shares can be offered to the market in general, or as a rights issue, only to existing shareholders (thereby not diluting their percentage shareholding). This forms the equity part of the capital structure.
- **Preference shares** can be viewed as a cross (hybrid) between debt and equity since it has characteristics of both. It is classified as either equity or debt, depending on the terms of issue (redeemable/convertible/guaranteed dividends and so forth).

NOTE

The classification of hybrid instruments, such as convertible and non-redeemable debentures, and all types of preference shares as either equity or debt (and in some cases even a bit of both) is beyond the scope of MAC2602. You will learn more about this classification and the International Financial Reporting Standards' (IFRS) requirements in this regard in your later Financial Accounting and MAC modules.

In the rest of this topic, we will exclude preference shares from the capital structure and assume all debentures are redeemable and non-convertible. It is sufficient at this stage for you to know that the principles of this topic will apply to the hybrid instruments, based on their final classification.

Key formula: DEBT:EQUITY RATIO (D:E) (SIMPLIFIED)

Debt:Equity ratio = all forms of long-term debt:all forms of equity

NOTE

This is a simplified formula. Multiple variations on this formula include or exclude certain items to measure specific aspects of the funding structure of the organisation. You will learn more about advanced debt:equity ratios in your later MAC modules. Later on in this module (topic 6 – ratio analysis) you will learn more about *other* formulas (except debt:equity) that are also used to provide information to assist in managing the organisation!

The capital structure of an organisation entails the mix of equity and long-term debt (the components) that an organisation employs to finance its long-term investments/ operations. The mix determines which percentage of the organisation's cash flow is attributable to owners/investors and which percentage is attributable to lenders. The mix of equity and long-term debt of an organisation will affect both the risk and the value of the organisation.

Example:

The following information relates to Mahlangu Ltd.

	R (Initial)	%
Equity	60 000 000	60
Debt	40 000 000	40
Total capital	100 000 000	100

Mahlangu Ltd started up with the following capital structure – 60% equity and 40% debt. The capital structure can be expressed as the debt:equity ratio (D:E) of 40%:60%.

3 The benefit of debt financing (the leverage effect)

All businesses start up with at least the owners' initial investment. For accounting purposes that can be classified as share capital (if incorporated as a company) or owners'/partners'/members' interest (if any other legal form). These funds are the initial equity financing. This amount may however, not be enough and the owners/investors are forced to take on debt financing as well to fund all the long-term assets of the new business.

As the business becomes more successful and wishes to expand, the owners/investors have a choice of increasing their own stake in the business by personally supplying more money to the business, or raising equity by inviting new owners to invest in the business. Alternatively, they can obtain debt funding.

FINANCIAL LEVERAGE

Financial leverage is the extent to which debt and redeemable preference shares are used in the capital structure of an organisation. (An organisation that has a high percentage of debt and redeemable preference shares in its capital structure will be regarded as having a high degree of financial leverage.)

Debt funding is attractive for the owners mainly because of two reasons:

1. Interest is deductable for tax purposes, making it a cheaper form of financing than equity.
2. The returns for equity holders (measured in the Return on Equity – see key term below) increase when expansion is funded by debt. **This is called the leverage effect**. However, this benefit only accrues up to a point (the optimal debt:equity ratio). Thereafter, the risk for debt providers becomes too high and the cost of debt funding increases to such an extent that it offsets the benefit.

RETURN ON ASSETS (ROA)

This is a measure of the performance generated on all the assets employed in the organisation and expresses **earnings before interest and taxes (EBIT)** as a percentage of the **total assets employed (= equity + debt)**. (Also refer to topic 6 that deals with ratios.)

RETURN ON EQUITY (ROE)

This is a measure of the performance realised by management for the equity holders (shareholders) and expresses **net profit** as a percentage of **equity**. Net profit is the amount of profit available after debt providers have been serviced (interest paid) and taxes paid.

NOTE

ROE measures the organisation's ability to earn a return on the owners'/shareholders' capital. Firstly, you should realise that equity holders receive their reward last; after all other expenses have been paid, including the interest paid to the providers of debt capital. It is therefore appropriate to use net profit as it represents the remaining amount, after

all other expenses have been paid; and furthermore, net profit is normally available for distribution as a dividend to the holders of equity. In this module, we will only be focusing on ordinary shareholders. (Also refer to topic 6 that deals with ratios.)

We will demonstrate the leverage effect in the next simplified example:

Example:

(i) The following information regarding the current situation of Dhlamini Ltd is available:

Total assets	R100 m
Equity	R100 m
Tax rate	28%
Interest rate	10%
Earnings before interest and tax	R20 m

The above (current) situation is presented in table (I) below.

(ii) Let us see what happens when an additional plant (asset of R100 m) is acquired by using **only equity** funding. You may assume that this new plant will generate the same operating returns (EBIT) as the current plant. The changed situation is presented in table (II) below.

(I) **Current financial leverage situation**		**(II)** Additional plant funded with **Equity only**	
Total assets 100:Equity 100		Total assets 200:Equity 200	
Earnings before interest (EBIT)	20,0	Earnings before interest (EBIT)	40,0
Interest (no debt)	0,0	Interest	0,0
Profit before tax	20,0	Profit before tax	40,0
Income tax expense	(5,6)	Income tax expense	(11,2)
Net profit	14,4	Net profit	28,8
Return on assets (ROA)	$= \frac{20}{100} \times \frac{100}{1}$ $= 20\%$	Return on assets (ROA)	$= \frac{40}{200} \times \frac{100}{1}$ $= 20\%$
Return on equity (ROE)	$= \frac{14,4}{100} \times \frac{100}{1}$ $=14,4\%$	Return on equity (ROE)	$= \frac{28,8}{200} \times \frac{100}{1}$ $= 14,4\%$

You will notice that the return on equity (ROE) stays the same, namely at 14,4% of the assets. This is because there were no change in the capital structure, it is still all equity funded. Since there is NO debt funding, the interest amount is 0.

(iii) Let us see what happens if the additional plant of R100 m is funded with 50% equity and 50% debt. This new situation is depicted in table (III) below.

The difference between situation (II) and (III) can be ascribed to the fact that debt funding is brought into the situation. Note that the interest deduction of (R50 m x 10%) decreases the profit before tax (from R40 m to R35 m) as well as the income tax expense on the resulting lower profit (from R11,2 m to R9,8 m). The lower net profit (after tax) is however now divided by a lower equity amount and results in a higher ROE (16,8%

instead of 14,4%). This comparison demonstrates that the inclusion of debt funding, increases the ROE and therefore the wealth of the equity holders (shareholders).

(iv) In order to confirm the above conclusion, that is that the inclusion of debt funding increases the shareholders' return on equity, we take a look at the next situation where the additional plant is funded entirely by debt. This is depicted in table (IV) below.

(III) Additional plant funded with **50% equity and 50% debt (interest 10%)**		**(IV)** Additional plant funded with **no equity and 100% debt (interest 10%)**	
Total assets 200:Equity 150 :Debt 50		Total assets 200:Equity 100 :Debt 100	
Capital structure = D:E = 25:75		Capital structure = D:E = 50:50	
Earnings before interest (EBIT)	40,0	Earnings before interest (EBIT)	40,0
Interest (10% x R50 m)	(5,0)	Interest (10% x R100 m)	(10,0)
Profit before tax	35,0	Profit before tax	30,0
Income tax expense	(9,8)	Income tax expense	(8,4)
Net profit	25,2	Net profit	21,6
Return on assets (ROA)	$= \frac{40}{200} \times \frac{100}{1}$	Return on assets (ROA)	$= \frac{40}{200} \times \frac{100}{1}$
	= 20%		= 20%
Return on equity (ROE)	$= \frac{25,2}{150} \times \frac{100}{1}$	Return on equity (ROE)	$= \frac{21,6}{100} \times \frac{100}{1}$
	= 16,8%		= 21,6%

The difference between situation (III) and (IV) can be ascribed to the fact that only debt funding is used to fund the additional plant in situation (IV). The effect is that the amount of debt increases from R50 m to R100 m. Note that the interest deduction doubled (from R5 m to R10 m) which decreases the profit before tax (from R35 m to R30 m) as well as the income tax expense on the lower profit (from R9,8 m to R8,4 m). The lower net profit (after tax) is divided by a lower equity amount and results in a higher ROE (21,6% instead of 16,8%).

This comparison illustrates that a greater portion of debt funding, (higher D:E rate indicating more debt in the capital structure) increases the return on equity and therefore the wealth of the equity holders (shareholders).

(v) Let us take a look at whether all increases in debt funding will increase ROE and thereby the wealth of shareholders? We assume an interest rate of **20%** and will acquire **two** additional plants with debt funding only. The new situation is depicted in table (V) below.

NOTE

The higher interest rate of 20% instead of the original 10% is due to the fact that when an organisation takes on more debt its obligation to repay its debt increases. The company may not be able to repay the debt and therefore it becomes more risky for debt providers to supply more debt. In order to compensate for the higher risk, the debt providers will expect a higher return (interest rate).

(V) Two additional plants funded with **no equity and 100% debt (interest 20%)**	
Total assets 300:Equity 100 :Debt 200	
Capital structure = D:E = 67:33	
Earnings before interest (EBIT)	60,0
Interest (20% x R200 m)	(40,0)
Profit before tax	20,0
Income tax expense	(5,6)
Net profit	14,4
Return on assets (ROA)	$= \frac{60}{300} \times \frac{100}{1}$
	= 20%
Return on equity (ROE)	$= \frac{14,4}{100} \times \frac{100}{1}$
	= 14,4%

The difference between situation (IV) and (V) can be ascribed to the fact that **the amount of debt increased** from R100 m to R200 m because two additional plants (at R100 m each) are acquired at double the original interest rate (20% instead of 10%). Note that the interest deduction increases (from R10 m to R40 m). This, in turn, decreases the profit before tax (from R30 m to R20 m) as well as the income tax expense on the lower profit (from R8,4 m to R5,6 m). The lower net profit (after tax) is divided by **the same** equity amount and results in a lower ROE (14,4% instead of 21,6%).

This comparison illustrates that the benefit of the leverage effect only accrues up to a point (the target or optimal debt/equity ratio). Thereafter, the risk for debt providers becomes too high and the cost of debt funding increases to such an extent that it offsets the benefit.

4 Target (optimal) capital structure and raising finance (pooling of funds)

TARGET CAPITAL STRUCTURE

Target capital structure or optimal capital structure is the point where the mix of the two capital components (debt and equity) achieves the lowest average cost of long-term financing for the organisation.

According to the above definition the target capital structure is a percentage mix of the components which management considers **optimal**. The organisation will strive to attain this capital structure over the long-term as it raises capital from different sources.

Let us again look at the example relating to Mahlangu Ltd. Additional information is supplied

	R	%	R	%	R	%
	Initial (start-up)		**After Project A (Add R10 m Debt)**		**After Project B (Add R20 m Equity)**	
Equity	60 000 000	60	60 000 000	55	80 000 000	62
Debt	40 000 000	40	50 000 000	45	50 000 000	38
Total capital	100 000 000	100	110 000 000	100	130 000 000	100

Mahlangu Ltd started up with the following capital structure – 60% equity and 40% debt. The capital structure is expressed as the debt:equity ratio (D:E) of 40%:60%.

Let us assume that this capital structure is the mix that management considers more desirable than any other, then this will be the target capital structure which should be used in place of the actual capital structure for certain calculations with regard to cost of capital. (We will deal with the cost of capital in the next study unit.)

In practice, an exact target capital structure cannot be maintained and the actual capital structure (as represented in the debt:equity ratio) will rarely be the same as the target capital structure. If Mahlangu Ltd now needs to raise R10 million for Project A, we can assume that it will issue and sell R10 million of debt, for example, debentures or bonds as its debt level are currently reasonably low. The new debt:equity ratio will now be R50 million:R60 million, which is 45%:55%. (50/110):(60/110). When the organisation needs to raise capital again for Project B (say R20 million), or purely to strengthen the capital structure, it can then try to move towards the target capital structure by raising equity. The new debt:equity ratio will then be R50 million:R80 million which is 38%:62%!

NOTE

Can you see that the actual capital structure at any given time is not the same as the target or optimal capital structure? This is because money tends to be acquired in fixed amounts by issuing securities of one kind at a time. It will be impractical to try to sell some of each security in the target proportion of 60% equity and 40% debt. The distortion arising from trying to get to the target capital structure will usually not be significant. The organisation can also from time to time make a decision to change its optimal capital structure for strategic reasons.

SEPARATION OF INVESTING AND FINANCING DECISION

The decision to invest in an expansion project will be based on the fact that the project generates returns in excess of the weighted average cost of capital of the funding and fits with the sustainable long-term strategy of the organisation. The method of financing is secondary. The latter is determined by the current capital structure versus the target or optimal structure as well as the rates of finance available in the market at the specific point in time.

NOTE

It is very important to understand that the feasibility studies surrounding the acceptance of Project A and B in the Mahlangu Ltd example (whether it will be generating a good enough return) will be done by discounting the cash flows from the projects with the **target capital structure's weighted average cost of capital**. We will not use the cost of the specific type of financing that will be obtained! The choice of financing (debt or equity) is driven by the objective of staying true, or close to the target capital structure. You will learn more about this in topic 8 on Capital budgeting later on in this module.

To recap, forms of capital funding (refer to topic 4) are:

1. Equity finance is provided by the owners (shareholders) of the organisation and can be obtained by:
   - issued share capital
   - distributable reserves, including retained income
   - non-distributable reserves
   - any part of debt instruments or preference shares that are classified as equity
2. Debt finance is provided by the lenders to the organisation and can be obtained by:
   - debentures (that does not have an option to convert to ordinary shares)
   - bonds
   - long-term loans
   - leases
   - any part of debt instruments or preference shares that are NOT classified as equity
   - mortgage bonds

Activity 12.1

Dulamo Ltd is financed as follows:

	Rm
250 million ordinary shares of R1 each	250
Retained income	350
180 000 debentures of R1 000 each	180

REQUIRED

Calculate the amount financed by

a. equity
b. debt

and present the capital structure of the organisation (based on book values).

Solution to activity 12.1

		Rm
a. Financed by equity	(R250 + R350)	= 600
b. Financed by debt	(R180)	= 180
		780
Capital structure:	Equity (600/780 x 100/1)	= 76,92%
	Debt (180/780 x 100/1)	= 23,08%

D:E ratio = 23,08:76,92

5 Summary

In this study unit, we explored the theory of capital structure and explained that equity and debt are the components of an organisation's capital structure. We also explained the meaning of "target capital structure".

Since each component of the capital structure has a different cost, we still need to explain how to calculate the cost of each component. We will explain these calculations in the next study unit.

Self-assessment activity

After having worked through this study unit, determine if you are able to answer the following questions:

a. Define and explain the theory of capital structure.
b. Identify the two components of capital structure.
c. Briefly discuss two main reasons why shareholders would encourage debt financing.
d. Explain what is meant by optimal or target capital structure.

Self-assessment questions:

QUESTION 1

Payless Ltd is financed as follows:

	Rm
400 million ordinary shares of R1 each	400
Retained income	250
Non-distributable reserves	50
Long-term loans	130
Bonds	100

REQUIRED

Calculate the amount financed by

a. equity
b. debt

and present the capital structure of the organisation (based on book values).

Feedback on self-assessment question 1

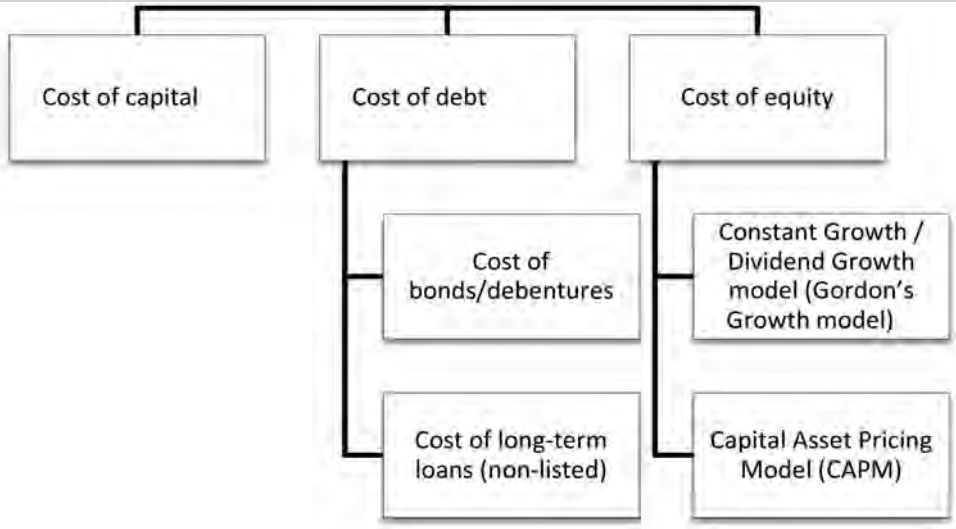
			Rm
a. Financed by equity	(R400 + R250 + R50)	=	700
b. Financed by debt	(R130 + R100)	=	230
			930
Capital structure:	Equity (700/930 x 100/1)	=	75,27%
	Debt (230/930 x 100/1)	=	24,73%

D:E ratio = 24,73:75,27

STUDY UNIT 13

The cost of capital

In this study unit



1 Introduction

In the previous study unit, we discussed the two components of the capital structure of an organisation, namely equity and debt. We pointed out that any given expansion project will be financed with either equity or debt in a bid to attain the target capital structure.

Once the decision on the form of finance has been made (equity or debt), the organisation would have to decide which **specific** financial instrument to use, that is, if the decision was made in favour of debt financing, should a long-term loan or a long-term lease be taken out? Each of these financial instruments has different costs. In order to determine which method of financing will have the lowest cost, we will need to calculate the effective cost of each form (equity and debt). In this study unit, you will learn how to calculate the effective cost of various financial instruments. An understanding of the time value of money concepts, as discussed in topic 3, is required to calculate the cost of these capital components. Please ensure that you have a thorough understanding of topic 3 before attempting this study unit!

2 Cost of capital

COST OF CAPITAL

Cost of capital is defined as the minimum return that the providers of capital require in order to invest (or to stay invested) in the organisation. An organisation must earn at least this return on its non-current assets and investments to ensure that the owners/ investors are satisfied.

According to the above definition, the cost is the return that investors and/or lenders who provided the funds expect to receive as a return on their investment/loan. Cost of capital can be regarded as the opportunity cost of finance.

OPPORTUNITY COST

Opportunity cost is the cash that could have been realised from the best alternative use of the funds that were given up.

The opportunity cost of capital therefore is the return that providers of capital/finance could have earned by investing in alternative projects. The providers of capital are the investors/lenders that have certain requirements regarding the return that they expect on their investment in the organisation.

The first step in determining the cost of capital is to determine the cost of the individual components used to finance the organisation. Calculating the cost of equity and debt is important as one of the fundamental differences between equity and debt is the risk associated with each type and the impact this has on the cost.

EFFECTIVE COST OF FINANCE

The effective cost of finance takes into account all the cash in and outflows related to that specific financial instrument, for example, issue proceeds, listing fees, underwriter fees, period interest, tax deductions, capital repayments, and so on. It also considers the timing of these cash flows by employing time value of money techniques (topic 3).

The effective cost of finance and the market values of financial instruments is an intertwined subject. The market values (expressed as currently traded prices) are determined based on the required rate of return that the fund providers expect. They take into consideration the future NET cash flows that the instrument will provide them, and then discount that with their required return in order to arrive at a value which they are prepared to pay NOW (= present value) for the instrument. These values form the currently traded market values between willing buyers and sellers in an informed market.

We will briefly introduce you to some basic valuation methods/formulae for a limited range of financial instruments (no hybrids). We will then use the current market values to estimate the cost of finance.

Rules/guidelines: MARKET VALUE OF FINANCIAL INSTRUMENTS

1. Market values are usually determined from the perspective of the holder or investor in the instrument.
2. Market value of any instrument is equal to the present value of all future cash flows to the holder of the instrument, that is:
   (a) periodic payments:
      i. interest (debt instruments)
      ii. dividends (shares)
      iii. free cash flows (cash available after tax and capital expenditure) and
   (b) capital repayments – if any
3. The present (market) value is obtained by discounting the future cash flows with the required (that is current or ruling) market rate of return. The current/ruling market rate of return is a pre-tax figure, expressed as a percentage.

4. Pre-tax cash flows are discounted by pre-tax discounting rates (required rate of return).

General remarks:

Market values (prices) for publicly traded financial instruments, such as bonds and shares, are easily available on the Internet and financial press. However, the costs of these instruments are not always so readily available.

To calculate the cost of finance, it then makes sense for us to use the current market prices and the known/estimated future cash flows and arrive at the implied required rate of return! This concept can be summed up very basically as follows:

Present value (PV) = future cash flows ÷ cost of finance (discount rate)

Cost of finance (discount rate) = future cash flows ÷ present value

NOTE

When VALUING debt instruments, we use the PRE-TAX market rate. In later MAC and TAX modules you will learn how section 24J of the Income Tax Act affects the deductibility/ taxability of interest paid/received in the hands of the issuer/holder. Once you know how to apply this, you will use after-tax cash flows and discount by an after-tax effective cost of debt rate. The answer is however, the same as when you discount pre-tax cash flows with pre-tax required returns (cost of finance)! For MAC2602 we would therefore, for ease of use, discount pre-tax cash flows with the pre-tax discount or market rate.

Rules/guidelines: EFFECTIVE COST AND MARKET VALUES

1. The effective pre-tax cost of debt financing (assuming capital is repaid) is always expressed as the yield to maturity (YTM) percentage (that is the internal rate of return (IRR) that will discount all cash flows to zero). The IRR is based on the current market value of the debt instrument and all future pre-tax cash flows.
2. As was mentioned in study unit 12, the cost of debt financing is deductable for tax purposes, which makes it attractive as a form of financing. In the calculation of the average cost of capital of the organisation, we always work with the **after-tax effective cost of debt percentage (%).**
3. In MAC2602, the effective after-tax cost of debt financing is only determined once the effective pre-tax cost (IRR) has first been determined.
4. The effective required return (cost) **for equity instruments** is determined by inference based on the current market price (traded price) of the share or by risk-based methods (capital asset pricing model – CAPM).
5. The effective cost of finance is usually determined from the perspective of the organisation or issuer of the financial instrument.

NOTE

In MAC2602 we will not include flotation costs and other fees in the calculation of the effective cost of financing. That will be covered in later MAC modules.

3 Cost of debt

When debt is introduced into the capital structure of an organisation, the financial risk for the equity holders increases and the cost of equity increases. However, if the amount of debt in the capital structure is optimal (not too high), the debt will lower the organisation's overall cost of finance. This was explained in study unit 12 section 3.

The cost of debt is usually lower (as long as the debt level is acceptable to the debt providers) than the cost of equity because debt carries a lower risk (as discussed in topic 4, it can be secured by assets and debt providers is repaid before equity providers in the case of liquidation). This lower risk also has the effect that the lenders require lower expected returns.

Furthermore, the cost of debt is lower because interest is deductible from taxable income. This is also referred to as the tax shield and means that the South African Revenue Services (SARS) funds the cost of debt to the extent of the ruling tax rate. For example, if the interest payment is R100 and the tax rate is 28%, the interest payment is deducted from other taxable income and the tax payment to SARS is R28 less (effectively a cash inflow netted off against the regular tax payment).

3.1 Cost of bonds/debentures

Before we proceed, let us first discuss some terms that is used with bonds and debentures.

MATURITY DATE / REDEMPTION DATE

The maturity date is the date when a bond/debenture will be redeemed.

For example, "redeemable at 1 March 20x4".

NOMINAL VALUE / FACE VALUE / REDEMPTION

Nominal value is the stated value (or face value) of bonds/debentures. This is the value which the holder will receive at redemption and also the value on which the bond or debenture pays interest.

For example, debentures have a face value of R1 000 and pay interest at 10% per annum.

Meaning:

- At the redemption date the holder will receive R1 000, and
- R100 (R1 000 x 10%) interest at the end of **each year** until the redemption date.

COUPON INTEREST RATE

This is the stated interest rate that the issuing organisation is required to pay, based on the face value of the bond. This interest payment is referred to as the coupon payment.

For example, 8% debentures (3 000 debentures of R100 each) = R300 000.

Meaning:

- The issuing company pays interest of R8 (R100 x 8%) per debenture.
- Total interest on debentures is therefore (R8 x 3 000) = R24 000.

MARKET RATE / RULING INTEREST RATE

The market rate is the current or ruling (required) market rate of return. It is obtained from similarly publicly traded instruments – a pre-tax rate.

For example, the current cost of a similar bond/debenture for five years (the same period).

Meaning:

- This is the rate determined by YTM calculations, based on current quoted values for listed bonds/debentures.

A typical bond/debenture is issued and listed on the applicable exchange as follows:

A company that wishes to issue bonds and be listed on the Bond Exchange of South Africa (BESA) must first obtain a rating from a rating agency such as Moody's, Fitch or Standard & Poor's, before it can list bonds on BESA. After a company's bonds are listed, BESA provides an effective and efficient market for the trading of these bonds.

NOTE

We will only address REDEEMABLE bonds/debentures. Convertible debentures are considered a hybrid instrument and are outside the scope of this module. We also exclude non-redeemable bonds/debentures.

As mentioned before, we will treat bonds and debentures as essentially the same type of instrument.

- **Step 1 – determine the current market value of the bond/debenture**

The market value (M_v) of redeemable debentures is the present value of future interest payments plus the present value of the redemption amount (for MAC2602 purposes, usually at face value). These cash flows are discounted to present values by using the **ruling** interest rate (cost of debt). (Refer to topic 3 where PV of annuities and single payments is covered.)

In valuation questions, we will provide you with this discount rate (k_d or i) (= required rate of return).

NOTE

Bonds/debentures are often redeemed at a discount or at a premium. You will learn how to deal with this in later MAC modules.

Key formula: VALUATION OF DEBENTURES

$$M_V = \underbrace{\left[\frac{I}{(1+k_d)}\right] + \left[\frac{I}{(1+k_d)^2}\right] + \ldots\ldots\ldots\ldots + \left[\frac{I}{(1+k_d)^n}\right]}_{\text{Present value annuity}} + \underbrace{\left[\frac{R}{(1+k_d)^n}\right]}_{\text{Present value single payment}}$$

$$M_V = I \times \left[\frac{1-\frac{1}{(1+i)^n}}{i}\right] + \left[\frac{R}{(1+i)^n}\right]$$

Where:

I = Actual (coupon rate) annual interest payments before tax
k_d or i = **Current** cost of debt (pre-tax market rate)
R = Redemption value
n = Number of years

NOTE

We need to point out again that for VALUATION purposes, we use the pre-tax rate for k_d in this module. Using the after-tax rate would result in the same market value than the value we arrive at by using the pre-tax rate. The application of the post-tax rate, based on the correct application of Section 24J falls outside the scope of this module. You will learn more about Section 24J in your other MAC and TAX modules.

- **Step 2 – calculate the effective cost before tax**

The pre-tax effective cost of redeemable bonds/debentures (k_d) is equal to the yield to maturity or internal rate of return.

YIELD TO MATURITY (YTM)

This is the implied return that the investor will receive by holding a bond/debenture until maturity. It is the discount rate that achieves a net present value (NPV) of NIL for all the cash in- and outflows and is also called the internal rate of return (IRR).

We use the term **net** present value (NPV) because we are discounting inflows AND outflows, therefore the answer is a net amount. The cash flows are entered/timed as follows:

1. Period 0 – The **current market value** of the bond/debenture is treated/entered as an **outflow** (the bondholder will currently PAY this amount to obtain the instrument on the market). *From the issuer's perspective, at the time of initial listing, this is the cash amount the organisation will receive*.
2. Period 1 to n – the **interest payments** (coupon rate before tax) that the bondholder will receive periodically as **inflows** in each period. *From the issuer's perspective, it is the periodic outflow.*
3. Period n – the **capital redemption** (face value, plus/minus premium or discount, if any) at the end of the period as an **inflow** at the end of period n. This is the amount repaid to the investor in terms of the issue terms. *From the issuer's perspective this is an outflow*.

The YTM is mathematically the same as the internal rate of return (IRR), which you can calculate by either …

a. guessing two discount rates, determining the NPV for each and then extrapolating or interpolating to obtain the rate that achieves NIL (refer to topic 3 to refresh your memory)

   OR

NOTE

Tip: Use one low rate to achieve a positive NPV and one high rate to achieve a negative NPV. Then use interpolation to calculate the IRR that results in a NIL NPV.

b. using your financial calculator to calculate IRR. (Refer to activity 13.1 below as an illustration of financial calculator steps to use in order to calculate IRR.)

This effective cost of debentures (YTM) is the cost before taxation.

NOTE

If the market value was correctly calculated based on the current market interest rate, the YTM calculation based on THAT market value will work out to equal the market rate!! The market adjusts the value of the bond/debenture so that any new entrant to the market who purchases the debenture at the going rate, will achieve an effective interest rate (YTM) equal to the going market interest rate, irrespective of the stated coupon rate!

- **Step 3 – calculate the after-tax cost**

The interest which is payable on debentures (or other debt instrument) is deductible for taxation purposes (assume it is used in the production of taxable income). Therefore, the effective cost of debentures **before** taxation should be converted to effective cost **after** taxation as follows:

(Assume a 12% rate before tax and an income tax rate of 28%)

$\therefore$ 12% x $[1-t]$

Where t = the current income tax rate as a decimal

$\therefore$ 12% x $\frac{72}{100}$ [1 – 0,28 (tax rate)]

= 8,64% after-tax rate

We must bear in mind the fact that the interest is tax deductible means a tax advantage of 28% of 12% = 3,36%. The tax payment (cash outflow) to SARS on other profits is reduced by an amount equal to 3,36% of the debenture's nominal value, which is effectively a cash INFLOW to the organisation. Therefore, we reduce the effective cost of debt with the tax benefit (also called tax shield).

Activity 13.1

Exco Ltd holds R1 000 000 debentures (par value) in BP Ltd. The annual interest (coupon) payment is 15% and the debentures are redeemable after five (5) years at face value. The current market return for similar debentures with a life of five years is 20%. Assume the current company tax rate is 28%.

REQUIRED

Determine:

a. the current market value (M_V) of the debentures with the mathematical formula. [Work to four (4) decimals and round your final answer to the nearest rand.]

b. the effective after tax cost of debt by:

   i. mathematically computing the IRR by interpolating between 14% and 22% (using the interest factor tables)

   ii. using your financial calculator

   Assume that the current market value is the same as the value you calculated in a.

c. Assume the current rate for similar debentures have changed. The new market value for these debentures is now R936 013. Calculate the effective cost of debt by using your financial calculator.

Feedback on activity 13.1

a. Market value of debentures

k_d or i = current market rate (pre-tax) = 20%

I = 15% x R1 000 000 = R150 000 (coupon payment)

R = R1 000 000

n = 5

Then:

$$M_V = I \times \left\{ \left[\frac{1 - \frac{1}{(1+i)^n}}{i} \right] \right\} + \left[\frac{R}{(1+i)^n} \right]$$

$$= 150\,000 \times \left[\frac{1 - \frac{1}{(1+0{,}2)^5}}{0{,}2} \right] + \left[\frac{1\,000\,000}{(1+0{,}2)^5} \right]$$

$$= R150\,000 \times \left[\frac{1 - \frac{1}{2{,}4883}}{0{,}2} \right] + \left[\frac{1\,000\,000}{2{,}4883} \right]$$

$$= R150\,000 \times \left[\frac{1 - 0{,}4019}{0{,}2} \right] + R401\,880{,}80$$

$$= R150\,000 \times \left[\frac{0{,}5981}{0{,}2} \right] + R401\,880{,}80$$

= (R150 000 x 2,9906) + R401 880,80
= R448 590,00 + R401 880,80
= R850 470,80
= R850 471 (rounded to the nearest rand)

NOTE

Do you notice that the current market value is less than the R1m par value? The investors are "punishing" BP Ltd for only offering 15% coupon interest, whilst the current market required rate of return is 20%!

b. Effective after-tax cost of debt

i. Calculate IRR/YTM by interpolating between 14% and 22%.

Firstly you have to calculate the NPV's by using 14% and 22% as discount rate (effective cost of debt). You are guessing that the actual effective cost of debt lies somewhere between 14% and 22%!

	At 14%		**At 22%**	
	N = 5 (5 period factor)	R	N = 5 (5 period factor)	R
150 000 p.a. **for** 5 years ∴150 000 x Table B factor	3,433	514 950	2,864	429 600
R1 000 000 **after** 5 years ∴1 000 000 x Table A factor	0,519	519 000	0,370	370 000
Present values of inflows		1 033 950		799 600
Less: Current market value as calculated in (a) above		(850 471)		(850 471)
= NPV		183 479		(50 871)

By interpolation, the effective cost (IRR or YTM) before tax equals:

a		*b*
14%	?%	22%
183 479	0	(50 871)
x	*y*	*z*

The IRR is where the NPV = 0.

Formula (topic 3) $a\% + \left[\frac{x-y}{x-y} \times (b-a)\right]$

$$= 14\% + \left[\frac{183\,479 - 0}{183\,479 - (-50\,871)} \times 8\%\right]$$

$$= 14\% + \left[\frac{183\,479}{234\,350} \times 8\%\right]$$

$$= 14\% + (0{,}7829 \times 8\%)$$

$$= 14\% + 6{,}2634\%$$

$$= 20{,}2634\%$$

$$\approx 20\%$$

The fact that we rounded some of the decimals caused a slight rounding difference.

The after-tax effective cost of debt is obtained by converting the before tax cost as follows:

$$k_d = 20\% \times [1 - t]$$

$$= 20\% \times [1 - 28\%]$$

$$= 14{,}4\%$$

ii. Calculate IRR/YTM with a financial calculator

	SHARP EL-738		**Hp10BII**
Initial outflow = R850 471. Number of PMT's/cash flows = 4 of R150 000 and at the end of year 5 = R150 000 + redemption value end year 5 = R1 150 000			
Key in:	Display will read:	Key in:	Display will read:
Clear all registers first:			
CFi 2ndF CA	0.0000	2ndF C ALL 3rdF C MEM	1 P_YR then 0.0000 c FLo clr then 0.0000
Enter data sets:			
+/– 850 471 ENT	DATA SET:CF 0.0000	850471+/– CF_j	CFLO/CF–850,471.0000
150000 (x, y) 4 ENT	DATA SET:CF 1.0000	150000 INPUT 4 CF_j	150000.0000 4.0000
1150000 ENT	DATA SET:CF 2.0000	1150000 CFj	CFLO/CF 1,150,000.0000
Clear cash flow registers:			
ON/C 2ndF CASH 2ndF CA	0.0000 RATE(I/Y)= RATE(I/Y)= 0.0000		
and **press COMP to get the IRR**	RATE(I/Y)= 19.9999 20% (rounded)	2ndF IRR/YR	19.9999 20% (rounded)

The pre-tax YTM of the debentures is 20%.

NOTE

Can you see that the YTM is equal to the current market rate!! The market adjusts the value of the debenture so that any new entrant to the market, who purchases the debenture at the going price, will achieve an effective interest rate (YTM) equal to the current market rate, irrespective of the stated coupon rate!

The after-tax cost of debt is then:

$$k_d = 20\% \times [1 - t]$$
$$= 20\% \times [1 - 28\%]$$
$$= 14{,}4\%$$

c. Calculate the effective cost (new market value provided) by using your financial calculator.

SHARP EL-738 **Hp10BII**

Initial outflow = R936 013. Number of PMT's/cash flows = 4 of R150 000 and at the end of year 5 = R150 000 + redemption value end year 5 = R1 150 000			
Key in:	Display will read:	Key in:	Display will read:
Clear all registers first:			
CFi 2ndF CA	0.0000	2ndF C ALL 3rdF C MEM 0	1 P_YR then 0.0000 c FLo clr then 0.0000
Enter data sets:			
+/– 936 013 ENT	DATA SET:CF 0.0000	936 013 +/– CF_j	CFLO/CF–936,013.0000
150000 (x, y) 4 ENT	DATA SET:CF 1.0000	150000 INPUT 4 CF_j	150000.0000 4.0000
1150000 ENT	DATA SET:CF 2.0000	1150000 CFj	CFLO/CF 1,150,000.0000
Clear cash flow registers:			
ON/C 2ndF CASH 2ndF CA	0.0000 RATE(I/Y) = RATE(I/Y) = 0.0000		
and **press COMP to get the IRR**	RATE(I/Y) = 17.0000	2ndF IRR/YR	17.0000

The after tax cost of debt now is:

$$k_d = 17\% \times [1 - t]$$
$$= 17\% \times [1 - 28\%]$$
$$= 12{,}24\%$$

3.2 Cost of long-term loans (non-listed)

Once again, we should use the market-related interest rates that can currently be negotiated for the same risk profile, security and repayment terms.

For example, ABC Ltd entered into a ten-year long-term loan with Best Bank three years ago at an interest rate of 10%. For calculating the average cost of capital of ABC Ltd, they would ask the bank to quote a new interest rate (market-related) for the remaining seven years and the current risk profile.

NOTE

It is beyond the scope of MAC2602 to investigate all the issues surrounding the determination of the effective cost and valuation of non-listed long-term loans. Therefore, you do not need to revalue a loan when calculating the weighted average cost of capital (WACC) in the next study unit (study unit 5.3). In WACC calculations we will use the **new rate** (this will be given to you) and the **book value** as per statement of financial position.

NOMINAL INTEREST RATE (LOANS)

This is the named or quoted rate usually stated on annually compounded basis. It may be different from the effective rate due to non-annual compounding. (Refer to topic 3 – Time value of money)

For example, BB Bank advertises loans at 12%.

The loans are normally entered into with reference to LIBOR, JIBAR or the prime rate. As example:

"Interest is charged at JIBAR plus 0,5%."

LONDON INTERBANK OFFERED RATE (LIBOR)

LIBOR is the average interest rate for interbank loans that leading banks in London charge. Banks borrow money and they pay interest to their lenders based on certain rates. The Libor figure is an average of these rates. Many financial institutions, mortgage lenders and credit card agencies track the rate, which is produced daily to fix their own interest rates. LIBOR is therefore a benchmark for finance all around the world.

http://en.wikipedia.org/wiki/LIBOR

JOHANNESBURG INTERBANK AGREED RATE (JIBAR)

JIBAR is the money market rate that is used in South Africa. It is calculated as the average prime lending rate at which local banks buys and sells money.

http://en.wikipedia.org/wiki/JIBAR

4 Cost of equity

The way in which an organisation raises equity influences the cost of equity in the following ways:

i. The issuing of new shares

The issue of new shares entails expenses that influence the cost of the shares. These expenses are commissions and various advisor and underwriter fees and are called flotation cost. Refer also to topic 4 where we briefly described the lengthy (and expensive) process involved in issuing new shares.

ii. Retaining earnings

Retained earnings also have a cost and it is not a free source of capital. The shareholders will incur an opportunity cost when retained earnings are used for capital projects. The opportunity cost is the cash that they would have received as dividends which, in turn, the shareholders could have invested in other investments themselves.

The cost of equity can be determined by various methods as will be discussed below.

4.1 Dividend growth model/Constant growth model/Gordon's growth model

We mentioned previously that the required return (cost) for equity is not instantly available by looking it up in the financial press. It is calculated with reference to the publicly available market (traded) price. The underlying assumption is that the required return was used to discount the cash flows to the shareholders to arrive at the market value (= present value). We will therefore use the market value to derive the required rate of return.

We will use the constant growth model, also known as the dividend growth model. This model is based on the assumption that owners/investors expect that there should be earnings growth and a corresponding increase in dividends, that is dividend **growth**, in any share investment. The assumption implies that there is a direct relationship between the market value of shares and the expected future dividends on the shares.

A growth rate for the dividends needs to be estimated and discounted cash flow analysis is then applied. This means that the present value of the future inflows of dividends is determined by using the constant growth rate as discount rate. (Discounting was explained in topic 3.) The formula is based on the present value of a perpetuity.

- **Step 1 – determine the market value of the share**

Key formula: DIVIDEND GROWTH MODEL (CONSTANT GROWTH MODEL)

$$P_0 = \frac{D_1}{k_e - g} \quad [\text{and } D_1 = D_0(1+g)]$$

where P_0 = current market price of the share (current value of the share) at point 0 in time

D_0 = current dividend (or earnings per share x payout ratio)

D_1 = D_0 x (1 + g) = the **expected** dividend per share for year 1 (after growth)

k_e = the required rate of return (market discount rate or cost of ordinary equity/ shares)

g = expected CONSTANT growth rate in earnings (and assuming a constant payout ratio, therefore in dividends as well)

NOTE

Can you see that we are only discounting dividends? An equity holder of ordinary shares is never ENTITLED to a repayment of capital from the company. Ordinary shares only have a residual interest. This means that, in the case of liquidation, the ordinary shareholders are paid out the residual cash after all other obligations and fund providers have been paid or partially paid. We can therefore not include the par value of the share in the discount model. If the shareholder wants to sell his shares, he/she has to sell it in the secondary market to another shareholder/investor.

We will cover share buy-backs in your third year MAC module. This is used in specific circumstances.

In order to calculate the current market price (P_0) realistically …

- it must be assumed that the expected dividend will grow at a constant rate (growth rate, (g)) into perpetuity.
- the expected dividend growth must be estimated as accurately as possible.

Criticisms against this method are …

- expected future dividends are uncertain.
- expected growth rate in dividends is uncertain and it is unrealistic to assume that it will stay constant.

Despite the criticisms, this method is still used, especially for valuing mature companies that pay a predictable dividend and the expected growth equals growth in the general economy or industry sector.

Activity 13.2

Super (Pty) Ltd is a listed company that has just paid a dividend of R1,30 on each of its ordinary shares. The expected rate of return of the shareholders (investors) in Super (Pty) Ltd's ordinary shares is 14,5%. They also expect that the dividend will grow at a constant rate of 8% in future.

REQUIRED

Determine the market value of an ordinary share of Super (Pty) Ltd.

Feedback on activity 13.2

$P_0 = \frac{D_1}{k_e - g}$ [and $D_1 = D_0(1 + g)$]

$P_0 = \frac{1,4040}{0,145 - 0,08}$ [and $D_1 = 1,30\ (1 + 0,08) = 1,30 \times 1,08 = 1,4040$]

$P_0 = \frac{1,4040}{0,065}$

$P_0 = R21,60$

- **Step 2 – determine the cost of equity**

The constant growth (dividend growth) model is based on the return that the investor is prepared to accept on the investment. The organisation cannot attract shareholder capital if it does not pay this return to the shareholders for the funds invested.

The valuation formula above can therefore be restated to calculate the expected rate that investors will require (k_e) (or cost of ordinary shares).

Key formula: REQUIRED RATE OF RETURN

$$k_e = \frac{D_1}{P_0} + g \quad [\text{and } D_1 = D_0(1 + g)]$$

Note that:

$\frac{D_1}{P_0}$ = expected dividend yield

Conceptually, the two components of the required return on shares are therefore the dividend yield (addressing the income expectation) and the capital growth (g) in the share price!

Activity 13.3

The current market price of a share is R80,00. The next expected dividend per share is R4,00. It is anticipated that the earnings and dividends will show a growth of 8% per annum.

REQUIRED

Determine the cost of an ordinary share (required rate of return) by using the constant growth model.

Feedback on activity 13.3

$$k_e = \frac{D_1}{P_0} + g$$

$$k_e = \frac{R4}{R80} + 0{,}08$$

$$= 0{,}05 + 0{,}08$$

$$= \underline{0{,}13} \text{ (or 13\%)}$$

NOTE

There was no need to calculate D_1 as it was given in the question. If we had given you the CURRENT dividend, you would have multiplied that with (1 + g) to obtain the expected dividend for year 1.

4.2 Capital Asset Pricing Model (CAPM)

- **Background**

The CAPM was developed to eliminate the limitations of the constant growth model. The CAPM is based on the principle that investors in ordinary shares should be rewarded for the risk they bear. Thus, the higher the risk, the higher the return in order to compensate for the higher risk. The CAPM attempts to quantify the level of risk in respect of a specific share investment and to ascertain the required rate of return in respect of the share investment. **This is then the required rate of return for the investor and can be used as the cost of ordinary shares of the organisation**.

The expected rate of return required by ordinary shareholders essentially comprises two elements, namely …

- a risk-free rate of return such as the rate of return on government bonds; (eg R186 (10,5% IRB 2025/26/27))

  http://www.treasury.gov.za/divisions/alm/2004/What%20are%20RSA%20Bonds.pdf

  and

- a quantification of the market risk element. Any instrument, other than government bonds, entails risk. The difference between the returns on a risk-free investment and the return for all the traded shares (risk bearing investments) is referred to as the market risk premium.

RISK-FREE RATE

The risk-free rate of return is the return that can be earned on investments that has zero risk. An example of a risk free instrument is government bonds and the return thereon will represent the risk-free rate.

NOTE

Rating agencies also rate the creditworthiness of governments. The euro crises in 2011/2 have seen the credit ratings of governments like Greece and Spain plummet. Make sure that you select an appropriate, government bond as the risk free rate. For MAC2602 we will provide you with the risk-free rate and you can assume that it is "risk-free".

- **Factors affecting the cost of equity**

The equity shareholders will determine the rate that they expect by taking the basic risk-free rate and adjusting it for the risk profile of the organisation.

– Market risk (also called 'systemic risk')

MARKET RISK

Risk associated with the economical environment in which ALL organisations do business and which is influenced by interest rates, exchange rates, oil prices and various other factors that are difficult to quantify.

TABLE 13.1: Factors that increase risk and affect the entire market

FACTORS THAT INCREASE RISK AND AFFECT THE ENTIRE MARKET
– the state of the world economy, for example an international slow down or recession
– the state of the national economy, for example high inflation
– political instability in the country
– market sentiment on the JSE, for example uncertainty regarding future prospects

The market assesses the above factors that affect the risk of public companies and determines a premium rate (market risk premium) that should be added to the risk-free rate in order to arrive at the return that investors require on ordinary shares. A specific company will be more or less sensitive to changes in the general market conditions. This is represented by Beta (β) in the CAPM.

– Specific risk (also called 'unsystemic risk')

SPECIFIC RISK

Risk associated with an investment in a specific company.

TABLE 13.2: Factors that increase risk and affect a specific organisation

FACTORS THAT INCREASE RISK AND AFFECT A SPECIFIC ORGANISATION
– high business risk (as discussed in detail later in this module)
– high financial risk (as discussed in detail later in this module)
– labour unrest and strikes

Portfolio theory assumes that the investor will address specific risks relating to a company by diversifying his/her portfolio (buying other shares not subject to these specific risks). For example, if platinum mining companies are considered having more specific risk, the prudent investor would diversify his/her portfolio of share investments by also including shares of a retailer, which is deemed less risky.

- **CAPM assumptions**

The CAPM is based on the assumption that an investor can avoid specific risk by investing in a diversified share portfolio and therefore spreading his risk and limiting it to a minimum. Thus, market risk is the only risk an investor can expect compensation for, and the expected rate of return (compensation) is determined by means of the CAPM.

In appraising the risk associated with an individual share investment, not only the variability of the expected returns of the share itself but also the correlation between expected returns on this share and the remainder of all the shares listed, must be taken into account.

Another way to describe the risk/return relationship is in terms of beta coefficients (β). The β represents the unavoidable (market/systemic) risk arising from general economic trends and political and social factors. The CAPM provides a means for determining a market-adjusted discount rate that is applicable to a specific share.

Key formula: CAPM FORMULA

Using the CAPM method, the expected (required) returns (the cost of common equity) (k_e) can be stated as follows:

$$K_e = R_f + \beta\ (R_m - R_f)$$

where:

Rf	=	risk-free rate
Rm	=	the market return (for all shares)
$(R_m - R_f)$	=	market risk premium
β	=	the share's beta coefficient, which measures the share's relative risk (return volatility)

NOTE

The portfolio effect and more detail in respect of the elements of the CAPM such as calculation of beta (β) and the risk-free rate, are dealt with in later MAC modules.

Activity 13.4

Bushbuck Limited has the following optimal capital structure:

Debt	= 25%
Equity (ordinary shares)	= 75%

Their tax rate is 28% and their beta is 1,3.

Investors expect earnings and dividends to grow at a constant rate of 7% in the future.

The previous year a dividend of R3,70 per share was paid (D_0).

The current market price at which a share sells is R60.

The risk-free rate is considered to be 6% and the market risk premium is 5%.

REQUIRED

Determine the cost of ordinary shares for Bushbuck Ltd …

a. by using the constant growth model (discounted cash flow approach).
b. by using the CAPM approach.

Feedback on activity 13.4

a. Constant growth model approach:

$$k_e = \frac{D_1}{P_0} + g \quad [\text{and } D_1 = D_0(1+g)]$$

$$k_e = \frac{\text{R3,9590 (calc.1)}}{\text{R60}} + 0{,}07$$

$$= 0{,}0660 + 0{,}07$$

$$= \underline{0{,}1360} \text{ (or 13,6\%)}$$

① D_1 = D_0 x (1 + g) = the expected dividend per share for year 1

= R3,70 x (1 + 0,07)

= R3,9590

b. CAPM approach:

$k_e = R_f + \beta(R_m - R_f)$

$= 0{,}06 + 1{,}3\ (0{,}05)$

$= 0{,}06 + 0{,}0650$

$= 0{,}1250$ (or 12,5%)

---

5 Summary

In this study unit, we explained what is meant by the concept cost of capital. Since the components of the capital structure consist of equity and debt, we need to calculate the cost of each component separately.

We explained the calculation of the cost of debt, based on the market value of the debt. We then presented two models, namely the constant growth model (dividend growth model) and the capital asset pricing model, to be used as methods to determine the cost of equity. We also highlighted factors that affect the market risk premium that is used in the CAPM.

We will use the cost of the different components in the capital structure to calculate the weighted average cost of capital in the next study unit.

Self-assessment activity

After having worked through this study unit, determine if you are able to answer the following questions:

a. Define cost of capital with reference to the rate of return.
b. Explain the meaning of "opportunity cost".
c. List reasons why cost of debt is usually lower than cost of equity.
d. Explain the principle on which the valuation (market value) of debt is based.
e. List two ways by which equity can be raised and explain the costs related to each method.
f. List and explain the assumption on which the constant growth model is based.
g. List and explain the limitations of the constant growth model.
h. List and explain the principle on which the CAPM is based.
i. Describe what is meant by the term "market risk premium".

Self-assessment questions:

QUESTION 1

NewAfrico Ltd holds R1 000 (par value) debentures in Zim Ltd. The annual interest (coupon) payment is 8% and the debentures are redeemable after four (4) years at face value. The current market return for similar debentures with a life of four years is 10%. Assume the current company tax rate is 28%.

REQUIRED

Determine

a. the current market value (M_V) of the debentures.
b. the effective after tax cost of debt by:
    i. mathematically computing the IRR by interpolating between 8% and 12% (using factor tables), and
    ii. using your financial calculator.

    Assume that the current market value is the same as the value you calculated in a.

c. Assume the current rate for similar debentures have changed. The new market value for these debentures is now R899. Calculate the effective cost of debt using your financial calculator.

QUESTION 2

MacBean's ordinary shares currently trade at R30,00 per share. The expected dividend to be paid per share at the end of the year is R3 (D_1 = R3,00). The dividend is expected to grow at a constant rate of 5% per year.

REQUIRED

Determine the cost of MacBean's ordinary shares (common equity).

QUESTION 3

Personal Book Stores Limited (PBS) has a beta of 0,8, a risk free-rate of 6% and the market risk premium is 5,5%. PBS' shares is currently trading at R3,24.

REQUIRED

Determine the estimated cost of common equity using the CAPM model.

Feedback on self-assessment questions

QUESTION 1

a. Market value of debentures

k_d or i = current market rate (pre-tax) = 10%
I = 8% x R1 000 = R80 (coupon payment)
R = R1 000
n = 4

Then:

$$M_V = I \times \left\{ \left[\frac{1 - \frac{1}{(1+i)^n}}{i} \right] \right\} + \left[\frac{R}{(1+i)^n} \right]$$

$$= R80 \times \left[\frac{1 - \frac{1}{(1+0,1)^4}}{0,1} \right] + \left[\frac{1\,000}{(1+0,1)^4} \right]$$

$$= R80 \times \left[\frac{1 - \frac{1}{1,4641}}{0,1} \right] + \left[\frac{1\,000}{1,4641} \right]$$

$$= R80 \times \left[\frac{1 - 0,6830}{0,1} \right] + R683,0135$$

$$= R80 \times \left[\frac{0,3170}{0,1} \right] + R683,0135$$

= (R80 x 3,170) + R683,0135
= R253,60 + R683,0135
= R936,6135
= R937 (rounded to nearest rand)

NOTE

R937 < R1 000, because 8% paid < 10% required market rate!

b. Calculate IRR/YTM by:

i. interpolating between 8% and 12%

Firstly you have to calculate the market values (NPV's) arrived at by using 8% and 12% as discount rate.

	At 8%		At 12%	
	N = 4 (4 period factor)	R	N = 4 (4 period factor)	R
R80 p.a. **for** 4 years ∴80 x Table B factor	3,312	265	3,037	243
R1 000 **after** 4 years ∴1 000 x Table A factor	0,735	735	0,636	636
Present values of inflows		1 000		879
Less: Current market value as calculated in (a) above		(937)		(937)
= NPV		63		(58)

By interpolation, the effective cost (IRR/YTM) before tax equals:

a		*b*
8%	?%	12%
|	|	|
63	0	(58)
x	*y*	*z*

Formula (topic 3) $a + \left[\frac{x-y}{x-z} \times (b-a)\right]$

$= 8\% + \left[\frac{63-0}{63-(-58)} \times 4\%\right]$

$= 8\% + \left[\frac{63}{121} \times 4\%\right]$

$= 8\% + (0{,}5207 \times 4\%)$

$= 8\% + 2{,}0826\%$

$= 10{,}0826\%$

$\approx 10\%$

The after-tax effective cost of debt is obtained by converting the before tax cost as follows:

k_d = 10% x [1 – t]

= 10% x [1 – 28%]

= 7,2%

b. (ii) Calculate IRR/YTM with your financial calculator.

SHARP EL-738 **Hp10BII**

Initial outflow = R937. Number of PMT's/cash flows = 3 of R80 and at the end of year 4 = R80 + redemption value end year 4 = R1 080			
Key in:	Display will read:	Key in:	Display will read:
Clear all registers first: CFi 2ndF CA	0.0000	2ndF C ALL 3rdF C MEM 0	1 P/YR then 0.0000 c FLo clr then 0.0000
Enter data sets: +/– 937 ENT	DATA SET:CF 0.0000	937+/– CF_j	CFLO/CF–937.0000
80 (x, y) 3 ENT	DATA SET:CF 1.0000	80 INPUT 3 CF_j	80.0000 3.0000
1 080 ENT	DATA SET:CF 2.0000	1080 CF_j	CFLO/CF1,080.0000
Clear cash flow registers: ON/C 2ndF CASH 2ndF CA	0.0000 RATE(I/Y) = 0.0000 RATE(I/Y) = 0.0000		
and **press COMP to get the IRR**	RATE(I/Y) = 9.9869 10% (rounded)	2ndF IRR/YR	9.9869 10% (rounded)

The pre-tax YTM of the debentures is 10%.

The after-tax cost of debt is then:

k_d = 10% x [1 – t]

= 10% x [1 – 28%]

= 7,2%

c. Calculate the effective cost (new market value (R899) provided) by using your financial calculator.

SHARP EL-738 **Hp10BII**

Initial outflow = R899. Number of PMT's/cash flows = 3 of R80 and at the end of year 4 = R80 + redemption value end year 4 = R1 080			
Key in:	Display will read:	Key in:	Display will read:
Clear all registers first: CFi 2ndF CA	0.0000	2ndF C ALL 3rdF C MEM 0	1 P_YR then 0.0000 c FLo clr then 0.0000
Enter data sets: +/– 899 ENT	DATA SET:CF 0.0000	899+/– CF_j	CFLO/CF–899.0000
80 (x, y) 3 ENT	DATA SET:CF 1.0000	80 INPUT 3 CF_j	80.0000 3.0000
1080 ENT	DATA SET:CF 2.0000	1080 CF_j	CFLO/CF1,080.0000
Clear cash flow registers: ON/C 2ndF CASH 2ndF CA	0.0000 RATE(I/Y) = RATE(I/Y) = 0.0000		
and **press COMP to get the IRR**	RATE(I/Y) = 11.2746 11% (rounded)	2ndF IRR/YR	11.2746 11% (rounded)

The pre-tax YTM (IRR) of the debentures is 11%.

The after-tax cost of debt is then:

k_d = 11% x [1 – t]
= 11% x [1 – 28%]
= 7,92%

QUESTION 2

Cost of an ordinary equity using the dividend growth model:

$$k_e = \frac{D_1}{P_0} + g \quad [\text{and } D_1 = D_0(1+g)]$$

$$k_e = \frac{R3}{R30} + 0{,}05$$

= 0,10 + 0,05
= 0,15 (or 15%)

QUESTION 3

CAPM approach:

k_e = R_f + β (R_m – R_f)
= 0,06 + 0,8(0,055)
= 0,06 + 0,0440
= 0,1040 (or 10,4%)

NOTE

The information in the question, regarding the current market price of the shares is not relevant for use in the CAPM approach. It only features in the dividend growth model. Sometimes additional information, that is not relevant to the specific question, will be supplied in order to test if you can distinguish whether it is relevant or not for the method you are required to use.

STUDY UNIT 14

The weighted average cost of capital

In this study unit

1 Introduction

We discussed the concept "cost of capital" in the previous study unit. We explained that the component cost associated with the cost of capital entails equity and debt. We also illustrated how to calculate the cost of these individual components.

In this study unit, we will discuss the calculation of the weighted average cost of capital (WACC).

2 Weighted average cost of capital

Thus far, we have dealt with the cost of the two components of the capital structure, namely equity and debt. We will assume that the organisation has identified its optimal capital structure as was discussed in study unit 5.1. We will now use the target proportions of debt and ordinary equity together with their respective component costs to calculate the weighted average cost of capital.

WEIGHTED AVERAGE COST OF CAPITAL (WACC)

The WACC represents the return that a company needs to achieve in order to cover the expected returns of both the equity providers and the debt providers.

Key formula: WEIGHTED AVERAGE COST OF CAPITAL (TARGET CAPITAL STRUCTURE)

$$WACC = (k_e \times \text{Equity funding \%}) + (k_d \times \text{Debt funding \%})$$

Where:

k_e = equity-holders' current required rate of return (cost of equity)

k_d = debt-holders' current required rate of return (cost of debt after tax)

For example:

If Mahlangu Ltd, from our previous example, decided that their optimal or target capital structure is a debt/equity ratio of 40%/60% and the effective cost of debt funding is currently 9% before tax and the shareholders expect a required return of 12%, their WACC would look as follows:

WACC = (k_e x Equity funding %) + (k_d x Debt funding %)
= (12% x 60%) + [(9% x (1 – 0,28)) x 40%]
= 7,2% + 2,5920%
= 9,7920%

NOTE

It is important that you use the current market effective after-tax cost of debt and required returns, and NOT the interest rates that the organisation is currently paying on its existing financing!

Using the target capital structure in calculating the WACC is conceptually the soundest method. However, in many instances we would not have access to the organisation's target capital structure as the top management would not necessarily communicate that to outsiders. In such instances, our point of departure is that an organisation is currently optimally financed and that the ratio of the financing is going to remain constant. (Refer back to study unit 12, section 4, where we indicated that the organisation would always strive to be close to the optimal or target capital structure.) If the ratio is not going to remain constant, the cost of capital will change and will have to be re-calculated.

NOTE

Where we do not give you the target capital structure in a question, you should base your calculations on the current funding structure, using the current market value of the equity and debt components.

The average cost of capital is calculated by multiplying the current market cost of each source of capital by their weightings, based on their respective current market values. The total of the weighted average amounts or percentages represent the weighted average cost of capital.

Key formula: WEIGHTED AVERAGE COST OF CAPITAL (MARKET VALUES)

$$WACC = k_e \times \frac{v_e}{v_e + v_d} + k_d \times \frac{v_d}{v_e + v_d}$$

where k_e = equity-holders' **current** required rate of return (cost of equity)
k_d = debt-holders' **current** required rate of return (cost of debt **after tax**)
v_e = market value of equity (weighting for k_e)
v_d = market value of debt (weighting for k_d)

The above formula shows that the WACC represents the company's required return for investments and includes financing from shareholders (k_e) and debt providers (k_d). The formula reflects the after tax cost of each source of finance, weighted by its contribution to the value of the organisation.

We use the current required rate of return as this is the rates that the organisation would have to pay when it sources new funding for its projects.

The formula above can be simplified as follows:

$$WACC = \frac{k_e v_e + k_d v_d}{v_e + v_d}$$

NOTE

It is important to realise that:

The market value of the company v_o = market value of equity (v_e) + market value of debt (v_d)

Steps to perform in order to calculate the WACC:

1. Determine the components making up the capital structure from the current statement of financial position. Ensure that you have correctly classified components (financing instruments) as either equity or debt.
2. Revalue each component to its CURRENT MARKET VALUE (perform the valuation if current prices were not given in the question) as demonstrated in study unit 13.
3. Establish the individual component's CURRENT, EFFECTIVE AFTER TAX costs or required return (k_e and k_d). If not given in the question, use the market values to inversely calculate the required return, as demonstrated in study unit 13.
4. WEIGH each component based on CURRENT MARKET VALUES as determined in step 2.
5. Calculate the WACC.

NOTE

The market value of the ordinary equity represents the owners' total interest at current market prices. You do not have to add the reserves as another component to the capital structure!

Unless there is something to the contrary, it is assumed in the examples that follow, that the capital structure presented is optimal. This is the capital structure which will require the minimum average cost of capital for obtaining a certain amount of funds.

Activity 14.1

BBC (Ltd) has the following information:

The market values of the different components are:

Debt (long-term loans)	:	R200 m
Ordinary shares	:	R500 m

The current (market related) cost of the different components was already calculated as being:

Debt (long-term loan)	:	6% (after-tax)
Ordinary shares	:	14%

REQUIRED

Calculate the WACC of BBC (Ltd) by …

a. using the mathematical formula.
b. completing the WACC table.

Feedback on activity 14.1

The weighted average cost of capital can be calculated as follows:

a. Using the formula (in R millions):

$$WACC = \frac{k_e v_e + k_d v_d}{v_e + v_d}$$

$$WACC = \frac{(14\% \times 500) + (6\% \times 200)}{500 + 200}$$

$$WACC = \frac{70 + 12}{700}$$

$$WACC = \frac{82}{700}$$

WACC = 11,71%

Or

b. Using the WACC table:

Type of capital	Total amount at market values ③ (R million)	% of total capital (weight)	Cost of capital ③	Weighted cost of capital
	R	%	%	%
E: Equity – ordinary shares	500	E/V 71,43	14	10,00 ①
+ D: Debt – long-term loans	200	D/V 28,57	6	1,71 ②
= V: Value	700	100		11,71

Calculations:

① 71,43% x 14% = 10,00

② 28,57% x 6% = 1,71%

③ Given

NOTE

Did you notice that the table above is solving the mathematical formula for WACC as noted below:

$$WACC = k_e \times \frac{V_e}{V_e + V_d} + k_d \times \frac{V_d}{V_e + V_d}$$

3 Using WACC for capital budgeting decisions

The weighted average cost of capital is used as a basis to determine whether a capital investment should be accepted or rejected. It is used as the discounting rate in capital budgets (capital investment decisions) in order to determine whether the capital investment renders a higher return than the cost of capital (WACC), or not. Capital investment decisions will be discussed in the topic, Capital budgeting, later on in this module.

4 Summary

In this study unit we explained the concept of the weighted average cost of capital and illustrated how it can be calculated. We will conclude this topic with comprehensive self-assessment questions that will pull together all the concepts covered in the three study units.

Self-assessment activity

After having worked through this study unit, determine if you are able to answer the following questions:

a. Define the key term “weighted average cost of capital”.

b. What do k_e and k_d represent in the WACC formula (k_e x Equity funding %) + (k_d x Debt funding %)?

c. Is the cost of debt that we use in the WACC formula before tax or after tax?

d. Do we use the current market-related effective interest rates and required returns or the interest rates that the organisation is paying on its existing financing in the calculation of WACC?

e. What does the WACC formula $\frac{k_e v_e + k_d v_d}{v_e + v_d}$ reflect?

f. Which structure will you use when calculating the WACC of an organisation if you do not have the target capital structure?

Self-assessment questions:

QUESTION 1

Brixton (Proprietary) Limited is financed as follows:

	Current market values
	R million
250 million ordinary shares	400
1 800 000, 18% debentures	200
	600

The following was established:

1. The management is convinced that the organisation is financed optimally and that the ratio of the financing components will remain constant in the future.
2. The current cost of the various financing components, **after taxation** at 28%, is as follows:
   - Ordinary shares 18%
   - Debentures 13%

REQUIRED

Calculate the WACC of Brixton (Pty) Ltd by …

a. using the mathematical formula.

b. completing the WACC table.

Feedback on self-assessment question 1

a. Using the formula:

$$\text{WACC} = \frac{k_e v_e + k_d v_d}{v_e + v_d}$$

$$\text{WACC} = \frac{(18\% \times 400) + (13\% \times 200)}{400 + 200}$$

$$\text{WACC} = \frac{72 + 26}{600}$$

$$\text{WACC} = \frac{98}{600}$$

WACC = 0,1633

WACC = 16,33%

Or

b. Using the table format

$$WACC = k_e \times \frac{V_e}{V_e + V_d} + k_d \times \frac{V_d}{V_e + V_d}$$

Type of capital	Total amount at market values ③ (R million)	% of total capital (weight)	Cost of capital③	Weighted cost of capital
	R	%	%	%
E: Equity – ordinary shares	400	E/V 66,67	18	12,00①
+ D: Debt – debentures	200	D/V 33,33	13	4,33②
= V: Value	600	100		16,33

Calculations:

① 66,67% x 18% = 12,00

② 33,33% x 13% = 4,33%

③ Given

COMPREHENSIVE SELF-ASSESSMENT QUESTIONS

(COVERING ALL STUDY UNITS OF TOPIC 5)

QUESTION 2

The following is an extract from Vuju's Steelwork Limited's statement of financial position as at 31 May 20x1:

EQUITY AND LIABILITIES	**Rm**
Capital and reserves	
Equity	**900**
Ordinary shares of R10 each	900
Non-current assets	**450**
Debentures	450
Total equity and liabilities	**1 350**

Additional information:

A dividend of R1,10 has been declared and paid during the financial year ending 31 May 20x1. Due to expansion, dividends are expected to grow at 4% per year from 1 June 20x1 for the foreseeable future. The current market price per share on 1 June 20x1 is R10,40.

Vuju's Steelwork Limited has a beta of 1,5. The market rate of return is 12%, and the risk free rate is 6%.

There are currently 1 000 000 debentures in issue at face value of R450 each. The debentures are redeemable after eight (8) years at face value. The coupon interest being paid is R90 (before tax) per debenture. The debentures are currently trading at R486,68.

The corporate tax rate for the foreseeable future is 28%.

REQUIRED

a. Calculate the current cost of equity using the capital asset pricing model (CAPM).
b. Calculate the current cost of equity using the dividend growth model.
c. Calculate the current effective cost of the debentures. (Use your financial calculator.)
d. Calculate the weighted average cost of capital (WACC) for Vuju's Steelwork Ltd by using the cost of equity (k_e) as determined in a. by means of the CAPM and effective cost of debt (k_d) as determined in c.

[Round percentages in a – c to the nearest full percentage.]

Feedback on comprehensive self-assessment question 2

a. Cost of equity using CAPM

$k_e = R_f + \beta(R_m - R_f)$
$k_e = 0,06 + 1,5(0,12 - 0,06)$
$k_e = 0,06 + 1,5(0,06)$
$k_e = 0,06 + 0,09$
$k_e = 0,15$ (or 15%)

b. Cost of equity using the dividend growth model

$$k_e = \frac{D_1}{P_0} + g \quad [\text{and } D_1 = D_0(1+g)]$$

$$k_e = \frac{R1,144 \text{ (calc.1)}}{R10,40} + 0,04$$

$= 0,11 + 0,04$
$= \underline{0,15}$ (or 15%)

① $D_1 = D_0 \times (1 + g)$ = the expected dividend per share for year 1
$= R1,10 \times (1,04)$
$= R1,144$

c. After tax cost of debentures

Calculate the effective after-tax cost of debt with your financial calculator.

SHARP EL-738		Hp10BII	
Initial outflow = R486 680 000[①]. Number of PMT's/cash flows = 7 of R90 000 000 and at the end of year 8 = R90 000 000 + R450 000 000 (redemption value end year 8) = R540 000 000			
Key in:	Display will read:	Key in:	Display will read:
Clear all registers first: CFi 2ndF CA	0.0000	2ndF C ALL 3rdF C MEM 0	1 P_YR then 0.0000 c FLo clr then 0.0000
Enter data sets: +/– 486680000 ENT	DATA SET:CF 0.0000	486680000 +/–CF_j	CFLO/CF–486,680,000.0000
90000000 (x, y) 7 ENT	DATA SET:CF 1.0000	90000000 INPUT 7 CF_j	90,000,000.0000 7.0000
540000000 ENT	DATA SET:CF 2.0000	540000000 CF_j	CFLO/CF 540,000,000.0000
Clear cash flow registers: ON/C 2ndF CASH 2ndF CA	0.0000 RATE(I/Y) = RATE(I/Y) = 0.0000		
and **press COMP to get the IRR**	RATE(I/Y) = 18.0009	2ndF IRR/YR	18.0009

The effective after tax cost of debt is now:

k_d = 18% x [1 – t]
= 18% x [1 – 28%]
= 12,96%
= 13% (rounded to full percentage)

① Initial outflow (current market value) = 1 000 000 x R486,68 = R486 680 000

d. Calculation of WACC

$$WACC = \frac{k_e v_e + k_d v_d}{v_e + v_d}$$

NOTE

Remember that we need to calculate the market values (and not use the book values as stated in the statement of financial position of the organisation) for the weighting of the components.

Market value of equity (v_e):

Current market price: given as R10,40 per share.
Number of shares: 90 000 000 shares as per statement of financial position.

v_e = 90 000 000 x R10,40
v_e = **R936 000 000**

Market value of debt (v_d):

As calculated in (c) = R486 680 000

Using the formula:

$$WACC = \frac{k_e v_e + k_d v_d}{v_e + v_d}$$

The individual component costs, k_e and k_d to be used in the WACC formula were already established in section a. and c. of this activity and the market values as above.

$$WACC = \frac{(15\% \times 936\,000\,000) + (13\% \times 486\,680\,000)}{936\,000\,000 + 486\,680\,000}$$

$$WACC = \frac{140\,400\,000 + 63\,268\,400}{1\,422\,680\,000}$$

$$WACC = \frac{203\,668\,400}{1\,422\,680\,000}$$

WACC = 0,1432

WACC = 14,32%

WACC = 14% (rounded to full percentage)

Or

$$WACC = k_e \times \frac{v_e}{v_e + v_d} + k_d \times \frac{v_d}{v_e + v_d}$$

Type of capital	Total amount at market values		% of total capital (weight)	Cost of capital	Weighted cost of capital
Share capital	936 000 000	(936 000 000 ÷ 1 422 680 000)	65,79%	15%	9,87%
Debentures	486 680 000	(486 680 000 ÷ 1 422 680 000)	34,21%	13%	4,45%
	1 422 680 000		100%		**14,32%**

QUESTION 3

Extract from the statement of financial position of Khumaba (Ltd):

	R
Ordinary issued shares	5 000 000
Non-distributable reserves	500 000
Retained income	3 400 000
Debentures at 15%	6 000 000
Long-term loan at 12%	1 000 000
	15 900 000

Additional information:

There is currently 1 000 000 shares in issue.

The current dividend is R1,50 per share.

The expected growth in dividends is 5%.

The shareholders required rate of return is 18%.

The debentures mature in 10 years time and the coupon rate thereon is 15%.

The market interest rate for similar debentures is 20%.

The long-term loan agreement provides that interest is charged at 12%. The current JIBAR rate for similar loans is 13% (after tax).

The tax rate is 28%.

REQUIRED

Use the information above and calculate the WACC of Khumaba (Ltd) at market value.

Feedback on comprehensive self-assessment question 3

Calculation of WACC at market value:

① Market value of equity P_0

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

$$P_0 = \frac{1,58}{0,18 - 0,05} \quad [\text{where} \quad D_1 = 1,50(1 + 0,05) = 1,58]$$

$$P_0 = \frac{1,58}{0,13}$$

P_0 = R12,12 per share

∴ 1 000 000 shares x R12,12

= **R12 120 000**

② Market value of debt k_d (debentures)

Firstly calculate the market value of the debentures.

k_d or i	=	current market rate (pre-tax) = 20%
I	=	15% x R6 000 000 = R900 000
R	=	R6 000 000
n	=	10

Then:

$$M_v = I \times \left\{\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]\right\} + \left[\frac{R}{(1+i)^n}\right]$$

$$= R900\,000 \times \left[\frac{1-\frac{1}{(1+0{,}20)^{10}}}{0{,}20}\right] + \left[\frac{6\,000\,000}{(1+0{,}2)^{10}}\right]$$

$$= R900\,000 \times \left[\frac{1-\frac{1}{6{,}1917}}{0{,}20}\right] + \left[\frac{6\,000\,000}{6{,}1917}\right]$$

$$= R900\,000 \times \left[\frac{1-0{,}1615}{0{,}20}\right] + R969\,039{,}1976$$

$$= R900\,000 \times \left[\frac{0{,}8385}{0{,}20}\right] + R969\,039{,}1976$$

= (R900 000 x 4,1925) + R969 039,1976

= R3 773 250 + R969 039,1976

= R4 742 289,198

= R4 742 298 (rounded to nearest rand)

The after tax cost of debt now is:

k_d = 20% x [1 – t]

= 20% x [1 – 28%]

= 14,4%

= 14% (rounded to full percentage)

Calculation of WACC:

Type of capital	Total amount at market values	% of total capital (weight)	Cost of capital③	Weighted cost of capital
	R	%	%	%
E: Equity – Ordinary shares	12 120 000	E/V 67,85	18③	12,21①
+ D: Debt – Debentures	4 742 298	D/V 26,55	14④	3,72②
+ D: Debt – Long-term loan (book value)	1 000 000	D/V 5,60	13	0,73⑤
= V: Value	17 862 298	100		16,66 17,00 (rounded)

Calculations:

① 67,85% x 18% = 12,21%

② 26,55% x 14% = 3,72%

③ 18% shareholders required return – given

④ 14% cost of debt after-tax (20% x 72%)

⑤ 5,6% x 13% = 0,73%

NOTE

Remember to include ALL long-term debt instruments in the weighting.

As explained before, we will leave unlisted long-term loans at book value for purposes of calculating the weightings.

The market value of the ordinary equity represents the owners' total interest at current market prices. You do not have to add the reserves to the capital structure again!

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ACCOUNTING RATE OF RETURN:	This is based on an investment's (project's) average net PROFIT after tax (not cash flow), divided by its average book value. It is also called the average rate of return on investment/capital (ROI or ROC) method.
ACCOUNTS PAYABLE (CREDITORS) DAYS:	Payable days (or the creditor payment period) is the measurement of the average number of days the organisation takes to pay for the goods/services received on credit from its suppliers.
ACCOUNTS RECEIVABLE:	Accounts receivable refers to the amount outstanding in respect of previous credit sales that customers/debtors have to pay in the near future.
AGEING SCHEDULE FOR CREDITORS:	Ageing schedule (or creditors' age analysis report) is a classification of accounts payable within bands of different outstanding periods, normally including current debt, up to and including 30 days, up to and including 60 days, up to and including 90 days, and greater than 90 days.
AGEING SCHEDULE FOR DEBTORS:	Ageing schedule (or debtors' age analysis report) is a classification of accounts receivable within bands of different outstanding periods, normally including, current debt, up to and including 30 days, up to and including 60 days, up to and including 90 days, and greater than 90 days.
ANALYSE:	To analyse is to examine in detail in order to discover meaning or to break down into smaller parts.
ANNUITY DUE:	An annuity where the payments fall due at the beginning of each payment interval (period) is an annuity due. The last payment of an annuity due is one payment before the end of the term.
BANK LOAN:	Medium and smaller companies mainly use bank loans for long-term financing. The loan may be a term loan that is repayable over a fixed period that relates to the specific financing requirement or the loan can be structured in the form of a loan facility from which the company draws down as needed (the money is only advanced by the bank when the client needs it to make a payment to a supplier, etc, up to the maximum loan amount approved). The costs involved (apart from the repayment of the capital amount) are interest charges as well as a charge for the right to use the loan facility.
BANK OVERDRAFT:	A bank overdraft is the facility that allows an organisation to use more money than is available in its bank account.
BANKER'S ACCEPTANCES (BA's):	A banker's acceptance is created when the organisation sells a bill of exchange to the bank.

BARRIERS TO ENTRY:	Barriers to entry are factors that prevent new players to enter a specific industry or market. These factors refer to the position of the current players, for example, they have good economies of scale, customers are loyal to their brand, and they have a well-established distribution channel.
BARRIERS TO EXIT	Barriers to exit are factors that prevent an organisation from leaving (exiting) the market for a specific product. If the cost of exiting is higher than the cost (losses) of remaining in the market, the organisation will be prohibited from exiting and will still be competing for market share.
BOARD OF DIRECTORS:	The board of directors (the board) consist of members/ directors who are elected to the board by the shareholders to oversee the activities of the organisation and to provide stewardship and leadership from the very top.
BOND/DEBENTURE:	A bond/debenture is a long-term contract between the organisation that issues the bond/debenture (borrower), and the buyer of the bond/debenture (lender of the money or investor). The main terms of this contract are the repayment conditions and the interest rate to be paid.
BUSINESS RISK:	Risks that arise from the activities of the organisation and relate to the people, processes, products and structure.
CAPITAL:	Capital is a long-term asset or the money used to support long-term assets and projects and is displayed as long-term debt and equity on the statement of financial position.
CAPITAL GROWTH:	Capital growth is the growth of an investment in a business. It means that the investment can be sold after a few years for more than it was bought for. Capital growth includes minimum annual returns.
CAPITAL INVESTMENTS/ EXPENDITURE:	Long-term assets (eg non-current) such as property, plant and equipment acquired individually or as part of large projects that generate returns (cash inflows) over a number of years.
CAPITAL MARKET:	A capital market is a financial market in which longer-term (longer than one year) debt and equity securities are traded.
CAPITAL STRUCTURE:	Capital structure is the manner in which an organisation's assets are financed. It is normally expressed in percentages of each type of capital used by the organisation, such as debt and equity.
CASH AND CASH EQUIVALENTS:	Cash is the money the organisation has on hand (eg petty cash, unbanked payments received) as well as the money in the bank (eg cheque accounts or short-term deposits).

CASH CONVERSION CYCLE:	The cash conversion cycle focuses directly on the cash flow associated with the overall cash flow from operations (including accounts payable). It represents the length of time between when an organisation makes payments to its creditors (outflow of cash) and when an organisation receives payments from its customers (inflow of cash). As the cash conversion cycle includes the cash flow benefit afforded by accounts payable, this cycle is shorter than the operating cycle.
CASH FLOW:	Cash flow is any receipt or payment of money that occur at a specific point in time. It includes capital and interest.
CLOSE CORPORATION:	A close corporation (CC) is a business that is formed as a legal person that exists separate from its owners. A maximum of ten owners, called members, which must be natural persons, are allowed.
COMPANY:	A company is a business form that is a legal organisation distinct from its "owners"."Owners" are referred to as shareholders and can be one or more individuals or organisations.
COMPLIANCE RISK:	These risks arise from non-compliance with legislation or regulations.
COMPOUNDING:	Compounding refers to the calculation of interest on a principal (initial) amount and adding that interest to the principal for investment in the following period. The interest is therefore not paid at the end of the period in which it accrues. In the next period(s), interest is earned on the interest re-invested.
CORE VALUES:	Core values are the principles that guide an organisation by describing how every employee is expected to behave.
CORPORATE CULTURE:	Corporate culture entails employees' shared beliefs, values and symbols (see also core values).
CORPORATE GOVERNANCE:	Corporate governance is a set of processes, customs, policies, laws and institutions affecting the way that a business is managed. It also includes the relationships among the many stakeholders involved and the goals of the business.
COST OF CAPITAL:	Cost of capital is defined as being the rate of return that an organisation must earn on its investments to ensure that the minimum requirements of the providers of capital are met.
COUPON INTEREST RATE:	This is the fixed interest rate that the issuing organisation is required to pay on the face value of the bond. This is similar to the coupon payment divided by the par value.

CREDIT RATING AGENCY:	A credit rating agency is an organisation that provides international financial research on bonds and other debt instruments issued by business and government organisations. The agency ranks the creditworthiness of borrowers/issuers by using a standardised ratings scale. The payment history as well as financial heath (ability to pay future obligations) is taken into account in determining the credit rating.
DILUTION:	Dilution occurs when new ordinary shares are issued. The existing shareholders must then share the control of the organisation with a greater number of shareholders. The control (voting power) that the existing shareholders had over the organisation will be diluted due to the increase in the number of shareholders.
DISCOUNTING:	Discounting is the process used to determine the original investment (principal) amount by discounting the future value, which resulted from the compounding of interest, back to the present value. (Discounting is thus used to determine the present value of an investment.)
DIVIDEND YIELD:	The dividend yield on an organisation's share is the organisation's total annual dividend payments divided by its price per share. The dividend yield can also be determined by finding a comparable dividend yield from a similar share and adjust it for growth and risk.
DU PONT RATIO:	Du Pont ratio is a method that breaks down the return on total asset ratio (ROA) into two components – a profit margin and an asset turnover rate.
ECONOMIC RISK:	Economic risks are directly related to risks that originate from activities or non-activities in the normal economy. This includes changes to inflation, the unemployment rate and international policy. These economic risks start before transactions take place and are considered to be external.
EFFECTIVE ANNUAL INTEREST RATE:	Effective annual interest rate (EAR) refers to the annual rate, which derives the same result as the compound interest rate, at a given periodic rate, for a given number of compounding periods PER year. The effective annual rate is therefore the annual rate, which, if compounded once a year, will give the same result as the interest per period compounded a number of times per year.
ENVIRONMENTAL RISK:	The risk relates to climate change and risk of natural disasters (deemed to be external risks). The risk of damage caused by a pollutant, that is a substance or by-product introduced into an environment other than its intended use/ purpose (deemed to be within the organisation's control).

EXTRAPOLATION:	Extrapolation refers to the calculation when you need to determine an actual rate where this actual rate lies outside (not within) two specific rates.
FACTORING:	Factoring is a form of debtors financing which results in improving the debtors' collection period.
FINANCIAL INFORMATION:	Financial information refers to the financial results, position and cash flows of an organisation's business operations in a specific period, stated in rand and cent terms.
FINANCIAL LEVERAGE:	Financial leverage is the extent to which debt is used in the capital structure of an organisation. (An organisation that has a high percentage of debt in its capital structure will be regarded as having a high degree of financial leverage.)
FINANCIAL RISK:	Financial risk relates to the financial operation and position of an organisation.
FUTURE VALUE:	The future value is the amount that an investment will be worth at a future date if invested at a particular simple or compound interest rate.
GROWTH RATE:	Growth rate simply refers to the percentage that a line item in an organisation's financial information has increased or decreased from one period/year to another.
HOLDING COSTS:	Holding costs are the costs of holding inventory and includes storage costs (eg renting warehouse space and security), insurance costs (for protection against losses), cost of obsolescence (inventory ageing or deteriorating whilst in storage) and opportunity cost (funds invested in inventory could have earned a return elsewhere at a certain rate, eg earning the weighted average cost of capital).
HUMAN RESOURCES:	The term human resources (HR) refer to the workforce (employees) of an organisation.
INDUSTRIAL RELATIONS:	Industrial relations deal with the employment relationship (workplace relationships).
INFORMATION RISK:	Information risk is the risk that decision makers within the organisation use invalid or poor quality information for decision-making, or the loss of information.
INHERENT RISK:	This involves the assessment of risk before the application of any controls, transfer or management responses.
INSTALMENT SALE AGREEMENT (ISA):	An instalment agreement entails the granting of a loan to an organisation (buyer) by the supplier (seller) of assets such as machinery, equipment and vehicles itself (supplier credit), or granted by banks. The conditions, interest rate, instalment amount and frequency of payment as well as the period of the agreement are set out in the specific contract.

INTEREST:	Interest is the price paid for borrowed money or received for money invested.
INTERNAL RATE OF RETURN:	The rate at which cash flows must be discounted so that the present value of the cash inflows equals the present value of the initial cash outflow. That is the rate at which the NPV will be equal to Rnil.
INTERPOLATION:	Interpolation refers to the calculation when you need to determine an actual rate, where the actual rate lies between two specific rates.
INVENTORY:	Inventory of a reseller is represented by purchased goods (held to be sold), and of a manufacturer by the completed products (held to be sold), work-in-process products (intended for sale) and raw material inventory (held for use in production). Both types of organisations can also have stores of consumable items.
INVENTORY DAYS:	Length of time that inventory remains unsold (goods for sale) or remains unused (raw materials).
LEASE:	A lease is a form of financing movable assets. Just like a loan, it can be structured in various ways. The lessor (granting the lease) remains the owner of the asset, while the lessee has the use of the asset. Lease payments are determined in such a way as to offer the lessor the cost of the asset plus a reasonable return thereon.
MARKET RATE / RULING INTEREST RATE:	The market rate is the current or ruling market rate of return. It is obtained from similarly publicly traded instruments – a pre-tax rate.
MARKET RISK:	Risk associated with the economical environment in which all organisations do business and which is influenced by interest rates, exchange rates, oil prices and various other factors that are difficult to quantify. Market risk therefore originates from events and transactions in the market place.
MATURITY DATE / REDEMPTION DATE:	The maturity date is the date when a bond/debenture will be redeemed.
MISSION STATEMENT:	A mission statement defines the core purpose of the organisation, by broadly stating the reason(s) why the organisation exists.
MONEY MARKET:	The money market is a financial market used mainly for raising short-term (of less than one year) finance.
MORTGAGE LOAN:	Mortgage loans are long-term loans raised against the value of property. The loan is normally secured over the value of the property offered as security.
NET PRESENT VALUE:	Net result of future periodic net after tax cash flows discounted to present value, using an appropriate rate, and the present value of the capital invested in the project.

NET WORKING CAPITAL:	Net working capital refers to the current assets less current liabilities, which is directly related to the operating activities of an organisation.
NOMINAL ANNUAL RATE:	In cases where interest is calculated more than once a year, the annual rate quoted is the nominal annual rate or nominal rate.
NOMINAL INTEREST RATE:	This is the named or quoted rate usually stated on annually compounded basis. It may be different from the effective rate due to non-annual compounding.
OPERATING CYCLE:	The operating cycle focuses on an organisation's internal (thus excluding accounts payable) cycle's impact on cash flow. It represents the length of time from committing cash for purchases of inventory to the inflow of cash from the sale of inventory on credit.
OPERATIONAL RISK:	"Operational risk is the risk of loss from a failure of internal business and control processes."
OPPORTUNITY COST:	Opportunity cost is the cash that could have been realised from the best alternative use of the funds that were given up.
ORDERING COSTS:	Ordering costs are the costs associated with placing an order, receiving the deliveries and the associated payment.
ORDINARY ANNUITY:	An ordinary annuity is an annuity where the payments take place at the end of each year or period (payment interval) at the same time that interest is calculated.
ORDINARY PREFERENCE SHARE:	An ordinary preference share is a security that pays a constant dividend into perpetuity (if not convertible or redeemable).
ORDINARY SHARE:	This is a security offered to investors in order to raise capital for the company. Investors receive dividends as return on their investment as well as capital growth if the share price increases and they sell their shares.
ORGANISATIONAL STRUCTURE:	The structure of a business can be defined as organisational arrangements, systems for gathering together human, physical, financial, and information resources at all levels of the system.
PARTNERSHIP:	Partnership is where a business is formed by between two and twenty individuals or organisations. It is unincorporated. Partners are severally and jointly responsible for all the debts of the partnership.
PAR VALUE/ REDEMPTION VALUE/ NOMINAL VALUE/ FACE VALUE:	Par value is the stated value (nominal or face value) of bonds /debentures. This is the value which the holder will receive at redemption and also the value on which the bond or debenture pays interest.
PAYBACK PERIOD:	The period of time required to recoup the total capital amount invested through the cash generation from the project.

PERIODIC PAYMENT:	The periodic payment I or PMT, is the amount of the annuity, namely the stream of equal amounts, invested per period or the equal periodic repayments of a loan.
PERIODIC RATE:	The periodic rate is the rate charged by a lender or paid by a borrower each period.
PERMANENT WORKING CAPITAL:	Permanent working capital supports a constant minimum level of sales.
PERPETUITY:	Perpetuity means that the cash flow will be received or paid periodically at certain time intervals into infinity, since there is no termination date. Another example of a perpetuity would be a non-redeemable preference share paying a fixed dividend.
POLITICAL RISK:	Refers to the effect that detrimental political activities or political instability have on an organisation.
PRESENT VALUE:	The present value is the current value of future cash flows, determined by application of the discount rate (discounting).
PROFITABILITY:	Profitability is the term used to describe the annual return or compensation earned on an investment.
PROFITABILITY INDEX (PI):	The PI is the ratio of the present value of cash flows (PVCF) to the initial investment of the project. PI is also known as a benefit/cash ratio.
PROJECT ANALYSIS:	Project analysis is the detailed examination of all the technical specifications (operational), marketing (sales units, market, etc) and financial aspects (costs and revenues) and/or problems of a project before funds are allocated and work on it is started.
RATIO ANALYSIS:	Ratio analysis is a method whereby further calculations are performed on a set of financial statements and is intended to create more meaningful information. Ratio analysis can be made even more useful when we compare the calculated ratios to the same ratios calculated for previous years or to industry norms and other ratios of the same set.
RECEIVABLE DAYS:	Receivable days (or the debtor collection period) is a measurement of the number of days it takes the average debtor to pay for the goods/services taken on credit.
REPORTING RISK:	The risk refers to the provision of unreliable financial and non-financial information to all levels of management and other stakeholders.
REPUTATION RISK:	A loss of reputation is the adverse consequence created by bad publicity due to the materialisation of another risk.
RESIDUAL RISK:	Residual risk involves the assessment of risk AFTER taking into account the application of any internal controls, transfer or management responses to reduce the risk.

RETURN ON ASSETS (ROA):	This is a measure of performance generated on all the assets employed in the organisation and expresses earnings before interest and taxes (EBIT) as a percentage of the total assets employed.
RETURN ON EQUITY:	This is a measure of the performance realised by management for the equity holders (shareholders) and expresses net profit as a percentage of equity.
REVOLVING CREDIT:	Revolving credit allows the organisation to withdraw money up to the original limit once a certain percentage (20% to 30%) has been repaid.
RISK:	The typical dictionary definition of risk is a chance or possibility of danger, loss, injury or other adverse consequences.
RISK APPETITE:	The risk appetite is related to an organisation's strategy and may be expressed as the acceptable balance between growth, risk and return.
RISK ASSESSMENT:	Risks are analysed by considering the impact (potential damage or loss) and likelihood of the risk occurring. Risks are assessed at an inherent basis (risk exposure before considering risk responses) and residual basis (risk exposure after considering risk responses).
RISK CAPACITY:	This is the maximum amount of risk that the organisation can accept.
RISK CULTURE:	This is the set of shared attitudes, values and practices that characterise how an organisation considers risk in its day-to-day activities.
RISK FINANCING:	Maintaining a balance between the economic and operational cost of risk reducing measures and the achievement of the organisation's objectives.
RISK IDENTIFICATION:	The process to identify internal and external events, which could affect the achievement of the organisation's objectives. This includes risks and opportunities.
RISK MANAGEMENT PLAN:	It is the document of identified risks (derived with reference to the organisation's objectives) with the corresponding risk assessment to create risk responses.
RISK MONITORING:	Risk monitoring entails the continuous evaluation of the organisation operations to ensure the adequacy of control measures and to identify new risks to the organisation.
RISK OR EVENT IDENTIFICATION:	Risk or event identification is the process to identify internal and external events, which could affect the achievement of the organisation's objectives. This includes risks and opportunities.
RISK REGISTER:	A risk register is a summary of identified risks, which are listed, described and assessed/measured (based on their potential impact and likelihood).

RISK REPORTING:	Risk reporting is concerned with periodic (usually quarterly) reports to the stakeholders and the board of directors or a sub-committee of the board, such as the risk and compliance committee, setting out the organisation's risk management policies and to provide information for the stakeholders to evaluate whether the policies are effectively achieved.
RISK RESPONSE:	Measures to reduce the likelihood and/or impact rating of a risk event.
RISK-FREE RATE:	The risk-free rate is the return that can be earned on investments that has zero risk. An example of a risk-free instrument is government bonds and the return thereon will represent the risk-free rate.
RULING INTEREST RATE / MARKET RATE:	The market rate is the current or ruling market rate of return. It is obtained from similarly publicly traded instruments – a pre-tax rate.
SALE AND LEASEBACK:	Trading organisations who own fixed property at times find it more rewarding to sell the properties to a financial institution at a capital profit. A leaseback agreement for a reasonably long term is then entered into immediately, to protect the trading organisation (which operates from this premises) – the period can sometimes be as long as 30 years.
SHORT-TERM:	Short term refers to a period of one year or less.
SIMPLE INTEREST:	Simple interest is the interest calculated on the principal only for the entire term.
SINGLE CASH FLOW:	A single cash flow is a once-off (non-repetitive) cash inflow or outflow.
SOCIAL RISK:	Social risk relates to the impact of the organisation on the community and vice versa.
SOLE PROPRIETORSHIP:	Sole proprietorship is where a business is formed by a single individual who is the owner of that organisation. It is unincorporated, meaning the owner and the business is treated as the same legal persona.
SPECIFIC RISK:	This is the risk associated with an investment in a specific company.
STAKEHOLDERS:	Stakeholders are those persons and organisations that are affected by the activities of the organisation and therefore have an interest in the strategy of an organisation. Stakeholders include staff, shareholders, creditors, suppliers, customers, government, local authorities, professional bodies, pressure groups and the community at large.

STRATEGIC FINANCIAL MANAGEMENT:	Strategic financial management is the identification of possible strategies capable of maximising an organisation's net present value, the allocation of scarce capital resources among the competing opportunities and the implementation and monitoring of the chosen strategy so as to achieve stated objectives.
STRATEGIC OBJECTIVES:	Strategic objectives clearly formulate measures of progress and targets to be achieved in a specific time frame.
STRATEGIC PLANNING:	Strategic planning is the process of defining the organisation's strategy and making decisions about the allocation of its resources to follow this strategy. The allocation of resources includes the organisation's capital and people.
STRATEGIC RISK:	Strategic risks have more to do with the organisation's position and relation with the external environment in the long-term.
STRATEGY:	Strategy is about choosing long-term activities to achieve the purpose set out in the mission statement and ultimately moving towards realising the vision.
SUBSTITUTE PRODUCTS:	Substitute products refer to alternative products having the ability of satisfying customers' needs effectively (for example, plastic bottles instead of glass bottles).
SUSTAINABILITY FOR BUSINESSES:	Sustainability for a business means that all their products, processes and manufacturing activities meet customer needs, while at the same time treating the environment in such a manner that it does not decrease the ability of future generations to meet their own needs. This entails that products, processes and activities should be designed and executed in such a way that current environmental concerns (eg the use of renewable resources) are taken into account while still maintaining a profit. A business should use sustainable development and distribution methods to influence the environment, growth of the business and society. Sustainable development within a business can create value for its investors, customers and the environment.
SUSTAINABILITY FOR HUMANS:	Sustainability for humans is the potential for long-term maintenance of well-being which has environmental and social dimensions.
SUSTAINABLE CAPITAL BUDGETING:	Sustainable capital budgeting involves planning and evaluation of how funds are spent on capital investments that will ultimately add to the organisation's value while taking cognisance of the social, environmental and governance impact of the decision.
SWOT ANALYSIS:	The SWOT analysis approach is to identify and analyse internal and external factors that are of strategic importance, and classify them into strengths, weaknesses, opportunities and threats.

TAKE-OVER:	Take-over is the term used when referring to the transfer of control of a company from one group of shareholders to another group of shareholders.
TARGET CAPITAL STRUCTURE:	Target capital structure or optimal capital structure is a mix of the two capital components at which the share price is maximised – if all other things are kept the same.
TECHNOLOGICAL RISK:	Risk involved with the operation, ownership and sustainability of the organisation's information technology (IT) systems. Technological risks also refer to the manufacturing plant being outdated or a product being obsolete when a more technologically advanced product has replaced it.
TEMPORARY WORKING CAPITAL:	Temporary working capital supports seasonal peaks in the organisation's operations.
TRADE ACCOUNTS PAYABLE:	Trade accounts payable refers to the amount of purchases on credit that has to be paid to the suppliers/creditors in the near future. Total accounts payable may also include other accounts payable, which do not relate directly to the main operations (trading activities) of the organisation.
TRADITIONAL FINANCIAL MANAGEMENT:	Traditional financial management is the management and control of money and money-related operations within a business. Financial management therefore includes planning, organising and controlling the financial activities of a business. The financial activities include the acquiring of funds as well as the use of these funds by applying general management principles.
UNEQUAL CASH FLOW:	Unequal cash flows can occur repetitively at the end of each year or period (payment interval).
VISION STATEMENT:	The vision statement defines where the organisation wants to go in the future.
WORKING CAPITAL MANAGEMENT:	Working capital management refers to the controlling of balances included in the current assets and current liabilities, the way the related functions within the organisation are performed and the way working capital is financed.
WORKING CAPITAL POLICY:	The working capital policy of an organisation stipulates the appropriate amount for the net working capital balance and for each of its components (investment policy), and, in addition, how the net working capital balance should be financed (financing policy).
YIELD TO MATURITY (YTM):	The discount rate that achieves a net present value (NPV) of NIL for all the cash in- and outflows.

APPENDIX C

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IMPORTANT INFORMATION:

This appendix contains the second part of the module content.

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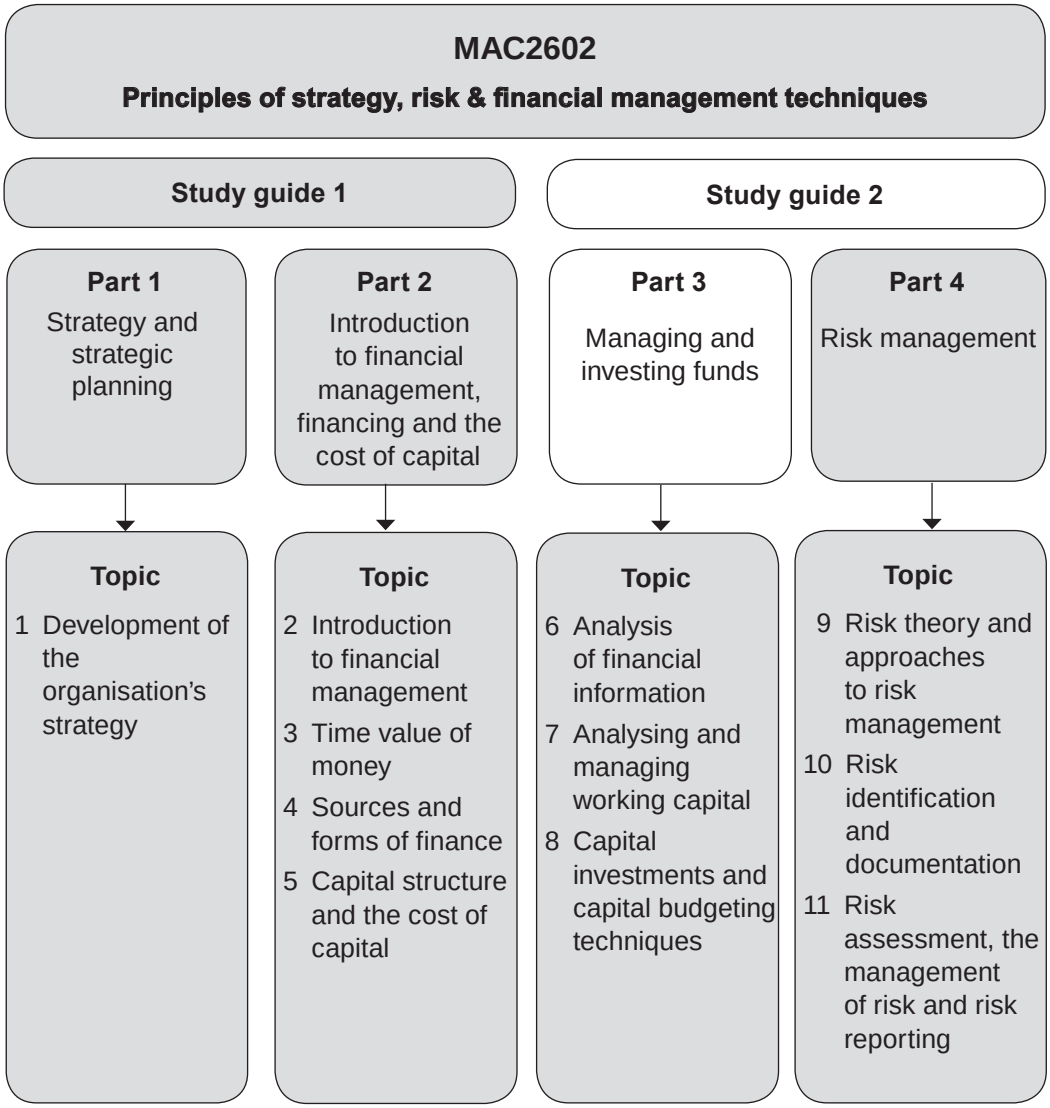
CONTENTS

Managing and investing funds



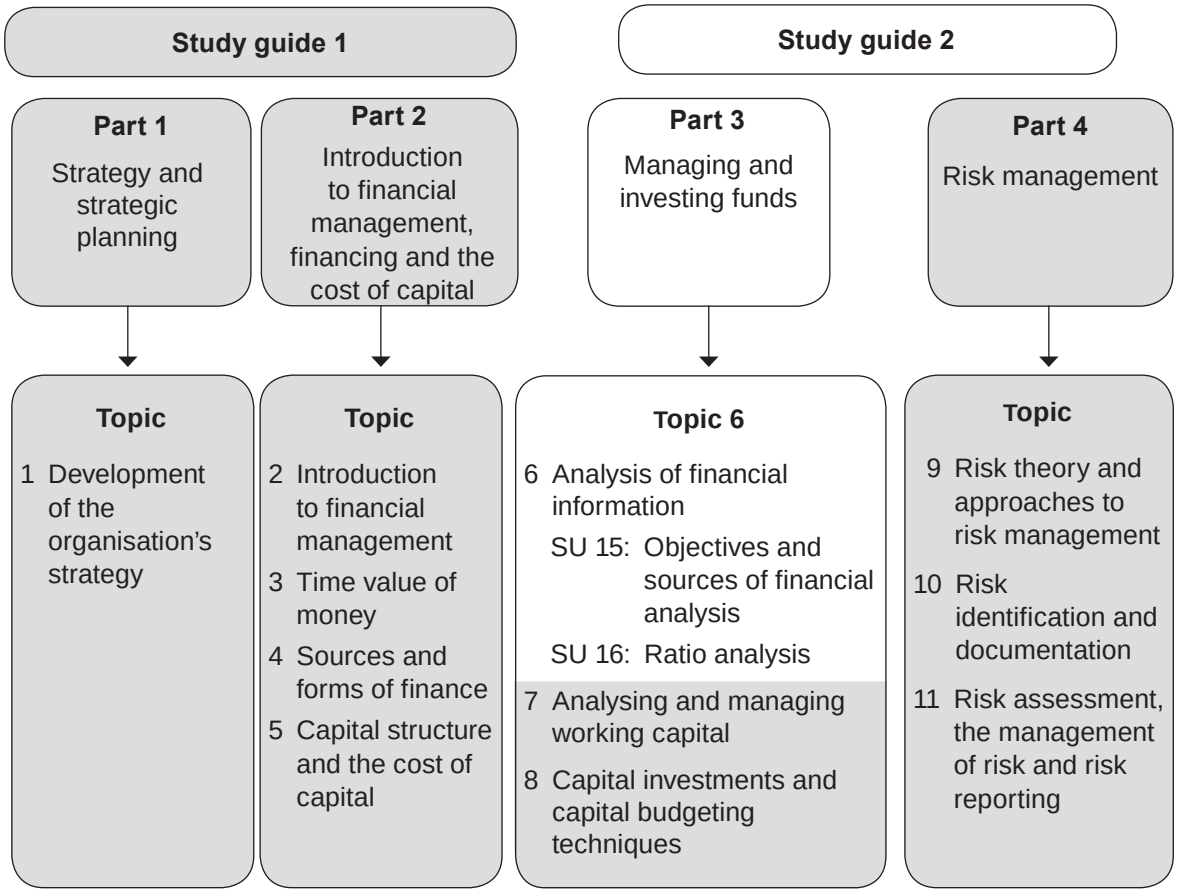
TOPIC 6

Analysis of financial information

LEARNING OUTCOMES

After studying this topic, you should be able to:

- define and identify the sources and limitations of financial information
- explain the objectives of financial analysis
- calculate, analyse and interpret growth rates and different ratios



INTRODUCTION

In this part of the guide we are teaching you how an organisation can manage its funds. To assist in the effective management of these funds, it is necessary to have knowledge about the organisation and its industry. Deeper knowledge will be gained by analysing financial and other information about the organisation and its industry.

Benjamin Franklin, an American statesman, once said:

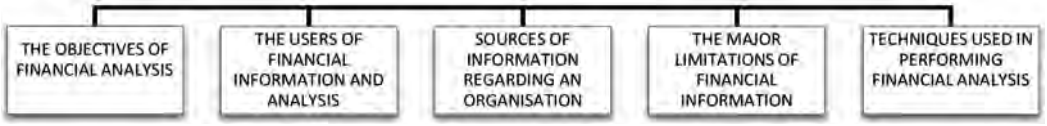
"An investment in knowledge pays the best interest."

When it comes to investments, nothing will pay off more than educating yourself. Do the necessary research, study and analyse before making any investment decisions, either in your personal capacity and/or as the manager of an organisation's funds.

STUDY UNIT 15

Objectives and sources of financial analysis

In this study unit



1 Introduction

In this unit, we will define, as well as identify, the objectives, users, sources and limitations of financial information. We will also discuss the techniques used in performing financial analysis.

2 The objectives of financial analysis

Analysis implies that financial information has to be examined or broken down in order to be useful.

ANALYSE

To analyse is to examine in detail in order to discover meaning or to break down into smaller parts.

The three main objectives of financial *analysis* are:

1. an evaluation of an organisation's prospects for the future (to help external fund providers with investment decisions)
2. to evaluate the performance of an organisation's management as reflected in an analysis of their historical financial information in the annual financial statements
3. for internal decision-making by management regarding investment of funds, cash management, and so on

Financial analysis will therefore assist in managing long- and short-term funds as well as guide decisions regarding distributions to the owners of an organisation. The management of short-term funds will be discussed in topic 7 and long-term funds in topic 8.

3 The users of financial information and analysis

The purpose of financial *reporting* is to satisfy the information needs of the users of the financial information. The financial reports are used for several purposes, including the evaluation of the organisation's financial performance, its current financial position and its cash generation and utilisation. The users of the financial information are outlined below:

a. Capital providers and financial analysts

Capital providers include current and potential new providers of share capital in the organisation and institutions which are or may lend money to the organisation. The equity holders are concerned about the prospects for growth and the lenders are more concerned about the organisation's cash flows and solvability (total assets exceeds total liabilities).

Investors analyse the financial information themselves in order to base their investment decisions on the outcome of such analysis, or make use of financial analysts to assist them. A financial analyst analyses financial information to forecast business, industry and economic conditions for use in making investment decisions. They then make recommendations about the investment value, whether to "buy" or "sell" or "hold" the shares or whether the debt is secure/safe ("hold").

b. Creditors

Creditors provide products and services to an organisation on credit. They have to be paid for the products and services and they are therefore concerned about the organisation's cash flows and liquidity (ability to meet short-term obligations).

c. Management

The organisations' own management includes the board of directors and managers of departments. The financial analysis can show their successes/strengths and failures/ weaknesses in running the business operations. They can use the analysis to correct mistakes and improve performance. The analysis assists them in managing the long- and short-term funds as well as decisions regarding the income distribution of the organisation.

d. Other users

Other users include employees, auditors and the South African Revenue Service (SARS).

Employees are concerned about profits earned by the organisation and how this is distributed; the ability of the organisation to pay their salaries; annual salary increases; and payments made to managers. Employee unions analyse the information on behalf of their members and use it in negotiations with management.

Financial analysis and interpretation will enable auditors to be in a better position to express an opinion regarding the fairness of the figures in the financial statements. The analysis would also indicate if the organisation is solvent and liquid, which will have an effect on the presentation and disclosure of the financial statements.

SARS uses the financial information to verify the income taxation received from the organisations.

4 Sources of information regarding an organisation

Information regarding an organisation can be grouped into two main categories, namely financial information and strategic information. We will investigate both in more detail now.

4.1 Financial information

FINANCIAL INFORMATION

Financial information refers to the financial results, position and cash flows of an organisation's business operations in a specific period, stated in rand and cent terms.

The main source of **historical** financial information about an organisation is its **annual report.** With a listed company, the financial statements are part of an organisation's annual report which provides information to the public about the organisation's operations, objectives and other relevant information.

You would know from your Financial Accounting modules that the financial statements consist of a statement of profit or loss and other comprehensive income, a statement of financial position, a statement of cash flows, a statement of changes in equity and notes to the financial statements. The directors' report and auditors' report also form part of the financial statements. This is mailed to all registered shareholders and is also available from the organisation's website.

As previously mentioned, the annual report of an organisation is the main source of financial information and therefore the financial analysis will be based on the information therein. The annual report contains at least the mandatory annual financial statements, but usually also provides a lot of feedback from the operations of an organisation. The first section contains the ***voluntary*** information. This section normally gives descriptive information about the organisation's operating results, a summary of the performances and new developments that may impact future performances. There is normally a letter from the chief executive officer or chairman and the executive director of each of the business units, as well as the finance and human resource directors. The second section consists of the annual financial statements. This section contains the information ***prescribed*** by statute and GAAP. The detail will be discussed in your Financial Accounting modules.

Financial information about organisations is also published in **newspapers and financial journals** like Businessweek, et cetera. Organisations are also increasingly publishing voluntary financial information, for example, results presentations to analysts and other forward-looking financial information, on their **websites**.

Activity 15.1

Access the following website of a company, Exxaro Ltd: www.exxaro.com. Exxaro is a South African-based mining group, listed on the JSE. Assume you are a potential investor. Can you identify the main source of financial information on the website? List briefly the types of financial information you could find there.

Feedback on activity 15.1

If you enter the website of Exxaro Ltd., you will find the home page. You will notice a heading/tab called "Investors/Annual report archive" or "Publications". The annual report of the different years can be viewed there, which is the main source of the organisation's historical financial information.

Other information that you will also find at the page called “Investors” is:

- Notice of the general meetings
- Financial archive
- Share data
- Financial calendar
- Analyst and broker information
- Shareholders’ analysis

4.2 Strategic (non-financial) information

It is important to note that “information” should include not only the financial information, but other **strategic information** about an organisation and its industry as well.

The strategic information about an organisation tells us how the business of the organisation is managed and what its long-term goals are. Disclosing this information is part of good corporate governance, which is guided by the King III Report and Code. It is intended that the King III Report should apply to all organisations. Refer to study unit 5, section 5 on corporate governance and sustainability.

Strategic information may include the following:

- the type of industry
- type of products or services
- the future prospects of the organisation
- market share of an organisation
- if the organisation has a major competitor (now or in the future)
- whether or not the organisation has a significant customer, single supplier
- legal and regulatory environment

Conditions wherein the organisation operates can either have a positive or negative effect on the organisation. These possible effects are discussed in your strategy and risk management topics.

Potential investors, for example, will have to also take account of such strategic information as part of their evaluation, before deciding on whether an organisation is a good investment option or not.

Strategic (non-financial) information can be found …

- in the voluntary section of the annual report.
- on the organisation’s website (presentations to analysts, about us, etc).
- articles in financial journals and/or industry journals, such as SA Mining.

Activity 15.2

Use the same website as in Activity 15.1: www.exxaro.com. Exxaro is a South African-based mining group, listed on JSE. Can you find and list strategic information which may affect the organisation?

Feedback on activity 15.2

If you enter the website of Exxaro Ltd., you will find the home page. You will notice a heading called "Publications". In the annual report, you can find the following strategic information:

- The type of industry – Exxaro is a mining company. [Home page]
- Type of products or services – "Exxaro is a diverse resources group with a portfolio of coal, mineral sands and base metals assets as well as a significant indirect interest in iron ore." [Home page]
- The future prospects of the organisation – The new projects are listed on the web page and from that we can see that the future prospects of Exxaro is strong and positive. [Year under review/Growth]
- If the organisation has a competitor (now or in the future) – This will not necessarily be published on the website. Information on this can be obtained from industry reports, management or minutes of the meetings of the board of directors.
- Does the organisation have a significant customer, single supplier? – This is part of the risk management of the company where the sustainability of the operations are discussed and rated. [Sustainability/Risk management]
- Legal and regulatory environment – This information can be found under the Governance section of the annual report. [Annual Report / Governance review]

5 The major limitations of financial information

a. The financial information is the responsibility of the directors as stated in the directors' report. It is reviewed by independent auditors who then state their opinion regarding the fairness of the financial performance, position and cash flows in the financial statements. The audit does not guarantee the total **accuracy**, but only give a fair level of assurance that the figures presented are in accordance with International Financial Reporting Standards (IFRS) in the case of a listed company. We can therefore never assume that the financial information is 100% accurate.

b. Another limitation of the financial statements is that they are, to an extent, subjective and reflective of the judgement of the accountants who prepared it. Although the IFRS helps to align the **accounting policies** of an organisation, there are still certain industry-specific transactions that may have an effect on the way the financial information is accounted for, or technical errors may occur.

c. In some instances, financial statements still reflect information on a historical cost basis, and thus do not include the effect of **inflation** or changes in, for example, an asset's **value**. The result is that true fair market values are often not reflected for non-financial instruments in the statement of financial position. For example, in South Africa, the inflation rate has been high for a number of years until recently, which may result in the carrying value of certain assets not being reflective of their fair market value.

d. Financial statements represent **past results** which will not necessarily predict what the future results will be. The annual report also has a tendency not to reflect all the failures and mistakes and can exaggerate achievements of management. Future market trends like: new competitors, smaller markets or substitute products, economic conditions like foreign exchange factors and future management are all factors not included in the historical financial information provided in the financial statements. However, information

about this might be presented in the operational reviews presented in the first part of a typical annual report, or in the *Investor Relations* pages on the website.

e. There is limited guidance on **forward-looking** information of an organisation. Organisations can be sued if they don't achieve specific targets. See the disclaimer on the website of Exxaro:

> Disclaimer of Exxaro:
>
> Warranties
>
> 1. Exxaro does not give any warranty or representation; express or implied, relating to information contained on this website or on any other website linked to this website or the accuracy of such information.
> 2. Exxaro does not warrant that this website or any website to which this website is linked or the content thereof is error free.
> 3. Exxaro does not give any warranty or representation, other than any warranty or representation that has been expressly set out in these terms and conditions.
>
> Forward-looking information
>
> This report includes certain information that is based on management's reasonable expectations and assumptions. These forward-looking statements include, but are not limited to, statements regarding estimates, intentions and beliefs, as well as anticipated future productions, reserves, costs and market conditions. While management has prepared this information using the best of their experience and judgement, in all good faith, there are risks and uncertainties involved which could cause results to differ from projections.

6 Techniques used in performing financial analysis

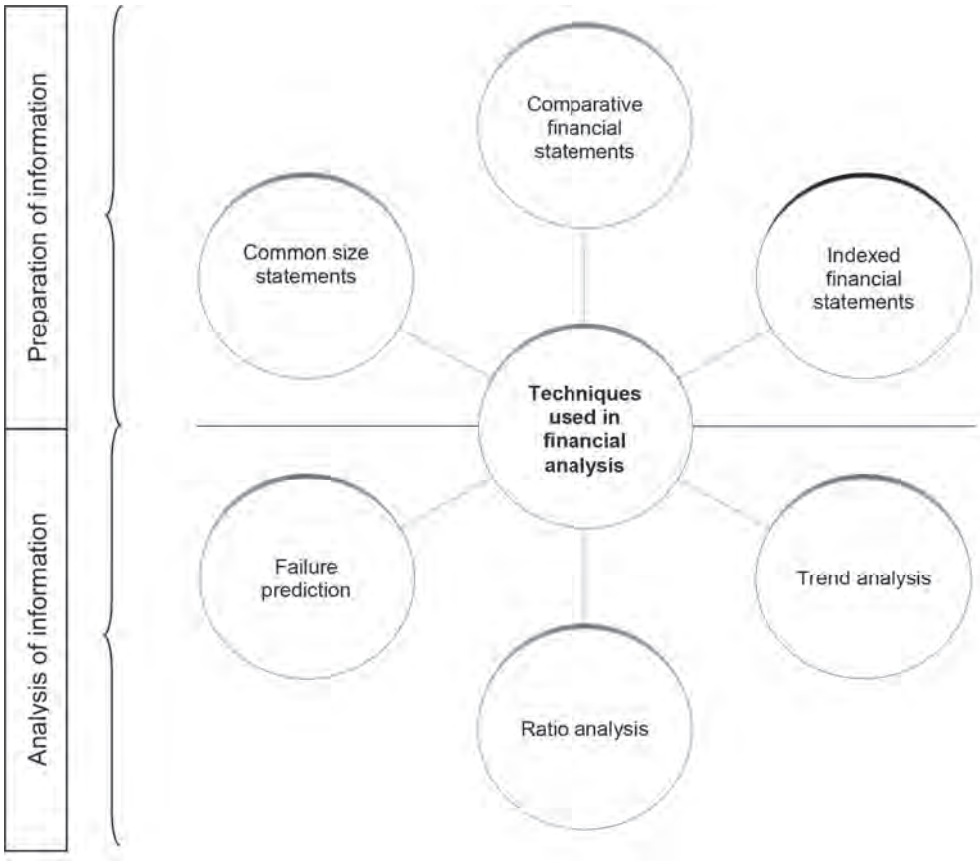
We have already explained that "to analyse" means to examine in detail in order to discover meaning or to break down into smaller parts in order to make information useful.

NOTE

In this topic we will focus on the analysis of financial information. If strategic or non-financial information is provided in the question, you should use it to give **context to the financial analysis**. For example, turnover decreased by 25% because a new competitor entered the market or because of cheap imports.

Various techniques can be used for the analysis of financial information in order to arrive at a conclusion about the organisation. The information will always be **compared** with the previous years' results or industry/similar organisation averages. This **comparison** gives more meaning to the information.

Below is figure 15.1 that illustrates the different techniques in performing financial analysis on historical financial information.



Source: Author, 2012

FIGURE 15.1: Different techniques for performing financial analysis on historical financial information

In the case of the three techniques in the top part of figure 15.1, namely, **comparative financial statements, common size statements** and **indexed financial statements**, the financial statements have to be redrafted (redoing the financial statements in a different format) to prepare the information for analysis.

a. Comparative financial statements offer the statements in a table format for a required period of time, for example, five or ten years. The trend over the years can then be calculated and analysed.
b. Indexed financial statements are redrafted on an indexed basis in order to overcome some of the limitations of the comparative financial statements. The same table format is used, but the first year is shown as the base year (set equal to 100) and the subsequent years and figures are shown as percentages of that year. This gives the reader a good overview of the growth or decline from the base year to a certain date. This can also be presented in a graph.
c. Common size statements are redrafted to normalise financial statements whereby each item on the statements are stated as a percentage of the total of the specific section. For example, in the statement of financial position, current and non-current assets will be stated as a percentage of the total assets; in the statement of profit or loss and other comprehensive income, the figures will be stated as a percentage of revenue.

Activity 15.3

You are given the following comparative statement of profit or loss and other comprehensive income of World Cup Ltd for five years:

	20x5 R'000	20x4 R'000	20x3 R'000	20x2 R'000	20x1 R'000
Revenue	3 640	2 552	1 506	2 054	1 569
Cost of sales	(1 503)	(998)	(525)	(553)	(402)
Gross profit	2 137	1 554	981	1 501	1 167
Operating costs	(778)	(650)	(445)	(506)	(150)
Distribution costs	(258)	(203)	(145)	(123)	(53)
Administrative expenses	(15)	(13)	(11)	(14)	(9)
Other expenses	(3)	(36)	(32)	(22)	(26)
Net operating profit /(loss)	1 083	652	348	836	929
Interest and other income	39	36	25	19	22
Earnings before interest and tax (EBIT)	1 122	688	373	855	951
Interest expense	(106)	(102)	(54)	(86)	(93)
Profit before tax	1 016	586	319	769	858
Income tax expense	(284)	(164)	(89)	(215)	(240)
Net profit	732	422	230	554	618

REQUIRED

Redraft the comparative statement of profit or loss and other comprehensive income of World Cup Ltd by using the following techniques:

a. indexed statements

b. common size statements

Feedback on activity 15.3

a. Indexed statements

	20x5 %	20x4 %	20x3 %	20x2 %	20x1 %
Revenue	232	163	96	131	100
Cost of sales	374	248	131	138	100
Gross profit	183	133	84	129	100
Operating costs	519	433	297	337	100
Distribution costs	487	383	274	232	100
Administrative expenses	167	144	122	156	100
Other expenses	12	138	123	85	100
Net operating profit /(loss)	117	70	37	90	100
Interest and other income	177	164	114	86	100
Earnings before interest and tax	118	72	39	90	100
Interest expense	114	110	58	92	100
Profit before tax	118	68	37	90	100
Income tax expense	118	68	37	90	100
Net profit	118	68	37	90	100

b. Common size statements

	20x5 %	20x4 %	20x3 %	20x2 %	20x1 %
Revenue	100,0	100,0	100,0	100,0	100,0
Cost of sales	41,3	39,1	34,9	26,9	25,6
Gross profit	58,7	60,9	65,1	73,1	74,4
Operating costs	21,4	25,5	29,5	24,6	9,6
Distribution costs	7,1	8,0	9,6	6,0	3,4
Administrative expenses	0,4	0,5	0,7	0,7	0,6
Other expenses	0,1	1,4	2,1	1,1	1,7
Net operating profit /(loss)	29,8	25,5	23,1	40,7	59,2
Interest and other income	1,1	1,4	1,7	0,9	1,4
Earnings before interest and tax	30,8	27,0	24,8	41,6	60,6
Interest expense	2,9	4,0	3,6	4,2	5,9
Profit before tax	27,9	23,0	21,2	37,4	54,7
Income tax expense	7,8	6,4	5,9	10,5	15,3
Net profit	20,1	16,5	15,3	27,0	39,4

NOTE

Can you see from the common size statements that the gross profit % declined from 74,4% (20x1) to 58,7% (20x5) and the net operating profit % almost halved from 59,2% (20x1) to 29,8% (20x5)? This is confirmed by viewing the indexed statements: cost of sales, operating costs and distribution costs reflect an unusually high increase from the base year (20x1).

Indicated in the bottom left part of figure 15.1 is **failure prediction**, which is a technique, used to predict the possibility of failure of an organisation – in advance. This will assist management to take precautionary steps to prevent such a failure.

Indicated in the bottom right part of figure 15.1 is **trend analysis**, which is a technique that is used to determine the trends in financial results of an organisation. This technique is used after other techniques, for example, the comparative financial statements, common size statements or indexed financial statements have been applied. The trend of the figures in these statements is determined in order to identify whether the organisation is heading in the right direction or not.

There will be more detailed discussions on these two techniques in your later MAC modules.

Indicated in the bottom part of figure 15.1 is **ratio analysis**, which is a very important technique as it is the most informative one. It gives essential information to the analysts about almost all the aspects of an organisation. We will discuss ratio analysis in more detail in the next study unit.

7 Summary

In this study unit, we have discussed the objectives of financial analysis. The users of financial information and analysis were listed and we have indicated how they will use the financial analysis to their benefit. We have also discussed the main source of financial information which is the annual report. We have also listed and discussed the major limitations of financial information. We presented a broad overview of the different techniques to be used in financial analysis.

The technique that we will be focusing on is ratio analysis which will be discussed in detail in the next study unit.

Self-assessment activity

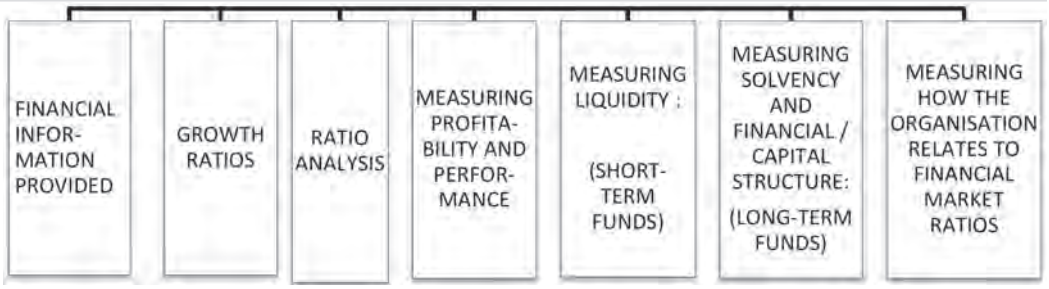
After having worked through the study unit, you should be able to answer the following questions:

a. What are the purposes or objectives of financial analysis?
b. Define financial information.
c. What is the main source of financial information?
d. What are the limitations of financial information provided by the organisation?
e. Name the users of financial analysis and how they will use the information for their benefit.
f. Name the different techniques that can be applied in financial analysis.
g. Describe briefly how each technique is used in performing financial analysis.

STUDY UNIT 16

Ratio analysis

In this study unit



1 Introduction

In the previous study unit, we discussed the objectives and sources of financial information and analysis. In this study unit, we will be focusing on the calculation, analysis and interpretation of growth percentages and ratios.

We will illustrate calculations of growth percentages as well as different ratios. These calculations, in turn, will be analysed and interpreted in order to increase our understanding of, amongst other things, the organisations operations and how to manage the long- and short-term funds of the organisation.

2 Financial information provided

We will now illustrate how to perform calculations, analysis and interpretation of some key ratios. The statement of profit or loss and other comprehensive income and statement of financial position of Anco Limited, presented below, will be used as the source of information throughout this study unit.

Anco Limited (or Anco Ltd)

Statement of profit or loss and other comprehensive income for the period ended 31 December 20x2

	20x2 R'000	20x1 R'000
Revenue	6 633	5 960
Cost of sales	(3 655)	(3 125)
Gross profit	2 978	2 835
Operating costs	(1 506)	(1 206)
Distribution costs	(650)	(539)
Administrative expenses	(205)	(246)
Other expenses	(156)	(78)
Net operating profit /(loss)	461	766
Interest and other income	55	36
Earnings before interest and tax (EBIT)	516	802
Interest expense	(335)	(265)
Profit before tax	181	537
Income tax expense	(54)	(161)
Net profit [#]	127	376

[#] *Without minority interest, this is also equal to earnings attributable to shareholders in this case study.*

Statement of financial position as at 31 December 20x2

	20x2 R'000	20x1 R'000
ASSETS		
Non-current assets		
Property, plant and equipment	7 254	6 652
Other investments	655	569
Total non-current assets	7 909	7 221
Current assets		
Inventories	290	303
Trade and other receivables	250	222
Cash and cash equivalents	354	156
Total current assets	894	681
TOTAL ASSETS	8 803	7 902
EQUITY AND LIABILITIES		
Capital and reserves		
Share capital	1 000	1 000
Retained earnings	1 646	1 519
Total equity	2 646	2 519
Non-current liabilities		
Interest-bearing borrowings	5 220	4 770
Deferred tax	332	299
Total non-current liabilities	5 552	5 069
Current liabilities		
Trade and other payables	365	245
Current tax payable	89	48
Current provisions	151	21
Total current liabilities	605	314
TOTAL EQUITY AND LIABILITIES	8 803	7 902

The following additional information applies:

- Anco Ltd has 5 million authorised shares. They have issued 1 000 000 shares.
- Assume that 100% of ordinary shares were recently valued at R3 million (20x1: R2,8 million) and that the market value of all liabilities equals the carrying value for both years.
- The market value of each share after the release of these audited annual financial statements was 300 cents[a] (20x1: 280 cents[a])
- The dividend per share is 6 cents[a] (20x1: 5 cents[a])
- The opening balance of inventory for 20x1 was R79 000.

- The opening balance of capital and reserves for 20x1 was R2 350 000 and for total assets it was R7 530 000.
- The amount of sales on credit is 60% of revenue for both years.
- Actual purchases made by Anco Limited on credit were R3 642 000 (20x2) and R3 349 000 (20x1).
- Value added tax (VAT) is calculated at a rate of 14%.

[a] Note that in the normal practice of the financial markets, share prices and figures such as dividend per share are expressed in cents, not rands.

NOTE

For the simplification of calculations below, the thousands in the figures were not shown.

3 Growth ratios

GROWTH RATE

Growth rate simply refers to the percentage that a line item in an organisation's financial information has increased or decreased from one period/year to another.

The growth rate provides an indication of the success of the organisation's operations over a number of periods or years. The method of calculating the growth rate is, for this example, as follows:

Key formula: GROWTH RATE

$$\frac{\text{Year 20x2} - \text{Year 20x1}}{\text{Year 20x1}} \times 100$$

NOTE

1. The annual growth rate is calculated relative to the earlier period/year (in this case the year 20x1, which is used as the denominator – to be written below the line in the calculation).
2. Growth rates can also be used to index figures by keeping the denominator constant and equal to the base year for all the years covered in the table. You had practice doing that with the indexed statements.

When there is an increase or decrease in the growth rate, further comparison and investigation should be done in order for the result to be sensible. It can also be read in conjunction with other ratios analysed, which may help clarify the results, for example, borrowings increased, leading to positive growth in the interest expense.

Growth rates can be calculated on figures in the statement of profit or loss and other comprehensive income as well as the statement of financial position and statement of cash flows.

Activity 16.1

Calculate the growth rate for Anco Ltd for the year ended 31 December 20x2 in the following line items:

a. revenue
b. cost of sales
c. operating costs
d. interest expense
e. profit for the year
f. property, plant and equipment
g. inventory

Feedback on activity 16.1

Growth rate calculations:

a. Revenue

$$\frac{\text{Year 20x2} - \text{Year 20x1}}{\text{Year 20x1}} \times 100 = \frac{673}{5\,960} \times 100$$

$$= 11{,}29\% \text{ growth (increase)}$$

Revenue has increased with 11,29% from Year 20x1 to Year 20x2.

b. Cost of sales

$$\frac{\text{Year 20x2} - \text{Year 20x1}}{\text{Year 20x1}} \times 100 = \frac{530}{3\,125} \times 100$$

$$= 16{,}96\% \text{ growth (increase)}$$

Cost of sales has increased with 16,96% from Year 20x1 to Year 20x2.

c. Operating costs

$$\frac{\text{Year 20x2} - \text{Year 20x1}}{\text{Year 20x1}} \times 100 = \frac{300}{1\,206} \times 100$$

$$= 24{,}88\% \text{ growth (increase)}$$

Operating costs has increased with 24,88% from Year 20x1 to Year 20x2.

d. Interest expense

$$\frac{\text{Year 20x2} - \text{Year 20x1}}{\text{Year 20x1}} \times 100 = \frac{70}{265} \times 100$$

$$= 26{,}42\% \text{ growth (increase)}$$

Interest expense has increased with 26,42% from Year 20x1 to Year 20x2.

e. Profit for the year (net profit)

$$\frac{\text{Year 20x2} - \text{Year 20x1}}{\text{Year 20x1}} \times 100 = \frac{(249)}{376} \times 100$$

$$= 66{,}22\% \text{ decline (decrease)}$$

Basic interpretation:

Profit for the year decreased by 66,22% from Year 20x1 to Year 20x2. Although revenue increased, the expenses increased by a higher percentage, resulting in the decline in the profit.

f. Property, plant and equipment

$$\frac{\text{Year 20x2} - \text{Year 20x1}}{\text{Year 20x1}} \times 100 = \frac{602}{6\ 652} \times 100$$

$$= 9{,}05\% \text{ growth (increase)}$$

Property, plant and equipment have increased with 9,05% from Year 20x1 to Year 20x2.

g. Inventory

$$\frac{\text{Year 20x2} - \text{Year 20x1}}{\text{Year 20x1}} \times 100 = \frac{(13)}{303} \times 100$$

$$= -4{,}29\% \text{ decline (decrease)}$$

Inventory has decreased with 4,29% from Year 20x1 to Year 20x2.

NOTE

When answering growth and ratio analysis questions where you have to comment and interpret the answer, you will NOT earn marks for merely stating, for example, cost of sales increased by 11%. You should bring ratios in context with one another and with the background information provided in the question.

4 Ratio analysis

Ratio analysis is a financial analysis technique and designed to assist in the evaluation of an organisation's financial results and the starting point for successful financial management.

RATIO ANALYSIS

Ratio analysis is a method whereby further calculations are performed on a set of financial statements and is intended to create more meaningful information. Ratio analysis can be made even more useful when we compare the calculated ratios to the same ratios calculated for previous years or to industry norms and other ratios of the same set.

We have grouped the ratios in the following four classifications:

1. **Profitability and performance**

   Profit is an important measure of an organisation's success. Within a certain time-horizon an organisation has to be profitable to both survive and to ensure continued support and funding from equity and debt providers. Profitability ratios only measure the organisation's success in generating profits. To enable us to make informed decisions and judgements, we need to also relate the profits to other financial information, for example, inflation or the exchange rate. Performance ratios and calculations also indicate if sufficient returns were generated.

2. **Liquidity**

   Liquidity ratios measure the organisation's ability to meet short-term financial obligations. Lenders and suppliers who provide products and services on credit are concerned about these ratios. It also provides an indication of the efficiency in which an organisation's current assets are managed.

3. **Solvency and financial/capital structure**

   Solvency and financial/capital structure ratios measure the organisation's financial health. Here we can ask for example: Is the organisation able to pay its debts, or is it in financial distress? Are the organisation's assets sufficient to cover its liabilities? Is the balance between debt and equity in an organisation's capital structure proper given its specific business environment and industry? Too much debt will increase the organisation's cost of funding.

4. **Financial market**

   The aforementioned categories of ratios largely relate to the internal management of an organisation and are more under the control of management. In contrast, the financial market is not controllable by management and is normally of specific interest to investors. The ratios and calculations that fall under this category can also be used by management to assist them in making dividend decisions, which will be discussed in your later MAC modules. It is also used in calculating the cost of different classes of funding, and used in valuations. You will learn about this in your third-year MAC module, MAC3702.

The answers to your ratio calculations can be classified as:

a. **percentages** (normally where calculating margins, growth, or changes in figures);
b. **cover ratios** (normally expressed as the "number of times", for example, "revenue covers (exceeds) total assets 2 times"), or
c. **proportional ratios** (normally where something is expressed relative to something else, for example debt to equity or "the asset turnover equals 2:1" *(but, importantly, the latter figure represents the "1" – we therefore do not use 1:0,5 for example)*).

Further notice that the formulae below represent **general** formulae and that, in some cases, alternative and additional formulae are available. We recommend that you follow the formulae in this guide, but also recommend that you always show the formula used in your calculation, where appropriate.

Activity 16.2 (Enrichment activity)

Access Aspen Holdings' website at www.aspenpharma.com and open the 2011 Annual Report. Page to the "Ten Year Review" and the "Definitions and Formulas".

Feedback on activity 16.2

Did you notice the slight variations from the general ratio definitions?

Figure 16.1 show the important margins and ratios that belong to the categories of profitability, liquidity, solvency and financial market.

Profitability and performance	Liquidity	Solvency and financial/capital structure	Financial market
• Gross profit margin • Operating profit margin • Net profit margin • Return of equity (ROE) • Return on assets (ROA) • Asset turnover	• Current ratio • Liquid asset ratio (or acid test or quick ratio) • Receivable days (debtors' collection period) • Payable days (creditors' payment period) • Inventory days • Inventory turnover ratio (times) • Cash conversion cycle – days • Cash ratio	• Interest cover ratio • Debt to equity ratio • Debt ratio (or gearing) • Total assets to total debt ratio • Financial leverage ROE:ROA	• Earnings per share • Dividend payout ratio • Dividend cover ratio • Price earnings ratio • Earnings yield • Dividend yield

Source: Author, 2012

FIGURE 16.1: Categories and common ratios

5 Measuring profitability and performance

5.1 Profit margins

There are three types of profit margins namely, the gross profit, operating profit and the net profit margin.

Key formula: GROSS PROFIT MARGIN

$$\frac{\text{Gross profit}}{\text{Revenue}} \times 100$$

Where **Gross profit** = Revenue – Cost of sales

The gross profit margin is calculated by stating gross profit as a percentage of revenue for the period. The gross profit margin shows the proportion of sales that is available to cover other expenses and to earn a profit, after accounting for cost of goods sold. For certain stable industries, this percentage will normally be fairly constant from one year to the next (stable industries may create stable conditions, justifying stable mark-ups).

Changes in these percentages should be traced back to factors that have an effect on gross profit, for example, trade discounts, mark-ups, purchasing details (like bulk discounts or theft), inventory levels, inventory valuation policies, and changes in the scale of operations.

Changes in mark-up percentages may affect revenue and the gross profit of the organisation. An increase in the mark-up will increase the profit earned on each item sold, due to the higher selling price of each item, but the higher prices may discourage customers, which may then result in lower total sales and lower total net profit. You will learn more about setting of selling prices in MAC2601 and later modules.

The gross profit (GP) margin is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Gross profit}}{\text{Revenue}} \times 100$	=	$\frac{2\ 978}{6\ 633} \times 100$	=	$\frac{2\ 835}{5\ 960} \times 100$
	=	44,90%	=	47,57%

- The gross profit margin has decreased from 47,57% in 20x1 to 44,90% in 20x2.
- The change in gross profit margin is relatively small (depending on industry) indicating that mark-up has not changed significantly.
- This reduction is slightly disconcerting, however, as it took place in spite of a likely increase in the scale of operations of the organisation. (We can assume that the scale of operations increased as the revenue grew by 11,29% during this time – this growth percentage probably exceeds the inflation rate during the same period; if revenue growth equals the inflation rate over a period then there is effectively no real growth.) When the scale of operations increase, we might expect savings due to efficiencies of scale (fixed costs spread over more products). This would result in improved gross profits. See cost-volume-profit analysis in MAC2601.
- A lower gross profit margin might be the result of a number of factors, including cost of sales inflated (eg where inventory is obsolete or unpopular) and old or stolen inventory.

Key formula: OPERATING PROFIT MARGIN

$$\frac{\text{Operating profit}}{\text{Revenue}} \times 100$$

Where **operating profit** = profit after accounting for operating expenditure, but before finance cost, tax and investment income. The latter items are excluded as it does not form part of the operating activities of an organisation.

The operating profit margin is the operating profit expressed as a percentage of revenue. Changes in this percentage can be ascribed to the change in the gross profit margin or the changes in the operating costs, for example, administrative, distribution and other operating expenses.

The operating profit margin is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Operating profit}}{\text{Revenue}} \times 100$	=	$\frac{461}{6\ 633} \times 100$	=	$\frac{766}{5\ 960} \times 100$
	=	6,95%	=	12,85%

- The operating profit margin has decreased from 12,85% in 20x1 to 6,95% in 20x2.
- This is attributable to the decrease in the GP margin and the increase in the overall operating costs, in particular, operating cost, distribution cost and other expenses. There was a slight saving in administrative expenses that had a small positive effect.
- As a management accountant, you would analyse the growth rates of these expenses in detail.

Key formula: NET PROFIT MARGIN

$$\frac{\text{Net profit}}{\text{Revenue}} \times 100$$

Where **net profit** = profit after accounting for finance cost, tax and investment income, or the final "bottom line".

The net profit margin expresses the relationship between net profit and revenue and gives an indication of the overall profitability of an organisation. It also gives insight into management's overall performance.

The net profit (NP) margin is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Net profit}}{\text{Revenue}} \times 100$	=	$\frac{127}{6\,633} \times 100$	=	$\frac{376}{5\,960} \times 100$
	=	1,91%	=	6,31%

- The net profit margin has decreased from 6,31% in 20x1 to 1,91% in 20x2.
- This is attributable to the decrease in GP margin, and the increase in overall operating costs and interest expense.
- The slight increase in interest and other income had a small positive effect.

5.2 Performance ratios

There are three types of performance ratios namely, return on equity, return on assets and asset turnover.

Return on equity (ROE) is a measure of the performance realised by management for the equity holders (shareholders) and expresses net profit as a percentage of equity. In this module, we will only be focusing on ordinary shareholders. The effect of minority interests will be covered in MAC3702.

Key formula: RETURN ON EQUITY (ROE)

$$\frac{\text{Net profit}}{\text{Equity}} \times 100$$

NOTE

ROE measures the organisation's ability to earn a return on the owners'/shareholders' capital. In order to calculate a meaningful return, we seek a relationship between the figure

used as the numerator (above the line) and the figure on which the return is calculated – the denominator (used below the line). Firstly, you should realise that equity holders receive their reward last; after all other expenses have been paid, including the interest paid to the providers of debt capital. It is therefore appropriate to use net profit as the numerator in this calculation (above the line) as it represents the remaining amount, after all other expenses have been paid; and furthermore, net profit is normally available for distribution as a dividend to the holders of equity. (The exact proportion paid out as a dividend and other considerations are discussed in your later MAC modules.)

The ROE is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Net profit}}{\text{Equity}} \times 100$	=	$\frac{127}{1\,646} \times 100$	=	$\frac{376}{2\,519} \times 100$
	=	4,80%	=	14,93%

- The ROE has decreased from 14,93% in 20x1 to 4,80% in 20x2.
- The reason for the decrease is to be found in the significant decrease in the net profit and a slight increase in the carrying value of equity.

To overcome movements in equity in the year, this return is sometimes also calculated based on opening balances of capital and reserves or on the average of the opening and closing balances.

Based on the opening balance basis, the ROE is now calculated as follows:

		20x2		**20x1**
$\frac{\text{Net profit}}{\text{Equity}} \times 100$	=	$\frac{127}{2\,519} \times 100$	=	$\frac{376}{2\,350^{①}} \times 100$
	=	5,04%	=	16,00%

① See additional information provided.

Based on the average basis, the ROE is now calculated as follows:

		20x2		**20x1**
$\frac{\text{Net profit}}{\text{Equity}} \times 100$	=	$\frac{127}{2\,583^{①}} \times 100$	=	$\frac{376}{2\,435^{②}} \times 100$
	=	4,92%	=	15,44%

① (2 646 + 2 519) ÷ 2 = 2 583
② (2 519 + 2 350) ÷ 2 = 2 435

- The ROE based on the averages are normally more accurate, as it assumes that the movements in equity were spread during the year.

- The ROE calculation based on the market value of Anco Ltd:

		20x2		20x1
$\frac{\text{Net profit}}{\text{Equity}} \times 100$	=	$\frac{127}{3\,000} \times 100$	=	$\frac{376}{2\,800} \times 100$
	=	4,22%	=	13,43%

- Based on the market value of the equity, the ROE has decreased from 13,43% in 20x1 to 4,22% in 20x2.
- The ROE based on market values are less than based on book values.
- The market values give a better indication of the true ROE.

Return on total assets (ROA) is a measure of the performance generated on all the assets employed in the business and expresses EBIT as a percentage of the total assets employed.

Key formula: RETURN ON TOTAL ASSETS (ROA)

$$\frac{\text{EBIT}}{\text{Total assets}} \times 100$$

NOTE

In calculating this return, we once again seek a relationship between the figure used as the numerator (above the line) and the figure on which the return is calculated – the denominator (used below the line). The appropriate return generated on total assets, to be used as the numerator (above the line), is EBIT as this figure includes the operating profit, and interest and other income earned by the total assets. Recall that total assets consist of non-current assets (property, plant and equipment) and current assets (inventories, trade and other receivables, other investments as well as cash and cash equivalents).

Capital-intensive businesses, such as airlines and companies involved in heavy industry, will normally display a low ROA as a great investment in assets is required in order for these businesses to generate a return. Against this, organisations requiring a low investment in assets, such as service organisations, generally display a higher ROA. **For this reason, ROA is normally only comparable between organisations in similar industries.**

The ROA is calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{EBIT}}{\text{Total assets}} \times 100$	=	$\frac{516}{8\,803} \times 100$	=	$\frac{802}{7\,902} \times 100$
	=	5,86%	=	10,15%

- The ROA has decreased from 10,15% in 20x1 to 5,86% in 20x2.
- The reason for the decrease is that the EBIT decreased and total assets increased.

- This implies that the organisation bought new assets, but generated an overall lower return on the new total assets.
- This poor performance may be caused by a lack of skills in managing the new assets or the timing of the investment, for example, if invested close to the year-end, it would not have had time yet to deliver a return.

To overcome movements in assets during the year, this return is sometimes also calculated based on opening balances of total assets or on the average of the opening and closing balances.

Based on the opening balance basis, the ROA is now calculated as follows:

		20x2		**20x1**
$\frac{\text{EBIT}}{\text{Total assets}} \times 100$	=	$\frac{516}{7\,902} \times 100$	=	$\frac{802}{7\,530^{①}} \times 100$
	=	6,53%	=	10,65%

① See additional information provided.

Based on the average basis, the ROA is now calculated as follows:

		20x2		**20x1**
$\frac{\text{EBIT}}{\text{Total assets}} \times 100$	=	$\frac{516}{8\,353^{①}} \times 100$	=	$\frac{802}{7\,716^{②}} \times 100$
	=	6,18%	=	10,39%

① (8 803 + 7 902) ; 2 = 8 353
② (7 902 + 7 530) ; 2 = 7 716

- The ROA based on the averages are normally more accurate, as it assumes that the movements in assets were spread during the year.

The ROA calculation based on the market value of Anco Ltd:

		20x2		**20x1**
$\frac{\text{EBIT}}{\text{Total assets}} \times 100$	=	$\frac{516}{9\,157^{①}} \times 100$	=	$\frac{802}{8\,183^{②}} \times 100$
	=	5,64%	=	9,80%

① 3 000 + 5 552 + 605 = 9 157
② 2 800 + 5 069 + 314 = 8 183

- Based on the market value of the equity, the ROA has decreased from 9,80% in 20x1 to 5,64% in 20x2.
- The ROA based on market values are less than the return based on carrying values.
- The market values give a better indication of the true ROA.

NOTE

As total assets = total equity and liabilities, we can also use the "other side" of the statement of financial position to calculate the market value of total assets. We just substitute the accounting carrying value of equity with the market value of equity.

Return on operating assets and other assets can also be calculated by using a return attributable to the specific asset as the numerator (above the line) and the value of the specific asset as the denominator (below the line). This will be dealt with on third-year level.

DU PONT RATIO

Du Pont ratio is a method that breaks down the return on total asset ratio (ROA) into two components – a profit margin and an asset turnover rate.

The return on total asset ratio (ROA) broken down into the two components (Du Pont ratio) is done by merely incorporating revenue as both a numerator and denominator, as follows:

Key formula: DU PONT RATIO

$$\frac{\text{EBIT}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Assets}} = \frac{\text{EBIT}}{\text{Assets}}$$

Asset turnover is normally expressed as a simple ratio (number of times) and not as a percentage. It shows how much revenue is generated per rand invested in total assets. An organisation that generates more revenue with a given number of assets is more efficient in this regard (this is also industry dependent).

NOTE

The impact of depreciation: Non-current assets that are old and have a low book value will generate a higher asset turnover than an organisation with newer assets, even if they are in the same industry.

Key formula: ASSET TURNOVER

$$\frac{\text{Revenue}}{\text{Total assets}} \times 100$$

The asset turnover is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Revenue}}{\text{Total assets}}$	=	$\frac{6\ 633}{8\ 803}$	=	$\frac{5\ 960}{7\ 902}$
	=	0,75 times	=	0,75 times

- The asset turnover remained constant at 0,75 times for both 20x1 and 20x2.

- This implies that the organisation is generating the same revenue given the total asset investment.
- This can also be compared with industry averages. If this ratio is below industry averages, ways and means should be sought to make more efficient use of assets: Revenue should be increased, or unproductive assets should be sold, or a combination of these two.

The different **profit margins** were illustrated in the beginning of section 5. The profit margin that we use in the Du Pont ratio, is the earnings before interest and tax (EBIT) divided by revenue.

Key formula: EBIT PROFIT MARGIN

$$\frac{\text{EBIT}}{\text{Revenue}} \times 100$$

The EBIT profit margin is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{EBIT}}{\text{Revenue}} \times 100$	=	$\frac{516}{6\,633}$	=	$\frac{802}{5\,960}$
	=	7,78%	=	13,46%

- The EBIT profit margin decreased from 13,46% in 20x1 to 7,78% in 20x2.
- This is attributable to the decrease in the GP margin and the increase in the overall operating costs, in particular, operating cost, distribution cost and other expenses. There was a slight saving in administrative expenses that had a small positive effect.

Therefore: ROA =

$$\frac{\text{EBIT}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Assets}} = \frac{\text{EBIT}}{\text{Assets}}$$

	20x2		**20x1**
=	0,75 x 7,78%	=	0,75 x 13,46%
=	5,84%	=	10,10%

- The ROA has decreased from 10,10% in 20x1 to 5,84% in 20x2.
- Compare this with the first ROA calculation above. Can you see the answer is the same? *(The rounding to 2 decimals creates a small difference!)*

6 Measuring liquidity – short-term funds

A business organisation's liquidity is very important to its operations. These ratios indicate the ability of the organisation to generate and conserve cash from its working capital. (Working capital refers to the current assets and current liabilities, which is directly related to the operating activities of an organisation. It will be discussed in detail in topic 7.) We discuss these ratios separately below, each under a separate heading.

6.1 Current ratio

This is the primary measure of an organisation's liquidity. This ratio is best viewed within the context of a particular industry. However, for most types of businesses, current assets should be more than current liabilities to ensure liquidity, which means that the ratio should exceed 1, but a ratio that is too high can indicate one of the following conditions: Current assets might be overstated (valued too high), current assets are not converted into cash fast enough, or too much money is tied up in non-productive current assets. For many organisations, the current ratio remains close to 2:1, but this can differ significantly per industry. For example, due to its particular trade environment, food retailers and wholesalers often have a current ratio below 1:1, which is the result of buying most/all of its inventory (normally its largest current asset) on credit, but selling most goods on a cash-basis. Notice that this ratio is stated as a number, not as a percentage.

Key formula: CURRENT RATIO

Current assets:Current liabilities

The current ratio is calculated for Anco Ltd:

		20x2		**20x1**
Current assets:Current liabilities	=	894:605	=	681:314
	=	1,48:1	=	2,17:1

- The current ratio has decreased from 2,17:1 in 20x1 to 1,48:1 in 20x2.
- The decrease to 1,48 implies that R1 of current liabilities are covered by only R1,48 of current assets.
- To properly evaluate this change, additional knowledge of the industry in which Anco Ltd operates should be sought. The current ratio of Anco Ltd should then be compared to the average of the industry, or rather, to organisations representing "best practice" for the industry.

6.2 Liquid asset ratio (or acid test or quick ratio)

This ratio is more conservative than the current ratio and recognises the fact that inventory may take longer to convert into cash than other current assets, such as accounts receivable. For many businesses the liquid asset ratio remains close to 1:1, but this can differ significantly per industry.

Key formula: LIQUID ASSET RATIO

Current assets *less* inventory:Current liabilities

The liquid asset ratio is calculated for Anco Ltd:

		20x2		**20x1**
Current assets *less* inventory:Current liabilities	=	604:605	=	378:314
	=	1,00:1	=	1,20:1

- The liquid asset ratio has decreased from 1,20:1 in 20x1 to 1,00:1 in 20x2.

- Although there is a decrease, it still shows that the organisation can meet its current liabilities without much difficulty.
- To properly evaluate this change, additional knowledge of the industry in which Anco Ltd operates should again be sought.

6.3 Inventory days

This calculation measures the days of sales in inventory and indicates the period an inventory item will lie in stock from its purchase (in the case of a reseller) or production (in the case of a manufacturer) up to date of sale. As revenue increase, we expect the inventory levels to increase as well, to ensure that the organisation does not run out of stock (when the organisation is out of stock, it will lose customers and sales). In such a case, however, the inventory days should still remain fairly constant. An increase in the inventory days may mean that the organisation does not properly manage inventory levels; a decrease in inventory days implies lower inventory holding costs to the organisation, but may have a negative effect where this results in an out-of-stock scenario.

Key formula: INVENTORY DAYS

$$\frac{\text{Inventory}}{\text{Cost of sales}} \times 365 \text{ (or x 12 if months are used)}$$

The inventory days is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Inventory}}{\text{Cost of sales}} \times 365$	=	$\frac{290}{3\,655} \times 365$	=	$\frac{303}{3\,125} \times 365$
	=	29 days	=	35 days

- The inventory days decreased from 35 days in 20x1 to 29 days in 20x2.
- This decrease implies that inventory has been managed better, especially considering that revenue has increased with 11%.
- The organisation should ensure, however, that it does have sufficient inventory so as not to reach an out-of-stock situation.

NOTE

Sometimes the working capital days are calculated based on 360 days (30 days per month). Please read the question carefully to see what number you should use.

6.4 Inventory turnover ratio

The inventory turnover ratio is a measure of the number of times inventory is sold or used in a year. This calculation is the inverse of the inventory days. A low turnover is not good, as the value of inventory tend to decline as they are in the warehouse for longer periods and inventory holding costs are higher. Organisations that are selling fresh products have a very high turnover.

Key formula: INVENTORY TURNOVER RATIO (RATE)

$$\frac{\text{Cost of sales}}{\text{Inventory}}$$

The inventory turnover rate is calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{Cost of sales}}{\text{Inventory}}$	=	$\frac{3\ 655}{290}$	=	$\frac{3\ 125}{303}$
	=	12,60 times	=	10,31 times

- The inventory turnover rate increased from 10,31 times in 20x1 to 12,60 times in 20x2.
- The increase is normally an indication of good inventory management. It also could lead to saving in costs like inventory holding costs.

If average inventory is used, the calculation will be as follows:

Key formula: INVENTORY TURNOVER RATIO (RATE) – FOR AVERAGE INVENTORY

$$\frac{\text{Cost of sales}}{\text{Average inventory}}$$

The inventory turnover rate is calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{Cost of sales}}{\text{Average inventory}}$	=	$\frac{3\ 655}{297^{①}}$	=	$\frac{3\ 125}{191^{②}}$
	=	12,33 times	=	16,36 times

① (290 + 303) ÷ 2 = 297
② (303 + 79) ÷ 2 = 191

- The inventory turnover rate decreased from 16,36 times in 20x1 to 12,33 times in 20x2.
- The big difference in the turnover rate in 20x1 is due to the low opening balance of inventory in the beginning of 20x1.
- The decrease in the turnover rate could indicate that the organisation's inventory levels are too high.
- As cost of sales occur over the entire year, it is better to use an average inventory measure.

6.5 Receivable days (debtors' collection period)

This calculation measures the number of days it takes for credit sales to be converted into cash, or for the average debtor to pay his debt. For most organisations, debtors should pay within a month or two of the sale (once again this will normally display a trend within an industry) so average receivable days should not exceed 30 days or 60 days, with too much, respectively. Notice that the longer the organisation takes to collect the cash, the more difficult it becomes. Debtors exceeding the allowed payment terms represent a greater

risk of becoming "bad debt" or irrecoverable. As the trade receivables amount includes VAT, the credit sales should also be calculated inclusive of VAT.

NOTE

If information on different sales categories are given, remember to split the export sales from the local sales, as there is no VAT on export sales.

Key formula: RECEIVABLE DAYS (DEBTORS' COLLECTION PERIOD)

$$\frac{\text{Receivables (trade and other debtors)}}{\text{Credit sales}} \times 365 \text{ (or x 12 if months are used)}$$

The receivable days is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Receivables}}{\text{Credit sales}} \times 365$	=	$\frac{250}{4\ 537^{①}} \times 365$	=	$\frac{222}{4\ 077^{②}} \times 365$
	=	20 days	=	20 days

① 6 633 x 60% x 1,14 = 4 537
② 5 960 x 60% x 1,14 = 4 077

- The receivable days stayed constant on 20 days for both 20x1 and 20x2.
- This answer is best compared to that of the industry, but is nonetheless positive as sales have increased by 11% (see paragraph 0) and the collection period has not changed.

Normally, an increase in revenue can result in an increase in debtors, but we expect the ratio to stay the same, for example, 15 ÷ 150 x 365 = 36,5 days and if both increase, the number of days stay the same: 16 ÷ 160 x 365 = 36,5 days. If the ratio gets worse, it means that the organisation has increased the revenue by allowing "easy" debt. Although profits may increase, it can become risky as the organisation may run into cash flow problems, or debtors may not pay.

6.6 Payable days (creditors' payment period)

This calculation measures the number of days it takes for the organisation to pay its creditors. For most organisations, a period between 30 and 60 days are considered to be normal. Current payables are a form of finance that is mostly free, dependant on timely payment discounts (if not taken then there is an "opportunity costs" to this) and other late payment costs (such as interest on overdue accounts charged by the creditor). The efficient management of payable days will depend on a number of factors, including industry norms and credit terms. As the trade payables amount includes VAT, the credit purchases should also be calculated inclusive of VAT.

Key formula: PAYABLE DAYS (CREDITORS' PAYMENT PERIOD)

$$\frac{\text{Payables (trade and other creditors)}}{\text{Credit purchases}} \times 365 \text{ (or x 12 if months are used)}$$

The payable days is calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{Payables}}{\text{Credit purchases}} \times 365$	=	$\frac{365}{4\ 152^{①}} \times 365$	=	$\frac{245}{3\ 818^{②}} \times 365$
	=	32 days	=	23 days

① 3 642 x 1,14 = 4 152
② 3 349 x 1,14 = 3 818

- The payable days has increased from 23 days in 20x1 to 32 days in 20x2.
- The 23 day period in 20x1 is almost the same as the 20 receivable days in 20x1, which is not a good indication for cash flow management.
- The increase to 32 days in this scenario can be interpreted as positive as it is greater than the corresponding receivable days, thereby financing the receivables and a portion of inventory, but is dependent on a number of factors, including its effect on supplier relationships. It should also be compared to the norm for the industry.

6.7 Cash conversion cycle (days)

The cash conversion cycle indicates the number of days it takes for cash to flow through the operating activities, from initial purchases on credit, until it is eventually converted into a cash inflow. The cycle is determined by taking the receivable days, adding the inventory days and subtracting the payable days. If the number of days in the cycle decreases, it indicates an improvement in the cash flow from operating activities.

The cash conversion cycle days is calculated for Anco Ltd:

	20x2	20x1
Period of credit taken by customers (Receivable days)	20	20
Plus: Number of days of inventory (Inventory days)	29	35
	49	55
Less: Period of credit granted by suppliers (Payable days)	(32)	(23)
Total cash conversion cycle	17 days	32 days

- The cash conversion cycle days has decreased from 32 days in 20x1 to 17 days in 20x2.
- This implies that the organisation has improved its cash flow from operating activities.

NOTE

In topic 7 on working capital management you will learn more about techniques to manage the cash conversion cycle and its components to remain within industry norms and funding available to the organisation.

6.8 Cash ratio

The cash ratio is not commonly used, but can be used to determine the organisation's immediate ability to pay its short-term obligations. The higher the ratio, the more liquid the organisation, but too high a ratio can also mean "*unproductive cash*" that is not generating a sufficient return (eg a return that could have been generated if it was invested in assets and investments).

Key formula: CASH RATIO

$$\frac{\text{Cash}}{\text{Current liabilities}}$$

NOTE

Unproductive cash: Bank balances with positive balances earn much lower interest than when it's invested in the money market or fixed term investments. Ultimately, funds should not lie in cash, but be invested in operating assets that generate higher returns.

The cash ratio is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Cash}}{\text{Current liabilities}}$	=	$\frac{354}{605}$	=	$\frac{156}{314}$
	=	0,59 times	=	0,50 times

- The cash ratio has increased from 0,50 times in 20x1 to 0,59 times in 20x2, but has not changed much.
- As the resulting ratios are below 1, it implies that cash cannot cover short-term obligations in either year.
- This will be of concern only if there is a possibility of trade and other payables suspending credit (consider increased accounts payable days/creditors' payment period, with a possible strain on relationships), or debt providers cancelling the loan agreement (consider the terms and conditions in the loan agreement).

7 Measuring solvency and financial/capital structure – long-term funds

These ratios tell more about the organisation's ability to repay its long-term debts, which include the repayment of the capital and also the payment of interest. It provides information about the risk that shareholders and debt providers are taking. These ratios are sensitive to the industry. We discuss these ratios separately below – each under a separate heading.

7.1 Interest cover ratio

This ratio measures the number of times the operating profit will cover the interest expense. The more times earnings before interest and tax (EBIT) cover the interest, the safer it is to borrow additional funds.

Key formula: INTEREST COVER RATIO

$$\frac{\text{EBIT}}{\text{Interest expense}}$$

The interest cover ratio is calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{EBIT}}{\text{Interest expense}}$	=	$\frac{516}{335}$	=	$\frac{802}{265}$
	=	1,54 times	=	3,03 times

- The interest cover ratio has decreased from 3,03 times in 20x1 to 1,54 times in 20x2.
- As the coverage is declining, it indicates that the organisation probably cannot afford to significantly increase interest-bearing debt in its capital structure.

7.2 Debt to equity ratio (or leverage ratio)

The debt to equity ratio is an important ratio as it measures the level of financial risk (as discussed in the part on risk management of this study guide). Debt financing creates an obligation that has to be settled, for example, through capital and interest payments that has to be paid whether the organisation can afford it or not, thereby creating financial risk.

The debt to equity ratio measures the relationship between an organisation's debt financing (financing with an obligation to settle, as mentioned) and equity financing (financing without an obligation to settle, eg dividends may be paid but isn't compulsory).

For the purposes of calculating this ratio, debt financing commonly comprises only long-term interest-bearing debt (including its current portion, which is normally payable within the next 12 months); equity comprises the organisation's assets less liabilities belonging to shareholders, or simply put, the total shareholders' interest. When determining the debt-portion of this ratio, non-interest bearing debt and current liabilities (other than the current portion of long-term debt, if any) are usually excluded, as we are concerned here with the portion of debt representing long-term capital financing.

Key formula: DEBT TO EQUITY RATIO

Long-term interest bearing debt (including its current portion):Equity

The debt to equity ratio is calculated for Anco Ltd:

		20x2		20x1
Long-term debt[#] (including its current portion):Equity	=	5 220 + 0[①]:2 646	=	4 770 + 0[①]:2 519
	=	1,97:1	=	1,89:1

[#]Long-term debt is long-term interest bearing debt.
[①] In this case there is no current portion of long-term debt.

- The debt to equity ratio has increased from 1,89:1 in 20x1 to 1,97:1 in 20x2.
- Both ratios indicate that the organisation has high gearing, as the long-term debt portion is nearly twice as much as the equity portion.
- Notice that this calculation used carrying values, which often understates the value of equity. (We therefore prefer that this ratio be calculated based on market values, as detailed below.)

The debt to equity calculation based on the market value of Anco Ltd:

		20x2		20x1
Long-term debt[#] (including its current portion):Equity	=	5 220 + 0[①]:3 000	=	4 770 + 0[①]:2 800
	=	1,74:1	=	1,70:1

[#] Long-term debt is long-term interest bearing debt.
[①] In this case there is no current portion of long-term debt.

- Based on the market values, the debt to equity ratio has increased from 1,70:1 in 20x1 to 1,74:1 in 20x2.
- The debt to equity ratio based on market values is still relatively high, but less than the ratio based on carrying values as equity is not understated in this case.
- The market values give a better indication of the true debt to equity ratio.

7.3 Debt ratio (or gearing ratio)

This ratio measures the percentage of total funds provided by holders of debt, including all forms of debt. It tells us how much of the organisation's assets are financed by total debt. A high debt ratio is risky to investors, debt providers and other creditors as it points to higher financing risk.

Key formula: DEBT RATIO

$$\frac{\text{Total debt}}{\text{Total assets}} \times 100$$

The debt ratio is calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{Total debt}}{\text{Total assets}} \times 100$	=	$\frac{6\ 157^{①}}{8\ 803} \times 100$	=	$\frac{5\ 383^{②}}{7\ 902} \times 100$
	=	69,94%	=	68,12%

[①] 5 552 + 605 = 6 157
[②] 5 069 + 314 = 5 383

- The debt ratio has increased slightly from 68,12% in 20x1 to 69,94% in 20x2.
- Both these percentages are considered high in most industries, the norm being about 50%. Note that this is also industry dependant.

The debt ratio calculation based on the market value of Anco Ltd:

		20x2		20x1
$\frac{\text{Total debt}}{\text{Total assets}} \times 100$	=	$\frac{6\ 157^{①}}{9\ 157^{③}} \times 100$	=	$\frac{5\ 383^{②}}{8\ 183^{④}} \times 100$
	=	67,24%	=	65,78%

[①] 5 552 + 605 = 6 157 and
[②] 5 069 + 314 = 5 383

Total assets = Total debt + total equity, therefore:

[③] 6 157 + 3 000 = 9 157 and
[④] 5 383 + 2 800 = 8 183

The debt ratio has increased from 65,78% in 20x1 to 67,24% in 20x2. The debt ratio based on market values is slightly less than based on carrying values as equity is not understated in this case. The market values give a better indication of the true debt ratio.

7.4 Total assets to total debt

This ratio indicates the number of times debt is covered by assets. The same figures are used as in the debt ratio above, just in the inverse. In this case, the higher the ratio, the lower the risk is for investors and creditors.

Key formula: TOTAL ASSETS TO TOTAL DEBT

$$\frac{\text{Total assets}}{\text{Total debt}}$$

The total assets to total debt ratio is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Total assets}}{\text{Total debt}}$	=	$\frac{8\ 803}{6\ 157}$	=	$\frac{7\ 902}{5\ 383}$
	=	1,43 times	=	1,47 times

- The ratio has decreased from 1,47 times in 20x1 to 1,43 times in 20x2.
- Both these ratios are considered too low in most industries (a similar unfavourable result as for the debt ratio above).

The total assets to total debt calculation based on the market value of Anco Ltd:

		20x2		**20x1**
$\frac{\text{Total assets}}{\text{Total debt}}$	=	$\frac{9\ 157}{6\ 157}$	=	$\frac{8\ 183}{5\ 383}$
	=	1,49 times	=	1,52 times

- The ratio has decreased from 1,52 times in 20x1 to 1,49 times in 20x2.
- The total assets to total debt ratio based on market values is higher than that based on carrying values (book values).
- The market values give a better indication of the total assets to total debt ratio.

7.5 Financial leverage effect

This ratio refers to the degree the organisation is utilising (leveraging) debt when they acquire additional assets in order to increase the returns to equity holders. This ratio should be evaluated in conjunction with the capital expenditure for the period and changes in the gearing ratio. The ratio should be greater than one, indicating that returns to equity holders (ROE) has benefited from debt financing of assets. It can also indicate that a high amount of borrowed funds are used in high risk investments in order to maximise the returns for equity holders.

Key formula: FINANCIAL LEVERAGE EFFECT

Return on equity (ROE):Return on assets (ROA)

The financial leverage is calculated for Anco Ltd:

		20x2		20x1
Return on equity (ROE)*: Return on assets (ROA)*	=	4,80:5,86	=	14,93:10,15
	=	0,82:1	=	1,47:1
and Gearing ratio (debt ratio)	=	69,94%	=	68,12%

(*See profitability ratios)

- The financial leverage has decreased from 1,47:1 in 20x1 to 0,82:1 in 20x2.
- The gearing (debt) ratio only increased slightly. This means that new capital expenditure was funded in the same debt to equity ratio as before.
- The gearing (debt) ratio is already quite high, limiting the extent to which further debt financing can be obtained.
- In the absence of increased gearing (debt ratio), we would expect the same returns as before.
- However, as discussed before, both the ROE and ROA declined due to lower profits.

The leverage effect is:

		20x2		20x1
ROE*	=	4,80%	=	14,93%
Less: ROA*	=	5,86%	=	10,15%
	=	(1,06)%	=	4,78%

(*See profitability ratios)

- The financial leverage effect has decreased from 4,78% in 20x1 to –1,06% in 20x2.
- The decrease in the financial leverage effect is an indication of the inefficient use of borrowed funds.
- The ROE is an indication of the return the shareholders receive on their investment.
- The negative return in 20x2 is shows that the organisation did not use the borrowed or own funds effectively.

8 Measuring how the organisation relates to financial market ratios

When measuring how the organisation is judged or valued by the financial market, several ratios and other calculations can assist in the process. Here we highlight only a few.

8.1 Earnings per share

Earnings per share (EPS) are an organisation's net profit (after minority interest) divided by the number of ordinary shares issued. EPS will be used later in calculating the price/earnings ratio.

Key formula: EARNINGS PER SHARE

$$\frac{\text{Earnings (or net profit)}}{\text{Number of shares issued}}$$

EPS represents historical financial information and is therefore also subject to the limitations in financial information as discussed in study unit 15, section 5. Notice further that EPS can be manipulated to an extent by making changes in accounting policies.

NOTE

The finer calculations involving diluted earnings, normalised earnings, headline earnings, et cetera, will be covered in later FAC and MAC modules.

The earnings per share are calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{Earnings (or net profit)}}{\text{Number of shares issued}}$	=	$\frac{127}{1\,000}$	=	$\frac{376}{1\,000}$
	=	R0,127	=	R0,376
	=	12,7 cents[a]	=	37,6 cents[a]

[a] Notice that in the financial markets, earnings per share are normally expressed in cents, not rands.

- The earnings per share have decreased from 37,6 cents in 20x1 to 12,7 cents in 20x2.
- This decrease is mainly attributable to the decrease in GP margin, and the increase in overall operating costs and interest expense.
- The slight increase in interest and other income had a small positive effect.

8.2 Dividend pay-out ratio

This ratio indicates the proportion of earnings per share paid out to the shareholders in the form of a dividend. A low dividend pay-out ratio can indicate that the organisation is in a growth phase and is retaining money to invest in profitable projects (which might eventually increase the share price and or allow for the payment of greater future dividends). Warren Buffet, the well-known investor and CEO of Berkshire Hathaway Inc, a US conglomerate, famously follows a general policy of not paying any dividends to investors in this conglomerate, instead choosing to reinvest funds in order to generate capital growth. An individual company might, however, have a high dividend pay-out ratio where its investors prefer high current pay-outs rather than capital growth, or where the organisation represents a mature organisation in a stable phase of its life-cycle (no expansions are envisioned). Furthermore, dividend pay-out ratios are sometimes comparable between business organisations within the same industry.

Key formula: DIVIDEND PAY-OUT RATIO

$$\frac{\text{Dividend per share (DPS)}}{\text{Earnings per share (EPS)}}$$

The dividend pay-out ratio is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Dividend per share (DPS)}}{\text{Earnings per share (EPS)}}$	=	$\frac{6}{12,7}$	=	$\frac{5}{37,6}$
	=	47,24%	=	13,30%

- The dividend pay-out ratio has increased from 13,30% in 20x1 to 47,24% in 20x2.
- The ratio increased as a greater proportion of the earnings per share was paid out to shareholders in 20x2 in the form of a dividend.
- The dividend itself increased from 5 cents to 6 cents.

NOTE

Organisations usually try to keep their dividends constant or to increase it slightly if they feel confident that they can maintain the new level in the future. In times of decreasing earnings, the pay-out ratio would therefore increase "artificially". You will learn more about distributions to equity holders in your later MAC modules.

Organisations that have a low dividend pay-out ratio, say below 60% of earnings, will have more money to invest back into the organisation and grow the share price.

8.3 Dividend cover ratio

Dividend cover measures an organisation's ability to pay its dividend payments to the shareholders. A healthy, growing company will have a high coverage ratio, which indicates that it has little difficulty in paying its dividends, and is retaining earnings (cash) to fund expansion projects. The dividend cover is the inverse of dividend pay-out ratio, which was calculated above. Normally, a ratio of 2 or higher is considered that the organisation can well afford the dividend, and anything below 1,5 is risky. When the ratio is below 1, the organisation is using its retained earnings from a previous year to pay this year's dividend.

Key formula: DIVIDEND COVER RATIO

$$\frac{\text{Earnings per share (EPS)}}{\text{Dividend per share (DPS)}}$$

The dividend cover ratio is calculated for Anco Ltd:

		20x2		**20x1**
$\frac{\text{Earnings per share (EPS)}}{\text{Dividend per share (DPS)}}$	=	$\frac{12,7}{6}$	=	$\frac{37,6}{5}$
	=	2,12 times	=	7,52 times

- The dividend cover ratio has decreased from 7,52 times in 20x1 to 2,12 times in 20x2.
- The ratio decreased as there are less EPS in 20x2 to cover the higher dividend per share.
- As the ratio in 20x2 is higher than 2, it shows that the organisation can still well afford the dividend payment.

8.4 Price/earnings ratio

The price/earnings (P/E) ratio, also known as a P/E-multiple, expresses the relationship between the market price of an organisation's shares and its earnings per share (both variables have to be available). The P/E ratio can be considered as "the number of years' earnings that are represented by the current share price" (SAICA, 2009:4).

Key formula: PRICE/EARNINGS RATIO

$$\frac{\text{Share price}}{\text{Earning per share (EPS)}}$$

Generally, the market price of the shares of an unlisted (private) organisation is not easily available. A P/E ratio is therefore normally only calculated for listed organisations, which have published share market prices (based on regular buy and sell transactions on a securities exchange), or for private organisations where there was a recent share transaction or where the value of the private shareholding was recently quantified by a specialist appraiser. In fact, appraisers often make use of a market-comparable approach to value a private shareholding, using a method that utilises the P/E multiple of a similar listed organisation as a point of departure in the valuation.

NOTE

You will learn more about valuations and the different market indicators used in your third-year MAC modules.

The price/earnings ratio is calculated for Anco Ltd:

		20x2		**20x1**
Share price	=	300,0	=	280,0
Earning per share (EPS)		12,7		37,6
	=	23,62	=	7,45

- The price/earnings ratio has increased from 7,45 in 20x1 to 23,62 in 20x2.
- Although the earnings per share decreased in 20x2, the share price still increased slightly, even after release of the downturn in the EPS, and this resulted in a higher P/E ratio. In other words, roughly a year ago the market priced a share at 7,45 times the 20x1 EPS, but currently it prices a share at 23,62 times the 20x2 EPS.
- A higher P/E ratio in this case, is a sign of optimism in the future, relative to the poor EPS on which it is based. This implies that the market expects the EPS to improve significantly in the future which will bring the P/E ratio back to previous levels, or slightly higher.
- P/E ratios can be placed in a better context by comparing them to the P/E ratios of similar (normally listed) organisations, calculated at the same date.

8.5 Earnings yield

The earnings yield is the inverse of the price/earnings (P/E) ratio.

Key term: EARNINGS YIELD

The earnings yield on an organisation's share is an estimate of the expected return from the organisation's share. The future earnings is expressed as a percentage of the value of the share. The earnings yield can also be determined by finding a comparable earnings yield from a similar share and adjust it for growth and risk.

Key formula: EARNINGS YIELD

$$\frac{\text{Earnings per share (EPS)}}{\text{Share price}}$$

The earnings yield is calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{Earnings per share (EPS)}}{\text{Share price}}$	=	$\frac{12,7}{300,0}$	=	$\frac{37,6}{280,0}$
	=	4,23%	=	13,43%

- The earnings yield has decreased from 13,43% in 20x1 to 4,23% in 20x2.
- The earnings per share decreased in 20x2 AND the share price still increased slightly. This combination resulted in a lower earnings yield.
- A lower earnings yield is a sign of optimism in the future, relative to the EPS on which it is based. This implies that the market expects the EPS to improve significantly in the future.
- Earnings yields can be placed in a better context by comparing them to the earnings yields of similar (normally listed) organisations, calculated at the same date.

8.6 Dividend yield

The dividend yield measures the return from distributions that the shareholders will earn from their investments in relation to the share price. The higher the dividend (distribution) is, the higher the return will be.

DIVIDEND YIELD

The dividend yield on an organisation's share is the organisation's total annual dividend payments divided by its price per share. The dividend yield can also be determined by finding a comparable dividend yield from a similar share and adjust it for growth and risk.

Key formula: DIVIDEND YIELD

$$\frac{\text{Dividend per share (DPS)}}{\text{Share price}}$$

The dividend yield is calculated for Anco Ltd:

		20x2		20x1
$\frac{\text{Dividend per share (DPS)}}{\text{Share price}}$	=	$\frac{6,0}{300,0}$	=	$\frac{5,0}{280,0}$
	=	2,00%	=	1,79%

- The dividend yield has increased from 1,79% in 20x1 to 2,00% in 20x2.
- Although the dividend per share increased in 20x2, the share price also increased slightly. This still resulted in a slightly higher dividend yield.
- A higher dividend yield is a sign of a higher return to the shareholders, but does not necessarily indicate whether the organisation is profitable or not.
- Dividend yields can be placed in a better context by comparing them to the dividend yields of similar (normally listed) organisations, calculated at the same date.

NOTE

Remember: where appropriate, always show your calculations and attempt to show as much insight as possible in your discussions. For discussions, a good understanding of the interactions between figures, calculations and ratios is required. For a test or exam, always analyse exactly what is required. Make sure you understand which calculations and ratios belong to each of the four categories. The number of marks should offer your further guidance on the extent of the calculations and discussions to be presented.

9 Summary

In this study unit, we have examined how to calculate growth rates and ratios. An income statement and balance sheet were provided to base the calculations on. The ratios were classified into four categories namely, profitability and performance, liquidity, solvability and financial/capital structure, and financial market. Different ratio formulas were given, calculations were performed and the results were analysed and interpreted. These techniques assist us in making decisions in managing the funds of the organisation or with respect to our investment decisions.

In the next topics we will examine how these ratios assist us in managing working capital and income distribution in the organisation.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. Why are growth ratios important?

b. Name and describe the four classifications that ratio analysis consists of.

c. List the ratios in each classification and describe how the ratio will assist you in financial analysis of an organisation.

QUESTION 1

Calculate the following ratios for years 20x2 and 20x1 by using the selected information below. Discuss your findings and offer **detailed reasons** for the change in the ratios from the one year to the next.

a. gross profit margin
b. operating profit margin
c. return on total assets
d. current ratio
e. debt to equity ratio

	20x2 R'000	20x1 R'000
Revenue	777	663
Net operating profit /(loss)	93	48
Gross profit	312	298
Operating costs	(101)	(150)

	20x2 R'000	20x1 R'000
Total assets	969	879
Interest-bearing borrowings	572	555
Total current assets	94	89
Total equity	330	265
Total current liabilities	67	59

The current portion of interest-bearing borrowings included in current liabilities is R34 000 (20x2) and R33 000 (20x1).

*(We deliberately **do not** reflect these items in the order in which they would appear in the annual financial statements.)*

Solution to self-assessment activity

QUESTION 1

For the simplification of calculations below, the thousands in the figures were not shown.

a. Gross profit margin

		20x2		20x1
$\frac{\text{Gross profit}}{\text{Revenue}} \times 100$	=	$\frac{312}{777} \times 100$	=	$\frac{298}{663} \times 100$
	=	40,15%	=	44,95%

Discussion and detailed reasons:

The gross profit margin decreased from 44,95% in 20x1 to 40,15% in 20x2, which could be due to a number of factors, including a reduction in GP margins, old or obsolete inventory written off. We can predict that the scale of operations increased as the revenue grew by 17,20% during this time – this growth percentage probably exceeding the inflation rate during the same period; if revenue growth equals the inflation rate over a period then there is effectively no real growth. When the scale of operations increase, we might expect savings due to efficiencies in scale (fixed costs spread over more products). This would result in IMPROVED gross profits. We can therefore eliminate REDUCTION in the GP% as a reason.

b. Operating profit margin

		20x2		**20x1**
$\frac{\text{Operating profit}}{\text{Revenue}} \times 100$	=	$\frac{93}{777} \times 100$	=	$\frac{48}{663} \times 100$
	=	11,97%	=	7,24%

Discussion and detailed reasons:

The operating profit margin increased from 7,24% in 20x1 to 11,97% in 20x2 due to the large saving in operating cost, which decreased significantly, even though revenue increased for this year. This saving was large enough to also compensate for the lower gross profit margin earned in 20x2, which reduced from 44,95% in 20x1 to 40,15% in 20x2.

NOTE

In order to discuss possible reasons for a change in a margin between years, we have to refer to relative changes in the variables that were used to calculate it (relative to revenue for each year, in this case). This is the reason why we discuss changes in gross profit margin (this is already relative to revenue and gross profit is incorporated into operating profit) and change in operating costs relative to revenue (operating cost is the last cost incorporated in order to calculate operating profit).

c. Return on total assets

		20x2		**20x1**
$\frac{\text{EBIT}}{\text{Total assets}} \times 100$	=	$\frac{93^a}{969} \times 100$	=	$\frac{48^a}{879} \times 100$
	=	9,60%	=	5,46%

[a] Operating profit equals EBIT in this case, as no other income was supplied.

Discussion and detailed reasons:

The ROA has increased from 5,46% in 20x1 to 9,60% in 20x2 due to the large increase in operating profit (which equals EBIT in this case) relative to the smaller increase in total assets. The organisation therefore generated a greater return on total assets (including new assets acquired) in 20x2, relative to 20x1. This increase implies good skills in managing the existing and new assets in 20x2. Further reasons should be sought for this improvement,

such as the type of new assets acquired, changes in market conditions, changes in management or competitors, and so on.

d. Current ratio

		20x2		20x1
Current assets:Current liabilities	=	94:67	=	89:59
	=	1,40:1	=	1,51:1

Discussion and detailed reasons:

The current ratio has decreased from 1,51:1 in 20x1 to 1,40:1 in 20x2. In order to evaluate whether this represents an improvement or not, detailed knowledge of the organisation and its industry will be required. Nonetheless, it could be interpreted as positive as it points to improved working capital management (less cash invested in debtors and inventory). On the other hand, a lower current ratio could be a warning of future cash flow problems (eg if debtors do not pay on time in future, or if inventory is not sold fast enough, the current assets will not convert to cash quickly enough to enable the organisation to pay the current liabilities, when due).

e. Debt to equity ratio

		20x2		20x1
Long-term debt[#] (including its current portion):Equity	=	606[①]:330	=	588[②]:265
	=	1,84:1	=	2,22:1

[#] Long-term debt is long-term interest bearing debt
[①] 572 + 34 = 606
[②] 555 + 33 = 588

The debt to equity ratio has decreased from 2,22:1 in 20x1 to 1,84:1 in 20x2. The decrease in the ratio shows that the level of debt capital increased by a smaller amount relative to the increase in equity for 20x2. The organisation therefore reduced its level of debt in 20x2, but it still represents a high level. This is at least a positive sign for investors, as the lighter gearing indicates a reduction in the risk of the organisation not being able to repay its debt.

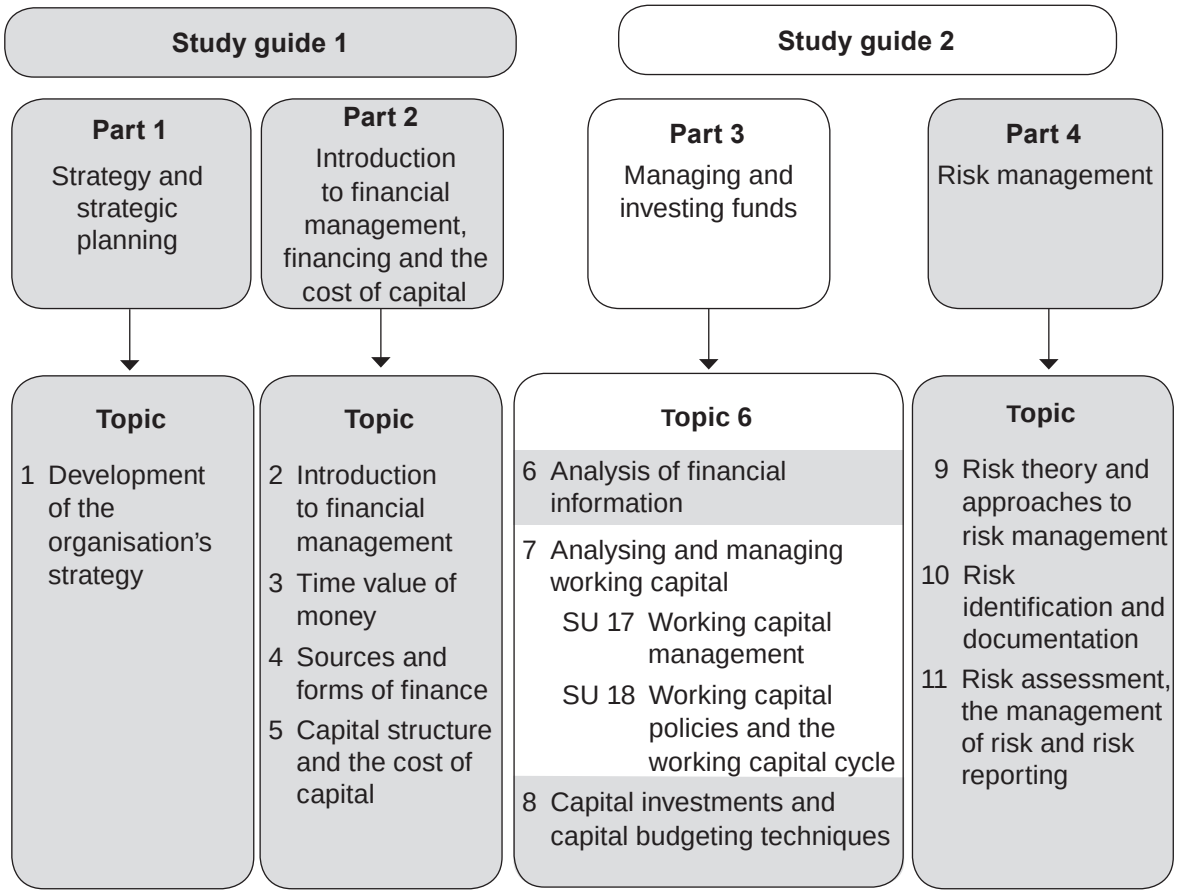
TOPIC 7

Analysing and managing working capital

LEARNING OUTCOMES

After studying this topic, you should be able to:

- define and explain working capital, net working capital and working capital management
- discuss strategies on how to monitor and manage each component of working capital
- calculate the effective cost of discount forfeited
- prepare basic cash flow forecasts
- define the concepts of working capital policy and working capital cycle
- calculate the weighted cost of different financing policies
- calculate the cash conversion cycle days



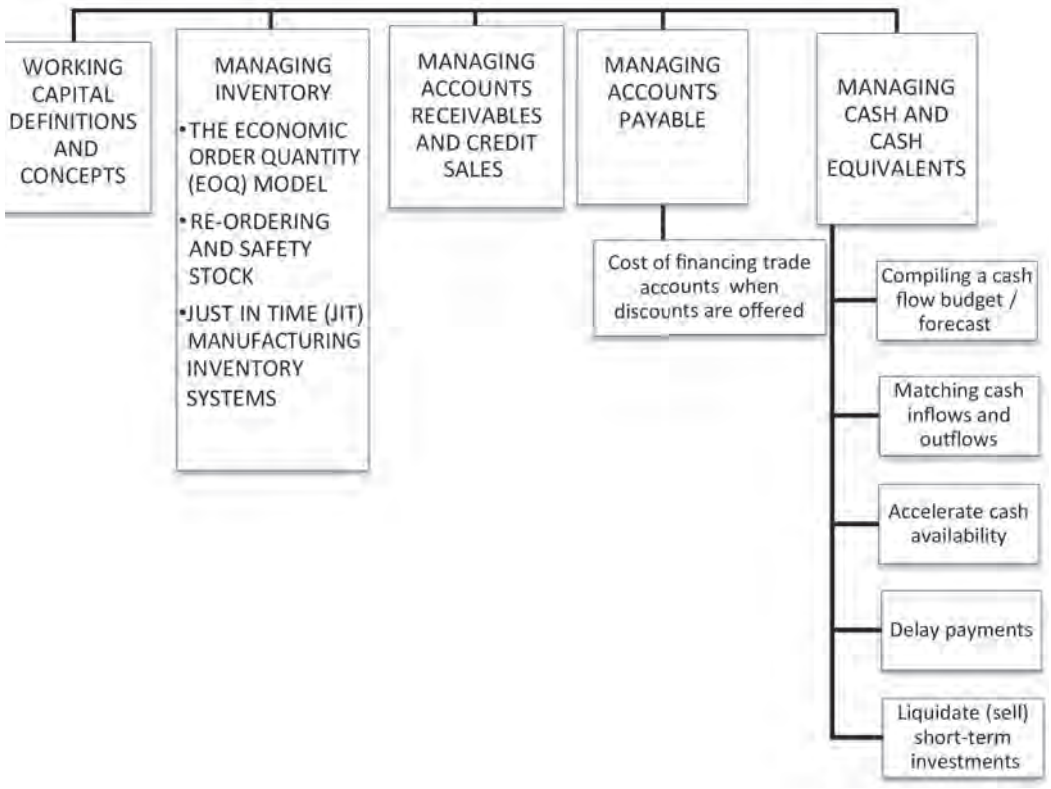
INTRODUCTION

Management of the working capital of the organisation is one of the most important functions of the financial manager. This determines how much cash is available to sustain the day-to-day activities of the organisation. Managing the working capital requires close cooperation with other managers in the organisation, that is, the purchasing manager, stores manager, accounts receivable manager and the accounts payable manager. The financial manager should also maintain a good relationship with his/her bank manager.

STUDY UNIT 17

Working capital management

In this study unit



1 Introduction

A profitable organisation has to decide on whether to retain its profits for reinvestment (including investment in capital projects (topic 8) and working capital (this topic) or to distribute the profits as dividends. This decision is partially based on the outcomes of the financial analysis discussed in topic 6.

In this study unit, we will explore the various concepts regarding working capital. We will discuss strategies to monitor and manage the different categories of working capital. We highlight the purpose and importance of the optimum level of working capital.

NOTE

The concepts discussed in this study unit links closely to ratios covered in topic 6. Make sure that you understand the ratios discussed in topic 6 before progressing to this topic.

2 Working capital definitions and concepts

NET WORKING CAPITAL

Net working capital refers to the current assets less current liabilities, which is directly related to the operating activities of an organisation.

The term *gross working capital* (or sometimes only called *working capital*) refers to the current assets. The term *net working capital* is the excess of current assets over current liabilities. This is computed by subtracting the current liabilities from the current assets. You will know from your Financial Accounting modules that current assets include:

- inventory
- trade receivables
- cash and cash equivalents

Current liabilities include:

- trade payables
- taxation due to the South African Revenue Services (SARS)
- the short-term portion of long-term loans

∴ Net Working Capital = Current Assets – Current Liabilities

The level of the net working capital has important implications for the rest of the business. We will briefly highlight each.

1. The net working capital figure is an important indication of the **short-term solvency** of an organisation. The higher the level by which the current assets cover the current liabilities, the more solvent the organisation is in the short term (it then has a higher ability to meet its short-term liabilities).
2. Net working capital can also be linked to the concept of **liquidity.** (Recall that liquidity represents the length of time until assets can be converted into cash, or the funds available for immediate investment.) Normally, the higher the level by which the current assets cover the current liabilities, the less liquid the organisation would be as more cash is then tied up in the net working capital balance. (The measurement of liquidity was highlighted earlier, in study unit 16, section 6.)
3. Net working capital can further be linked to the concept of **profitability**, in which case lower net working capital levels can often be linked to lower profitability. For example, if an organisation lowers its net working capital levels in order to improve liquidity, it might have to limit the amount of credit sales, which, in turn, could lower the interest from current or prospective customers, and thus the level of revenue and profit that might otherwise have been earned. (The measurement of profitability and performance was highlighted earlier, in study unit 16, section 5.)

WORKING CAPITAL MANAGEMENT

Working capital management refers to the **controlling** of balances included in the current assets and current liabilities, the way the related **functions** within the organisation are performed and the way working capital is **financed.**

As described, the efficient analysis and management of working capital are important in the management of an organisation's short-term solvency, liquidity and profitability. In fact, the objective of working capital management is often to balance the level of net working

capital between operational requirements (often calling for higher levels) and cash flow requirements (often necessitating lower levels).

Next, we will discuss basic strategies in the management of each component of net working capital.

3 Managing inventory

INVENTORY

Inventory of a reseller is represented by purchased goods (held to be sold), and of a manufacturer by the completed products (held to be sold), work-in-process products (intended for sale) and raw material inventory (held for use in production). Both types of organisations can also have stores of consumable items.

Managing the organisation's inventory is important as it ensures that the level of inventory is adequate to sustain the operations, whilst the inventory costs are kept at a minimum.

The adequate inventory level will differ from organisation to organisation, as it depends on the type and complexity of the business. Although the management of inventory is not the direct responsibility of the financial manager, he/she should still provide advice to make sure that it is managed cost effectively.

NOTE

The scientific management of inventory levels is a very advanced field. This forms part of what is called "supply chain management". People qualify as specialists in this area by completing specific qualifications in this field. In MAC2601 and MAC3701 you will only be provided a very rudimentary education in this area. The financial manager therefore acts in an advisory capacity where the organisation is large enough to employ supply chain specialists!

The management of inventory involves having a delicate balance between the benefits of holding inventory, and the costs of holding and ordering too much inventory.

Having inventory on hand at all times will:

- reduce "out of stock" situations – the risk of inventory required for production or by a customer not being on hand. This situation leads to loss of income.
- prevent disruptions in the manufacturing operations, which are normally costly.
- require less detailed planning (production scheduling) as there are always enough inventories.
- retain customers (all else being equal) and prevent them from going to another supplier.

On the other hand, keeping (too much) inventory incurs:

- holding cost
- ordering cost
- physical stores/infrastructure required to maintain the inventories in good condition
- systems to manage/control it
- greater risk of obsolescence

HOLDING COSTS

Holding costs are the costs of holding inventory and includes storage costs (eg renting warehouse space and security), insurance costs (for protection against losses), cost of obsolescence (inventory ageing or deteriorating whilst in storage) and opportunity cost (funds invested in inventory could have earned a return elsewhere at a certain rate, eg earning the weighted average cost of capital).

ORDERING COSTS

Ordering costs are the costs associated with placing an order, receiving the deliveries and the associated payment.

Inventory management refers to the methods the organisation uses to control its inventory. An organisation can buy or develop a system to help them with the managing process (refer to your Accounting Information (AIN) modules for the discussion on types of accounting systems and databases). Some of the methods and models are discussed briefly below.

3.1 The economic order quantity (EOQ) model

The EOQ model uses certain assumptions to determine the optimum order quantity that will minimise the total relevant inventory holding cost and ordering cost. The focus of this model is on *incremental* (additional) holding and ordering cost associated with the inventory; the model ignores the costs that are not relevant (ie those that will not change) within a short-term time horizon, such as the acquisition cost of inventory and fixed costs that will not change within this time.

For today's economy, where inventory holding costs are very high and the risk of obsolescence is high (fast changing world, global competition), the EOQ model normally indicates that total inventory costs are minimised by ordering smaller quantities, more frequently.

3.2 Re-ordering and safety stock

An order for inventory has to be placed in advance in order for the inventory to be delivered to the organisation at the time when it is needed. The time elapsed from placing an order until inventory is delivered is called "lead time". When the organisation knows with certainty the quantity of inventory that is required during a period, the quantity to be ordered can be calculated exactly by taking the lead time into account.

However, an organisation is normally uncertain about the exact level of demand and is therefore often required to keep additional safety stocks to prevent "out-of-stock" situations. Safety stock therefore represents emergency inventory that is held and used when normal inventory is depleted. There are holding costs attached to these safety stock items, which should be weighed up against lost revenues when a sale can't be made or when production stands still.

3.3 Just in Time (JIT) – manufacturing inventory systems

Several western companies emulated Japanese firms by implementing JIT manufacturing systems during the 1980s and 90s. (Japanese firms were highly successful then, even though their current performance seems to be less inspiring.) JIT systems pursue excellence in all phases of manufacturing and, if suitable to the business environment and properly implemented, it can reduce costs, time and inventory-holding.

Inventory holding cost are reduced specifically as a JIT system requires that suppliers deliver the exact quantity and type of inventory "just in time" to be used in the manufacturing process. However, a JIT system is often difficult to successfully introduce in practice, as it requires a total re-engineering of business practices, including the requirement of very good relationships between the organisation and its suppliers. As a result, the system can normally work only for large and powerful organisations where the suppliers are located nearby and will do their best to keep the organisation's support.

NOTE

The three methods/models used to manage and control the costing of inventory will be explained in more detail and applied in MAC2601, MAC3701 and MAC4861/2.

The results of the inventory management actions are measured in the inventory days (refer to topic 6).

INVENTORY DAYS

Length of time that inventory remains unsold (in the case of goods for sale) or remains unused (in the case of raw materials).

Key formula: INVENTORY DAYS

- Purchased inventory: Inventory value ÷ cost of goods sold x 365 (or 360) days
- Manufactured inventory: Inventory value ÷ cost of goods sold x 365 (or 360) days
- Raw material inventory: Inventory value ÷ raw material expense included in cost of goods sold x 365 (or 360) days

Activity 17.1

Assume you are the financial manager of Decorplan CC, an organisation that sells blinds for windows. How do you think the next two aspects would impact on the management of Decorplan's inventory?

- type and complexity of the blinds
- type of customers

Feedback on activity 17.1

- Type and complexity of the inventory

  Will the blinds be custom-made in specific measurements and on requests or manufactured in standard sizes?
- Type of customers

  Will the customers be large groups, for example, Builders City or only private clients?

Level of inventory

The adequate level of inventory can be determined if the above questions are considered.

- If blinds are custom-made, the level of inventory will be lower (it will not fit other windows) than when it is manufactured in standard sizes.
- If the type of customers is large groups, the level of inventory will be higher than private client type of customers as their premises are larger (more windows).

NOTE

In your AIN2601 module you will learn how to generate reports from Pastel that will indicate which inventory are slow moving and is at risk for obsolescence. You will also learn about the classes of inventory; re-order levels for each inventory code, et cetera. The inventory classed as slow moving would be subjected to provision for obsolescence.

4 Managing accounts receivable and credit sales

ACCOUNTS RECEIVABLE (TRADE DEBTORS)

Accounts receivable refers to the amount outstanding in respect of previous credit sales that customers/debtors have to pay in the near future.

Normally an organisation would prefer to sell its products and services for cash, but by granting credit to customers, revenue and profits may increase and the organisation will stay competitive.

NOTE

You may have experienced this yourself as a customer. Depending on your finances, you might prefer to shop at a retailer that allows you to open an interest-free account instead of paying cash. In your later MAC modules you will learn how to weigh up the costs of each option.

A large balance of trade accounts receivable, relative to revenue, implies that the organisation grants credit to customers easily and is willing to wait relatively longer to be paid. The downside to this is that there is a cost involved, since it is similar to an interest-free loan given to customers. There is also a risk involved in that the amount owed by the customers will not be collected and it will become bad debt.

Managing the level of credit sales is important as it also has an effect on the profitability of the organisation. The effective managing of credit sales (and the resulting accounts receivable) requires a balance between an increase in revenue and profits, an increase in holding cost of accounts receivable (the effective cost of offering this “interest-free loan”) and an increase in bad debts. Accounts receivable are managed by having a credit policy and enforcing it.

The **credit policy** is the main instrument used to influence the balance of accounts receivable. It affects the revenue, selling prices, types of inventory and marketing methods. The credit policy focuses on the following four areas:

1. Creditworthiness

This refers to the financial strength of customers and their ability to repay debt. When applying for credit, you will be asked to identify yourself and to provide proof of residence and income. The company providing the credit will probably also do a credit check with the credit bureaus (such as Experian or TransUnion) to see if your payment history is in order. You have probably opened accounts with clothing stores or cell phone providers yourself. The same process applies to organisations.

A more lenient credit policy, with lax creditworthiness requirements, might lead to increased revenue (more customers will be able to buy on credit), but also to higher bad debts (the customers might not be able to pay their accounts).

2. Credit period

This refers to the length of time customers are given to pay their outstanding balance. If properly enforced, a shorter credit period will lower the balance of accounts receivable. This is not the same indicator as the actual debtors' (receivable) days outstanding! See discussion later on.

3. Discounts

This refers to discounts given to customers for early payments (before the credit period expires). The credit policy indicates the discount percentage as well as the period in which the payment must be made in order to qualify for the discount. A larger discount will reduce the amount of the accounts receivable outstanding, as customers will be motivated to pay earlier, but it reduces the profitability as the discount awarded is expensed!

4. Collection policy

This refers to the methods the organisation uses to collect overdue accounts receivable. A more aggressive collection policy will result in a lower balance of trade accounts receivable as payments are actively "chased", but if the policy is too aggressive, it may damage the relationship between the organisation and the customer, which might reduce future sales.

Customers that stay in default are usually reported to the credit bureaus (such as Experian and TransUnion) which keep a database of individuals' and organisations' payment records. Having a bad credit record will affect the ability of the debtor to obtain credit in the future.

NOTE

The credit period and the discount collectively form the "credit terms". Credit terms are often described using specific terminology, for example, a credit policy of 2/10 net 60, implies that a 2% discount is offered to customers paying within 10 days, but that the debt has to be paid on/before 60 days from the date of sale.

Refer to section 5, Accounts payable, for the discussion on what the effective cost of the discount offered is.

The balance of the accounts receivable (in the debtors' ledger and the statement of financial position) is determined by the volume of credit sales, and the payments received in respect thereof. The net result is measured in the receivable days measure and the debtors' ageing schedule (report).

RECEIVABLE DAYS

Receivable days (or the debtor collection period) is a measurement of the number of days it takes the average debtor to pay for the goods/services bought on credit.

Key formula: RECEIVABLE DAYS

Outstanding (unpaid) accounts receivable ÷ credit sales x 365 (or 360) days

AGEING SCHEDULE (FOR DEBTORS)

An ageing schedule for debtors (or debtors' age analysis report) is a classification of accounts receivable within bands of different outstanding periods, normally including, current debt, up to and including 30 days, up to and including 60 days, up to and including 90 days, and greater than 90 days.

This **ageing schedule** reflects the accounts receivable balance, segregated into bands according to the age of each invoice. The ageing schedule will also indicate whether the organisation's credit policy is adequately enforced or not (debtors in the bands greater than the credit period should be a minimum!).

This ageing schedule can be compiled from the organisation's accounts receivable (debtors') ledger. There are also computer systems available that makes it easy to determine the age of each debtor's invoice. These systems can then also generate an ageing schedule for debtors.

NOTE

In your AIN2601 module you will learn how to view the debtors' age analysis report in Pastel. The overdue amounts are also used to determine your provision for doubtful debts.

The balance outstanding of accounts receivable and the receivable days should be monitored closely, to reduce the possibility of bad debts. Shareholders (or owners), investors and banks are also interested in this balance as it will have an impact on their investment. Calculating the receivable days (as discussed in study unit 16, section 6) and analysing the organisation's ageing schedule, assists the financial manager in managing the balance.

When the receivable days start to increase relative to prior periods, or the ageing schedule shows that the percentage of past-due accounts is increasing, the organisation often needs to tighten its credit policy.

Activity 17.2

The ageing schedule of two garden centres, Sunshine and Moonlight, are supplied as at the end of March 20x1. Both organisations have approximately the same (rand) balance for accounts receivable.

Days out-standing	Sunshine		Moonlight	
	Balance of the account	Percentage of total balance	Balance of the account	Percentage of total balance
0–10	859 960	61%	509 632	35%
11–30	559 677	39%	426 301	29%
31–60			255 690	18%
60 +			262 906	18%
	1 419 637	100%	1 454 529	100%

The credit terms offered to the customers of Sunshine are: 2,5/10 net 30 (if payment is made within 10 days, the customer will receive a discount of 2,5%; or else the total amount is due within 30 days).

The credit terms offered to the customers of Moonlight are: 2/10 net 30.

REQUIRED

Analyse the two ageing schedules and discuss possible issues by referring to the credit policy.

Feedback on activity 17.2

Analysis of the ageing schedules:

The ageing schedule of Sunshine indicates that all its customers pay within the allowed credit period which is 30 days. A total of 61% makes use of the 2,5% discount by paying within 10 days and 39% pays within 30 days and does not receive any discount.

The ageing schedule of Moonlight indicates that several of its customers are not complying with its credit terms. A large proportion of the accounts receivable balance, equalling 36% (18%+18%), is more than 30 days old. This is the case in spite of Moonlight's credit terms that require full payment within 30 days.

Discussion of the issues by referring to the credit policy:

1. Creditworthiness

Based on an analysis of the ageing schedule, it seems that Sunshine might have stricter assessment procedures of the creditworthiness of customers. Moonlight, on the other hand, seems to be more lenient in granting credit to customers. This may have increased their revenue, but could also result in higher bad debts.

2. Credit period

The credit period granted to trade debtors of both organisations is the same.

3. Discounts

The customers of Sunshine are more eager to make use of the 2,5% discount on early payments. It seems that the smaller discount of 2% offered by Moonlight to their customers was not sufficient to motivate them to pay earlier.

4. Collection policy

Based on an analysis of the ageing schedule, it seems that Sunshine might have stricter debt collecting procedures as all the customers of Sunshine are paying within the required period of 30 days as was stipulated in the credit policy. Moonlight might have to use a more aggressive collection policy, but be wary not to damage relationships with their customers.

5 Managing accounts payable

TRADE ACCOUNTS PAYABLE (TRADE CREDITORS)

Trade accounts payable refers to the amount of purchases on credit that has to be paid to the suppliers/creditors in the near future. Total accounts payable may also include other accounts payable, which do not relate directly to the main operations (trading activities) of the organisation.

We have already explained the term *net working capital* in section 2 when we discussed working capital. In the previous sections, we have addressed the management of accounts receivable and inventory. We will now look at the managing of current liabilities and we will focus on the management of trade accounts payable, since it normally forms the biggest part of current liabilities.

Trade accounts payable is a type of financing that arises naturally from normal operations. It emanates from credit given by an organisation's suppliers and is often the largest source of short-term credit, especially for small organisations.

The **advantages** are that it is usually offered and relatively easy to obtain, assuming a good credit record. It is largely interest-free if payments occur in line with the credit terms (but not always cost-free as we will explain below).

The cost **disadvantages** can be high however, since failing to pay accounts payable on due dates could lead to poor relationships with suppliers or suppliers may refuse to extend further credit to the organisation. Interest and recovery fees are usually charged when payment terms is exceeded. The impact on the organisation's credit rating (by the credit bureaus) is also very negative for future transactions on credit.

Proper management of the accounts payable process is necessary, because the decisions regarding payments to suppliers may have significant effects on the cost of financing and therefore have an impact on the organisation's profit. As part of this process, the credit terms of the suppliers' credit policy should be taken into account when payments are planned.

ACCOUNTS PAYABLE (CREDITORS) DAYS

Payable days (or the creditor payment period) is the measurement of the average number of days the organisation takes to pay for the goods/services received on credit from its suppliers.

Key formula: PAYABLE DAYS

Outstanding (unpaid) accounts payable ÷ credit purchases x 365 (or 360) days.

NOTE

When you are analysing a statement of financial position and the amount of credit purchases were not given, a rough alternative is to use the cost of sales figure.

AGEING SCHEDULE FOR CREDITORS

An ageing schedule for creditors (or creditors' age analysis report) is a classification of accounts payable within bands of different outstanding periods, normally including current debt, up to and including 30 days, up to and including 60 days, up to and including 90 days, and greater than 90 days.

This ageing schedule reflects the accounts payable balance, segregated into bands according to the age of each invoice due/unpaid. The ageing schedule will also indicate which payments are long overdue, in dispute and/or accruing interest.

This ageing schedule can be compiled from the organisation's accounts payable (creditors') ledger. There are also computer systems available that makes it easy to determine the age of each suppliers' invoice. These systems can then also generate an ageing schedule for creditors.

NOTE

In your AIN2601 module you will learn how to view the creditors' age analysis report in Pastel as well as amounts due for payment. The overdue amounts are the ones at risk.

5.1 The cost of financing trade accounts when discounts are offered

The implied monetary cost of finance, through the use of trade accounts payable, lies in the settlement discount forfeited if payment is postponed (at this point in your studies, ignore the interest charged on overdue accounts).

This is illustrated by the following example:

The credit terms allowed by a supplier is 2/10 net 30 (indicating that if payment is made within 10 days after invoice date, the customer will receive a settlement discount of 2%; otherwise, the total amount is due within 30 days after invoice date). As the amount paid could be less by using the discount (paying on day 10), there is an implied cost (opportunity cost) involved if the payment is postponed (to day 30) and the discount is forfeited.

Another way to look at it is that the discount is invested ("left" with the supplier or "paid back" to the supplier) in order to make use of the credit from day 11 to day 30! This is then the cost of the financing.

For this example, assume further that the value of the invoice is R200 and that the organisation will be forfeiting the discount if they decide not to pay within 10 days. The discount amount lost would equal: 2% x R200 = R4

or alternatively:

The organisation would pay the full R200 if settled at 30 days, but only the following amount if settled within 10 days: R200 x [(100 – 2) ÷ 100] = R200 x [98 ÷ 100] = R196.

Therefore, R200 – R196 = R4 is the discount lost, or alternatively, the implied finance charge for postponing payment by 20 days (30 days less 10 days). (We will describe later how to convert this to a percentage.)

Due to the nature of credit terms in general, managing the accounts payable involves two distinct periods:

1. Period of free credit

This refers to the credit received and utilised **during** the period that discount is available (in our example: day 1 to 10).

2. Period of costly credit

This refers to the credit used **after** the period of free credit and which has costs involved based on unused discounts (in our example: day 11 to 30). The cost of not taking discounts can be significant and, furthermore, the risk of being classified as a "late payer" can also lead to more strict credit terms.

The decision whether to make use of trade discounts or to use the full credit period, should be part of the organisation's short-term financing decisions. Postponing payments to creditors may be costly, but should be compared to the cost of other short-term financing sources (usually the bank overdraft).

The following equation can be used to calculate the implied nominal percentage cost, on an annual basis, of not taking discounts:

Key formula: IMPLIED *NOMINAL* ANNUAL PERCENTAGE COST OF ACCOUNT PAYABLE (CREDIT)

$$r_{NOM} = \frac{\text{Discount\%}}{100 - \text{discount\%}} \times \frac{365 \text{ days}}{\text{Days credit outstanding} - \text{discount period}}$$

If we apply this formula to the example earlier in this section, then we could calculate the implied annual percentage cost of the financing of postponing payment to 30 days:

$$r_{NOM} = \frac{2}{(100 - 2)} \times \frac{365 \text{ days}}{(30 - 10)}$$

$$r_{NOM} = \frac{2}{98} \times \frac{365 \text{ days}}{20}$$

$$= 0{,}3724$$

$$= 37{,}24\%$$

or alternatively

$$r_{NOM} = \frac{R4}{(R200 - R4)} \times \frac{365 \text{ days}}{(30 - 10)}$$

$$r_{NOM} = \frac{R4}{R196} \times \frac{365 \text{ days}}{20}$$

$$= 0{,}3724$$

$$= 37{,}24\%$$

NOTE

Notice that this is a very high annual rate. Continuously forfeiting discounts by postponing payments can thus be an expensive form of finance.

The nominal annual cost equation does not take the effect of compounding into account. The following familiar equation (refer to topic 3 – time value of money) is used to calculate the effective annual rate:

Key formula: EFFECTIVE ANNUAL PERCENTAGE COST OF ACCOUNT PAYABLE (CREDIT)

Effective annual rate (EAR) $= (1 + \text{periodic rate})^n - 1$

Where:

The periodic rate = discount % ÷ (100% – discount %)

n = the number of interest periods per year

If we now apply this formula to the example earlier in this section, then we could calculate the implied effective annual cost percentage of postponing payment to 30 days:

n = 365 ÷ 20

= 18,25 interest periods in a year

Thus:

EAR $= [1 + \text{periodic rate}]^n - 1$

$= [1 + (\frac{2\%}{100\% - 2\%})]^{365/20} - 1$

$= [1 + (\frac{2}{98})]^{18,25} - 1$

$= [1,0204]^{18,25} - 1$

$= 1,4459 - 1$

$= 0,4459$

$= 44,59\%$

NOTE

Notice that the implied effective annual rate is even higher than the nominal cost due to the effect of compounding.

Rule: WHEN TO TAKE UP DISCOUNT OFFERED

The effective cost of discount forgone should be weighed against the organisation's regular cost of short-term funding (usually the overdraft rate). If the overdraft rate is lower, the discount should be taken. When the overdraft rate is higher, it is not cost-effective to take the discount (you will be paying more than you are saving in the discount received)!

NOTE

The same calculations should be done when an organisation is considering whether to OFFER discounts to its clients. In this case, the effective cost of discount should be less than the cost of financing from short-term sources!

Activity 17.3

Arwin CC purchases an average of R300 000 of inventory from its supplier on an annual basis. The credit terms of the supplier is 2/10 net 45 and is strictly enforced. The cost of other short-term financing options (such as the bank overdraft) has an effective annual rate of 13%.

REQUIRED

a. Determine the true total monetary cost of the inventory to Arwin if all purchases are paid within the discount period.
b. Calculate the nominal annual cost of credit if Arwin follows the policy of paying for the purchases on the latest date allowed.
c. Advise Arwin on the best short-term financing option.

[Use four decimal places and round **only** the final answer to two decimal places.]

Feedback on activity 17.3

a. The true (net cash) price of the inventory is:

$$R300\,000 \times \frac{98^*}{100} = R294\,000$$

*(100 – 2 ÷ 100)

NOTE

This net amount is only used for decision-making purposes! Remember that in terms of IAS2 settlement discount cannot be netted off the purchase price for purposes of valuing inventory!

b. The nominal annual cost of credit if discount is not taken:

$$r_{NOM} = \frac{\text{Discount\%}}{100 - \text{discount\%}} \times \frac{365 \text{ days}}{\text{Days credit outstanding} - \text{discount period}}$$

$$r_{NOM} = \frac{2}{(100 - 2)} \times \frac{365 \text{ days}}{(45 - 10)}$$

$$r_{NOM} = \frac{2}{98} \times \frac{365 \text{ days}}{35}$$

$$= 0{,}2128$$

$$= 21{,}28\%$$

c. In order to determine which form of short-term financing is the best option, we have to compare like-to-like: An effective annual rate was provided for other short-term financing. We therefore have to calculate the same rate for the implied cost of not taking the settlement discount on trade accounts.

The effective annual rate rate of utilising the full credit period, instead of taking the settlement discount, can be calculated as follows:

$$EAR = [1 + \text{periodic rate}]^{n} - 1$$

$$= [1 + (\frac{2\%}{100\% - 2\%})]^{365/(45-10)} - 1$$

$$= [1 + (\frac{2}{98})]^{10,4286} - 1$$

$$= [1,0204]^{10,4286} - 1$$

$$= 1,2345 - 1$$

$$= 0,2345$$

$$= 23,45\%$$

Arwin can borrow from other short-term financing options at an effective annual rate of 13%. This is far less than the rate of credit (applicable to day 11 to 45) if discount is not taken. Therefore, Arwin should preferably make use of alternative short-term financing options first (if sufficient total funds are available) and rather pay the supplier on the 10th day following the invoice date, in order to receive the discount.

6 Managing cash and cash equivalents

The net result of all the management actions to optimise the inventory levels, accounts receivable and accounts payable, is reflected in the cash or overdraft balance! We will now investigate how this aspect of current assets should be managed.

CASH AND CASH EQUIVALENTS

Cash is the money the organisation has on hand (eg petty cash, undeposited payments received) as well as the money in the bank (eg cheque accounts or short-term deposits).

Cash and cash equivalents are needed in every organisation for the operations to run smoothly. It is used, for example, to pay salaries and other expenses, buy assets or pay liabilities. Cash generally earns a lower rate of return than financial instruments, short-term investments or non-current capital assets. It is therefore important to properly manage the levels of cash held.

Too high levels of cash will reduce the profitability of the organisation due to the low return that is earned thereon. Too low levels of cash on the other hand will increase the risk that the organisation will not have enough funds when it is needed, or that it will have to borrow cash at higher interest rates (eg use a bank overdraft). There are four possible reasons for holding enough cash:

1. **Transactions** – routine transactions are paid in cash or via a bank transfer. These are transactions that are done on a regular basis and include payments to suppliers, employees, taxation, et cetera.
2. **Precautionary** balances – there can be unpredictable or unforeseen transactions and therefore the organisation would need additional cash in reserve. Examples

of these transactions are delayed payments by debtors, payments of the excess to an insurance claim in case of an accident or fire, or legal costs. A greater level of uncertainty in a cash forecast model warrants a higher level of precautionary cash balances. This is the equivalent of safety stock.

3. **Opportunities** – Unexpected opportunities may arise, for instance, investment opportunities, unexpected changes in exchange rates, and so on. The organisation will need sufficient cash to take advantage of that opportunity, otherwise it will be lost.
4. **Obligations** – A bank, for example, may require that their customers (the organisation) maintain a minimum amount of cash in their account.

It is easier to manage an organisation with sufficient cash resources (less planning is required) and it also indicates that the organisation is more liquid. An organisation may experience financial distress if there is not enough cash.

The disadvantage of too much cash, as we mentioned before, is that cash earns little interest and therefore a low return on investment. The objective is to have the minimum of cash on hand, but to have enough cash to run operations effectively. The question that arises is: How much cash is enough?

We will now look at different techniques that can assist with cash management.

6.1 Compiling a cash flow budget/forecast

A cash budget or forecast is the best known cash management technique. A cash budget can be compiled daily, weekly, monthly or for any required period. It indicates whether a cash surplus or shortfall can be expected in the specified period. Management uses the cash budget to plan for the period ahead, estimate short-term cash requirements and use it to evaluate subsequent performance.

NOTE

Preparing detailed cash budgets based on sales, production and payment terms will be discussed in more detail in MAC2601.

6.2 Matching cash inflows and outflows

By performing cash flow forecasting, the timing of cash payments and requirements can be planned to match with the cash receipts. This “matching” will entail that when you receive cash from debtors, you will then pay the outstanding creditors and other expenses. **Matching cash flows** provide cash when it is needed and thus enable the organisation to lessen the cash balances that has to be kept in reserve.

6.3 Accelerate cash availability

There are different payment methods used by debtors, each taking longer or shorter to reflect as cash in the supplier’s bank account.

1. **Cheque payments** were popular years ago, but very few organisations still accepts cheques today. Cheque payments necessitated a lengthy administrative process resulting in a long delay before it is reflected as cash in the bank.

2. Another payment method, which is much faster and effective, is the **electronic funds transfer (EFT)** method. If the customer uses the same bank as the organisation, the transfer will reflect the same day or if it is a different bank, the transfer will reflect within two to three days.
3. The **direct debit** method is another efficient payment method where funds are automatically deducted from the customers' account and added to the organisation's account. A direct debit is only suitable to certain businesses, but has the added advantage of a reduction in debtor reconciliations (as there will be fewer problems with payment references and in allocating amounts).
4. **Credit cards** are another method of payment in the retail industries. The payment is reflected in the organisations account within two days, but the drawback is that credit card fees are expensive. However, many customers prefer to pay by credit card, so the organisation has to weigh-up the benefit of increased sales versus increased financing fees.

Accelerating the cash availability means that you "move" your customers (by promotions and incentives) to the payment method that reflects as cash soonest.

6.4 Delay payments

If the organisation currently settles early in order to take up discount offered, it can decide to rather delay payments to the normal credit period. However, bear in mind that this involves the effective cost of forfeiting the discount. In extreme cash flow shortages, the organisation can approach its suppliers with a request for extension. This might entail further interest charges. The long-term relationship with the suppliers should not be damaged.

6.5 Liquidate (sell) short-term investments

An organisation can also hold short-term investments in addition to the cash balances. These short-term investments include money market financial instruments such as commercial paper (unsecured promissory notes) issued by banking and non-banking institutions like SABMiller and Sappi with exceptional credit ratings, treasury bills (issued by the government) and negotiable certificates of deposit (issued by authorised deposit-taking institutions).

These are liquid financial instruments (it is traded on the money markets) and it can be sold within a day or on very short notice. This is very important as an organisation normally needs the cash immediately for emergencies or other opportunities. Money market financial instruments usually earn a superior return to the interest paid on normal bank accounts (if any).

Activity 17.4

The management of Flashco Limited is concerned about their cash flows for the next three months. Flashco have invested R15 million in a short-term financial instrument that will expire (repaid) only at the end of March (expected interest R260 000). Their cash balance at the beginning of the January is R9 million. The expected OPERATING cash flows over the next three months are as follows:

	January	**February**	**March**
	R'000	**R'000**	**R'000**
Expected cash inflows per month	55 988	44 890	74 552
Expected cash outflows per month	54 890	71 255	69 556

You may assume that cash flows will occur at the end of every month, with inflows occurring right before the outflows.

REQUIRED

a. Compile a simplified cash flow budget for the months ending January, February and March.

b. Advise the management of Flashco on possible corrective actions that may be required.

Feedback on activity 17.4

a. Simplified cash flow budget for the three-month period:

	January	**February**	**March**
	R'000	**R'000**	**R'000**
Expected cash inflows (given)	55 988	44 890	74 552
Expected cash outflows (given)	(54 890)	(71 255)	(69 556)
Expected net cash inflow/(outflow) for the month	1 098	(26 365)	4 996
Plus Opening cash balance – positive/(negative)	9 000	10 098	(16 267)
Plus Inflow from short-term financial instrument			15 260
Closing cash balance – positive/ (negative)	**10 098**	**(16 267)**	**3 989**

b. Advice:

The calculated cash balance of Flashco Limited had a negative balance of R16,2 m at the end of February. Flashco would either have to apply for a bridging loan or an overdraft facility at the bank (at least equal to this amount) from the end of February to the end of March, or request that the short-term investment be terminated earlier, if possible (but they must consider possible penalties).

Because of the uncertainty involved in the cash flows and budgeting process, we would advise them to apply for more finance than indicated by the calculation above, for example R20 million, to support the negative balance at the end of February.

All efforts should be made to encourage debtors to pay early (end February and not in March) and suppliers should be approached for a delay in payment from the end of February to March.

Since there is a positive cash balance at the end of January, the financial manager of Flashco should consider investing the excess cash in short-term investments. This will likely earn a higher return than the current bank account.

NOTE

Notice the importance of the assumption that cash flows would occur at the *end* of every month, with inflows occurring right before the outflows. If not the case, cash flows could occur *during* the month, which would necessitate a similar cash flow budget prepared on a daily basis (or even before every payment is made).

7 Short-term financing

Rule: MATCHING MATURITIES

The maturity of the assets (current or non-current) should be matched with the maturity of the financing (current or non-current). Matching maturities further implies that the financing term (and related cash outflows) should match the duration of the asset that is supported (and its related cash inflow benefits).

A basic principle of effective financing is that short-terms assets (current assets) should *mostly* be financed by short-term financing instruments (current liabilities). In study unit 18, section 2.2, we will discuss this in more depth.

Where an organisation uses short-term instruments to finance non-current assets that offer benefits over a longer timeframe, there may be a mismatch between cash outflows (to repay interest and capital in the short-term) whilst the cash inflows (from the assets) arise over a longer period. This may create financial distress.

SHORT TERM

Short term refers to a period of one year or less.

As mentioned earlier, accounts payable is a spontaneous form of short-term financing that arises from normal operations, but this is not always adequate to finance all the current assets. As a result, additional sources of finance are often required and these could further be classified as either short-term or long-term finance. When considering short-term financing, certain inherent advantages and disadvantages have to be considered.

Advantages of short-term financing are:

- It can generally be **obtained much faster** than long-term financing – lenders of long-term financing will require a more detailed investigation of the organisation's financial status.
- As the term is of a **short period**, it can be obtained for periodic needs and the organisation does not have to commit for long periods.
- It may **not** be necessary to offer **collateral** for short-term financing.
- **Interest rates** on short-term financing may be **lower** than interest rates on long-term financing. (Here we should compare short and long-term financing on a like-for-like basis – both options with collateral, or without as the risk also impacts on the cost of debt.)

Disadvantages of short-term financing are:

- The **interest expense may fluctuate** more on the short term.
- Short-term finance might in some cases be **cancelled with little or short notice**, which could create financial distress where an organisation cannot arrange for alternative finance at short notice. (Notice that this is especially relevant in today's day and age, where banks are stricter in offering finance than in the past.)

Forms of short-term financing (excluding accounts payable) include bank overdrafts and short-term bank loans. Bank overdrafts and bank loans are provided by most commercial banks. Large companies with excellent credit ratings may also sell commercial paper (promissory notes) in the money market to raise financing for periods of 1–270 days. The interest rates offered (paid to the holders) on these notes are often cheaper than that obtained from the organisation's bank.

8 Summary

In this study unit we have explained working capital management and how to manage each component of working capital. In managing inventory, the advantages and disadvantages of holding inventory were discussed as well as methods to assist in managing inventory. In managing accounts receivable, the credit policy has been discussed and the ageing schedule identified as a way to monitor the balance. In managing accounts payable as a type of short-term financing, we explained that there is a cost involved if early settlement discounts are not taken. As part of "cash management", the reasons for holding cash and cash management techniques were explained. Lastly, the advantages and disadvantages of short-term financing were pointed out.

In the next study unit, we will continue with the topic of working capital by discussing working capital policies and working capital cycle.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. Why is the management of inventory important?
b. Why is the management of accounts receivable important?
c. Explain the periods associated with "free credit" and "costly credit" when referring to trade accounts payable.
d. Why is cash management important?
e. Name the different cash management techniques.
f. Give the main reasons for holding cash.
g. What are the advantages and disadvantages of short-term financing?

QUESTION 1

The following are selected items from Green Industries Ltd's trial balance at 31 December 20x1.

Accounts receivable	R 265 110
Accounts payable	R 656 000
Cash	R 120 500
Accruals	R90 650
Property, plant and equipment	R 980 000
Long-term debt	R3 500 900
Inventory	R 550 000
Investments	R1 400 400

*(We deliberately **do not** reflect these items in the order in which they would appear in the annual financial statements.)*

REQUIRED

a. Calculate the gross working capital.

b. Calculate the net working capital.

QUESTION 2

Go-to-Basic Corporation buys its inventory from any of four suppliers. The suppliers all offer basically the same quality and their prices are competiitve. Their credit terms, however, vary noticeably as follows:

Supplier	**Credit terms**
EverGreen	1/5, net 20
LetsSave	2,5/10, net 35
SimplicityCorp	0,5/10, net 20
Universe&I	2/5, net 30
Live-from-Earth	3/5, net 45

REQUIRED

a. Calculate the implied **nominal** annual interest rate associated with each policy. Use a 365-day year and round your final answer to two decimal places.

b. If Go-to-Basic buys inventory from the SimplicityCorp supplier, advise them of the best financing option if they pay an **effective** annual rate of 12% for other working capital financing?

Solution to self-assessment activity

QUESTION 1

a. Gross working capital

Accounts receivable	R 265 110
Cash	R 120 500
Inventory	R 550 000
Gross working capital	**R 935 610**

b. Net working capital

Current assets (Gross working capital)	R 935 610
Less: Current liabilities:	R 746 650
Accounts payable	R 656 000
Accruals	R 90 650
Net working capital	**R 188 960**

QUESTION 2

a. Nominal interest rate

EverGreen

$$r_{NOM} = \frac{\text{Discount\%}}{100 - \text{discount\%}} \times \frac{365 \text{ days}}{\text{Days credit outstanding} - \text{discount period}}$$

$$= \frac{1}{99} \times \frac{365}{(20 - 5)}$$

$$= 0{,}2458$$

$$= 24{,}58\%$$

LetsSave

$$r_{NOM} = \frac{\text{Discount\%}}{100 - \text{discount\%}} \times \frac{365 \text{ days}}{\text{Days credit outstanding} - \text{discount period}}$$

$$= \frac{2{,}5}{97{,}5} \times \frac{365}{(35 - 10)}$$

$$= 0{,}3744$$

$$= 37{,}44\%$$

SymplicityCorp

$$r_{NOM} = \frac{\text{Discount\%}}{100 - \text{discount\%}} \times \frac{365 \text{ days}}{\text{Days credit outstanding} - \text{discount period}}$$

$$= \frac{0{,}5}{99{,}5} \times \frac{365}{(20 - 10)}$$

$$= 0{,}1834$$

$$= 18{,}34\%$$

Universe&I

$$r_{NOM} = \frac{\text{Discount\%}}{100 - \text{discount\%}} \times \frac{365 \text{ days}}{\text{Days credit outstanding} - \text{discount period}}$$

$$= \frac{2}{98} \times \frac{365}{(30 - 5)}$$

$$= 0{,}2980$$

$$= 29{,}80\%$$

Live-from-Earth

$$r_{NOM} = \frac{\text{Discount\%}}{100 - \text{discount\%}} \times \frac{365 \text{ days}}{\text{Days credit outstanding} - \text{discount period}}$$

$$= \frac{3}{97} \times \frac{365}{(45 - 5)}$$

$$= 0{,}2822$$

$$= 28{,}22\%$$

b. Effective annual rate rate

EAR = $(1 + \text{periodic rate})^n - 1$

Effective annual rate of discount not taken, thus of postponing payment.

EAR = $(1 + \text{periodic rate})^n - 1$

$= (1 + 0{,}5/99{,}5^*)^{[365/(20 - 10)]} - 1$

$= (1{,}0050)^{36{,}5} - 1$

$= 20{,}08\%$

(*Use the periodic rate of the option/supplier with the lowest nominal rate. In this case SimplicityCorp = 18,34%)

Go-to-Basic can obtain short term funding through other instruments (options) at an effective annual rate of 12%.

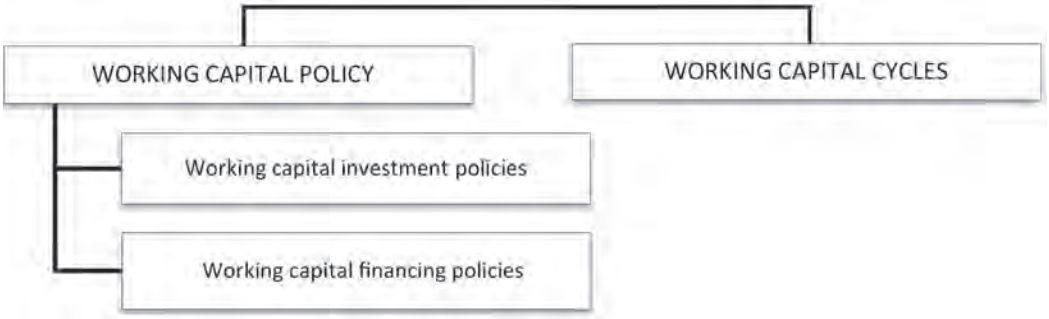
The effective cost of postponing the payment from the 10th to the 20th day (taking 10 days extra credit) after invoice, is 20,08%, while the other funding is available at 12% should they wish to pay on the 10th day. The 12% is less than the rate of credit, if discount is not taken.

Therefore, they should preferably make use of alternative short-term financing instruments (options) first (if sufficient total funds are available) and rather pay the supplier on the 10th day following the invoice date, in order to receive the discount.

STUDY UNIT 18

Working capital policies and the working capital cycle

In this study unit



1 Introduction

In the previous study unit, we have explained why the management of working capital is important as well as the factors that affect the level of working capital and cash balances. In this study unit, we will be focusing on working capital policies, which include investment and financing policies. The working capital cycle will also be explained and illustrated.

2 Working capital policy

WORKING CAPITAL POLICY

The working capital policy of an organisation stipulates the appropriate amount for the net working capital balance and for each of its components (*investment policy*), and, in addition, how the net working capital balance should be financed (*financing policy*).

We already explained that working capital is an important and necessary component for most organisations in conducting their operations. The holding of working capital is however costly as it is money that could have been invested in other return-generating assets. This policy should strike an appropriate balance between the level of cash and inventories on hand, the level of accounts receivable, and the level of accounts payable.

The following matters have an effect on an organisation's working capital policy:

1. the total amount of working capital required
2. financing of working capital by short- or long-term funds
3. the nature and source of short-term financing used
4. the management of each component of working capital

The working capital investment policy of an organisation will be addressed next. Thereafter, we will address the question of how the investment in working capital should be financed by discussing the working capital financing policy of an organisation.

2.1 Working capital investment policies

An organisation must determine what the optimum level of investment in working capital should be. Every organisation needs a minimum level of investment in working capital in order to support its basic operations. The organisation could be at risk if the investment in working capital is lower than this minimum requirement. These risks were discussed in the previous study unit in sections 2 and 3.

When a low level of net working capital is kept compared to total assets, it is described as an **aggressive investment policy**. In contrast, when the investment in working capital of an organisation is high when compared to all the assets of the organisation, the risk is much lower. However, as with investments in general, lower risk usually warrants a lower expected return on that investment. Since working capital does not actively generate income, the return of the organisation will be lower and therefore also the profitability of the organisation. As a result, where the investment in working capital of an organisation is high compared to all assets, it is called a **conservative investment policy**.

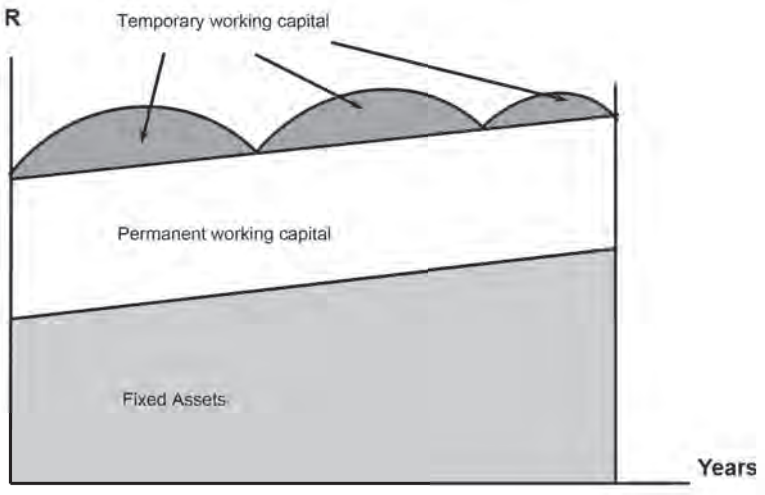
In general, for most businesses the net working capital varies directly with sales. (Where more products are sold, more inventories will generally have to be kept on hand, more debtors will owe the organisation money from sales on credit, etc).

When an organisation's business is seasonal (ie in agriculture, or beer sales that is correlated to the weather or seasons), the sales will vary throughout the year, and so will its working capital needs. Seasonal business is the reason for the distinction between permanent and temporary working capital.

PERMANENT and TEMPORARY WORKING CAPITAL

- Permanent working capital supports a constant **minimum** level of sales.
- Temporary working capital supports **seasonal peaks** in the organisation's operations.

See Figure 18.1 below for a graphical presentation of these two concepts.



Source: Kriek, Beekman & Els (adapted), 2008

FIGURE 18.1: Permanent and temporary working capital

2.2 Working capital financing policies

After the organisation has determined the optimum level of investment in working capital, the next step is to decide on how to finance the amount of working capital that is required. The extreme opposite options are predominantly long-term funding (conservative policy) and predominantly short-term funding (aggressive policy). The moderate policy is somewhere between the two extremes.

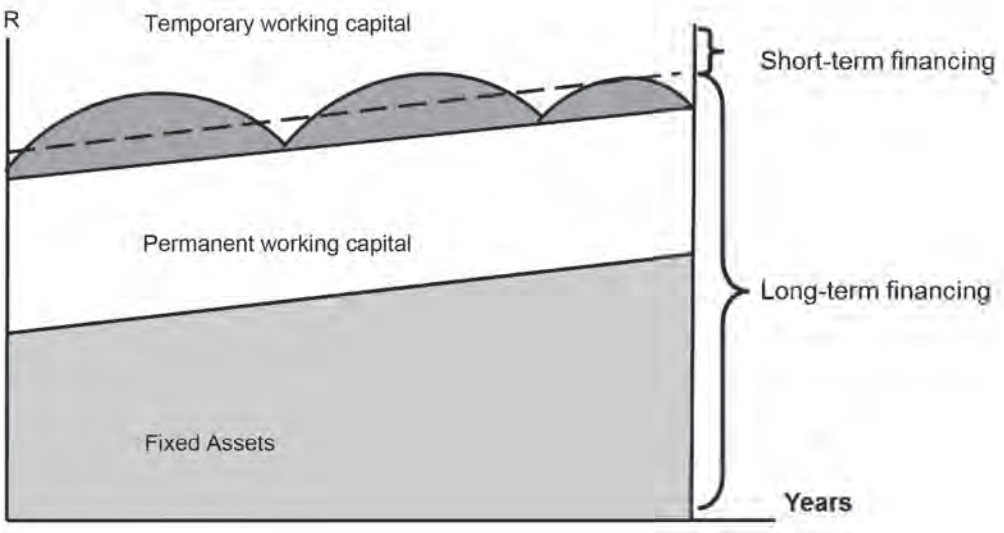
The current ratio (as explained in study unit 16, section 6) can give an indication of which policy the organisation is following. This ratio indicates the ability of the organisation to pay its current liabilities with its current assets. The higher the ratio, the more conservative the working capital policy would be. We will now look at the three different working capital financing policy options, as well as the advantages and disadvantages of each.

1. Conservative financing policy

In the case of the conservative policy, the organisation makes use of more long-term financing. Short-term financing is only used to support the peaks of the temporary working capital. When temporary working capital is low, the total funding will mainly consist of long-term funds; excess money will be invested in short-term deposits or financial instruments.

The **advantages** of a conservative financing policy are that the risk of not being able to fund the ups and downs in working capital is low, as the repayment of the long-term funds is not due soon.

The **disadvantage** is that the interest rates on long-term funds are generally higher than those of short-term funding. This is one of the reasons why this policy is more expensive and this then has a negative effect on the profitability of an organisation.



Source: Kriek, Beekman & Els (adapted), 2008

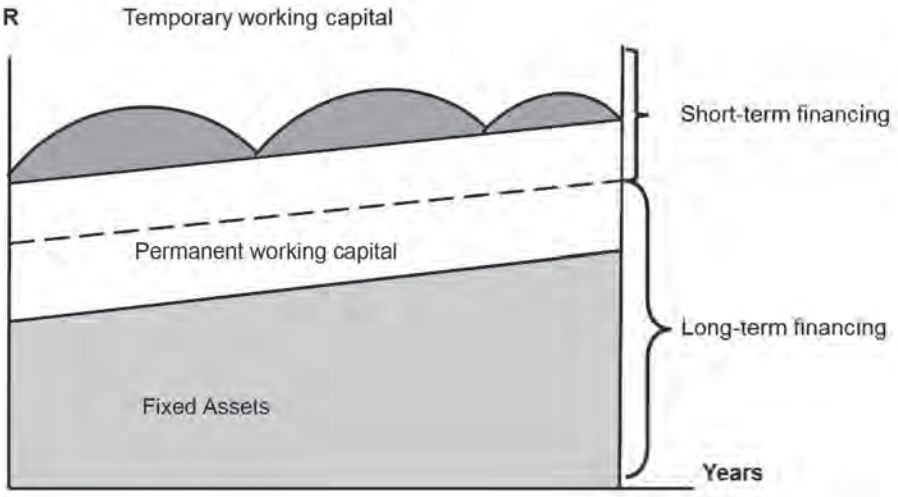
FIGURE 18.2: The conservative financing policy

2. Aggressive financing policy

In the case of the aggressive policy, the organisation makes use of more short-term financing. Here short-term financing is supporting the entire temporary and some of the permanent working capital.

The **advantage** is that the profitability of the organisation should increase. The reduction of costs is possible because short-term funds are generally cheaper than long-term funds.

The **disadvantage** is a greater level of financing risk, as the risk of the organisation not being unable to repay the funding when it is due, is higher.

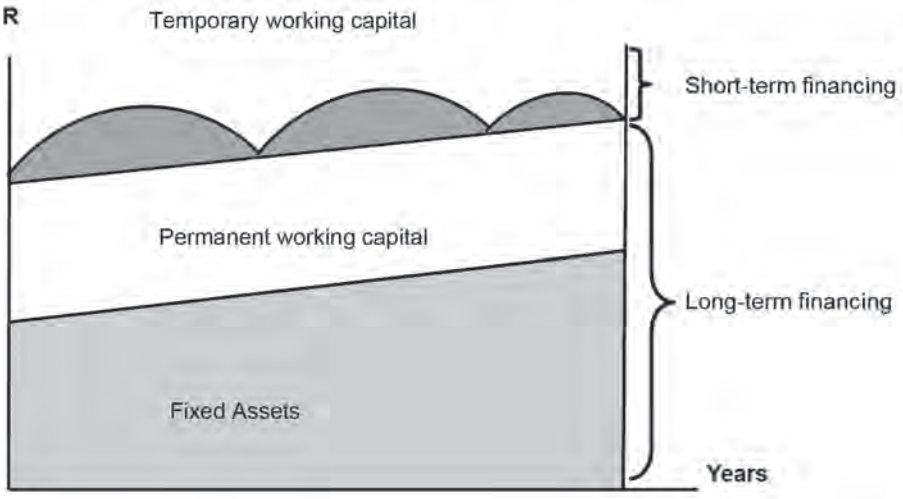


Source: Kriek, Beekman & Els (adapted), 2008

FIGURE 18.3: The aggressive financing policy

3. Moderate financing policy

This policy lies between the two extreme policies above. Long-term financing is used to finance fixed assets and permanent working capital and short-term financing is used to finance the temporary working capital. Here the matching maturities concept, that matches the maturity of the assets with the maturity of the financing, is applicable.



Source: Kriek, Beekman & Els (adapted), 2008

FIGURE 18.4: The moderate financing policy

Activity 18.1

Winter-Heat Limited manufactures and sells electric heaters. Most of the manufacturing is done in the five months from October to February in order to have the heaters ready to sell in the autumn and winter months. The company holds permanent net working capital of R1 200 000 all year, with total net working capital increasing to R6 000 000 during these five months. Secured long-term financing has an interest rate of 12% and secured short-term financing is available at 10%. Winter-Heat Limited is considering two financing options:

Aggressive – Finance half of permanent working capital with long-term funds and the remaining permanent and temporary working capital with short-term funds.

Conservative – Finance the entire permanent and half of the temporary working capital with long-term funds and the remaining temporary working capital with short-term funds.

REQUIRED

a. Calculate the cost of each option.

b. Motivate why the financial manager may choose the expensive policy.

[You may ignore the effect of compounding in your answer. Round **only** the final answer to the nearest rand.]

Feedback on activity 18.1

a. The following calculations should be done in order to calculate the cost of each option:

Aggressive financing policy	**R**		**R**
Half of permanent for full year	(1 200 000 ÷ 2) = 600 000	x 12%	72 000
Half of permanent for full year	600 000	x 10%	60 000
Temporary for 5 months	(6 000 000 – 1 200 000) = 4 800 000	x 10% x (5 ÷ 12)	200 000
Total			332 000

Conservative financing policy	**R**		**R**
Permanent for full year	1 200 000	x 12%	144 000
Half temporary for 5 months	(4 800 000 ÷ 2) = 2 400 000	x 12% x (5 ÷ 12)	120 000
Half temporary for 5 months	2 400 000	x 10% x (5 ÷ 12)	100 000
Total			364 000

NOTE

The temporary working capital is only required from October to February (5 months).

b. The financial manager may choose the conservative option, even if it represents the more expensive one, because the financing risk is lower for the organisation. Short-term financing may be unavailable for small companies like Winter-Heat and, where available, may be recalled at short notice, which may create financial distress.

NOTE

Both options provided in the question represent secured debt (where collateral has to be offered). This would therefore not create a benefit for either option.

3 Working capital cycles

Certain cycles can be associated with the use of working capital in an organisation's operations. These cycles are: inventory is purchased from suppliers on credit; inventory is then sold to customers on credit; the next step is the collection of accounts receivable; and finally, payment is made to accounts payable. The cycles are segregated into two distinct areas: the *operating cycle* and *cash conversion cycle*.

OPERATING CYCLE

The operating cycle focuses on an organisation's **internal** (thus excluding accounts payable) cycle's impact on cash flow. It represents the length of time from committing cash for purchases of inventory to the inflow of cash from the sale of inventory on credit.

Key formula: OPERATING CYCLE

Operating cycle = inventory days + accounts receivable days

CASH CONVERSION CYCLE

The cash conversion cycle focuses directly on the cash flow associated with the overall cash flow from operations (including accounts payable). It represents the length of time between when an organisation makes payments to its creditors (outflow of cash) and when an organisation receives payments from its customers (inflow of cash). As the cash conversion cycle includes the cash flow benefit afforded by accounts payable, this cycle is shorter than the operating cycle.

Key formula: CASH CONVERSION CYCLE

Cash conversion cycle = inventory days + accounts receivable days – accounts payable days

Number of days inventory (Inventory days)
+
Period of credit taken by customers (Receivable days)
–
Period of credit granted by suppliers (Payable days)
=
Total cash conversion cycle

Source: Author, 2012

FIGURE 18.5: The calculation of the cash conversion cycle

The cash conversion cycle consists of the following:

1. Inventory turnover (conversion) time (= inventory days)

   In a manufacturing organisation, it is the time that is required to convert raw materials into finished goods and then to sell the inventory.

2. Receivables collection time (= receivable days)

   The time required to collect the receivables after the credit sale.

3. Payables deferral time (= payable days)

   The time it takes from purchasing the inventory or raw materials to the payment thereof.

4. Cash conversion time (= cash conversion cycle – days)

   The net of the length of the above times (inventory, receivables and payables) and equals the time from cash expenditure to the receipts from sales.

The cash conversion cycle is an important cycle as it contributes to our understanding of how the organisation's operations are running on an on-going basis. Managing the cash conversion cycle is important as longer cycles consume more financial resources.

The cash conversion cycle can be shortened in a number of ways, including:

- reducing inventory levels by implementing inventory management systems
- delaying payments to suppliers or obtaining more finance
- recovering outstanding accounts sooner by making the credit terms more strict or by improving on the collection process

Each of these methods, in turn, has associated advantages and disadvantages. (These were discussed earlier in the previous study unit, sections 3, and 5.) The calculation of the cash conversion-cycle days was explained as part of ratio-analysis, in study unit 16, section 6.

Activity 18.2

RoofJacks is a manufacturer of roof trusses and a range of roofing materials. The company wants to improve on their cash conversion cycle to eliminate the need for additional funds to finance their working capital. An extract from the company's financial statements of the most recent financial year is offered below.

The total amount of credit purchases relating to inventory for the year were R254 521. Total sales revenue (all on credit) was R390 000. Cost of sales amounted to R245 112 for the year.

Balances at year-end:

	R
Inventories	88 965
Trade receivables	74 556
Trade payables	36 559

REQUIRED

a. Calculate the cash conversion-cycle days for the most recent financial year.
b. Suggest how RoofJacks can shorten their cash conversion cycle.

You may assume that year-end balances were reflective of average balances for the year. Round **only** the final answer to the nearest rand. Use 365 days per year.

Feedback on activity 18.2

a. The cash conversion cycle days:

$$\frac{\text{Receivables}}{\text{Credit sales}} \times 365 = \frac{74\,556}{390\,000} \times 365$$

$$= 70 \text{ days}$$

$$\frac{\text{Payables}}{\text{Credit purchases}} \times 365 = \frac{36\,559}{254\,521} \times 365$$

$$= 52 \text{ days}$$

$$\frac{\text{Inventory}}{\text{Cost of sales}} \times 365 = \frac{88\,965}{245\,112} \times 365$$

$$= 132 \text{ days}$$

Cash conversion cycle	Days
Number of days of inventory (Inventory days)	132
Plus: Period of credit taken by customers (Receivable days)	70
	202
Less: Period of credit granted by suppliers (Payable days)	(52)
Total cash conversion cycle	150

b. How to shorten the cash conversion cycle days:

Refer to section 3.

4 Summary

In this study unit, we have defined working capital policy and listed the factors that may have an effect on the policy. The working capital investment policy was explained as well as the different working capital financing policies. We defined operating cycle and illustrated the calculation of the cash conversion cycle.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. Define working capital policy.
b. Explain the difference between permanent and temporary working capital.
c. Name and describe the different working capital financing policies.
d. Define the operating cycle.
e. Define the cash conversion cycle.
f. Explain how the cash conversion cycle days are calculated.

QUESTION 1

New Harvest Limited has an inventory turnover rate of ten times, an accounts collection period (receivable days) of 45 days and turns over its payables (payable days) once in two months.

REQUIRED

a. Calculate the length of the operating cycle.
b. Calculate the length of the cash conversion cycle.

(Use a 360-day year.)

QUESTION 2

Ladybird Limited is in a seasonal business as their high income period is in the summer time. They require a permanent base of net working capital of R10 million throughout the year, but that requirement temporaralily increases to R20 million during the 6-month summer period each year. Ladybird Limited has two financing policy options for net working capital:

1. Finance all net working capital needs with short-term debt at 12,5%.
2. Finance permanent net working capital with equity at a cost of 18% and temporary net working capital with a short-term loan at 12%.

REQUIRED

a. Calculate the cost of each financing policy option.
b. Which option will you classify as the aggressive working capital policy? Why?
c. Which option will you choose and why?

Solution to self-assessment activity

QUESTION 1

a. Operating cycle

Inventory turnover rate (number of times inventory is sold or used in a year – refer to topic 6) converted into days are:

360-day year / 10 times = 36 days

Inventory days	36
Plus: Receivable days	45
Operating cycle	**81 days**

b. Cash conversion cycle

Inventory days	36
Plus: Receivable days	45
Less: Payable days	60
Cash conversion cycle	**21 days**

QUESTION 2

a. The following calculations should be done in order to calculate the cost of each option:

Financing policy: Option 1	**R**			**R**
Permanent for full year		10 000 000	x 12,5%	1 250 000
Temporary for 6 months	(20 000 000 – 10 000 000) = 10 000 000		x 12,5% x (6 ÷ 12)	625 000
Total				1 875 000
Alternatively:	**R**			**R**
Balance of working capital for 6 months		10 000 000	x 12,5% x (6 ÷ 12)	625 000
Balance of working capital for 6 months		20 000 000	x 12,5% x (6 ÷ 12)	1 250 000
Total				1 875 000

Financing policy: Option 2	**R**			**R**
Permanent for full year		10 000 000	x 18%	1 800 000
Temporary for 6 months	(20 000 000 – 10 000 000) = 10 000 000		x 12% x (6 ÷ 12)	600 000
Total				2 400 000

b. The first financing policy is the aggressive policy, because the organisation makes use of more short-term financing. The short-term financing is supporting the entire temporary and all of the permanent working capital. Short-term financing is more volatile.

c. The financial manager may choose the conservative option, which is the second option, even if it represents the more expensive one, as the financing risk is lower for the organisation.

References and additional reading

Kriek, JH, Beekman, E & Els, G. 2008. *Fundamentals of finance.* 4th edition. Durban: LexisNexis.

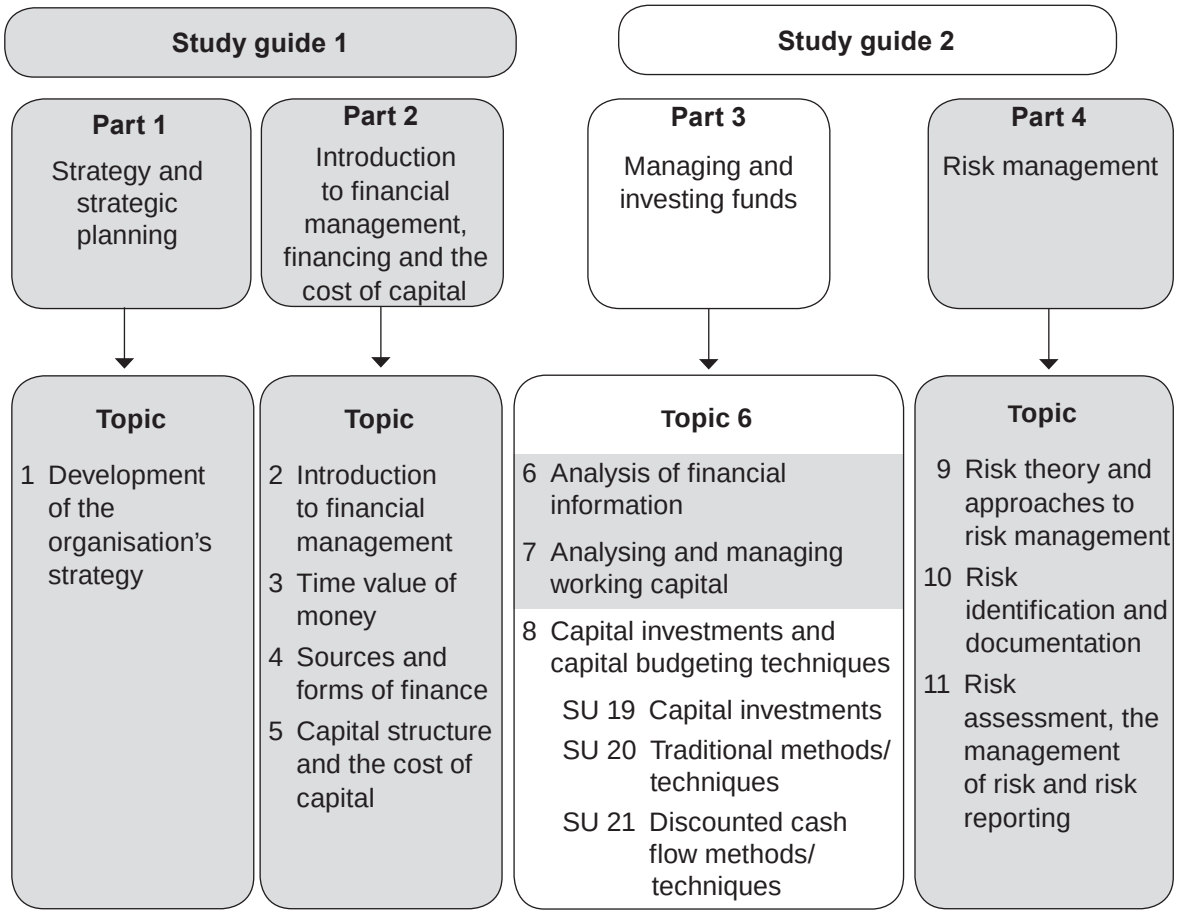
TOPIC 8

Capital investments and capital budgeting techniques

LEARNING OUTCOMES

After studying this topic, you should be able to:

- discuss the purpose and importance of capital investment decisions
- classify projects into types of expenditure and types of projects
- determine relevant cash flows for the capital budget of a project
- list and define traditional capital budgeting techniques
- list and define discounted cash flow capital budgeting techniques
- apply the capital budgeting techniques in the evaluation of different capital projects, asset acquisitions and investment decisions



INTRODUCTION

In topic 7, we dealt with managing the investment in working capital (current or short-term assets) and sources of financing available for this investment type. In this topic, we will explain how an organisation can invest in long-term (non-current) assets such as property, plant and equipment by looking at capital budgeting, investment appraisals and valuation methods.

We have already dealt with the basics of financing long-term assets in topic 4 – sources and forms of finance and topic 5 – capital structure and the cost of capital.

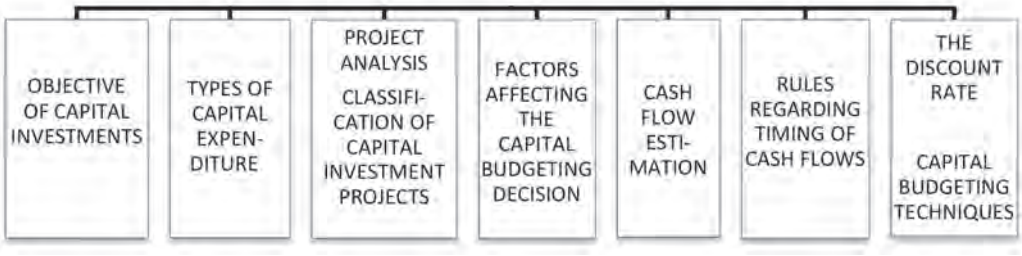
NOTE

This topic relies strongly on your knowledge of topic 3 – time value of money and topic 5 – capital structure and the cost of capital. If you get stuck, please refer back to these topics!

STUDY UNIT 19

Capital investments

In this study unit



1 Introduction

In this study unit, we provide an overview of capital investments whilst distinguishing between different types of investments. We also discuss the project analysis process and different classifications of capital projects.

2 Objective of capital investments

As a shareholder or owner of an organisation, you would have an expectation to earn a return on your investment, whether it is in the form of dividends/distributions or capital gain. Therefore, the role of management is to use the funds in the organisation to increase the value for the shareholder/owner, whilst still taking cognisance of the interest of other stakeholders, that is, creating long-term sustainable wealth as discussed in topics 1 and 2. The management should also manage the risks which face the organisation (you will learn more about that in the next part on risk management).

You will know from your Financial Accounting modules that the organisation's **cash outflows** are either classified as **expenses or as assets**. Investments in assets can be divided into two further categories, namely **short-term (current) assets** and **long-term (non-current) assets**. Investment in working capital was covered in topic 7. Funds that are invested in assets, large projects and capital market instruments (refer to topic 4) are long-term assets. Examples include machinery that needs to be replaced, start-up cost for a new business or long-term projects. This topic deals with long-term capital investments.

When making capital investment decisions, management's objective is therefore to select assets and projects that will **increase the long-term sustainable value of the organisation**. Management has to invest the funds sensibly. Capital budgeting decisions are the most important investment decisions made by the management of an organisation. Capital investments create value if they are worth more than what they cost. Most of the time, capital investments produce most of an organisation's income in future years.

CAPITAL INVESTMENTS / EXPENDITURE (also called CAPEX)

Long-term assets (eg non-current) such as property, plant and equipment acquired individually or as part of large projects that generate returns (cash inflows) over a number of years.

NOTE

The definition also includes investments in financial instruments (ie shares, debentures) issued by other organisations where the intention is a long-term investment and not speculation. Large companies usually own shares in their subsidiaries and associate companies instead of holding all the long-term assets directly in their own legal organisation (ie instead of buying another plant in their own name, they buy shares in another company that owns such a plant).

In this topic, we will focus on non-financial (tangible) long-term assets. You will learn more about the advanced issues surrounding the acquisition of shares in another organisation in MAC3702 and MAC4861/2. The basic evaluation process though is largely the same.

Although we use the term "capital *expenditure*" in our MAC modules, it does not mean it is expensed to the statement of profit or loss and other comprehensive income in terms of International Financial Reporting Standards (IFRS) – it still remains a long-term asset!

SUSTAINABLE CAPITAL BUDGETING

Sustainable capital budgeting involves planning and evaluation of how funds are spent on capital investments that will ultimately add to the organisation's value while taking cognisance of the social, environmental and governance impact of the decision.

Capital budgeting is an organisation's formal process for the acquisition and investment of capital. It involves an organisation's decision to invest its current funds for addition, modification and replacement of long-term assets.

The capital budgeting decision is an important one for any organisation, in the sense that it determines the nature of the organisation's operations and products over the long term. Before the organisation commits its scarce and valuable capital resources to capital investments (fixed productive projects/assets), it needs to be assured of the **profitability** as well as an **acceptable return** on the funds invested therein. Therefore, capital budgeting provides methods by which capital investments are evaluated.

The evaluation forms the basis of deciding whether a specific capital asset/project makes sense for a particular organisation at a specific time and whether it is in line with long-term strategic goals.

3 Types of capital expenditure

The capital expenditure process starts with an organisation's strategic plan, which states the strategy for the next three to five years. Strategic objectives are then converted into business plans that give details of quantifiable targets for each business unit (refer to topic 1).

The **capital budget** forms part of the business plans (you will learn more about the details surrounding the budgeting process in your MAC2601 module) and outline the reasons and budgeted amount required for capital expenditure.

Types of capital expenditures are as follows:

- **Major repair or upgrade**

After some time, plant and equipment must undergo major repairs, be rebuilt or updated with new technology. This usually restores the asset to its previous condition and output capacity. These decisions do not require a detailed analysis and are made during the course of the business operations. (Note that the taxation treatment of this expenditure is different than that for replacement and expansion!)

- **Replacement**

The replacement of assets is done when it's irreparable, worn out or damaged. These decisions involve the replacement of the asset with a similar or updated one. These decisions will require a detailed analysis and also approval from the organisation's board of directors. Project cash flows can be forecasted with a greater degree of accuracy, based on existing sales and manufacturing conditions.

- **Expansion**

The expansion of a business unit involves producing new products, entering into a new market or increasing capacity. These decisions will require a detailed analysis and also approval from the organisation's board of directors. Project cash flow estimates are subject to greater uncertainty regarding eventual success of the new products or new markets.

Activity 19.1

You are given the following examples of capital expenditure:

a. A manufacturing company decides to increase the output of existing products. This involves the purchase of new equipment to produce more products and extension of their distribution system.
b. A delivery company has a fleet of delivery vehicles. They decide to renovate the vehicles and their engines rather than to purchase new ones.
c. An organisation has a machine that has become obsolete and has to decide whether to replace the machine with a similar one or to purchase a different machine that would require a change in the production process. The new machine may provide cost savings with respect to labour or material usage and/or may improve product quality.

REQUIRED

Identify the correct type of capital expenditure for each example.

Feedback on activity 19.1

Refer to section 3.

a. This type of capital expenditure is an expansion as it involves increases of capacity and the company's distribution system.
b. This type of capital expenditure is a major repair or upgrade as the repairs will restore the vehicles to its previous condition and output capacity instead of purchasing new ones.
c. This type of capital expenditure is a replacement as it will replace an old machine. Although it has other benefits as well (if a different machine is

purchased), it still is not an expansion, as the output (capacity) was not improved!

4 Project analysis

PROJECT ANALYSIS

Project analysis is the detailed examination of all the technical specifications (operational), marketing (sales units, market, etc) and financial aspects (costs and revenues) and/or problems of a project before funds are allocated and work on it is started.

The project analysis process involves the following steps:

PROJECT ANALYSIS PROCESS
Proposal generation
Project evaluation
Project selection
Implementation, monitoring and post-implementation audit

1. Proposal generation

The first step is the generation of a capital investment proposal. This entails the gathering of information, both financial and non-financial.

Examples of the proposals for capital investment may include some of the following:

- proposals to add a new product to the product line (to be sold in existing or new markets)
- proposals to expand the production capacity in existing product lines (to be sold in existing or new markets)
- proposals to reduce the costs of the output of the existing products without changing the scale of operation
- proposals to upgrade the production facilities to meet new environmental regulations regarding gas emissions, effluents, and so on

2. Project evaluation

The proposal is then received by management and compared to other proposals. Management has to ensure that all cash inflows from a project will be sufficient to cover the initial cash outflow that will take place. An estimation of benefits and costs are measured in terms of cash flows which are mainly dependant on future uncertainties.

The risk associated with each project should be analysed carefully and sufficient provision must be made for covering the different types of risks.

Environmental, social and governance impacts should also be evaluated properly.

3. Project selection

Capital investment criteria should be compiled by management (the board) to judge the attractiveness of the project. These selection criteria should be consistent with the

organisation's objective of increasing sustainable long-term wealth. The criteria should include financial and non-financial parameters.

The screening and selection procedures for approving the investment proposal will be different from organisation to organisation. The board (or top management) approves selected projects and it is usually awarded a "vote number" and minuted as such.

Once the proposal for capital expenditure is approved (vote number obtained), it is the duty of the financial manager to investigate the different alternatives available for acquiring the funds, in line with the target capital structure of the organisation (refer to topic 5).

NOTE

There is a difference between the approval of the project (getting the vote number) and getting approval in each financial year to spend the money (in line with the overall approval granted)! The board sits at different intervals in the year. The budget is submitted for approval to the board at a specific sitting (before the start of the new financial year).

4. Implementation, monitoring and post-implementation audit of the project.

The financial manager has to prepare a capital budget (detailing how and where the funds will be spent) and various reports in order to get authorisation from the organisation's board of directors as the money is actually spent.

Systematic procedures should be developed to review the performance of the capital investments during their lifetime and after completion in the case of capital projects. It is important to identify any significant deviations from the initial proposal and quantify these as soon as possible.

The follow up and comparison of actual performance with the original estimates (part of the post-implementation audit) does not only ensure better forecasting, but should also improve the capital investment appraisal process in future and assist management not to repeat the same mistakes there might have been made.

5 Classification of capital investment projects

Potential capital projects can be grouped into the following classifications:

PROJECT CLASSIFICATION
Independent projects (projects with unrelated cash flows)
Mutually exclusive projects (competing alternatives)
Contingent projects (acceptance depends on acceptance of another project
Divisible and indivisible projects

1. Independent projects (projects with unrelated cash flows)

Independent projects **do not compete** with one another in terms of functionality. Their cash flows are also independent from one another.

For example, a financial manager is reviewing a company's capital investment proposals. One proposal is to acquire a new machine for its existing product line and another proposal is to purchase mining rights. Both these projects can be accepted if they meet the criteria because they have different functions.

2. Mutually exclusive projects (competing alternatives)

Mutually exclusive projects are projects that **do compete** with one another. These are projects for which acceptance of one prevents acceptance of the other. The different projects are alternatives for one another, and one has to be selected.

Consider a company that has to replace a machine. There are two types of machines that can do the job. These two projects (machines) compete with each other because they have the same function. Only one project can be chosen. Choosing one project automatically eliminates the other from further consideration.

3. Contingent projects (projects, of which the acceptance depends on the acceptance of another project)

With contingent projects, the acceptance of the one project is contingent on the acceptance of another. If there are different (sub) projects required to complete a larger project, it is called contingent projects. These different projects are treated as a single investment for the purpose of evaluation. In this module, we will not deal with contingent projects.

4. Divisible and indivisible projects

When a project can be broken down into smaller parts that can be executed on their own, it is a divisible project. A project that cannot be broken down in subparts is indivisible and has to be undertaken in its entirety.

For example, divisible projects are common in the construction industry where developments take place in "phases". The organisation can decide to complete Phase I now and start on Phase II in two years' time (or never, if conditions become unfavourable!)

An indivisible project is, for example, where an organisation wants to erect a new bottling facility in a new area to service a different market. The whole project has to be completed as no smaller part of the plant can operate on its own.

NOTE

An organisation usually has only a limited amount of long-term funding available. Therefore, all projects under consideration cannot be accepted. The type of project plays an important role in allocating the available money!

Activity 19.2

You are given the following examples of capital investment projects:

a. A gas company wants to build a new power plant which involves different projects. Firstly, a power plant will have to be built. Then, in order to comply with environmental standards, they also need to invest in suitable pollution control equipment.

b. An automobile company decided to manufacture sedans in South Africa. It considered three possible manufacturing sites (or capital projects) namely KwaZulu-Natal, Northern Cape and Gauteng. Management has decided

and selected Gauteng as a manufacturing site after their detailed capital budgeting calculations.

c. A property developer wants to develop a vacant area into a new shopping centre. Phase I includes the anchor retailers (such as Woolworths and Edgars) while Phase II involves four restaurants and a stationery shop.

d. The management of a manufacturing company has three projects in mind: (1) build a new parking area at its head office; (2) acquire a small truck; and (3) add manufacturing capacity to one of its workshops.

REQUIRED

Identify the correct classification for each project.

Feedback on activity 19.2

Refer to section 5.

a. These are contingent projects. The acceptance of the power plant is contingent on the acceptance of the pollution control equipment. We can also say that the pollution control investment is a compulsory contingent project. This is also an example of in indivisible project. It is no use to build the plant, if the pollution control equipment is not installed too, as the plant will not get authorisation to start production.

b. These are mutually exclusive projects. Once management has decided and selected Gauteng as a manufacturing site, the other two possible locations for the investment are no longer considered.

c. These are divisible projects. The developer can decide to only go ahead with Phase I.

d. These are independent projects. Since the cash flows for each project are unrelated, accepting or rejecting one of the projects will have no effect on the others.

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6 Factors affecting the capital budgeting decision

Because the amount of funds available at any given time for new capital investments is limited, management needs to use capital budgeting techniques to determine which assets or projects will earn the highest return over an applicable period of time.

Apart from the returns of the individual projects under consideration, some of the factors listed below also influence the capital allocation decision:

- availability of funds
- current and target capital structure of the organisation
- legal factors
- lending policies of financial institutions
- immediate need for the project
- future earnings

Some of the risks and uncertainties in capital budgeting decisions include:

- expected economic life of the asset or project
- environmental, social and governance impact of the project(s)
- the duration of the construction and ramp-up phase (getting the equipment ready to produce at specified capacity)
- recoupment value of the assets and working capital (if any) at the end of the project
- overall capacity of the asset or project (output units)
- selling price of the product
- future demand for the product
- reaction from competitors – affecting the projected sales volumes
- South African Revenue Services' (SARS) allowances for capital expenditure
- production cost
- successfully implementing new technology or new production techniques
- inflation rates for different input costs
- exchange rates, especially with imported plant and equipment and where the output of the project is exported
- tax rate

7 Cash flow estimation

Almost all the techniques (discussed in the next two study units) used in capital budgeting appraisal is based on cash flows. Cash inflows and outflows are assessed in order to determine whether the returns generated by the capital investment meet a sufficient target benchmark, which is often the weighted average cost of capital (discussed in section 9).

The cash flow information needed to perform the capital budgeting appraisal or evaluation is mostly obtainable within the organisation. It often starts with sales representatives and marketing managers who are in the market place talking to potential and current customers. Cost accountants and production engineers determine the cost of producing a product and any capital expenditure necessary to manufacture it. Where the project involves optimising production processes, the production managers will provide the details surrounding savings, increased output levels, and so forth.

When preparing a proposal, it is important for the financial manager to only include cash flows that are relevant to the capital investment decision.

A few of the cash flow concepts will be discussed next.

1. Relevant cash flows

Relevant cash flows are inflows and outflows that arise in the future as a result of the investment decision being approved. Its inclusion or exclusion from the capital budgeting calculation can affect the overall investment decision. For example, if the project is not accepted, the machine will not be bought and no costs will be incurred. Relevant cash flows will therefore **be included** in the capital budgeting calculation.

Examples of relevant cash flows are:

- the acquisition cost of a machine (outflow of funds)
- proceeds from sale of any project assets at the end of its useful life (estimated residual value)

- the initial investment in working capital for the project, such as the **additional** inventories to support the new operation, or **increases** in accounts receivable due to new customers taken on
- the cash sales attributed to the new machine and the payments in respect of variable costs associated with the sales
- salaries of the **additional** employees that needs to be hired specifically for the new operation
- rent to be paid for **additional** space for the new machine

Non-cash flow items are not included in the capital budgeting calculation. An example of a non-cash flow item is depreciation and amortisations. Depreciation is an accounting entry and not a flow of funds and therefore it must not be treated as a cash flow. However, it has an effect on the income tax liability and must be taken into account when the cash flow pertaining to the income tax liability is to be calculated (more on that later). Another example is bad debts written off. The credit sale that gave rise to the debtor is only an accounting entry; no cash has yet flowed.

Non-relevant cash flows include, for example, the rent of a factory if an organisation wants to add a new product to the existing product lines. The new product will be manufactured in the existing factory, so the rent of the factory is not relevant. If the project to manufacture the new product is rejected, the rent still needs to be paid, because current products will still be manufactured in the factory.

NOTE

The same principle applies as that in Relevant Costing covered in MAC2601. We only include ***incremental cash in or outflows***. Existing cash flows or cash flows already committed before the investment decision is irrelevant. For example, if an additional machine can be accommodated on the factory floor, we will not include a pro rata portion of the factory rental to the project (even though the rental is paid in cash) as there is no increase in the total amount of rental paid as a result of the investment decision. However, should additional premises need to be rented, that rental will be included as additional cash fixed cost of the project!

2. Working capital

Net working capital invested normally consists of additional inventories that are required to support a new business operation or plant, and which will also have an effect on accounts payable (inventories bought on credit), accounts receivable (increase in credit sales) and cash. The amount invested is reflected as an outflow at the beginning of the investment period.

The investment in net working capital is returned/realised at the end of the investment period as the working capital is no longer required and the cash that was tied up in it is now made available. For example, the last inventory has been sold, the debtors have all paid and the creditors have been settled. It reflects as a net cash inflow at the end of the investment period.

Should there be an annual change in the level of the working capital related to the project, the net movement would reflect as either an outflow (increase in working capital balance) or inflow (reduction in working capital balance).

For example, let us assume the working capital required over the life of the project is as follows:

	0 R	1 R	2 R	3 R	4 R
Working capital	50 000	55 000	56 000	49 000	0

This can be reflected in the capital budget cash flows in two ways:

a. Net movements

Annual net cash movement	(50 000)	(5 000)	(1 000)	5 000	49 000

b. Annual balances

Working capital opening balance	0	50 000	55 000	56 000	49 000
Working capital closing balance	(50 000)	(55 000)	(56 000)	(49 000)	0

3. Sunk costs

Sunk costs are costs that have already been committed or that have already taken place in the past and will not be considered in the capital budgeting calculation. Sunk costs cannot be changed or reversed by the acceptance or rejection of the project.

Examples of sunk costs include:

- costs of research and development relating to the project which has already taken place
- patent fees for protection of intellectual property rights (new products/techniques developed)
- costs of feasibility studies
- market research costs (if extensive market research has proved a demand for a new product and the product is then being manufactured, the market research cost is sunk costs and will be irrelevant to the capital budgeting decision)

4. Wear and tear allowances for taxation calculation

For accounting purposes, assets are depreciated by writing off a depreciation charge over the productive life of the asset. SARS too allows a capital allowance on assets purchased. In many cases this allowance (called wear and tear) occurs at a **higher rate** (to encourage organisations to invest in productive capacity and create employment) than that which is used to depreciate the asset for accounting purposes. It bears **no correlation to the life** of the asset. This results in the taxable income being different to the accounting profit before tax.

For example, an asset with a cost of R600 000 may have a useful life of six years. For accounting purposes, we will charge depreciation at R100 000 per annum and deduct that from the profits of the business. SARS may allow a wear and tear allowance of 20% per year, which means that R120 000 is allowed as a deduction in the calculation of taxable income. If we assume the organisation has other net cash profits before tax of R1 000 000, the impact is as follows:

Statement of profit or loss and other comprehensive income

	R
Other net cash profits	1 000 000
Depreciation	(100 000)
Profit before tax in statement of profit or loss	900 000
Normal tax (see below)	(246 400)
Profit after tax	653 600

NOTE

Do you notice that when we add back the accounting depreciation, we are back to the other net cash profits?

The calculation of taxable income will be as follows:

Profit before tax	900 000
Add back depreciation	100 000
Other net cash profits	1 000 000
Deduct wear and tear	(120 000)
Taxable income	880 000

Normal tax at 28% 246 400

Cash flow for capital budgeting:

	R
Profit before tax	900 000
Add back: Non-cash depreciation	100 000
Net cash from operations	1 000 000
Less: Taxation paid	(246 400)
Net cash flow for the period	753 600

NOTE

Depreciation does not feature in cash flows as it is a non-cash item. It is added back to profit. We include the tax payment as an outflow.

When the wear and tear allowance is different to the accounting depreciation, the asset will also have a tax value which is different from the accounting book value. For the example above, it looks as follows:

Year	0 R	1 R	2 R	3 R	4 R	5 R	6 R
Original cost price	600 000						
Book value end of year		500 000	400 000	300 000	200 000	100 000	0
Tax value end of year		480 000	360 000	240 000	120 000	0	

Another aspect that should be considered is where the asset is disposed of. When the proceeds are more than the tax value, a recoupment of previous wear and tear allowances occurs. This is added to the taxable income. For example, let us assume the asset was sold at the end of year four for R150 000.

For accounting purposes, the loss is R(50 000) (= R150 000 – R200 000).

For taxation purposes, the recoupment is R30 000 (= R150 000 – R120 000), which is added to the taxable income. If we once again assume the organisation has other net cash profits before tax of R1 000 000, the impact is as follows:

	Year 4
	R
Other net cash profits	1 000 000
Depreciation	(100 000)
Loss on sale of asset	(50 000)
Profit before tax in statement of profit or loss	850 000
Normal tax (see below)	(254 800)
Profit after tax	595 200

The calculation of taxable income will be as follows:

Profit before tax	850 000
Add back: Depreciation	100 000
Loss on sale	50 000
Other net cash profits	1 000 000
Deduct wear and tear	(120 000)
Recoupment of wear and tear	30 000
Taxable income	910 000

Normal tax at 28% R254 800

5. Normal income tax

This also is a relevant cash flow, as it has to be paid according to the Income Tax Act based on the taxable income generated by the project (after taking account of wear and tear allowances). The relevant cash flows (returns available to owners/fund providers) are always net of tax. A detailed tax calculation (see previous point) is usually a part of determining the after tax cash flows relating to the project.

NOTE

You will learn more about how taxable income is determined in your Taxation modules. For purposes of MAC2602, we will limit it to very basic calculations.

6. Opportunity costs

Opportunity costs are net cash inflows that could have been generated from an alternative investment or transaction and is therefore a lost (forfeited) return. The lost return can be

viewed as a cost that arises from a lost opportunity and will be included in your capital budgeting calculation.

An example is if a new project is implemented which requires the use of an existing machine. The decision leads to the machine not being available to earn income for its existing application any longer. The net cash income lost is a relevant cost to the capital budgeting decision of the new project. The implication is that the new project must recoup at least this lost income and more!

7. Financing costs

Financing costs (interest etc) is **NEVER** taken into account in the capital budgeting exercise.

Even though the interest on debt financing represents a cash outflow, the weighted average cost of capital (used as the discount rate), based on the target capital structure, includes the required return of all providers of capital (after tax) and will ensure that providers of debt (and equity) will receive their return.

In topic 5 we have stressed that we use the target capital structure (or the actual, when the target structure is unknown), because the source of funding for the next expansion of the organisation is driven by the objective of moving towards to the target structure, irrespective of how the funds are invested!

NOTE

In the next two study units, you will get the opportunity to see how all the different aspects discussed above is treated in the capital budget!

8 Rules regarding timing of cash flows

In the discounted cash flow techniques, we take into account both the **timing** of cash flows as well as the streams of cash flows **over the full life time** of the project.

A capital budget is usually prepared in a spread sheet like the example below:

Example	NPV	Period 0	Period 1	Period 2	Period 3
	R	R	R	R	R
Capital outlay (cash outflow)		(90 000)	–	–	–
Realisable value (inflow)		–	–	–	5 000
Working capital		(20 000)	–	–	15 000
Net cash inflow from operations		–	80 000	50 000	35 000
Normal tax payments		–	(15 000)	(6 000)	(3 000)
Net cash inflow/(outflow)		(110 000)	65 000	44 000	52 000
PV factor of R1 at 10% p.a.		1,000	$1\div(1+0{,}1)^1$	$1\div(1+0{,}1)^2$	$1\div(1+0{,}1)^3$
OR per Table A		1,000	0,909	0,826	0,751
Present value	24 481	(110 000)	59 085	36 344	39 052

The following guidelines will assist you in populating the spread sheet:

Rule: TIMING OF CASH FLOWS

- The initial cost of the investment or capital outlay always occurs in year 0 and is an outflow (negative amount), which can be seen as the beginning of year 1. The present value of R1 now (year 0), is R1 regardless of the size of the discount rate.
- Cash flows (in and out) that occurs *during* any period is said to occur at the end of that period/year. So, if a relevant cost occurs during the first year, it will be included in year 1, which is the *end of year 1*.
- Cash flows that occur at the *beginning* of a period/year are taken to have occurred at the end of the previous period/year. So, if a relevant cost occurs at the beginning of the second year, it will be included in year 1, which is the *end of year 1*.
- Any *sale of assets* or *recoupment* of working capital at the end of the project is reflected as an inflow at the end of the last year.

Activity 19.3

The business that you work for, Refti Limited, owns a piece of land that have cost them R500 000 five years ago. The land can be used for a new building or it can be sold for R650 000.

REQUIRED

Identify the relevant costs when they decide to build a building on the piece of land instead of selling the land.

Feedback on activity 19.3

The R500 000 are sunk costs, as the money was paid in the past. The cost is irreversible and cannot affect your capital budgeting decision regarding the erection of the new building. It is therefore an irrelevant cost.

The R650 000 is an opportunity cost as it is a lost opportunity when they decide not to sell the land, but to build a building on it. It is therefore a relevant cost and to be included in the capital budgeting calculation for the building.

9 The discount rate

In the previous section, we identified the cash flows that are relevant to the capital investment decision. In topic 3, we have learned that money has a time value. Some of the methods that will be discussed in the next sections and study units are based on the time value of money. The correct decisions can only be made if all cash flows are measured at the same point in time. Therefore, all cash flows must be discounted back to today's value (called the net present value (NPV) of the project).

The discount rate used is the *weighted average cost of capital* (WACC), which was discussed in topic 5. The cost of capital is the rate of return that a capital investment must earn to be accepted by management. The providers of the capital need the project to deliver at least this minimum return on the investment.

NOTE

This rate is sometimes adjusted for risk if the risk of the project differs from that of the organisation in general (on which the WACC was based). You will learn more about this in later MAC modules.

10 Capital budgeting techniques

Capital budgeting techniques help the management of an organisation to analyse the business opportunities in order to decide on the best capital investments. Various techniques have been developed to determine whether an investment opportunity meets the organisation's requirements for a "satisfactory return". These methods/techniques are classified as follows:

Traditional methods/techniques (also called conventional methods)

They are based on highly simplified and at times, unrealistic assumptions. They fail to take into account the effect of risk factors or the time value of money.

The following traditional methods/techniques will be discussed and illustrated in study unit 20:

1. payback period
2. accounting rate of return (ARR)

Discounted cash flow methods/techniques (also called profitability methods)

They are more realistic as they take the time value of money into consideration when the return on an investment is calculated through the application of discounted cash flow methods.

The following discounted cash flow methods/techniques will be discussed and illustrated in study unit 21:

1. net present value (NPV)
2. internal rate of return (IRR)
3. profitability index (PI)

11 Summary

In this study unit, we discussed the meaning and function of capital investments and capital budgets. We discussed types of capital expenditure and the stages in the execution and completion of a project. We also explained the different classifications of capital investment projects. The importance of capital budgeting, factors influencing the decision and the risks and uncertainties involved in these decisions were highlighted. We briefly discussed sources of information and explained relevant cash flows and the discount rate. We also listed the different capital budgeting techniques.

In the next study unit, we will illustrate the traditional methods used in capital budgeting.

Self-assessment activity

After having worked through the study unit, you should be able to answer the following questions:

a. Define capital investments.
b. Define capital budgeting.
c. What is the objective of capital investments?
d. Name and describe the different types of capital expenditure.
e. Discuss the project analysis process.
f. Discuss the classifications of capital investment projects.
g. List some of the factors influencing the capital budgeting decision.
h. List some of the risks and uncertainties in capital budgeting decisions.
i. Define relevant cash flows, sunk cost and opportunity cost.
j. Which rate can be used as the discount rate?
k. Name the conventional methods/techniques.
l. Name the profitability methods/techniques.

QUESTION 1 – Eskom

You are given the following examples of capital expenditure of Eskom:

a. During the 1980s, Eskom realised that they supplied an excess electricity. The supply was much more than the demand. They then decided to *mothball* three power stations, of which Camden power station was one. In 2006, Eskom realised that there was going to be a 15% shortfall in meeting the demand and they decided to start up the Camden power station again to ensure that the supply is sufficient. However, the control systems used (a major part of the plant) in the Camden power station was installed before 1980 and was too old and worn-out. It had to be replaced.

   Mothball: If an organisation mothballs a factory, building or plant, it closes it or does not use it for a long time, but may open it or use it again in future. Minimal maintenance is done to prevent damage and to ensure a smooth start-up when it is required again.

b. Eskom is currently producing 40 gigawatts of electricity to satisfy the country's electricity needs. Their predictions show that the electricity demand in 2015 will be 43 gigawatts. They decided to build the Madupi power station that will produce 3,6 gigawatts.

c. During the nine warmer months of a year, Eskom does the necessary major repairs and maintenance on their generators to make sure that they will be able to generate sufficient power during the three winter months when the demand is very high.

REQUIRED

Identify the correct types of capital expenditure for each example.

QUESTION 2 – Gunsite company

The Gunsite company manufactures a line of hunting rifles. Management is considering a new business opportunity to produce a new product. New legislation by the government requires that six months from now, all current and future rifle owners must store their rifles in a rifle safe certified by the South African Bureau of Standards (SABS). The new product line entails the manufacture and supply of SABS approved rifle safes.

The opportunity has been investigated carefully and the following information is estimated:

Cost of new production machinery and equipment including transport and setup costs		R500 000
Expense of appointing and training new employees		R225 000
Pre-start-up advertising and other miscellaneous expenses		R 60 000
Additional selling expenses per year after start-up		R180 000
Unit sales prediction:		
Year 1	650	
Year 2	1 590	
Year 3	1 320	
Year 4	1 400	
Unit selling price		R2 700
Unit cash cost to manufacture (50% of revenue)		R1 350

Last year, in anticipation of this new opportunity, Gunsite bought the rights to a new safe design which has SABS approval, for R85 000.

Gunsite's production facilities are currently being utilised to capacity, so a new workshop has to be found for the incremental production. The company owns a plot near the present facility on which a new building can be constructed for R700 000. The land was purchased ten years ago for R300 000 and now has an estimated market value of R1 010 000.

If Gunsite produces rifle safes, it expects to increase some of its current sales of rifles, as there will be more feet in the shop. An addition of ten percent of the rifle sales are expected to come from this new business each year and will contribute an additional cash profit of R70 000 per year.

Gunsite's general overhead includes salary payments, repairs and maintenance. Small one-time increments in business don't affect overhead spending, but a major continuing increase in volume would require additional support. Management estimates that additional cash spending in overhead areas will amount to about 3% of the new project's revenue.

Incremental inventories are estimated at R220 000 at start-up and for the first year. After that, the working capital requirement will decrease to R80 000 and remain at that level for the duration of the project.

The useful life of the machinery and equipment is six years and wear and tear for taxation purposes is deductible at 20% per annum based on the cost of the asset by using the straight line method.

The company's current tax rate is 28%.

REQUIRED

a. Calculate the total initial cash outlay (period 0) relating to the new product line of rifle safes.
b. Estimate the cash flows of the new product line of rifle safes for the first four years.
   [Round your figures to the nearest rand.]

QUESTION 1 – Eskom

a. This type of capital expenditure is replacement as the control system was worn out and had to be replaced.

b. This type of capital expenditure is an expansion as they will be building a new power station to increase capacity of power supply.

c. This type of capital expenditure is a major repair as equipment needs to be maintained and repaired. One can even argue that some of the expenditure is normal maintenance, but we need more information on the details.

QUESTION 2 – Gunsite company

a. The initial outlay (period 0) for the new product line of rifle safes.

Assets necessary to get started	**R**
Machinery and equipment	500 000
New building construction	700 000
Initial working capital (inventory)	220 000
Total of assets	1 420 000

Operating costs necessary to get started	**R**
Appointing and training of new employees	225 000
Advertising and miscellaneous	60 000
Net operating costs ①	285 000

NOTE

The expenses are paid upfront in period 0, but remember that the tax deduction of these expenses takes place at the end of year 1. You should include it as a deduction in the calculation of the taxable income of year 1.

Opportunity cost of the land	**R**
Market value – current selling price	1 010 000

The historical cost of the land (R300 000) is a sunk cost and is excluded!

NOTE

We will ignore the capital gains tax on the potential sale as it falls outside the scope for MAC2602.

The total initial outlay for the new product line is as follows:

Total initial outlay	**R**
Assets necessary to get started	1 420 000
Operating costs necessary to get started	285 000
Opportunity cost of the land	1 010 000
Total for year 0	**2 715 000**

b. The cash flow estimation for the first four years of the new product line – the rifle safes

	Years			
	1	2	3	4
Units	650	1 590	1 320	1 400
	R	R	R	R
Turnover (units x R2 700)	1 755 000	4 293 000	3 564 000	3 780 000
Cash gross profit (units x R1 350)	877 500	2 146 500	1 782 000	1 890 000
Increase in current rifle sales	70 000	70 000	70 000	70 000
Selling expenses	(180 000)	(180 000)	(180 000)	(180 000)
Depreciation (non-cash flow)	–	–	–	–
General overhead (3% x turnover)	(52 650)	(128 790)	(106 920)	(113 400)
Net cash income before tax	714 850	1 907 710	1 565 080	1 666 600
Taxation paid ②	(92 358)	(506 159)	(410 222)	(438 648)
Working capital (R220 000 – R80 000)	140 000	–	–	–
Net cash flow	762 492	1 400 551	1 154 858	1 227 952

②**Taxation calculation:**	Years			
	1	2	3	4
	R	R	R	R
Net cash income before tax	714 850	1 907 710	1 565 080	1 666 600
Start-up operating costs (from a. ①)	(285 000)	–	–	–
Wear and tear (R500 000 x 20%)	(100 000)	(100 000)	(100 000)	(100 000)
Total taxable income	329 850	1 807 710	1 465 080	1 566 600
Taxation at 28%	(92 358)	(506 159)	(410 222)	(438 648)

NOTE

The R85 000 that was spent on the new SABS approved design, is not taken into account in the relevant cash flow estimation. It is a **sunk cost**, as the cost occurred in the past and is irrelevant whether the new rifle safe opportunity was accepted or not. Only future

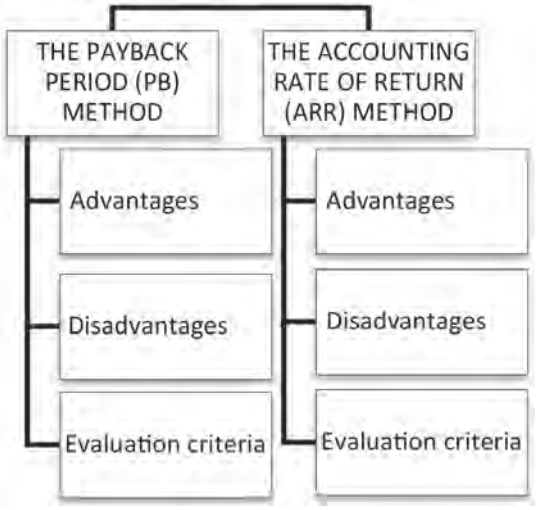
cash flows that depend on the decision to go ahead should be included in the cash flow estimation.

Also note that there are no **financing costs** deducted as it is included in WACC when the NPV and IRR techniques are applied.

STUDY UNIT 20

Traditional methods/techniques

In this study unit



1 Introduction

In the previous study unit, we discussed the importance of capital budgeting. Two different capital budgeting techniques namely traditional and discounted cash flow were identified. This study unit provides an illustration of the underlying principles involved in the evaluation of capital assets/projects by virtue of examples that cover the traditional methods/techniques for evaluating capital investments. These include the payback period- and the accounting rate of return methods.

2 The payback period (PB) method

PAYBACK PERIOD

The period of time required to recoup the total capital amount invested through the cash generation from the project.

In other words, it calculates the time it takes the **cash inflows** from a capital project to equal the **cash outflows, that is, to break even**.

A long payback period means capital is tied up for a long time, which increases business risk (the longer the time horizon, the greater the uncertainty regarding cash flows and the business environment). Organisations use this method to set a maximum payback time, above which investments are no longer acceptable. The calculated payback period of a project is therefore compared with the target period that is set by management.

This method is based on simplicity and is very popular in practice. It is a very crude measure though, and should be used in conjunction with other methods.

Key formula: PAYBACK PERIOD

$$PB = \text{Years } \textbf{before} \text{ break-even year} + \frac{\text{Remaining cost to recover}}{\text{Cash flow during the break-even year}}$$

Where:

Years before break-even year	=	number of years that the cumulative cash outlay is still negative
Remaining cost to cover	=	capital outlay (investment) less cash recovered in years before the break-even year or cumulative negative cash outlay at the start of the break-even year
Cash flow during the break-even year	=	cash flow during the year in which break-even takes place
Cash flows	=	operational cash flows AFTER tax

Example:		**Periodic cash flow**	**Cumulative (unrecovered cash outlay) or excess cash inflow**	
Outlay (investment)	=	R(10) m	R(10) m	
After tax cash inflow year 1	=	R2 m	R(8) m	
After tax cash inflow year 2	=	R3 m	R(5) m	Last year that cumulative outlay is still negative
After tax cash inflow year 3	=	R6 m	R1	Break-even occurs somewhere in this year
After tax cash inflow year 4	=	R2 m	R3	

$$PB = \text{Years } \textbf{before} \text{ cost recovery} + \frac{\text{Remaining cost to recover}}{\text{Cash flow during the year}}$$

$= 2 + (5 \div 6)$

$= 2{,}8333$ years

2.1 Advantages

- The method involves a simple calculation.
- Acceptance or rejection of the project can be made easily.
- It is biased towards short-term projects and liquidity and favours investments that free up cash for other uses more quickly.
- It is a good method for evaluating high risk projects. The longer it takes to recover the initial investment, the higher the risk of the project. It thereby potentially eliminates the uncertainty of later years' cash flows.

2.2 Disadvantages

- The method does not recognise the importance of time value of money.
- It does not recognise patterns of cash flows.
- It does not take risk explicitly into account.
- It ignores cash flows after the payback period (break-even). It therefore ignores the need to make profits from a project.
- The target payback period is subjectively set by management.

2.3 Evaluation criteria

The acceptance or rejection of the project is based on the cash flow generation of a project. After your calculation of the payback period, you can evaluate the project as follows:

- If the payback period is shorter than the target payback period (as set by management), the project should be considered for funding.
- If the payback period is longer than the target payback period (as set by management), the project should be rejected.
- If projects are mutually exclusive, the project with the shortest payback period should be considered for funding, but the target payback period should still be taken into consideration.

Based on the disadvantages listed above, it is therefore recommended that this method be used in conjunction with other methods before final decisions are made.

Activity 20.1

A business has to choose between two machines, Sip and Huk:

- Sip has a cost of R100 000 and will give a net cash flow saving in operating cost after tax of R25 000 per annum for five (5) years.
- Huk has a cost of R110 000 and will give a net cash flow saving in operating cost after tax of R26 000 per annum for five (5) years.
- Depreciation amounts to R20 000 for Sip and R22 000 for Huk per annum, but it has not been included in determining the cost saving as it does not constitute cash flow.

REQUIRED

a. Calculate the payback periods for both Sip and Huk.
b. Which machine should be chosen if we use this method in isolation? Why?
c. If management has set a target payback period of four (4) years, which machine should be rejected?

Feedback on activity 20.1

a. The payback periods for both Sip and Huk:

$$\text{PB} = \text{Years } \textbf{before} \text{ break-even year} + \frac{\text{Remaining cost to recover}}{\text{Cash flow during the break-even year}}$$

$$\text{Sip: Payback period} = \frac{\text{R100 000}}{\text{R25 000}}$$

$$= 4 \text{ years}$$

$$\text{PB} = \text{Years } \textbf{before} \text{ break-even year} + \frac{\text{Remaining cost to recover}}{\text{Cash flow during the break-even year}}$$

$$\text{Huk: Payback period} = \frac{\text{R110 000}}{\text{R26 000}}$$

$$= 4{,}23 \text{ years}$$

NOTE

This is an alternative method to calculate the payback period where we have **equal cash inflows per year**! The annual cash inflows are treated as an annuity. We therefore do not need to calculate the cumulative unrecovered cash outlay for each year.

Proof for Huk:

		R'000	Cumulative (unrecovered cash outlay) or excess cash inflow	
Outlay (investment)	=	R110	R(110)	
Cash inflow year 1	=	R26	R(84)	
Cash inflow year 2	=	R26	R(58)	
Cash inflow year 3	=	R26	R(32)	
Cash inflow year 4	=	R26	R(6)	Last year that cumulative outlay is still negative
Cash inflow year 5	=	R26	R20	Break-even occurs somewhere in this year

$$PB = \text{Years before cost recovery} + \frac{\text{Remaining cost to recover}}{\text{Cash flow during the year}}$$

$$= 4 + \frac{6}{26}$$

= 4,2308 years

b. The payback period of Sip and Huk should be compared. The payback period of Sip is shorter than that of Huk. Therefore, machine Sip should be chosen.

c. Machine Huk should be rejected as its payback period is longer than the target of four (4) years.

3 The accounting rate of return (ARR) method

ACCOUNTING RATE OF RETURN (ARR)

This is based on an investment's (project's) **average net PROFIT after tax** (not cash flow), divided by its **average book value**. It is also called the average rate of return on investment/capital (ROI or ROC) method.

The accounting rate of return method calculates the average rate of return generated by the investment over its useful life (life span). If this return exceeds a target rate of return (set by management), the investment project should be undertaken.

Key formula: ACCOUNTING RATE OF RETURN (ARR)

$$ARR = \frac{\text{Average net profit after taxation}}{\text{Average investment}} \times \frac{100}{1}$$

Where:

Average net profit after taxation = the average annual profit after taxation for the whole period (life of the project/asset)

Average investment = the average of the original investment cost (outlay) and any residual value at the end of its useful life (usually Rnil). (*This is equal to the cost of the investment ÷ 2 if depreciation is levied on the straight-line basis!)*

Example:

Outlay (investment) = R10 m Depreciated straight-line over 4 years, no residual value

			Annual profit (loss) after depreciation charged
After tax cash inflow year 1	=	R2 m	R(0,5) m
After tax cash inflow year 2	=	R3 m	R0,5 m
After tax cash inflow year 3	=	R6 m	R3,5
After tax cash inflow year 4	=	R2 m	R(0,5)
Total over 4 years	=		R3 m
Average over 4 years	=		R0,75 m
Average investment (R10 m ÷ 2)			R5 m

$$\text{ARR} = \frac{\text{Average net profit after taxation}}{\text{Average investment}} \times \frac{100}{1}$$

$$= \frac{\text{R0,75}}{\text{R5 m}} \times \frac{100}{1}$$

$$= 15\%$$

NOTE

The average investment can also be calculated as the average of the book values over the life of the asset:

Outlay (investment) = R10 m Depreciated over 4 years, no residual value

	Book value		**Average book value**		
End of year 1	=	R7,5 m	R8,75 m	=	(10 + 7,5) ÷ 2
End of year 2	=	R5 m	R6,25 m	=	(7,5 + 5) ÷ 2
End of year 3	=	R2,5 m	R3,75 m	=	(5 + 2,5) ÷ 2
End of year 4	=	R0 m	R1,25 m	=	(2,5 + 0) ÷ 2
Total over 4 years	=		R20 m		
			÷ 4		
Average book value over 4 years			= R5 m or	=	R10 m ÷ 2

Where assets are **not depreciated on the straight-line basis**, OR the **residual value is significant**, you should rather determine the average investment based on the **average book values** and not on the investment divided by two! The reason is that there is not a gradual decline (to Rnil) in the book value over the useful life.

3.1 Advantages

- It is very simple to understand and use.
- It provides a better means of comparison of projects than the payback period method, because it takes into account the saving over the entire economic life of the project.
- It can readily be calculated by using the accounting data.
- A rate is always easy to interpret.

3.2 Disadvantages

- It ignores cash flows.
- It ignores time value of money.
- It ignores risk.
- It ignores the fact that the profits earned can be reinvested.
- It does not consider the length of life of the projects.
- The target rate of return is set subjectively by management.

NOTE

Where managers' performance are measured based on return on investment (ROI), the timing of the profits (how much is generated in which year) can have an impact on whether a project that should be accepted, based on the average ARR, is accepted or not. You will learn more about this in MAC3701 in Performance Management.

3.3 Evaluation criteria

After your calculation of the ARR, you can evaluate the project as follows:

- If the ARR of the project exceeds the target rate (as set by management), the project should be considered for funding.
- If the ARR of the project is lower than the target rate (as set by management), the project should be rejected.
- If projects are mutually exclusive, the project with the highest ARR should be considered for funding, but the target rate should still be taken into consideration.

Based on the disadvantages listed above, it is therefore recommended that this method be used in conjunction with other methods before final decisions are made.

Activity 20.2

Use the same information as in activity 20.1 before.

REQUIRED

a. Calculate the ARR for both Sip and Huk.
b. Which machine should be chosen? Why?
c. If management has set a target rate of 10%, which machine should be rejected?

Feedback on activity 20.2

a. The ARR for both Sip and Huk:

$$\text{Sip: ARR} = \frac{\text{Average net profit after taxation}}{\text{Average book value}} \times \frac{100}{1}$$

$$= \frac{(\text{R25 000} - \text{R20 000})}{(\text{R100 000} + 0) \div 2} \times \frac{100}{1}$$

$$= \frac{\text{R5 000}^{(1)}}{\text{R50 000}^{(2)}} \times \frac{100}{1}$$

$$= 10\%$$

$$\text{Huk: ARR} = \frac{\text{Average net profit after taxation}}{\text{Average book value}} \times \frac{100}{1}$$

$$= \frac{(\text{R26 000} - \text{R22 000})}{(\text{R110 000} + 0) \div 2} \times \frac{100}{1}$$

$$= \frac{\text{R4 000}}{\text{R50 000}^{(2)}} \times \frac{100}{1}$$

$$= 7{,}27\%$$

(1) The average annual profit is brought about by the net saving in after tax cost, which is calculated at R5 000 per annum for machine Sip and R4 000 per annum for machine Huk (the cash flow figures provided in activity 20.1 were before depreciation, but already after taxation).

(2) As depreciation is calculated on the straight-line basis, we can use the short-cut and divide the investment amount by two.

b. The ARR of Sip and Huk should be compared. The ARR of Sip is higher than that of Huk. Therefore, machine Sip should be chosen (in the absence of other methods).

c. Machine Huk should be rejected as its ARR is lower than the target rate of 10%.

4 Summary

In this study unit, we discussed traditional techniques used in capital budgeting. Advantages, disadvantages and evaluation criteria of the payback period method and the accounting rate of return method were explained. We illustrated these techniques in the calculations of different activities.

In the next study unit, we shall proceed with the illustration of discounted cash flow techniques used in capital budgeting.

Self-assessment activity

After having worked through this study unit, you should be able to **discuss** the following:

a. the advantages, disadvantages and evaluation criteria of the payback period method
b. the advantages, disadvantages and evaluation criteria of the ARR method

The next question will assess your skills in calculating the payback period and the use of the ARR method.

QUESTION 1

A project requires a cash outlay of R200 000 and generates cash flow savings in operating cost after tax of R80 000, R70 000, R40 000 and R30 000 during the next four years. Depreciation of R50 000 per year has not been deducted from the operating cash flow after tax figures as it is a non-cash item.

REQUIRED

a. What is the project's payback period?
b. What is the accounting rate of return (ARR) for the project?

Feedback on self-assessment activity

QUESTION 1

a. The project's payback period:

Payback period = 1 year : R200 000 – R80 000 = R120 000
= 2 years: R120 000 – R70 000 = R50 000
= 3 years: R50 000 – R40 000 = R10 000
= 3 years and (R10 000 ÷ R30 000) x 12 months
= 3 years and 4 months

b. The accounting rate of return (ARR) for the project:

$$ARR = \frac{\text{Average net profit after taxation}}{\text{Average book value}} \times \frac{100}{1}$$

$$= \frac{(R55\,000 - R50\,000)}{(R200\,000 - 0) \div 2} \times \frac{100}{1}$$

$$= \frac{R5\,000^{(1)}}{R100\,000} \times \frac{100}{1}$$

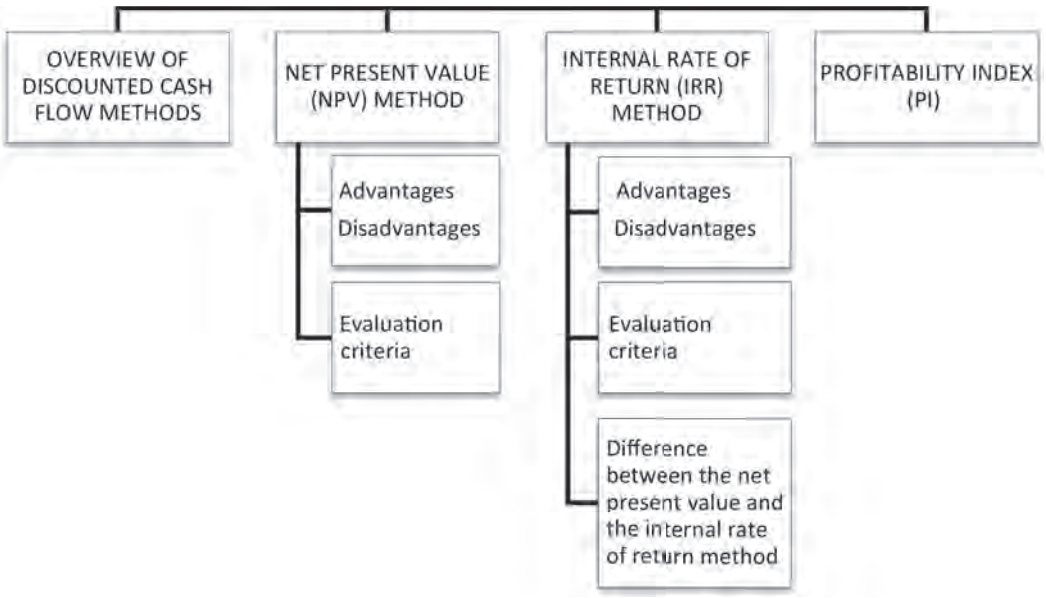
$$= 5\%$$

(1) Average operating cash flow after tax for 4 years
= (R80 000 + R70 000 + R40 000 + R30 000) ÷ 4
= R55 000

STUDY UNIT 21

Discounted cash flow methods/techniques

In this study unit



1 Introduction

In the previous study unit, traditional techniques used in capital budgeting were discussed and illustrated. This study unit provides a further illustration of the underlying principles involved in the evaluation of capital assets/projects by virtue of examples that cover the discounted cash flow methods/techniques for evaluating capital investments. These include the net present value, internal rate of return and profitability index methods/techniques.

2 Overview of discounted cash flow methods

These methods factor in the **timing** of cash flows and it considers cash flows after the payback period (ie **all the cash flows over the life** of the investment or project) and are an improvement on the traditional methods such as payback period and accounting rate of return.

The presence of time as a factor in investment decision-making is fundamental because the real value of money fluctuates over a period of time. A total of R40 000 received today has more value than R40 000 received in five year's time (refer to topic 3). In evaluating investment projects, it is therefore important to consider the timing of returns on investment.

We will now discuss each of the three methods in more detail.

3 Net present value (NPV) method

NET PRESENT VALUE

Net result of future periodic net after tax cash flows discounted to present value, using an appropriate rate, and the present value of the capital invested in the project.

The net present value method is a discounted cash flow (DCF) method because it takes cash flows and time value of money into account. It is considered as the best method of evaluating capital investment proposals and it is widely used in practice.

Key formula: NET PRESENT VALUE

$$NPV=\left[\sum_{t=1}^{n}\frac{C_t}{(1+k)^t}\right]-I$$

Where:

n = number of periods (life of the project)

t = specific period

k = discount rate (= WACC ± risk adjustment, if any)

C_t = net cash flow for period t

I = initial capital investment at period 0 (note, this is not a figure "1", but "I" for "Investment")

The NPV method involves the following steps which are represented in the formula above:

1. Determine and calculate the net cash flows PER PERIOD for the entire life of the investment/project/asset. This is C_t in the formula.
2. Discounting each of the net cash flows by an appropriate discount factor (refer to study unit 19, section 9 and topic 5 – capital structure and cost of capital). This is the denominator $(1 + k)^t$ in the above formula.
3. Add together the discounted cash flows for each period (the present values) 1 to t. This is the $\sum$ in the formula.
4. The net value (NPV) is derived by subtracting the amount invested at point 0 (this is the I in the formula) from the total present values of all the project generated cash flows, calculated in step 3.

In applying this method, an acceptable discount factor (or required rate of return), normally based on the weighted average cost of capital (WACC) (refer to topic 5), is calculated. It is this percentage at which the cash flows are discounted to obtain a net present value. The NPV's of each project will be used for measurement against the accept or reject criteria.

3.1 Advantages

- This method recognises the time value of money.
- It considers the cash inflow of the entire project.
- The discount rate can be adjusted to take account of the riskiness of the investment/project.
- It assumes that surplus cash inflows can be reinvested at the WACC.

3.2 Disadvantages

- The concept of WACC is difficult to understand.

- The calculation of the WACC is complex and subject to interpretation.
- The risk premium/discount that is added to the WACC can be manipulated by management.
- The result of the discounted cash flows is a rand amount, rather than a rate (%), which makes it more difficult to interpret.

3.3 Evaluation criteria

Determine **what** has to be decided on. This could be, inter alia:

- whether a single project is to be undertaken or not (compare cash cost with cash advantages)
- a choice between alternative projects (compare equivalent periodic cash advantages with each other)
- to decide whether capital must be invested to obtain a saving in operating costs (compare the cash costs before investment with cash costs after investment)

The cash flows pertaining to each project must be included in a time schedule or time statement and a net cash flow per period must be determined. The NPV can be calculated using the formula for present value, the factor tables or a financial calculator. (These methods were discussed and explained in topic 3 – time value of money.)

After your calculation of the NPV, you can evaluate the project as follows:

- If the NPV is **positive (exceeds 0)**, the project may be accepted.
- Should the NPV be **negative (lower than 0)**, the project must be rejected.
- A NPV of **nil**, where the present values of the cash inflows and cash outflows are equal, means that the project may still be accepted and the internal rate of return (IRR) has been achieved.
- If the projects are mutually exclusive, the project with the highest positive (exceeds 0) NPV may be accepted.

We will now demonstrate the application of this method with the next two activities.

Activity 21.1 – Projects Yum, Tum and Pun

An organisation should choose between three projects namely Yum, Tum and Pun. The cost of each of these projects are R100 000 and they are mutually exclusive. Assume a required rate of return on capital of 14%.

The net cash inflow from operations after tax for each project is as follows:

	Project		
Year	Yum	Tum	Pun
	R	R	R
1	50 000	60 000	20 000
2	50 000	50 000	40 000
3	25 000	40 000	80 000

REQUIRED

a. Evaluate the above three projects by calculating their NPV as follows:

   i. Project Yum by using the factors from the tables and combining years with the same cash flows.

   ii. Project Tum by using the factors from the tables and a financial calculator.

   iii. Project Pun by using the factors from the tables and Microsoft Excel.

b. Conclude on what project should be accepted.

Feedback on activity 21.1

a. i. Project Yum by using the factors from the tables and NOT combining years:

	Years			
	0	1	2	3
	R	R	R	R
Capital outlay (cash outflow)	(100 000)	–	–	–
Net cash inflow from operations	–	50 000	50 000	25 000
Net cash inflow/(outflow)	(100 000)	50 000	50 000	25 000
PV factor of R1 at 14% p.a. (Table A)	1,000	0,877	0,769	0,675
Present values	(100 000)	43 850	38 450	16 875
NPV		(825)		

Combining of years

Where the cash flows of more than one year are identical, they may be combined in one column to save time and space. These cash flows are treated as an **annuity** (refer to topic 3 – time value of money). The PV factor that is used then is from Table B which is a present value (PV) of cash flow per annum. By using Table B, the cash flow is projected for multiple years, as illustrated below.

Project Yum (years of identical cash flow COMBINED)

	Years		
	0	1 – 2	3
	R	R	R
Capital outlay (cash outflow)	(100 000)	–	–
Net cash inflow from operations	–	50 000	25 000
Net cash inflow/(outflow)	(100 000)	50 000	25 000
PV factor of R1 at 14% p.a. (Table A)	1,000	1,646①	0,675
Present values	(100 000)	82 300	16 875
NPV		(825)	

NOTE

Please note that the cash flow **for one year is indicated in the column, and not the cash flow per year multiplied by the number of years.**

Calculation:

① **Factor**

Year 1: Table A at 14%, year 1	0,877
Year 2: Table A at 14%, year 2	0,769
Years 1 to 2	1,646

OR

Year 1 – 2: Table B at 14%, 2 years = 1,647

The difference is due to rounding and can be ignored.

a. ii. Project Tum by using the factors from the tables and a financial calculator:

	Years			
	0	1	2	3
	R	R	R	R
Capital outlay (cash outflow)	(100 000)	–	–	–
Net cash inflow from operations	–	60 000	50 000	40 000
Net cash inflow/(outflow)	(100 000)	60 000	50 000	40 000
PV factor of R1 at 14% p.a. (Table A)	1,000	0,877	0,769	0,675
Present values	(100 000)	52 620	38 450	27 000
NPV		18 070		

Financial calculator

In order to use your financial calculator, read the manual, as each calculator has its own specific way of working. The following steps have been demonstrated for a Sharp and HP financial calculator:

SHARP EL-738		Hp10BII	
Key in:	Display will read:	Key in:	Display will read:
Clear all registers first:		2ndF C ALL	1 P_Yr then 0.0000
CFi 2ndF CA	0.0000	3rdF C MEM 0	c FLo clr then 0.0000
		2ndF 1 I/YR	1.0000
Enter data sets:			
+/– 100 000 ENT	DATA SET:CF 0.0000	100000+/– CF_j	CFLO/CF-100,000.0000
60 000 ENT	DATA SET:CF 1.0000	60000 CF_j	CFLO/CF 60,000.0000
50 000 ENT	DATA SET:CF 2.0000	50000 CF_j	CFLO/CF 50,000.0000
40 000 ENT	DATA SET:CF 3.0000	40000 CF_i	CFLO/CF 40,000.0000
Clear cash flow registers:			
ON/C	0.0000		
2ndF CASH	RATE (I/Y) =		
2ndF CA	RATE (I/Y) = 0.0000		
Enter rate:			
(I/Y) 14 ENT	RATE (I/Y)= 14.0000	14 I/YR	14.0000
Use arrows to get to NPV and press COMP	NET_PV = 0.0000 18'103.8160	2ndF NPV	18 103.8160

Thus, the net present value is R18 104 (rounded to the nearest rand) according to the financial calculator and is R18 070 according to the method using the factors from the tables. The difference of R34 is due to the fact that the factors in the tables are rounded off.

a. iii. Project Pun by using the factors from the tables and Microsoft Excel:

	Years			
	0	1	2	3
	R	R	R	R
Capital outlay (cash outflow)	(100 000)	–	–	–
Net cash inflow from operations	–	20 000	40 000	80 000
Net cash inflow/(outflow)	(100 000)	20 000	40 000	80 000
PV factor of R1 at 14% p.a. (Table A)	1,000	0,877	0,769	0,675
Present values	(100 000)	17 540	30 760	54 000
NPV		2 300		

Using Microsoft Excel:

Net present value problems can also be solved by using a spread sheet program. The spread sheet is designed to keep track of all the cash flows and the periods in which they occur. The following spread sheet setup shows how to calculate the NPV for project Pun.

	A	B	C	D	E
1					
2		Net Present Value Calculations			
3					
4		Year		Cash flows in Rand	
5		0		(100 000)	
6		1		20 000	
7		2		40 000	
8		3		80 000	
9					
10		WACC		0.14	
11					
12		**NPV**		**2 320**	
13					
14		Formula used:		=NPV(D10,D6:D8)+D5	
15				and rounded to the	
16				nearest Rand	
17					

NOTE

Notice that the preset NPV formula (***in Excel, not your financial calculator***) only determines the net present values of the cash flows in all other years, excluding period 0! Therefore, you should only enter the cash flows in years 1 to 3, along with the discount rate. You then add/deduct the cash flow in year 0 to the total of the NPV formula calculation to arrive at the NPV for the investment.

Remember to keep track of signs. Cash outflows are negative and cash inflows are positive.

Thus, the net present value is R2 320 according to Microsoft Excel and is R2 300 according to the method using the factors from the tables. The difference of R20 is due to the fact that the factors in the tables are rounded off.

b. Conclusion

An overview of the three projects, bearing in mind the project cost of R100 000 each, reflects that project **Yum** has a negative net present value (cash inflow). It does not meet the 14% return which is required and will not provide for the return of the capital invested and the required interest thereon.

Project **Tum** has a positive net present value of R18 070, which indicates that its return substantially exceeds the required 14% per annum. In the next section, we will revisit how to calculate the internal rate of return (which you encountered in topic 5 – capital structure and cost of capital).

Project **Pun** with a positive net present value of R2 300, indicates that its internal rate of return is also in excess of 14% per annum.

Project Yum cannot be recommended, whilst projects Tum and Pun are both acceptable, with Tum being preferred as it has the highest NPV.

Where the amounts to be invested differ, the most profitable project is that for which the ratio of income to investment is the highest. You will learn how to calculate this in the section on the profitability index.

Where sufficient funds are available for investment in both projects and they are divisible projects, the maximum amount should be invested in Tum and the balance in project Pun.

NOTE

Qualitative issues as discussed in topics 1 and 2 should also be considered when making the final investment decision. These issues include the consideration of other stakeholders as well as non-financial aspects such as environmental, social and governance in order to ensure the long-term sustainability of the organisation. It is no longer acceptable to make decisions based on financial impact alone.

Self-assessment activity

Abrey Ltd is considering the replacement of its machine Adro, which is currently in use, with a new machine, Bedro.

The following information regarding the two machines is available:

	Machine	
	Adro	**Bedro**
	R	**R**
Cost price	49 000	56 000
Book value – Current	28 000	–
Tax value – Current	12 250	–
Market value – Current	10 000	–
Useful life:		
– Original	7 years	4 years
– Remaining	4 years	–
Estimated costs:		
– Direct material (per unit)	100 cents	100 cents
– Annual fixed costs (including depreciation)	R25 000	R52 000
– Annual variable conversion costs (based on annual production)	R25 000	R36 000
Annual production:		
– Maximum production (units)	25 000	45 000
– Maximum sales (units)	40 000	40 000
– Selling price (per unit)	500 cents	500 cents
Annual wear and tear allowance for taxation purposes (R49 000 ÷ 4) (R56 000 ÷ 4)	R12 250	R14 000
Annual depreciation (R49 000 ÷ 7) (R56 000 ÷ 4)	R 7 000	R14 000

Additional information:

1. The annual production for Bedro will be limited to the maximum number of units that can be sold annually, whilst the production for Adro, should it be retained, will be limited to the maximum annual production.
2. The rate of taxation is 28% and VAT can be ignored.
3. Management requires a return of 12% on capital projects.
4. Assume that all cash flows, except initial capital outlays which occur at the beginning of the year, occur at the end of the year concerned.

REQUIRED

Determine whether machine Adro should be replaced by machine Bedro. Execute your calculations to the nearest rand, and round off all your factors to three decimal places.

Feedback on self-assessment activity – Abrey Limited

Option 1 – Retain existing Adro

	Years		
	0	1	2–4
	R	**R**	**R**
Opportunity cost – current market value forfeited	(10 000)	–	–
Sales (25 000 x R5)	–	125 000	125 000
Material costs (25 000 x R1)	–	(25 000)	(25 000)
Fixed costs (R25 000 – R7 000)	–	(18 000)	(18 000)
Variable costs	–	(25 000)	(25 000)
Taxation②	–	(13 160)	(15 960)
Net cash inflow/(outflow)	(10 000)	43 840	41 040
Factor at 12%③	1,000	0,893	2,144③
Present values	(10 000)	39 149	87 990
Net present value	R117 139		

NOTE

In years where the cash flows FOR ALL LINE ITEMS ARE CONSTANT/IDENTICAL, we treat the net cash flows as an annuity in order to save time! See calculation ③.

As Adro is an older machine, its output is limited to 25 000 units, even though the market can take 40 000 units. Remember to always base your calculations on the lowest number of units that can physically be manufactured or that which can be sold!

Calculations:

① **Tax disadvantage as a result of not selling Adro at the beginning of year 4 (= year 1 of the capital budget)**

	R
Current market value (proceeds)	10 000
Current tax value (end of year 3)	12 250
Scrapping allowance forfeited	2 250

NOTE

The present market value of Adro together with the forfeiture of the tax saving which would have resulted from the scrapping allowance is the "cost"/price of retaining the Adro machine. This is the cash flow which is forfeited by retaining the machine, in other words, an opportunity cost. The tax effect is still considered as a year-end cash flow and is taken into account in year 1.

The question indicated that there are four years left. Therefore, the book and tax values provided for machine Adro is at the end of year 3. The potential sale could have taken place at the beginning of year 4. We therefore calculate the opportunity cost based on the values and proceeds as at the end of year 3.

② **Taxation**

	Years	
	1	2–4
	R	**R**
Sales	125 000	125 000
Material costs	(25 000)	(25 000)
Fixed costs	(18 000)	(18 000)
Variable costs	(25 000)	(25 000)
Wear and tear[4]	(12 250)	–
Scrapping allowance forfeited	2 250	–
Taxable amount	47 000	57 000
Taxation at 28%	(13 160)	(15 960)

③ **Factor – Years 2–4**

Years 1–4:	Table B at 12%, year 4	3,037
Minus: Year 1:	Table A at 12%, year 1	(0,893)
= Years 2–4		2,144

OR

Per Table A (Year 2)	0,797
(Year 3)	0,712
(Year 4)	0,636
	2,145

The difference is due to the factors being rounded off in the tables.

④ Note that the tax value of Adro is R12 250 at the time of the decision (= end of year 3). The annual wear and tear allowance is given as R12 250, therefore the wear and tear allowance may only be claimed for one remaining year (the fourth year), where after the asset would have been written off fully for tax purposes. NO wear and tear allowance can therefore be claimed in years 5–7 in the life of the asset (or years 2–4 for the capital budget)!

Option 2: Acquire new Bedro

	Years	
	0	1–4
	R	**R**
Cost price	(56 000)	–
Sales (40 000 x R5)	–	200 000
Material costs (40 000 x R1)	–	(40 000)
Fixed costs (R52 000 – R14 000)	–	(38 000)
Variable costs	–	(36 000)
Taxation ⑤	–	(20 160)
Net cash inflow/(outflow)	(56 000)	65 840
Factor at 12% (Table B)	1,000	3,037
Present values	(56 000)	199 956
Net present value	R143 956	

NOTE

As Bedro is a new machine, its potential output of 45 000 units is higher than the 40 000 units that the market can take. Remember to always base your calculations on the lowest number of units that can physically be manufactured or that which can be sold!

Calculations:

⑤ **Taxation**

	Years 1–4
	R
Sales	200 000
Material costs	(40 000)
Fixed costs	(38 000)
Variable costs	(36 000)
Wear and tear	(14 000)
Taxable income	72 000
Taxation at 28%	(20 160)

NOTE

The market value of Adro and the tax effect thereon cannot be treated as a cash inflow for Bedro. The new machine (Bedro) must be considered in isolation as the two options are mutually exclusive projects: either we keep the existing machine, or we buy a new machine. Bedro should achieve a positive NPV on its own, without including cash flows from Adro.

Recommendation:

Adro should be replaced with Bedro as it renders a higher positive net present value.

NOTE

Qualitative issues as discussed in topics 1 and 2 should also be considered when making the final investment decision. These issues include the consideration of other stakeholders as well as non-financial aspects such as environmental, social and governance in order to ensure the long-term sustainability of the organisation. It is no longer acceptable to make decisions based on financial impact alone.

You will have more opportunities to assess your skills with NPV calculations at the end of this study unit!

4 Internal rate of return (IRR) method

The internal rate of return method is also a discounted cash flow (DCF) method and requires that the actual rate of return of the project be calculated.

INTERNAL RATE OF RETURN (IRR)

The rate at which cash flows must be discounted so that the present value of the cash inflows equals the present value of the initial cash outflow. That is the rate at which the NPV will be equal to Rnil.

It is called the internal rate, because it depends mainly on the outlay and proceeds associated with the projects and not on any rate determined outside the investment.

Key formula: INTERNAL RATE OF RETURN (IRR)

$$0=\left[\sum_{t=1}^{n}\frac{C_t}{(1+r)^t}\right]-I$$

Where:

r = internal rate of return

n = number of periods (life of the project)

t = specific period

C_t = net cash flow for period t

I = capital investment at period 0

NOTE

Note that this is based on the NPV formula. There are two differences:

1. We have pre-set the NPV to Rnil.
2. The "k" is replaced with "r" as we do not know what return will generate a NPV of Rnil. When you are instructed NOT to use a financial calculator, you will "find" the "r" by means of interpolation. Refer back to topic 3 if you are not sure how interpolation works.

4.1 Advantages

- This method recognises the time value of money.
- It considers the cash inflow of the entire project.
- The IRR attempts to find the maximum rate of interest at which funds invested in the project could be repaid out of the cash inflows arising from the project.
- The result of the discounted cash flows is a rate (%), which makes it easier to interpret.
- It is very popular in the business world.

4.2 Disadvantages

- It assumes that surplus cash inflows can be reinvested at the IRR, which is an unrealistic rate for future reinvestments.
- It may give results that are inconsistent with the NPV method, especially in the case of mutually exclusive projects.
- It can generate more than one IRR for the same project when there are inconsistent cash flows, that is net inflows followed by net losses again.

4.3 Evaluation criteria

The internal rate of return is the true interest rate earned on an investment over the course of its useful life (eg the discounted rate of return). Management may once again set a minimum IRR which should be exceeded. This is referred to as the hurdle rate. The hurdle rate can be set equal to the WACC plus/minus any adjustment for project specific risk.

- If the IRR exceeds the required (acceptable) rate of return or the WACC, the project may be accepted.
- Should the IRR be lower than the required (acceptable) rate of return or the WACC, the project must be rejected.
- If the projects are mutually exclusive, the project with the highest IRR and exceeding the required (acceptable) rate of return or the WACC, may be accepted.

4.4 Difference between the net present value and the internal rate of return method

These two methods use the same process (discounted cash flows), but sometimes result in widely different rankings, especially when the useful lives and the discounting rates of the projects differ considerably. The difference between the two methods can be summarised as follows:

i. Net present value method: This method assumes re-investment of the net cash flows at the *acceptable rate of return or the WACC*. It calculates the NPV, given the discount rate.

ii. Internal rate of return method: This method assumes re-investment of the net cash flows at the *internal rate of return*. It assumes that NPV is nil and calculates the discount rate that makes NPV nil.

NOTE

Unless the internal rate of return method is specifically requested, the net present value method should be used in the examination.

We will now demonstrate how to calculate the IRR in the next activity.

Activity 21.2 – Projects Yum, Tum and Pun

Refer to the information in activity 21.1.

REQUIRED

a. Evaluate the above three projects by calculating their IRR's as follows:

   i. Project Yum by using a financial calculator.

   ii. Project Tum by interpolating between 25% and 26%.

   iii. Project Pun by interpolating between 15% and 16% and using Microsoft Excel.

b. Which project shoud be accepted? Explain how you reached your conclusion.

Feedback on activity 21.2

a i. The IRR of Project Yum by using a financial calculator:

Financial calculator

In order to use your financial calculator, read the manual, as each calculator has its own specific way of working. The following has been done with a Sharp and HP financial calculator:

SHARP EL-738		Hp10BII	
Key in:	Display will read:	Key in:	Display will read:
Clear all registers first:		2ndF C ALL	1 P_YR then 0.0000
CFi 2ndF CA	0.0000	3rdF C MEM 0	C FLo clr then 0.0000
		2ndF 1 I/YR	
Enter data sets:			
+/- 100 000 ENT	DATA SET:CF 0.0000	100000+/- CF_j	CFLO/CF-100,000.0000
50 000 ENT	DATA SET:CF 1.0000	50000 CF_j	CFLO/CF 50,000.0000
50 000 ENT	DATA SET:CF 2.0000	50000 CF_j	CFLO/CF 50,000.0000
25 000 ENT	DATA SET:CF 3.0000	25000 CF_i	CFLO/CF 25,000.0000
Clear cash flow registers:			
ON/C	0.0000		
2ndF CASH	RATE (I/Y) =		
2ndF CA	RATE (I/Y) = 0.0000		
and			
press COMP to get the IRR	RATE (I/Y) = 13.4765	2ndF IRR/YR	13.4765

As regards the internal rate of return, it is clear that project Yum, with a negative NPV, will have an internal rate of return which is below 14%. The calculated IRR is 13,48% (rounded to two decimal places).

NOTE

Let us see if a discount rate of 13,48% will indeed return a R Nil NPV.

	Years			
	0	1	2	3
	R	**R**	**R**	**R**
Capital outlay (cash outflow)	(100 000)	–	–	–
Net cash inflow from operations	–	50 000	50 000	25 000
Net cash inflow/ (outflow)	(100 000)	50 000	50 000	25 000
PV factor of R1 at 13,48% p.a.	1,000 1,000	$1 \div (1+0{,}1348)^1$ 0,881	$1 \div (1+0{,}1348)^2$ 0,777	$1 \div (1+0{,}1348)^3$ 0,684
Present values	(100 000)	44 050	38 850	17 100

NPV **Nil**

The objective is then to calculate the effective interest rate for projects Tum and Pun, that is, where the net present value of inflows = initial capital outlay:

a ii. The IRR of Project Tum by interpolating between 25% and 26%

Project Tum

	Years			
	0	1	2	3
	R	**R**	**R**	**R**
Net cash in-/(outflow)	(100 000)	60 000	50 000	40 000
Present value factor of R1 at **25%** p.a.	1,000	0,800	0,640	0,512
Present values	(100 000)	48 000	32 000	20 480
NPV	480			
Present value factor of R1 at **26%** p.a.	1,000	0,794	0,630	0,500
Present values	(100 000)	47 640	31 500	20 000

NPV (860)

Interpolation

$$25\% + \left[\frac{(R480 - R0)}{[R480 - (-R860)]} \times 1\%\right]$$

$$= 25\% + \left[\frac{R480}{R1\,340} \times 1\%\right]$$

$$= 25\% + [0{,}358 \times 1\%]$$

∴ Effective rate (IRR) = 25,36%

a. iii. The IRR of Project Pun by interpolating between 15% and 16% and using Microsoft Excel

Project Pun

	Years			
	0	1	2	3
	R	**R**	**R**	**R**
Net cash in-/(outflow)	(100 000)	20 000	40 000	80 000
Present value factor of R1 at **15%** p.a.	1,000	0,870	0,756	0,658
Present values	(100 000)	17 400	30 240	52 640
NPV	280			
Present value factor of R1 at **16%** p.a.	1,000	0,862	0,743	0,641
Present values	(100 000)	17 240	29 720	51 280

NPV (1 760)

Interpolation

$$15\% + \left[\frac{(R280 - R0)}{[R280 - (-R1\ 760)]} \times 1\%\right]$$

$$= 15\% + \left[\frac{R280}{R2\ 040} \times 1\%\right]$$

$$= 15\% + [0{,}137 \times 1\%]$$

$\therefore$ Effective rate (IRR) = 15,14%

Using Microsoft Excel:

Calculating the IRR can be a long process. Knowing all the cash flows and an approximate return, will allow you to use a spread sheet formula from Microsoft Excel and get an answer right away. The spread sheet below shows the setup for calculating the IRR for project Pun

	A	B	C	D	E
1					
2		Internal Rate of Return Calculations			
3					
4		Year		Cash flows in Rand	
5		0		(100 000)	
6		1		20 000	
7		2		40 000	
8		3		80 000	
9					
10		WACC		0.14	
11					
12		**IRR**		**15.12%**	
13					
14		Formula used:		=IRR(D5:D8,D10)	
15				and rounded to two	
16				decimal places	
17					

NOTE

Notice that, unlike the NPV formula ***(in Excel)***, the IRR formula accounts for all cash flows in ONE step, including the initial cash flow in year 0. There is no need to add the initial investment later to the formula. Also, you will need an estimated rate to calculate the IRR, for example, the WACC which will be given to you in the activities and questions. If the WACC is not given, Excel uses 10% as default from which to extrapolate!

Remember to keep track of signs. Cash outflows are negative and cash inflows are positive.

Thus, the IRR is 15,12% according to Microsoft Excel and is 15,14% according to the interpolation method. The difference of 0,02% is due to rounding.

b. Conclusion

An overview of the three projects, bearing in mind the project cost of R100 000, shows that project **Yum** has an IRR of 13,48%. It does not meet the 14% return which is required and will not provide for the return of the capital invested and the required interest thereon.

Project **Tum** has an IRR of 25,36%, which shows that its return substantially exceeds the required 14% per annum.

Project **Pun** with an IRR of 15,14%, indicates that it exceeds the 14% return which is required.

Project Yum cannot be recommended, whilst projects Tum and Pun are both acceptable, with Tum (with the highest IRR) being preferred.

In this case, the IRR method ranked the projects in the same order as the NPV method!

Where the amounts to be invested differ, the most profitable project is that of which the ratio of income to investment is the greatest. We will cover this in the next section.

Where sufficient funds are available for investment in both projects, the maximum amount should be invested in Tum and the balance in project Pun, assuming it is divisible.

NOTE

Qualitative issues as discussed in topics 1 and 2 should also be considered when making the final investment decision. These issues include the consideration of other stakeholders as well as non-financial aspects such as environmental, social and governance in order to ensure the long-term sustainability of the organisation. It is no longer acceptable to make decisions based on financial impact alone.

You will have more opportunities to assess your skills with IRR calculations at the end of this study unit!

5 Profitability index (PI)

The profitability index, or PI, method compares the present value of future cash inflows with the initial investment on a relative basis.

PROFITABILITY INDEX

The PI is the ratio of the present value of cash flows (PVCF) to the initial investment of the project. PI is also known as a benefit/cash ratio.

Key formula: PROFITABILITY INDEX

$$PI = \frac{PVCF}{\text{Initial investment}}$$

In this method, a project with a PI greater than 1 is accepted, but a project is rejected when its PI is less than 1. Note that the PI method is closely related to the NPV approach. In fact, if the net present value of a project is positive, the PI will be greater than 1. On the other hand, if the net present value is negative, the project will have a PI of less than 1.

The same conclusion is reached whether the net present value or the PI is used. In other words, if the present value of cash flows exceeds the initial investment, there is a positive net present value and a PI greater than 1, indicating that the project is acceptable.

This method is **useful to rank projects where the initial investment differs**, but the NPVs are all positive and close to each other.

Activity 21.3

Refer to the information in activity 21.1

REQUIRED

Evaluate the three projects by calculating their profitability index (PI). You may use the information calculated in activity 21.2

Feedback on activity 21.3

a. i. The PI of Project Yum:

$$PI = \frac{99\ 175}{100\ 000} = 0{,}99175$$

a. ii. The PI of Project Tum:

$$PI = \frac{118\ 070}{100\ 000} = 1{,}1807$$

a. iii. The PI of Project Pun:

$$PI = \frac{102\ 300}{100\ 000} = 1{,}0230$$

b. Conclusion

Accept project if PI > 1

Reject if PI < 1

According to the PI, Project Yum is rejected as being < 1. Project Tum's and Pun's PI's are greater than 1 and both can be accepted. As these are mutually exclusive projects, preference should be given to Project Tum with the highest PI.

NOTE

The cash flows in the numerator (above the line) of the fraction are the total project cash flows excluding the investment's amount! In other words, it is NOT the NPV amount, but total of net cash flows from year 1 to the end of the project!

6 Summary

In this study unit, we focused on discounted cash flow techniques for capital budgeting. We discussed the advantages, disadvantages and evaluation criteria of the net present value, internal rate of return, and profitability index methods. We illustrated these techniques in different approaches.

This study unit concludes the part dealing with capital investments. In the next part we will look into risk management.

Self-assessment activity

After having worked through this study unit, you should be able to answer the following questions:

a. List the advantages, disadvantages and evaluation criteria of the NPV method.
b. List the advantages, disadvantages and evaluation criteria of the IRR method.
c. Briefly describe the differences between the NPV and IRR method.
d. Define the PI method.

The next questions will assess your skills in using discounted cash flow techniques.

QUESTION 1 – Nkonki Limited

Nkonki Limited operates a large fleet of delivery vehicles in order to make deliveries to its customers. A cost-benefit analysis has previously indicated that the maximum period to retain a vehicle, based on the assumption that the average vehicle would cover 30 000 kilometres a year, is five years. The asset register indicated that four vehicles are due for replacement. The accountant gathered the following information:

- The cost price of a new delivery vehicle is R360 000.
- Depreciation is calculated by taking the realisable value into account.
- It has a residual (realisable) value of R10 000 at the end of year five.
- It is estimated that the operating costs per vehicle (including depreciation) will be R170 000 for the first year and R190 000 per annum for years two to five.

Sibiya Transport, which satisfactorily serves a number of other firms in the area, has offered a similar service to the company at R220 000 per delivery vehicle, per year.

The company's required rate of return is calculated to be 15% per annum.

REQUIRED

Apply the net present value method and make a recommendation on whether Nkonki Limited should purchase and operate the four delivery vehicles themselves or accept Sibiya Transport's offer.

Ignore taxation and assume that management and administration costs will be the same for both alternatives. Calculate and indicate the discounting factors that you used.

QUESTION 2 – Lex Power Limited

The company, a manufacturer of power tools, is considering buying a new machine. They have gathered information on two possible options – machine Zin or machine Wic.

1. The following information regarding the machines is available:

	Machine	
	Zin	Wic
	R	**R**
Cost price	100 000	80 000
Working capital required	10 000	8 000
Net operating income before tax	25 000	21 100
Realisable value at end of useful life	20 000	18 000
Useful life	5 years	5 years

2. Taxation:
   - Wear and tear allowances are calculated on the straight-line method at 25% per annum, on the cost of the asset.
   - Normal income tax rate – 28%.
3. In determining net operating income, depreciation has already been taken into account. Depreciation is calculated by taking the realisable value into account.
4. Management requires a 23% after-taxation return on all capital investments.

REQUIRED

Determine, using the internal rate of return method, whether machine Zin or machine Wic should be purchased, by interpolating between 22% and 24%.

Assume that all cash flows occur at the end of each year, except the initial capital outlays, which occur at the beginning of year 1.

[Calculations must be rounded off to the nearest rand.]

QUESTION 3 – Cyco Limited

The company uses a certain machine, TS.40, in a manufacturing process. The supplier of the TS.40 has demonstrated an improved model, TS.50, to management. Management consequently approached the management accountant for an opinion in this regard.

The following information is available:

	Machine	
	TS.40	TS.50
	R	**R**
Cost	400 000	700 000
Realisable value – end of useful life	80 000	100 000
– current	200 000	–
Annual net cash inflow before taxation	95 000	150 000
Useful life – total	5 years	6 years
– remaining	3 years	–

Additional information:

1. Wear and tear for taxation purposes is deductible at 20% per annum based on the cost of the asset by using the straight-line method.
2. The present rate of taxation 28%.
3. The company requires a 15% rate of return on investments.

REQUIRED

Advise management whether TS.40 should be replaced by TS.50, by using the net present value method.

[Execute your calculations to the nearest rand and round all your factors to three decimal places.]

Feedback on self-assessment activity

QUESTION 1 – Nkonki Limited

Option – Own vehicles

	Years			
	0	1	2–4	5
	R	**R**	**R**	**R**
Cost price	(360 000)	–	–	–
Operating costs	–	(170 000)	(190 000)	(190 000)
Add back – depreciation①	–	70 000	70 000	70 000
Residual (realisable) value		–	–	10 000
Net cash outflows	(360 000)	(100 000)	(120 000)	(110 000)
Factor at 15%	1,000	$1 \div (1+0{,}15)^1$	②	$1 \div (1+0{,}15)^5$
	1,000	0,870	1,986	0,497
Present values	(360 000)	(87 000)	(238 320)	(54 670)

NPV for one vehicle (R739 990)

Option – Sibiya Transport service

NPV = R220 000 per annum for 5 years at 15% p.a.
= (R220 000) x 3,353③
= (R737 660)

① **Depreciation**

Value to be depreciated = original cost price less realisable value
= R360 000 – R10 000
= R350 000

Depreciation over life = R350 000 ÷ 5 years
= R70 000 per year

NOTE

Discounted cash flow techniques only work with estimated cash flows. You therefore have to ADD BACK NON-CASH FLOW items!

② Annuity for years 2 to 4

$= [1 \div (1+ 0{,}15)^{2}] + [1 \div (1+ 0{,}15)^{3}] + [1 \div (1+ 0{,}15)^{4}]$
= 0,756 + 0,658 + 0,572
= 1,986

③ Annuity for 5 years

$= [1 \div (1+ 0{,}15)^{1}] + [②] + [1 \div (1+ 0{,}15)^{5}]$
= 0,870 + 1,986 + 0,497
= 3,353

NOTE

Even if the time value of money (TMV) tables or factors are not given to you in a question or as an addendum to the paper, you should still be able to work out the factors mathematically based on your knowledge of topic 3 – time value of money!

Remember to **group years with EXACTLY the same cash flows and to use an annuity factor**. It saves time in that you don't have to write out the figures in three columns (in this scenario). You should then use an annuity as it is the same cash flow for x-number of periods!

Recommendation:

Based on the financial analysis alone, the company should accept the offer of Sibiya Transport as their offer presents a LOWER negative net present value.

NOTE

In this scenario, we were comparing the net COSTS of two options that were mutually exclusive. You should remember to select the option with the lowest cost! When you

are comparing options for projects with cash inflows, you should select the option with the highest NPV.

Qualitative issues as discussed in topics 1 and 2 should also be considered when making the final investment decision. These issues include the consideration of other stakeholders as well as non-financial aspects such as environmental, social and governance in order to ensure the long-term sustainability of the organisation. It is no longer acceptable to make decisions based on financial impact alone.

QUESTION 2 – Lex Power Limited

Capital budget – Machine Zin

	Years		
	0	1–4	5
	R	**R**	**R**
Cost price	(100 000)	–	–
Working capital*	(10 000)	–	10 000
Net operating income	–	25 000	25 000
Add back: Non-cash items			
– depreciation (R100 000 – R20 000) ÷ 5	–	16 000	16 000
Realisable value	–	–	20 000
Taxation ①	–	(4 480)	(17 080)
Net cash in-/(outflow)	(110 000)	36 520	53 920
Factor at 22% (Table B, 4 years) ; (Table A, 5 years)	1,000	2,494	0,370
Present values	(110 000)	91 081	19 950
Net present value	R1 031		
Factor at 24% (Table B, 4 years) ; (Table A, 5 years)	1,000	2,404	0,341
Present values	(110 000)	87 794	18 387
Net present value	(R3 819)		

Interpolation

$$22\% + \left[\frac{(R1\,031 - R0)}{[R1\,031 - (-R3\,819)]} \times 2\%\right]$$

$$= 22\% + \left[\frac{R1\,031}{R4\,850} \times 2\%\right]$$

∴ Effective rate (IRR)

$$= 22\% + [0{,}2126 \times 2\%]$$

$$= \underline{\underline{22{,}43\%}}$$

NOTE

The interval between 22% and 24% is 2%. The interpolation fraction is therefore based on 2%!

* Working capital is an amount invested once at the beginning of the investment period (outflow) and realised at the end of the investment period (inflow), as the working capital is no longer required and the cash that was tied up in it is made available.

Calculations:

① Taxation

	Years	
	1–4	5
	R	**R**
Net cash income (R25 000 + R16 000)	41 000	41 000
Wear and tear (R100 000 x 25%)	(25 000)	–
Wear and tear recouped ②	–	20 000
Taxable amount	16 000	61 000
Taxation at 28%	(4 480)	(17 080)

② Wear and tear recouped

	R
Cost	100 000
Less :Wear and tear (R100 000 x 25% x 4)	(100 000)
Tax value at end of useful life	NIL
Realisable value	20 000
Wear and tear recouped	20 000

Capital budget – Machine Wic	Years		
	0	1–4	5
	R	**R**	**R**
Cost price	(80 000)	–	–
Working capital*	(8 000)	–	8 000
Net operating income	–	21 100	21 100
Add back: Non-cash items			
– depreciation (R80 000 – R18 000) ÷ 5	–	12 400	12 400
Realisable value	–	–	18 000
Taxation ①	–	(3 780)	(14 420)
Net cash inflow/(outflow)	(88 000)	29 720	45 080

	Years		
	0	1–4	5
Factor at 22% (Table B, 4 years); (Table A, 5 years)	1,000	2,494	0,370
Present values	(88 000)	74 122	16 680
Net present value	R2 802		
Factor at 24% (Table B, 4 years); (Table A, 5 years)	1,000	2,404	0,341
Present values	(88 000)	71 447	15 372
Net present value	(R1 181)		

Interpolation

$$22\% + \left[\frac{(R2\,802 - R0)}{[R2\,802 - (-R1\,181)]} \times 2\%\right]$$

$$= 22\% + \left[\frac{R2\,802}{R3\,983} \times 2\%\right]$$

$$= 22\% + [0{,}7035 \times 2\%]$$

∴ Effective rate (IRR) = 23,41%

Calculations:

③ Taxation

	Years	
	1–4	5
	R	**R**
Net cash income (R21 100 + R12 400)	33 500	33 500
Wear and tear (R80 000 x 25%)	(20 000)	–
Wear and tear recouped ④	–	18 000
Taxable amount	13 500	51 500
Taxation at 28%	(3 780)	(14 420)

④ Wear and tear recouped

	R
Cost	80 000
Less: Wear and tear (R80 000 x 25% x 4)	(80 000)
Tax value at end of useful life	NIL
Realisable value	18 000
Wear and tear recouped	18 000

Conclusion:

The company should buy machine Wic, as it renders a higher internal rate of return and the IRR of 23,41% is also higher than the 23% after-taxation return that management requires on all capital investments.

NOTE

Qualitative issues as discussed in topics 1 and 2 should also be considered when making the final investment decision. These issues include the consideration of other stakeholders as well as non-financial aspects such as environmental, social and governance in order to ensure the long-term sustainability of the organisation. It is no longer acceptable to make decisions based on financial impact alone.

QUESTION 3 – Cyco Limited

Capital budget – TS.40	Years			
	0	1	2	3
	R	**R**	**R**	**R**
Realisable value – proceeds forfeited	(200 000)	–	–	–
Net cash inflow from operations	–	95 000	95 000	95 000
Proceeds on realisation	–	–	–	80 000
Taxation ②	–	(15 400)	(4 200)	(26 600)
Net cash inflow/(outflow)	(200 000)	79 600	90 800	148 400
Factor	1,000	$1 \div (1+0{,}15)^1$	$1 \div (1+0{,}15)^2$	$1 \div (1+0{,}15)^3$
Factor at 15% (Table A)		0,870	0,756	0,658
Present values	(200 000)	69 252	68 645	97 647
Net present value	35 544			

Calculations:

① Scrapping allowance forfeited – TS.40

	R
Cost	400 000
Less: Wear and tear to date [(R400 000 x 20%) x (5 – 3) years]	(160 000)
Tax value at date of decision	240 000
Current realisable value	200 000
Realisation allowance forfeited at date of decision	40 000

NOTE

The machine has a total useful life of 5 and a remaining useful life of 3 years. We therefore know that it has been used productively for 2 years at the time that this decision is being taken, during which period wear and tear would have been written off, for 2 years.

② Taxation

	Years		
	1	2	3
	R	**R**	**R**
Net cash inflow from operations	95 000	95 000	95 000
Wear and tear (R400 000 x 20%)	(80 000)	(80 000)	(80 000)
Scrapping allowance forfeited ①	40 000	–	–
Wear and tear recouped ③	–	–	80 000
Taxable amount	55 000	15 000	95 000
Taxation at 28%	(15 400)	(4 200)	(26 600)

③ Wear and tear recouped

	R
Cost	400 000
Less: Wear and tear (R400 000 x 20% x 5)	(400 000)
Tax value at end of useful life	NIL
Realisable value	80 000
Wear and tear recouped	80 000

Capital budget – TS.50

	Years		
	0	1–5	6
	R	**R**	**R**
Cost	(700 000)	–	–
Net cash inflow from operations	–	150 000	150 000
Proceeds on realisation	–	–	100 000
Taxation ④	–	(2 800)	(70 000)
Net cash inflow/(outflow)	(700 000)	147 200	180 000
Factor at 15% (Table B); (Table A)	1,000	3,352	0,432
Present values	(700 000)	493 414	77 760
Net present value	(128 826)		

Calculations:

④ Taxation

	Year	
	1–5	6
	R	**R**
Net cash inflow from operations	150 000	150 000
Wear and tear (R700 000 x 20%)	(140 000)	–
Wear and tear recouped ⑤	–	100 000
Taxable amount	10 000	250 000
Taxation at 28%	(2 800)	(70 000)

⑤ Wear and tear recouped

	R
Cost	700 000
Less: Wear and tear (R700 000 x 20% x 5)	(700 000)
Tax value at end of useful life	NIL
Realisable value	100 000
Wear and tear recouped	100 000

Recommendation:

Machine TS.40 renders the positive required rate of return, while TS.50 does not render the required rate of return. Thus TS.40 should be retained and not be replaced by TS.50.

NOTE

Where the periods of the two projects are different, the equivalent annual income method has to be used. This method will be dealt with in your third-year module, MAC3702. In this activity, machine TS.40 had a positive NPV and TS.50 had a negative NPV and therefore the recommendation could be done without performing the equivalent annual income method.

Qualitative issues as discussed in topics 1 and 2 should also be considered when making the final investment decision. These issues include the consideration of other stakeholders as well as non-financial aspects such as environmental, social and governance in order to ensure the long-term sustainability of the organisation. It is no longer acceptable to make decisions based on financial impact alone.

QUESTION 4 – Alpha Limited

The budget committee of the company is faced with a choice between two machines, A and B, which differ in their production characteristics and capabilities.

The following information regarding the two machines is available:

	Machine	
	A	**B**
	R	**R**
Cost price	1 000 000	1 500 000
Residual (realisable) value at end of useful life	110 000	160 000
Annual income after depreciation and income tax	152 000	183 000
Required working capital	180 000	220 000
Expected useful life	10 years	10 years

Additional information:

1. The company can invest all its funds at a rate of 12% per annum, which is also regarded as an acceptable return on the investment in either of the above machines.
2. The accounting policy of the company is to provide for depreciation on the straight-line method, over the useful lives of the machines after taking the residual (realisable) value into account.
3. The South African Revenue Services allows wear and tear allowances on the same basis as that determined for depreciation.

REQUIRED

a. Apply the following methods to evaluate the two mutually exclusive options available to Alpha Ltd and comment on the results of each:
   i. net present value (NPV), indicating the factors you used
   ii. internal rate of return (IRR), using 12% and 18% to interpolate
   iii. profitability index (PI)
   iv. payback period (PB)
   v. accounting rate of return (ARR)

b. Make a final recommendation based on your calculations and deliberations in a.

QUESTION 4 – Alpha Limited

a. i. Net present value method

	Machine					
	A			B		
	Years			Years		
	0	1–9③	10	0	1–9③	10
	R	**R**	**R**	**R**	**R**	**R**
Cost price	(1 000 000)	–	–	(1 500 000)	–	–
Working capital ④	(180 000)	–	180 000	(220 000)	–	220 000
Annual cash flow from operations ①	–	241 000	241 000	–	317 000	317 000
Realisable value	–	–	110 000	–	–	160 000
Present values	(1 180 000)	241 000	531 000	(1 720 000)	317 000	697 000
Factor at 12% ②	1,000	5,328	0,322	1,000	5,328	0,322
	(1 180 000)	1 284 048	170 982	(1 720 000)	1 688 976	224 434
Net present value	R275 030			193 410		

Calculations:

① Annual cash flow from operations, after taxation

	Machine	
	A	B
	R	**R**
Profit after depreciation and tax	152 000	183 000
Add back: Non-cash items – Depreciation		
$\frac{\text{R1 000 000 – R110 000}}{10}$	89 000	–
$\frac{\text{R1 500 000 – R160 000}}{10}$	–	134 000
Annual cash flow from operations, after taxation	241 000	317 000

② PV factors

Years 1–9: Table B at 12% = 5,328

Year 10: Table A at 12% = 0,322

Or

$1 \div (1 + 0{,}12)^1$	0,893
$1 \div (1 + 0{,}12)^2$	0,797
$1 \div (1 + 0{,}12)^3$	0,712
$1 \div (1 + 0{,}12)^4$	0,636
$1 \div (1 + 0{,}12)^5$	0,567
$1 \div (1 + 0{,}12)^6$	0,507
$1 \div (1 + 0{,}12)^7$	0,452
$1 \div (1 + 0{,}12)^8$	0,404
$1 \div (1 + 0{,}12)^9$	0,361
Annuity	5,329#
$1 \div (1 + 0{,}12)^{10}$	0,322

Small rounding difference may occur.

NOTE

Tip: when using your pocket calculator:

Enter 1 ÷ 1.12 = to get factor for year 1, then add to memory.

Press = again to get factor for year 2, then add to memory.

Press = again and add to memory each time until you reach year 9, then add to memory.

Press = again to get factor for year 10, write down – DO NOT ADD TO MEMORY.

Press memory recall to get the cumulative factor for the 9-year annuity!

③ Combining of years

In deciding which years may be combined, you must be guided by the information in the specific question. Often the first and last year differ from the rest, but sometimes all the years differ and would have to be kept apart (column for each year).

④ Working capital

Working capital is an amount invested once at the beginning of the investment period (outflow) and realised at the end of the investment period (inflow), as the working capital is no longer required and the cash that was tied up in it is now made available. It is not an annual outflow, unless the working capital levels differ in each year (then the net increase or decrease is reflected as an (outflow) or inflow respectively.

a. ii. Internal rate of return (IRR)

	Machine					
	A			B		
	Years			Years		
	0	1–9	10	0	1–9	10
Cash flow from a.	(1 180 000)	241 000	531 000	(1 720 000)	317 000	697 000
Factor at 18% ①	1,000	4,303	0,191	1,000	4,303	0,191
Present values	(1 180 000)	1 037 023	101 421	(1 720 000)	1 364 051	133 127
Net present value	R(41 556)			R(222 822)		

① Factors at 18%

$1 \div (1 + 0{,}18)^1$	0,847
$1 \div (1 + 0{,}18)^2$	0,718
$1 \div (1 + 0{,}18)^3$	0,609
$1 \div (1 + 0{,}18)^4$	0,516
$1 \div (1 + 0{,}18)^5$	0,437
$1 \div (1 + 0{,}18)^6$	0,370
$1 \div (1 + 0{,}18)^7$	0,314
$1 \div (1 + 0{,}18)^8$	0,266
$1 \div (1 + 0{,}18)^9$	0,225
Annuity	4,302#
$1 \div (1 + 0{,}18)^{10}$	0,191

Small rounding differences may occur between already rounded annual factors and when one uses the factor from the tables or calculate it without rounding.

	Machine A	**Machine B**
Interpolation	$12\% + \left[\frac{(R275\,030 - R0)}{[R275\,030 - (-R41\,556)]} \times 6\%\right]$	$12\% + \left[\frac{(R193\,410 - R0)}{[R193\,410 - (-R222\,822)]} \times 6\%\right]$
	$= 12\% + \left[\frac{R275\,030}{R316\,586} \times 6\%\right]$	$= 12\% + \left[\frac{R193\,410}{R416\,232} \times 6\%\right]$
∴ Effective rate	= 12% + [0,8687 x 6%]	= 12% + [0,4647 x 6%]
(IRR)	= 17,2122%	= 14,7882%

NOTE

The interval between 12% and 18% is 6%. The interpolation fraction is therefore based on 6%!

Due to the fact that we used factors individually rounded to 3 decimals for the NPV calculations at 12% and 18%, our answer might be slightly different than when you use your financial calculator or Excel. Excel generate an IRR of 17,0666% for machine A and 14,498% for machine B.

a. iii. Profitability index

The PI of Machine A

$$PI = \frac{(275\,030 + 1\,180\,000)}{1\,180\,000} = 1{,}2331$$

The PI of Machine B

$$PI = \frac{(193\,410 + 1\,720\,000)}{1\,720\,000} = 1{,}1124$$

According to the PI, both of the above machines should be accepted, as both have a PI greater than 1. Machine A is the highest. This correlates with the NPV calculation which also indicated that Machine A should be selected.

a. iv. Payback period method

	Machine	
	A	**B**
Cash outflow	R1 180 000	R1 720 000
Annual cash inflow (from a. above)	R241 000	R317 000
	R1 180 000	R1 720 000
	R241 000	R317 000
Payback period	= 4,9 years	= 5,4 years

NOTE

We can use the annuity method of calculating the payback period as the cash flows in years one to nine is identical and the break-even occurs BEFORE year ten, which have a different annual cash flow! Remember that the last year of the capital budget usually has a different cash flow (as a result of residual values etc) and if the break-even occurs in the last year, you have to use the pro rate method to calculate the portion of the year, that is the remainder of cash outflow to be covered divided by the cash flow in last year. Where each year's cash flow varies, you have to use the tabular and pro rate method.

The payback period method indicates that once again, Machine A is preferred as the payback period is the shorter of the two options.

a. v. Accounting rate of return

As the assets' residual value at the end of the period is greater than 10% of the original cost, it cannot be considered to be immaterial. We will therefore have to calculate the average investment as follows:

	Machine A	**Machine B**
	R	**R**
Original investment	1 000 000	1 500 000
Less: residual value	110 000	160 000
Depreciable value	890 000	1 340 000
Average value (÷ 2)	445 000	670 000
Add: residual value	110 000	160 000
Average investment value (1)	555 000	830 000
Annual profit after tax (2)	152 000	183 000
Return (2) ÷ (1)	27,39%	22,05%

Machine A generates a higher ARR than Machine B, despite the fact that Machine B has a higher annual profit (B's asset base is also that much higher).

NOTE

The assumption in the calculation of the asset base is that the residual value is outstanding for the entire life of the project. We therefore do not apply an average to it.

The ARR is based on the investment in non-current assets only. We therefore ignore the working capital investment.

b. Recommendation

All the methods indicate that machine A should be purchased and in the absence of any other qualitative issues that favour machine B, we recommend that machine A is acquired.

NOTE

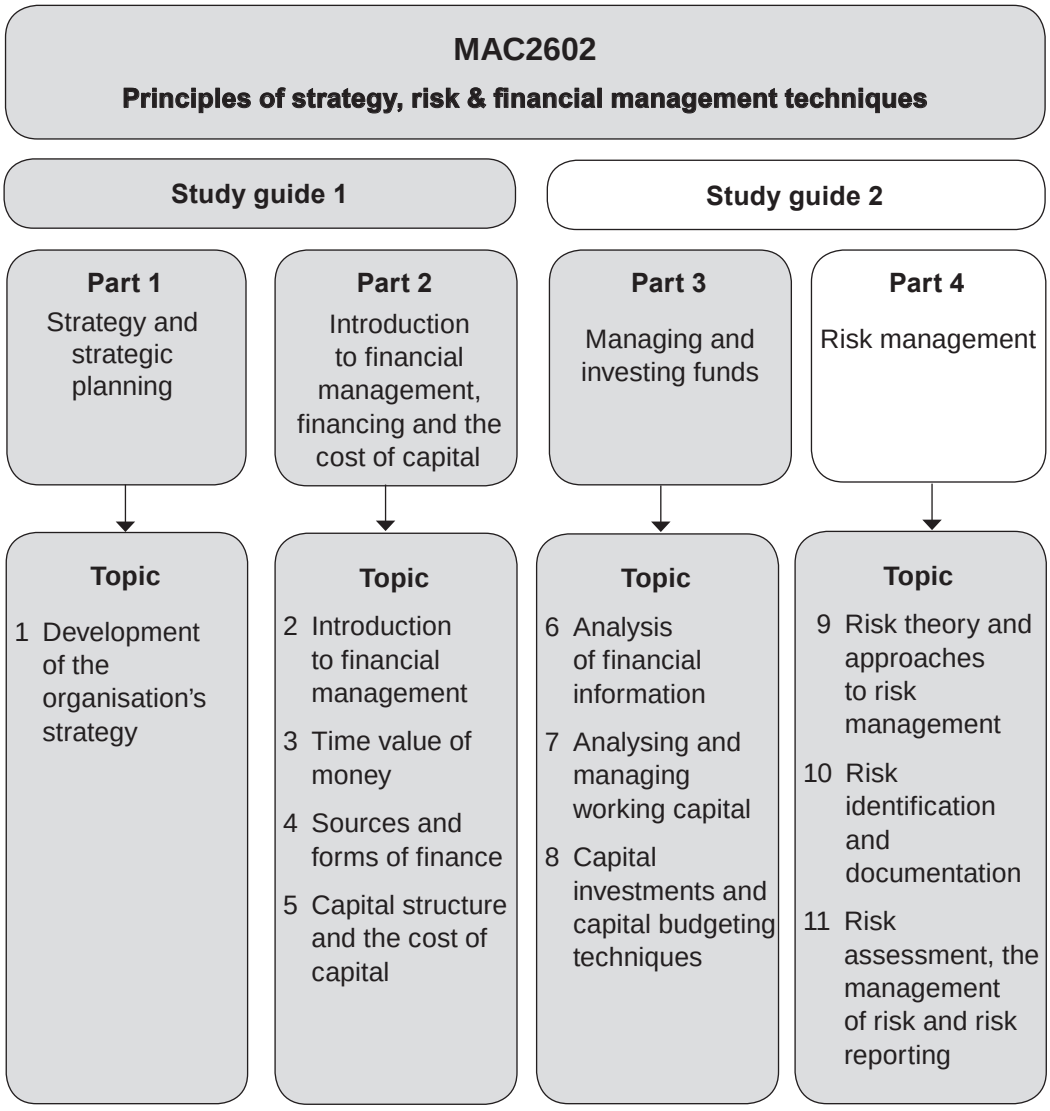
Qualitative issues as discussed in topics 1 and 2 should also be considered when making the final investment decision. These issues include the consideration of other stakeholders as well as non-financial aspects such as environmental, social and governance in order to ensure the long-term sustainability of the organisation. It is no longer acceptable to make decisions based on financial impact alone.

Risk management

PURPOSE

Risk management is concerned with identifying, assessing and managing threats/risks resulting from pursuing the organisation's strategies *(SAICA, 2010, Detailed Guideline for Academic Programmes)*.

The purpose of this part is to define risk and to explain risk management. This includes risk identification, risk assessment, managing the risk and risk reporting.



NOTE

We touched on risks and stakeholder management in topic 1 – development of the organisations' strategy and topic 2 – introduction to financial management, earlier in this module. You will also find this background useful when you encounter the internal control and governance modules in Auditing. The knowledge and skills you acquire in this part of MAC2602 will further find practical applications in the advanced financing, capital structure, working capital management and capital investment topics covered later in MAC3702 as well as in MAC3701 (decision-making).

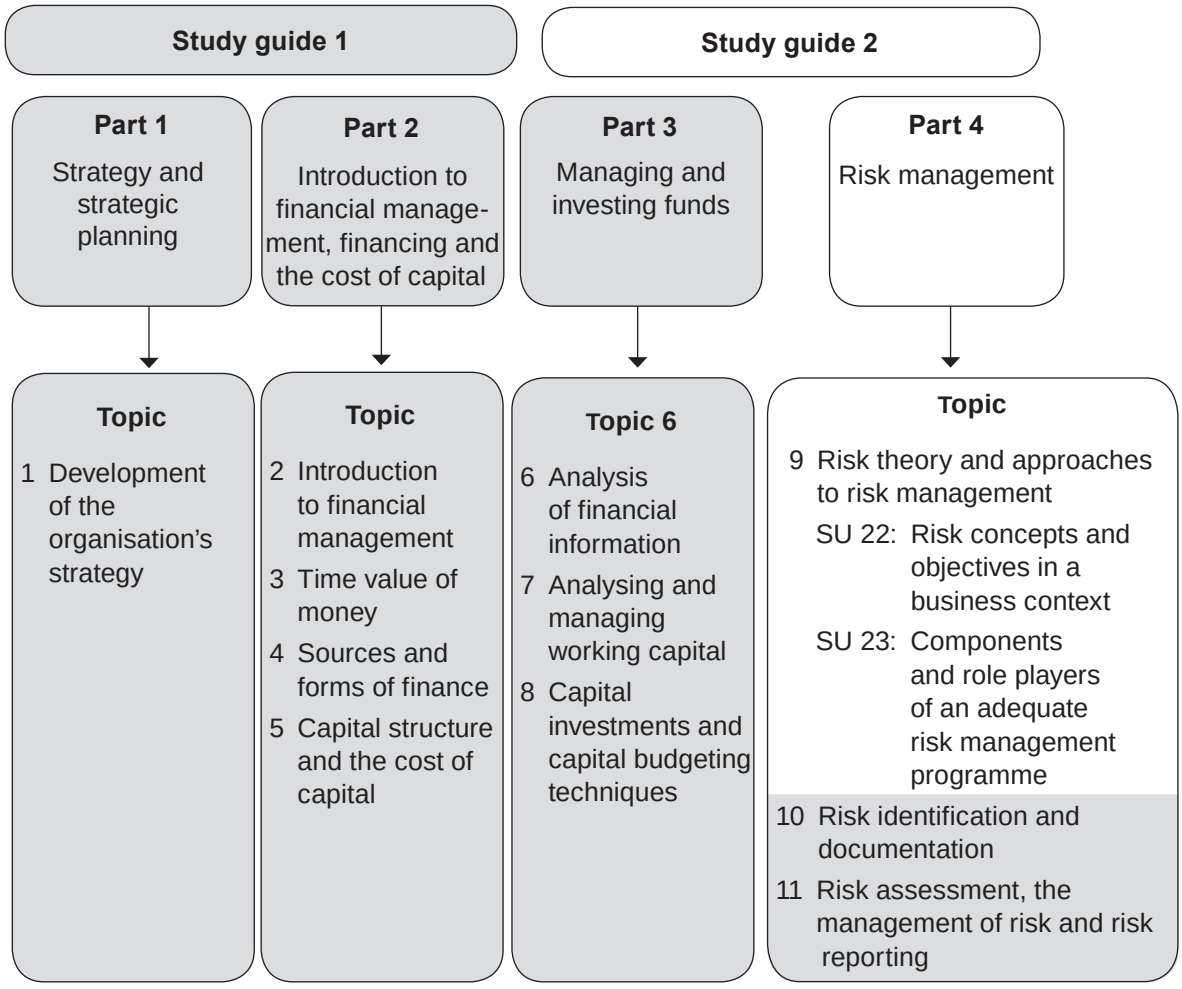
TOPIC 9

Risk theory and approaches to risk management

LEARNING OUTCOMES

After studying this topic, you should be able to:

- define risk in a business context
- identify the objective of risk management
- explain what the components are of an adequate risk management programme



INTRODUCTION

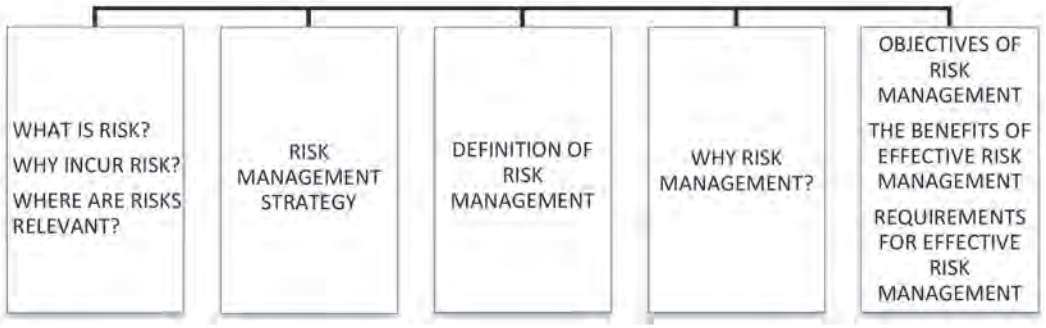
The main purpose of this topic is to introduce you to the concepts of risk and risk management. You will also learn about the objective of risk management and the components of an adequate risk management programme.

This topic includes a fair amount of theory best understood by applying it to your own life or in a business environment.

STUDY UNIT 22

Risk concepts and objectives in a business context

In this study unit



1 Introduction

In this study unit, we will define risk in a business context and introduce you to risk management and its objective.

2 What is risk?

RISK

The typical dictionary definition of risk is a chance or possibility of danger, loss, injury or other adverse consequences.

Risk is associated with something happening with a negative future outcome.

The Chartered Institute of Management Accountants (CIMA) (2011:10) defines business risk facing an organisation as risks that affect the achievement of the organisation's overall objectives that should be reflected in its strategic aims.

Activity 22.1

You also face risks in your own life. An example is that your car could be stolen.

a. Identify some risks in the picture below:

Source: © 1998 – 2012 Signnetwork.com

FIGURE 22.1: Bart Simpson

b. Name three other risks in your own life.

Feedback on activity 22.1

a. Risks from the picture could include:

- Bart is riding a skateboard and may fall off and injure himself.
- Bart may be hit by a car and be seriously injured.
- Bart is not wearing a helmet, which is required by legislation. This contravention could result in a fine.

b. Risks in your own life could include:

- traffic congestion on the road to the exam centre on the day of your exam, which could result in you being late; or
- that your car or other belongings are stolen.

NOTE

Drury (2011) notes in Management and Cost Accounting that **risk** is inherent in a situation and exist where there are several possible outcomes but there is relevant past experience to predict the possible outcome.

Uncertainty exists where there are several possible outcomes, but there is little previous statistical evidence to predict the possible outcomes. Uncertainty can possibly be reduced by gaining more information.

This distinction is not essential and we shall use the terms interchangeably.

Business leaders are often confronted by uncertainties and risk in decision-making. The inability to predict the precise outcome of a decision, that is the inability to predict the sales volumes of a new product – normally due to a lack of information – creates risk.

3 Why incur risk?

Source: CIMA (2011:11)

FIGURE 22.2: Why incur risk?

- Taking risks allows the organisation to be more competitive and to generate higher returns. For example, you could launch a new technologically advanced product even though there is uncertainty whether customers will buy the new product.
- Benefits could be financial in the form of higher returns or reduced cost.
- Benefits could be intangible, for example, gaining more valuable client information to be used for future products.

Risk taking could result in losses, but in business, the potential rewards of risk taking usually become greater when the chance of loss becomes greater.

Activity 22.2

With enough capital, you could start a company that manufactures solar-powered vehicles or you could place your money in the bank and earn interest on the investment.

Illustrate the concept of risk versus reward when evaluating the risks associated with each option.

Feedback on activity 22.2

The risks for a company that manufactures solar-powered vehicles are significant, as the vehicles may be unroadworthy if it does not comply with government standards and related regulations. Customers may be sceptical and question the vehicles' performance and endurance, and the organisation could fail. Alternatively, the vehicles could be far less expensive to operate, with cleaner emissions, which could receive government's support and be a huge success with large returns.

In comparison, the risk/chance that the money in the bank could be lost is very low, but the potential return on the investment is also lower.

Activity 22.3

Quickclean (Pty) Ltd, a facilities management company that provides cleaning and security services, has a number of business objectives including the following: "Grow the brand in a socially and economically effective way to obtain a significant market share in the Limpopo province."

The management of the organisation has recently learnt that provincial government tenders in Limpopo are mainly awarded to organisations with a very high (level 1 or 2) broad-based black economic empowerment (BBBEE) rating. Quickclean (Pty) Ltd is BBBEE compliant, but only has a level four (4) rating, which is not deemed high enough. The very high BBBEE requirement is the main reason why very few facility management organisations operating in Limpopo submit tenders to the provincial government.

REQUIRED

Explain what you think the risk is for Quickclean (Pty) Ltd. Also, explain why there could be an opportunity for Quickclean (Pty) Ltd.

Feedback on activity 22.3

Quickclean (Pty) Ltd will not be successful in its tender applications to do work for the provincial government in Limpopo with its current BBBEE rating. This reduces the organisation's ability to get work and the risk is that the organisation may not achieve its objectives and fail to realise a profit to ensure the continued success/sustainability of the business.

Very few facility management companies currently operating in Limpopo are BBBEE compliant so there is an opportunity for Quickclean (Pty) Ltd to get very lucrative government contracts if it increases its BBBEE rating.

4 Where are risks relevant?

We have already noted that risks are relevant in everybody's day-to-day lives.

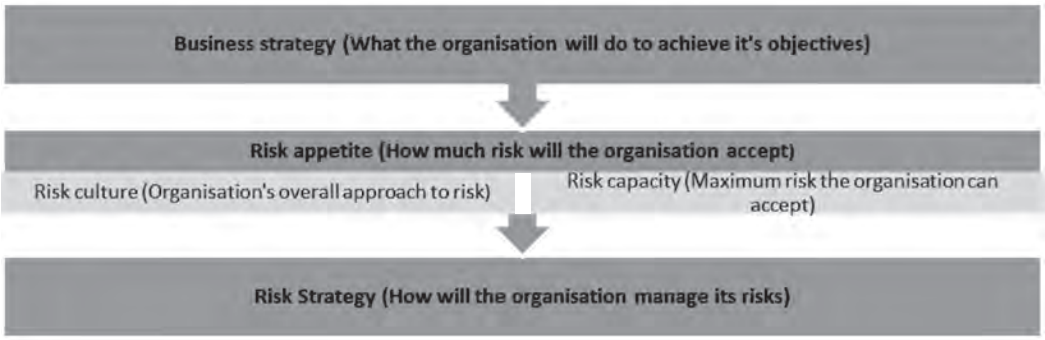
In the financial world, one finds different types of risk. Risks can come from uncertainty in financial markets, such as the future rand/dollar exchange rate, project failures, legal liabilities, credit risk, accidents, natural causes and disasters, as well as fraud and error.

For management accounting, the concepts of probability and sensitivity will be considered in decision-making techniques as well as consequences of relevant costing decisions.

In financial accounting, risk is considered when evaluating investment and financing decisions as well as hedging techniques. Hedging is a transaction that lowers or even eliminates an organisation's risk due to fluctuating commodity prices, interest rates and exchange rates.

5 Risk management strategy

The purpose of the risk management strategy is to support the achievement of the required organisation objectives.



Source: Author, 2012

FIGURE 22.3: Risk Management Strategy

RISK APPETITE (RISK TOLERANCE)

This refers to the amount of risk an organisation is willing to accept in pursuit of value/ benefits.

The risk appetite is related to an organisation's strategy and may be expressed as the acceptable balance between growth, risk and return. The risk appetite may be clear/ explicit in an organisation's strategies, policies and procedures. Alternatively, it may be implicit, needing to be determined from an analysis of the organisation's decisions and actions.

It can be classified as follows:

- risk averse – an organisation or investor who will attempt to avoid risk by opting for "safer" investments, such as government bonds despite the lower returns on "safer" investments
- risk neutral – an organisation or investor with a balanced view
- risk seeking – an organisation or investor who is an aggressive risk taker and willing to take many risks in search of high returns

RISK CULTURE

This is the set of shared attitudes, values and practices that characterise how an organisation considers risk in its day-to-day activities.

This is driven by management and can be determined by analysing the organisation's practices, especially rewards or sanctions for risk-taking or risk-avoiding behaviour.

RISK CAPACITY

This is the maximum amount of risk that the organisation can accept.

BOARD OF DIRECTORS

The board of directors (the board) consist of members/directors who are elected to the board by the shareholders to oversee the activities of the organisation and to provide stewardship and leadership from the very top.

Activity 22.4

Illustrate your risk appetite if the following are risks in your own life:

- traffic congestion on the road to the exam centre on the day of your exam, which could result in you being late
- that your car or other belongings are stolen

Feedback on activity 22.4

Your risk appetite may be that:

- If your risk appetite is low, you will leave home three hours before the exam starts and attempt to avoid the risk of traffic congestion that may cause you to be late.
- If your risk appetite is high, you will leave home an hour before the exam starts and accept the risk of traffic congestion that may cause you to be late.
- Your risk appetite may be low to suffering losses when your car or personal belongings are stolen, so you will want to arrange insurance to reduce the risk.

6 Definition of risk management

Below are a few definitions of risk management by different organisations.

① Risk management is the process to reduce significant risks facing the organisation in a cost effective manner to contribute to the achievement of the organisation's objectives.

② CIMA's official terminology (2011:36) defines risk management as:

"The process of understanding and managing the risks that an organisation is subject to in attempting to achieve its corporate objectives."

③ The Committee of Sponsoring Organisations of the Treadway Commission (COSO) defines Enterprise Risk Management (ERM) as follows:

"A process affected by an organisation's board of directors, management and other personnel, applied in strategy setting across the organisation. This process is designed to identify potential events that may affect the organisation (risk), to manage risks within the organisation's risk appetite, and to provide reasonable assurance regarding the achievement of organisation objectives."

④ The Institute of Risk Management gives the following definition for risk management:

"The process by which organisations methodically address the risks attached to their activities to achieve sustained benefit."

NOTE

You will not be required to distinguish between the different definitions. Any one of the definitions will be accepted for assessment, as they all convey the same basic message.

The risk management process can be illustrated as follows:

Source: Author, 2012

FIGURE 22.4: Components of the risk management process

Based on Valsamakis, Vivian & Du Toit (2010:145), the above components can be described as follows:

- **RISK IDENTIFICATION**

The process to identify internal and external events, which could affect the achievement of the organisation's objectives. This includes risks and opportunities.

- **RISK ASSESSMENT**

Risks are analysed by considering the impact (potential damage or loss) and likelihood of the risk occurring. Risks are assessed at an inherent basis (risk exposure before considering risk responses) and residual basis (risk exposure after considering risk responses).

- **RISK RESPONSE**

Measures to reduce the likelihood and/or impact rating of a risk event.

- **RISK FINANCING**

Maintaining a balance between the economic and operational cost of risk reducing measures and the achievement of the organisation's objectives.

7 Why risk management?

The King Report on Governance for South Africa 2009 (King III) states that an organisation's strategy, risk, performance and sustainability are inseparable.

King III requires the board of directors (the board) to disclose how the board has satisfied itself that risk assessments, responses and interventions are effective. Due care and diligence will need to be exercised and disclosed. This due care and diligence are achieved through:

- the structures of governance – risk/audit committee
- adoption and implementation of an annual risk management plan

- effective risk management practices through the application of recognised frameworks, methodologies, continuous assessments and monitoring
- applying risk considerations into the decision-making frameworks (appetite/tolerance) and specific decisions
- ensuring that the board receives adequate assurance on the effectiveness of the risk management process and on the management of specific risks
- disclosing how the board is satisfied with the effectiveness of risk management in the organisation

8 The objective of risk management

The objective is to add maximum sustainable value by aligning the risk management function to the achievement of the organisation's business objectives.

It involves:

- the identification and treatment of risks with reference to the organisation's vision, mission and strategic objectives
- addressing risks (threats) and opportunities
- increasing the probability of success by reducing uncertainties

Risk management should form part of every organisation's strategic management. Risk management should add value by controlling the probability (likelihood) and/or impact of unfortunate events and should maximise the realisation of opportunities.

In CIMA's Official Learning System, Collier & Agyei-Ampomah (2009:122) also indicates that an organisation's risk management strategy should include the following elements:

- the risk profile/risk appetite of the organisation, that is stating the level of risk it finds acceptable
- the risk management process (risk identification and assessment) that the organisation practices
- the organisation's preferred option for risk treatment (that is retention, avoidance, reduction, or transfer)
- who is directly responsible for the organisation's risk management
- how reporting and monitoring take place

9 The benefits of effective risk management

The following are benefits of effective risk management:

- aligning the risk appetite and business strategy
- linking growth, risk and return
- focus management responses on the most significant risks
- improving decision-making, planning and prioritisation by contributing to a structured understanding of the business activities and volatility
- developing and supporting people and the organisation's information base
- minimising operational losses and optimising operational efficiency
- protecting and enhancing the organisation's brand and image
- contributing to a more sustainable supply chain and operating environment
- identifying and managing risks throughout the whole organisation
- seizing opportunities
- reducing the cost of finance

10 Requirements for effective risk management

The following are requirements for effective risk management:

- management commitment to effective risk management
- integration with the strategic planning process
- using a common language and framework
- acceptance of risk management as a continuous process
- wide ownership with a supportive culture across the organisation
- effective risk management should be embedded in the organisational processes

NOTE

The rest of the study units to follow will elaborate on the components of the risk management strategy. At the end of this part of the study guide, you should be able to compile an organisation's risk management strategy or evaluate a strategy presented to you.

11 Summary

- In this study unit, we defined risk as a chance or possibility of danger, loss, injury or other adverse consequences.
- Organisations take risks to gain a competitive advantage and increase returns.
- For business decisions, the direct relationship between potential benefits and the associated risks should always be considered.
- Concepts of risk appetite and culture were explained, as well as the relevance of risk in financial management and management accounting.
- The need to manage risks to contribute to the achievement of business objectives was described.
- The key elements of a risk management strategy were identified.

The next study unit will address the components and role players of an adequate risk management programme.

Self-assessment activity

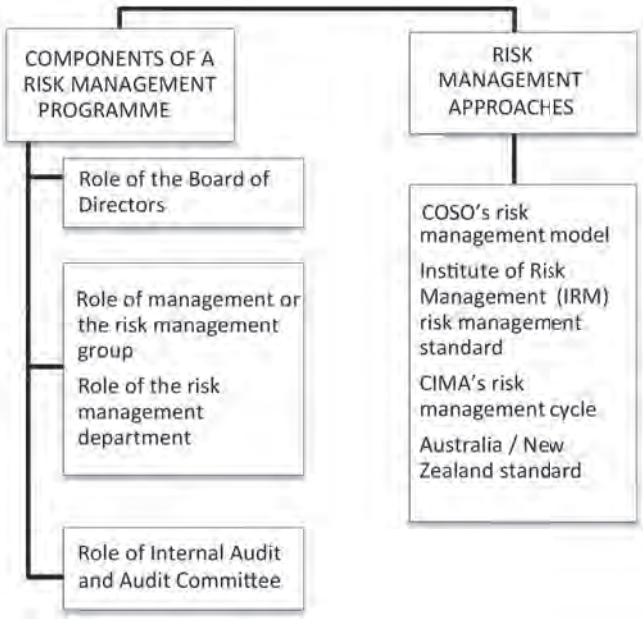
Having worked through this study unit, you should be able to answer the following questions:

a. Illustrate the relationship between risk and return.
b. Explain the concepts risk, risk culture and risk appetite.
c. Summarise the three (3) categories of risk appetite.
d. Discuss the five (5) key elements of an organisation's risk management strategy as defined by CIMA.

STUDY UNIT 23

Components and role players of an adequate risk management programme

In this study unit



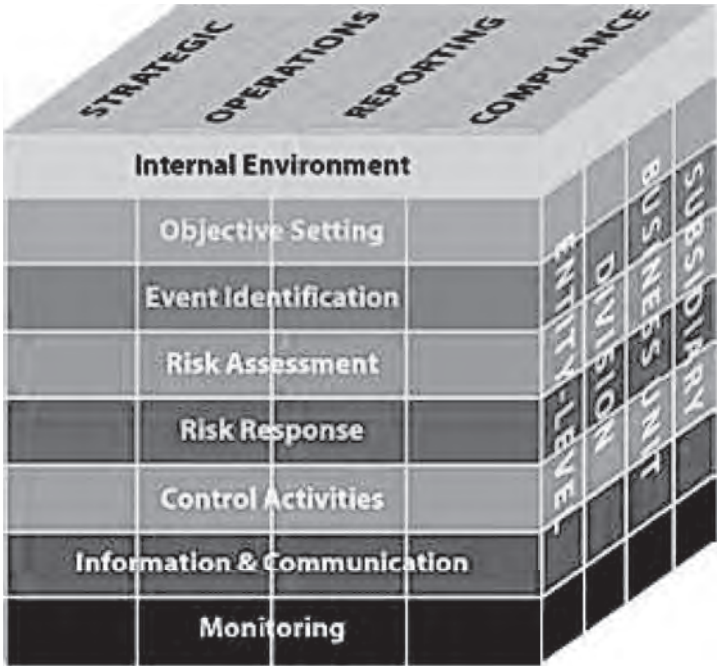
1 Introduction

In the previous study unit, we defined and explained risk, risk management and mentioned the requirements of a risk management strategy. In this study unit we will cover the requirements of KING III for risk management and discuss the inter-related components of the COSO Enterprise Risk Management (ERM) Framework (refer to section 2) to formulate a risk management plan.

2 Components of a risk management programme

A risk management programme is necessary to achieve the organisation's risk management objectives and could be based on the principles of the Committee of sponsering organisations of the Treadway Commission (COSO)'s Enterprise Risk Management (ERM) – Integrated Framework (COSO, 2004).

The figure below represents COSO's risk management framework.



Source: COSO (2004)

FIGURE 23.1: Enterprise Risk Management (ERM) Integrated Framework

Various other commonly used frameworks are also available and will be discussed later in this study unit. They make use of similar concepts and terminology so it is apt that we describe COSO's ERM framework first.

The eight (8) inter-related components of the enterprise risk management (ERM) programme are:

	INTER-RELATED COMPONENTS OF ERM	RESPONSIBLE PARTY
1	**Internal (control) environment:** The tone of the organisation and management's operating style. This sets the basis of how risk is managed, including the risk management philosophy and risk appetite.	Board of directors (the board).
2	**Objective setting:** A process to define the organisation's objectives to realise the organisation's mission – whilst being aware of the risk appetite.	The board.
3	**Event identification:** The process to identify internal and external risk events, which could affect the achievement of objectives. This includes risks and opportunities.	The board can delegate this responsibility to a sub-committee (risk committee or audit committee).
4	**Risk assessment:** Risks are analysed by considering the impact (potential damage or loss) and likelihood, as a basis for determining how the risk should be managed on both an inherent① (gross) and residual② (net) basis.	The board is ultimately responsible. Management and the risk management department will usually do the assessments and provide feedback to the board or a sub-committee thereof.

	INTER-RELATED COMPONENTS OF ERM	RESPONSIBLE PARTY
5	**Risk response:** Management decides whether to avoid, accept, reduce or share the risk. A set of actions is designed to align the residual risk ratings with the organisation's risk appetite.	The board should ensure that management considers and implements appropriate risk responses. The board does this by approving and monitoring the annual risk management plan③.
6	**Control activities:** The internal control system, including all the policies and procedures to help ensure that risk responses are adequate and effective. The adequacy and effectiveness of risk responses are assessed based on feedback from management, risk management, internal audit and external audit.	The board should ensure continuous risk monitoring by management and the risk management department. The board does this by approving and monitoring the annual risk management plan.③
7	**Information and communication:** Relevant information is identified, captured and communicated. This enables people to carry out their responsibilities.	The board should ensure that there are processes in place enabling complete, timely, relevant, accurate and accessible risk disclosure to stakeholders.
8	**Monitoring:** The entire ERM is monitored through ongoing management activities and separate evaluations and modified when necessary.	The board does this by approving and monitoring the annual risk management plan③.

① **INHERENT RISK**

This involves the assessment of risk before the application of any controls, transfer or management responses.

② **RESIDUAL RISK**

It is the risk that remains after the application of any controls, transfer or management response to mitigate the risk under consideration.

③ **RISK MANAGEMENT PLAN**

It is the document of identified risks (derived with reference to the organisation's objectives) with the corresponding risk assessment to create risk responses. The achievement of the risk management plan is the responsibility of the risk management group.

Role players in the execution of the risk management strategy

ROLE PLAYERS	RESPONSIBILITIES
board of directors	● ultimately responsible for risk management
audit committee	● board committee charged with oversight of internal control systems and financial reporting ● works with external and internal auditors
risk committee (the work will be done by an audit committee if a risk committee does not exist)	● board committee with direct responsibility for risk management
risk management group (lead by the risk manager and the risk department)	● group of senior and middle management responsible for risk management processes ● report to the board via the audit and risk committee ● monitor the effectiveness of the overall risk management process and make recommendations for improvement
internal audit function	● test the adequacy and effectiveness of key internal controls; ● provides recommendations to improve the risk management process

2.1 Role of the board of directors

- The board is ultimately responsible for effective risk management.
- The board is responsible for defining the organisation's risk appetite.

2.2 Role of management/risk management group

The board requires management to ensure effective risk management, make recommendations for improvement and to maintain a good control environment.

A good control environment includes an internal control system, which consists of all the policies and procedures necessary to ensure that the organisation's objectives are achieved, including:

- the orderly and efficient conduct of the organisation
- the safeguarding of assets
- the prevention and detection of fraud and error
- accuracy and completeness of the accounting records
- timely preparation of reliable financial information

2.3 Role of the risk management department

Based on adaptations from the Institute of Risk Management (IRM) and CIMA (2011:69) the role of the risk management department/risk manager's function includes the following:

- setting policy and strategy for risk management
- primary champion of risk management at strategic and operational level
- building a risk aware culture within the organisation including appropriate education
- establishing internal risk policy and structures for business units

- designing and reviewing processes for risk management
- coordinating the various functional activities which advise on risk management issues within the organisation
- identification and evaluation of the risks affecting an organisation based on the organisation's strategy, operations and policies
- developing risk response processes, including contingency and business continuity programmes
- implementing a set of risk indicators and reports including losses, incidents, key risk exposures and early warning indicators
- liaising with insurance companies with regards to cover available, claims and conditions
- facilitates the monitoring of risk responses based on the risk management plan and reports on the results thereof
- monitors the implementation of internal audit recommendations
- preparing reports on areas of significant residual risk and the achievement of the risk management plan for the board and the stakeholders

The risk management department, usually through the chief risk officer or risk manager, reports to the board or a sub-ordinate committee, such as the risk and compliance committee. Note that these reports may have statutory requirements, such as the Sarbanes-Oxley (SOX) reports for United States companies.

2.4 Role of internal audit and audit committee

Risk management is an important precursor to internal control as it allows the internal controls to be focused on the most significant risks. Based on COSO, a model of internal control contains five (5) elements:

1. a control environment that includes management values, operating style, organisation structure, authority and policies
2. the risk assessment of internal and external risks
3. control activities, which should be integrated with a risk assessment
4. a system for monitoring the effectiveness of internal controls
5. means by which information can be captured and communicated

The role of internal audit is therefore to focus on the significant risks, as identified by management, and to audit the risk management processes across an organisation. This includes the testing of the effectiveness and adequacy of controls set to address significant risks to provide reasonable assurance of the effectiveness and adequacy of the financial controls, efficiency of operations and compliance with laws and regulations.

Therefore, risks are assessed and control activities introduced to mitigate the risks to an acceptable level (risk appetite). The monitoring of the controls is the responsibility of management, assisted by the risk management function.

Internal audit can provide advice to the board, or a sub-committee of the board, such as the audit committee, regarding the effectiveness of the processes to identify and assess inherent risks, the adequacy and effectiveness of risk mitigation and the effectiveness of the residual risk assessment.

NOTE

The monitoring of risk mitigating actions such as internal controls remains the responsibility of management. An internal audit review cannot be regarded as a control as the internal audit function should remain independent from management and test the adequacy and effectiveness of controls.

Activity 23.1

Use your knowledge of the eight components of the ERM programme and rank the following in chronological order/order of dependence:

a. The board of directors approves a risk management programme, which could include all the components of enterprise risk management.
b. The organisation's vision, mission and strategies are formulated.
c. A risk management strategy is defined.

Feedback on activity 23.1

a. **The organisation's vision, mission and strategies** are formulated and are used as a basis for risk management.
b. **A risk management strategy** is defined with reference to the organisation's vision, mission and objectives.
c. **A risk management programme** is drafted to achieve the effective identification, assessment and evaluation of risks and the reporting thereof. The risk management programme should ideally include all the components of enterprise risk management as defined by COSO.

3 Risk management approaches

Over the years, several risk management standards or approaches have been developed. We will name four and briefly discuss them.

3.1 COSO's risk management model

The Committee of Sponsoring Organisations of the Treadway Commission (COSO) established the following Enterprise Risk Management Framework in 2004 (refer to section 2):

- internal environment or control environment (to establish the tone of the organisation and management's operating style towards the management of risks)
- objective setting
- event identification
- risk assessment
- risk response
- control activities
- information and communication
- monitoring

With this framework in mind, one has to identify the risks applicable and categorise them into the following *risk objectives* (see figure 23.1):

1. Strategic: High level goals and related risks which are aligned with the organisation's mission and strategic objectives
2. Operations: Risks related to the efficient and effective use of resources
3. Reporting: Reliability of reporting
4. Compliance: Comply with laws and regulations

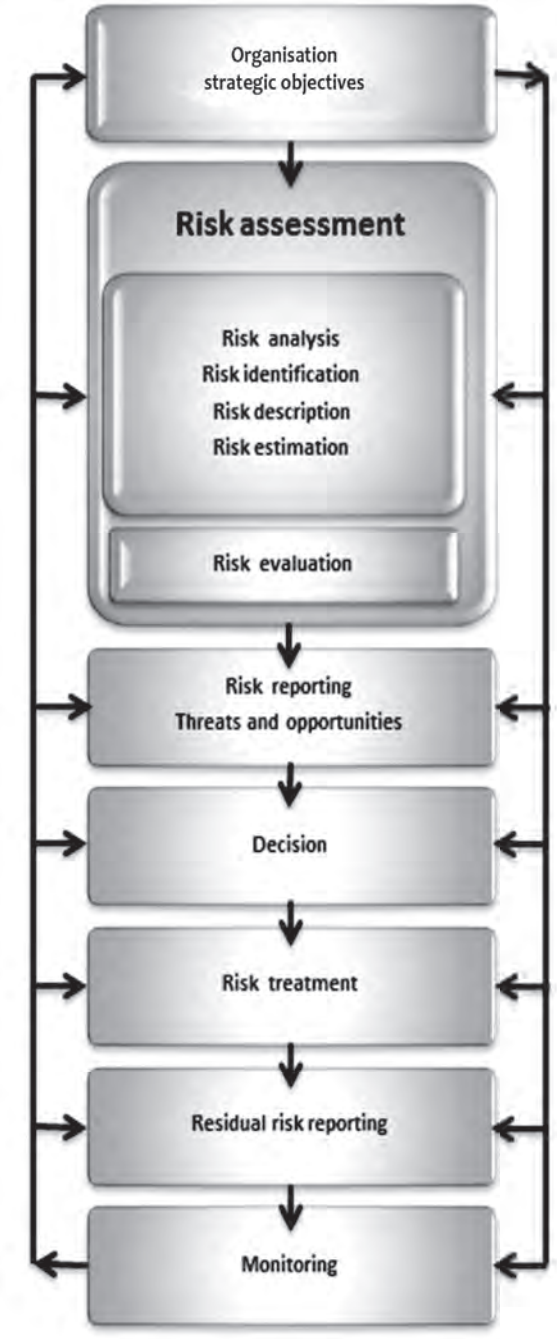
This will then allow you to assess, respond and control the risks.

This process takes place at organisation-, division-, business unit and subsidiary level.

3.2 IRM risk management standard

According to the Institute of Risk Management (IRM), risk assessment comprises the analysis and evaluation of risk through processes of identification, description and estimation. Risk assessment leads to risk evaluation, which leads to decision-making.

The IRM risk management standard is also clear about the fact that risks could result from internal and external factors.

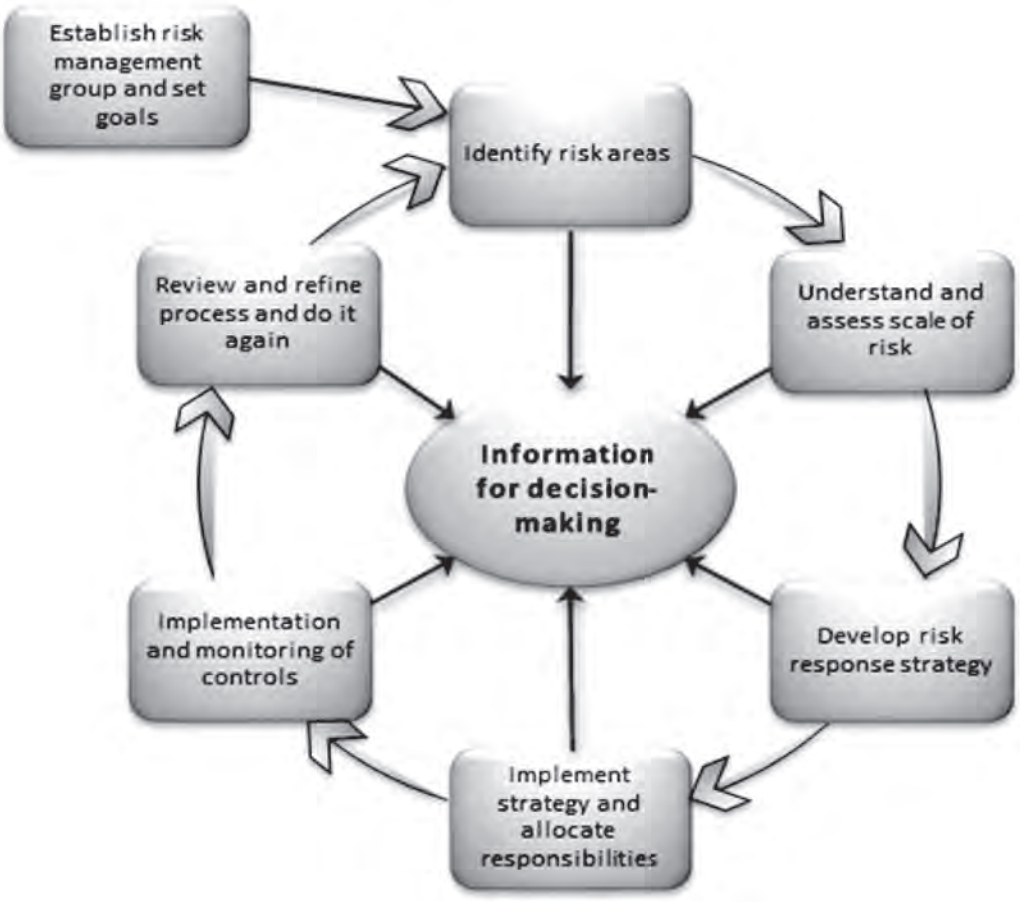


Source: AIRMIC, ALARM, IRM (2002:4)

FIGURE 23.2: The Institute of Risk Management risk management standard (adapted)

3.3 CIMA's risk management cycle

This model is based on the principle of continued feedback that is inherent in management control systems. The figure below indicates the flow of information needed to make decisions.



Source: CIMA (2009:123)

FIGURE 23.3: CIMA risk management cycle

3.4 Australia/New Zealand standard

The International Standard Association within the International Organisation for Standardisation (ISO) considers the Australia/New Zealand standard for adoption as an ISO standard. The standard is a generic guide for managing risk and can be applied to a wide range of activities. It comprises five steps, namely:

1. Establish the goals and context for risk management.
2. Identify risks.
3. Analyse risks and estimate the level of risk faced.
4. Evaluate and rank the risks.
5. Treat the risks through appropriate options.

Communication and monitoring are ongoing processes.

Activity 23.2

A newly established organisation has built a brewery and hopes to establish itself as a leading player in the South African beer industry with the establishment of various unique brands. Identify what could be regarded as the organisation's main "risk objectives", with reference to the COSO risk management framework.

Feedback on activity 23.2

After considering the internal and external environment, the organisation defined the following objectives:

a. Strategic: Establish the organisation as leading player in the South African beer industry. This could be done by identifying opportunities in the market and positioning the new brands in such a way to achieve sustained success.

b. Operations: Produce and deliver products of the highest quality in an efficient, effective and timely manner.

c. Reporting: Providing reliable and timely information aligned with reporting standards and best practices to enable stakeholders to analyse data and make sound business decisions.

d. Compliance: Conform to all legislative requirements for licensing, production, distribution, branding, advertising, labour relations, taxation, and so forth.

4 Summary

In this study unit, we explained the responsibility of the board of an organisation to disclose the effectiveness of risk assessments and responses. This is achieved with due care and diligence by adopting a risk management programme. The success of this programme is largely dependent on a good internal control environment and a comprehensive risk management plan with regular reporting on the achievement of this plan and the results thereof.

We briefly discussed the eight (8) inter-related components of an effective and adequate risk management programme. These eight components link with the Institute of Risk Management's risk management process, which also includes risk assessment, risk response (treatment) and risk reporting (communication).

Four (4) risk management approaches were named and briefly discussed. From these discussions, it became clear that most risk management approaches require an analysis of the organisation's strategic objectives and an analysis of the objectives of risk management. This analysis is necessary to achieve organisation objectives while managing threats and opportunities.

The categories of risk facing an organisation will be discussed in the next topic.

Self-assessment activity

After having worked through this study unit, you should be able to answer the following questions:

a. Identify the four (4) risk objectives as defined by COSO.

b. Briefly discuss the four (4) risk management approaches.

c. Illustrate the inter-related components of enterprise risk management (ERM) that is part of the COSO risk management approach.

d. Describe the role of management and risk management in the execution of a risk management strategy.

e. Discuss methods to monitor the effectiveness of the risk management process.

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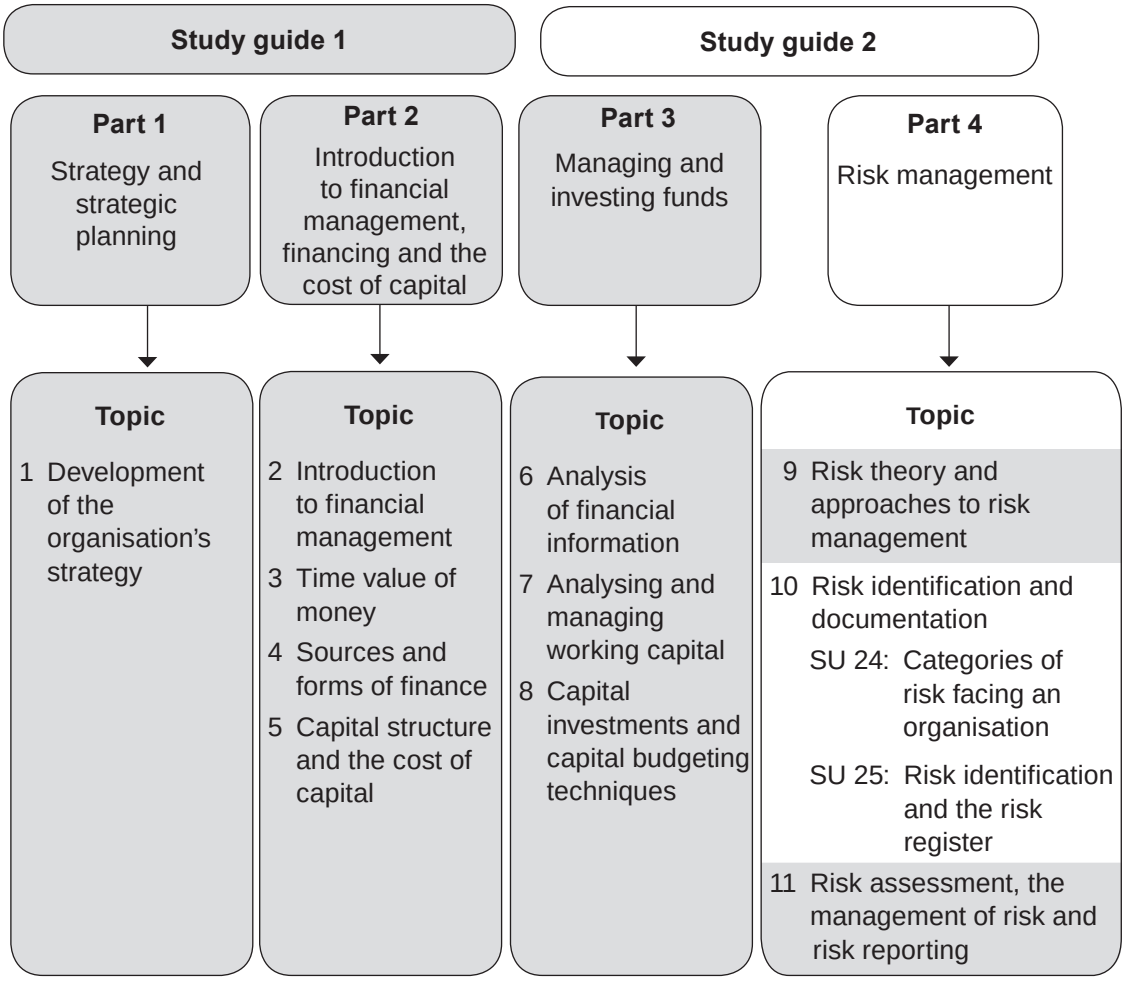
TOPIC 10

Risk identification and documentation

LEARNING OUTCOMES

After studying this topic, you should be able to:

- categorise risks facing an organisation
- identify risks facing an organisation by using various methods
- document risks facing an organisation in a risk register



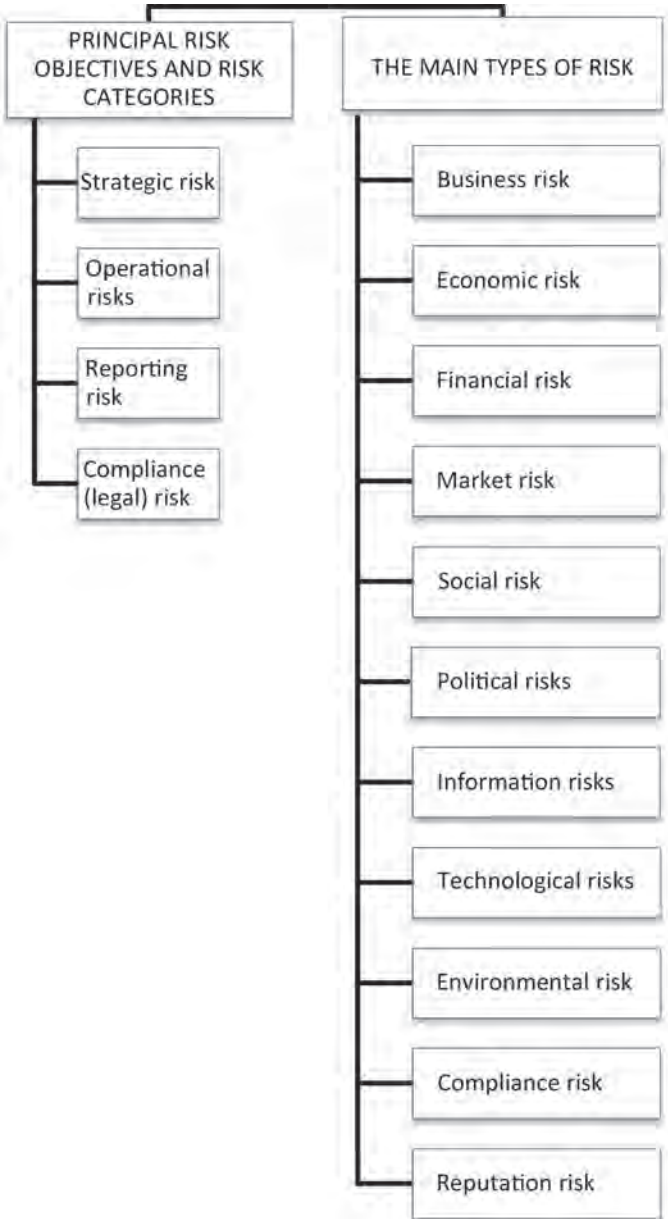
INTRODUCTION

In the previous topic, we explained the components of an adequate enterprise risk management (ERM) programme. With reference to the ERM framework, this topic will deal with the practical application of risk management by focussing on the categories and types of risk, the tools available to identify risks and the documentation thereof in a risk register.

STUDY UNIT 24

Categories of risk facing an organisation

In this study unit



1 Introduction

In this study unit, we will discuss the risk objectives of an organisation and look at types of risk that could face the organisation before we explain the methods to identify these risks in study unit 25.

2 Principal risk objectives/categories

Risks are categorised to streamline the management of similar risks with control measures suitable for the specific kind of risk. The categorisation of risks contributes to management and employees' risk awareness leading to an effective risk management programme whereby controls and other risk mitigating actions are introduced and monitored.

You will remember the four (4) risk objectives, as defined by COSO are:

1. Strategic objectives: refer to the high-level goals of the organisation and are aligned with the mission of the organisation.
2. Operational objectives: aim to use the organisation's resources in an effective and efficient manner.
3. Reporting objectives: aim to ensure reliable reporting of financial and non-financial data.
4. Compliance objectives: target compliance with applicable laws and regulations.

These four (4) risk objectives could then be used as the basis to identify categories of risk. A fifth category, namely information and technology as well as a sixth category namely systematic and unsystematic risk could be added to the list of COSO categories/ risk objectives.

2.1 Strategic risk

STRATEGIC RISK

Strategic risks have more to do with the organisation's position and relation with the external environment in the long-term.

These strategic risks – being from the external environment – are not under the control of the organisation, which make the risks difficult to mitigate. This business environment in which the organisation operates determines the profit volatility. This is strategic risk. The strategy an organisation decides on, regarding resources and possible structural changes of the organisation has a major impact on costs, prices, products, sales and sources of finance. However, some internal functions in an organisation have a key bearing on the organisation's situation in relation to its environment.

Factors, which influence strategic risks specifically, are the following:

- industries within which the organisation operates
- general state of the economy
- actions of competitors
- the specific stage of the product's life cycle
- price fluctuations over which you have little control
- level of operating gearing
- flexibility of production processes when product specifications alter
- research and development capacity with the ability to innovate
- significance of new technology

In many cases, these strategic risks will be out of the control of management, but by diversification, strategic risks can be minimised. Strategic risks are most important and should be clearly understood.

Also refer to the first part of this study guide to understand the role of strategic risks on the development and changes to an organisation's strategy.

Activity 24.1

The following is an extract from the MultiChoice website (www.multichoice.co.za) illustrating the organisation's mission statement and vision.

Read the information below as well as the *ABOUT US* and *MEDIA* section on the MultiChoice website and try to identify some of the risks faced by the organisation.

MISSION & VISION

MultiChoice Enriches Lives. It's our mission to brighten people's lives with compelling digital media content. Whether it's through Pay TV, the Internet, mobile phones or any other device on the digital horizon, our goal remains the same: We Enrich Lives. It can happen anywhere. In a city. In a remote village. To millions of people. To one person. To someone we don't know. To someone we work with. To the fortunate. To the less fortunate.

MISSION STATEMENT

We surround you with a world of entertainment.

VISION STATEMENT

We will be Number One in all chosen market segments, as the most trusted, best value provider of:

- *The most compelling digital media content*
- *The most innovative delivery*
- *The best customer care*
- *Nurturing the best talent*

Source: Quoted from http://www.multichoice.co.za/multichoice/view/multichoice/en/page44128

NOTE

Refer to Topic 1 and 2 at the beginning of this module for definitions of an organisations' mission, vision and values and how these concepts are used in strategy setting.

Feedback on activity 24.1

By visiting websites such as http://engineeringnews.co.za and http://www.channel24.co.za/TV/News, you can could get information such as the following:

Appetite for mobile TV strong, but take-up hinges on coverage, cost

Christy van der Merwe

18.02.2011

There has been a "massive leap" in interest in mobile TV in South Africa over the past year, World Wide Worx director **Arthur Goldstuck** tells Engineering News.

"We found previously that, if there is a technology that is incoming in the future and one asks about take-up, enthusiasm is very low. But the moment that the technology becomes available, enthusiasm leaps," Goldstuck notes.

In September 2010 ... the Independent Communications Authority of South Africa (Icasa) issued mobile TV broadcasting licences to e.tv (40), and MultiChoice (60%).

MORE

Information technology set to play a bigger role in education

Schalk Burger

2012-03-16

Information technology (IT) will increasingly be used in schools to improve the effectiveness of teaching and the availability of materials, says Department of Basic Education Curriculum Innovation and e-Learning director Phil Mnisi ...

Mindset, which has a dedicated education broadcast channel on Digital Satellite Television and on TopTV, has developed multimedia and video lessons for pupils and teachers to use, said Mindset CEO **Roith Rajpal**.

The non-profit company uses multiple platforms to distribute its content and has installed technology infrastructure at a number of schools ...

MORE

Source: Quoted from http://engineeringnews.co.za

Report: Separate channels will end pay TV

2012-06-26

Thinus Ferreira

If pay TV operators were forced to sell TV channels separately to their subscribers on a so-called *a la carte* basis or as part of a so-called "unbundling" of their TV channels, it would destroy the billion dollar pay TV industry, a new independent analysis on the pay TV industry has found.

A new report warns that so-called "unbundling" would lead to less choice and to only ten TV channels in America surviving the move.

Related links

- DStv Compact overtakes Premium
- Nando's tells MultiChoice to take a hike
- DStv lifts ban of Nando's ad

Source: Quoted from http://www.channel24.co.za/TV/News

By analysing the above market news and reading the mission and vision of MultiChoice, we can identify numerous possible risks, which could include:

- The organisation will not be the most compelling digital media provider if it is not able to secure the exclusive broadcast rights for a significant portion of highly rated content, television series, and sporting events. The rising cost of international content, negative currency fluctuations or the introduction/growth of a competitor in the market increase the risk of not being the most compelling digital media provider. Note that the introduction of a competitor increases awareness and interest in the industry, which could also present opportunities for growth.
- MultiChoice will lose its attraction if it does not provide the most innovative delivery, which includes high definition (HD) broadcasts, 3G streaming over the internet and mobile television.
- Not providing the best customer care could result in unhappy customers and losses. With technology at the core of the business, it may be a challenge to find enough skilful employees, which increases the risk of poor customer care. Measures such as learnership programmes and skills development initiatives could be risk responses that will contribute to reducing the likelihood and impact of this risk.
- If the organisation is unable to nurture the best talent, it could negatively impact on service delivery and result in losses. Working in a stressed working environment, which requires precision to ensure the achievement of broadcast schedules could have a negative impact on staff morale.
- Providing employee wellness service programmes and equipping staff with the skills to be efficient and effective reduces the risk of not achieving this objective.

As mentioned before, numerous other risks could be derived from the above.

NOTE

In your MAC modules (undergraduate and post-graduate), it is important that you read and watch financial news reports. You will not be examined on news events, but it will give you a better understanding of the context of what we are trying to teach you, especially if you are a full-time student!

2.2 Operational risks

As strategic risk focuses on the long-term, operational risk is more concerned with the day-to-day operations of the organisation.

Key term: OPERATIONAL RISK

① According to the definition by BPP Learning Media (2011:8):

"Operational risk is the risk of loss from a failure of internal business and control processes."

② The Basel Committee on Banking Supervision defines operational risk as:

"The risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events."

Examples of operational risks are:

- losses from poor internal control systems, for example slack physical access control resulting in theft
- non-compliance with regulations or internal procedures
- information technology failures
- human error
- loss of key-person risk
- fraud
- business interruptions, such as those due to power failures and no back-up power generators

2.3 Reporting risk

REPORTING RISK

The risk refers to the provision of unreliable financial and non-financial information to all levels of management and other stakeholders.

This could result in inappropriate decisions being made. Reporting risk is also linked to financial risk that relates to the financial operation and position of an organisation.

2.4 Compliance (legal) risk

COMPLIANCE RISK

These risks arise from non-compliance with legislation or regulations.

This is often a significant risk as it could result in huge fines and penalties or the suspension of operating licences which could create a ***going concern problem*** for the organisation (organisation will not be able to continue operations).

There are often hundreds of acts, pieces of legislation and other regulations that require compliance. This includes labour laws, tax legislation, regulations for listed organisations (if applicable), and so forth.

The term ***going concern problem*** is one that you will come across throughout your studies. When an organisation is threatened by a ***going concern problem,*** it is faced with a significant event or situation that threatens the ongoing survival of the organisation.

Activity 24.2

Use the risk categories or objectives (as provided by COSO) and categorise the following risks, which were noted by the chief risk officer of an organisation in the courier industry, that delivers mail and packages, and committed itself to specific delivery times and destinations:

- There is no communication with drivers during the day to notify them of traffic problems/delays, which sometimes result in drivers being stuck in traffic, resulting in late deliveries.
- The organisation's management has decided to work for two key customers in future. This has significant benefits for the organisation, as fixed contracts will guarantee work and an excellent revenue stream for next few years. However, one of the customers is already in financial distress and if the

business is lost it will be difficult to collect the money. It will also require marketing cost and time to expand the customer base to the current levels.

- Drivers sometimes exceed the speed limit in an effort to get the work done quickly.
- A driver was recently caught delivering packages with the organisation's vehicle for his own benefit. He also accused other drivers of collecting money for their own benefit for work done with the organisation's resources.
- In an effort to save cost, the chief financial officer has decided to reduce the staff in the financial department and not fill the position before the end of the financial year when the financial statements are drafted.

Feedback on activity 24.2

- Inadequate communication with drivers resulting in late deliveries is an **operational risk**, as it is part of the day-to-day activities.
- The decision to work for only two key customers increases the risk of future failure of the organisation if one of the key customers suffers financial losses or close down. This is a **strategic risk**, as it is a long-term risk.
- Drivers exceeding the speed limit are breaking the law. This is a **compliance risk**.
- Drivers doing deliveries for their own benefit with the organisation's resources are defrauding the organisation. This is an **operational risk**.
- The reduction in staff in the finance department could result in inaccurate and unreliable financial information, which is a **reporting risk**.

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3 The main types of risk are

Business risk
Economic risk
Financial risk
Market risk
Social risk
Political risk
Information risk
Technology risk
Environmental risk
Compliance risk
Reputation risk

We will now discuss the above types of risk in more depth.

3.1 Business risk

Key term: BUSINESS RISK

Risks that arise from the activities of the organisation and relate to the people, processes, products and structure.

This includes product failure, fraud, loss of suppliers, loss of key employees, business interruptions, contractual inadequacy risk, and so forth. These risks are generally within the organisation's control and can be managed by introducing internal controls or insurance.

3.2 Economic risk

ECONOMIC RISK

Economic risks are directly related to risks that originate from activities or non-activities in the normal economy. This includes changes to inflation, the unemployment rate and international policy. These economic risks start before transactions take place and are considered to be external.

To understand economic risks, one needs to have a thorough knowledge of the organisation's competitive position on a global basis. Other examples of these risks are:

- Product risk

A product risk arises when consumers' taste change and they do not purchase your product any longer, preferring another product instead of your product. When preferences change, your organisation's sales drop, which result in losses. This could include changes in trends, for example, a sudden preference for leather handbags could result in reduced sales for handbags made from other material.

- Stakeholder risk

Stakeholders or investors can lose interest in your organisation. A non-committed stakeholder can be a huge risk as they might hold back new funds for new developments or the urgent maintenance of the production plant. Employees (as stakeholders) can also be a risk in constant strikes and disruption.

3.3 Financial risk

FINANCIAL RISK

Financial risk relates to the financial operation and position of an organisation.

The most important financial risk is that the organisation will not be able to continue to function as a going concern. Financial risks are also linked to the organisation's financial structure. This is the mix of equity and debt capital, the risk of not finding funding and for overtrading. The following are examples of financial risks:

- Investment risk

Investment risk arises, for example, when an organisation makes a decision to invest capital in a project, expansion, and so on, but due to uncertainties, the investment decision turns out to have been untimely and wrong. Examples of uncertainties are insufficient data or the definition of cost of capital wrongly interpreted.

- Currency risk

Transactions involving foreign countries always have the possibility of a gain or loss, due to value of one currency fluctuating in relation to another currency. To reduce or eliminate

these risks, organisations can use hedging techniques. The three most important risks arising from currency risks are:

– Transaction risk – changes in the settlement values
– Translation risk – changes to the values of foreign assets and liabilities at year-end
– Economic risk – the effect of the exchange rate on the cost of goods

- Interest rate risk

If an organisation has reasonably high debt not linked to a fixed rate, the uncertainty of interest rate fluctuations is a risk. If it rises, the cost of capital can cripple the organisation. The reverse also being true – if the organisation has high fixed rate debt and the rate drops, the organisation cannot reap the benefits of lower finance cost. Hedging techniques also apply.

Interest rate risk also applies to investments linked to interest rates.

- Credit Risk

The Official CIMA Terminology (2011:23) for credit risk is:

"The possibility of losses due to non-payment by debtors. This usually applies to the organisation's debtors and counter parties to hedging transactions."

Credit risk is influenced by: the organisation's credit policy, the proportion of credit sales, credit terms offered, the screening of debtors and debt collection procedures.

- Trading risks

These are risks that occur due to environmental, cultural and time differences between local and international organisations.

- Financial records and reporting risk

Ineffective accounting systems or a breakdown in accounting systems can lead to financial reporting risk as this could result in invalid, incomplete, and unreliable recording of transactions in the accounting records.

NOTE

You will learn more about hedging currency and interest rate risk in your post-graduate modules.

3.4 Market risk

MARKET RISK

Market risk originates from events and transactions in the market place.

Market risks are risks that can result in a financial loss for an organisation, due to the actions of competitors or a change in the prices of commodities and investments on stock markets. Market risks can be caused by:

- Competitors

Actions taken by competitors can be a risk for your organisation. For example, if your competitor introduces a new product more advanced than your own, you are in danger of having a cash flow problem, ending in a loss, because clients may prefer to buy

the competitor's product, instead of yours. In addition, your competitor can offer a reduced price for his product, at which you cannot manufacture and sell your product.

- Commodities

The possibility exists that certain raw materials crucial to the manufacturing of a product can no longer be supplied. This can force the organisation to use substandard raw materials, resulting in products of lower or inferior standard being sold. This can lead to a decline in market share and a threat to your organisation. Active trading markets exist for certain commodities such as gold, platinum, maize, and so forth. This also includes commodity price risk that relates to the risk of a change in commodity prices.

You can manage some of these risks by hedging contracts.

3.5 Social risk

SOCIAL RISK

Social risk relates to the impact of the organisation on the community and vice versa.

Social risks include drug addiction and social upheaval, that is as a result of, for example, a decision to close a business unit or a mine in a small mining community.

3.6 Political risk

POLITICAL RISK

Refers to the effect that detrimental political activities or political instability have on an organisation.

3.7 Information risk

INFORMATION RISK

Information risk is the risk that decision makers within the organisation use invalid or poor quality information for decision-making, or the loss of information.

Good information is information that adds to the understanding of a situation. BPP Learning Media created the mnemonic ***ACCURATE*** to help you remember the qualities of good information. They are:

A – Accurate. Figures should add up.
C – Complete. All the required information is included.
C – Cost-beneficial. Cost to obtain information should not be more than the benefit.
U – User-targeted. The needs of the user should be kept in mind to make it user-friendly.
R – Relevant. Only information relevant to the decision must be supplied.
A – Authoritative. The source of the information must be reliable.
T – Timely. Information should be available when required.
E – Easy to use. Information should be clearly presented.

The above are the characteristics of *good* information. In business, one does not always have "good" information and sometimes have to make decisions based on inadequate information, which creates an information risk.

The information technology (IT) systems and databases of a short-term insurance company on which all the client information is stored is an example where information risk is prevalent. Clients' personal information and details of their possessions are stored on these systems

and regular back-ups and advanced data security are very important risk responses in order to prevent the loss of information.

This is a very important risk and it is imperative for management to have proper policies and procedures in place to keep the occurrence of such an event to the minimum.

3.8 Technological risk

TECHNOLOGICAL RISK

① Risk involved with the operation, ownership and sustainability of the organisation's information technology (IT) systems. This includes the negative impact on productivity, service delivery, and so on, when IT systems fail, but also the risk associated with missing opportunities to use technology to enable or enhance the business.

② Technological risks also refer to the manufacturing plant being outdated or a product being obsolete when a more technologically advanced product has replaced it.

NOTE

The risks directly related to information technology (IT) are addressed in the AIN1501 module.

3.9 Environmental risk

ENVIRONMENTAL RISK

- The risk relates to climate change and risk of natural disasters (deemed to be external risks)
- The risk of damage caused by a pollutant, that is, a substance or by-product introduced into an environment other than its intended use/ purpose (deemed to be within the organisation's control). This could result in damage to the environment as well as fines and penalties in countries with strict regulations.

3.10 Compliance risk

COMPLIANCE RISK

Risks that arise from non-compliance with legislation, regulations or internal procedures.

3.11 Reputation risk

REPUTATION RISK

A loss of reputation is the adverse consequence created by bad publicity due to the materialisation of another risk. External stakeholders will normally perceive this loss and it has serious consequences.

NOTE

As mentioned before, the list of types of risks is endless. You have to think outside the box and apply your mind to the circumstances of the organisation. Think of risks that may be applicable to the specific situation in the organisation.

Activity 24.3

List some risks that may be relevant to a South African organisation manufacturing paper from tree pulp. The organisation exports to various clients in South America and Africa. The company operates with 80% debt capital.

Feedback on activity 24.3

With reference to the study material, there could be numerous types of risks and the following are just a few examples that you could have considered:

- environmental risks caused by air pollution from the paper mill (paper manufacturing plant)
- environmentalists may place pressure on the organisation and cause restrictions on the cutting of trees if a conscious effort is not made to ensure the sustainability of the water resources, fertile land, natural forests and the biological system in the area
- the high level of gearing increases the financial risk and could place restrictions on future expansion as loans require fixed repayments and are often secured by assets
- the organisation exports to South America and other African countries, which increases currency risk as contract values may change with currency fluctuations

4 Summary

In this study unit, we again mentioned the four categories of objectives according to ERM. We also discussed a significant list of types of risks. You might find other risks not mentioned here when reading other textbooks, but as stated, you have to think outside the box.

In the next study unit, we will examine methods to identify risks.

Self-assessment activity

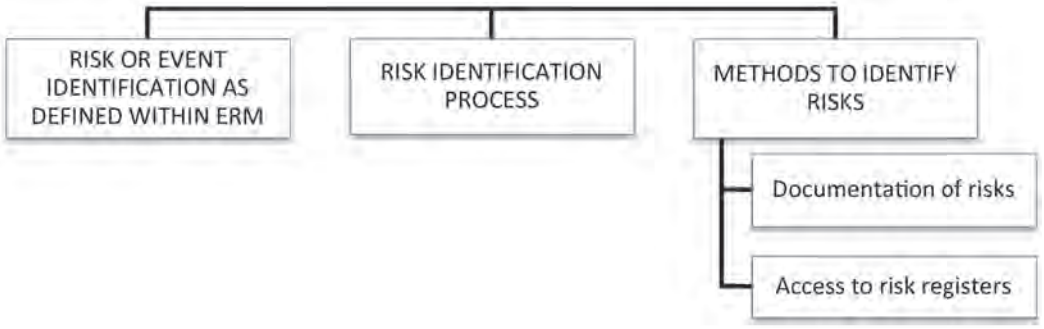
After having worked through the study unit, determine if you are able to answer the following questions:

a. Describe the difference between operational and strategic risks and formulate five (5) examples of each.
b. Describe the characteristics of *good* information for decision-making.

STUDY UNIT 25

Risk identification and the risk register

In this study unit



1 Introduction

In the previous study unit, we discussed the types of risk that could affect the organisation. This study unit deals with the identification of risks. This process is often facilitated by a risk management department and will be best to summarise it in a risk register.

2 Risk or event identification as defined within ERM

RISK OR EVENT IDENTIFICATION

Risk or event identification is the process to identify internal and external events, which could affect the achievement of the organisation's objectives. This includes risks and opportunities.

Risks are identified with reference to the organisation's strategy and objectives.

There are various methods to identify risk. In practice, members of the risk manager/ risk management department often facilitate the risk identification process with the risk management group and the organisation may adopt either a "top down" approach, which starts with senior management, or a "bottom up" approach, which starts with lower ranking employees.

3 Risk identification process

- One risk identification method will not be sufficient to identify all the risk exposures.
- The risk identification process has to be supported by consulting with as many people inside the organisation as possible. This includes management, internal audit and key employees.
- Risk identification is a continuous process.

4 Methods to identify risks

The methods to identify risks include the following:

METHOD	DESCRIPTION
Control self-assessments completed by management:	Tool to assess management's perception of perceived strengths, risks, weaknesses within the business processes and the adequacy and effectiveness of the controls designed to mitigate the risks and achieve business objectives.
SWOT analysis:	Strategic planning method used to evaluate the strengths, weaknesses, opportunities and threats. The management of threats and weaknesses should be prioritised before committing time and resources to the enhancement of strengths or achievement of opportunities. This will contribute to a sustained organisation.
PESTEL analysis	An analysis of all the **P**olitical, **E**conomic, **S**ocial, **T**echnological, **E**cological, and **L**egal factors that could affect the organisation.
Five Forces Model (Porter, 1980)	Considers the following in an effort to identify risk: ● rivalry among existing organisations ● bargaining power of buyers ● bargaining power of suppliers ● threat of new entrants ● threat of substitute products or services
Brainstorming/risk workshops	A group tries to find a solution for a specific problem or question by gathering a list of ideas spontaneously contributed by the group.
Stakeholder consultations	Techniques involving data collection and could include the survey of stakeholders by interview or questionnaire.
Benchmarking	Could be applied to risk management as management identifies the best risk management practices in their industry, or in another industry where similar processes exist, and compare the results and processes of those studied (the "targets") to the organisation's own results and processes.
Diagnostics	Diagnostics is a term used in risk management to refer to methodologies measuring specific risk exposures ("value-at-risk"), that is tools used to selectively examine actions, performance and events to measure an organisation's safety culture. This enables management to measure and highlight potential shortcomings or risks.
Organisation charts and flow charts	These charts indicate the processes/divisions of the organisation and assist to identify risks as well as indicate risk concentrations and dependencies.

METHOD	DESCRIPTION
Fish bone	The process to break down a business process into its component parts to examine all the risks to that process.
Analysis of the financial statements	This helps to identify values that are at risk, possible legal exposures or contractual liabilities (on the statement of financial position); and/or to indicate sources of income and losses (statement of profit or loss and other comprehensive income).
Results of quality control checks, inspections and audit reviews	The results of quality control checks, inspections and audit findings will assist with the identification of risks.

Many of the above techniques are also used to embed risk awareness and risk management into management's activities to improve the control environment.

NOTE

In the rest of this and other MAC modules, you will encounter questions requiring you to list or discuss other/ qualitative (subjective) factors when evaluating various options. The SWOT and PESTEL analysis are useful tools to consider when answering those questions.

In the following activity, we will demonstrate the use of the more widely used techniques of SWOT and PESTEL analysis.

Activity 25.1

Consider the following case study of Wakeup (Pty) Ltd, a coffee manufacturer based in South Africa. The organisation's differentiating factor is that it sources unrefined or raw coffee beans from a small region in Ethiopia. These coffee beans are roasted using a refined process to produce an aromatic and rounded flavour. The coffee is expensive and targets a niche (exclusive) segment of the market.

The following information was noted based on recent discussions with key stakeholders including: The chairman of the audit committee (an independent non-executive director), the chief executive officer (CEO), the chief financial officer (CFO), the chief risk officer (CRO) and key members of management, including the head of the legal department:

- The organisation has a strong financial position to facilitate the financing of future projects.
- The organisation has an excellent distribution network across South Africa.
- This distribution network is used to supply two large retailers with stores across South Africa.
- Only one of the retailers has placed their order for the next quarter.
- Based on market research, Wakeup's aromatic and rounded coffee blends will be very popular in the fast growing Russian and Brazilian markets.

- The economic downturn in South Africa is a concern as expensive coffee is a luxury item and there are inexpensive substitutes.
- Wakeup has a contract with an international company for the coffee beans to be shipped in special containers from Ethiopia to South Africa. The shipping company has expressed concerns about the growing number of pirate attacks off the Somalian coast, but has indicated that alternative routes are not economically viable. The attacks have resulted in some cargo being lost or stolen and in the shipping company not achieving the delivery dates.
- There is currently a legal dispute over the patent rights of one of the coffee blends sold by Wakeup.
- The company has a strong and stable base of employees with very good succession planning.
- Wakeup has a strong and recognisable brand in South Africa.

REQUIRED

a. Draft a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis.

b. Draft a PESTEL analysis.

Feedback on activity 25.1

a. SWOT analysis for Wakeup (Pty) Ltd

	Strengths	Weaknesses
Internal perspective	• The organisation has a strong financial position to facilitate financing future projects. • The organisation has an excellent distribution network across South Africa. • Strong and stable base of employees with good succession planning. • Strong and recognisable brand in South Africa.	• Wakeup has a small customer base and only supplies two large retailers. • Wakeup produces expensive coffee blends, which could result in reduced sales in the current economic downturn. • Currency risk exposures from imports.

	Opportunities	Threats
External perspective	• Opportunity to expand to the fast growing Russian and Brazilian markets.	• Only one of the retailers has placed its order for the next quarter. • Growing number of pirate attacks off the Somalian coast could result in delayed delivery dates or the coffee beans (raw material) being lost or stolen. • There is currently a legal dispute over the patent rights of one of the coffee blends sold by Wakeup.

NOTE

This is a SWOT analysis, but based on the above, a number of significant risks can be identified. The assessment of the risks resulting from the threats and weaknesses will be more significant than the advancement of the strengths and opportunities. This is apparent because the threats and weaknesses need to be addressed to ensure the sustainability of the organisation before committing time and resources to the enhancement of strengths or achievement of opportunities.

b. PESTEL analysis:

ANALYSIS	CONSIDERATIONS
Political factors	• The government stability in lucrative Russian and Brazilian markets needs to be considered. • Some governments offer agricultural subsidies which could influence the price of raw coffee beans in those countries. • Taxation policies in South Africa, Ethiopia and other potential markets. The taxation policies of countries where significant competitors are based should also be considered. • Some governments and regions offer tax incentives/ grants, which could facilitate new projects or expansion.

ANALYSIS	CONSIDERATIONS
Economic factors	• The sustainability of Wakeup's two large customers is important when identifying future risks. • Other growing markets around the world offer the opportunity for expansion. • The economic downturn could result in reduced sales as unemployment increases and people have less disposable income. • Rate of inflation in Ethiopia could see an increase in commodity prices, which will be hard to control. • Stricter credit control from banks makes it harder to acquire finance for expansions. • Interest rate fluctuations could influence the cost of production. • Exchange rate fluctuations could influence the competitiveness of Wakeup's product pricing if it hopes to expand into international markets. It could also increase the risk of more inexpensive substitutes in the South African market.
Social factors	• Lifestyle changes influence demand, that is when people work harder and spend more time at work, it could influence the demand for coffee. • Behaviour that is socially acceptable, will drive demand. • The influence of consumer protection movements, which seek to protect consumers from dishonest packaging, advertising and guarantees. This includes promoting healthier products. • The effect of changes in demographics and increased urbanisation.
Technological factors	• Government spending on new technologies. • Advancements in the production process which could make it cheaper, quicker and more cost effective. • Advancements in the transport of goods and improvements to ensure that goods remain dry and unscathed. • The ability to apply technologically advanced production processes in foreign markets needs to be considered.

ANALYSIS	CONSIDERATIONS
Ecological factors	• Environmental laws and regulations. • By-products of the coffee production process and the cost and effect of waste disposal. • The sustainable management of the fertile land by the Ethiopian coffee bean suppliers. • Changing weather patterns.
Legal factors	• Foreign trade regulations regarding the unroasted/ raw coffee beans (agricultural commodity) and the coffee (finished product). • Laws and regulations including labour laws, product safety, and so forth. • The organisation is involved in a legal dispute over patent rights.

These are only some considerations that could be considered when doing a PESTEL analysis and there are many more.

We will discuss the assessment of risks in study unit 26 and risk responses (methods to address risks) in study unit 27.

5 Documentation of risks

The risk management department often facilitates this process and documents the risks in a risk register.

RISK REGISTER

A risk register is a summary of identified risks, which are listed, described and assessed/ measured (based on their potential impact and likelihood).

Data that could be included in a risk register is:

- risk objective/category that the risk relates to
- date when the risk was identified
- description of the risk
- inherent risk rating (based on the impact and likelihood of the risk, which will be discussed in the next topic)
- root cause analysis
- risk responses (risk mitigating action plan, which will be discussed in the next topic) if any
- the target/ implementation date of the risk responses (This is important as the risk register is a living document, which will change as the organisation grows and changes.)
- residual risk rating (to be discussed in the next topic)
- the "owner" of the risk (The individual responsible for ensuring that risks are appropriately engaged with risk responses.)
- interdependencies with other risks

Various software packages are available for the recording, storing and management of risk registers.

Activity 25.2

Based on the Wakeup case study noted in activity 25.1 of this study unit, there is a growing number of pirate attacks off the Somalian coast, which could result in delayed delivery dates for the coffee beans (raw material) or the coffee beans (raw material) being lost or stolen.

The risk is that the operations department may be unable to manufacture coffee without the raw material or that unacceptable delays occur while the raw material is at sea.

REQUIRED

Indicate how this risk could be documented and tracked in a risk register.

Feedback on activity 25.2

Risk objective/ category	Risk type	Date of the risk identifi-cation	Risk description	Inherent risk assess-ment	Risk responses	Risk response target date	Residual risk assess-ment	Risk owner
Operational	Com-modity risk	1 March 20XX	Insufficient coffee beans to ensure an effective and efficient manufacturing process	Critical (20)	Negotiate insurance for the shipments or find a feasible alternative supplier	30 April 20XX	Medium (6)	Head of Opera-tions

Legends:

	Critical	Usually represented by the colour red
	High	Usually represented by the colour orange
	Medium	Usually represented by the colour yellow
	Low	Usually represented by the colour green

NOTE

The calculation of the inherent risk assessment, formulation of risk responses, as well as the calculation of the residual risk assessment will be discussed in the next topic.

6 Access to risk registers

Access to edit the risk registers should be limited to key personnel, that is the members of the risk management department. Access to view the risk registers should be broader to enable those members of management responsible for the implementation of risk responses to understand their roles and responsibilities. However, the ability to view the risk registers should also be limited to prevent the risks and weaknesses of the organisation from becoming public knowledge, which could be used by competitors or by people with malicious intent.

Access controls over the risk register is clearly important. Consider other general controls that need to be applied to ensure the effective documentation of risks and related information.

7 Summary

In this study unit, we focused on the initial identification of risk and the subsequent documentation of risks. The process to draft and update risk registers on a periodic basis is often facilitated by the risk management department.

We will discuss the assessment of inherent risk in study unit 26, the assessment of residual risks and risk responses to manage risk in study unit 27 and risk monitoring and risk reporting in study unit 28.

Self-assessment activity

After having worked through this study unit, you should be able to answer the following questions:

a. Illustrate methods to identify risks and discuss how the result of external- and internal audit can assist in identifying risks.
b. State data that will typically be noted when drafting a risk register.

Enrichment/additional reading

Browse the internet for examples of risk management software and reflect on everything that management will need to consider when buying and implementing the software.

References and additional reading

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http://engineeringnews.co.za

[Accessed on 9 July 2012]

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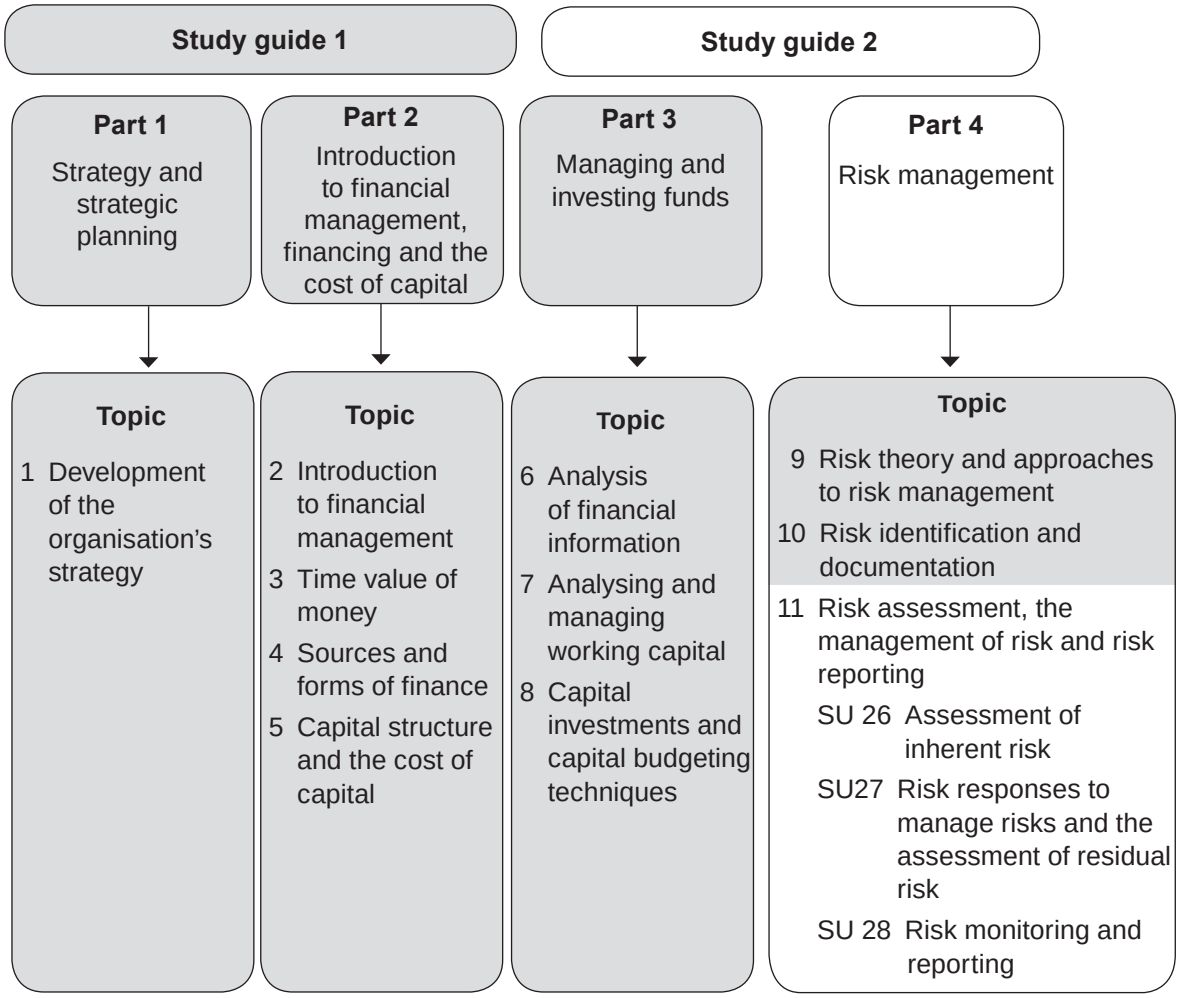
TOPIC 11

Risk assessment, the management of risk and risk reporting

LEARNING OUTCOMES

After studying this topic, you should be able to:

- evaluate the assessment of inherent and residual risks
- formulate risk responses to manage risks
- discuss risk reporting



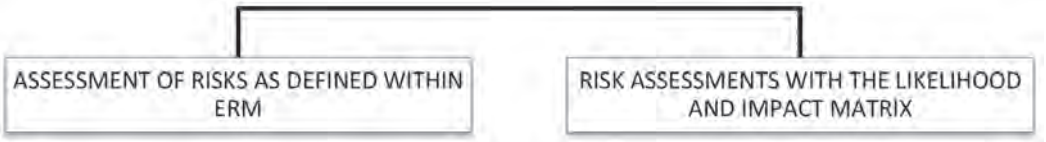
INTRODUCTION

The previous topic focussed on the identification of risk. Topic 11 will explain the assessment of risk, risk responses to reduce or mitigate the risk, and risk reporting.

STUDY UNIT 26

Assessment of inherent risk

In this study unit



1 Introduction

In the previous study units, we dealt with the identification and documentation of risk events. In this study unit, we will examine the next step in the ERM risk management model, which is the assessment of risks at the inherent risk level. This process is often facilitated by a risk management department in consultation with management and should be summarised in a risk register.

2 Assessment of risks as defined within ERM

Risks are analysed by considering two dimensions, namely the impact (potential damage or loss) and the likelihood of the event occurring. This is used as a basis for determining how the risk should be managed on both an inherent (gross) and residual (net) basis.

The following definitions are critical:

INHERENT RISK AND RESIDUAL RISK

INHERENT RISK involves the assessment of risk **BEFORE** the application of any risk responses.

Risk responses can include the introduction of internal controls, the transfer of the risk or management responses.

RESIDUAL RISK involves the assessment of risk **AFTER** taking into account the application of any internal controls, transfer or management responses to reduce the risk.

The residual risk rating will indicate whether the remaining risk is within the organisation's risk appetite. Risk responses are discussed in the next study unit.

3 Risk assessments with the likelihood and impact matrix

The process to assess risks through the likelihood or impact matrix is called risk mapping. For many organisation's a 3x3 matrix of high/medium/low will suit their needs, while for others a 5x5 matrix or even a 7x7 matrix may be more suitable.

Figure 26.1 (CIMA 2009) below illustrates one way in which risks can be assessed by using a 5x5 matrix.

LIKELIHOOD/PROBABILITY		
Assessment	**Measure-ment**	**Description**
extreme	5	expected to occur
very high	4	will probably occur
medium	3	can occur at some time and may be difficult to control
low	2	not expected to occur
negligible	1	may occur only in exceptional circumstances

IMPACT/CONSEQUENCE		
Assessment	**Measure-ment**	**Description**
extreme	5	impact or consequence of the risk will threaten the survival or viability of the organisation
very high	4	will have a significant impact on the achievement of organisation objectives or threaten the continued operation of the organisation
medium	3	will have a moderate impact on the achievement of organisation objectives
low	2	will threaten efficiency or effectiveness of some aspects of the organisation
negligible	1	limited effect and the impact or consequence of the risk can be dealt with by routine operations

Source: CIMA (2009)

FIGURE 26.1: Risk assessments with the likelihood and impact matrix

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green

The risk assessment is calculated by multiplying the likelihood measurement with the impact measurement.

Activity 26.1

Browse the internet for images of risk-rating matrices.

Feedback on activity 26.1

Various images of risk rating matrices are available on the internet. The following is an illustrative example of a risk-rating matrix with the calculated values (results of the risk assessments) in brackets:

IMPACT	LIKELIHOOD				
	Negligible (1)	**Low (2)**	**Medium (3)**	**Very high (4)**	**Extreme (5)**
Extreme (5)	medium (5)	medium (10)	high (15)	critical (20)	critical (25)
Very high (4)	low (4)	medium (8)	medium (12)	high (16)	critical (20)
Medium (3)	low (3)	medium (6)	medium (9)	medium (12)	high (15)
Low (2)	negligible (2)	low (4)	medium (6)	medium (8)	medium (10)
Negligible (1)	negligible (1)	negligible (2)	low (3)	low (4)	medium (5)

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green
	Negligible	usually represented by the colour blue or no colour

Activity 26.2

The following three (3) risks were identified as part of a brainstorming session facilitated by the risk analyst (a member of the risk management department):

a. A foreign competitor will be introducing new technologies, which can result in the organisation's products becoming outdated.
b. Employees can enter into inefficient or wasteful contracts on behalf of the organisation.
c. A fluctuation in currencies can have a negative effect on the price of imported raw materials. The organisation currently imports 2% of its raw material from Australia, but can buy the raw material from local suppliers.

The following likelihood and impact ratings were attributed to each risk event:

a. New technologies to be introduced by a competitor:

Likelihood: Will probably occur (4).

Impact: The impact or consequence of the risk will threaten the survival or viability of the organisation (5).

b. Inefficient or wasteful contracts:

Likelihood: Can occur at some time and may be difficult to control (3).

Impact: Will have a significant impact on the achievement of organisation objectives or threaten the continued operation of the organisation (4).

c. A fluctuation in currencies:

Likelihood: Can occur at some time and may be difficult to control (3).

Impact: Limited effect and the impact or consequence of the risk can be dealt with by routine operations as a small percentage of raw material is imported and the raw materials can be sourced from local suppliers (1).

REQUIRED

Populate the following selected fields of the risk register. Indicate the applicable risk type and complete the inherent risk rating.

Risk objective/ category	Risk type	Risk description	Inherent risk rating

Feedback on activity 26.2

Calculation of inherent risk ratings:

a. new technologies to be introduced by a competitor: 4 x 5 = 20

b. inefficient or wasteful contracts: 3 x 4 = 12

c. a fluctuation in currencies: 3 x 1 = 3

The following represents selected fields of the risk register after taking the above information into account.

Risk objective/ category	Risk type	Risk description	Inherent risk rating
Strategic risk	Technological risk	New technologies to be introduced.	20
Operational risk	Business risk	Inefficient or wasteful contracts can be entered into on behalf of the organisation.	12
Financial risk	Currency risk	Fluctuation in currencies can have a negative effect on the price of imported raw materials.	3

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green

4 Summary

In this study unit, we discussed the concepts “inherent” and “residual risk”. We also noted that the most common way of assessing risks is through the likelihood and impact matrix. Risk assessments are evaluated to make decisions about the significance of the risks and to determine what risk response will be most appropriate.

Risk responses and the assessment of residual risk will be discussed in the next study unit.

Self-assessment activity

After working through this study unit, you should be able to define:

a. inherent risk
b. residual risk

STUDY UNIT 27

Risk responses to manage risks and the assessment of residual risk

In this study unit

1 Introduction

In the previous study unit, we discussed the concepts “inherent” and “residual risk” as well as the assessment of risks. In this student unit, we will discuss strategies to manage risks and how to reduce risks so that the residual risk ratings are at an acceptable level.

2 Risk responses are included in the risk management strategy

We have learned that an organisation’s risk management strategy should include:

- the risk profile/risk appetite of the organisation, that is stating the level of risk it finds acceptable
- the risk management processes (risk identification and assessment) the organisation practices, together with its preferred option for risk treatment (that is, avoidance, reduction, transfer, or retention and acceptance)
- who is directly responsible for the organisation’s risk management
- how reporting and monitoring processes will take place

3 Risk responses

The purpose of risk responses is to reduce the likelihood and/or impact rating of a risk event.

COSO’s ERM lists the following possible risk responses (mitigating actions):

1. **Avoid:** Action is taken to avoid activities, which give rise to high-risk events, that is, to refrain from business activities in a certain geographical market, such as in a war-torn country. Management accepts that avoiding the risks outweighs the benefits.
2. **Reduce:** Action is taken to mitigate the risk likelihood or impact, or both, generally through preventative and detective internal controls.
3. **Transfer or share:** Action is taken to transfer a portion of the risk to a third party through, for example, insurance, hedging or outsourcing.

4. **Accept:** No *action is taken* to change the impact or likelihood of the risk. These risks have a low impact when they occur and the "cost versus benefit" does not justify the mitigation of the risk.

NOTE

Based on Valsamakis, Vivian & Du Toit (2010:145), risk financing is a critical term which forms a close link with risk control as it strives to ensure that the cost of risk management does not exceed the benefit.

4 Who is responsible for risk responses?

The implementation of adequate and effective risk responses is the responsibility of the risk management team or management. The monitoring and review of risk responses should be done by management and the risk management department (based on the risk management plan) to ensure that:

- risk responses were adequate and effective and achieved their objectives
- the residual risk assessment was reasonable, based on the information and data used
- knowledge and awareness of risk management in the organisation are enhanced for future benefit

Activity 27.1

With reference to activity 22.4 in study unit 22, what do you think are the risk responses or mitigating actions to the activities below?

- If your risk appetite is low, you will leave home three hours before the exam starts and attempt to avoid the risk of traffic congestion that may cause you to be late.
- If your risk appetite is high, you will leave home an hour before the exam starts and accept the risk of traffic congestion that may cause you to be late.
- Your risk appetite may be low to suffering losses when your car or personal belongings are stolen so you will want to arrange insurance to reduce the risk.

Feedback on activity 27.1

- Avoidance – if you leave home three hours before the exam starts, you will attempt to avoid the risk
- Acceptance – if you leave home an hour before the exam starts, you will accept the risk
- Transfer – when you arrange insurance, action is taken to transfer the risk

Activity 27.2

Consider the following risks and the corresponding inherent risk ratings and formulate suitable risk responses if you assume that the organisation's risk appetite is low:

Risk category	Risk type	Risk description	Inherent risk rating	Risk response
Strategic risk	Technological risk	New technologies to be introduced.	20	
Operational risk	Business risk	Inefficient or wasteful contracts are entered into on behalf of the organisation.	12	
Financial risk	Currency risk	Fluctuation in currencies can have a negative effect on the price of imported raw materials.	3	

Feedback on activity 27.2

The risk responses below were introduced to align the residual risk ratings with the organisation's risk appetite (refer to study unit 22, section 5), which is low, for these types of risks.

Risk category	Risk type	Risk description	Inherent risk rating	Risk response
Strategic risk	Technological risk	New technologies to be introduced.	20	i. Obtain the rights to incorporate the new technology into the current products.
Operational risk	Business risk	Inefficient or wasteful contracts can be entered into on behalf of the organisation.	12	i. Draft a policy and procedure document for contract management; ii. Have the board approve a delegation of authority; and iii. Appoint a lawyer to review and sign-off on all contracts.

Risk category	Risk type	Risk description	Inherent risk rating	Risk response
Financial risk	Currency risk	Fluctuation in currencies can have a negative effect on the price of imported raw materials.	3	i. Accept the risk.

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green
	Negligible	usually represented by the colour blue or no colour

5 Assessment of the residual risk

Residual risk takes into account the application of any internal controls, transfer or management responses to reduce the likelihood and potential impact of the risk under consideration.

Activity 27.3

Based on the feedback on activity 27.2 above, calculate the residual risk ratings for the risks above and complete the risk register.

Assume the following likelihood and impact or ratings:

- New technologies:

  Likelihood: Will probably occur (4). Previously (4).

  Impact: Limited effect and the impact/consequence of the risk as the organisation will incorporate the new technology in its products (1). Previously (5).

- Inefficient or wasteful contracts:

  Likelihood: May occur only in exceptional circumstances (1). Previously (3).

  Impact: Will have a significant impact on the achievement of organisation objectives or threaten the continued operation of the organisation (4). Previously (4).

A fluctuation in currencies:

Likelihood: Can occur at some time and may be difficult to control (3). Previously (3).

Impact: Limited effect and the impact or consequence of the risk could be dealt with by routine operations as a small percentage of raw materials are imported and the raw materials could be sourced from local suppliers (1). Previously (1).

Feedback on activity 27.3

Calculation of residual risk ratings:

1. New technologies: 4 x 1 = 4.
2. Inefficient or wasteful contracts: 1 x 4 = 4.
3. A fluctuation in currencies: 3 x 1 = 3.

The following diagram represents selected fields of the risk register after taking the information above into account.

Risk category	Risk type	Risk description	Inherent risk rating	Risk response	Residual risk rating
Strategic risk	Technological risk	New technologies to be introduced.	**20**	i. Obtain the rights to incorporate the new technology into the current products.	**4**
Operational risk	Business risk	Inefficient or wasteful contracts can be entered into on behalf of the organisation.	**12**	i. Draft a policy and procedure document for contract management; ii. Have the Board approve a delegation of authority; and iii. Appoint a lawyer to review and sign-off on all contracts.	**4**
Financial risk	Currency risk	Fluctuation in currencies can have a negative effect on the price of imported raw materials.	**3**	i. Accept the risk.	**3**

Legends:

	Critical	usually represented by the colour red
	High	usually represented by the colour orange
	Medium	usually represented by the colour yellow
	Low	usually represented by the colour green
	Negligible	usually represented by the colour blue or no colour

NOTE

① Can you see that the residual risk rating is clearly in line with the organisation's low risk appetite?

② Students should be able to identify and discuss risk responses at the organisation level. Modules presented by the Department of Auditing will address the identification of risks and risk responses within each audit cycle.

6 Summary

Risk response is the process of selecting and implementing measures to reduce or mitigate the risk to an acceptable level. The acceptable level will be determined by the organisation's risk appetite, bearing in mind that a certain level of risk is required to acquire the desired level of return. Remember that the potential benefits increase as the exposure to risk increases.

We also discussed and did a practical example to perform a residual risk assessment, which takes into account the application of risk responses to reduce risk to an acceptable level.

The next study unit will elaborate on risk reporting.

Self-assessment activity

Describe practical examples of avoidance, reduction, transfer or sharing and acceptance, which could be applied to mitigate risks.

STUDY UNIT 28

Risk monitoring and reporting

In this study unit

1 Introduction

In the previous study unit, we discussed risk responses to reduce risks to an acceptable level. We also did a residual risk assessment, which assesses the likelihood and impact of the risk on the organisation after taking into account the risk responses to the risk.

2 Risk monitoring

RISK MONITORING

According to Valsamakis, Vivian & Du Toit (2010:146), risk monitoring entails the continuous evaluation of the organisation operations to ensure the adequacy of control measures and to identify new risks to the organisation.

Methods available to the risk management team or risk management department to monitor the effectiveness of the risk management process include:

- **Loss management:** Losses are recorded and a loss report drafted to summarise loss events, values and root causes. Risk responses are the implemented to prevent or reduce the likelihood of similar events occurring in future.
- **Key risk indicators:** Key trends are measured against a specific threshold and risks are highlighted when the threshold is breached. For example, an organisation selling products over the phone may set a maximum waiting time of one minute for all customer calls to be answered. If that waiting time is breached, it is an indicator to management to take action to prevent a negative impact on the organisation.
- **Risk and control self-assessments completed by management:** This is an analysis of the organisation objectives and processes. Tool to assess management's perception of perceived strengths, risks, weaknesses within the organisation processes and the adequacy and effectiveness of the controls designed to mitigate the risks and achieve organisation objectives. This is also an effective method to identify risks.
- **Scenario management:** This is a method to determine future risks, based on the views of experts.

3 Residual risk reporting

Periodic risk reporting to the board will enable the board to achieve its responsibilities in terms of King III. Effective risk reporting will enable the board to consider the following:

- the nature and extent of risks facing the organisation
- the extent and categories of risk which is regarded as acceptable (risk strategy)
- the likelihood of risk materialising
- the cost and benefit of risk responses

> **Key term: RISK REPORTING**
>
> Risk reporting is concerned with periodic (usually quarterly) reports to the stakeholders and the board of directors or a sub-committee of the board, such as the risk and compliance committee, setting out the organisation's risk management policies and to provide information for the stakeholders to evaluate whether the policies are effectively achieved.

There is also a need for residual risk reporting where significant risks facing the organisation (despite efforts to reduce these risks) are highlighted to review the adequacy and effectiveness of the risk responses and possibly to gain alternative opinions from relevant stakeholders.

3.1 Risk reporting

Risk reporting includes the following:

1. feedback on the annual review of the risk forecast
2. a review of management's responses to significant risks and the risk strategy
3. results from the monitoring of risk responses and significant residual risks that exist
4. results from the regular monitoring of significant key risk indicators (early warning systems) that could indicate a material change in the organisation's risk profile that increase exposures or threaten areas of opportunity
5. results of audit reviews to assess the adequacy and effectiveness of the risk management process and mitigating action plans to reduce risks to an acceptable level

3.2 What the IRM-standard indicates that the board of directors should do

The board should do the following:

- know about the most significant risks facing the organisation
- know the possible effects on shareholder value of deviations to expected performance ranges
- ensure appropriate levels of awareness throughout the organisation
- know how the organisation will manage a crisis
- know the importance of stakeholder confidence in the organisation
- know how to manage communications with the investment community where applicable
- be assured that the risk management process is working effectively
- publish a clear risk management policy covering risk management philosophy and responsibilities

Activity 28.1

Access the following link and view Implats' Annual Report for 2009 to gain an understanding of the importance of risk management, the role of the audit committee and how key risks are included in the annual report (especially on page 109):

http://www.implats.co.za/reports/2009/AR/f/implats_ar09.pdf

You can also access the following link to view the Implats' Risk Report for 2009, which illustrates how the organisation reported inherent risks and how the risks were mitigated:

http://www.implats.co.za/cr/files/risk_management_sep09.pdf

4 Summary

In this study unit, we mentioned that risk reporting to the stakeholders and the board, or a sub-committee, is critical for them to measure the achievement of the organisation's risk management policies. The reporting is more concerned with the processes to manage risks and with the reporting of risks with significant residual risk ratings.

We also discussed the benefits of risk management and that it plays an important role in the achievement of the objectives of the organisation, because risk management improves the organisation's ability to respond and mitigate risks efficiently and effectively. It enables it to take advantage of opportunities without harming its objectives or reputation.

Self-assessment activity

Now that you have worked through this study unit, you should be able to answer the following:

a. How could effective risk reporting contribute to the board of directors achieving their responsibilities in terms of King III?

b. What are the components of effective risk reporting to the board of directors?

References and additional reading

CIMA. 2011. *CIMA Official Learning System. Paper P3 – performance strategy. 1st* edition. Oxford: Elsevier.

Committee of Sponsoring Organizations of the Treadway Commission (COSO). 2004. *Enterprise risk management – integrated framework*. www.coso.org. [Accessed on 22 March 2012]

Implats. *Annual Report 2009.* http://www.implats.co.za/reports/2009/AR/f/implats_ar09.pdf [Accessed on 22 March 2012]

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GLOSSARY

ACCOUNTING RATE OF RETURN:	This is based on an investment's (project's) average net PROFIT after tax (not cash flow), divided by its average book value. It is also called the average rate of return on investment/capital (ROI or ROC) method.
ACCOUNTS PAYABLE (CREDITORS) DAYS:	Payable days (or the creditor payment period) is the measurement of the average number of days the organisation takes to pay for the goods/services received on credit from its suppliers.
ACCOUNTS RECEIVABLE:	Accounts receivable refers to the amount outstanding in respect of previous credit sales that customers/debtors have to pay in the near future.
AGEING SCHEDULE FOR CREDITORS:	Ageing schedule (or creditors' age analysis report) is a classification of accounts payable within bands of different outstanding periods, normally including current debt, up to and including 30 days, up to and including 60 days, up to and including 90 days, and greater than 90 days.
AGEING SCHEDULE FOR DEBTORS:	Ageing schedule (or debtors' age analysis report) is a classification of accounts receivable within bands of different outstanding periods, normally including, current debt, up to and including 30 days, up to and including 60 days, up to and including 90 days, and greater than 90 days.
ANALYSE:	To analyse is to examine in detail in order to discover meaning or to break down into smaller parts.
ANNUITY DUE:	An annuity where the payments fall due at the beginning of each payment interval (period) is an annuity due. The last payment of an annuity due is one payment before the end of the term.
BANK LOAN:	Medium and smaller companies mainly use bank loans for long-term financing. The loan may be a term loan that is repayable over a fixed period that relates to the specific financing requirement or the loan can be structured in the form of a loan facility from which the company draws down as needed (the money is only advanced by the bank when the client needs it to make a payment to a supplier, etc, up to the maximum loan amount approved). The costs involved (apart from the repayment of the capital amount) are interest charges as well as a charge for the right to use the loan facility.
BANK OVERDRAFT:	A bank overdraft is the facility that allows an organisation to use more money than is available in its bank account.
BANKER'S ACCEPTANCES (BA's):	A banker's acceptance is created when the organisation sells a bill of exchange to the bank.

BARRIERS TO ENTRY:	Barriers to entry are factors that prevent new players to enter a specific industry or market. These factors refer to the position of the current players, for example, they have good economies of scale, customers are loyal to their brand, and they have a well-established distribution channel.
BARRIERS TO EXIT	Barriers to exit are factors that prevent an organisation from leaving (exiting) the market for a specific product. If the cost of exiting is higher than the cost (losses) of remaining in the market, the organisation will be prohibited from exiting and will still be competing for market share.
BOARD OF DIRECTORS:	The board of directors (the board) consist of members/ directors who are elected to the board by the shareholders to oversee the activities of the organisation and to provide stewardship and leadership from the very top.
BOND/DEBENTURE:	A bond/debenture is a long-term contract between the organisation that issues the bond/debenture (borrower), and the buyer of the bond/debenture (lender of the money or investor). The main terms of this contract are the repayment conditions and the interest rate to be paid.
BUSINESS RISK:	Risks that arise from the activities of the organisation and relate to the people, processes, products and structure.
CAPITAL:	Capital is a long-term asset or the money used to support long-term assets and projects and is displayed as long-term debt and equity on the statement of financial position.
CAPITAL GROWTH:	Capital growth is the growth of an investment in a business. It means that the investment can be sold after a few years for more than it was bought for. Capital growth includes minimum annual returns.
CAPITAL INVESTMENTS/ EXPENDITURE:	Long-term assets (eg non-current) such as property, plant and equipment acquired individually or as part of large projects that generate returns (cash inflows) over a number of years.
CAPITAL MARKET:	A capital market is a financial market in which longer-term (longer than one year) debt and equity securities are traded.
CAPITAL STRUCTURE:	Capital structure is the manner in which an organisation's assets are financed. It is normally expressed in percentages of each type of capital used by the organisation, such as debt and equity.
CASH AND CASH EQUIVALENTS:	Cash is the money the organisation has on hand (eg petty cash, unbanked payments received) as well as the money in the bank (eg cheque accounts or short-term deposits).

CASH CONVERSION CYCLE:	The cash conversion cycle focuses directly on the cash flow associated with the overall cash flow from operations (including accounts payable). It represents the length of time between when an organisation makes payments to its creditors (outflow of cash) and when an organisation receives payments from its customers (inflow of cash). As the cash conversion cycle includes the cash flow benefit afforded by accounts payable, this cycle is shorter than the operating cycle.
CASH FLOW:	Cash flow is any receipt or payment of money that occur at a specific point in time. It includes capital and interest.
CLOSE CORPORATION:	A close corporation (CC) is a business that is formed as a legal person that exists separate from its owners. A maximum of ten owners, called members, which must be natural persons, are allowed.
COMPANY:	A company is a business form that is a legal organisation distinct from its "owners". "Owners" are referred to as shareholders and can be one or more individuals or organisations.
COMPLIANCE RISK:	These risks arise from non-compliance with legislation or regulations.
COMPOUNDING:	Compounding refers to the calculation of interest on a principal (initial) amount and adding that interest to the principal for investment in the following period. The interest is therefore not paid at the end of the period in which it accrues. In the next period(s), interest is earned on the interest re-invested.
CORE VALUES:	Core values are the principles that guide an organisation by describing how every employee is expected to behave.
CORPORATE CULTURE:	Corporate culture entails employees' shared beliefs, values and symbols (see also core values).
CORPORATE GOVERNANCE:	Corporate governance is a set of processes, customs, policies, laws and institutions affecting the way that a business is managed. It also includes the relationships among the many stakeholders involved and the goals of the business.
COST OF CAPITAL:	Cost of capital is defined as being the rate of return that an organisation must earn on its investments to ensure that the minimum requirements of the providers of capital are met.
COUPON INTEREST RATE:	This is the fixed interest rate that the issuing organisation is required to pay on the face value of the bond. This is similar to the coupon payment divided by the par value.

CREDIT RATING AGENCY:	A credit rating agency is an organisation that provides international financial research on bonds and other debt instruments issued by business and government organisations. The agency ranks the creditworthiness of borrowers/issuers by using a standardised ratings scale. The payment history as well as financial heath (ability to pay future obligations) is taken into account in determining the credit rating.
DILUTION:	Dilution occurs when new ordinary shares are issued. The existing shareholders must then share the control of the organisation with a greater number of shareholders. The control (voting power) that the existing shareholders had over the organisation will be diluted due to the increase in the number of shareholders.
DISCOUNTING:	Discounting is the process used to determine the original investment (principal) amount by discounting the future value, which resulted from the compounding of interest, back to the present value. (Discounting is thus used to determine the present value of an investment.)
DIVIDEND YIELD:	The dividend yield on an organisation's share is the organisation's total annual dividend payments divided by its price per share. The dividend yield can also be determined by finding a comparable dividend yield from a similar share and adjust it for growth and risk.
DU PONT RATIO:	Du Pont ratio is a method that breaks down the return on total asset ratio (ROA) into two components – a profit margin and an asset turnover rate.
ECONOMIC RISK:	Economic risks are directly related to risks that originate from activities or non-activities in the normal economy. This includes changes to inflation, the unemployment rate and international policy. These economic risks start before transactions take place and are considered to be external.
EFFECTIVE ANNUAL INTEREST RATE:	Effective annual interest rate (EAR) refers to the annual rate, which derives the same result as the compound interest rate, at a given periodic rate, for a given number of compounding periods PER year. The effective annual rate is therefore the annual rate, which, if compounded once a year, will give the same result as the interest per period compounded a number of times per year.
ENVIRONMENTAL RISK:	The risk relates to climate change and risk of natural disasters (deemed to be external risks). The risk of damage caused by a pollutant, that is a substance or by-product introduced into an environment other than its intended use/ purpose (deemed to be within the organisation's control).
EXTRAPOLATION:	Extrapolation refers to the calculation when you need to determine an actual rate where this actual rate lies outside (not within) two specific rates.

FACTORING:	Factoring is a form of debtors financing which results in improving the debtors' collection period.
FINANCIAL INFORMATION:	Financial information refers to the financial results, position and cash flows of an organisation's business operations in a specific period, stated in rand and cent terms.
FINANCIAL LEVERAGE:	Financial leverage is the extent to which debt is used in the capital structure of an organisation. (An organisation that has a high percentage of debt in its capital structure will be regarded as having a high degree of financial leverage.)
FINANCIAL RISK:	Financial risk relates to the financial operation and position of an organisation.
FUTURE VALUE:	The future value is the amount that an investment will be worth at a future date if invested at a particular simple or compound interest rate.
GROWTH RATE:	Growth rate simply refers to the percentage that a line item in an organisation's financial information has increased or decreased from one period/year to another.
HOLDING COSTS:	Holding costs are the costs of holding inventory and includes storage costs (eg renting warehouse space and security), insurance costs (for protection against losses), cost of obsolescence (inventory ageing or deteriorating whilst in storage) and opportunity cost (funds invested in inventory could have earned a return elsewhere at a certain rate, eg earning the weighted average cost of capital).
HUMAN RESOURCES:	The term human resources (HR) refer to the workforce (employees) of an organisation.
INDUSTRIAL RELATIONS:	Industrial relations deal with the employment relationship (workplace relationships).
INFORMATION RISK:	Information risk is the risk that decision makers within the organisation use invalid or poor quality information for decision-making, or the loss of information.
INHERENT RISK:	This involves the assessment of risk before the application of any controls, transfer or management responses.
INSTALMENT SALE AGREEMENT (ISA):	An instalment agreement entails the granting of a loan to an organisation (buyer) by the supplier (seller) of assets such as machinery, equipment and vehicles itself (supplier credit), or granted by banks. The conditions, interest rate, instalment amount and frequency of payment as well as the period of the agreement are set out in the specific contract.
INTEREST:	Interest is the price paid for borrowed money or received for money invested.

INTERNAL RATE OF RETURN:	The rate at which cash flows must be discounted so that the present value of the cash inflows equals the present value of the initial cash outflow. That is the rate at which the NPV will be equal to Rnil.
INTERPOLATION:	Interpolation refers to the calculation when you need to determine an actual rate, where the actual rate lies between two specific rates.
INVENTORY:	Inventory of a reseller is represented by purchased goods (held to be sold), and of a manufacturer by the completed products (held to be sold), work-in-process products (intended for sale) and raw material inventory (held for use in production). Both types of organisations can also have stores of consumable items.
INVENTORY DAYS:	Length of time that inventory remains unsold (goods for sale) or remains unused (raw materials).
LEASE:	A lease is a form of financing movable assets. Just like a loan, it can be structured in various ways. The lessor (granting the lease) remains the owner of the asset, while the lessee has the use of the asset. Lease payments are determined in such a way as to offer the lessor the cost of the asset plus a reasonable return thereon.
MARKET RATE/ RULING INTEREST RATE:	The market rate is the current or ruling market rate of return. It is obtained from similarly publicly traded instruments – a pre-tax rate.
MARKET RISK:	Risk associated with the economical environment in which all organisations do business and which is influenced by interest rates, exchange rates, oil prices and various other factors that are difficult to quantify. Market risk therefore originates from events and transactions in the market place.
MATURITY DATE/ REDEMPTION DATE:	The maturity date is the date when a bond/debenture will be redeemed.
MISSION STATEMENT:	A mission statement defines the core purpose of the organisation, by broadly stating the reason(s) why the organisation exists.
MONEY MARKET:	The money market is a financial market used mainly for raising short-term (of less than one year) finance.
MORTGAGE LOAN:	Mortgage loans are long-term loans raised against the value of property. The loan is normally secured over the value of the property offered as security.
NET PRESENT VALUE:	Net result of future periodic net after tax cash flows discounted to present value, using an appropriate rate, and the present value of the capital invested in the project.
NET WORKING CAPITAL:	Net working capital refers to the current assets less current liabilities, which is directly related to the operating activities of an organisation.

NOMINAL ANNUAL RATE:	In cases where interest is calculated more than once a year, the annual rate quoted is the nominal annual rate or nominal rate.
NOMINAL INTEREST RATE:	This is the named or quoted rate usually stated on annually compounded basis. It may be different from the effective rate due to non-annual compounding.
OPERATING CYCLE:	The operating cycle focuses on an organisation's internal (thus excluding accounts payable) cycle's impact on cash flow. It represents the length of time from committing cash for purchases of inventory to the inflow of cash from the sale of inventory on credit.
OPERATIONAL RISK:	"Operational risk is the risk of loss from a failure of internal business and control processes."
OPPORTUNITY COST:	Opportunity cost is the cash that could have been realised from the best alternative use of the funds that were given up.
ORDERING COSTS:	Ordering costs are the costs associated with placing an order, receiving the deliveries and the associated payment.
ORDINARY ANNUITY:	An ordinary annuity is an annuity where the payments take place at the end of each year or period (payment interval) at the same time that interest is calculated.
ORDINARY PREFERENCE SHARE:	An ordinary preference share is a security that pays a constant dividend into perpetuity (if not convertible or redeemable).
ORDINARY SHARE:	This is a security offered to investors in order to raise capital for the company. Investors receive dividends as return on their investment as well as capital growth if the share price increases and they sell their shares.
ORGANISATIONAL STRUCTURE:	The structure of a business can be defined as organisational arrangements, systems for gathering together human, physical, financial, and information resources at all levels of the system.
PARTNERSHIP:	Partnership is where a business is formed by between two and twenty individuals or organisations. It is unincorporated. Partners are severally and jointly responsible for all the debts of the partnership.
PAR VALUE/ REDEMPTION VALUE/ NOMINAL VALUE/ FACE VALUE:	Par value is the stated value (nominal or face value) of bonds /debentures. This is the value which the holder will receive at redemption and also the value on which the bond or debenture pays interest.
PAYBACK PERIOD:	The period of time required to recoup the total capital amount invested through the cash generation from the project.
PERIODIC PAYMENT:	The periodic payment I or PMT, is the amount of the annuity, namely the stream of equal amounts, invested per period or the equal periodic repayments of a loan.

PERIODIC RATE:	The periodic rate is the rate charged by a lender or paid by a borrower each period.
PERMANENT WORKING CAPITAL:	Permanent working capital supports a constant minimum level of sales.
PERPETUITY:	Perpetuity means that the cash flow will be received or paid periodically at certain time intervals into infinity, since there is no termination date. Another example of a perpetuity would be a non-redeemable preference share paying a fixed dividend.
POLITICAL RISK:	Refers to the effect that detrimental political activities or political instability have on an organisation.
PRESENT VALUE:	The present value is the current value of future cash flows, determined by application of the discount rate (discounting).
PROFITABILITY:	Profitability is the term used to describe the annual return or compensation earned on an investment.
PROFITABILITY INDEX (PI):	The PI is the ratio of the present value of cash flows (PVCF) to the initial investment of the project. PI is also known as a benefit/cash ratio.
PROJECT ANALYSIS:	Project analysis is the detailed examination of all the technical specifications (operational), marketing (sales units, market, etc) and financial aspects (costs and revenues) and/or problems of a project before funds are allocated and work on it is started.
RATIO ANALYSIS:	Ratio analysis is a method whereby further calculations are performed on a set of financial statements and is intended to create more meaningful information. Ratio analysis can be made even more useful when we compare the calculated ratios to the same ratios calculated for previous years or to industry norms and other ratios of the same set.
RECEIVABLE DAYS:	Receivable days (or the debtor collection period) is a measurement of the number of days it takes the average debtor to pay for the goods/services taken on credit.
REPORTING RISK:	The risk refers to the provision of unreliable financial and non-financial information to all levels of management and other stakeholders.
REPUTATION RISK:	A loss of reputation is the adverse consequence created by bad publicity due to the materialisation of another risk.
RESIDUAL RISK:	Residual risk involves the assessment of risk AFTER taking into account the application of any internal controls, transfer or management responses to reduce the risk.
RETURN ON ASSETS (ROA):	This is a measure of performance generated on all the assets employed in the organisation and expresses earnings before interest and taxes (EBIT) as a percentage of the total assets employed.

RETURN ON EQUITY:	This is a measure of the performance realised by management for the equity holders (shareholders) and expresses net profit as a percentage of equity.
REVOLVING CREDIT:	Revolving credit allows the organisation to withdraw money up to the original limit once a certain percentage (20% to 30%) has been repaid.
RISK:	The typical dictionary definition of risk is a chance or possibility of danger, loss, injury or other adverse consequences.
RISK APPETITE:	The risk appetite is related to an organisation's strategy and may be expressed as the acceptable balance between growth, risk and return.
RISK ASSESSMENT:	Risks are analysed by considering the impact (potential damage or loss) and likelihood of the risk occurring. Risks are assessed at an inherent basis (risk exposure before considering risk responses) and residual basis (risk exposure after considering risk responses).
RISK CAPACITY:	This is the maximum amount of risk that the organisation can accept.
RISK CULTURE:	This is the set of shared attitudes, values and practices that characterise how an organisation considers risk in its day-to-day activities.
RISK FINANCING:	Maintaining a balance between the economic and operational cost of risk reducing measures and the achievement of the organisation's objectives.
RISK IDENTIFICATION:	The process to identify internal and external events, which could affect the achievement of the organisation's objectives. This includes risks and opportunities.
RISK MANAGEMENT PLAN:	It is the document of identified risks (derived with reference to the organisation's objectives) with the corresponding risk assessment to create risk responses.
RISK MONITORING:	Risk monitoring entails the continuous evaluation of the organisation operations to ensure the adequacy of control measures and to identify new risks to the organisation.
RISK OR EVENT IDENTIFICATION:	Risk or event identification is the process to identify internal and external events, which could affect the achievement of the organisation's objectives. This includes risks and opportunities.
RISK REGISTER:	A risk register is a summary of identified risks, which are listed, described and assessed/measured (based on their potential impact and likelihood).

RISK REPORTING:	Risk reporting is concerned with periodic (usually quarterly) reports to the stakeholders and the board of directors or a sub-committee of the board, such as the risk and compliance committee, setting out the organisation's risk management policies and to provide information for the stakeholders to evaluate whether the policies are effectively achieved.
RISK RESPONSE:	Measures to reduce the likelihood and/or impact rating of a risk event.
RISK-FREE RATE:	The risk-free rate is the return that can be earned on investments that has zero risk. An example of a risk-free instrument is government bonds and the return thereon will represent the risk-free rate.
RULING INTEREST RATE/MARKET RATE:	The market rate is the current or ruling market rate of return. It is obtained from similarly publicly traded instruments – a pre-tax rate.
SALE AND LEASEBACK:	Trading organisations who own fixed property at times find it more rewarding to sell the properties to a financial institution at a capital profit. A leaseback agreement for a reasonably long term is then entered into immediately, to protect the trading organisation (which operates from this premises) – the period can sometimes be as long as 30 years.
SHORT-TERM:	Short term refers to a period of one year or less.
SIMPLE INTEREST:	Simple interest is the interest calculated on the principal only for the entire term.
SINGLE CASH FLOW:	A single cash flow is a once-off (non-repetitive) cash inflow or outflow.
SOCIAL RISK:	Social risk relates to the impact of the organisation on the community and vice versa.
SOLE PROPRIETORSHIP:	Sole proprietorship is where a business is formed by a single individual who is the owner of that organisation. It is unincorporated, meaning the owner and the business is treated as the same legal persona.
SPECIFIC RISK:	This is the risk associated with an investment in a specific company.
STAKEHOLDERS:	Stakeholders are those persons and organisations that are affected by the activities of the organisation and therefore have an interest in the strategy of an organisation. Stakeholders include staff, shareholders, creditors, suppliers, customers, government, local authorities, professional bodies, pressure groups and the community at large.

STRATEGIC FINANCIAL MANAGEMENT:	Strategic financial management is the identification of possible strategies capable of maximising an organisation's net present value, the allocation of scarce capital resources among the competing opportunities and the implementation and monitoring of the chosen strategy so as to achieve stated objectives.
STRATEGIC OBJECTIVES:	Strategic objectives clearly formulate measures of progress and targets to be achieved in a specific time frame.
STRATEGIC PLANNING:	Strategic planning is the process of defining the organisation's strategy and making decisions about the allocation of its resources to follow this strategy. The allocation of resources includes the organisation's capital and people.
STRATEGIC RISK:	Strategic risks have more to do with the organisation's position and relation with the external environment in the long-term.
STRATEGY:	Strategy is about choosing long-term activities to achieve the purpose set out in the mission statement and ultimately moving towards realising the vision.
SUBSTITUTE PRODUCTS:	Substitute products refer to alternative products having the ability of satisfying customers' needs effectively (for example, plastic bottles instead of glass bottles).
SUSTAINABILITY FOR BUSINESSES:	Sustainability for a business means that all their products, processes and manufacturing activities meet customer needs, while at the same time treating the environment in such a manner that it does not decrease the ability of future generations to meet their own needs. This entails that products, processes and activities should be designed and executed in such a way that current environmental concerns (eg the use of renewable resources) are taken into account while still maintaining a profit. A business should use sustainable development and distribution methods to influence the environment, growth of the business and society. Sustainable development within a business can create value for its investors, customers and the environment.
SUSTAINABILITY FOR HUMANS:	Sustainability for humans is the potential for long-term maintenance of well-being which has environmental and social dimensions.
SUSTAINABLE CAPITAL BUDGETING:	Sustainable capital budgeting involves planning and evaluation of how funds are spent on capital investments that will ultimately add to the organisation's value while taking cognisance of the social, environmental and governance impact of the decision.
SWOT ANALYSIS:	The SWOT analysis approach is to identify and analyse internal and external factors that are of strategic importance, and classify them into strengths, weaknesses, opportunities and threats.

TAKE-OVER:	Take-over is the term used when referring to the transfer of control of a company from one group of shareholders to another group of shareholders.
TARGET CAPITAL STRUCTURE:	Target capital structure or optimal capital structure is a mix of the two capital components at which the share price is maximised – if all other things are kept the same.
TECHNOLOGICAL RISK:	Risk involved with the operation, ownership and sustainability of the organisation's information technology (IT) systems. Technological risks also refer to the manufacturing plant being outdated or a product being obsolete when a more technologically advanced product has replaced it.
TEMPORARY WORKING CAPITAL:	Temporary working capital supports seasonal peaks in the organisation's operations.
TRADE ACCOUNTS PAYABLE:	Trade accounts payable refers to the amount of purchases on credit that has to be paid to the suppliers/ creditors in the near future. Total accounts payable may also include other accounts payable, which do not relate directly to the main operations (trading activities) of the organisation.
TRADITIONAL FINANCIAL MANAGEMENT:	Traditional financial management is the management and control of money and money-related operations within a business. Financial management therefore includes planning, organising and controlling the financial activities of a business. The financial activities include the acquiring of funds as well as the use of these funds by applying general management principles.
UNEQUAL CASH FLOW:	Unequal cash flows can occur repetitively at the end of each year or period (payment interval).
VISION STATEMENT:	The vision statement defines where the organisation wants to go in the future.
WORKING CAPITAL MANAGEMENT:	Working capital management refers to the controlling of balances included in the current assets and current liabilities, the way the related functions within the organisation are performed and the way working capital is financed.
WORKING CAPITAL POLICY:	The working capital policy of an organisation stipulates the appropriate amount for the net working capital balance and for each of its components (*investment policy*), and, in addition, how the net working capital balance should be financed (*financing policy*).
YIELD TO MATURITY (YTM):	The discount rate that achieves a net present value (NPV) of NIL for all the cash in- and outflows.

TABLE A

PRESENT VALUE OF R1 RECEIVED/PAID AFTER N YEARS

Formula: $\frac{1}{(1+i)^n}$

Year N	1%	2%	4%	6%	8%	10%	12%	14%	15%	16%	18%	20%	22%	24%	25%	26%	28%	30%	35%
1	0,990	0,980	0,962	0,943	0,926	0,909	0,893	0,877	0,870	0,862	0,847	0,833	0,820	0,806	0,800	0,794	0,781	0,769	0,741
2	0,980	0,961	0,925	0,890	0,857	0,826	0,797	0,769	0,756	0,743	0,718	0,694	0,672	0,650	0,640	0,630	0,610	0,592	0,549
3	0,971	0,942	0,889	0,840	0,794	0,751	0,712	0,675	0,658	0,641	0,609	0,579	0,551	0,524	0,512	0,500	0,477	0,455	0,406
4	0,961	0,924	0,855	0,792	0,735	0,683	0,636	0,592	0,572	0,552	0,516	0,482	0,451	0,423	0,410	0,397	0,373	0,350	0,301
5	0,951	0,906	0,822	0,747	0,681	0,621	0,567	0,519	0,497	0,476	0,437	0,402	0,370	0,341	0,328	0,315	0,291	0,269	0,223
6	0,942	0,888	0,790	0,705	0,630	0,564	0,507	0,456	0,432	0,410	0,370	0,335	0,303	0,275	0,262	0,250	0,227	0,207	0,165
7	0,933	0,871	0,760	0,665	0,583	0,513	0,452	0,400	0,376	0,354	0,314	0,279	0,249	0,222	0,210	0,198	0,178	0,159	0,122
8	0,923	0,853	0,731	0,627	0,540	0,467	0,404	0,351	0,327	0,305	0,266	0,233	0,204	0,179	0,168	0,157	0,139	0,123	0,091
9	0,914	0,837	0,703	0,592	0,500	0,424	0,361	0,308	0,284	0,263	0,225	0,194	0,167	0,144	0,134	0,125	0,108	0,094	0,067
10	0,905	0,820	0,676	0,558	0,463	0,386	0,322	0,270	0,247	0,227	0,191	0,162	0,137	0,116	0,107	0,099	0,085	0,073	0,050
11	0,896	0,804	0,650	0,527	0,429	0,350	0,287	0,237	0,215	0,195	0,162	0,135	0,112	0,094	0,086	0,079	0,066	0,056	0,037
12	0,887	0,788	0,625	0,497	0,397	0,319	0,257	0,208	0,187	0,168	0,137	0,112	0,092	0,076	0,069	0,062	0,052	0,043	0,027
13	0,879	0,773	0,601	0,469	0,368	0,290	0,229	0,182	0,163	0,145	0,116	0,093	0,075	0,061	0,055	0,050	0,040	0,033	0,020
14	0,870	0,758	0,577	0,442	0,340	0,263	0,205	0,160	0,141	0,125	0,099	0,078	0,062	0,049	0,044	0,039	0,032	0,025	0,015
15	0,861	0,743	0,555	0,417	0,315	0,239	0,183	0,140	0,123	0,108	0,084	0,065	0,051	0,040	0,035	0,031	0,025	0,020	0,011
16	0,853	0,728	0,534	0,394	0,292	0,218	0,163	0,123	0,107	0,093	0,071	0,054	0,042	0,032	0,028	0,025	0,019	0,015	0,008
17	0,844	0,714	0,513	0,371	0,270	0,198	0,146	0,108	0,093	0,080	0,060	0,045	0,034	0,026	0,023	0,020	0,015	0,012	0,006
18	0,836	0,700	0,494	0,350	0,250	0,180	0,130	0,095	0,081	0,069	0,051	0,038	0,028	0,021	0,018	0,016	0,012	0,009	0,005
19	0,828	0,686	0,475	0,331	0,232	0,164	0,116	0,083	0,070	0,060	0,043	0,031	0,023	0,017	0,014	0,012	0,009	0,007	0,003
20	0,820	0,673	0,456	0,312	0,215	0,149	0,104	0,073	0,061	0,051	0,037	0,026	0,019	0,014	0,012	0,010	0,007	0,005	0,002
21	0,811	0,660	0,439	0,294	0,199	0,135	0,093	0,064	0,053	0,044	0,031	0,022	0,015	0,011	0,009	0,008	0,006	0,004	0,002
22	0,803	0,647	0,422	0,268	0,184	0,123	0,083	0,056	0,046	0,038	0,026	0,018	0,013	0,009	0,007	0,006	0,004	0,003	0,001
23	0,795	0,634	0,406	0,262	0,170	0,112	0,074	0,049	0,040	0,033	0,022	0,015	0,010	0,007	0,006	0,005	0,003	0,002	0,001
24	0,788	0,622	0,390	0,247	0,158	0,102	0,066	0,043	0,035	0,028	0,019	0,013	0,008	0,006	0,005	0,004	0,003	0,002	0,001
25	0,780	0,610	0,375	0,233	0,146	0,092	0,059	0,038	0,030	0,024	0,016	0,010	0,007	0,005	0,004	0,003	0,002	0,001	0,001
26	0,772	0,598	0,361	0,220	0,135	0,084	0,053	0,033	0,026	0,021	0,014	0,009	0,006	0,004	0,003	0,002	0,002	0,001	
27	0,764	0,586	0,347	0,207	0,125	0,076	0,047	0,029	0,023	0,018	0,011	0,007	0,005	0,003	0,002	0,002	0,001	0,001	
28	0,757	0,574	0,333	0,196	0,116	0,069	0,042	0,026	0,020	0,016	0,010	0,006	0,004	0,002	0,002	0,002	0,001	0,001	
29	0,749	0,563	0,321	0,185	0,107	0,063	0,037	0,022	0,017	0,014	0,008	0,005	0,003	0,002	0,002	0,001	0,001	0,001	
30	0,742	0,552	0,308	0,174	0,099	0,057	0,033	0,020	0,015	0,012	0,007	0,004	0,003	0,002	0,001	0,001	0,001		
40	0,672	0,453	0,208	0,097	0,046	0,022	0,011	0,005	0,004	0,003	0,001	0,001							
50	0,608	0,372	0,141	0,054	0,021	0,009	0,003	0,001	0,001	0,001									

TABLE B

PRESENT VALUE OF R1 PER ANNUM RECEIVED/PAID AT THE END OF THE YEAR FOR N YEARS

Formula: $\left[\frac{1-\frac{1}{(1+i)^n}}{i}\right]$

Year N	1%	2%	4%	6%	8%	10%	12%	14%	15%	16%	18%	20%	22%	24%	25%	26%	28%	30%	35%
1	0,990	0,980	0,962	0,943	0,926	0,909	0,893	0,877	0,870	0,862	0,847	0,833	0,820	0,806	0,800	0,794	0,781	0,769	0,741
2	1,970	1,942	1,886	1,833	1,783	1,736	1,690	1,647	1,626	1,605	1,566	1,528	1,492	1,457	1,440	1,424	1,392	1,361	1,289
3	2,941	2,884	2,775	2,673	2,577	2,487	2,402	2,322	2,283	2,246	2,174	2,106	2,042	1,981	1,952	1,923	1,868	1,816	1,696
4	3,902	3,808	3,630	3,465	3,312	3,170	3,037	2,914	2,855	2,798	2,690	2,589	2,494	2,404	2,362	2,320	2,241	2,166	1,997
5	4,853	4,713	4,452	4,212	3,993	3,791	3,605	3,433	3,352	3,274	3,127	2,991	2,864	2,745	2,689	2,635	2,532	2,436	2,220
6	5,795	5,601	5,242	4,917	4,623	4,355	4,111	3,889	3,784	3,685	3,498	3,326	3,167	3,020	2,951	2,885	2,759	2,643	2,385
7	6,728	6,472	6,002	5,582	5,206	4,868	4,564	4,288	4,160	4,039	3,812	3,605	3,416	3,242	3,161	3,083	2,937	2,802	2,508
8	7,652	7,325	6,733	6,210	5,747	5,335	4,968	4,639	4,487	4,344	4,078	3,837	3,619	3,421	3,329	3,241	3,076	2,925	2,598
9	8,566	8,162	7,435	6,802	6,247	5,759	5,328	4,946	4,772	4,607	4,303	4,031	3,786	3,566	3,463	3,366	3,184	3,019	2,665
10	9,471	8,983	8,111	7,360	6,710	6,145	5,650	5,216	5,019	4,833	4,494	4,192	3,923	3,682	3,571	3,465	3,269	3,092	2,715
11	10,368	9,787	8,760	7,887	7,139	6,495	5,937	5,453	5,234	5,029	4,656	4,327	4,035	3,776	3,656	3,544	3,335	3,147	2,752
12	11,255	10,575	9,385	8,384	7,536	6,814	6,194	5,660	5,421	5,197	4,793	4,439	4,127	3,851	3,725	3,606	3,387	3,190	2,779
13	12,134	11,343	9,986	9,853	7,904	7,103	6,424	5,842	5,583	5,342	4,910	4,533	4,203	3,912	3,780	3,656	3,427	3,223	2,799
14	13,004	12,106	10,563	9,295	8,244	7,367	6,628	6,002	5,724	5,468	5,008	4,611	4,265	3,962	3,824	3,695	3,459	3,249	2,814
15	13,865	12,849	11,118	9,712	8,559	7,606	6,811	6,142	5,847	5,575	5,092	4,675	4,315	4,001	3,859	3,726	3,483	3,268	2,825
16	14,718	13,578	11,652	10,106	8,851	7,824	6,974	6,265	5,954	5,669	5,162	4,730	4,357	4,033	3,887	3,751	3,503	3,283	2,834
17	15,562	14,292	12,166	10,477	9,122	8,022	7,120	6,373	6,047	5,749	5,222	4,775	4,391	4,059	3,910	3,771	3,518	3,295	2,840
18	16,398	14,992	12,659	10,828	9,372	8,201	7,250	6,467	6,128	5,818	5,273	4,812	4,419	4,080	3,928	3,786	3,529	3,304	2,844
19	17,226	15,678	13,134	11,158	9,604	8,365	7,366	6,550	6,198	5,877	5,316	4,844	4,442	4,097	3,942	3,799	3,539	3,311	2,848
20	18,046	16,351	13,590	11,470	9,818	8,514	7,469	6,623	6,259	5,929	5,353	4,870	4,460	4,110	3,954	3,808	3,546	3,316	2,850
21	18,857	17,011	14,029	11,764	10,017	8,649	7,562	6,687	6,312	5,973	5,384	4,891	4,476	4,121	3,963	3,816	3,551	3,320	2,852
22	19,660	17,658	14,451	12,042	10,201	8,772	7,645	6,743	6,359	6,011	5,410	4,909	4,488	4,130	3,970	3,822	3,556	3,323	2,853
23	20,456	18,292	14,857	12,303	10,371	8,883	7,718	6,792	6,399	6,044	5,432	4,925	4,499	4,137	3,976	3,827	3,559	3,325	2,854
24	21,243	18,914	15,247	12,550	10,529	8,985	7,784	6,835	6,434	6,073	5,451	4,937	4,507	4,143	3,981	3,831	3,562	3,327	2,855
25	22,023	19,523	15,622	12,783	10,675	9,077	7,843	6,873	6,464	6,097	5,467	4,948	4,514	4,147	3,985	3,834	3,654	3,329	2,856
26	22,795	20,121	15,983	13,003	10,810	9,161	7,896	6,906	6,491	6,118	5,480	4,956	4,520	4,151	3,988	3,837	3,566	3,330	2,856
27	23,560	20,707	16,330	13,211	10,935	9,237	7,943	6,935	6,514	6,136	5,492	4,964	4,524	4,154	3,990	3,839	3,567	3,331	2,856
28	24,316	21,281	16,663	13,406	11,051	9,307	7,984	6,961	6,534	6,152	5,502	4,970	4,528	4,157	3,992	3,840	3,568	3,331	2,857
29	25,066	21,844	16,984	13,591	11,158	9,370	8,022	6,983	6,551	6,166	5,510	4,975	4,531	4,159	3,994	3,841	3,569	3,332	2,857
30	25,808	22,396	17,292	13,765	11,258	9,427	8,055	7,003	6,566	6,177	5,517	4,979	4,534	4,160	3,995	3,842	3,569	3,332	2,857
40	32,835	27,355	19,793	15,046	11,925	9,779	8,244	7,105	6,642	6,234	5,548	4,997	4,544	4,166	3,999	3,846	3,571	3,333	2,857
50	39,196	31,424	21,482	15,762	12,234	9,915	8,304	7,133	6,661	6,246	5,554	4,999	4,545	4,167	4,000	3,846	3,571	3,333	

If you need to use a factor for annuities due (paid in advance or at the beginning of the period):

1. Look up the factor for periods n + 1 2. **Then** add one (the PV of R1 invested now is R1). Or use the mathematical formula.

TABLE C

FUTURE VALUE OF R1 RECEIVED NOW, AFTER N YEARS

Formula: $(1 + i)^n$

Year N	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%
1	1,0100	1,0200	1,0300	1,0400	1,0500	1,0600	1,0700	1,0800	1,0900	1,1000	1,1200	1,1400	1,1500	1,1600	1,1800	1,2000
2	1,0201	1,0404	1,0609	1,0816	1,1025	1,1236	1,1449	1,1664	1,1881	1,2100	1,2544	1,2996	1,3225	1,3456	1,3924	1,4400
3	1,0303	1,0612	1,0927	1,1249	1,1576	1,1910	1,2250	1,2597	1,2950	1,3310	1,4049	1,4815	1,5209	1,5609	1,6430	1,7280
4	1,0406	1,0824	1,1255	1,1699	1,2155	1,2625	1,3108	1,3605	1,4116	1,4641	1,5735	1,6890	1,7490	1,8106	1,9388	2,0736
5	1,0510	1,1041	1,1593	1,2167	1,2763	1,3382	1,4026	1,4693	1,5386	1,6105	1,7623	1,9254	2,0114	2,1003	2,2878	2,4883
6	1,0615	1,1262	1,1941	1,2653	1,3401	1,4185	1,5007	1,5869	1,6771	1,7716	1,9738	2,1950	2,3131	2,4364	2,6996	2,9860
7	1,0721	1,1487	1,2299	1,3159	1,4071	1,5036	1,6058	1,7138	1,8280	1,9487	2,2107	2,5023	2,6600	2,8262	3,1855	3,5832
8	1,0829	1,1717	1,2668	1,3686	1,4775	1,5938	1,7182	1,8509	1,9926	2,1436	2,4760	2,8526	3,0590	3,2784	3,7589	4,2998
9	1,0937	1,1951	1,3048	1,4233	1,5513	1,6895	1,8385	1,9990	2,1719	2,3579	2,7731	3,2519	3,5179	3,8030	4,4355	5,1598
10	1,1046	1,2190	1,3439	1,4802	1,6289	1,7908	1,9672	2,1589	2,3674	2,5937	3,1058	3,7072	4,0456	4,4114	5,2338	6,1917
11	1,1157	1,2434	1,3842	1,5395	1,7103	1,8983	2,1049	2,3316	2,5804	2,8531	3,4785	4,2262	4,6524	5,1173	6,1759	7,4301
12	1,1268	1,2682	1,4258	1,6010	1,7959	2,0122	2,2522	2,5182	2,8127	3,1384	3,8960	4,8179	5,3503	5,9360	7,2876	8,9161
13	1,1381	1,2936	1,4685	1,6651	1,8856	2,1329	2,4098	2,7196	3,0658	3,4523	4,3635	5,4924	6,1528	6,8858	8,5994	10,699
14	1,1495	1,3195	1,5126	1,7317	1,9799	2,2609	2,5785	2,9372	3,3417	3,7975	4,8871	6,2613	7,0757	7,9875	10,147	12,839
15	1,1610	1,3459	1,5580	1,8009	2,0789	2,3966	2,7590	3,1722	3,6425	4,1772	5,4736	7,1379	8,1371	9,2655	11,974	15,407
16	1,1726	1,3728	1,6047	1,8730	2,1829	2,5404	2,9522	3,4259	3,9703	4,5950	6,1304	8,1372	9,3576	10,748	14,129	18,488
17	1,1843	1,4002	1,6528	1,9479	2,2920	2,6928	3,1588	3,7000	4,3276	5,0545	6,8660	9,2765	10,761	12,468	16,672	22,186
18	1,1961	1,4282	1,7024	2,0258	2,4066	2,8543	3,3799	3,9960	4,7171	5,5599	7,6900	10,575	12,375	14,463	19,673	26,623
19	1,2081	1,4568	1,7535	2,1068	2,5270	3,0256	3,6165	4,3157	5,1417	6,1159	8,6128	12,056	14,232	16,777	23,214	31,948
20	1,2202	1,4859	1,8061	2,1911	2,6533	3,2071	3,8697	4,6610	5,6044	6,7275	9,6463	13,743	16,367	19,461	27,393	38,338
21	1,2324	1,5157	1,8603	2,2788	2,7860	3,3996	4,1406	5,0338	6,1088	7,4002	10,804	15,668	18,822	22,574	32,324	46,005
22	1,2447	1,5460	1,9161	2,3699	2,9253	3,6035	4,4304	5,4365	6,6586	8,1403	12,100	17,861	21,645	26,186	38,142	55,206
23	1,2572	1,5769	1,9736	2,4647	3,0715	3,8197	4,7405	5,8715	7,2579	8,9543	13,552	20,362	24,891	30,376	45,008	66,247
24	1,2697	1,6084	2,0328	2,5633	3,2251	4,0489	5,0724	6,3412	7,9111	9,8497	15,179	23,212	28,625	35,236	53,109	79,497
25	1,2824	1,6406	2,0938	2,6658	3,3864	4,2919	5,4274	6,8485	8,6231	10,835	17,000	26,462	32,919	40,874	62,669	95,396

TABLE D

FUTURE VALUE OF R1 PER ANNUM RECEIVED FOR N YEARS AT THE END OF EACH YEAR

Formula: $\frac{(1+i)^n - 1}{i}$

Year N	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%
1	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000	1,0000
2	2,0100	2,0200	2,0300	2,0400	2,0500	2,0600	2,0700	2,0800	2,0900	2,1000	2,1200	2,1400	2,1500	2,1600	2,1800	2,2000
3	3,0301	3,0604	3,0909	3,1216	3,1525	3,1836	3,2149	3,2464	3,2781	3,3100	3,3744	3,4396	3,4725	3,5056	3,5724	3,6400
4	4,0604	4,1216	4,1836	4,2465	4,3101	4,3746	4,4399	4,5061	4,5731	4,6410	4,7793	4,9211	4,9934	5,0665	5,2154	5,3680
5	5,1010	5,2040	5,3091	5,4163	5,5256	5,6371	5,7507	5,8666	5,9847	6,1051	6,3528	6,6101	6,7424	6,8771	7,1542	7,4416
6	6,1520	6,3081	6,4684	6,6330	6,8019	6,9753	7,1533	7,3359	7,5233	7,7156	8,1152	8,5355	8,7537	8,9775	9,4420	9,9299
7	7,2135	7,4343	7,6625	7,8983	8,1420	8,3938	8,6540	8,9228	9,2004	9,4872	10,089	10,730	11,067	11,414	12,142	12,916
8	8,2857	8,5830	8,8923	9,2142	9,5491	9,8975	10,260	10,637	11,028	11,436	12,300	13,233	13,727	14,240	15,327	16,499
9	9,3685	9,7546	10,159	10,583	11,027	11,491	11,978	12,488	13,021	13,579	14,776	16,085	16,786	17,519	19,086	20,799
10	10,462	10,950	11,464	12,006	12,578	13,181	13,816	14,487	15,193	15,937	17,549	19,337	20,304	21,321	23,521	25,959
11	11,567	12,169	12,808	13,486	14,207	14,972	15,784	16,645	17,560	18,531	20,655	23,045	24,349	25,733	28,755	32,150
12	12,683	13,412	14,192	15,026	15,917	16,870	17,888	18,977	20,141	21,384	24,133	27,271	29,002	30,850	34,931	39,581
13	13,809	14,680	15,618	16,627	17,713	18,882	20,141	21,495	22,953	24,523	28,029	32,089	34,352	36,786	42,219	48,497
14	14,947	15,974	17,086	18,292	19,599	21,015	22,550	24,215	26,019	27,975	32,393	37,581	40,505	43,672	50,818	59,196
15	16,097	17,293	18,599	20,024	21,579	23,276	25,129	27,152	29,361	31,772	37,280	43,842	47,580	51,660	60,965	72,035
16	17,258	18,639	20,157	21,825	23,657	25,673	27,888	30,324	33,003	35,950	42,753	50,980	55,717	60,925	72,939	87,442
17	18,430	20,012	21,762	23,698	25,840	28,213	30,840	33,750	36,974	40,545	48,884	59,118	65,075	71,673	87,068	105,93
18	19,615	21,412	23,414	25,645	28,132	30,906	33,999	37,450	41,301	45,599	55,750	68,394	75,836	84,141	103,74	128,12
19	20,811	22,841	25,117	27,671	30,539	33,760	37,379	41,446	46,018	51,159	63,440	78,969	88,212	98,603	123,41	154,74
20	22,019	24,297	26,870	29,778	33,006	36,786	40,995	45,762	51,160	57,275	72,052	91,025	102,44	115,38	146,63	186,69
21	23,239	25,783	28,676	31,969	35,719	39,993	44,865	50,423	56,765	64,002	81,699	104,77	118,81	134,84	174,02	225,03
22	24,472	27,299	30,537	34,248	38,505	43,392	49,006	55,457	62,873	71,403	92,503	120,44	137,63	157,41	206,34	271,03
23	25,716	28,845	32,453	36,618	41,430	46,996	53,436	60,893	69,532	79,543	104,60	138,30	159,28	183,60	244,49	326,24
24	26,973	30,422	34,426	39,083	44,502	50,816	58,177	66,765	76,790	88,497	118,16	158,66	184,17	213,98	289,49	392,48
25	28,243	32,030	36,459	41,646	47,727	54,865	63,249	73,106	84,701	98,347	133,33	181,87	212,79	249,21	342,60	471,98

If you need to use a factor for annuities due (paid in advance or at the beginning of the period):

1. Look up the factor for periods n + 1 2. **Then** subtract ONE

Or look up factor for n and multiply with (1 + i)

Or use the mathematical formula.

Notes

Notes