

CT2 – P C – 14

Combined Materials Pack

ActEd Study Materials: 2014 Examinations

Subject CT2

Contents

Study Guide for the 2014 exams

Course Notes

Question and Answer Bank

Series X Assignments*

***Note:** The Series X Assignment Solutions should also be supplied with this pack unless you chose not to receive them with your study material.

If you think that any pages are missing from this pack, please contact ActEd's admin team by email at ActEd@bpp.com.

How to use the Combined Materials Pack

Guidance on how and when to use the Combined Materials Pack is set out in the *Study Guide for the 2014 exams*.

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2014 Study Guide

Subject CT2

Introduction



This Study Guide contains all the information that you will need before starting to study Subject CT2 for the 2014 exams. **Please read this Study Guide carefully before reading the Course Notes**, even if you have studied for some actuarial exams before.

When studying for the UK actuarial exams, you will need a copy of the **Formulae and Tables for Examinations of the Faculty of Actuaries and the Institute of Actuaries, 2nd Edition (2002)**. These are often referred to as simply the yellow **Tables** and are available separately from the Publications shop of the Institute and Faculty of Actuaries. You will also need a “permitted” scientific calculator from the list published in the Student Handbook. Please check the list carefully, since it is reviewed each year. You will find the list of permitted calculators and a link to the Publications shop on the profession’s website at www.actuaries.org.uk.

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1 The Subject CT2 course structure

There are four parts to the Subject CT2 course. The parts cover related topics and have broadly equal lengths. The parts are broken down into chapters.

The following table shows how the parts, the chapters and the syllabus items relate to each other. The end columns show how the chapters relate to the days of the regular tutorials. This table should help you plan your progress across the study session.

Part	Chapter	Title	No of pages	Syllabus objectives	Half day	2 full days	3 full days
1	1	The key principles of finance	27	(ii)	1	1	1
	2	Company ownership	38	(iii)			
	3	Taxation	21	(iv)			
	4	Financial instruments	44	(iii), (iv), (v)			
	5	Use of derivatives	21	(v)			
	6	Issue of shares	38	(v)			
2	7	Introduction to accounts	34	(ix)	2	2	2
	8	The main accounts	42	(ix)			
	9	Depreciation and reserves	19	(ix)			
	10	Generating accounts	22	(ix)			
3	11	Group accounts and insurance company accounts	25	(ix)	3	2	2
	12	Interpretation of accounts	54	(x)			
	13	Limitations of accounts	16	(x)			
	14	Financial institutions	47	(viii)			
4	15	Weighted average cost of capital	42	(vii), (xi)	4	3	3
	16	Capital structure and dividend policy	40	(vi)			
	17	Capital project appraisal (1)	39	(vii), (xi)			
	18	Capital project appraisal (2)	47	(vii), (xi)			
	19	Glossary	25	(i)			

2 ***ActEd study support***

Successful students tend to undertake three main study activities:

1. *Learning* – initial study and understanding of subject material
2. *Revision* – learning subject material and preparing to tackle exam-style questions
3. *Rehearsal* – answering exam-style questions, culminating in answering questions at exam speed without notes.

Different approaches suit different people. For example, you may like to learn material gradually over the months running up to the exams or you may do your revision in a shorter period just before the exams. Also, these three activities will almost certainly overlap.

ActEd offers a flexible range of products to suit you and let you control your own learning and exam preparation. The following table shows the products that ActEd produces. Note that not all products are available for all subjects.

LEARNING	LEARNING & REVISION	REVISION	REVISION & REHEARSAL	REHEARSAL
Course Notes	Q&A Bank X Assignments Combined Materials Pack (CMP) X Assignment Marking Tutorials Online Classroom	Flashcards Sound Revision MyTest	Revision Notes ASET Revision Tutorials	Mock Exam A Additional Mock Pack (AMP) Mock / AMP Marking

The products and services available for Subject CT2 are described below.

“Learning” products

Course Notes

The Course Notes will help you develop the basic knowledge and understanding of principles needed to pass the exam. They incorporate the complete Core Reading and include full explanation of all the syllabus objectives, with worked examples and short questions to test your understanding.

Each chapter includes the relevant syllabus objectives, a chapter summary and, where appropriate, a page of important formulae or definitions.

“Learning & revision” products

Question and Answer Bank

The Question and Answer Bank provides a comprehensive bank of questions (including some past exam questions) with full solutions and comments.

The Question and Answer Bank is divided into five parts. The first four parts include a range of short and long questions to test your understanding of the corresponding part of the Course Notes. Part five consists of 100 marks of exam-style questions.

X Assignments

The four Series X Assignments (X1 to X4) cover the material in Parts 1 to 4 respectively. Assignments X1 and X2 are 80-mark tests and should take you two and a half hours to complete. Assignments X3 and X4 are 100-mark tests and should take you three hours to complete. The actual Subject CT2 examination will have a total of 100 marks.

Combined Materials Pack (CMP)

The Combined Materials Pack (CMP) comprises the Course Notes, the Question and Answer Bank and the Series X Assignments.

The CMP is available in **eBook** format for viewing on a range of electronic devices. eBooks can be ordered separately or as an addition to paper products. Visit www.ActEd.co.uk for full details about the eBooks that are available, compatibility with different devices, software requirements and printing restrictions.

CMP Upgrade

The CMP Upgrade lists all significant changes to the Core Reading and ActEd material so that you can manually amend last year's study material to make it suitable for study for this year.

The upgrade includes replacement pages and additional pages where appropriate. If a large proportion of the material has changed significantly, making it inappropriate to include all changes, the upgrade will still explain what has changed and if necessary recommend that students purchase a replacement CMP or Course Notes at a significantly reduced price.

The CMP Upgrade can be downloaded free of charge from our website at www.ActEd.co.uk.

X Assignment Marking

We are happy to mark your attempts at the X assignments. Marking is not included with the Assignments or the CMP and you need to order it separately. You can submit your scripts by email, fax or post. Your script may be marked electronically, in which case you will be able to download your marked script via a secure link on the internet. Otherwise your marked script will be returned to you in the post.

Don't underestimate the benefits of doing and submitting assignments:

- Question practice during this phase of your study gives an early focus on the end goal of answering exam-style questions.
- You're incentivised to keep up with your study plan and get a regular, realistic assessment of progress.
- Objective, personalised feedback from a high quality marker will highlight areas on which to work and help with exam technique.

In a recent study, it was found that students who attempt more than half the assignments have significantly higher pass rates.

Series Marking

Series Marking applies to a specified subject, session and student. If you purchase Series Marking, you will **not** be able to defer the marking to a future exam sitting or transfer it to a different subject or student.

We typically send out full solutions with the Series X Assignments. However, if you order Series Marking at the same time as you order the Series X Assignments, you can choose whether or not to receive a copy of the solutions in advance. If you choose not to receive them with the study material, you will be able to download the solutions via a secure link on the internet when your marked script is returned (or following the final deadline date if you do not submit a script).

If you are having your attempts at the assignments marked by ActEd, you should submit your scripts regularly throughout the session, in accordance with the schedule of recommended dates set out in information provided with the assignments. This will help you to pace your study throughout the session and leave an adequate amount of time for revision and question practice.

The recommended submission dates are realistic targets for the majority of students. Your scripts will be returned more quickly if you submit them well before the final deadline dates.

Any script submitted *after* the relevant final deadline date will not be marked. It is your responsibility to ensure that scripts are received by ActEd in good time.

Marking Vouchers

Marking Vouchers give the holder the right to submit a script for marking at any time, irrespective of the individual assignment deadlines, study session, subject or person.

Marking Vouchers can be used for any assignment. They are valid for four years from the date of purchase and can be refunded at any time up to the expiry date.

Although you may submit your script with a Marking Voucher at any time, you will need to adhere to the explicit Marking Voucher deadline dates to ensure that your script is returned before the date of the exam. The deadline dates are provided with the assignments.

If you live outside the UK you must ensure that your last script reaches the ActEd office earlier than this to allow the extra time needed to return your marked script.

Tutorials

ActEd tutorials are specifically designed to develop the knowledge that you will acquire from the course material into the higher-level understanding that is needed to pass the exam.

ActEd runs a range of different tutorials at various locations, including online. Full details are set out in ActEd's *Tuition Bulletin*, which is sent regularly to all students based in the UK, Eire and South Africa and is also available from the ActEd website at www.ActEd.co.uk.

Regular and Block Tutorials

In preparation for these tutorials, we expect you to have read the relevant part(s) of the Course Notes before attending the tutorial so that the group can spend time on exam questions and discussion to develop understanding rather than basic bookwork.

You can choose ***one*** of the following types of tutorial:

- **Regular Tutorials** (two or three days) spread over the session.
- **A Block Tutorial** (two or three consecutive days) held two to eight weeks before the exam.

Online Classroom

The Online Classroom acts as either a valuable add-on to a face-to-face tutorial or a great alternative to a tutorial, particularly if you're not based in the UK or near a tutorial venue.

At the heart of the Online Classroom in each subject is a comprehensive, easily-searched collection of over 60 tutorial units. These are a mix of:

- teaching units, helping you to really get to grips with the course material, and
- guided questions, enabling you to learn the most efficient ways to answer questions and avoid common exam pitfalls.

The best way to discover the Online Classroom is to see it in action. You can watch a sample of the Online Classroom tutorial units on the ActEd website at www.ActEd.co.uk.

“Revision” products

For most subjects, there is ***a lot of material*** to revise. Finding a way to fit revision into your routine as painlessly as possible has got to be a good strategy! Flashcards, Sound Revision and MyTest are inexpensive options that can provide a massive boost. They can also provide a variation in activities during a study day, and so help you to maintain concentration and effectiveness.

Flashcards

Flashcards are a set of A6-sized cards that cover the key points of the subject that most students want to commit to memory. Each flashcard has questions on one side and the answers on the reverse. We recommend that you use the cards actively and test yourself as you go.

Flashcards are available in **eBook** format for viewing on a range of electronic devices. eBooks can be ordered separately or as an addition to paper products. Visit www.ActEd.co.uk for full details about the eBooks that are available, compatibility with different devices, software requirements and printing restrictions.

Sound Revision

It is reported that only 30% of information that is read is retained but this rises to 50% if the information is also heard.

Sound Revision is a set of three audio CDs, designed to help you remember the most important aspects of the Core Reading.

The CDs cover the majority of the course, split into a number of manageable topics based on the chapters in the Course Notes. Each section lasts no longer than a few minutes so it's perfect for the train, tube, or car journey on the way to work, or where taking folders and course notes is not practical.

MyTest

MyTest is a revision product containing over 300 questions specially written for actuarial students. There are some multiple-choice questions and some requiring a longer answer. The more you use it, the more it learns about the gaps in your knowledge and understanding. Questions become ever more focused onto these gaps, until they are filled. In a recent study, it was found that students who focus on questions testing the areas of the course they find most difficult have significantly higher pass rates.

MyTest is only available online. Registration runs for one exam session and will automatically expire after the exam. Visit our website at www.ActEd.co.uk for information on how the programme works and details of how to place an order for MyTest.

Choice of revision product

For most students, using one or two of these products will be more effective than using all three and different students will have preferences for different products.

So, what might influence your choice between these three study aids? The following questions and comments might help you to choose the revision products that are most suitable for you:

Flashcards

- Do you have a regular train or bus journey?
Flashcards are ideal for regular bursts of revision on the move.
- Do you want to fit more study into your routine?
Flashcards are a good option for “dead time”, eg using flashcards on your phone or sticking them on the wall in your study.
- Do you find yourself cramming for exams (even if that’s not your original plan!)?
Flashcards are an extremely efficient way to do your pre-exam memorising.

Sound Revision

- Do you have some regular time where carrying other materials isn’t practical, eg commuting, at the gym, walking the dog?
Sound Revision is an ideal “hands-free” revision tool.
- Do you have a preference for auditory learning, eg do you remember conversations more easily than emails?
Sound Revision will suit your preferred style and be especially effective for you.

MyTest

- Do you tend to avoid studying topics you find difficult?
MyTest tracks your progress and tailors future tests to reflect this.
- Do you want to fit in some study at work?
MyTest is ideal for regular bursts of revision at the start of the day or at lunchtime.
- Do you like being at your computer?
If you’re not tired of looking at a screen after a day at work, then MyTest may be for you.

All three

- Are you retaking a subject?

Using a different selection of revision products than on a previous attempt can be a major aid to keeping your revision fresh and effective.

“Revision & rehearsal” products

Revision Notes

ActEd’s Revision Notes have been designed with input from students to help you revise efficiently. They are suitable for first-time sitters who have worked through the ActEd Course Notes or for retakers (who should find them much more useful and challenging than simply reading through the course again).

The Revision Notes are a set of six A5 booklets – perfect for revising on the train or tube to work. Each booklet covers one main theme of the course and includes:

- Core Reading with a set of integrated short questions to develop your bookwork knowledge
- relevant past exam questions with concise solutions from the last ten years
- detailed analysis of key past exam questions, and
- other useful revision aids.

ActEd Solutions with Exam Technique (ASET)

The ActEd Solutions with Exam Technique (ASET) contains ActEd’s solutions to the previous four years’ exam papers, *ie* eight papers, plus comment and explanation. In particular it will highlight how questions might have been analysed and interpreted so as to produce a good solution with a wide range of relevant points. This will be valuable in approaching questions in subsequent examinations.

A “Mini-ASET” will also be available in the summer session covering the April Exam only.

Revision Tutorials

Revision Tutorials are intensive one-day face-to-face tutorials or half-day online tutorials in the final run-up to the exam.

They give you the opportunity to practise interpreting and answering past exam questions and to raise any outstanding queries with an ActEd tutor. These courses are most suitable if you have previously attended Regular Tutorials or a Block Tutorial in the same subject.

Details of how to apply for ActEd's tutorials are set out in our *Tuition Bulletin*, which is available from the ActEd website at www.ActEd.co.uk.

“Rehearsal” products

Mock Exam A

Mock Exam A is a 100-mark mock exam paper and is available for students as a realistic test of their exam preparation. It is based on Mock Exam A from last year but it has been updated to reflect any changes to the Syllabus and Core Reading.

Additional Mock Pack (AMP)

The Additional Mock Pack (AMP) consists of two further 100-mark mock exam papers – Mock Exam B and Mock Exam C. This is ideal for students who are retaking and have already sat Mock Exam A, or for those who just want some extra question practice.

Mock / AMP Marking

We are happy to mark your attempts at Mock Exam A or the mock exams included within the AMP. The same general principles apply as for the X Assignment Marking. In particular:

- Mock Exam Marking is available for Mock Exam A and it applies to a specified subject, session and student
- Marking Vouchers can be used for Mock Exam A or the mock exams contained within the AMP; please note that attempts at the AMP can **only** be marked using Marking Vouchers.

Recall that:

- marking is not included with the products themselves and you need to order it separately
- you can submit your scripts by email, fax or post
- your script may be marked and returned to you electronically, or marked and returned by post.

Queries and feedback

From time to time you may come across something in the study material that is unclear to you. The easiest way to solve such problems is often through discussion with friends, colleagues and peers – they will probably have had similar experiences whilst studying. If there's no-one at work to talk to then use ActEd's discussion forum at www.ActEd.co.uk/forums (or use the link from our home page at www.ActEd.co.uk).

Our online forum is dedicated to actuarial students so that you can get help from fellow students on any aspect of your studies from technical issues to study advice. You could also use it to get ideas for revision or for further reading around the subject that you are studying. ActEd tutors will visit the site from time to time to ensure that you are not being led astray and we also post other frequently asked questions from students on the forum as they arise.

If you are still stuck, then you can send queries by email to **CT2@bpp.com** (but we recommend that you try the forum first). We will endeavour to contact you as soon as possible after receiving your query but you should be aware that it may take some time to reply to queries, particularly when tutors are away from the office running tutorials. At the busiest teaching times of year, it may take us more than a week to get back to you.

If you have many queries on the course material, you should raise them at a tutorial or book a personal tuition session with an ActEd tutor. Information about personal tuition is set out in our current brochure. Please email **ActEd@bpp.com** for more details.

If you find an error in the course, please check the corrections page of our website (www.ActEd.co.uk/Html/paper_corrections.htm) to see if the correction has already been dealt with. Otherwise please send details via email to **CT2@bpp.com** or send a fax to **01235 550085**.

Each year ActEd tutors work hard to improve the quality of the study material and to ensure that the courses are as clear as possible and free from errors. We are always happy to receive feedback from students, particularly details concerning any errors, contradictions or unclear statements in the courses. If you have any comments on this course please email them to **CT2@bpp.com** or fax them to **01235 550085**.

The ActEd tutors also work with the profession to suggest developments and improvements to the Syllabus and Core Reading. If you have any comments or concerns about the Syllabus or Core Reading, these can be passed on via ActEd. Alternatively, you can send them directly to the Institute and Faculty of Actuaries' Examination Team by email to **examinations@actuaries.org.uk**.

3 How to study to pass the exams

The CT Subject exams

The Core Reading and exam papers for these subjects tend to be very technical. The exams themselves have many calculation and manipulation questions. The emphasis in the exam will therefore be on *understanding* the mathematical techniques and applying them to various, frequently unfamiliar, situations. It is important to have a feel for what the numerical answer should be by having a deep understanding of the material and by doing reasonableness checks.

Subjects CT2 and CT7 are more “wordy” than the other subjects, including an “essay-style” question or two in Subject CT7.

As a high level of mathematics is required in the courses it is important that your mathematical skills are extremely good. If you are a little rusty you may wish to consider buying the Foundation ActEd Course (FAC) available from ActEd. This covers all of the mathematical techniques that are required for the CT Subjects, some of which are beyond A-Level (or Higher) standard. It is a reference document to which you can refer when you need help on a particular topic.

You will have sat many exams before and will have mastered the exam and revision techniques that suit you. However it is important to note that due to the high volume of work involved in the CT Subjects it is not possible to leave all your revision to the last minute. Students who prepare well in advance have a better chance of passing their exams on the first sitting.

Unprepared students find that they are under time pressure in the exam. Therefore it is important to find ways of maximising your score in the shortest possible time. Part of your preparation should be to practise a large number of exam-style questions under timed exam conditions as soon as possible. This will:

- help you to develop the necessary understanding of the techniques required
- highlight the key topics, which crop up regularly in many different contexts and questions
- help you to practise the specific skills that you will need to pass the exam.

There are many sources of exam-style questions. You can use past exam papers, the Question and Answer Bank (which includes many past exam questions), assignments, mock exams, the Revision Notes and ASET.

Overall study plan

We suggest that you develop a realistic study plan, building in time for relaxation and allowing some time for contingencies. Be aware of busy times at work, when you may not be able to take as much study leave as you would like. Once you have set your plan, be determined to stick to it. You don't have to be too prescriptive at this stage about what precisely you do on each study day. The main thing is to be clear that you will cover all the important activities in an appropriate manner and leave plenty of time for revision and question practice.

Aim to manage your study so as to allow plenty of time for the concepts you meet in this course to “bed down” in your mind. Most successful students will probably aim to complete the course at least a month before the exam, thereby leaving a sufficient amount of time for revision. By finishing the course as quickly as possible, you will have a much clearer view of the big picture. It will also allow you to structure your revision so that you can concentrate on the important and difficult areas of the course.

A sample CT subject study plan is available on our website at:

www.ActEd.co.uk/Html/help_and_advice_study_plans.htm

It includes details of useful dates, including assignment deadlines and tutorial finalisation dates.

Study sessions

Only do activities that will increase your chance of passing. Try to avoid including activities for the sake of it and don't spend time reviewing material that you already understand. You will only improve your chances of passing the exam by getting on top of the material that you currently find difficult.

Ideally, each study session should have a specific purpose and be based on a specific task, *eg “Finish reading Chapter 3 and attempt Questions 1.4, 1.7 and 1.12 from the Question and Answer Bank”*, as opposed to a specific amount of time, *eg “Three hours studying the material in Chapter 3”*.

Try to study somewhere quiet and free from distractions (*eg a library or a desk at home dedicated to study*). Find out when you operate at your peak, and endeavour to study at those times of the day. This might be between *8am* and *10am* or could be in the evening. Take short breaks during your study to remain focused – it's definitely time for a short break if you find that your brain is tired and that your concentration has started to drift from the information in front of you.

Order of study

We suggest that you work through each of the chapters in turn. To get the maximum benefit from each chapter you should proceed in the following order:

1. Read the Syllabus Objectives. These are set out in the box on page 1 of each chapter.
2. Read the Chapter Summary at the end of each chapter. This will give you a useful overview of the material that you are about to study and help you to appreciate the context of the ideas that you meet.
3. Study the Course Notes in detail, annotating them and possibly making your own notes. Try the self-assessment questions as you come to them. Our suggested solutions are at the end of each chapter. As you study, pay particular attention to the listing of the Syllabus Objectives and to the Core Reading.
4. Read the Chapter Summary again carefully. If there are any ideas that you can't remember covering in the Course Notes, read the relevant section of the notes again to refresh your memory.

It's a fact that people are more likely to remember something if they review it several times. So, do look over the chapters you have studied so far from time to time. It is useful to re-read the Chapter Summaries or to try the self-assessment questions again a few days after reading the chapter itself.

You may like to attempt some questions from the Question and Answer Bank when you have completed a part of the course. It's a good idea to annotate the questions with details of when you attempted each one. This makes it easier to ensure that you try all of the questions as part of your revision without repeating any that you got right first time.

Once you've read the relevant part of the notes and tried a selection of questions from the Question and Answer Bank (and attended a tutorial, if appropriate) you should attempt the corresponding assignment. If you submit your assignment for marking, spend some time looking through it carefully when it is returned. It can seem a bit depressing to analyse the errors you made, but you will increase your chances of passing the exam by learning from your mistakes. The markers will try their best to provide practical comments to help you to improve.

To be really prepared for the exam, you should not only know and understand the Core Reading but also be aware of what the examiners will expect. Your revision programme should include plenty of question practice so that you are aware of the typical style, content and marking structure of exam questions. You should attempt as many questions as you can from the Question and Answer Bank and past exam papers.

Active study

Here are some techniques that may help you to study actively.

1. Don't believe everything you read! Good students tend to question everything that they read. They will ask "why, how, what for, when?" when confronted with a new concept, and they will apply their own judgement. This contrasts with those who unquestioningly believe what they are told, learn it thoroughly, and reproduce it (unquestioningly?) in response to exam questions.
2. Another useful technique as you read the Course Notes is to think of possible questions that the examiners could ask. This will help you to understand the examiners' point of view and should mean that there are fewer nasty surprises in the exam room! Use the Syllabus to help you make up questions.
3. Annotate your notes with your own ideas and questions. This will make you study more actively and will help when you come to review and revise the material. Do not simply copy out the notes without thinking about the issues.
4. Attempt the questions in the notes as you work through the course. Write down your answer before you refer to the solution.
5. Attempt other questions and assignments on a similar basis, *ie* write down your answer before looking at the solution provided. Attempting the assignments under exam conditions has some particular benefits:
 - It forces you to think and act in a way that is similar to how you will behave in the exam.
 - When you have your assignments marked it is *much* more useful if the marker's comments can show you how to improve your performance under exam conditions than your performance when you have access to the notes and are under no time pressure.
 - The knowledge that you are going to do an assignment under exam conditions and then submit it (however good or bad) for marking can act as a powerful incentive to make you study each part as well as possible.
 - It is also quicker than trying to write perfect answers.
6. Sit a mock exam four to six weeks before the real exam to identify your weaknesses and work to improve them. You could use a mock exam written by ActEd or a past exam paper.

4 Frequently asked questions

Q: *What knowledge of earlier subjects should I have?*

A: Very little knowledge of earlier subjects is in fact required for Subject CT2. There is quite a bit of overlap between Subject CT1 and Subject CT2. For example, you will study various financial instruments, including derivatives, in both subjects. However, the emphasis will be different. In Subject CT1 you will be concerned with technical issues such as the pricing of products, whereas in Subject CT2 you will be more concerned with the way in which these products can be used by a company. Similarly, in the area of investment appraisal, CT1 is concerned with the technicalities of the various methods of appraisal, whereas CT2 is concerned with the relative merits of the various methods.

Q: *What are the key question answering skills?*

A: Parts 2 and 3 of the course cover the construction and interpretation of accounts. This work can be quite complex and it helps to have a quick numerical brain. A lot of question practice in this area will help. Examination questions often ask you to recommend action for a particular firm in a particular situation. You need to know and understand the course content and be able to apply principles to a given situation.

Q: *What should I do if I discover an error in the course?*

A: If you find an error in the course, please check our website at

www.acted.co.uk/Html/paper_corrections.htm

to see if the correction has already been dealt with. Otherwise please send details via email to **CT2@bpp.com** or send a fax to **01235 550085**.

Q: *What calculators am I allowed to use in the exam?*

A: Please refer to **www.actuaries.org.uk** for the latest advice.

5 Core Reading and the Syllabus

Core Reading

The Syllabus for Subject CT2, and the Core Reading that supplements it, has been written by the Institute and Faculty of Actuaries to state the requirements of the examiners. The relevant individual Syllabus Objectives are included at the start of each course chapter and a complete copy of the Syllabus is included in Section 6 of this Study Guide. We recommend that you use the Syllabus as an important part of your study. The purpose of Core Reading is to give the examiners, tutors and students a clear, shared understanding of the depth and breadth of treatment required by the Syllabus. In examinations students are expected to demonstrate their understanding of the concepts in Core Reading. Examiners have the Core Reading available when setting papers.

Core Reading deals with each syllabus objective. Core Reading covers what is needed to pass the exam but the tuition material that has been written by ActEd enhances it by giving examples and further explanation of key points. The Subject CT2 Course Notes include the Core Reading in full, integrated throughout the course. Here is an excerpt from some ActEd Course Notes to show you how to identify Core Reading and the ActEd material. **Core Reading is shown in this bold font.**

Note that in the example given above, the index *will* fall if the actual share price goes below the theoretical ex-rights share price. Again, this is consistent with what would happen to an underlying portfolio.

After allowing for chain-linking, **the formula for the investment index becomes:**

$$I(t) = \frac{\sum_i N_{i,t} P_{i,t}}{B(t)}$$

where $N_{i,t}$ is the number of shares issued for the i th constituent at time t ;
 $B(t)$ is the base value, or divisor, at time t .

This is
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text

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The Institute and Faculty of Actuaries would like to thank the numerous people who have helped in the development of this material and in the previous versions of Core Reading.

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Changes to the Syllabus and Core Reading

The Syllabus and Core Reading are updated as at 31 May each year. The exams in April and September 2014 will be based on the Syllabus and Core Reading as at 31 May 2013.

We recommend that you always use the up-to-date Core Reading to prepare for the exams.

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Past exam papers

You can download some past exam papers and Examiners' Reports from the profession's website at www.actuaries.org.uk.

Further reading

The exam will be based on the relevant Syllabus and Core Reading and the ActEd course material will be the main source of tuition for students.

However, some students may find it useful to obtain a different viewpoint on a particular topic covered in Subject CT2. The following list of further reading for Subject CT2 has been prepared by the Institute and Faculty of Actuaries. This list is not exhaustive and other useful material may be available.

Accounting and finance for non-specialists. Atrill, P.; McLaney, E. 7th ed. Prentice Hall, 2010. 576 pages. ISBN: 978-0273745964

Fundamentals of financial management (concise edition). Brigham, E. F.; Houston, J. F. 7th ed. South-Western, 2011. 384 pages. ISBN: 978-0538481526

How to understand the financial pages. Davidson, A. 2nd ed. Kogan Page, 2008. 369 pages. ISBN: 978-0749451448

Interpreting company reports and accounts. Holmes, G.; Sugden, A.; Gee, P. 10th ed. 336 pages. FT Prentice Hall, 2008. ISBN: 978-0273711414

Principles of corporate finance (Global edition). Brealey, R. A.; Myers, S. C.; Allen, F. 10th ed. McGraw-Hill, 2010. ISBN: 978-0071314176

Calculators

Please refer to www.actuaries.org.uk for the latest advice on which calculators are permitted in the exams.

6 Syllabus

The full Syllabus for Subject CT2 is given here. To the right of each objective are the chapter numbers in which the objective is covered in the ActEd course.

Aim

The aim of the Finance and Financial Reporting subject is to provide a basic understanding of corporate finance including a knowledge of the instruments used by companies to raise finance and manage financial risk and to provide the ability to interpret the accounts and financial statements of companies and financial institutions.

Links to other subjects

Subject CT1 – Financial Mathematics: uses this subject to provide a grounding in financial mathematics and investments.

Subject CA1 – Actuarial Risk Management: develops some of the concepts introduced in this subject.

Subjects ST5 – Finance and Investment Specialist Technical A, ST6 – Finance and Investment Specialist Technical B, SA5 – Finance Specialist Applications and SA6 – Investment Specialist Applications: develop the technical and practical applications of topics introduced in this subject.

Objectives

On completion of this subject the candidate will be able to:

- (i) Demonstrate a knowledge and understanding of the principal terms in use in investment and asset management.
(whole course: see Index (after the Study Guide) and Glossary in Chapter 19)
- (ii) Demonstrate an awareness of the key principles of finance. (Chapter 1)
 - 1. Outline the relationship between finance and the real resources and objectives of an organisation.
 - 2. Outline the relationship between the stakeholders in an organisation (including lenders and investors).
 - 3. Outline the role and effects of the capital markets.
 - 4. Outline agency theory.
 - 5. Outline the theory of the maximisation of shareholder wealth.

- (iii) Describe the structure of a joint stock company and the different methods by which it may be financed. (Chapter 2)
1. Outline the distinctive characteristics of sole traders, partnerships and limited companies as business entities.
 2. Describe the different types of loan and share capital.
 3. Distinguish between authorised and issued share capital.
 4. Discuss the economic advantages and disadvantages of a limited company as a business entity.
 5. Outline the main differences between a private and public company.
 6. Outline the different types of medium-term company finance:
 - hire purchase
 - credit sale
 - leasing
 - bank loans.
 7. Describe the following different types of short-term company finance:
 - bank overdrafts
 - trade credit
 - factoring
 - bills of exchange
 - commercial paper.
- (iv) Describe the basic principles of personal and corporate taxation. (Chapter 3)
1. Describe the basic principles of personal taxation.
 2. Describe the basic principles of the taxation of capital gains.
 3. Describe the basic principles of company taxation.
 4. Explain the different systems of company taxation from the points of view of an individual shareholder and the company.
 5. Outline the basic principles of double taxation relief.
- (v) Demonstrate a knowledge and understanding of the characteristics of the principal forms of financial instrument issued or used by companies and the ways in which they may be issued. (Chapters 4, 5, 6)
1. Outline the reasons a company might have for seeking a quotation on the stock exchange.

2. Describe the characteristics, from an issuer's point of view of:
 - debenture stocks
 - unsecured loan stocks
 - Eurobonds
 - preference shares
 - ordinary shares
 - convertible unsecured loan stocks
 - convertible preference shares
 - warrants
 - floating rate notes
 - subordinated debt
 - options issued by companies
3. Describe the characteristics and possible uses by a non-financial company of:
 - financial futures
 - options
 - interest rate and currency swaps.
4. Outline the following methods of obtaining a quotation for securities:
 - offer for sale
 - offer for sale by tender
 - offer for subscription
 - placing
 - introduction.
5. Describe the following types of new issues to existing shareholders:
 - scrip issue
 - rights issue.
6. Describe the role of underwriting in the issue of securities.

- (vi) Discuss the factors to be considered by a company when deciding on its capital structure and dividend policy. (Chapter 16)
1. Describe the effect that the capital structure used by a company will have on the market valuation of the company.
 2. Describe the effect of taxation on the capital structure used by a company.
 3. Discuss the principal factors that a company should consider in setting dividend policy.
 4. Discuss alternative ways of distributing profits, such as buybacks.
 5. Discuss the effect that the dividend policy will have on the market valuation of a company.
- (vii) Define what is meant by a company's cost of capital and discuss how its cost of capital interacts with the nature of the investment projects it undertakes. (Chapters 15, 17, 18)
1. Describe how to calculate a company's weighted average cost of capital.
 2. Discuss the different methods used for project evaluation.
 3. Describe methods commonly used to evaluate risky investments including probability trees, simulation and certainty equivalents.
 4. Discuss the issues in establishing the required rate of return for a capital project.
- (viii) Describe the major types of financial institution operating in the financial markets. (Chapter 14)
1. Describe the main features of the following institutions and analyse their influence on the financial markets:
 - central banks
 - investment exchanges
 - investment banks
 2. Describe the role played in financial markets by each of the following institutions:
 - clearing banks
 - building societies
 - investment trusts

- unit trusts
- investment management companies
- self-administered pension funds
- life insurance companies
- general insurance companies

(ix) Describe the basic construction of accounts of different types and the role and principal features of the accounts of a company. (Chapters 7, 8, 9, 10, 11)

1. Explain why companies are required to produce annual reports and accounts.
2. Explain the fundamental accounting concepts which should be adopted in the drawing up of company accounts.
3. Explain the purpose of a:
 - statement of financial position
 - statement of comprehensive income
 - cashflow statement
 and of the notes to the accounts.
4. Construct simple statements of financial position and income statements; understand and interpret cashflow statements
5. Understand the structure and content of insurance company accounts.
6. Explain what is meant by the terms subsidiary company and associated company.
7. Explain the purpose of consolidated accounts.
8. Explain how goodwill might arise on the consolidation of group accounts.
9. Explain how depreciation is treated in company accounts.
10. Explain the function of the following accounts – share capital, other reserves and retained earnings.

(x) Interpret the accounts of a company or a group of companies and discuss the limitations of such interpretation. (Chapters 12, 13)

1. Calculate and explain priority percentages and gearing.
2. Calculate and explain interest cover and asset cover for loan capital.
3. Describe the possible effects of interest rate movements on a highly geared company.

4. Calculate and explain price earnings ratio, dividend yield, dividend cover and EBITDA.
 5. Explain net earnings per share.
 6. Calculate and explain accounting ratios which indicate:
 - profitability
 - liquidity
 - efficiency.
 7. Discuss the shortcomings of historical cost accounting.
 8. Discuss the limitations in the interpretation of company accounts.
 9. Discuss the ways that reported figures can be manipulated to create a false impression of a company's financial position.
- (xi) Show how financial techniques can be used in the assessment of capital investment projects. (Chapters 15, 17, 18)
1. Discuss the principal methods that may be used to determine the viability of a capital project.
 2. Discuss the factors underlying the choice of discount rate within project assessment including:
 - the assumptions and limitations in the use of the weighted average cost of capital
 - the allowance for leverage
 - the allowance for risk.
 3. Discuss the methods that may be used for identifying the risks that may be present for different types of project.
 4. Discuss suitable techniques for ascertaining the probability of occurrence of different risks over varying timescales and the financial impact of occurrence.
 5. Discuss suitable techniques for ascertaining the distribution of the possible financial outcomes of a capital project.

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CT2 Index

Chapter 19 contains a glossary of principal terms.

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Chapter 1

The key principles of finance



Syllabus objectives

- (ii) Demonstrate an awareness of the key principles of finance.
 - 1 Outline the relationship between finance and the real resources and objectives of an organisation.
 - 2 Outline the relationship between the stakeholders in an organisation (including lenders and investors).
 - 3 Outline the role and effects of the capital markets.
 - 4 Outline agency theory.
 - 5 Outline the theory of the maximisation of shareholder wealth.

0 Introduction

This chapter introduces the basic ideas relating to the theory of corporate finance.

Section 1 discusses the two key decisions relating to the financing of a company's operations, namely the *capital budgeting decision* (what to invest in) and the *financing decision* (how to finance that investment).

Section 2 considers business objectives. A company is a complex organisation with many interested parties or *stakeholders*, eg shareholders, managers, employees. Each group has its own set of objectives and these objectives might conflict with those of other groups. *Agency theory* considers these complex relationships and conflicts of interest (and how to avoid them). This section also considers the role of information and agreements.

Section 3 is concerned with the *maximisation of shareholder wealth* in the face of the different needs and objectives of the shareholders of a company. It suggests that, ultimately, the goal of the company's financial manager should be to increase the market value of each shareholder's stake in the company.

Finally, Section 4 describes the role of *capital markets* in providing information to monitor the performance of the financial manager and to assist the financial manager when making decisions.

You might find this chapter quite difficult on first reading, but it is a very useful introduction to the course. You might want to re-read this chapter as you progress through the course, and, in particular, when you have finished the course.

The rest of the course explores financial management further. In the other chapters of Part 1 of the course we study the ways in which companies are set up, some of the general concepts of taxation and the principal forms of financial assets. In Parts 2 and 3 of the course we consider how company accounts are drawn up and how we can use accounting information to make useful analyses. In Part 4 of the course we study the capital budgeting decision and the financing decision in more detail.



The examination is likely to test your *understanding* of the role of the financial manager, the objectives of stakeholders, agency theory and the role of capital markets.

1 **Introduction to finance**

1.1 **Finance and the real resources of an organisation**



Question 1.1

If you were to set up a new business manufacturing pine furniture, what resources would you need?

To set up any business, you would need a variety of real assets. By real assets, we mean the assets that are used by the company in its normal line of business to generate profits. We use the term real assets to distinguish them from financial assets, such as shares or bonds. **In order to carry on business, companies need to employ real assets, both tangible and intangible.** Tangible assets are assets that physically exist (eg machinery and buildings) whereas intangible assets are assets that do not (eg goodwill, trademarks and brand names).



Question 1.2

How would you raise the finance to set up your new business?

To acquire such assets, the company must raise finance – by issuing financial assets such as shares or bonds. We will study the various ways a business can be organised in Chapter 2 and the various forms of finance in Chapter 2 and Chapter 4.

Thus the financial manager (who is responsible for the major investment and financing decisions) **stands between:**

- **the firm's operations** (*ie* the purchase of real assets, which are then used by the firm to undertake projects in order to generate profits) **and**
- **the financial markets (where investors hold the financial assets issued by the firm to obtain money).**

The role of the financial manager as the link between the firm's operations and the financial markets is summarised by the following diagram.

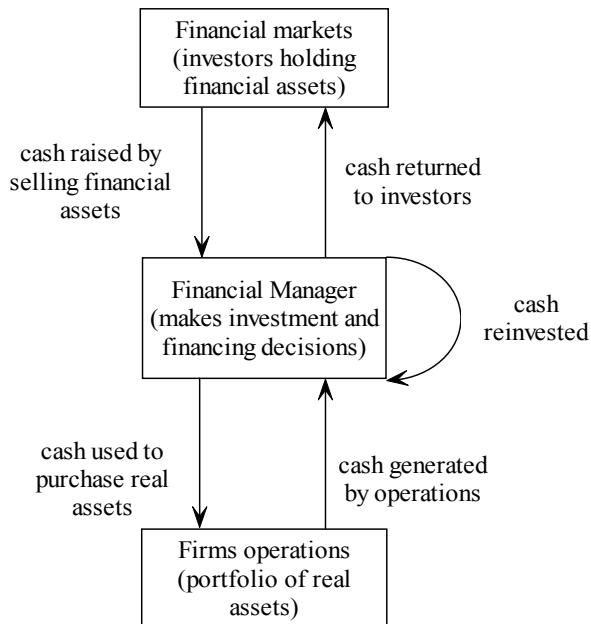


Figure 1: The role of the financial manager

1.2 Finance and the organisation's objectives

Most companies aim to increase the value of their shares by investing in profitable projects and raising the finance in a cost-effective way.



Finance involves two basic issues:

1. **What real assets should the firm invest in? (the *investment or capital budgeting decision*)**
2. **How should the cash for the investment be raised? (the *financing decision*).**

Firms use real assets to undertake projects – a firm can essentially be thought of simply as a collection of projects. These projects generate revenues and incur costs. The aim of the firm should be to undertake those projects for which the revenues exceed the costs in order to generate profits on behalf of the owners of the firm – typically the shareholders. The capital budgeting decision considers the choice of projects, and hence real assets, in which the firms should invest.

In practice, the capital budgeting decision is often complicated by the fact that:

- there may be more than one apparently profitable project between which to choose
- it is very difficult to estimate the future profitability of a project.

The typical project requires a significant expenditure prior to the receipt of the first revenues. In addition, it may be several years before incoming revenues first exceed outgoing costs and so the project becomes profitable. A net investment will therefore be required to get the project off the ground. The financing decision considers how best to raise the required finance. For example, should the finance be raised by issuing shares (known as *equity finance*) or by borrowing (known as *debt finance*)?

We shall examine the organisation's objectives further in Section 2.

1.3 Responsibilities for financial decisions

Remember that the two main questions for the financial manager are:

- What real assets should the firm invest in?
- How should the cash for the investment be raised?

The first question is normally the remit of a controller or, in many instances, the Chief Financial Officer (CFO).

However, capital budgeting decisions will be tied into plans for product development, production and marketing and so will involve managers from these areas (as well as any staff specialising in corporate planning).

The second question is the responsibility of the treasurer who:

- looks after the company's cash
- raises new capital and
- maintains relationships with banks, shareholders and other investors.

Typically, the CFO will report directly to the Chief Executive Officer whilst the treasurer will report to the CFO. In practice, the controller/CFO and the treasurer are sometimes the same individual.

Responsibility for financial issues will, ultimately, rest (by law or custom) with the board of directors. In practice, boards usually delegate decisions for small or medium-sized matters. However, responsibility for large financial decisions is rarely delegated. We shall examine this further in Section 2.

1.4 **The importance of capital budgeting**

The importance of capital budgeting is due to the complexity of the analysis involved and the cost of poor decisions. It is difficult to project the prospective cashflows arising from a particular project with any great confidence. Further complications arise when allowing for different possible scenarios, incorporating options into the analysis and discounting the cashflows.

Investment in working capital (such as stock) **is largely routine and involves few complications or risks.**

Investment in fixed capital, (such as premises, machinery and vehicles) **however, often involves complex choices between:**

- **alternative capital assets**, each with various advantages and disadvantages
- **dates of commencement and**
- **methods of financing** – eg bank loan, issuing debt, issuing equity.

These choices are both complex and critical, given the scope for (and very high cost of) erroneous decisions. Moreover, fixed capital outlays often have a serious bearing on the direction and pace of a firm's growth. As such, they determine the opportunities open to a firm and the directions in which it can move.

This is because fixed capital choices can involve the commitment of large sums of money for long periods of time.

1.5 **Financial analysis**

Progress in management depends on applying logic to experiences, to known or assumed facts in order to enlarge the area of understanding. Investment decisions are no exception. Even where it is impossible for financial analysis to improve the actual fortunes of a particular project, it may nevertheless be able to:

- **delineate the risks involved in the project**
- **highlight the salient factors** – ie those that lead to the greatest uncertainty
- **possibly suggest methods by which these risks might be reduced** – we discuss some methods of risk mitigation in Chapter 18.

More generally, it may provide greater insight on which to base informed and sensible investment decisions.

Financial analysis in capital budgeting involves bringing together estimates and ideas from a variety of disciplines – marketing, technology, accounting, tax, law – in order to reveal their financial implications.

As its name suggests, *financial analysis* in this context simply means analysing the financial implications of different possible courses of action. An in-depth financial analysis of a project may require the input of experts from each of several different disciplines such as those listed above.

Ultimately, the problems of capital budgeting in any enterprise are both financial and political. Leaving the investment appraisal of a project to be conducted by the very people who are most concerned to see the project accepted – the department primarily interested in the project – is to expect impossible objectivity.

In other words, all decisions are ultimately made by human beings who are not always impartial and objective.

The use of a specialist finance function is an attempt to enforce impartiality and realism. However, the possible downside of this is that the finance function may lack specialist knowledge of the particular project under consideration.



Question 1.3

What is the role of financial management in an organisation? Why is it important? Why is it difficult?

2 Business objectives

We assumed in Section 1 that companies aim to increase the value of their shares. We assume this because most businesses are owned by shareholders, who, we assume, are interested in maximising the value of their investments in shares.

The extent to which this is true in reality depends on:

- the extent to which the shareholders control the business
- the extent to which other stakeholders are considered.

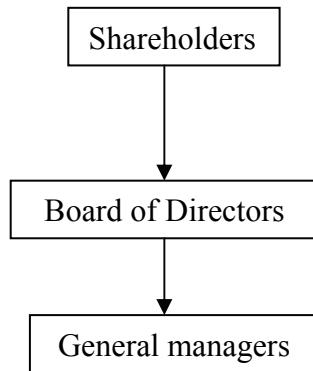
We shall consider the various interest groups (*ie* stakeholders) in a business and will consider the possibility of conflicting objectives. We will then move on to consider the ways in which these conflicts are managed.

2.1 The stakeholders

There are many groups involved in running a company: shareholders, managers, employees, lenders, customers, suppliers, the government. We must consider their interests and their role.

Shareholders

We shall study the various ways of organising a business in Chapter 2, but we will briefly examine a typical company structure.



The shareholders own the company and elect the Board of Directors to run the company on their behalf. Sometimes the directors run the company themselves, but quite often they hire general managers, who are not shareholders but who are experts in their fields, to run the company.

Ultimate responsibility for financial decisions within a company will usually lie with the directors. The directors are acting on behalf of the ultimate shareholders (who elected them). In practice, they will often delegate operational decision making to the executives, while retaining control of strategic issues.

This is sometimes known as “the divorce of ownership from control”.

Such separation of ownership and management has advantages – freedom for ownership to change without affecting operational activities, freedom to hire professional managers – but also disadvantages if the interests of the owners and managers diverge.



Question 1.4

What are the objectives of shareholders?

Other stakeholders



Question 1.5

Give examples of objectives of:

- (i) managers
- (ii) banks and other lenders
- (iii) employees
- (iv) customers
- (v) government.

2.2 Conflicting objectives

Shareholders and managers

The scope for conflict between owners and managers is evident – managers may be motivated by objectives which are at variance with the desires (and interests) of the shareholders.

For example, the main objective of shareholders will normally be to receive a high return on their investment in the company. In contrast, some managers might instead wish to pursue projects of interest over more profitable projects; to take over other companies and so gain control of as large a business empire as possible; to have a more leisurely or luxurious working lifestyle; or to aim for a satisfactory return rather than a maximum return.

Providers of finance

Of particular interest is the potential for conflict between providers of finance, notably *lenders* (such as banks and bondholders) and the providers of equity capital (the *shareholders*).

For example, a company's shareholders may be keener to see the company invest in a potentially high risk and high return project than are its lenders. This is because it is the shareholders who stand to benefit should the project prove successful, whereas the lenders have no particular interest in upside profits – they simply wish to ensure that they receive the promised interest and capital payments.

Fundamentally, this can be characterised as the difference between the lenders' *short-term* desire for security and the shareholders' *long-term* interest in the development of the company.

This may be the case if the company is in financial difficulty. The shareholders may then be very keen to undertake a risky project as a last-ditch attempt to turn the company around, whereas lenders may not wish to see their capital placed in even more jeopardy. Thus, it is difficult for the management to simultaneously satisfy the preferences of both sets of investors.

At times, however, the interests of different sub-groups of financiers may diverge, so that different classes of lenders or shareholders may have different interests.



Question 1.6

Give examples of other conflicts that may arise.

2.3 Ways of managing conflict

A company comprises a number of stakeholders, each with its own set of objectives. Some of these objectives coincide, but others conflict. One theory that tries to explain these complex relationships and conflicting objectives within an organisation is agency theory.

Agency theory



Agency theory, which considers the relationship between a principal and an agent of that principal, includes issues such as the nature of the agency costs, conflicts of interest (and how to avoid them) and how agents may be motivated and incentivised.

Consider the relationship between the shareholders and the management. The shareholders are the *principals* who employ the management as the *agents* to run the company on their behalf. Divergence of interests leads to the possibility of conflicts of interest.

Such conflicts are referred to as *principal-agent problems*, and give rise to *agency costs*. These include the costs associated with monitoring the actions of others, and seeking to influence their actions.

In practice, the agency costs incurred by the shareholders are usually defined as the sum of three different component costs, namely:

1. those incurred in monitoring the managers
2. those incurred in seeking to influence the actions of managers
3. those incurred because the managers do not act in the owners' best interests.

There are two factors that encourage managers to operate in the interests of the shareholders: job security and remuneration packages. Managers do not want to lose their jobs, nor their reputations. Many managers receive bonuses based on the company's earnings or the share price.

If the shareholders feel that the company is underperforming, they can elect a new board of directors, which, in turn, will probably appoint a new management team. Alternatively, shareholders might express their disapproval by selling their shares. If sufficient shareholders do this, then the share price falls. If the company is underperforming and the share price falls, the company is vulnerable to a take-over bid. The management team is likely to be replaced by one that will do what is necessary to maximise shareholder value.

Conflicts of interest may equally arise between other stakeholders – junior management, other employees, customers, suppliers, pensioners, and the state. For example, the company's management (principals) may wish to motivate the employees (agents) to work hard so that the company's profits are high and the management receive large profit-related bonuses. Conversely, the employees may wish to have an easy time at work.

Note that the company's managers may be viewed as agents when managing the company on behalf of its owners, whereas they may be viewed as principals when employing more junior staff to actually carry out the day-to-day work.

The role of information

Such problems may be easier to resolve if all parties share the same insights into the fortunes of the company. However, *information asymmetries* will often exist between the various classes of stakeholder.

For example, the decision to increase a dividend payment is likely to lead to an increase in the share price as investors read this new information from managers and conclude that the management is confident of future earnings, whether or not this is in fact so.

Similarly, the employees of a company may demand large salary increases in response to the previous year's high profits. At the same time the financial manager may be reluctant to grant large increases because he knows that the firm is unlikely to sustain the current level of profits in the face of proposed tax and regulatory changes.

In some countries, *eg* Germany and Scandinavia, power-sharing structures exist that allow employees to have a role in the running of the business, *eg* worker directors. The Social Chapter of the Maastricht Treaty of the European Union promotes the establishment of Works Councils. These measures make more information available and aim to create a better understanding between stakeholders.

However, keeping all stakeholders informed is difficult. Company decision-making often involves sensitive business information and the need to keep it from commercial rivals also restricts the ability to communicate it to stakeholders.

A possible advantage of private debt and venture capital equity is that the small number of investors involved will often be much better informed about the issuing company than is the case where large numbers of investors hold small volumes of publicly quoted securities.

The role of agreements

Written agreements between the various classes of stakeholder may specify key aspects of the relationship between them, but cannot realistically cover all possible future eventualities. Contracts that do not cover all possible future eventualities – *ie* the great majority of contracts in practice – are sometimes referred to as *incomplete contracts*. **Such agreements therefore need to be supplemented by less formal understandings and arrangements.**

Contractual theory views a firm as a network of contracts, actual and implicit, which specify the roles of the various participants in the organisation (workers, managers, owners, lenders, etc) and define their rights, obligations and pay-offs under various conditions. For example, workers will expect an employment contract; banks will expect a loan agreement setting out details of the rate of interest and repayments dates.

Most participants bargain for limited risk and fixed pay-offs, whereas the firm's owners are liable for any residual risk (and thus hold a residual claim on any assets and earnings of the firm that remain after covering costs).

As we have seen, **there are, however, potential conflicts.** One such is between a firm's owners and its creditors. If managers substantially alter the riskiness of a firm's product-market investment activities, this will benefit shareholders greatly (if the investments are successful). However, risky investments that fail will reduce the security of debt holders and reduce debt values. If a firm does not give strong assurances to debt holders that investment policies will not be changed to their disadvantage, it must pay interest rates high enough to compensate debt holders against the possibility of such adverse policy changes. In other words, the contracts drawn up must take into account, as far as possible, the various conditions that could face the firm and the reaction of the firm to those conditions. In this way, the stakeholders will be aware, as far as possible, of the risks they are taking.

Social responsibility must also be considered. Efficient, well-managed operations (relative to consumer demand patterns) lead to new products, new technologies and greater employment. But firms must take into account the effects of their policies and actions on society as a whole. The expectations of workers, consumers and various interest groups create other dimensions of the external environment that firms must respond to. '**Externalities**' (such as pollution, product safety and job security) must be considered when formulating **policy**. Some of these expectations are embodied in law, *eg* health and safety at work, employment protection, consumer protection, environmental protection. Beyond these laws, there are unwritten, implicit rules of behaviour. Companies' reputations can be seriously damaged if they are found to be untrustworthy or thought to be unethical, and there can be serious consequences for the share price.

2.4 Business objectives: a re-statement



Industry and government should co-operate in establishing rules for corporate behaviour, so that firms strive to maximise shareholder wealth *within external constraints*.



Question 1.7

When are agency costs incurred?



Question 1.8

How might the interests of a company's management be aligned with those of the shareholders?

We will now examine the objective of maximising shareholder wealth in detail.

3 **The maximisation of shareholder wealth**

3.1 **The goal of the financial manager**

Most large organisations will have many thousands, if not millions, of individual shareholders. Here we have in mind publicly owned companies. Privately owned companies will typically have a much smaller number of shareholders, whilst a sole trader is the single owner of a business.

The needs (and objectives) of these shareholders will vary according to factors such as:

- **attitude towards risk**
- **time preference and consumption needs** – ie are investment returns required now or some time in the future?
- **balance between the need for income and for capital growth** – ie do the shareholders want a regular dividend from their shares or are they interested in buying and selling shares to make a capital gain?
- **tax position** – eg allowances before paying tax and marginal rates of tax. Since dividends are taxed differently from capital gains, this might affect whether the shareholder would prefer dividend or capital gain.

How can managers and directors, acting as agents for the ultimate owners, satisfy the different desires of these owners? Indeed, how can they even know what these desires are? Whilst in theory they could ask the shareholders, in practice it would be very costly and time-consuming to do so.

Luckily, there is a mechanism that enables this conundrum to be solved – the market. Provided that a free, competitive, capital market exists, (see Section 4) shareholders can choose their investments to meet their needs for cashflow, risk and so on. If we assume that all shareholders seek to be as rich as possible (ie that they seek to maximise current worth) then the goal of the financial manager is simply stated: to increase the market value of each shareholder's stake in the firm.

In this context, “financial manager” refers to anyone responsible for significant investment and financial decisions within the company. The aim of each company’s financial manager(s) is therefore simply to increase the price of the company’s shares, by undertaking profitable and appropriately financed investment opportunities. Investors can then choose which shares to include within their investment portfolios so as to best meet their own particular objectives.

3.2 **The opportunity cost of capital**

This goal can be further refined to provide an operational tool for financial management. Any operational decision will be reflected in a pattern of future cashflows (positive and negative).

Just as a firm can essentially be thought of as a collection of projects, so any project can likewise be thought of in terms of the set of cashflows that it generates. For example, if a company invests in new technology, it will incur negative cashflows from the purchase of the new equipment, the expense of training the staff and the cost of developing and implementing the new technology; and positive cashflows as new revenue is generated from the new investment. There will probably be a net cash outflow in the early years as the equipment is purchased and implemented and revenue is low; and a net cash inflow in later years as revenue is earned and running costs are reduced as a result of the new technology.

When analysing an investment project, the company must estimate all future cashflows. Since cashflows are taking place in the future, the company should take account of the time value of money and discount the future cashflows to the present value.



Question 1.9

A project costs £1.5 million, and is expected to bring in a net cashflow of £500,000 each year for the next 4 years. If the discount rate is 10%, is this project worth doing?

By discounting the cashflows at an appropriate rate of interest, we can establish the net present value of any opportunity. If we use the (opportunity) cost of capital as the rate at which future cashflows are discounted, then all opportunities that display a positive net present value will add to the current value of shareholders' wealth. Opportunities that display a negative present value are "value destroying" and should be avoided.



Question 1.10

Why should projects that display a positive net present value when calculated at the company's (opportunity) cost of capital add to the current value of shareholders' wealth?

Once again, the market enables us to identify the appropriate cost of capital to use in decision making – it is the rate of return offered by equivalent investment alternatives in the capital market – ie the rate foregone by investing in the project rather than investing in securities.

This is because the shareholders could easily take their money and invest it elsewhere, eg in the securities issued by other companies.

Thus, we need to assess opportunities from the point of view of the shareholders (and, hence, the alternative uses that they could put their capital to) rather than simply asking whether the return on a project is greater than the cost of borrowing the funds needed to finance it. The latter approach may enable us to increase the value of the company (in accounting terms) but will not maximise its value in the eyes of the shareholders – and as we discussed above, the aim of the financial manager should be to maximise the wealth of the shareholders.

Note also the stipulation that we need to consider the rate of return offered by equivalent investment alternatives. Specifically, we need to consider the risks associated with the project, as well as the returns, to ensure that we are comparing like with like. This suggests that in practice we should consider the risk and return characteristics of alternative investment opportunities in closely related industrial sectors.



Question 1.11

Why do we need to consider the risks associated with the project when determining the cost of capital, as well as the returns, to ensure that we are comparing like with like?

Question 1.12

- (i) What is the objective of financial managers?
- (ii) How can this objective be refined for operational use?

4 The capital markets

The capital markets are the markets in long-term finance for companies, such as the shares (or stock) market and the bond market. These markets provide a great deal of important information. This information will be used firstly, to monitor the performance of the financial manager and secondly, to assist the financial manager when making decisions.

For large, publicly quoted companies, the stock market serves as a performance monitor. While share prices may react to the general economy or industry-wide factors, the basic component of the share price is the market's perception of the particular firm's current and expected future performance. If managers are not performing effectively, relative to the potential of the assets under their control, it will not be long before this is reflected in a lower share price. This may make the firm a bargain for a corporate acquirer and a take-over bid will be made.

Business organisations are, therefore, directly and measurably subject to the disciplines of the financial markets. These markets are continuously determining the valuations of business firms' securities, thereby providing measures of the firms' performance. The presence of the capital markets' continuous assessment therefore stimulates efficiency and provides incentives to business managers to improve their performance.

The financial markets also provide useful information for the financial manager when making decisions on sources of finance and investment projects.

Key effects of the capital markets on a firm's decisions include:

- **Sound investment decisions require accurate measurement of the cost of capital**
- **Limitations in the supply of capital focus attention on methods of raising finance**
- **Mergers and take-overs create threats and opportunities to be exploited**
- **“Externalities” require managers to determine the appropriate role of organisations.**

**Question 1.13**

What information does the capital market provide:

- (i) to monitor the financial manager?
- (ii) to help the financial manager make decisions?



Examiners have asked many questions on these topics since they came into the syllabus in 2005. For example:

“Explain how market forces would discipline the managers of a quoted company if they were not performing in a satisfactory manner.” (April, 2005)

“Agency theory underpins many of the theoretical models used in finance. Explain the logic underlying agency theory, briefly referring to the role of monitoring in managing the relationship between principal and agent.” (September, 2005)

“In theory, companies exist to maximise shareholder wealth. In practice, the relationship between shareholders and the directors whom they appoint to manage their companies appears to suggest that the directors have other motives. Explain why it is difficult for shareholders to be assured that directors are consistently working to serve their interests.” (April, 2006)

“Comment on the suggestion that the interests of shareholders and lenders can conflict.” (April, 2011)

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Chapter 1 Summary

Introduction

Finance involves two basic issues:

1. What real assets should the firm invest in? (the *capital budgeting decision*)
2. How should the cash for the investment be raised? (the *financing decision*)

The main parties involved in financing decisions are the treasurer, the controller, the Chief Financial Officer and the board of directors.

Capital budgeting is important because the costs of mistakes are high. It is very difficult because there are often many options to assess and future cashflows are uncertain.

Agency theory

There are many groups of stakeholders in an organisation, each with its own objectives. These objectives may conflict. This causes problems when one group is responsible for taking decisions on behalf of others. The directors of a company make strategic decisions on behalf of its shareholders, whilst delegating operational decisions to managers. This separation of ownership and management can lead to *principal-agent problems* and *agency costs* if the interests of the owners and managers diverge.

Conflicts of interest may also arise between other stakeholders in a business, notably between lenders and the providers of equity capital, and may be reinforced by *information asymmetries*. *Agency theory* considers issues such as the nature of the agency costs, conflicts of interest (and how to avoid them) and how agents may be motivated and incentivised.

The maximisation of shareholder wealth

The needs (and objectives) of shareholders will vary according to factors such as:

- attitude towards risk
- time preference and consumption needs
- balance between the need for income and for capital growth
- tax position.

The goal of the financial manager should be to increase the market value of each shareholder's stake in the firm. Opportunities that display a positive net present value based on the company's cost of capital will add to the current value of shareholders' wealth and should therefore be undertaken.

Capital markets

Capital markets are the markets in long-term capital, such as the share (or stock) market and the bond market. The capital market provides information to assess the performance of the financial managers and also to assist the financial managers when making financial decisions.

Chapter 1 Solutions

Solution 1.1

To set up your new business, you would need *fixed assets or fixed capital* such as premises, machinery, tools, computers *etc*, which will last for many years, as well as *working capital* such as stocks of wood, nails, varnish *etc*, which will be used up in production and sold.

Solution 1.2

You might contribute some of your own savings to the business; you might ask friends and family to contribute their savings; and/or you might ask the bank for a loan. If you set up as a company, you would sell shares. To help you buy your stocks of materials you might ask suppliers to give you credit.

We will study the various ways that you could set up your business (*eg* sole trader, partnership, company) in Chapter 2 and we will look at the various ways of financing the business in Chapter 2 and Chapter 4.

Solution 1.3

Financial management involves making careful choices in the raising of finance (the financing decision) and in the investment of this finance in real assets (the capital budgeting decision). It is very important because a wrong decision could have very serious consequences for the business. It is also very difficult because there are often many options to choose from and the outcomes from any of the options are subject to great uncertainty. There are many factors to consider and it is important that the financial team gathers all the available information and examines the options objectively and realistically.

Solution 1.4

The objectives of the shareholders might be:

- to obtain a regular dividend
- to make a capital gain, *ie* to sell the shares for more than they cost
- to maximise the overall return on their investment.

Solution 1.5

(i) Managers may aim for:

- job security
- good pay
- good benefits, *eg* perks such as company cars, long holidays.
- prestige and power.

They may therefore wish the company to aim for:

- growth (salary and prestige are often related to the size of the firm)
- stability (and not to take unnecessary risks)
- a satisfactory level of profit (rather than a maximum level of profit)

(ii) Banks and other lenders may wish the company to:

- remain in business
- to pay a market rate of return on the borrowed funds
- to meet the payment deadlines.

(iii) Employees may wish the company to:

- pay a market rate of pay for the work
- stay in business
- provide safe working conditions
- provide training
- provide a variety of benefits such as pensions, holidays *etc.*

(iv) Customers may wish the company to:

- remain in business (for after-sales service *etc*)
- provide goods at reasonable prices
- provide goods of good quality
- produce and market goods ethically.

(v) The government may wish the company to:

- perform well so that it pays more corporate taxes
- perform well so that it provides jobs to as many citizens of the state as possible
- act morally and responsibly, *eg* in line with consumer law.

Solution 1.6

Other examples of conflicts include:

- The shareholders and managers may wish to invest in labour-saving technology, but workers fear the loss of jobs and consumers fear a reduction in quality.
- Shareholders, management and employees wish to expand production on a greenfield site, but the local community and local government fear a reduction in the quality of life, with greater visual and air pollution and more congestion.

Solution 1.7

Agency costs are incurred when:

- managers (as agents) do not attempt to maximise the value of the company
- shareholders (as principals) incur costs monitoring the managers and attempting to influence their actions.

Solution 1.8

The interests of a company's management can be aligned with those of the shareholders by linking the management's remuneration to the performance of the company's shares. One way of doing this is by giving the managers a stake in the equity of the company, *eg* via a share option scheme.

Solution 1.9

The company will consider the present value of all future cashflows. £100 now is worth more than £100 next year because the £100 now could be invested at 10% and be worth £110 next year. The £100 received next year is therefore worth £90.91 now.

Assuming earnings are received at the end of each year, the net present value of the project (in £000) is:

$$\begin{aligned} &= -1,500 + \frac{500}{(1.1)} + \frac{500}{(1.1)^2} + \frac{500}{(1.1)^3} + \frac{500}{(1.1)^4} \\ &= +84.95 \end{aligned}$$

Since the net present value is positive, this project is worth doing. The project will earn at least a 10% return.

If you are doing or have done Course CT1, you will know a quick way of doing this.

Solution 1.10

We can think of any company as consisting of a portfolio of projects, each of which generates an associated stream of (positive and negative) cashflows. If the project yields a rate of return in excess of the cost of capital required to fund it, then the net present value of the associated cashflows must be positive. Undertaking the project will therefore increase the total net present value of the company's cashflows. This increase in the value of the company should in turn be reflected in the market price of the company's shares and hence the wealth of the shareholders.

Solution 1.11

We need to consider the risks associated with the project in determining the cost of capital because shareholders will typically be concerned with both the risk and return characteristics of their investments.

Solution 1.12

- (i) The aim of the financial manager is to increase the market value of each shareholder's stake in the firm. This means the financial manager aims to increase the company's share price by undertaking profitable and appropriately financed investment opportunities.
- (ii) The financial manager should aim to invest in projects that yield a positive net present value when discounted at the opportunity cost of capital.

Solution 1.13

- (i) The capital market provides information about the company's share price and the prices of the company's bonds. These are indicators of the financial manager's performance. For example, if shareholders hear bad news about a company's performance, they are likely to sell their shares and bring about a fall in the share price. This might affect managers directly if they own shares in the company, or indirectly, through the expressed displeasure of the shareholders. So the capital market keeps managers on their toes!
- (ii) The capital market provides information on rates of return required from different types of financial assets such as shares and bonds. This is helpful when the manager is contemplating sources of finance. It is also helpful in calculating the cost of capital for use as the discount rate when appraising investment projects.

By studying the capital market, the financial manager will be able to monitor the market's reaction to various policies (either of its own company or others). For example, if shareholders think a company's proposed investment is likely to increase shareholder wealth, the share price will tend to rise.

Managers can also monitor the policies and performance of particular companies. For example, if Company X is buying other companies that are involved in a particular line of business, then other such companies will consider themselves possible targets. A company that has been performing less well than the sector average and/or has lots of cash will be more vulnerable to a take-over because the predator will feel that it could make better use of the company's resources.

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Chapter 2

Company ownership



Syllabus objectives

- (iii) *Describe the structure of a joint stock company and the different methods by which it may be financed.*
1. *Outline the distinctive characteristics of sole traders, partnerships and limited companies as business entities.*
 4. *Discuss the economic advantages and disadvantages of a limited company as a business entity.*
 5. *Outline the main differences between a private and public company.*
 6. *Outline the different types of medium-term company finance:*
 - *hire purchase*
 - *credit sale*
 - *leasing*
 - *bank loans.*
 7. *Describe the following types of short-term company finance:*
 - *bank overdrafts*
 - *trade credit*
 - *factoring*
 - *bills of exchange*
 - *commercial paper.*

0 Introduction

In this chapter we lay the foundations for much of the work involved in studying Subject CT2, by looking at how companies are set up and financed.

We first look at the different types of business structure used and the legal framework in which business entities are set up, and then at the ways in which limited companies raise medium- and short-term finance.

The structure of this chapter is as follows:

- Section 1: Types of business entity
- Section 2: Pros and cons of limited companies
- Section 3: Types of medium-term company finance
- Section 4: Types of short-term company finance

The information in this chapter reflects UK examples but similar principles apply in other countries.



In the past, the examination has tested *knowledge* of business structures and finance, and the *ability to analyse for a particular business* the advantages and disadvantages of different business structures and different methods of finance.

1 **Types of business entity**

We shall look at four types of business entity:

1. the sole trader
2. the partnership
3. the limited company
4. the limited liability partnership.

1.1 **Sole trader**



A sole trader is a business which is owned by one person and which is not a limited company. Sole traders have unlimited legal liability for their business debts.

Description

Many sole traders are one person operations, such as a window cleaner or a freelance journalist, where the owner carries out all the work. However, **the definition refers only to ownership of the business. There are sole traders who have employees working for them.**

The sole trader can decide what to do with the business (eg pass it on to an offspring).

The sole trader can draw out money from the business as he or she needs to (assuming that there is some money!).

Liability

The sole trader has unlimited liability. This means that if a customer sues the sole trader (for breach of contract for example), the total personal wealth of the sole trader, including his house and bank deposits, would be available to pay off trading liabilities.

Legal and accounting documentation

A sole trader will need to fill in a normal income tax return in respect of the business. However, **no specific documentation is needed to legally establish this form of business entity.**

1.2 Partnership



A partnership is a business which is owned by more than one person and is not a limited company.

Description

When two or more people go into business together, a partnership is formed. Many professional firms such as accountancy firms and actuarial consultancies are partnerships. Some partnerships are large, and may have literally hundreds of partners.

The partnership may be owned in equal or unequal amounts by the partners. Usually all the partners will be involved in the running of the business, but some may just provide capital and take no part in the day to day operation of the business (such partners are sometimes called “sleeping partners”).

Most partnerships will strictly control who might be allowed to buy an interest in the partnership.

Partners will draw money from the partnership from time to time. This can be more or (often) less than their share of profits. The internal accounts will show any surplus/deficit in each partner's “capital account” resulting from under or over drawing, and from capital (finance) provided to the partnership.

Liability

The owners have unlimited liability. All the partners are jointly liable for any business debts. They will also be “severally liable”, that is, each partner is liable to the full extent of his/her personal estate for the deficiencies of the partnership. This means that each individual partner can be sued separately for the entire debts of the whole business. This explains why businesses which involve a measure of trust between the business and its clients, such as solicitors and consulting actuaries, are often set up as partnerships. It is a signal that the people running the business are willing to put their own personal wealth behind the firm's obligations.

Legal and accounting documentation

Most partnerships will have a “partnership agreement” which sets out the rights of individual partners, such as who can make what decisions and how profits are shared between partners. Strictly, no specific documentation is needed. The partnership will also need to provide accounts so that Her Majesty’s Revenue and Customs (“HMRC”) can work out each partner’s liability to tax on their share of the partnership’s profits. Partners pay income tax.

A new form of partnership was introduced in 2001. The limited partnership is discussed after we have discussed the limited company.

1.3 Limited companies



A limited company is a business which has a legal identity separate from the owners of the business.

Description

A limited company has its own distinct legal identity. It can own or deal in property in its own right. It can arrange contracts on its own behalf. It can also sue and be sued. A company can be fined by the court (but not imprisoned!).

Almost all limited companies are set up by the issue of shares. **The owners of the company are called shareholders.** Each shareholder will hold a certificate showing how many shares they own in the company. **Most shares give the right to vote at company meetings. The shareholders will appoint directors who are responsible for the control of the company on behalf of the shareholders.** The company is run by *managers* who carry out the directors’ policies on a day to day basis. Managers are often elected as directors, in which case they are known as *executive* directors. Directors who are not involved on a daily basis are known as *non-executive* directors.

In most cases, shares in a company may be purchased and sold without the permission of the other shareholders. Shareholders will not generally be actively involved in the running of the company. These statements are more true of *public* limited companies than of *private* limited companies (we discuss these two types of company in a later section).

Profit will be calculated each year and a dividend declared from this profit which will be paid to each shareholder in proportion to the number of shares that they own. It is common for dividends to be paid in two instalments: an interim payment made halfway through the year and a final payment at the end of the year once the accounts have been finalised. The total amount of dividends is usually less than the profits for the year, the balance being *retained* in the company on behalf of the shareholders. However, the amount of dividends can be the same or even greater than the profits (dividends can exceed profits in a particular year if there are sufficient retained profits from previous years).

Liability

The owners' liability is limited to the fully paid value of their shares. Shareholders in a limited company have their liability limited to the fully paid value of their shares. **So that, if shares have been issued "partly-paid" then, in the event of a liquidation, shareholders will only be liable to pay the outstanding instalments. If the shares are "fully paid", the shareholders have no further liability. If shares have been issued at a premium to their par value, the whole of this "share premium" is payable at the outset, even if the shares are issued on a "partly-paid" basis.** If the company becomes insolvent, creditors cannot claim further payment from the shareholders' personal wealth beyond the fully paid value of their shares.

Legal and accounting documentation

Limited companies must have a Memorandum of Association and Articles of Association.

Prior to 2009, the Memorandum of Association included a lot of detail such as the name of the company, its objectives and its total share capital. However, since 2009, the Memorandum of Association simply confirms the subscribers' intention to form a company and become members of that company on formation. Members have to agree to take at least one share each in the company. Once the company is incorporated, the Memorandum of Association is regarded as a historical document that cannot be amended and does not affect the company going forward.

The Articles of Association lay down the internal rules by which the directors run the company and set out the rights of owners of the different classes of share capital. The contents include internal arrangements such as voting rights of different classes of shares, rules for electing directors, payment of dividends and winding-up provisions.

Since 2009, a third document must be completed. Form IN01 is an application form to register a company and contains many of the details that used to be included in the Memorandum of Association, such as the company name, the registered office and the share capital details.

Once the above documents have been submitted to Companies House, a certificate of incorporation will be issued. The certificate is conclusive evidence that the requirements of the Companies Act 2006 as to registration have been complied with and that the company is duly registered under this Act.

All companies above a certain size (in terms of turnover, assets or number of employees) must produce audited accounts each year.

Companies pay corporation tax on the profit earned. Employees pay income tax on wages and salaries earned.

1.4 Limited liability partnerships

A new corporate identity, the Limited Liability Partnership (LLP), was introduced in the UK in 2001.



This is a business vehicle that gives the benefits of limited liability whilst retaining other characteristics of a traditional business partnership.

Description

Any firm consisting of two or more *members* (note: not *partners*) engaged in a profit-making venture, may become a LLP. Unlike limited companies, there are no directors (or company secretary) and, of course, no shareholders.

The LLP, as with a limited company, is a separate legal entity. As a separate legal entity, the LLP is able to enter into contracts, hold property and to continue in existence regardless of changes in membership. Any third party dealing with a LLP makes a contract with the LLP rather than with a member

Liability

Whilst the LLP itself is responsible for its assets and liabilities, the liability of its members is limited. (As with companies, however, actions may be taken against individual members who are found to be negligent or fraudulent in their dealings.)

Legal and accounting documentation

Unlike a limited company, a LLP has no Memorandum or Articles of Association. In general terms, a LLP is governed by the partnership agreement that may already be in force within an existing partnership. In the absence of any agreement, the mutual rights and duties will be governed by the default provision contained in the regulations.

Like a company, a LLP has to be registered at Companies House. An incorporation document must be submitted and signed by at least two persons, who will become the first members of the LLP. A LLP is required to appoint at least two designated members who will be responsible for a number of duties in the running of the LLP such as the signing and filing of the annual accounts.

The accounting and audit requirements for LLPs are similar to those for companies, for example, financial disclosure for third parties dealing with the LLP and disclosure of earnings of the highest paid member. Like a company, audited accounts must be submitted if the LLP is above a certain size.

A LLP is taxed in the same way that conventional partnerships are taxed. LLPs that do not carry on business as a trade or profession, such an investment company, are subject to corporation tax.

It is expected that LLPs will prove most attractive to professional firms (such as accountants and solicitors). The UK saw a steady flow of partnerships incorporating as LLPs since the first conversion in 2001, with the rate of change increasing as the LLP model became more widely understood.



Question 2.1

Contrast the different types of liability which are characteristic of the following forms of business entity:

- sole trader
- partnership
- limited company
- limited liability partnership.

**Question 2.2**

Draw up a table to compare a partnership, a limited liability partnership and a limited company with respect to:

- main source of finance
- legal identity
- liability
- documentation
- disclosure
- tax.

1.5 **Private and public limited company**

Limited companies come in two forms, public limited companies and private limited companies. The two forms of company are very similar. The difference is simply how they register themselves. It is quite easy for almost any private limited company to re-register as a public limited company. The legal definitions are set out in the Companies Act 2006.

Public limited company

Public limited companies offer shares to the general public and shareholders have limited liability.



A public limited company is a company whose Memorandum states that it is a public company and which has an issued share capital of at least £50,000. The name of a public limited company must end with the words “public limited company” or the abbreviation PLC or plc.

A public limited company must be “correctly registered” with the Registrar of Companies at Companies House. All public companies must produce audited accounts.

Each issued share must be paid up to at least a quarter of its par value plus the whole of any premium on it.

Note that the definition does *not* have anything to do with whether the company is owned by the public sector (*ie* government) or private sector – although most public companies are private sector companies.

Private limited company



All other limited companies are classed as private limited companies. A private limited company's name must end with the word "limited" (or the abbreviation *LTD* or *ltd*). A private limited company is not allowed to offer its shares to the public.

Listed companies

It is a requirement of the Stock Exchange that a company that wants to have a full Stock Exchange listing must be a public limited company. It is possible to have an unlisted public company, but in practice most companies will "go public" and obtain a listing on the Stock Exchange, allowing widespread dealing in the company's shares, at the same time. (We will look at how companies obtain a Stock Exchange listing later in the course.)

Consequently, most public companies are large companies whose shares are held by many different shareholders who take no part in the companies' day to day operations. Private companies are more typically small companies with a narrow range of shareholders, often being "family run" businesses.

Less common types of company

The following types of company also exist in the UK:

- Companies limited by guarantee. Each member's liability is limited to the amount they have guaranteed, *eg* £100. These are often used to form clubs and associations.
- Companies established by Royal Charter.
- Close company. A company under the control of five or fewer people. Both private and public limited companies could be close.

2 Pros and cons of limited companies

2.1 Advantages of limited companies

The main advantage is that the **limited liability makes it easier to raise capital**.



Question 2.3

Why is it easier for a limited liability company to raise capital than it is for a large partnership?

This is particularly important in the cases of:

- **Business ventures involving a risk of incurring substantial debts.** Insurance companies would be a good example of a company that might not exist without limited liability. (Note that most mutual offices are set up as limited companies, albeit without share capital.)
- **Businesses which require large amounts of capital.** Most industrial businesses need vast amounts of capital. This means that large numbers of people need to provide money. Without limited liability, companies would find it very difficult to raise capital. Few investors would provide capital to a partnership in which they had no day to day control.

Limited liability allows large numbers of people to invest small amounts of money with relatively minimal checking of the company's prospects. In turn, this allows investors to diversify their exposure to sectors and to the risk of failure.

The company is owned by a number of shareholders, perhaps very many. In small companies, each shareholder might also be an executive director and thus have some control of the company. This is sometimes called a “tight” shareholding. However, in the case of public limited companies and quite often in private limited companies too, most of the shareholders take little or no role in the management of the company. This was discussed in Chapter 1 and is known as the separation of ownership and control (or the divorce of ownership from control). This has some advantages for the company:

- **Separation of ownership and management allows share ownership to change without interfering with the operation of the business.**
- **It also allows the firm to hire professional managers.**

2.2 Disadvantages of limited companies

To the creditors

Once the company's assets have been exhausted, the trade creditors have no way of ensuring payment following a wind-up. Similarly, customers have no way of ensuring that they receive goods and services for which they have pre-paid. Over the last few years there have been many stories of companies running into problems because some customer companies have been liquidated leaving unpaid bills. Newspapers are particularly keen on stories of travel companies being liquidated leaving customers stranded overseas or with no holiday at all.

To the company

Limited liability allows people to invest in shares without taking an active interest in the long-term needs of the company. The UK Stock Market has often been accused of "short-termism" - the desire for good short-term share price performance with little interest in the long-term health of the company.

To the shareholders

The managers of a company may have aims which are not in the best interests of the shareholders (this is known as the "agency problem" as we discussed in Chapter 1). An "inefficient" corporate attitude may develop since ownership of the business is divorced from day to day control. With an identity of their own, companies may see survivorship, good employment terms for their staff and expansion as goals in themselves. Managers may use retained profits to fund growth and diversification of the company, even if the economically most desirable action is for the company to wind up. Many companies seem to pursue sales growth (to increase the directors' salaries?) without worrying too much about profit maximisation for shareholders.

There is also the problem of "information asymmetries" where different stakeholders (managers, shareholders and lenders) all have different information about the value of a real or financial asset. This reinforces the need for proper accounting standards to be observed. The managers control the information available to interested parties and thus might, in the absence of strict standards, be able to present the information in a particular light. For example, a fall in profit might be hidden in order to avert an adverse reaction by the shareholders and the creditors. We will discuss accounting standards in Chapter 7.

2.3 Conclusion

It is no coincidence that the increase in numbers of large, efficient industrial enterprises occurred in the second half of the 19th century when the modern concept of limited liability was introduced.

Limited liability is usually necessary for a company to grow beyond the size that one family or a small partnership can control (some large professional partnerships are an exception to this). Most of the benefits of economies of scale resulting from modern capital-intensive production line techniques can thus be attributed to the concept of limited liability.



Question 2.4

If you were starting up a new business with a friend, what factors would you consider when deciding whether to set up as a partnership or a company?



Examiners usually ask a general question about the relative merits of different forms of business organisation (as above) but sometimes they like to put you in a particular situation and ask you to think of an appropriate form of business organisation for that situation. For example:

“Harold and Maude are in the process of setting up a risk management consultancy. Explain the relative advantages and disadvantages of setting up this business as a partnership and as a limited company.” (September 2002 adapted)

Make sure you know the relevant points, but always relate them to the particular business. Much of the time, you make general points but use the names given in the question! In this case, you would particularly consider: how well Harold and Maude know each other (can they trust each other in a partnership?); whether or not they need to display commitment in the business to gain clients’ trust; and whether or not they will need the protection of limited liability (particularly if one contributes more than another to the business and therefore has more to lose).

3 Medium-term company finance

3.1 Introduction

All organisations need capital to finance premises, equipment and operations. The main sources of long-term finance – debt and equity – are considered in Chapter 4. Here we will consider the sources of medium- and short-term finance.

In this section we look at medium-term finance and in the next section we look at short-term types of finance. Medium-term finance typically has a term of over one year, but less than about five years. Short-term finance typically has a term of less than one year.

The four forms of medium-term finance we look at are:

- hire purchase
- credit sale
- leasing
- bank loans.

3.2 Hire purchase

Hire purchase arrangements are used both for consumers (eg buying a new car or computer) and for commercial transactions (eg buying a new tractor).



A hire purchase agreement is an agreement to hire goods for a period of time making regular rental payments and then to buy the goods at the end of the rental period. Legal ownership passes to the buyer only when the final payment is made.

In most cases, the good is bought by making the last of the regular series of payments. No special payment is needed.

The payments can be thought of as being partly payment for the good, and partly interest.

If the buyer fails to make the payments due under the hire purchase agreement, the seller can take back the goods (subject to a few legal niceties).



Example

Mrs Grass is buying a lawnmower. Her local garden centre has one on sale for £225 which she can pay for in cash. Alternatively, she can pay a deposit of £50 plus 12 monthly payments of £20 each under a hire purchase agreement.

Note that the total cost of using the hire purchase agreement to buy the lawn mower is £290. The extra £65 she has to pay can be considered as interest.

Mrs Grass uses the hire purchase agreement to take the lawn mower home and cut her lawn today. However, she subsequently fails to make the payments under the hire purchase agreement. The garden centre therefore reclaims the lawn mower and so ends up with a second hand lawn mower for sale. Mrs Grass ends up with long grass!

Companies will often use hire purchase agreements to buy machines and computer equipment. It is important from the seller's point of view that the term of the hire purchase agreement is a lot less than the useful life of the good. If this is not the case, the buyer might decide not to make the final payments when the good is worthless.

3.3 Credit sale

Credit sales are similar to hire purchase agreements, with the crucial difference that legal ownership passes from the seller to the buyer *at the start* of the agreement.



A credit sale is a normal sale of a good together with an agreement that payment will be made by a series of regular instalments over a set period of time. Legal ownership passes to the buyer at outset.

Again, the payments under a credit sale can be thought of as part interest and part payment for the good being bought.

The seller cannot reclaim the goods even if the buyer defaults. All that the seller can do is to sue for payment through the courts as with any other debt. The seller has no more legal right over the good sold than over any of the defaulting customer's other possessions. Not surprisingly, hire purchase agreements are more popular with sellers, particularly when dealing with consumers of dubious creditworthiness.



Example

Mrs Grass is fed up with having long grass and wants to buy another lawnmower. She disguises herself and goes down to her local garden centre. They have a hardly used second-hand lawn mower on sale for £140 which she can pay for in cash. Alternatively, she can pay a deposit of £75 plus 12 monthly payments of £10 each under a credit sale agreement.

The extra £55 she has to pay can be considered as interest.

Mrs Grass uses the credit sale agreement, takes the lawn mower home and gives her lawn a long overdue cut. When she subsequently fails to make the payments under the credit sale agreement she gets lots of nasty letters from the garden centre threatening to take her to court. Eventually she *is* taken to court and ordered to pay the money owing. When she refuses the bailiffs come round and take away her television which is sold and the proceeds given to the garden centre. So, rather than watching the television, Mrs Grass sunbathes on her neatly kept lawn.



Question 2.5

Compare and contrast a credit sale agreement with a hire purchase agreement.

3.4 Leasing

Leasing is used by companies to obtain the use of machines, property and vehicles. The key distinction between leasing and credit sales or hire purchase agreements is that legal ownership does not change hands at all. There is no sale and no purchase. A lease is simply an agreement for the “lessee” to rent from the “lessor”.



A lease is an agreement where the owner of an asset gives the lessee the right to use the asset over a period of time, in return for a regular series of payments. Legal ownership does not change hands.

Sometimes, lease agreements do give the lessee the option to buy the asset at the end of the lease period. This then blurs the distinction between a lease and a hire purchase agreement, although under a lease the payment made to exercise an option to buy will reflect the remaining value of the asset. Also, the lessee does not *have* to buy the goods at the end.

There are two types of lease: operating leases and finance leases. The difference hinges on the length of the lease in relation to the expected economic life of the asset.

Operating leases

Under an operating lease, the owner of the asset will retain most of the risks associated with owning the asset. The lease will be for a period substantially shorter than the likely life of the asset.

Finance leases

Under a finance lease, the lessee takes on most of the risks associated with owning the asset. The lease will be for a period similar to the likely life of the asset. In effect, the lessee is buying the asset outright, but financing the purchase by paying rent rather than by paying a lump sum up front.

The present value of the payments under the agreement is shown in the lessee's balance sheet twice: as an asset and as a corresponding liability.

The reason for this treatment is explained when we look at accounting concepts and the workings of company balance sheets later in the course (starting in Chapter 7).



Example

The owner of a gold mine with an expected working life of 15 years leases the mine to a mining company for 3 years. In this case the owner of the gold mine still experiences the joy of seeing gold prices rise, and the misery of seeing them fall, because he has an asset which is heavily dependent upon the price of gold. This lease would be classified as an "operating lease".

If, on the other hand, he had leased the mine for 14½ years, he would have effectively sold it. The lease is being used only as a finance arrangement. The owner might be as interested in whether Norway win the Eurovision Song Contest again as in what happens to the price of gold. Such a lease is known as a "finance lease".

3.5 Bank loans



A bank loan is a form of medium-term borrowing from a bank where the full amount of the loan is paid into the borrower's current account and the borrower undertakes to make interest payments and capital repayments on the full amount of the loan.

Bank loans are usually secured on the borrower's assets using a floating charge, that is, all the assets of the company or the individual are assigned as security for the loan, although banks do sometimes grant unsecured loans. For a small business, the owner of the company may even provide a fixed charge on his house as security. Bank loans can be used to buy non-current assets such as machinery and vehicles.

The interest rate is usually variable (although fixed rate bank loans do exist). It might be set at a margin above the bank's own base rate, or as a margin over a benchmark interest rate such as LIBOR. (LIBOR stands for the London Interbank Offered Rate – it is the rate at which the banks will lend to each other, and is quoted daily in the *FT*). If LIBOR is used, the rate is re-calculated at discrete points in time in line with the particular term of LIBOR which is being used.



Example

A company arranges a £2,000,000 bank loan to buy a piece of machinery. The interest rate is set as being 3% above 3-month LIBOR. At outset, 3-month LIBOR is 6.2% (it is customary to quote as an annual rate of interest), so the company pays interest at a rate of 9.2% for the first 3 months. After the first 3 months, 3-month LIBOR is 6.9% *pa*, so the company pays 9.9% for the next 3 months, and so on.

Most bank loans in the UK are for a period of 7 years or less, although the terms offered vary. In general, UK banks have been reluctant to lend for longer terms, preferring companies to use loan capital and share capital for longer terms. In the rest of the EU, banks are more willing to lend longer term, and loan capital is less important.

Loan "facilities"

Over the last decade the range of types of bank loans that are available has widened a lot. For example, **loans are available where the borrower can take out the loan in instalments, giving the bank a few days' notice before each new bit is taken out.** Such arrangements are called "loan facilities" because they are a cross between an overdraft facility (discussed in Section 4) and a traditional bank loan. Interest is only charged on the amount outstanding and repayment schedules are more flexible.

Other variations

Complex loans are available for large scale borrowing. For example:

- **multi-currency loans:** where the bank acts as a middle man and arranges to borrow money in whichever currency looks the best value to borrow in. The bank then swaps the loan into sterling or whatever currency is required.
- **syndicated loans: where the loan facility is provided by a group of banks.** This would be used where the sums to be borrowed are larger than any one bank would happily lend on a single project.



Question 2.6

Give some examples of situations where a syndicated loan might be considered.

4 Short-term company finance

In this section we consider the following types of short-term finance.

- bank overdrafts
- trade credit
- factoring
- bills of exchange
- commercial paper.

The last two are “securities” which means that they can be sold from one investor to another. All other types cannot be traded.

4.1 Bank overdrafts



An overdraft is a form of short-term borrowing from a bank where the borrower is granted a facility to draw money out of a current account such that it becomes negative, down to an agreed limit. The borrower pays interest only on the amount by which he or she is actually overdrawn. No explicit capital repayments are made.

As with bank loans, **overdrafts made to companies are usually secured by a floating charge**. Interest rates are almost always variable, often on a daily basis. **The interest charged on an overdraft will usually be higher than on a loan of equivalent amount**. However, an overdraft is more flexible and the borrower pays interest only on the amount of the facility that is actually used. The borrower does not have to use the facility.

Banks like the use of overdrafts to be restricted to short-term working capital needs, for example to cover seasonal variations in a company’s need for finance, *eg* for buying stock ahead of the peak selling period. In practice, many businesses seem to have overdrafts that have been in existence for long periods of time.

Overdraft facilities usually need to be re-negotiated annually. Unlike bank loans, **a bank can demand immediate repayment of an overdraft with no notice**. This makes a company that borrows on overdraft for long-term purposes (*eg* to build a factory) vulnerable to a bank’s continuing support. It is often lack of liquidity (*ie* shortage of cash) with an overdraft being called in that causes business bankruptcy, not fundamental lack of profitability.

**Question 2.7**

Which is likely to be more expensive: a bank loan or a bank overdraft?

4.2 **Trade credit**



Trade credit is an agreement between a company and one of its suppliers to pay for goods or services after they have been supplied.

Trade credit is available from almost all suppliers of goods and services to their business customers. Typically, after goods are delivered, the business customer will be sent an invoice demanding payment within a set period, *eg* 28 days or 91 days. This usually forms part of a supplier's normal terms of business.

In most cases no explicit interest is charged. In many industries, late payment is so common that explicit discounts can be negotiated for not using trade credit, in effect giving discounts for “cash on delivery”.

In practice, businesses often try to pay later than the date stated on the invoice. Suppliers often have to devote considerable resources to chasing up late payers. Many owners of small businesses complain that they are pushed to the point of bankruptcy by business customers who fail to pay up on time.

Using trade credit to the full is a way for businesses to obtain “free” finance. The problem with using (or more likely abusing) trade credit is that it can damage a company’s relationship with its suppliers.

4.3 **Factoring**

Trade credit can cause problems for the suppliers of goods. Often they will have a higher overdraft than they would otherwise need. An alternative way of financing the trade credit that they have to give is to use factoring.

There are two types of factoring: “non-recourse factoring” and “recourse factoring” (or “invoice discounting”).

Non-recourse factoring



Non-recourse factoring is where the supplier sells on its trade debts to a factor in order to obtain cash payment of the accounts before their actual due date. The factor takes over all responsibility for credit analysis of new accounts, payment collection and credit losses.

As well as sending invoices to its customers, the supplying company sends an invoice to its factoring house. The factoring house then immediately pays over a fixed amount, for example 85%, of the value of the invoices to the supplying company. The 15% discount will reflect:

- interest on the money advanced: the customer who has been invoiced will not pay the factoring house for some time whereas the factor has paid the supplying company immediately
- the administrative costs of the factoring house: they will have to spend time chasing up unpaid invoices
- credit risk: if the customer never pays up, it is the factoring house that loses out

Using a factor gives the supplying company money earlier than if it had to wait to be paid, protection against bad debts, and an administrative service. However, the factor will want to get the customers to pay up as soon as possible, so may put excessive pressure on the supplying company's customers. This could have a negative effect on the supplier's future business with these customers.

Recourse factoring

A copy of the invoice is sent to the factor who then gives the supplying company the money up front equal to, say, 85% of the invoices it sends out. However, the supplying company is still responsible for collecting its debts (so its customers are not contacted by the factor). When the supplying company eventually gets paid by a customer, it passes the money on to the factor.

The factor has no control over the debt collection process, so it charges the supplying company interest on the 85% of the invoice that it has paid from the date the advance was made to the date that the supplying company gives the factor the money.

The factor and the supplying company then settle up by the amount:

$$\text{amount advanced} + \text{interest accrued} - \text{amount of invoice}$$

being paid by the supplying company to the factor (or *vice versa* if this amount is negative as will usually be the case).



Example

Company R sends out an invoice for £100 to one of its customers. At the same time, it sends a copy of the invoice to its factors, Eezeekash Ltd, in return for the sum of £85. Six months later, Company R's customer pays the invoice, and Company R sends the £100 to Eezeekash. During that six-month period, interest of £8.50 has been incurred on the loan. Eezeekash settles up the transaction by sending £(100 – 85 – 8.50) = 6.50 to Company R.

In this example, the company received short-term finance in return for an interest charge of £8.50, which represents the profit made by the factor on the transaction.



Recourse factoring only provides early payment of invoices.

It is a loan which is secured against the invoices, and has a value which automatically fluctuates with the amount that the company sells. In other words, the more invoices the company sends out, the more finance it receives from the factor.

Credit risk remains with the original supplier.

4.4 Bills of exchange

Suppose that company *S* supplies some good or service to company *C* on three month credit terms (*i.e.* *C* does not need to pay immediately, but agrees to pay *S* in three months time).

Rather than just invoicing *C*, *S* can draw up a formal bill and ask *C* to sign it. (*S* is known as the “drawer” of the bill and *C* is known as the “drawee” or, once *C* signs, the “acceptor”).

The bill that S draws up for C to sign might look like this

	Payee: Company S Side Street Sutton Surrey SM6 6SS 9/7/12
Three months hence, pay to me or my order the sum of four thousand three hundred pounds sterling only (£4,300).	
To: Company C Coal Close Chester Cheshire CH3 3CH	
Signed _____ (Mr C Collins, director of Company C)	

Such a bill is known as a “trade bill” or an “acceptance”.

The reasoning for getting C to accept a bill, rather than just using a normal invoice, is that S will subsequently be able to sell the bill if it needs cash. Suppose that S needs the cash quickly. It *might* be able to immediately sell the bill to a discount house (a financial institution that specialises in dealing with bills) or a bank which would then be able to present the bill to C in three months time and so receive the stated payment from C .

However, in most cases a discount house or a bank will not know company C and will not want to take on the unknown credit risk. So, before the bill is bought, most trade bills have to be guaranteed by someone. An investment bank will guarantee the bill, so that if company C defaults, the investment bank will pay up instead. Once an investment bank has endorsed the trade bill, it becomes known as a “bill of exchange” or a “bank bill”. The cost of getting an investment bank to endorse a bill of exchange depends upon the creditworthiness of C (*ie* the first “name”).

Bills of exchange are known as “two name” papers because they carry both the name of the company which owes the money and the name of the accepting bank.

Where the endorser is an “eligible” bank, the bill is known as an “eligible bill of exchange” which is a very secure investment. An eligible bank is an investment bank whose endorsed bills of exchange are eligible to be sold to the Bank of England.

An eligible bill of exchange can then be sold on to a discount house or a bank which will pay a price below the face value of the bill. The discount rate used for this calculation will be very close to the then current rate of discount on Treasury bills (a type of risk-free government security).



A bill of exchange is effectively a claim to the amount owed by a purchaser of goods on credit and may be “accepted” by a bank (for a fee). This means that the bank guarantees payment against the bill to whomsoever holds the bill at maturity. The bill can then be sold to raise short-term finance.

4.5 Commercial paper

Commercial paper is a form of short-term borrowing by large companies. From the companies' perspective, issuing commercial paper is an alternative to overdrafts or short-term bank loans. A piece of commercial paper might appear as follows:

On surrender of this note to the registered office of Company D plc on or after 15 March 2012, the holder will be entitled to receive payment of five hundred thousand pounds sterling (£500,000).

Company D
Dittisham
Dartmouth
Devon
DD1 1DD

Valid only if the seal of Company D appears here:

Commercial paper is a type of bearer document, *ie* there is no register of holders. Payment is made to whoever presents the piece of paper at the end of the term. Commercial paper is issued at a discount and later redeemed at its face value. For example, the piece of commercial paper shown above might have been issued at a price of about £470,000 on 15th July 2011.

By buying a new issue of commercial paper, investors are effectively lending money to companies for an agreed period (ranging from 1 week to 1 year). The effective rate of interest paid by the borrowing company will be slightly higher than the equivalent rate on a risk-free investment (such as a Treasury bill). The size of the “margin” over the risk-free rate of interest will depend on the company’s credit rating.

Commercial paper is not listed on the Stock Exchange but can still be bought and sold quite easily. There is a large market for commercial paper in the US. Euro-commercial paper also exists, and is traded internationally over the telephone in a similar way to Eurobonds. In the UK, there is Sterling Commercial Paper. Other countries also have their own domestic markets for this type of borrowing.

These instruments may be described as “single-name”. The security is provided only by the company issuing the paper (*ie* borrowing the money). This contrasts with bank bills described above which have two names: the issuer and the bank that endorses the bill.

Companies that wish to raise finance by issuing sterling commercial paper have to meet certain minimum standards. Issuing companies must:

- **be listed on the London Stock Exchange.**
- **issue a statement to confirm that they comply with the requirements of the Stock Exchange and that there have been no adverse changes in the company’s circumstances since they last published accounts in accordance with Stock Exchange rules.**

The minimum size in which sterling commercial paper can be denominated is £500,000. The total size of an issue is typically about £50m (eg 100 lots of £500,000). Given that this is only for *short-term* finance, we are talking about *big* companies borrowing *large* amounts of money!



Commercial paper is a single name form of short-term borrowing used by large companies. It comes in the form of bearer documents for large denominations which are issued at a discount and redeemed at par.

**Question 2.8**

- (i) What are the advantages and disadvantages of hire purchase agreements and credit sale agreements from the point of view of the supplier?
- (ii) State the main distinction between an operating lease and a finance lease.
- (iii) State the main distinction between a bank loan and a loan facility.
- (iv) State the main distinction between a loan facility and an overdraft.
- (v) State the main distinction between a credit sale agreement and trade credit.
- (vi) What are the advantages and disadvantages of invoice discounting and non-recourse factoring from the point of view of the supplier?
- (vii) Describe how a company raises finance using:
 - (a) bills of exchange
 - (b) sterling commercial paperand indicate the most important differences between these two financial instruments.



Examiners usually ask for descriptions of the main forms of finance and comparisons between them. They might also ask you to think about the appropriate form of finance for a particular situation. For example:

“Trade credit and debt factoring are both used to provide businesses with short-term finance. Describe the main features of each.” (September 2011)

This page has been left blank so that you can keep the chapter summaries together for revision purposes.



Chapter 2 Summary

Types of business entity

There are four main types of business entity: the sole trader, the partnership, the limited company, and the limited liability partnership.

A *sole trader* is a business which is owned by one person and which is not a limited company. Sole traders have unlimited liability for their business debts.

A *partnership* is a business which is owned by more than one person and is not a limited company. All the partners are jointly and severally liable for any business debts.

A *limited company* is a business set up under Companies Act legislation which has a legal identity separate from the owners of the business. A company is owned by its shareholders. Their liability is limited to the fully paid value of their shares.

A *public limited company* sells share to the general public and has an issued share capital of at least £50,000. Public companies can apply for a listing on the Stock Exchange.

A *private limited company* is a company that is not a public limited company. Private companies' shares cannot be listed on the Stock Exchange.

A *limited liability partnership* (LLP) is owned by its members but has a separate legal identity. The members benefit from limited liability. The members are free to agree amongst themselves the relationship between them.

Pros and cons of limited companies

Limited liability makes it easier for a company to raise capital. This is particularly important for business ventures where there is a risk of incurring substantial debts, or businesses which need to raise large amounts of finance from many people.

The main disadvantage of limited companies is that creditors may not get their money back if the company is wound up. Also, ownership is often divorced from control.

Medium- and short-term company finance

A *hire purchase* agreement is an agreement firstly to hire a good for a period of time making regular rental payments, and then to buy the good at the end of the rental period. Legal ownership passes to the buyer only when the final payment is made.

A *credit sale* is a normal sale of a good together with an agreement that payment will be made by a series of regular instalments over a set period of time. Legal ownership passes to the buyer at outset.

A *lease* is an agreement where the owner of an asset gives the lessee the right to use the asset over a period of time, in return for a regular series of payments. Legal ownership does not change hands.

A *bank loan* is a form of medium-term borrowing from a bank where the full amount of the loan is paid into the borrower's current account, and the borrower undertakes to make interest payments and capital repayments on the full amount of the loan. A *loan facility* is a more flexible form of borrowing from banks.

An *overdraft* is a form of short-term borrowing from a bank where the borrower is granted a facility to draw money out of a current account such that it becomes negative, up to an agreed maximum limit. The borrower pays interest only on the amount by which he or she is actually overdrawn. No explicit capital repayments are made, although the bank can call in the overdraft at any time.

Trade credit is an agreement between a company and one of its suppliers to pay for goods or services after they have been supplied.

Non-recourse factoring occurs when a supplier sells on its trade debts to a factor. The factor takes over responsibility for the collection of the debts. Under *recourse factoring*, the supplier keeps responsibility for collecting its own debts.

A *bill of exchange* is a negotiable instrument. It is issued by a company, accepted by the receiver of a good, and guaranteed by an investment bank. Bills of exchange may be referred to as two-name instruments. The supplier may sell the bill to a discount house for cash rather than waiting for the acceptor to pay the bill at the end of the stated time period.

Commercial paper is a type of bearer document for short-term borrowing. It is suitable for large companies who wish to raise a lot of short-term cash. Commercial paper is a single-name instrument, *ie* it is not guaranteed by a bank, so the issuing companies have to meet certain minimum requirements.

Chapter 2 Solutions

Solution 2.1

A sole trader has unlimited liability. The whole of the owner's personal wealth is at risk if the business runs into debt and is sued.

In a partnership there is unlimited liability. Partners are jointly and severally liable for the debts of the business. Their entire personal wealth may be at stake if the partnership is sued successfully.

A limited company is owned by shareholders. Shareholders' liability is limited to the fully-paid value of the shares they own. Creditors cannot claim payment from the shareholders' personal wealth.

In a limited liability partnership, each member's liability is limited to the amount that he or she put into the business.

Solution 2.2

	<i>Partnership</i>	<i>LLP</i>	<i>Limited company</i>
<i>Source of finance</i>	Partners	Members	Shareholders
<i>Legal identity</i>	Not separate	Separate	Separate
<i>Liability</i>	Unlimited	Limited	Limited
<i>Documentation</i>	None	Partnership agreement recommended; must be registered at Companies House and granted a certificate of incorporation.	Memorandum and Articles of Association and Form IN01; must be registered at Companies House and granted a certificate of incorporation.
<i>Disclosure</i>	None, though the accounts will be needed by HMRC to calculate each partner's tax liability.	Rules on disclosure; must produce audited accounts if above a certain size. HMRC needs accounts to calculate tax liability.	Rules on disclosure; all companies above a certain size must produce audited accounts.
<i>Tax</i>	Partners pay income tax.	Members pay income tax.	Companies pay corporation tax.

Solution 2.3

People may be reluctant to become involved as a part owner of a partnership since they risk their entire personal wealth. With limited liability people should be much more willing to provide capital.

PLCs have to comply with certain rules regarding the standards of accounts, which may give investors more confidence in the company.

Where shares are quoted on an exchange, their value is easily determined. If the company has to raise finance by selling shares, the price can be quickly negotiated. A partnership may have difficulties determining the “value” of a part ownership.

Solution 2.4

The main factors to consider when deciding on the type of business organisation to set up with your friend are:

the need for finance and the amount of finance you are able to contribute – the more you need and the less you have, the more likely it is that you will consider setting up a company.

the ease of raising finance in the future – the greater your plans to expand, the greater the tendency to set up a company.

liability for debts – the greater the possibility of running into debt, the more likely you are to consider setting up a company.

ease of setting up – the quicker and cheaper you want the set up to be, the more likely you are to set up a partnership.

disclosure – the more reluctant you are to disclose information about the business, the more likely you are to set up a partnership.

control of the business – the greater the amount of control you want to retain, the more likely you are to set up a partnership. However, you could set up a private limited company with just a few (even two) shareholders if you wish to retain tight control.

roles and responsibilities – the firmer you wish the roles and responsibilities to be defined, the more likely you are to set up a company. However, you could have a firm partnership agreement. This is linked to the trust you have in your friend.

the type of business – the greater the need to display commitment in order to gain trust, eg accountants, solicitors, the greater the tendency to set up as a partnership.

NB. The LLP might be a good compromise!

Solution 2.5

Ownership of asset – Under a hire purchase agreement, ownership of the asset does not pass to the buyer until the last payment is made. Under a credit sale agreement the ownership passes immediately.

Structure of payments – Both involve a series of (usually fixed) payments over a period of typically up to ten years.

Event of default – Under a hire purchase agreement the owner can reclaim the asset. Under a credit sale, the recipient of the payments must sue to reclaim the outstanding amounts.

Solution 2.6

- In 2010, and again subsequently, the European Union and the International Monetary Fund agreed a bailout package for Greece, involving loans of €240 billion in total.
- Banks lending to the companies that built the Millennium Dome would have loaned on a syndicated basis.
- The venues and the infrastructure for the 2012 London Olympics were funded by the Department for Culture, Media and Sport, the Greater London Authority and the National Lottery.

Solution 2.7

A bank overdraft will be more expensive. The reasons are:

- Overdrafts are more flexible for the borrower. This means that they are less predictable for the lender.
- Loans are normally secured on assets of the company. Overdrafts are sometimes unsecured and therefore more risky for the lender. (More risk means higher return expected.)
- Loans are longer term, which may mean that interest rates are slightly lower than interest rates for overnight borrowing (which is effectively what overdrafts are).

Solution 2.8(i) ***Hire purchase and credit sale agreements****Hire purchase*

- Advantage to supplier: the supplier retains ownership of the goods until the end of the term of the agreement and can reclaim them if the buyer does not keep up the repayments. Seller receives interest on top of the price of the goods.
- Disadvantage to supplier: few disadvantages (although not as good as getting the cash up-front).

Credit sale agreement

- advantage to supplier: seller receives interest in addition to the price of the goods.
- disadvantage to suppliers: legal ownership of the goods passes to the buyer at the start of the agreement. If the buyer defaults on the repayments, the seller has to sue the buyer through the courts.

(ii) ***Operating and finance leases****Operating lease*

The owner of the asset retains most of the risks associated with ownership of the asset. The term of the lease will be substantially shorter than the expected useful life of the asset.

Finance lease

The lessee takes on most of the risks and rewards of ownership. The term of the lease will be close to the expected useful life of the asset.

(iii) ***Bank loan and loan facility***

Bank loan

Here, a fixed sum is lent to the borrower on a fixed date for a specified term.

Loan facility

A sum is made available to the borrower. The borrower may draw the sum in instalments, giving the bank a few days' notice of each instalment. In addition, there may be flexible repayment arrangements. Interest is only charged on the amount outstanding.

(iv) ***Loan facility and overdraft***

Loan facility

A sum of money is available for borrowing. This sum can be drawn in instalments and added to the borrower's bank account. The bank will need a few days' notice before each instalment is made. There may be flexible repayment terms.

Overdraft

The borrower is granted a facility to draw money out of a current account so that its balance becomes negative, subject to an agreed maximum limit. The borrower does not have to give any notice to be able to use the overdraft. There are no set repayment terms. However, the bank has the option to demand immediate repayment of the overdraft at any time with no notice.

(v) ***Credit sale and trade credit***

Credit sale

This will be repaid by regular instalments over a period of time. The instalments will include an element of interest.

Trade credit

This means that a company can pay its supplier for goods and services after they have been received. Typically, business customers will settle their bills 30 to 60 days after they have been invoiced. The bills are then settled in full, in one payment. No explicit interest is charged, although suppliers may give discounts for "cash on delivery".

(vi) ***Invoice discounting and non-recourse factoring***

Invoice discounting (recourse factoring)

- advantage to supplier: supplier receives a certain proportion (say 85%) of the amount it bills immediately from the factor.
- disadvantage to supplier: the supplier still has to provide its own credit administration and collect its debts. It bears the credit risk. In addition it has to pay interest to the factor, based on the amount of time between the date the advance was made and the date that payment was received from the customer.

Non-recourse factoring

- advantage to supplier: supplier receives a certain proportion (say 85%) of the amount it bills immediately from the factor. In addition the factor gives a full administration service and will take on the credit risk associated with the invoices.
- disadvantage to supplier: the main disadvantage is that the factor wants only to get paid as soon as possible. It has no particular interest in maintaining good relationships with the supplier's customers. It may therefore apply pressure to such an extent that the supplier loses goodwill and subsequently custom (although this may not be such a disadvantage if the customers were bad payers!).

(vii) ***Bills of exchange and sterling paper***

Bills of exchange

A company can issue a bill to one of its customers. If the customer accepts the bill, and it is guaranteed by an investment bank, the original company can sell the bill to a discount house for cash, rather than having to wait for the acceptor to pay up. Bills of exchange therefore provide short-term cash to companies.

Commercial paper

A company can issue commercial paper directly to investors. The company must meet certain requirements, such as being listed on the London Stock Exchange. The term of the commercial paper must be between one week and one year. The minimum size in which sterling commercial paper can be denominated is £500,000.

Both of these forms of borrowing are short-term negotiable financial instruments. The main difference between them is that bills of exchange must be guaranteed by an investment bank, and are therefore two-name instruments, whereas commercial paper is not guaranteed by a bank, and is therefore a single-name instrument. Bills of exchange can be issued by any company, whereas commercial paper can only be issued by large quoted companies that meet certain requirements.

Chapter 3

Taxation



Syllabus objectives

- (iv) *Describe the basic principles of personal and corporate taxation.*
1. *Describe the basic principles of personal taxation.*
 2. *Describe the basic principles of the taxation of capital gains.*
 3. *Describe the basic principles of company taxation.*
 4. *Explain the different systems of company taxation from the points of view of an individual shareholder and the company.*
 5. *Outline the basic principles of double taxation relief.*

0 *Introduction*

Chapter 3 looks at the various ways in which individuals and corporate bodies are taxed. The sections in this chapter are as follows:

1. personal taxation
2. company taxation
3. capital gains tax
4. other taxes
5. double taxation relief.

The discussion of taxation in this chapter will help your understanding of a number of other areas that you will study later, for example:

- the characteristics of investments and investors (Chapters 4, 5)
- the structure of accounts and how to analyse them (Chapters 8 and 12)
- the analysis of the structure of company capital (Chapters 15 and 16).



In the past, the examination has tested *knowledge* of personal and corporate taxation, and the *ability to analyse the tax implications* of particular choices made by investors and companies.

At this stage, concentrate mainly on understanding the basic principles. The tax implications of investors' choices are covered in Chapter 4, and the tax implications of companies' choices are discussed in Chapters 4, 8, 12 and 16.



Note that the UK tax rates and allowances mentioned in the notes below are subject to change. It is likely that the government will make alterations to the tax system during the lifetime of these notes. We would advise you to be aware of changes to the tax system, although remember that it is only the Core Reading that is examinable.

1 Personal taxation

Personal taxation is typically levied on all of the financial resources of an individual such as:

- **income (whether earned – wages and salaries – or unearned – investment income and rent)**
- **profit from operating as a sole trader or partner**
- **inherited wealth**
- **investment gains**
- **value of assets held.**

Income tax is often one of the main sources of tax revenue for governments. Employed and self-employed (sole traders and partners) pay income tax.

In addition, most countries also levy social security contributions on earnings. In the UK, national insurance contributions count towards certain social security benefits such as incapacity benefit and retirement pensions.

Governments may also introduce:

- a tax on capital gains, *ie* a tax on the gain made from selling an asset for more than it cost. We shall look at capital gains taxation in Section 3.
- a wealth tax, *ie* a tax on the amount of wealth, such as property, owned. In the UK, the Council Tax is a tax based on the value of property. It is used to raise money for local government.
- an inheritance tax, *ie* a tax on the amount transferred on death. There is usually a generous allowance so that most of the population are not caught by this tax. Wealthy individuals often place their assets in trust in order to avoid such taxes.

1.1 Considerations

The state has to decide what to tax and how much to tax. It also has to consider the practical issues of collecting the tax.

Taxing cashflows

In many countries taxation is limited to cashflows, since these are indicative of cash being available to finance the tax payable. Where tax is determined on the value of assets, there is the possibility that these assets may have to be realised in order to generate the funds needed to pay the taxes. In other words it is easier to tax income than wealth because income is an accessible cashflow. Wealth is often tied up in large indivisible units such as a large property and it is sometimes necessary to sell a large inheritance in order to pay the inheritance tax on it.

Taxing in arrears

In addition to ability to pay, governments will also seek to ensure that citizens have sufficient retained income and wealth to meet their essential needs. It is common, therefore, to assess tax liabilities *in arrears* taking into account all relevant sources of wealth and/or income, and to exempt some basic levels of income or wealth from the calculations.

However, there may be some arrangement whereby tax is levied at source on income throughout the tax period in order to accelerate tax flows to the government. In the UK, for example, most employed people pay tax weekly or monthly through the PAYE (pay as you earn) scheme. **In this case, the final assessment for the period will establish the final payment (or credit) needed to generate the correct overall tax payments.** Individuals might receive a tax rebate at the end of the year if they have paid too much in tax or be asked to pay more tax if they have paid too little. The self-employed in the UK pay income tax twice a year, in January and July. An estimate is made of the current year's earnings and when the actual earnings are known, an amendment is made.

Taxing once

In general, governments will seek to ensure that revenue flows are taxed only once in the hands of the recipients. However, if taxes are also levied on wealth or the value of specific assets, then “double” taxation will be likely (since the assets may well have been purchased using after-tax funds).

1.2 Calculating taxable income

The government may make adjustments to total income to arrive at taxable income, *ie* that part of income subject to tax. The government might exempt some sorts of income and expenditure from tax, so there might be some *tax-free income* and *tax-free expenditure*. On the other hand they might treat some sorts of benefits as *income in kind* and therefore as taxable income. If any income has been received from investments and savings this must be added on to total income, even if tax has been deducted at source, in order to assess the correct amount of tax to pay.

Finally, there is usually an *allowance*, *ie* an amount that a person is allowed to earn before paying any tax. This is deducted from total adjusted income to arrive at taxable income.

Tax-free income

Certain items of income are tax-free. For example, in the UK the following are tax-free:

- **most profits from gambling**
- **most forms of social security benefit**
- **income from certain types of investment such as an Individual Savings Account (ISA).**

In the UK most forms of means-tested benefits, such as income support, are tax-free and most benefits that are not means-tested, such as pensions, are taxable. Means-tested benefits are those which require a person's income (or means) to be assessed.

Tax-free expenditure

Tax relief may also be available on certain forms of expenditure such as contributions to an approved pension scheme and charitable gifts. In general, tax relief works to reduce a person's taxable income.

Income in kind

Where an employee receives additional “fringe” benefits as well as a wage or salary, the value of the benefits is usually included in the definition of taxable income.

For example:

- company cars available for private use
- medical insurance premiums
- free housing
- subsidised mortgages (*ie* a reduced rate of interest payable on mortgage finance).

Investment income deducted at source

Investment income often has income tax deducted at source. For tax purposes, the grossed up equivalent is included as taxable income and the tax deducted at source can be offset against the person’s tax liability.

For example, interest from a building society account is often received net of tax, the building society having already paid tax to the tax authorities. When assessing a person’s tax liability, the tax authorities will need to add the gross amount of interest received to the total income received from all other sources but will then offset the tax paid by the building society against the person’s tax liability.

Similarly, in the UK, income in the form of company dividends are paid net of tax (for example, net of 10% in the UK), with an attaching tax credit for the recipient. This is termed *franked investment income*. The tax credit cannot be reclaimed by the investor and those who are subject to a higher rate of tax on dividend income have to pay additional tax.

Allowances

Consideration must be given to:

- **The underlying “tax-free” level of income or capital which may need to reflect personal or family circumstances. This is usually catered for using a personal allowance which is deducted from income before determining the liability to tax.**
- **Other additional allowances for example age allowances for older taxpayers, an additional allowance for married couples.**

1.3 Tax rates

Consideration must be given to whether marginal tax rates should increase, remain constant or decrease as the individual's taxable base varies. The marginal tax rate is the proportion of an additional unit of income that is taken in tax. In the UK, for the tax year 2013-14, the marginal tax rates are 20% (the basic rate), 40% (the higher rate) and 45% (the additional rate). The tax rates are applied to bands of taxable income. As income increases and is taken into a higher band, the higher marginal rate applies to the additional income earned.



Question 3.1

How is taxable income calculated?



Question 3.2

Assume that the personal allowance is £5,000, and that the marginal tax rates are 20% for the first £40,000, and 40% for taxable income above this. Assuming there are no adjustments to total income, how much tax will a single person earning £50,000 pay? What proportion of total income is paid in tax?

2 Company taxation



Companies are liable to corporate income tax (corporation tax) on their taxable profits.

2.1 Calculating taxable profit

Taxable profits usually include both income (less allowable expenses) and capital gains. We will look at the assessment of capital gains in Section 3.

Accounting profit

The starting point for a company's tax assessment is "profit on ordinary activities before taxation". We will look at the income statement in Chapter 8. The figure in the accounts is called the *accounting profit*. Very briefly, this is calculated as follows:

	Sales revenue
<i>less</i>	<u>Expenses</u>
	Operating profit
<i>plus</i>	<u>Non-trading income</u> (interest, dividends, capital gains)
	Profit before tax and interest
<i>less</i>	<u>Interest paid</u>
	Profit before tax

After tax has been deducted, the company then distributes some of the after-tax profits to the shareholders in the form of a dividend and retains the rest in the business as retained profit.

Taxable profit

This figure (accounting profit before tax) **then needs to be adjusted** since the rules for computing *taxable* profits are not always the same as the rules that will have been used for computing accounting profits.

The main adjustments are:

- **Add back any business expenses or potential expenditure shown in the accounts which are not allowable for tax** (eg entertainment of customers, fines for illegal acts).

- **Add back any charge for depreciation, and instead subtract the “capital allowances”** Depreciation is an allowance for the using up of capital equipment during the year’s production. It is treated as a cost in the income statement. Companies can choose a number of ways of calculating this depreciation allowance but the tax authorities have to treat all companies consistently and so they use their own capital allowances. Depreciation is discussed in more detail in Chapters 8 and 9.
- **deduct any special reliefs, eg research and development costs may be able to be deducted immediately.**

In addition, the company might not have to pay tax on dividends earned from its shareholdings in other companies. (See Section 2.3 below.)

2.2 ***The rates of tax***

In the UK, for the tax year 2013-14, the standard rate of corporation tax is 23%. This is due to fall to 21% for tax year 2014-2015. Small companies pay a lower rate of 20%.

Corporation tax rates around the world vary considerably. For simplicity, the Core Reading and ActEd notes often use a corporation tax rate of 30% as a proxy for the true rate of a company’s corporation tax.

2.3 ***Uses of the corporation tax system***

Since dividends are paid from profit after tax, some countries give relief to shareholders to ensure that dividends are not subject to both personal and corporate income tax.

Dividend income is known as *franked income*, ie income that has been taxed. Most governments give at least some credit to the shareholder for the tax that has already been paid. In this way the shareholders are *imputed* or ascribed at least part of the tax, ie they are deemed to have paid at least part of the tax

Such an “imputed” tax system ensures that there is no disadvantage experienced by the shareholder when a company distributes profits. Without such a system, the company would pay corporation tax on its profits and the shareholder would, in addition, pay income tax on the dividends. This would discourage firms from distributing profit as dividends.

However, governments sometimes seek to incentivise companies to retain and reinvest earnings. The government may wish to pursue a faster rate of economic growth and therefore may try to encourage greater investment by firms. Since a large proportion of funds for new investment comes from retained profit, the government could use the tax system to encourage firms to plough their profit back into the business.

This may be achieved by levying higher taxes on dividends than on “retained” profits, or by allowing tax relief for new investment (such as the “capital allowances” mentioned above). Profits flowing from such investment would then be taxed in the usual way. A system that has been used in the past in the UK is one that allows “accelerated depreciation” of new capital equipment. When a company buys new capital equipment, *eg* a new machine, it estimates how long the equipment will last and “writes off” part of its value as depreciation (and therefore as a cost) each year. The cost of the machine is therefore spread over the life of the machine. Accelerated depreciation allows the company to depreciate a large part of the machine in the early years, thus increasing the company’s costs, decreasing its profit and therefore decreasing its tax liability in the early years. Profitability and therefore tax liability will increase in the later years.

A particular example of this relates to pension provision, where the government may seek to encourage private and institutional pension arrangements by offering tax reliefs (or even subsidies) on contributions and, possibly, investment earnings within the pension scheme. While the final pension benefit will be subject to tax, when paid, the individual recipient will often benefit from a lower personal tax regime when in retirement. In some countries, such tax-advantaged funds are available for other purposes (such as house purchase, medical expenses or education and training finance).



Question 3.3

What are the three main adjustments that have to be made to accounting profit to arrive at taxable profit?



Question 3.4

How can the government use the corporation tax system to encourage or discourage a particular activity?

3 Capital gains tax



Individuals and companies are typically subject to capital gains tax on chargeable gains.

Chargeable gains normally fall into the tax year of assessment during which the gain is realised so that, again, the funds to pay the tax should be available.

3.1 Calculating chargeable gains

Capital gains on most assets are chargeable. However, there may be exceptions.

Exceptions

For example, in the UK the following assets are free from capital gains tax:

- private motor cars
- a main private residence
- foreign currency obtained for personal use
- British Government securities and other qualifying fixed-interest stocks
- small tangible moveable assets (or chattels) worth less than £6,000 (eg furniture, jewellery, paintings, antiques etc).

Transactions between a husband and wife do not normally attract capital gains tax.

Basic definition

A chargeable gain is typically defined as:

$$\text{sale price} - \text{purchase cost}$$

The sale price can be reduced to reflect any costs associated with the sale. The purchase cost can be increased by any costs associated with the purchase, and any expenditure made to enhance the value of the asset during the period the asset was held. In normal circumstances, the purchase cost would be the original cost of the asset.

There may be further deductions, depending on whether the tax is being applied to companies or individuals.

Indexation allowance

Some countries have allowances to remove the inflationary element of any gain, or to encourage individuals to retain assets.

Without such an allowance, the formula above would mean that increases in *nominal* asset values due to inflation would be taxable.

It is common for *companies* to offset inflation by deducting a further *indexation allowance*.

In the UK, this is calculated with reference to the Retail Price Index (RPI), which reflects the rise in the general level of prices of goods in the UK. Indexation allowance tables are published monthly by HMRC.

Since April 2008 in the UK, for *individuals* (including sole traders and partners), no allowances are made for inflation.

Capital losses

The above chargeable gain calculations may result in a negative number. Such an amount is known as a “capital loss”.

Capital losses can normally be offset against capital gains in the same year.

Capital losses cannot, however, be offset against any other form of taxation.

Any “unused” capital loss may be carried forward to be offset against capital gains in any future year(s).

The rules for offsetting capital losses do not apply if the loss is only caused by the indexation allowance.

Allowances

In most countries, individuals are given an allowance each year and only pay capital gains tax on chargeable gains in excess of this amount. For the tax year 2013-2014, the *annual exempt amount (AEA)* in the UK is £10,900. Companies do not usually receive an allowance.

3.2 The rates of tax

For individuals, the amount chargeable to capital gains tax could be added on to the income liable to income tax and charged to CGT at the individual's marginal tax rate. In the UK, from 6 April 2008, a flat rate of 18% or 28% will apply to capital gains above the allowance, depending on the level of taxable income.

The taxable gain is treated as additional income; and the gains that fall in the basic tax band are taxed at 18% and any remaining gains are taxed at 28%.



Example

Assume that the capital gains allowance is £10,000 and the capital gains tax rate is 18% on gains that fall within the basic rate tax band and 28% on any further gains.

After income tax, Mr X has £1,000 of the basic tax band left unused. He makes a chargeable gain of £5,000. How much capital gains tax does he pay?

Nothing, because he would only pay CGT on chargeable gains in excess of £10,000.



Question 3.5

Assume the same tax system as given in the above example. Mrs Y has £1,000 of the basic tax band left unused. She makes a chargeable gain of £15,000. How much capital gains tax does she pay?

Companies pay corporation tax on chargeable gains at the rate at which they normally pay corporation tax.

**Question 3.6**

Which of the following items would be subject to capital gains tax? (Justify your answers.)

1. The sale of Mr X's house.
2. The sale of a house that Mr X bought for his long-lost aunt to live in.
3. The sale of Mr X's car (a vintage Rolls Royce).
4. The sale of Mr X's collection of antique silver snuff boxes (valued at £18,000).
5. The transfer of Mr X's holiday cottage to his wife.

**Question 3.7**

Are the following true or false?

- (i) Chargeable gains made by individuals are taxed at their marginal rate.
- (ii) Capital losses can be offset against profit made from normal trading activities.
- (iii) A husband and wife have an effective capital gains allowance that is double that of an individual.

4 Other taxes

Other categories of tax levied on companies and individuals include:

- **Stamp duty on contract documents.** For example, when an individual buys a house, he/she must pay stamp duty tax based on the value of the house.
- **Inheritance taxes**
- **Property taxes.**

Inheritance taxes and property taxes were discussed briefly in Section 1.

There may also be a system for levying tax on expenditure, either in respect of general expenditure (eg a sales tax, such as VAT in the UK) or on specific types of expenditure (eg customs duties and excise taxes).

A *sales tax* (as is used in the US) is collected only at the point of final sale to the consumer. *Value Added Tax* (as is used in the European Union, including in the UK) is collected at each stage of the production process according to the value added at each stage of the production process. These taxes are levied on most goods though there are usually exceptions.

Certain classes of “essential” expenditure, such as basic foodstuffs, may be exempted from sales taxes. In the UK, the standard rate of VAT is 20%, but domestic fuel and power is taxed at 5% and some items such as food and books are zero-rated.

Customs duties are taxes on imported goods. Imported goods are taxed in different ways in different countries. Such taxes often involve flat taxes based on the value of the goods imported, weight taxes, taxes based on the physical size of the goods and special taxes for certain industries such as the car industry based on emissions.

Excise duties are duties or taxes levied on goods produced and sold within the country, eg duties on petrol, beer, cigarettes.

Such specific taxes may be designed, additionally, to encourage certain patterns of consumer expenditure or to raise revenues for particular categories of government expenditure. For example, by taxing cigarettes the government could discourage smoking and hence improve health; by taxing petrol (and perhaps additionally subsidising public transport), the government could discourage the use of the private motor car and hence reduce congestion and pollution. The government could use all tax revenue from cigarettes for use in the health service.

5 Double taxation relief

Most countries have a double taxation agreement with other countries. The UK has “double taxation” agreements with many countries. These agreements prevent the same income being taxed in the country of origin as well as in the UK.



Double taxation relief (DTR) means that the local tax authority will allow companies and individuals with overseas income or capital gains to offset tax paid overseas against their liability to domestic tax on that income or capital gains.

The maximum offset is the rate of tax that would have been paid locally. Double tax relief cannot result in tax being reclaimed from the tax authorities.



Example

Assume a 23% rate of corporation tax in the UK.

1. XYZ (a UK company) earns the equivalent of £10,000 in Japan where it has been subject to 38% tax. In the UK, the remaining £6,200 of after-tax earnings will not be subject to further tax. However if the company has other earnings in the UK, tax will be paid in the usual manner to the UK authorities.

2. XYZ earns the equivalent of £10,000 in Iceland where it is subject to 20% tax. In the UK the £10,000 (or £8,000 after Icelandic tax) will be subject to an additional 3% tax. So, XYZ will end up with £7,700 after UK tax.



Question 3.8

Explain what is meant by “double taxation relief”.



Examination questions in the past have tended to be knowledge based. For example:

“Explain how a company’s UK corporation tax liability is calculated.” (September 2003 adapted)

You would need to discuss taxable profit and double taxation relief.



Chapter 3 Summary

Personal taxation

Personal taxation is levied on all the financial resources of an individual. The main sources are:

- income both earned (wages and salaries) and unearned (investment income and rent)
- profit from operating as a sole-trader or partner
- capital gains
- inheritance
- wealth, *eg* property.

Individuals (including partnerships) are usually subject to *income tax* and may, in addition, pay *social security contributions*.

Income tax is calculated with reference to *taxable income*.

Taxable income includes income received in kind, such as subsidised mortgages, and also gross investment income.

Income tax liability may be reduced by tax relief on certain forms of income, such as income from an ISA, and on certain forms of expenditure, such as contributions to an approved pension scheme.

A person's taxable income for a certain year will be reduced by any *allowances* to which they are entitled, *eg* personal allowance, age allowance.

Corporation tax

Companies are liable to *corporation tax* on their taxable profits. Taxable profits include both income (less allowable expenses) and capital gains. A company's *accounting profit* has to be adjusted to *taxable profit* by:

- adding back on any business expenses or potential expenditure that are not allowable
- adding back depreciation and deducting the capital allowance
- deducting any special reliefs, *eg* research and development.

The government can use the corporation tax system to encourage or discourage certain behaviour. For example, the government can encourage investment by taxing retained profit less heavily than distributed profit or it might encourage pension schemes by granting tax relief on pension contributions.

Capital gains tax

Individuals and companies are subject to capital gains tax on *chargeable gains*.

A chargeable gain is defined as: sale price – purchase cost

Capital losses can normally be offset against capital gains in the same year.

Individuals are usually given an *annual exempt amount*. For an individual in the UK, the rates are 18% and 28% depending on taxable income. Companies pay corporation tax on chargeable gains at the usual rate.

Double taxation relief

Most countries have a *double taxation agreement* with other countries. These agreements allow companies and individuals with overseas income or capital gains to offset tax paid overseas against their liability to domestic tax on that income or capital gains.

Chapter 3 Solutions

Solution 3.1

Taxable income is calculated as follows:

	income earned
<i>plus</i>	income in kind
<i>plus</i>	gross investment income
<i>less</i>	tax-free income
<i>less</i>	tax-free expenditure
<i>less</i>	allowance

Solution 3.2

There is a personal allowance of £5,000, so the person is only taxed on £45,000 of income.

<i>Tax rates</i>	<i>Tax bands</i>	<i>Tax due</i>
Taxed @ 20%	40,000	⇒ 8,000
Taxed @ 40%	5,000	⇒ 2,000
<i>Total</i>		£10,000

Total tax paid is 20% of total income. This is known as the average rate of tax.

Solution 3.3

The three main adjustments are:

- adding back on any business expenses or potential expenditure that are not allowable
- adding back depreciation and deducting the capital allowance
- deducting any special reliefs, *eg* research and development.

Solution 3.4

The government can:

- use a lower rate of tax on retained profit than on distributed profit to encourage investment
- allow pension contributions to be treated as an expense and grant tax relief to investment earnings within the scheme to encourage the setting up of pension schemes.

Solution 3.5

Mrs Y's chargeable gain is in excess of the annual allowance of £10,000. She will therefore pay capital gains tax on £15,000 – £10,000 = £5,000.

She has £1,000 of the basic rate allowance left so:

<i>Tax rates</i>	<i>Amount of gain</i>	<i>Tax due</i>
Taxed @ 18%	1,000	⇒ 180
Taxed @ 28%	4,000	⇒ 1,120
<i>Total</i>		£1,300

She will pay capital gains tax of £1,300.

Solution 3.6

The following items will be liable for CGT:

2. because the house was not Mr X's main residence
4. no exemption for snuff boxes! (because the collection is valued at more than £6,000).

The following items will not be liable for CGT:

1. assuming it is Mr X's principal residence
3. because CGT does not apply to private motor cars
5. because it is a transaction between a husband and wife.

Solution 3.7

- (i) False. The two rates are 18% and 28%.
- (ii) False. Capital losses can only be offset against capital gains: they cannot be offset against any other tax.
- (iii) True. Transactions between a husband and wife do not normally attract capital gains tax; therefore spouses can transfer assets between themselves to “double up” their allowance.

Solution 3.8

- Allows overseas tax paid in countries for which double taxation agreements exist to be offset against liability to domestic tax.
- Applies to individuals and companies.
- Applies to income and capital gains.
- The credit is equal to the lower of foreign tax paid and the UK tax due.

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Chapter 4

Financial instruments



Syllabus objectives:

- (iii) *Describe the structure of a joint stock company and the different methods by which it may be financed.*
2. *Describe the different types of loan and share capital.*
3. *Distinguish between authorised and issued share capital.*
- (v) *Demonstrate a knowledge and understanding of the characteristics of the principal forms of financial instrument issued or used by companies and the ways in which they may be issued.*
2. *Describe the characteristics, from an issuer's point of view of:*
- *debenture stocks*
 - *unsecured loan stocks*
 - *Eurobonds*
 - *preference shares*
 - *ordinary shares*
 - *convertible unsecured loan stock*
 - *convertible preference shares*
 - *warrants*
 - *floating-rate notes*
 - *subordinated debt*
 - *options issued by companies.*

0 Introduction

This chapter looks at the principal sources of long-term capital available to companies – debt and equity. We will consider the risk and return aspects of each type of finance from the viewpoint of the company raising the money (rather than the investor). However, we shall see that the attitudes of investors to different types of finance are critical in determining whether or not a particular method of finance could or should be used.

In Chapter 2 we looked at the legal basis of a company and some of the medium- and short-term forms of capital available to companies. In this chapter we concentrate on the long-term forms of capital which constitute by far the largest portion of company finance. In Chapter 3 we looked at the principles of personal and corporate taxation. This knowledge will be useful in this chapter when analysing the tax implications of particular methods of finance for both investors and for companies. In Chapter 6 we will continue our study of finance by looking at the process of raising finance and issuing shares.



In the past, the examination has tested *knowledge* of the main forms of long-term finance and the *ability to analyse for both investors and for companies* the relative merits of particular types of long-term finance.

1 **Loan capital (Debt)**

1.1 **Introduction**

A company issues loan capital to raise money from investors. In return, the company will pay the investor a stream of interest payments plus an eventual return of capital. The amounts of interest and capital payments to be made will be specified at outset (or at least a formula to calculate the payments will be set out). This contrasts with shares, where dividends are paid at the discretion of the company's directors.

UK listed companies often raise more finance each year by borrowing from investors by issuing loan capital than they raise by issuing shares. Long-term loan capital instruments are often referred to as "bonds", and short-term instruments as "bills".

Issues of loan capital may be listed on a stock exchange. This applies to both traditional and Eurobond issues (see later).

Holders of loan capital are creditors of the company and, unlike shareholders, they do not have voting rights. They receive specified "interest" payments which are a *cost* to the company, not a distribution of profits. On a winding-up they would rank equally with, or in some cases above, other creditors.

Features of loan capital

- **It is conventional to refer to loan capital in units of £100 nominal.** The nominal amount of a loan is often referred to as its "par value".
- **It is usual to express the interest payments as a proportion of the par value.** For example, a holder of £100 nominal of a 10% debenture will receive £10 interest per annum. The loan coupon payments are normally made every six months so this debenture would pay £5 every six months per £100 nominal held.
- **It is normal to issue loan capital at a price close to, or just below, par.** Unlike shares, there is no legal restriction on the issue price relative to par. So, £98, £99, £100, £101 etc are all possible issue prices per £100 nominal.
- **Almost all loan capital is redeemed at par.**
- As with shares, the market price of £100 nominal of loan capital need not be £100.
- Most loan capital is redeemable on a set date, often after 10 to 20 years.



Question 4.1

What is the total amount of cash you would receive if you purchased £200 nominal of a 6% government bond redeeming on 31 December 2022, and purchased on 1 January 2012?

Since bonds are tradable, the price of a bond varies with supply and demand for the bonds. One of the main influences on the price of a bond is the interest rate in the economy. There is a see-saw relationship between interest rates and the price of a bond.

Question 4.2

Suppose interest rates rise in the economy, what would happen to the demand for a fixed-coupon bond and hence what would happen to the price of the bond?

Variations

Most loan capital is redeemed at par on a set date and coupons are paid every six months. You may also come across the following variations:

- the capital repayment may be made at a time between two dates at the company's option.
- interest payments may be set as a fixed margin (*eg* ¾%) over a benchmark interest rate, *eg* six month LIBOR rather than as a fixed absolute amount. These are known as "variable rate issues".
- interest and redemption proceeds may be linked to an inflation index. These are known as "index-linked" bonds.
- interest payments may increase in steps in a similar way to stepped preference shares (see later) *eg* 6% for three years, 8% for the next three years and so on. These are known as "stepped" bonds.
- the company may be able to repay the loan at *any* time (known as a "call option" on the bond).
- the loan stock holder may be able to demand repayment at any time (known as a "put option" on the bond).

- capital repayments might be made throughout the term of the loan (like a capital and repayment mortgage). Such arrangements are known as “sinking funds”. They are now rare.

The rights of bondholders

The rights of holders of loan capital will be set out in a loan agreement drawn up when the loan is issued. In most cases, a trustee is appointed to act on behalf of the loan stockholders. The trustee is normally a corporate body such as a bank or insurance company. The legal documentation setting out the obligations of the issuing company to the loan stockholders is known as the Trust Deed.



Question 4.3

What details might you expect to find in the trust deed of a bond issued by a company?

The main characteristics of debt or loan capital were discussed above. We now consider some categories of loan stock.

1.2 Debenture stocks

Description



Debentures are loans which are secured on some or all of the assets of the company.

This means that, if the company fails to make one of the coupon payments or the capital repayment, various actions are available to the stockholders. They may:

- **appoint a receiver to intercept income from the secured asset(s) (eg rent on property)**
- **take possession of the secured asset to sell it in order to meet their debt** (with any surplus being returned to the company). This action is called “foreclosure”.

There are two types of debenture:

(i) Mortgage debenture (fixed charge)

A fixed charge means that there are specific secured assets mentioned in the legal documentation for the mortgage debenture.

The company will be able to sell or make major alterations to the secured asset only with the mortgage debenture holders' permission.

(ii) Floating charge debenture

The company can change the secured assets in the normal course of business. For example, it can sell the assets, so long as they are replaced by equally satisfactory assets from the debenture holders' viewpoint. It will be the trustee's responsibility to give permission for this.

When a company fails to make an interest or capital payment, the debenture holders can apply to the courts to make the floating charge become a fixed charge. This is called "crystallising".

Debentures and loan stocks are used to raise large amounts of funds (typical issues in the UK may range from £30m to £100m). They have a fixed redemption date and carry a fixed rate of interest so that the borrower has a known debt servicing commitment.

The interest payments are tax deductible – meaning that the debenture interest is deducted from pre-tax profits before the calculation of tax liability (as an expense of the company) – but the debenture holders are creditors of the company and have no right to interfere in its running.

However, the interest payments must be made irrespective of the company's profitability or cashflow position and, if the debentures are secured against the assets of the company, failure to adhere to the agreed terms may place the continuation of the company at risk.

We will now consider the main investment characteristics of debentures: the risk, return and marketability of debentures.

Risk

Payments on debentures, unlike dividend payments to shareholders, are a legal obligation on the company and (if there are sufficient assets) loan capital holders get repaid fully in the event of a winding-up before shareholders can receive anything. Therefore, debentures in a given company are much more secure than ordinary or preference shares in the same company.

As we have seen, there are two ways in which the security on a debenture can be provided. Often, a fixed charge will be backed up by a floating charge as well, in case the charged asset under the fixed charge turns out to have insufficient value to meet the money due to the debenture holders. The rights of debenture holders are overseen by a trustee.

There is still an element of risk attaching to debentures. This is because of the risk of default combined with the risk that the asset over which the fixed charge has been placed will turn out to be insufficient to cover the loan.

Return

Debentures carry the risk that coupon payments or capital repayment may not be made, but the stockholders have security in respect of the secured assets. As such, debentures do trade at yields above government securities, although some of this might be accounted for by the lack of marketability (see later).

The value of all payments – capital and interest – may be eroded by inflation.

Debenture stocks may also not be readily marketable.

The total return on debentures will reflect all these risks. Generally, the total return (referred to as the gross redemption yield, or GRY) of a debenture would be expected to be:

- superior to that of a *government bond*, because a government bond is safer than even the safest corporate bond and more marketable; and
- less than that of an *unsecured loan stock* because an unsecured loan stock offers no capital growth and is far riskier than a debenture.

Marketability

Marketability of debentures is usually worse than for government bonds: there are bigger spreads between buying and selling prices, and lower volumes traded. This is because the typical issue size is smaller (*eg* £30m). Therefore trading in a particular debenture can be infrequent. With some issues marketability can be very low indeed. In general, marketability is highest just after a new issue.

Conclusion

The existence of a fixed and/or floating charge together with the appointment of a trustee is designed to reduce the risk to the debenture holder. However, the security ultimately depends upon the company's continuing profitability in order to meet the required payments, and failing that, on the market value of the charged assets. In practice neither can be guaranteed for the full outstanding term of the debenture. Therefore, debenture stocks are considered more risky than government bonds.

1.3 Unsecured loan stocks

Description



With unsecured loan stock there is no specific security for the loan.

If the company defaults, the loan stockholders' only remedy is to sue the company. In practice this means asking the courts to wind up the company. When this happens, any debenture holders will have a prior claim to the assets of the company on which there is a charge. So the unsecured loan stockholders rank after the debenture holders.

Other creditors of the company rank equally with the unsecured loan stock holders. An exception to this is that some banks have issued subordinated loan stock so that the loan stockholders rank after the bank's depositors in the event of a winding-up. If (as is usual) there is insufficient money generated from the liquidation of the company's assets to meet all these claims, what is available is shared out in proportion to the amount owed. For example, "35p in the £" might be paid to all creditors. If there is a surplus it will be distributed to the company's shareholders.

Thus, on a winding-up, high-ranking claimants (*eg* debenture holders) may well get all of their capital returned. Low-ranking claimants (*eg* shareholders) may get nothing. At the highest level of ranking at which the total money available is insufficient (*eg* unsecured creditors) a proportionate payment will be made.

Risk

There is no security for the loan, although (as with debentures) payments are a legal obligation on the company. The rights of unsecured loan stock holders are often set out in a trust deed and looked after by a trustee. If a company fails to make interest or capital repayments when they are due, the loan stock holders can apply to the courts to have the company wound up. When the company is liquidated, unsecured loan stock holders will rank equally with other unsecured creditors of the company (*eg* customers awaiting delivery of goods, suppliers awaiting payment).

In practice, if a company has got to the stage of being wound up, its assets are usually of little value so unsecured loan stock holders may get little or nothing back.

Return

Gross redemption yields are higher than on debentures to compensate for poorer marketability and greater risk.

The yield margin over government bonds tends to be a little higher than for debentures in a given company to reflect the extra risk.

Marketability

Marketability tends to be similar to debentures, *ie* a lot worse than government bonds. The standing of the issuer and the size of issue determine marketability. Again, marketability decreases a few months after a new issue.

Conclusion

The appointment of a trustee and the restrictions on further borrowing which are typically found in a trust deed are designed to reduce the risk to the unsecured loan stock (ULS) holder. However, ULS will be less secure than debentures. An unsecured loan stock holder is even more dependent upon the company's continuing profitability in order to meet the required payments. Therefore, unsecured loan stocks are considered more risky than government bonds, local authority issues *and* debentures.

As with a debenture, payments are a legal obligation on the company and unsecured loan stock holders are entitled to be repaid fully in the event of a winding-up before shareholders can receive anything. Therefore, unsecured loan stock in a company is more secure than shares in the same company.



Question 4.4

Why don't companies always issue unsecured loan stocks rather than debentures?

Corporate bonds behave much like government bonds. The major differences between corporate bonds and government bonds are:

- Corporate bonds are less secure than government bonds. The level of security depends on the type of security, the company that has issued it, and the term.
- Corporate bonds are much less marketable than government bonds, mainly because the sizes of issues are much smaller.

1.4 Subordinated debt

In the event of default, the holder of subordinated debt ranks below the firm's general creditors (but ahead of preference shareholders and the ordinary shareholders). The subordinated lender holds a *junior debt* and is paid after all senior debt holders are satisfied.



Subordinated debt or junior debt is debt over which senior debt takes priority.

Lenders can assume that they have a senior claim unless the debt agreement says otherwise.

The rating of the debt and, consequently the terms on which it is issued, will reflect this lower level of security.

1.5 Eurobond loan capital

Description

Traditionally a company would issue loan stock within the tax and legal framework of its own country.

However, it is also possible to borrow in another country. For example, overseas borrowers can issue sterling-denominated bonds in the UK bond market. These are called *bulldogs*. Similarly UK firms can issue dollar-denominated bonds in the US market. These are known as *Yankee bonds*. Foreign bond issues give borrowers access to the investors of another country.

Eurobonds go one stage further: they give borrowers access to international investors.



A Eurobond is a bond issued in the Euromarket. A Eurobond is marketed internationally, mainly by the London branches of international banks.

Since the 1950s it has been possible to arrange with investment banks for loan capital to be issued to investors without it coming under the legal or tax jurisdiction of any country. The market for this type of loan capital is known as the “Euro” market – although it is not confined to Europe. The main centres for trading are London and Luxembourg.

Eurobond issues can be made in almost any currency including the euro. The majority of Eurobond issues are denominated in dollars.

Companies throughout the world raise money by issuing Eurobonds. Governments can also issue Eurobonds. Recently, more money has been raised by UK companies through Eurobond issues than through the traditional markets.

Most Eurobonds are redeemed at par on a set date with fixed coupon payments during the term of the Eurobond. However, coupon payments on Eurobonds are usually made annually rather than six-monthly. For example, a 10% Eurosterling issue would pay £10 every year per £100 nominal held.

Almost all Eurobonds are unsecured. Like holders of unsecured loan stocks, Eurobond investors would rank equally with other unsecured creditors if a company were wound up.

Eurobonds are “bearer form” documents.



Question 4.5

What does “bearer” mean? What form will a security be if it is not “bearer”?

To claim interest payments, holders must cut out coupons from the certificates and send them to the company (or its paying agent). This is one reason why payments are made annually rather than six monthly.

As with other forms of company securities, Eurobonds can be held by individuals as well as by corporate borrowers. There is a story about Belgian dentists holding large amounts of their investments in this form. The story goes as follows:

Belgian dentists are paid lots of money and therefore are taxed highly. In order to postpone/avoid/reduce their tax liability (choose whichever option you prefer), it is convenient for them to hold investments which are not registered but are bearer documents. In addition, Belgium is close to Luxembourg, and so it is just a short train ride once a year for the dentists to go and collect their interest, which is paid gross (*ie* with no tax deducted).

A significant minority of Eurobonds have a variable coupon payment. They are known as “floating-rate notes” (see Section 1.6 below).

Many innovative types of Eurobonds have been issued. This is because Eurobonds are issued with freedom from national regulation. For example, on some issues interest payments may be made in more than one currency.

Although most Eurobond issues are listed on a stock exchange (often in London), **most trading in them occurs through the banks rather than through a stock exchange.**

Eurobonds are also used to raise large sums – the minimum acceptable issue is \$75m or more. They are not secured against the assets of the issuing company.

The key difference between Eurobonds and unsecured loans is that Eurobonds are marketed in a different way. A Eurobond is an issue underwritten by an international syndicate of banks and typically (but not exclusively) sold in countries other than the country of the currency in which it is denominated. Issues are often marketed in several countries simultaneously. Eurobonds are not fully within the legal control of any government.

Common currencies of issue include the US Dollar (which accounts for about 50% of the market), the Japanese Yen and Sterling. Issues in these currencies are respectively known as “Eurodollar”, “Euroyen” and “Eurosterling” issues.

Risk

There is no security for the loan. Furthermore, Eurobond issues do not always place restrictions on the issuing company’s future borrowing powers. Consequently investors are very dependent upon the profitability and good name of the issuing company. If anything, Eurobond issues are more risky than traditional unsecured loan stock issues made by the same company. However, issuers of Eurobonds tend to be large stable firms, institutions or governments.

Return

Gross redemption yields depend upon the issuer (and hence risk) and issue size (and hence marketability). Inflation will affect the real return achieved.

The gross redemption yield on a Eurobond of a given size and issued by a given company should be similar to the gross redemption yield on an unsecured loan stock. In practice, Eurobonds are often issued by very secure borrowers in large amounts (giving quite good marketability). Therefore margins above government bond yields are typically very low (eg ½%).

Marketability

Marketability is better than debentures and unsecured loan stocks, but not usually as good as government bonds.

Conclusion

Eurobonds can be issued with either fixed or floating rates of interest, and normally have a fixed maturity date. **They represent a convenient method of raising large amounts of foreign currency denominated funds without having to enter overseas financial markets. It may be possible to raise funds at a lower rate of interest than is available on domestic currency funds, but there may be associated exchange rate risks if the funds raised are converted for use in domestic projects.**

1.6 Floating-rate notes

Most people are aware of the idea of floating or variable interest rates. Most people's savings earn a variable rate of interest and the interest rate on many mortgages in the UK are variable (though elsewhere fixed-interest mortgages are more common).

Many UK borrowers prefer fixed-interest bonds because they know their costs in advance and can plan their cashflows. However, when interest rates are high, companies are reluctant to borrow. In the 1970s interest rates were very high and floating-rate notes became more attractive.



Floating-rate notes (FRNs) are medium-term debt securities issued in the Euro market whose interest payments "float" with short-term interest rates, possibly with a stipulated minimum rate.

It is common for floating-rate notes to have a minimum interest rate below which the coupons will not fall even if the benchmark interest rate falls lower. This is known as an interest-rate floor.

Thus, the issuer does not need to estimate the likely levels of future inflation and interest rates when issuing the notes, and the lender does not require an inflation risk premium.

If inflation increases, then short-term interest rates tend to increase. (This relationship is studied in Subject CT7.) A company that issues floating-rate stock does not need to worry about future inflation. A company that issues fixed-interest stock has to estimate future inflation in order to give a satisfactory return (after inflation) to the investors. Investors too need to consider the risk of inflation wiping out the return received from an investment. If they are uncertain about inflation they might demand a higher interest rate as a premium to cover the risk they are taking.

2 Share capital

2.1 Ordinary shares ("Equities")

Description



Ordinary shares give rights to a share of the residual profits of the company, and to the residual capital value if the company is wound up, together with voting rights and various other rights.

Ordinary shares are the main way in which UK companies are financed. A company may or may not have loan capital and/or preference shares. However, to exist it must have ordinary share capital (unless it is "limited by guarantee").

The shareholders are the owners of the business. Shareholders will have voting rights at meetings in proportion to the number of shares held.

They will receive "dividend" payments made from a company's profits. Dividends are not a legal obligation of the company and are only paid at the discretion of the directors. In practice directors try to pay a steadily increasing stream of dividends.

Dividends are paid net of tax (for example, net of 10% in the UK), with an attaching tax credit for the recipient. This is termed "franked" investment income. In the UK, the tax credit can be used against the taxpayer's tax liability, but it cannot be reclaimed and those who are subject to a higher rate of tax on dividend income have to pay additional tax. This was covered in Chapter 3, Section 1.2.

They hold the equity interest or residual claim since they receive whatever assets or earnings are left over in the business after all its debts are paid.

Ordinary shares are sometimes called "equities" which, in this context, means "residual". In other words, holders of ordinary shares are entitled to whatever profit is left over after other providers of finance have received their interest payments. In most cases the directors will choose to retain some of the profits attributable to ordinary shareholders, but if they are invested effectively, the retained earnings should enhance ordinary shareholders' profits in future years.

Ordinary shares are the lowest ranking form of finance issued by companies. On a winding-up they will rank after all creditors of the company, eg employees, customers, suppliers, bankers, holders of loan capital and HMRC. If the company is wound up, ordinary shareholders will only receive any residual assets once all other creditors and preference shareholders have been repaid in full.

The upside of this residual nature is that there is no upper limit on the size of residual profits and hence no upper limit on the return which ordinary shareholders could earn.

Ordinary shares are almost always irredeemable, ie there is no fixed date when the company has to repay the share capital.

All shares have a “par” or “nominal” value, often 25p. The par value has no relevance to the market value of the share. Companies are not allowed to issue shares below the par value, although partly paid issues (shares where the investor is committed to make a further payment of capital to the company at a later date) are allowed.

Shareholders have a liability up to the fully paid value of the shares. For example, a 25p par value share issued at a price of 40p may only be 80% “paid up” ie only 32p was originally invested in the company – the other 8p to be called for at a later date. A holder of a single share would be liable to pay another 8p into the company if it was wound up with unpaid debts.

The figure shown in the accounts for issued share capital is the nominal value. However, this nominal value (ie number of shares × par value) has little practical significance.

The Memorandum of Association will set out the total nominal value of authorised share capital. This is the maximum amount that the directors can issue without calling for a vote from the shareholders. **The issued share capital is the nominal amount actually issued. The issued share capital cannot be greater than the authorised share capital.**

Almost all ordinary shares:

- give an equal right to share in residual profits (after the preference shareholders, if any, have received their full entitlement to dividends). This is the most important feature, and is the main reason for buying shares.
- give one vote per share.
- give an equal share to any assets left over following a winding-up after all other creditors have been paid.
- are fully paid (partly paid issues are discouraged by the Stock Exchange).
- give various other minor rights (*eg* the right to receive the annual report and accounts).

The low ranking of ordinary shares in terms of payment of dividends and upon winding up makes ordinary shares a more risky investment than other types of capital from the investors' point of view. For example, if the company has a bad year for profits, there may be no dividend for that year.

As well as having the right to residual profits and assets, ordinary shareholders have the right to:

- attend and speak at company meetings, or appoint a proxy to attend and vote on their behalf (a proxy is not allowed to speak)
- vote to reduce, but not increase, dividends
- vote to appoint directors
- vote to forego the "pre-emptive" right to be offered any new shares to be issued
- vote to change the company's borrowing powers.



Question 4.6

A friend says: "Ordinary shares are the most risky form of investment so a prudent investor should avoid investing in them."

Comment briefly on this statement.

Variations

Occasionally some companies issue variations of the basic ordinary share described above. For example:

- “**deferred**” shares which come in two varieties: either no dividends are paid until normal ordinary shareholders’ dividends or profits reach a given level, or no dividends are paid until a given date
- **redeemable ordinary shares** which will be repaid by the company at a certain date
- **non-voting shares**
- **shares with multiple voting rights, and**
- “**golden**” shares in newly privatised industries. Golden shares are those held by the government following a privatisation. These shares give the government certain rights, eg voting rights and veto rights on certain issues.



Question 4.7

Can you think why some companies might end up with non-voting shares?

The Stock Exchange discourages the issue of “non-standard” ordinary shares.

The theory of risk and expected return

Much of what you will learn in the actuarial syllabus is based on the Capital Asset Pricing Model and the assumptions that form the basis of this model. The fundamental principle is one of risk and return which is critical to this course, and to some of the later courses you will meet such as Subject CT8, CA1 and ST5.

In brief we assume that any rational investor making an investment decision will first decide what return they require from a particular investment. This required return will be influenced by the investor’s perception of how risky the investment is – the more risk, the more return he or she will require. For most rational investors (other than owners of football clubs) the risk of loss or the uncertainty attached to the amount and timing of future payments would lead them to be less inclined to invest in the security. Consequently such securities generally trade in the market at prices which offer the investor a higher return to compensate. Risk is often defined in terms of the volatility of the expected returns from the investment, partly because it fits with the general feeling among investors and partly because it allows rather tidy results to flow from the analysis.

The investor will then determine a price for the asset such that the expected return from the asset at the specified price gives a return at least as high as the required return.

Considering ordinary shares, the expected return on the investment will be influenced by two things:

- how much income yield (or “dividend yield” for equities) she expects to receive
- how much capital growth she expects to obtain from holding the share over a certain period.

The first of these components is linked to the price at which the asset is purchased. If we define the net dividend yield as $\frac{\text{net dividend per share}}{\text{market price per share}}$ we can see that the higher the

price paid, the lower the dividend yield from the investment (the net dividend paid by a company does not alter when the market price of the share changes).

The second component is equal in theory to the growth in the dividend. The determination of the share price is covered in CT1. It is assumed that the share price is the present value of the future dividend stream.

So an investment in an ordinary share will bring the investor a dividend yield and capital growth. The sum of these should be sufficient to give a return equal to or greater than the required return he or she calculated at the very start of this process. Although the total return from holding an equity share will usually be greater than the return available on loan capital, the dividend yield on its own is usually lower than the gross redemption yield available on loan capital.

Risk

When companies are wound up, ordinary shareholders often end up with nothing as they rank below creditors and usually rank below preference shareholders (although sometimes preference shareholders and ordinary shareholders rank equally on winding up). So, ordinary shares in most companies are *risky*.

Risk can often be thought of in two components:

- the uncertainty and volatility of the future income stream
- the uncertainty of capital return in the event of a winding-up.

As ordinary shares offer both of these in large quantities, they can be classed as high risk.

Return

Ordinary shares offer investors high potential returns for high risk, particularly the risk of capital losses.

The initial running yield (that is, the rate of income the share will produce at its current market price) is low but dividends should increase with inflation and real growth in a company's earnings. Historically, equities have given the highest return of any of the main asset classes over the long term. Because of this, investors have been prepared to accept the high variance of return which can lead to poor short-term performance even for a well diversified portfolio.

Income from ordinary shares is a form of franked investment income (as described in Chapter 3 of the course).

Marketability

Marketability of ordinary shares varies according to the size of the company but is usually much better than for the loan capital of the same company.

There are three main reasons for this:

- (i) **For many companies, the bulk of their capital is in the form of ordinary shares. So issues of ordinary shares tend to be large.**
- (ii) **Most companies only have one type of ordinary share whereas their loan capital is likely to be fragmented into several different issues.**
- (iii) **Investors tend to buy and sell ordinary shares more frequently than they trade in loan capital because the residual nature of ordinary shares makes them more sensitive to changes in investors' views about a company.**

In other words, if an investor has a view about the likely future profits growth of a company she should express that view by buying or selling the ordinary shares. Any increase or decrease in the profits of the company will flow through directly to the shareholders, whereas increasing profitability will influence only the security of the bond payments, not the amount of the payments.

Conclusion

Ordinary shares offer investors the potential for high returns but shareholders take a great risk. Dividends can be volatile, as can the market values of the shares. Ordinary shareholders rank last in the event of a winding-up. Shares are usually highly marketable.

2.2 Preference shares

Description

Preference shares are much less common than ordinary shares. Overall, preference shares are much less important than ordinary shares.

The investment characteristics are more often like those of unsecured loan stocks than ordinary shares. Assuming that the company makes sufficient profits, they offer a fixed stream of investment income (which is paid net of tax, like dividends). **Preference shares pay a fixed dividend, and so can be regarded as a form of fixed-interest stock.** The dividend is usually expressed as a fixed percentage of the par value, so when we refer to the “dividend” from preference share it is more akin to an interest payment on a bond than to a dividend on an ordinary share. **They do not usually carry voting rights.**



Preference shareholders have a preferential right to either dividends, or return of capital, or both, compared to ordinary shareholders.

Dividends do not have to be paid. However, if dividends are not paid on preference shares, no ordinary share dividends can be paid. It is usual for the preference shareholders to get voting rights whilst their dividends remain unpaid. Preference shareholders also have the right to vote if the rights attaching to their shares are being varied.

The crucial difference between preference shares and ordinary shares is that preference share dividends (except for participating shares) are limited to a set amount which is almost always paid.

Most preference shares are:

- cumulative
- irredeemable.

Cumulative preference shares require any unpaid arrears of dividends, as well as the current year's dividend, to be paid before any dividend can be paid to ordinary shareholders.

Variations

However, preference shares may also be:

- non-cumulative
- redeemable
- participating
- convertible
- stepped.

Participating shares are entitled to a share of the profits, on top of the fixed dividend, once the ordinary share dividend exceeds a certain amount.

Stepped shares have a dividend that increases in a predetermined way.



Question 4.8

List the possible varieties of:

- (i) preference share
- (ii) ordinary share.



Question 4.9

Briefly compare a preference share to an unsecured loan stock.

Risk

Preference shares rank below loan capital and above (or equal to) ordinary shares if the company is wound up.

In a given company, the risk of preference shareholders not getting their dividends is greater than the risk of loan stockholders not being paid, but less than the risk of ordinary shareholders not being paid. This is valid both for the dividend payments during a difficult period, and for the repayment of capital in the event of a winding-up.

The variability of return will only be a little greater than for loan capital. Preference shares offer a relatively predictable future income stream, but uncertainty about the return of capital in the event of a winding-up. However, the variability of return will be significantly less than that of ordinary shares, because a preference share's capital value will fluctuate much less than the capital value of an ordinary share.

Return

If there were no tax complications, the expected return on preference shares would be a little greater than the expected return on loan capital for all shareholders. However, there is a tax complication, as the following example shows.



Example

For this question, you may assume that:

- interest payments are made annually in arrears
- no tax is payable on net dividend income
- the discount rate for valuing the cashflows is 10%.

- (i) Calculate the value of the following to an individual paying 20% income tax:
 - (a) an irredeemable loan stock paying 10% per annum
 - (b) an irredeemable preference share paying a net dividend of 7.8%.
- (ii) Repeat the above calculation for a company paying 23% corporation tax.

Solution

- (i) ***Individual paying 20% income tax***

- (a) For a holding of £100 nominal, the individual receives net interest payments of £8 per year (after the deduction of tax @ 20%). The value of these payments is:

$$8 \times (v + v^2 + v^3 + \dots) = 8a_{\infty}^{10\%} = £80$$

- (b) The investor receives net payments of £7.80 per £100 of preference shares held. The value of these payments will be £78.00.

- (ii) ***Company paying 23% corporation tax***

- (a) The calculation proceeds as above for the loan stock, however we must also consider the extra tax (23% rather than 20%) the company has to pay on the net income. The value of this net cashflow to the company is:

$$10 \times 0.77 (v + v^2 + v^3 + \dots) = 7.7a_{\infty}^{10\%} = £77$$

- (b) The company receives net payments of £7.80 per £100 of preference shares held. The value of the income stream to the company is therefore £78.

Remember from Chapter 3, that since dividend income is franked income (*ie* paid from companies' post-tax income) the government might choose to give shareholders at least some credit for the tax that has already been paid. In the case above, it is assumed that shareholders are required to pay no more tax on dividend income.

As can be seen from the above example, the tax treatment can have an effect on the value of the stock to different investors. In particular, companies might prefer to invest in preference shares rather than loan stock, because they pay no more tax on the net dividends received, whereas they pay 23% tax on gross interest received.

For most investors, preference shares offer a lower after-tax return than loan capital. However, for corporation tax payers preference shares can sometimes offer a higher net return than the net return available on loan capital.

As discussed above in the case of ordinary shares, any increased uncertainty relating to the payment of dividends or the repayment of capital is likely to make the share less popular to investors. As such, you would expect that preference shares are likely to have to offer a higher expected return than loan stock. This is generally true for corporation taxpayers because of the tax advantage in investing in preference shares rather than loan stock (as shown in the last example). This tax advantage means that preference shares are popular with corporation taxpayers, forcing their price up and making them unattractive for other investors.

For all investors, the expected return on preference shares is likely to be less than on ordinary shares because the risk of holding preference shares is less.

Marketability

Marketability of preference shares is similar to loan capital marketability.

Conclusion

Preference shares offer the investor a lower risk than ordinary shares and therefore earn a lower rate of return. Since the risk of holding a preference share is higher than the risk of holding loan stock, the return is higher than that received on loan stock. Preference shares are a particularly attractive form of investment for companies because of the preferential tax treatment of dividends compared with interest on loan capital.

**Question 4.10**

Complete the following table comparing ordinary shares with preference shares.

	<i>ordinary shares</i>	<i>preference shares</i>
Voting rights		
Dividends		
Importance for company		
Different varieties		
Priority on winding up the company		

3 Other types of long-term finance

There are many other types of finance that straddle the divide between debt and equity finance. We shall look at the main types of these hybrids.

3.1 Convertibles

Description



Convertible forms of company securities are, almost invariably, unsecured loan stocks or preference shares that convert into ordinary shares of the issuing company.

Convertible preference shares are preference shares which give the right to convert into ordinary shares at a later date. The investor does not pay anything to convert other than surrendering the convertible preference shares.

Convertible unsecured loan stocks are unsecured loan stocks which give the right to convert into ordinary shares of the company at a later date. For example, £100 nominal of convertible unsecured loan stock might be convertible into, say, 30 ordinary shares on 1st October 2012.

The only difference between convertible loan stocks and convertible preference shares is the form of the capital before it converts into equity. Convertible loan stocks are loan capital until conversion, whereas convertible preference shares are share capital.

The convertible loan stock will have a stated annual interest payment (paid in twice-yearly instalments). For convertible preference shares, the stated rate will be in a similar format to dividends. (For example, in the UK, the rate will be net of a 10% tax).

In the UK, in respect of capital gains, all convertibles are non-qualifying and therefore capital gains tax may be payable. Loan stocks provide gross income (ie income that has not been taxed) and preference shares provide income in the same format as dividends.

Convertible stocks have several advantages over ordinary share capital and ordinary unsecured loan stocks, both from the issuer's and from the investor's point of view.

They are popular in the United States as a form of finance for new companies. These companies have no track record and might find it difficult to raise funds in more conventional ways.

Investors have the security of a fixed return in the short term and the possibility of long-term capital gain if they convert to ordinary shares in the future.

This additional prospective return means that the issuer does not have to offer excessively high rates of interest on the loan stocks in order to attract lenders.

Following conversion the shareholder will receive an ordinary share certificate to replace the convertible preference share or loan stock certificate. The shareholder then stops receiving preference dividends or interest payments and instead starts receiving whatever ordinary share dividend is declared.

If the holder chooses not to convert, then the security might continue as a loan stock or preference share for a period of time known as the stub. Alternatively it might be redeemed on a prescribed basis immediately.

Conversion dates and terms

The dates and terms of conversion are specified at the time of issue. **There will be a specified number of ordinary shares for each convertible. The date of conversion might be a single date or, at the option of the holder, one of a series of specified dates.**

The following examples illustrate the range of possible conversion terms:



Examples

Fixed date and fixed terms

Each convertible 8% (net) irredeemable preference share may be converted into an ordinary share on 1 July 2020.

Variable dates and fixed terms

Each convertible preference share may be convertible into 2 ordinary shares on any 1st January between 2020 and 2025. It is up to the investor to choose when (and whether) to convert between these dates.

Variable dates and variable terms

Each convertible preference share may convert into 2 shares if conversion takes place on 1 January 2020, 2.5 shares if conversion takes place on 1 January 2021, 3 shares if conversion takes place on 1 January 2022 etc.

The conversion terms are always revised following a capital restructuring such as a scrip issue or a rights issue – these are described later in the course.

The period prior to the first possible date for conversion is known as the rest period. The period during which conversion may take place is, not surprisingly, known as “the conversion period”.

Conversion premium



At any time, the cost of obtaining one ordinary share by purchasing the required number of convertible securities and converting can be compared with the market price of the share. The difference is known as the conversion premium.



Question 4.11

GHI plc issues £500,000 of convertible loan stock. Holders will have the option to convert each £5.00 of stock into 4 ordinary shares in 6 months' time. The current share price is 86p, and the loan stock is trading at par.

Calculate the conversion premium.

Investment characteristics prior to conversion

The characteristics of a convertible security in the period prior to conversion are a cross between those of fixed-interest stock and ordinary shares. As the likely date of conversion (or not) gets nearer, it becomes clearer whether the convertible will stay as loan stock or become ordinary shares. As this happens, its behaviour becomes closer to that of the security into which it will convert.

Risk

There will generally be less volatility in the price of the convertible than in the share price of the underlying equity, because the dividend payment is fixed and does not depend to the same extent on the short-term profits growth of the company.

The security of dividend payments for a convertible is higher than that of an ordinary share, and the *option* to convert to an ordinary share or leave it as a fixed-interest security allows the investor to be sure of a minimum expected return.

Return

Because convertibles do not benefit from the dividend growth enjoyed by ordinary shareholders, **convertibles generally provide higher income than ordinary shares**. Conversely, because they do offer the prospect longer term of benefiting from the growth of the dividends, convertibles will provide a **lower income than conventional loan stock or preference shares**.

Marketability

The market in convertible stock is not large in the UK. In the US, convertibles are a useful form of finance for the many new businesses that set up each year.

Conclusion

From the investor's point of view, convertible securities offer the opportunity to combine the lower risk of a debt security with the potential for large gains of an equity. The price paid for this is a lower running yield than on a normal loan stock or preference share.

3.2 Warrants



Warrants are call options written by a company on its own stock.

(See Chapter 5 for further discussion of options.) The purchaser of a warrant has the right but not the obligation to buy a fixed number of the company's shares at a fixed price at a fixed date.

When they are exercised, ie when the purchaser exercises his/her right to buy the shares, **the company issues more of its own shares and sells them to the option holder for the strike price. Thus, the exercise of a warrant leads to an increase in the number of shares that are outstanding. This, in turn, leads to some dilution in the value of the equity.**

Warrants are often added to the issue of a fixed-interest bond to make it more attractive to investors – a significant proportion of private placement bonds, (ie those bonds sold directly to a small number of lenders such as banks, insurance companies and pension funds) are sold with warrants. Warrants are also often given to investment banks as compensation for underwriting services or used to compensate creditors in the case of bankruptcy. Investment banks issue shares on behalf of companies and agree to buy any shares that are not sold to the general public, *ie* they underwrite the share issue. We shall look at the issue of shares in Chapter 6.

The warrant holders are not entitled to vote or receive dividends. But the exercise price of the warrant is automatically adjusted for any share dividends or share splits. For example, if the company doubles the number of shares and distributes two new shares for every one share held, then it will also double the number of warrants and halve the exercise price. (A share split is known as a *scrip issue* in the UK. We shall study scrip issues in Chapter 6.)

Typically, a warrant lasts for a number of years. Once they have been created, they sometimes trade separately from the bonds to which they were originally attached.

3.3 Options issued by companies

In addition to warrants and convertibles, the main class of option issued by companies are **executive stock options**.



These are, effectively, warrants issued to senior managers as part of their remuneration package, with strike prices that are intended to represent a performance target for the executive.

As noted in 3.2 above, the effect of issuing such instruments is to dilute the value of the equity already in issue. Increasingly, firms with significant amounts of warrants (or convertibles) outstanding are required to report earnings on a "fully diluted" basis. This recognises the potential increase in the number of shares.

Shareholders are interested in the *earnings* of the company, ie the profit after tax that is available for distribution to the shareholders or for ploughing back into the business. Total earnings may not mean very much to a shareholder but *earnings per share* shows how much after-tax profit has been generated per share. If the number of shares is likely to rise because of obligations that the company has entered into, such as convertibles, warrants and stock options, then the *diluted earnings per share* can be calculated. This assumes that all options are exercised in full and therefore gives a "fully-diluted" figure. We shall look at various ratios for analysing the performance of companies in Chapter 12.

4 ***Winding up a company***

To help explain the contents of this chapter and of Chapter 2 it is useful to consider the hypothetical winding-up of a company:

Imagine the ABC Company plc. The company makes widgolets, a component required by the widget-making industry. The company has issued both share capital, including ordinary and preference shares, and loan capital: some fixed-charge debentures secured on the company's factory, and an unsecured loan stock.

The company has borrowed money from the bank using a flexible loan facility. It has also pushed its overdraft to the limit. The company has trade credit agreements with its suppliers and is buying some machinery on hire purchase.

The company has had a bad year owing to a recession, which has hit the widget industry particularly hard. Its profits are down to such an extent that it is unable to pay the interest on the unsecured loan stock, although the debenture interest payments are made in full.

The unsecured loan stock holders have a meeting and decide to sue the company. Their claim is successful and the court orders the company to be wound up. The assets are sold and the various lenders receive payment as follows:

1. The hire purchase company repossesses its machinery.
2. Mortgage debenture holders receive payment from the proceeds of the assets charged to them, *ie* the factory. This is not necessarily a comfort to them. If the widget industry is in serious decline, the factory and its contents (widgolet-making machinery) may be almost worthless.
3. Floating-charge debenture holders (together with fixed-charge debenture holders should the fixed charge prove to be insufficient) have first claim to the remaining assets. As soon as the court decides that the company should be wound up, the floating charge is crystallised into a fixed charge.
4. Employees receive any arrears in their wages. The employees of a company have first call on the *company's* assets.
5. Other creditors come next. This includes the bank and the trade suppliers and unsecured loan stock holders.
6. If anything is left, preference shareholders are paid next.
7. Ordinary shareholders will receive whatever is left after the rest of the claimants have been paid. As you can imagine, this may not be very much. Often it will be zero.

**Question 4.12**

Distinguish fully between:

- (a) par value and market value of shares
- (b) authorised and issued share capital
- (c) preference shares and ordinary shares
- (d) loan capital and ordinary share capital
- (e) fixed and floating charges
- (f) debentures and unsecured loan stocks
- (g) Eurobonds and traditional forms of UK loan capital.

**Question 4.13**

True or false?

- (a) Government bonds are more marketable than debenture stock.
- (b) Eurobonds are more marketable than ordinary shares.
- (c) Debentures provide a higher return than unsecured loan stock.
- (d) Convertible loan stock generally provides a lower income than conventional loan stock.
- (e) Ordinary shares generally provide a higher income than convertible preference shares.
- (f) Warrants are a form of loan stock.
- (g) Executive share options are a form of warrant.
- (h) Eurobonds are less risky than debentures.



In the past, exam questions have expected you to be able to describe the features and discuss the relative merits for an issuer and for an investor of all the different types of long-term finance. For example:

“Describe the main characteristics of ordinary shares and explain why ordinary shares are more marketable than loan capital.” (April 2001 adapted)

You should discuss the key characteristics of risk, return, marketability and rights of ownership. Marketability is high because of large issues, standard issues and frequent trading.

“Explain why Eurobonds tend to offer investors a higher rate of return than traditional loan stock.” (September 2010)

You should discuss the level of regulation, possibility of security, and attractiveness to investors.

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Chapter 4 Summary

Long-term finance

Long-term company finance can be classified as *share capital* and *loan capital*.

Ordinary shares are the most common type of share capital. They give rights to a share of the residual profits of the company, and to the residual capital value if the company is wound up, together with voting rights and various other rights.

Preference shares give their holders a preferential right to dividends and return of capital, compared to ordinary shareholders. Preference shares pay a fixed dividend. They normally give voting rights only when dividends are not declared.

Convertible preference shares are one variety of preference shares. They give holders the right to convert their preference shares into ordinary shares on fixed terms on certain dates.

Holders of share capital are *members* of the company. Holders of loan capital are *creditors* of the company. They do not have voting rights. They receive *interest payments* which are a cost to the company, not a distribution of profits. Interest is normally paid twice a year.

Debentures are loans which are secured on some or all of the assets of the company. They are regulated by a *Trust Deed* which is overseen by a *trustee*. Debentures may be secured by a *fixed charge* on specified assets, or by a *floating charge* across a class of assets.

With *unsecured loan stock* there is no specific security for the loan. *Convertible unsecured loan stocks* give their holders the right to convert into ordinary shares of the company at a later date. *Subordinated debt* is junior debt and is paid after all senior debt holders are paid.

A *Eurobond* is a form of unsecured loan capital that is issued outside the legal and tax jurisdiction of any country. It is a *bearer document*, paying interest normally once a year. Interest is paid *gross*. It may pay a variable rate of interest, in which case it is known as a *floating-rate note*.

A *warrant* is a call option written by a company on its own stock. The owner of the warrant has the option to buy a fixed quantity of the company's shares at a fixed price at a fixed date. *Executive stock options* are effectively warrants issued to senior managers, with strike prices that are intended to represent a performance target for the managers.

The various forms of company capital differ in many ways:

Risk

Debentures are the most secure form of company capital, being covered by a floating charge over the company's assets or a fixed charge on a specific asset. *Eurobonds* and *unsecured loans* follow debentures – they have a prior right to profits before *preference* capital or *equity*, which are last on the list in that order. *Convertible shares* or *loan stock* will be as risky as the corresponding preference share or loan stock until it is converted into equity, at which point the riskiness increases.

Return

Investors expect a higher return for accepting higher risk. As such the expected return from each form of capital is in reverse order to the list for risk, namely (highest to lowest): *equity, preference, unsecured loans, Eurobonds, and debentures*. The actual cost to the company will be equal to the return achieved by the investor (ultimately), however the immediate cost to the company of servicing the capital is higher for debt than for equity.

Marketability

Equity is the most common form of company capital, and is as such the most marketable. The marketability of the other forms depends very much on the size of the issue (which usually favours *Eurobonds*) and the credit rating of the borrower, as assessed by an independent agency.

Most forms of company debt have the advantage that interest payments are deducted from pre-tax profits and so help to reduce the tax charge. Coupons are paid gross to the investor. Preference shares however pay franked income, which is deducted from the company's income statement after the tax line and paid net of tax to the investor. The tax treatment can be beneficial to various types of investor, and can reduce the cost of the borrowing for the company.

Chapter 4 Solutions

Solution 4.1

In each of the years 2012 to 2022 inclusive, you would receive 6% of £200 = £12. This would normally be paid in two semi-annual payments of £6. This amounts to £132. At the maturity of the bond you would get £200 back in addition to the final coupon payment we have included above. Total cash received = £332.

Solution 4.2

If interest rates rise general in the economy, the fixed interest on the bond compares unfavourably with that received elsewhere. The demand for such bonds will therefore fall and the price will fall. As the price falls, the fixed interest becomes a higher percentage of the market price and the capital gain (if any) on redemption increases until equilibrium is restored.

Solution 4.3

Typical issues covered in a trust deed:

- Description of any assets of the company that might be set aside to cover the particular loan in the event that the company winds up.
- Details of exactly how the assets should be used to repay the bondholders in the event of a winding-up and how surplus cash should be treated.
- The rights of the company to issue further bonds that rank above or alongside this particular issue.
- Covenants that describe how much the company's profit must remain above the amount of the interest payments on the bond. This is a form of protection for bondholders to ensure that their interest payments are easily met by the company in future.
- Arrangements for changing the trustees.
- A description of circumstances under which bondholders must be consulted. For example if covenants are breached or about to be breached.

Solution 4.4

Debentures are secured upon the assets of a company. This security means that the company can offer a lower rate of coupon (*ie* interest) to investors. The company will therefore find it cheaper to borrow using debentures than using unsecured loan stock.

Solution 4.5

This means that the issuing company does not keep a register of holders, unlike share capital and traditional loan capital. So, holding the Eurobond loan certificate is proof of ownership. Rather like a pound note – if you lose it, you've lost it.

If a certificate is not bearer, it is normally “registered” which means that your name is on a computer list somewhere, and if you lose your certificate, the registrars can issue you with another one. Dividends can be transferred directly to your bank account.

Solution 4.6

It is true that ordinary shares are potentially risky in that the return from them may be very volatile (and uncertain). However, an investor would expect, on average, to gain a higher return from shares than from other investments, to compensate for the higher level of risk.

In the long term, dividends and share prices should increase in line with inflation and real economic growth. Therefore shares are a suitable investment for an institution which requires a return linked to inflation.

Also, holding a diversified portfolio of shares can help to reduce risk.

Solution 4.7

Non-voting shares often arise when a family-controlled company needs to raise more cash, but does not want the loss of control (and potential take-over) that comes with it. They therefore issue non-voting shares for the general public, and retain the voting shares themselves.

Solution 4.8

Types of preference share:

- cumulative / non-cumulative
- redeemable
- participating
- convertible
- stepped.

Types of ordinary share:

- deferred where no dividends are paid until after a certain time period
- deferred where no dividend is paid until profits reach a certain level
- redeemable
- non-voting
- golden.

Solution 4.9

Both have a fixed coupon, expressed as a percentage of the nominal amount. However the preference share percentage will be a net percentage, and the investor will get this percentage of “franked” income. Companies and basic rate taxpayers in the UK will not have to pay further tax. On a loan stock the coupon will be paid gross and further tax will have to be paid.

Preference shares can be redeemable but are normally irredeemable. Loan stocks can be irredeemable, but are normally redeemable.

Preference shares normally carry the right to vote if dividends have been passed. Loan stock holders only have the right to wind up the company and try to recover their losses. On a winding-up, a loan stockholder will rank above a preference shareholder.

Solution 4.10

	<i>Ordinary shares</i>	<i>Preference shares</i>
Voting rights	usually one vote per share	only under certain circumstances, such as non-payment of dividends or variation of rights
Dividends	variable: paid out of residual profits	fixed dividend: paid before ordinary dividends
Importance for company financing	very important – form the bulk of company share capital	not very important – a very small proportion of total share capital
Different varieties	deferred (2 types), non-voting, redeemable, multiple, “golden”	non-cumulative, redeemable, participating, convertible, stepped
Priority on winding up the company	paid after all other creditors and after preference shareholders	paid after all creditors but before ordinary shareholders

Solution 4.11

First we need to find the effective conversion price. This is the price an investor pays for a share by buying it via the convertible, rather than on the cash market. The stock is trading at par and so £5 of stock costs £5.

$$\text{Effective conversion price} = \frac{500}{4} = 125p.$$

The conversion premium is the effective conversion price *minus* the current share price. So here the conversion premium = $125 - 86 = 39p$.

Solution 4.12(a) ***Par value and market value***

The par value of a share is a unit of account with little significance other than the restriction that shares cannot be issued for less than their par value. The nominal value of a company's share capital is found by multiplying the par value of its shares by the number of shares in issue.

The market value of a share is what it would actually sell for in the open market. It usually bears no relation whatever to the par value of the share. The market value can change from minute to minute as trading takes place. The par value, however, is fixed and cannot normally be changed.

(b) ***Authorised and issued share capital***

The authorised share capital of a company is expressed as a nominal value, *i.e* x shares of y par value. The value stated is the maximum amount that the directors can issue without the approval of the shareholders of the company.

The issued share capital is the nominal amount that has actually been issued. It cannot be greater than the authorised share capital.

(c) ***Preference and ordinary shares***

Preference shares pay a fixed dividend. Ordinary share dividends vary depending on the level of profits made by the company.

Preference dividends must be paid before an ordinary dividend can be paid. There is no similar obligation for companies to pay ordinary dividends.

Ordinary shares will (normally) carry the right to vote. Preference shares do not normally have this right, unless either a) a preference dividend is not paid, or b) the company is proposing to alter the rights attaching to preference shares.

(d) ***Loan capital and share capital***

Holders of loan capital are creditors of the company. They receive interest payments which are a cost to the company, not a distribution of profits. Loan capital is redeemable, often after 10 to 20 years. The interest payments and redemption terms are fixed at the outset of the loan. Loan capital may be secured on the assets of the company, which may be sold in the event of default.

Holders of share capital are members of the company, *ie* they own the company. They receive dividends which are variable, and which are paid out of the profits of the company. Shares are not usually redeemable. Share capital is not secured on the assets of the company, although the shareholders do have a right to the residual value of the company on a winding-up – but only after all the creditors have been paid.

(e) ***Fixed and floating charges***

A fixed charge means that the loan is secured against specific named assets. If the company defaults on interest or capital payments, the assets can be sold and the proceeds used to reimburse the lenders.

A floating charge means that the loan is secured on the general assets or a class of assets of the company. No specific assets are named in the trust deed. The company can sell or alter its assets, as long as the replacement assets are satisfactory for the lenders (*ie* of a sufficient value to cover the amount of the loan). If the company defaults, a floating charge will “crystallise” and the assets must be sold to repay the lenders.

(f) ***Debentures and unsecured loan stock***

A debenture is a loan to a company which is secured on the assets of the company. It may be secured by a fixed charge or a floating charge. If the company defaults on its payments, the assets covered by the charge will be sold and the proceeds used to reimburse the debenture holders. The rights of the debenture holders will be set out in a Trust Deed, which is overseen by a trustee.

An unsecured loan stock will not be secured on any of the company’s assets. It may be governed by a Trust Deed. If the company defaults, the only remedy available to the loan stockholders is to sue the company.

(g) ***Eurobonds and traditional loan capital***

Eurobonds are issued outside the legal and tax jurisdiction of the country in whose currency they are denominated. They are traded on the international markets. They may have fixed or variable rates of interest. If the interest paid is variable, the issue is known as a “floating-rate note”. Eurobonds are bearer documents. They are normally unsecured. Coupons are normally payable annually, without deduction of tax.

Traditional UK loan capital is issued in the UK and may be traded on the London Stock Exchange. Fixed interest rates are the norm (although a very small number of issues with variable interest rates have been made). The issuing company will keep a register of loan holders. Traditional UK loan capital is often secured on the issuing company's assets. Coupon payments are typically made twice a year.

Solution 4.13

- (a) True. Marketability of debentures is lower than the marketability of government bonds because the debenture issues are smaller. Trading in a particular debenture can be infrequent.
- (b) False. Ordinary shares are the most common form of company finance and are the most marketable. Eurobonds are usually more marketable than other forms of debt finance because they are issued in larger amounts and are actively marketed by banks.
- (c) False. Debentures provide a lower return because they are the more secure form of company finance. Holders of unsecured loan stock take a greater risk and thus require a greater reward.
- (d) True. Convertible loan stock generally provides a lower income than conventional loan stock because convertibles offer the prospect of dividend growth in the future. Investors are attracted by the prospect of dividend growth in the future and are thus willing to accept lower income in the short term.
- (e) False. Convertible preference shares generally provide a higher income than ordinary shares because convertibles do not at present offer the benefit of dividend growth. An ordinary shareholder is willing to accept a lower income in return for dividend growth, whereas the holder of a convertible cannot reap the benefit of dividend growth at present and would require a higher income.

- (f) False. Warrants are not a form of loan stock. They are call options written by a company on its own stock. They are often added to a fixed-interest bond to make it more attractive to investors.
- (g) True. Executive share options are options to buy the company's shares. They are issued to senior management as part of an incentive package.
- (h) False. Debentures are secured on some or all of the assets of the company. Eurobonds are a form of unsecured loan stock and rank after debentures in a wind-up.

Chapter 5

Use of derivatives



Syllabus objective

- (v) Demonstrate a knowledge and understanding of the characteristics of the principal forms of financial instrument issued or used by companies and the ways in which they may be issued.
3. Describe the characteristics and possible uses by a non-financial company of:
- financial futures
 - options
 - interest rate and currency swaps.

0 Introduction

Subject CT1 covers the basics of the most common derivative products. This chapter concentrates on the use of derivatives by non-financial companies. The two aims of this chapter are:

- (i) to show how derivatives serve a real purpose in the commercial world, rather than being abstract financial products of use only to the financial world.
- (ii) to broaden your knowledge of the derivatives themselves.

The chapter is divided into three sections. We look at *financial futures* in Section 1, *options* in Section 2 and *swaps* in Section 3.



In the past, the examination has tested *knowledge* of the features of derivative products and the *ability to apply* an appropriate derivative product to a particular situation.

1 Financial futures

1.1 Introduction

Definition



A futures contract is a standardised, exchange tradable contract between two parties to trade a specified asset on a set date in the future at a specified price.

Futures were originally developed for agricultural and other commodities. Chicago developed an important market in the trading of wheat, pork belly and coffee futures. Gold, silver and copper soon developed their own futures markets. **Financial futures are based on an underlying financial instrument, rather than a physical commodity.** Financial futures were invented in 1972 and within a few years, trading in financial futures exceeded trading in commodity futures.

Remember to distinguish between futures and forwards. A *forward* is an agreement between two parties to trade a specified asset at a set date in the future at a set price. For example, a UK company could contract to buy a certain type of bond at a set price at a set date in the future. This is a two-party deal, tailor-made to suit the two parties, and the company cannot sell this contract to anyone else. Futures differ from forwards in that *futures* are standardised and exchange-tradeable. If the UK company had bought a future, it would be a standardised contract (*i.e.* not tailor-made) that could be sold.

Futures contracts are dealt with on the London International Financial Futures and Options Exchange (Euronext.liffe) in the UK, and the London Clearing House acts as counterparty to every trade.

Categories

They exist in four main categories:

- **bond futures**
- **short interest rate futures**
- **stock index futures**
- **currency futures.**

Individual stock futures are also now available on some markets.

We will look at these in more detail in the next section.

Margins

When you enter into a futures contract to buy or sell an asset, the price is fixed today but payment is not made until later. For example, you might agree to buy a bond future at £94,000 in three months' time. You pay nothing now, but **each party to a futures contract must deposit a sum of money known as *margin* with the clearing house.**



Margin payments act as a cushion against potential losses which the parties may suffer from future adverse price movements.

When the contract is first struck, *initial margin* is deposited with the clearing house. For example, you (and the other party to the future) might be asked to pay initial margin of £500.

Additional payments of *variation margin* are made daily to ensure that the clearing house's exposure to credit risk is controlled. This exposure can increase after the contract is struck through subsequent adverse price movements. For example, if the price of bond futures fell to £93,000 the following day, then you as the buyer would have made a loss of £1,000, whereas the supplier would have made a profit of £1,000. You as the buyer would pay the clearing house £1,000 and the clearing house would pay the seller £1,000.

In this way, the clearing house protects itself by settling up profits and losses each day. In effect, the futures positions are “closed out” every day and a new contract is made. In effect, in the example above, after the first day, the seller has an obligation to provide the bond future at £93,000.

Shortly before the contract is due to expire, the buyer and the seller normally close out the futures position, *ie* neutralise existing contracts by entering into equal but opposite contracts, and the clearing house returns the initial margin. For example, having entered into a futures contract to buy a bond in three months' time, the position could be closed out the day before expiry by entering into a futures contract to sell the same bond in one day's time.



Question 5.1

Why is it necessary for the exchange to require that companies trading futures contracts deposit a margin when they trade?

In financial futures, “delivery” rarely takes place – most deals are “cash settled”. In the example above, the bond is unlikely to be delivered – profit or loss is made by the movements in the price of the bond future and is realised through the variation margin payments, as shown in the example above.

1.2 Types of futures

Bond futures

For delivery, the contract requires physical delivery of a bond. If the contract were specified in terms of a particular bond then it would be possible simply to deliver the required amount of that stock. If the contract is specified in terms of a notional stock then there needs to be a linkage between it and the cash market. The bonds which are eligible for delivery are listed by the exchange. The party delivering the bond will choose the stock from the list which is *cheapest to deliver*. The price paid by the receiving party is adjusted to allow for the fact that the coupon may not be equal to that of the notional bond which underlies the contract settlement price.



Example

A bond future might have the following features:

Long Bond Future

Unit of trading: £100,000 nominal value government bond with 6% coupon
Delivery month: March, June, September, December
Quotation: per £100 nominal

The settlement of such a future involves buying or selling a prescribed nominal amount of an actual government bond (the amount being determined by certain rules) on the exercise date. The result is that the future trades very much like the basket of underlying deliverable assets, and can be treated as a bond itself.

Short interest rate futures



Example

The 3-month interest rate future

This is based on an artificial index which is defined as:

$$\text{Index} = 100 - (4 \times \text{the implied 3-month interest rate expressed as a percentage})$$

For example, if the implied (*ie* the rate that investors expect at the expiry of the contract) interbank 3-month rate were 2% (or 8% *pa*), then the index would stand at 92. An investor can buy or sell this index as if it were a normal asset. Indeed, being an exchange traded contract, he can sell it before he has even bought it (known as going “short” of the index) and provided he buys it back before expiry he need never deliver it. This is very common.

The price is stated as 100 minus the 3-month interest rate. For example, with an interest rate of 6.25% the future is priced as 93.75.

The way that the quotation is structured means that as interest rates fall the price rises, and vice versa. If interest rates fall to 5%, the price of the interest rate future rises to 95. This means that the see-saw relationship between price and interest rates applies to interest rate futures as well as bonds. (We saw this relationship applied to bonds in Chapter 4.)

The contract is based on the interest paid on a notional deposit for a specified period from the expiry of the future. For example, on Euronext.liffe, the nominal size of a sterling interest rate future is £500,000. **However no principal or interest changes hands. The contract is cash settled. On expiry the purchaser will have made a profit (or loss) related to the difference between the final settlement price and the original dealing price. The party delivering the contract will have made a corresponding loss (or profit).** Remember that futures contracts are effectively closed out every day by the use of variation margin. Profits and losses are calculated daily. At expiry, the final day’s profit or loss is calculated, variation margin is paid to or received from the clearing house and the initial margin is returned to both parties. The notional deposit on which the contract is based is not exchanged.

Stock index futures

The contract provides for a notional transfer of assets underlying a stock index at a specified price on a specified date.

Currency futures

The contract requires the delivery of a set amount of a given currency on the specified date.

1.3 Uses of financial futures



A company can use financial futures to “lock in” the value of assets or liabilities, or to guarantee the value of receipts and payments.

There are many circumstances that can lead a company to use the financial futures market, some are more obvious than others. Some examples for each of the above contract types are listed below.

Bond futures

When issuing bonds

If a company intends to issue bonds in the future but wishes to lock in the current level of yields, it could *sell some bond futures contracts* at the current price, thereby locking in current yields. This futures position would be unwound when the actual bond is issued.

For example, suppose the company agrees to sell bonds at 110 in 3 months’ time (the time of the proposed issue of the new bonds). If the price increases to 120, then the company will lose on the future (it has to sell bonds worth 120 for only 110) but gain from the higher issue price of its bonds. On the other hand, if the price falls to 100, the company’s gain on the future will be offset by its lower issue price.

When it has a fixed-rate loan

A company could agree to *buy bond futures contracts* to hedge the risk of interest rates falling if it has a fixed-interest rate loan.

If interest rates fell, bond prices would rise and therefore, it would offset the “loss” from being unable to benefit from the fall in interest rates on its loan with a “gain” on its bond futures. Similarly, if interest rates rose, bond prices would fall and therefore the company would gain from its fixed interest rate loan but lose on its bond futures.

Short interest rate future

When it has a floating-rate loan

A company could use interest rate futures to protect it from the risk of rising interest rates. **For example, if a company has raised capital by borrowing at floating interest rates, but wishes to fix its future interest payments, it can use interest rate futures to fund any increase in the interest rate payable (but will have to pay over any interest saved if market rates fall).**

Suppose a company has to borrow in three months' time and is worried that interest rates will rise from the present rate of 4% *pa*. It could lock in the current interest rate by selling short interest rate futures. It could agree to *sell sufficient contracts* at the current price of 96 to hedge its borrowing costs in three months' time.

If interest rates rose to 6% *pa* over the next three months, the price of the interest rate future would fall to 94. The profit the company would make on this transaction would offset the higher borrowing costs.

If interest rates fell to 2% *pa* over the next three months, the company could borrow at a lower cost than it expected. However any profit from the lower borrowing costs would be offset by the loss on the interest rate future contracts.

Stock index futures

During a takeover

During a takeover, a rise in the target company's share price can cause an increase in the amount the predator company has to pay. We are assuming here that part of the offer is for cash and that the cash needed to pay for the target company will increase if the price goes up. The predator company can *buy stock market index futures* to hedge this risk.



Question 5.2

How would stock index futures help hedge the risk that share prices rise during the bid?



Question 5.3

What are the limitations with such a hedging strategy?

Currency futures

In the same way, currency futures could be used to fix the value of foreign receipts or payments. In practice, forward currency markets would be used.

It is not difficult to think of situations in which a non-financial company might use currency futures, although currency forwards would be more common. In the following example, we describe a situation in which a company might use currency futures to hedge a currency risk, and explain the advantage of futures over forwards.

To fix the value of receipts



Example

Company XYZ is expecting a payment of \$100 million at the end of a year and those dollars must be converted back into the domestic currency (sterling). It might choose to *sell the dollars forward*, thereby fixing the value of the receipts in the domestic currency.

Suppose XYZ sells \$100 million for £60 million for settlement in one year's time. This can be done either with a bank as a forward contract or through the exchange in the form of futures contracts. The amount of dollars sold is sufficient to hedge the full anticipated \$100 million foreign earnings.

However, the amount of the US dollar payment is subject to review, *eg* a large part of the work is cancelled leading to a reduced payment of only \$50 million at the end of the year. XYZ is now "over-hedged" because it has a contract to sell \$100 million at the end of the year but only expects to receive \$50 million. It has two options:

- If it bought futures contracts then it can close out half of the contracts it bought in the market. It will reduce the futures exposure until it has a liability to sell only \$50 million dollars in a year's time.
- If it bought a forward contract then it must settle that contract. XYZ should therefore take out a fresh contract to buy \$50 million for £30 million for settlement in one year's time. This contract will cancel out half of the existing hedge.

It can be seen that the futures contract gives the company additional flexibility in these circumstances.

**Question 5.4**

Why might futures contracts be a useful product during pricing negotiations when various companies are presenting bids for a large construction project?

1.4 Forwards

Like futures contracts, forwards are contracts to buy or sell an asset on an agreed basis in the future. The difference is that futures contracts are standardised contracts that can be traded in a recognised exchange.

So:

- a *forward* contract is a non-standardised and privately negotiated contract between two parties to trade a specified asset on a set date in the future at a specified price.
- a *futures* contract is a *standardised, exchange-tradeable* contract between two parties to trade a specified asset on a set date in the future at a specified price.

2 Options

2.1 Introduction

Definition



An option gives an investor the right, but not the obligation, to buy or sell a specified asset on a specified future date.

The *buyer* of an option has the *right* but not the obligation to take up the option at the specified exercise price. The *seller (writer)* of an option has the *obligation* to honour the option given to the buyer.

Margins and premiums

The writer of the option pays a *margin* to the London Clearing House. The buyer pays a *premium* to the writer.

Types of options



A **call option** gives the right, but not the obligation, to buy a specified asset on a set date in the future for a specified price.

A **put option** gives the right, but not the obligation, to sell a specified asset on a set date in the future for a specified price.

An **American style option** is an option that can be exercised on any date before its expiry.

A **European style option** is an option that can be exercised only at expiry.

Traded options are available on individual equities and also on financial futures contracts.

We looked at warrants and executive share options in Chapter 4.

2.2 **Uses of options**

Options allow a company to protect itself against adverse movements in the financial environment while retaining the ability to profit from favourable movements.

For example, a company that has borrowed at variable interest rates could purchase options to protect itself against increases in market interest rates. If rates fall the company will only suffer the loss of the premium paid to purchase the options.



Question 5.5

What option would be used in these circumstances?

Since an option is a right to buy (or sell) an asset rather than an obligation to do so, the company that holds the option can choose to exercise it or not, depending on whether events move in its favour or move against it. Therefore the option never becomes a liability to the company.



Question 5.6

Is this a “no-lose” situation for the company?

3 Interest rate and currency swaps

3.1 Introduction

Definition



A swap is a contract between two parties under which they agree to exchange a series of payments according to a prearranged formula.

Usually one party to a swap agreement will be a bank (often referred to as the market maker) and the other will be a company. The bank will enter into many such swaps. The parties involved in a swap are often called counterparties.

Pricing

The swap will be priced so that the present value of the cashflows is slightly negative for the investor and positive for the issuing organisation. The difference represents the price that the investor is prepared to pay for the advantages brought by the swap on the one hand, and the issuer's expected profit margin on the other.

Risks

Each counterparty to a swap faces two kinds of risk:

Market risk



The risk that market conditions will change so that the present value of the net outgo under the agreement increases.

The market maker will often attempt to hedge market risk by entering into an offsetting agreement. In other words the market maker would enter into a second agreement, which worked in the opposite direction, so that the potential loss is cancelled out.

Credit risk



The risk that the other counterparty will default on its payments.

This will only occur if the swap has a negative value to the defaulting party so the risk is not the same as the risk that the counterparty would default on a loan of comparable maturity.

3.2 Types of swaps

Interest rate swaps



In the most common form of interest rate swap one party agrees to pay to the other a regular series of fixed amounts for a certain term. In exchange, the second party agrees to pay a series of variable amounts based on the level of a short-term interest rate. Both sets of payments are in the same currency.

The fixed payments can be thought of as interest payments on a deposit at a fixed rate, while the variable payments are the interest on the same deposit at a floating rate. The deposit is purely a notional one; no exchange of principal takes place.

A company might agree to pay (usually to a bank) 6% fixed for 10 years based on a nominal amount of £100 million. This would involve making payments of £6 million each year for 10 years to the bank. In return the company would receive interest based on the 6-month money-market interest rate over the same 10-year period and based on £100 million nominal. The money-market interest rate will be determined by supply and demand from institutions wishing to lend and borrow for 6 months and will fluctuate on a daily basis. It will also be affected by base rates. The initial interest rate received would be linked to the current 6-month interest rates and might be (say) 5% pa. But this would be re-fixed every 6 months by reference to the interbank market 6-month deposit rate. It may be substantially above 6% by the end of the 10-year period, in which case the company would receive substantially more than it has to pay.



Question 5.7

Why might a company choose to pay a higher rate and receive a lower rate?

3.3 Currency swaps



A currency swap is an agreement to exchange a fixed series of interest payments and a capital sum in one currency for a fixed series of interest payments and a capital sum in another.

A company might agree to pay the current US dollar fixed rate for 10 years based on a nominal amount of \$100 million and receive the current UK fixed rate for 10 years based on a nominal amount of £60 million. Note the difference here between single currency interest rate swaps and cross currency swaps (or currency swaps).

The nominal amounts used to calculate the interest payments are different in the two currencies. Alternatively it could agree to receive UK floating rate interest on the basis of the 6-month UK interest rate, re-fixing every 6 months for 10 years. Both of the above would be classed as currency swaps.

One important aspect of currency swaps is that the nominal amount of each *position* is exchanged at the end of the contract.

For example, at the expiry of the currency swap described above, the party receiving the US dollar coupons would receive a payment of \$100 million, exactly as if he had bought a 10-year US bond. He would simultaneously have to pay an amount of £60 million, exactly as if he had issued a UK sterling bond.

3.4 **Uses of swaps**

Risk management

A company can use swaps to reduce risk by matching its assets and liabilities. For example a company which has short-term liabilities linked to floating interest rates but long-term fixed rate assets can use interest rates swaps to achieve a more matched position.

Currency swaps could be used by a company with liabilities in one currency and assets in another.

Companies are often involved in large overseas projects, where the project will earn profits in a foreign currency for 10 years and then be sold at the end of the 10-year period. Such companies might be interested in such a swap.



Question 5.8

Why might using swaps be suitable under such conditions?

Reducing the cost of debt

If one company has a comparative advantage in borrowing at a floating rate while another company has a comparative advantage in borrowing at a fixed rate, they can use an interest rate swap to reduce the total cost of financing and both benefit from a lower cost of debt.

Note that comparative advantage here implies that the companies' relative credit ratings are different in the long and short-term debt markets.

Swaps enable companies to borrow in the form that offers the lowest yield margin (or financial cost) to them. If the cheapest form of borrowing is not what the company wants, it can swap the payments into the desired form (*ie* floating or fixed) using an interest rate swap. Similarly, if the cheapest form of borrowing is not in the currency the company wants, it can use a currency swap to swap the payments into the desired currency.



The emphasis in Subject CT2 is on the practical uses of derivatives. For example:

“Explain the possible uses by a non-financial company of swaps.” (September 2002)

There are two sorts of swaps to discuss (interest rate swaps and currency swaps) and two main motives (reducing risk by matching assets and liabilities and reducing cost).

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Chapter 5 Summary

Definitions

A *forward* contract is a contract to trade an asset at a fixed price at a fixed date in the future. A *future* contract is a standardised, tradable contract to trade an asset at a fixed price at a fixed date in the future. A *financial future* contract is based on an underlying financial instrument rather than a physical commodity.

An *option* gives an investor the right, but not the obligation, to buy or sell a specified asset on a specified future date.

A *swap* is a contract between two parties under which they agree to exchange a series of payments according to a prearranged formula.

Uses of derivatives

The uses of derivatives vary widely and can involve:

- currency risk management
- interest rate risk management
- borrowing cost reduction.

Companies traditionally use *forward* contracts for delivery of the raw materials required for their business. Forward contracts will normally result in deliveries of raw materials to the buyer of the contract.

Futures contracts on the other hand are used to hedge price movements in commodity prices or finance costs. These are normally closed before reaching the exercise date.

Options offer companies the ability to hedge downside risk while leaving open the possibility of upside risk. The cost of this opportunity is the insurance cost of the option premium.

Both interest rate and currency *swaps* are used by companies primarily to manage their debt. Companies can reduce risk by structuring their debt to be consistent with their assets. This can mean swapping fixed into floating rates or vice versa, or indeed swapping a liability in one currency into one in another currency. Swaps can also enable companies to reduce the cost of debt.

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Chapter 5 Solutions

Solution 5.1

The exchange assumes responsibility for the settlement of all contracts. Thus it assumes substantial credit risk itself, in that if any trader fails to settle, then the exchange must settle the deal on their behalf and suffer the loss. For this reason the exchange insists that traders place sufficient funds in an account to cover:

- the current negative value of any outstanding contracts
- an extra amount to cover any likely future volatility in the contract over a short period.

The exact rules are very complex, and vary from contract to contract.

Solution 5.2

The company purchases sufficient stock index futures to hedge the amount of its cash offer. If the market rises sharply and the company is forced to raise the amount of its bid, it should make sufficient profit on its futures contracts to offset this higher cost.

Solution 5.3

The share price of the target company might not move in line with the market index.

As is often the case in the commercial world, the exact cash movements are seldom known in advance. The key is to hedge the best estimate of the known risks.

Solution 5.4

When companies submit bids for construction projects they are exposed to currency and interest rate movements during the period that the bids are being considered. Using futures contracts the current market rates can be used to price the bids, and then the company can hedge its exposure through futures contracts. Even if market rates move during the bidding process, the company can still be confident that its bid is sufficient to undertake the project profitably. Of course if the bid fails, the company has been exposed to the markets to the extent of the hedge! The company might prefer to use options on currency futures for this purpose.

Solution 5.5

The company would *buy a put option* on interest rate futures. This would give it the right to sell interest rate futures at a fixed price at a fixed date in the future. If interest rates rise, then the price of the interest rate future would fall, so the company would exercise its option to sell, thus making a gain on the future to offset the higher interest rates it has to pay on its loan. On the other hand, if interest rates fall (and the price of the future rises) the company will not exercise its right to sell, and will just benefit from the fall in interest rates on its loan.

Solution 5.6

No. The company must consider the cost of buying the option, *i.e.* paying the premium.

Solution 5.7

There could be many reasons which include:

- They expect the shorter rate to rise over the period such that at the end of the 10-year period the company will receive more interest than it is paying.
- They expect long-term yields to rise in the near future. If long-term rates rise to 7%, the contract that the company owns (to pay 6% and receive 6 month floating rate) will be worth money.
- It has fixed rate income and fixed rate finance over the 10-year period. It can reduce this investment risk by making this swap.

According to the expectation theory of the yield curve (considered in detail in Subject CA1), the total return to the investor from investing for 10 years fixed and from investing continuously in 6-month deposits over a ten-year period should be the same. Indeed the 10-year fixed rate is the market's best estimate of the total annual return from reinvesting continuously in 6-month deposits.

Solution 5.8

If the company's domestic currency is (for example) dollars, and it expects to receive a flow of euro profits for 10 years, then a currency swap would essentially sell all of these foreign payments into dollars. Even if the euro payments fluctuate, a swap would go a long way to hedge the overall currency risk involved.

At the end of the period the asset will be sold for euros. The exchange of nominal at the end of the currency swap hedges this payment as well (albeit in an approximate manner).

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Chapter 6

Issue of shares



Syllabus objectives

- (v) Demonstrate a knowledge and understanding of the characteristics of the principal forms of financial instrument issued or used by companies and the ways in which they may be issued.
1. Outline the reasons a company might have for seeking a quotation on the Stock Exchange.
 4. Outline the following methods of obtaining a quotation for securities:
 - offer for sale
 - offer for sale by tender
 - offer for subscription
 - placing
 - introduction.
 5. Describe the following types of new issues to existing shareholders:
 - scrip issue
 - rights issue.
 6. Describe the role of underwriting in the issue of securities.

0 Introduction

In Chapters 2 and 4 we introduced the main securities traded in the financial markets. In this chapter we look at some aspects of how the *markets* for these securities actually work. We look at how companies issue securities, and how securities are subsequently traded.

There are two types of transactions to consider:

- *new issues* (or “primary” market transactions) where a borrower (*eg* a company or a government) raises money by selling securities to lenders (*eg* institutional investors such as pension funds and life offices)
- *secondary market transactions* where one investor sells the security on to another investor.

Secondary market transactions also serve a useful economic purpose. If shareholders could not easily sell their shares, few people would be willing to buy shares in the first place.

The structure of this chapter is as follows:

Section 1: Obtaining a stock exchange quotation

Section 2: Issues made by companies already quoted.

The information in this chapter reflects the UK context but similar issues apply in other countries.



This chapter has been quite heavily examined in the past. Examination questions have tested *knowledge* of the various methods of issuing shares (for companies applying for a quotation and for those companies already quoted which undertake a rights issue or a scrip issue); *understanding of the implications* of a rights issue and a scrip issue; and the *ability to analyse* the strengths and weaknesses of these issues from the point of view of the company and the shareholder.

1 **Obtaining a stock exchange quotation**

1.1 **Meaning of the word “quotation”**

If a company successfully obtains a quotation on a stock exchange, the price of its securities will be included on the exchange's official list. Such quoted securities are called listed securities.

The UK Stock Exchange runs *two* different markets for UK equities:

1. the “Alternative Investment Market” (AIM) (established in June 1995)
2. the main market.

Companies requiring a quotation on either market must fulfil certain minimum requirements. The minimum requirements for a “full” listing on the Stock Exchange’s main market are more severe than for an Alternative Investment Market quotation. For example:

- a full listing requires 25% of shares to be in public hands (there is no such requirement for an AIM quotation)
- a full listing requires a three-year trading record (there is no minimum trading record required for an AIM quotation).

There are over 1,000 companies with a full listing on the UK Stock Exchange, and over 1,000 (generally smaller) companies quoted on the AIM.

1.2 **The reasons for seeking a quotation**

Obtaining a quotation has costs (eg accountants’, solicitors’ and brokers’ fees), as does maintaining a quotation (eg an annual fee paid to the Stock Exchange). So why do companies choose to incur these costs? Possible reasons are set out on the following pages.

To raise capital for the company

Most businesses start off small and, if they are successful, grow over a period of time. There may come a stage in the life of a company where further expansion requires more capital than the existing shareholders and the company’s bankers are willing to provide. **Obtaining a quotation allows the company to sell new shares to a wide market and thus raise large sums of money as cheaply as possible.**

This is often the prime motivation for obtaining a quotation. **The vast majority of companies choose a method of obtaining a quotation which simultaneously raises new funds.**

To make it easier for the company to raise further capital

Once a company has a quotation, it will be easier for it to sell new shares in the future. In addition, providers of debt finance will be happier to lend money to a quoted company because they will feel safer in the knowledge that the company has to meet the Stock Exchange's on-going quotation requirements (eg concerning the availability of information on the company).

To give existing shareholders an exit route

This is another common reason for obtaining a quotation. A family run business may have got to the stage where the family members want to retire, or where they feel that the company would do better with professional managers. Alternatively, the family may simply want to realise the value of their investment. Whatever the reason, obtaining a quotation provides an easy way for a family to sell its holdings. This will usually form part of the process of obtaining a quotation.

Similarly, specialist providers of equity capital to small unquoted businesses (known as venture capitalists) usually want to realise their investments after a few years. A quotation provides an exit route for venture capital investment (often referred to as "private equity").

To make the shares more marketable and easy to value

The reasons given in the list below are unlikely to be the main motivation for a quotation. However, the directors may feel that the following advantages for shareholders will reinforce some of the other benefits.

- **The fact that shares can be easily valued helps with inheritance and capital gains tax calculations.**
- **Because the shares are more marketable and more easily valued, shareholders will find the shares more useful as backing for their own borrowing.**
- **Quoted companies often use their own shares to offer to the target company's shareholders in a takeover bid. Quoted shares are much more effective for this purpose.** Note however that obtaining a quotation could make the company more likely to become the *target* of a takeover.
- **Some companies offer employee share schemes to help motivate their staff. Such schemes will be more attractive if the shares are quoted.**

**Question 6.1**

What is the difference between primary and secondary markets?

**Question 6.2**

What is the case for and the case against obtaining a quotation?

1.3 Methods of obtaining a quotation

We will now look at the main methods of obtaining a quotation. These are:

- offer for sale at a fixed price
- offer for sale by tender
- offer for sale by subscription
- placing
- introduction.

1.4 Offer for sale (at a fixed price)

Description

The usual method for obtaining a stock exchange quotation and simultaneously raising new money is an offer for sale.



In an offer for sale at a fixed price, a predetermined number of shares (or other securities) is offered to the general public at a specified price via an issuing house.

The shares offered could be new shares (if the purpose of the quotation is for the company to raise money). Alternatively, the shares may be old shares (if the purpose of the quotation is for the existing shareholders to sell some or all of their shares).

Offers for sale are the most common method used to obtain a listing. Also, offers for sale are almost exclusively used when a company first obtains a quotation (*ie* an offer for sale is hardly ever used on other occasions). Companies that are already quoted are more likely to use rights issues to raise further equity capital. (See Section 2.)

The issuing house and underwriting

Rather than selling shares directly to the public, the company or existing shareholders sell the shares to an issuing house. The issuing house is then responsible for selling shares to the public. In this way the issuing house “underwrites” the issue.

If the public does not buy all of the shares that are offered, the issuing house (and those whom the issuing house gets to “sub-underwrite”) will end up holding the shares. The company (or existing shareholders) are certain to raise the required amount of money. Underwriting is covered in more detail later in the course.

Issuing houses are usually part of an investment bank. As well as underwriting an offer for sale, their role is to act as professional advisers to the company, overseeing the whole process and co-ordinating the activities of the other professional advisers. Issuing houses may be remunerated in one of two ways:

1. a fee is charged to the company, or
2. the price at which the securities are sold to the issuing house is a little below the price at which the securities are subsequently sold to the public.

Issuing houses are very keen that issues with which they are involved are successful. Consequently, the reputation of the issuing house is sometimes used by investors as an indication that the offer is a good one. This reinforces the issuing houses' desire to maintain their good name.

Timetable for an offer for sale

About one year before the offer

The directors of a company wishing to obtain a quotation will usually start to talk to an issuing house at least a year before the securities are offered for sale. The issuing house will want to satisfy itself that the company and its directors are suitable before proceeding.

The issuing house will try to ensure that pre-launch comments appearing in press are favourable. The company will also need to prepare itself eg by changing its Memorandum of Association to make it a public limited company (see Chapter 2). A sponsoring broker will be appointed to discuss the issue with, and get approval from, the Stock Exchange's Quotation Committee.

The weeks leading up to the issue

In this period the issuing house will advise on the price which should be set. Setting a price can be quite difficult. Both the issuing house and the company will want to avoid an undersubscribed issue because it is felt that this damages the reputation of both. **The tradition is to be fairly conservative in pricing new issues – ie set the price on the low side.** As a consequence, it is usual for a new issue to be oversubscribed. **The final price will not be set until the formal prospectus is published.**

Issuing the prospectus – “Impact day”

Once the offer price is set, the prospectus (or listing particulars) is made available to the public. The prospectus, or alternatively an offer notice, will be reproduced in at least one national newspaper, and the prospectus may be made available through other channels such as high street banks.

The prospectus contains a great deal of information about the company, its activities, financial position, reasons for the issue and people involved in the issue. There is a duty on the professional advisers to disclose all relevant information, and the issuing house will want to protect its reputation. Therefore, information in a prospectus is generally reliable. The prospectus will also include an application form.

Applications

Typically, applications from the public to buy securities can be made for a period of about a week following the issue of the prospectus.

Usually, the issue will have been oversubscribed by the time the offer is closed. In these cases the issuing house needs to determine the basis of allocation ie how it will determine which offers to accept in full, which to reject, and which to scale down.

Often there are two objectives to be balanced:

1. ensuring that the securities are widely held (so that there is an active market in the shares)
2. reducing administration costs.

A basis of allotment could be to reject all applications for less than, say, 1,000 shares, to fully meet applications for between 1,000 and 20,000, and for applications over 20,000 shares to give only, say, one share for every five applied for. Another common allocation method is to use a ballot in order to determine which applications are accepted.

Letters of acceptance

Letters of acceptance are sent out to successful applicants, and refund cheques sent to those whose applications were rejected, or were scaled down. It takes some time for share certificates to be issued, and in the meantime the letters of acceptance can be used in place of share certificates for trading. Official trading on the Stock Exchange starts the day after acceptance letters are posted.

Conclusion

The need to advertise in a national newspaper and to deal with lots of applications from the public, together with the cost of underwriting, make an offer for sale very expensive. However, the big advantage is that it ensures the widest possible market for the securities. It is the most common method of obtaining a quotation for large issues. Indeed, the Stock Exchange does not normally allow a quotation involving more than £50m of shares to be made without an offer for sale (at a fixed price or by tender).

1.5 Offer for sale by tender

Description



An offer for sale by tender is similar to an offer for sale at a fixed price. However, instead of inviting applications at a specified price, the issuing house invites members of the public to submit a tender stating the number of shares which they are prepared to buy, and the price which they are prepared to pay.

The prospectus will give a minimum price, but it is up to investors to determine how much to bid.

After the offer closes, the issuing house will determine a single strike price. This may be the highest price at which all the stock can be allocated. However, a lower strike price will be chosen if this is necessary to ensure a sufficient spread of shareholders. All applicants who bid at least as much as the strike price will have their applications accepted.

All successful applicants will pay the strike price, regardless of how much more they had bid. Applicants who bid less than the strike price will have their applications rejected.

Conclusion

A company can raise more capital through using a tender rather than a fixed price, because investors are asked, in effect, to state the maximum amount that they are prepared to pay for the shares.

However, the allocation process for an offer for sale by tender is more complex. The method is also more likely to produce a more concentrated ownership of the shares, which is detrimental to their marketability. This is not only because smaller investors are put-off by the tender process, but also because all investors who bid below the strike price in the event of the offer being over-subscribed receive no shares at all. This contrasts with an offer for sale at a fixed price. Here, if the offer is oversubscribed, applications will often be scaled down. In fact, sometimes the strike price of an offer for sale by tender may be reduced and applications above the strike price scaled down, so as to achieve a wider share ownership.

1.6 Concessionary methods of obtaining a listing

The Stock Exchange likes offers for sale because it ensures a wide ownership of securities and because all investors are treated equally. However, in some circumstances the Stock Exchange allows alternative new issue methods to be used.

Offer for subscription

These are similar to offers for sale. They are normally at a fixed price, but can be by tender. However, the whole issue is not underwritten. The company sells shares directly to the public. The issuing company bears (at least part of) the risk of undersubscription. An issuing house will still be employed as an adviser to the issue.

Sometimes offers for subscription are used for unusual issues (eg a hi-tech bio-research company) and launches of investment trusts. In these types of issue it is far from certain whether investors will want to buy shares, and how many can be sold. In these cases the offer for subscription will only go ahead if a minimum number of shares are purchased. If too few applications are received, all applications will be rejected and cheques returned. If an offer for subscription is used, only new shares can be sold.



In an offer for subscription the issuing company sells its securities directly to the public, and bears the risk of undersubscription.

Placings (or “selective marketings”)

Raising money from the public can be an expensive exercise. **A simpler, cheaper method of making small issues is known as a “placing” or “selective marketing”.**

The issuing house first buys the securities from the company. The issuing house, or a stockbroking firm, **will then individually approach institutional investors such as pension funds and life offices directly.** The institutions will be offered securities, but no public applications will be invited.

Smaller investors dislike placings because they are not able to buy the shares. They would have to buy the shares later from one of the lucky institutions, usually at a price in excess of the placing price.

Companies like placings because they are cheaper for two main reasons:

- advertising and administration costs are minimised
- no sub-underwriting is needed (the process of a placing itself is very similar to the process used to obtain sub-underwriters anyway).



In a placing the issuing house offers securities to a small number of its institutional clients.

Introductions

Not all of the reasons for wanting a stock exchange listing involve the immediate desire to raise new money or the sale of existing shares. In these cases, a stock exchange may allow the shares to be “introduced” to a stock exchange listing.



Introductions do not involve the sale of any shares. They simply mean that the existing shares will in future be quoted on the London Stock Exchange.

As always **for a full listing, 25% of shares must be in public hands, that is, the “free float” of shares available for purchase excluding strategic holdings in subsidiaries or cross-holdings must be at least 25% of the issued shares.** The Stock Exchange only allows introductions in cases where this requirement is already met.

Introductions can be used in several circumstances. For example:

- where an overseas company is already listed in, say, the USA, but wants to have a UK Stock Exchange listing as well
- where an already listed company wants to “de-merge” into two or more separate companies; the new companies will obtain a quotation by way of an introduction
- where an unquoted company already has shares in wide ownership and sufficient capital but wants to become quoted.

1.7 *The role of underwriting*

In a previous section we mentioned underwriting in the context of an offer for sale. **Underwriting is always used for an offer for sale. Underwriting may also be used for other share issues. The process is:**

1. A company wants to raise equity capital by issuing shares. **Rather than run the risk of not managing to sell all the shares and raise enough money, the company arranges to sell all the shares at an agreed price to the issuing house. The company will pay the issuing house a fee.** Alternatively, in the case of an offer for sale, the fee can be included in the difference between the price at which the shares are sold to the issuing house and the price at which the issuing house sells them to the public. Underwriting is really like insurance for the company against the risk that the issue may not be successful.
2. **The issuing house accepts the risk that all the shares may not be bought. However, the issuing house will not want to retain the entire risk. The issuing house will arrange sub-underwriting. In return for a commission the sub-underwriters agree to take a proportion of the shares that are not bought by the public.** Usually the issuing house will use several institutional investors such as pension funds and life assurance companies as sub-underwriters.
3. **Issues are priced so that they should be successful. Issuing houses take care not to over-price issues. The main risk faced by underwriters is that an unexpected event occurs between agreeing to accept the underwriting and the closing date for the offer for sale.** For example the stock market crash in October 1987 occurred just as the government’s offer for sale in BP shares was taking place, with the result that the offer was under-subscribed. The level of underwriting risk varies with the time between agreeing to accept the underwriting and the closing date for the offer for sale.

- 4a. **Fully subscribed issue:** the issue goes ahead, and is fully subscribed. The issuing house and the sub-underwriters will have made an underwriting profit equal to their underwriting commission less any administrative expenses.
- 4b. **Partly subscribed issue:** the issue goes ahead, but not all of the shares are purchased. The underwriters and sub-underwriters get their fee/commission, but they also need to pay for all the shares that have not been purchased. Suppose an individual institution had underwritten (as a sub-underwriter) $y\%$ of the issue. Following an unsuccessful issue in which there were only applications to buy $x\%$ of the entire issue, the institution would be obliged to buy $y(100 - x)\%$ of the shares at the agreed price. The institution can then choose to sell in the market at a price that will almost certainly be well below what they have just paid. Alternatively, it can hold the shares on a longer-term basis, and hope that the price will recover.



Underwriting is a form of insurance against the risk of an unsuccessful issue. It is used to ensure that the issuing company raises the required amount of money.



Question 6.3

What are the main methods by which a company can obtain a listing on the Stock Exchange?

**Question 6.4**

In each of the following multiple-choice questions, either one or two of these options is correct:

- I offer for sale
- II offer for subscription
- III introduction

In each case answer the question using the following code:

- A if I and II only are correct
 - B if II and III only are correct
 - C if I only is correct
 - D if III only is correct
- (i) Which may be at either a fixed price, or by tender?
 - (ii) Which raise new money?
 - (iii) Which may be used to allow existing shares to be sold?
 - (iv) Which involve the sale of shares to an issuing house?
 - (v) Which does not involve the sale of shares?
 - (vi) Which are always underwritten?
 - (vii) Which is cheapest for the company?
 - (viii) Which is most expensive for the company?



For the examination you must be clear on the reasons for and against seeking a quotation. You must also know the different methods of obtaining a quotation and the relative merits (*eg* costs, spread of shareholders) of each. For example:

“Explain the advantages and disadvantages of obtaining a stock exchange quotation. Identify the most appropriate way by which Z plc might issue fresh share capital and describe the steps that are involved.” (September 2000, adapted)

The arguments are fairly standard but some information about Z plc was given in the question and you should use it. For example, it was a large company and could therefore afford an offer for sale.

2 Issues made by companies already quoted

2.1 Introduction

We now look at how new shares are issued by companies that are already quoted. The choices are set out below.

Company wanting to raise new ordinary share capital

The UK Stock Exchange's rules require that, in normal circumstances, a company issuing equity capital or convertibles for cash must offer these issues in the first place to the existing shareholders in proportion to their holdings. These are called "pre-emptive rights". (This requirement does not cover the case where a company takes over another company by issuing more shares to the target company's shareholders in return for their shares.) So a quoted company *must* make what is known as a "rights issue" to existing shareholders if it wants to raise new equity capital.

In some countries existing shareholders do not have these pre-emptive rights. Shareholders may also vote to waive their pre-emptive rights. In such cases, a company may use a *placing* to raise additional capital as described in section 1.6.

Company wanting to increase the number of shares in issue, without raising new money

This might seem like a strange thing to do, but it happens a lot in the UK. What happens is that new shares are issued to existing shareholders in proportion to their existing shareholdings. No money is raised, no one really gains, and no one really loses. This strange exercise is known as a "scrip" issue, and is described in this chapter. Many overseas countries' investment markets, understandably, view this as a silly thing to do. As we will see, the reasons for having a scrip issue are mainly psychological.

Company wanting to raise new loan (or preference share) capital

Here the choice is wider. Most companies will use a placing, although an offer for sale or for subscription could be used.

Existing shareholders wanting to sell a large block of shares

Occasionally, a large shareholder will want to sell shares in a quoted company. In this case an offer for sale will normally be made, rather than simply trying to sell a large number of shares in the normal way on the market.

2.2 Rights issues

Introduction

Under Stock Exchange requirements, when companies want to raise more capital through a further issue of shares, they are obliged to offer the new shares to the existing shareholders. This forms part of the rights of a shareholder.



A rights issue is where a company offers further shares, at a given price, to existing shareholders in proportion to their existing holdings.

For example, a one-for-five rights issue allows each shareholder to purchase one new share for every five currently held.

The price will be at a discount to the current share price. Otherwise why should anyone want to buy the extra shares? It would be cheaper to buy further shares in the open market.

The main effects of a successful rights issue are:

- **new shares are created**
- **new money is raised for the company**
- **the total value of the whole company should be increased by the extra money raised**
- **the price per share will fall depending on the extent of the discount and the number of new shares issued.**

Purpose of a rights issue

From the company's perspective there is a very clear objective which is to raise more money. The reasons for needing more money vary greatly:

1. the company has a fundamental problem, and its future survival depends on raising more cash
2. to reduce the ratio of debt to equity capital
3. the company has expanded too quickly and needs more cash for day to day needs
4. to finance an expansionary investment programme
5. to pay for the purchase of another company.

The reaction of the stock market to individual rights issues will depend very much on the reasons for the issue.

Timetable for a rights issue

A few weeks before the rights issue, the company will discuss the possibility of an issue with its advisers. Companies often like to have a rights issue when the stock market is high because they see this as raising more money for a given cost (where cost to the company is measured in terms of dividends payable).

The company will publish a rights offer document which will explain why the rights issue is being made. Shareholders are then sent provisional allotment letters and the shares start to trade ex-rights ie if someone new buys the shares, it is the seller not the new holder who has the rights. The rights themselves can also be traded.

Shareholders will be given three or more weeks in which to accept the offer or to sell their nil-paid rights, ie rights for which the shareholder has not paid anything.

Impact on share price

Before looking at the impact on the share price we need the following definition:

Market capitalisation is defined as:

$$\text{market capitalisation} = P \times \text{number of shares}$$

where P is the share price.

Hence **before a rights issue, the share price is given by:**

$$P = \frac{\text{market capitalisation}}{\text{number of shares}}$$

The price per share after a rights issue is:

$$P^* = \frac{\text{original market capitalisation} + \text{extra value}}{\text{total new number of shares}}$$

To estimate the ex-rights share price it is necessary to estimate the extra value component in the above equation. The factors incorporated within the extra value are:

- + the amount of new money raised by the rights issue
- the expenses of the issue
- +/- the change in value based on the market's revised perception of the company and the use to which the money is being put.

Ignoring expenses and ignoring the market's reaction

When only the first of the three factors given above is considered when trying to calculate the price of the shares following the rights issue, this is known as calculating the theoretical ex-rights price.

Suppose a company with share price P and N shares in issue makes a n -for- m rights issue at a price of Q (at a discount to P).

If we suppose that the extra value to the company is exactly equal to the gross amount raised, the new share price will be given by:

$$P' = \frac{(N \times P) + \left(\frac{n}{m} N \times Q \right)}{\left(\frac{m+n}{m} \right) \times N}$$

so $P' = \frac{mP + nQ}{m+n}$

This theoretical price is the weighted average of P , the share price before the rights issue, and Q , the price at which the new shares are offered in the rights issue. Because the new shares are offered at a discount, the ex-rights share price will be below the original share price.

Allowing for expenses and market reactions

Although the expenses item is easy to incorporate into the calculation, it is impossible to calculate explicitly the market's reaction. Often the share price immediately following the rights issue will be depressed below the theoretical weighted average price because:

- shareholders don't usually like being asked for more money, so the company loses favour with investors
- if the rights issue is because the company is in trouble, market support for the company falls
- there will be an increased supply of shares in the company on the market (because some shareholders will sell their rights or extra shares), and this will depress the share price, in the short term at least.

**Question 6.5**

Estimate the theoretical ex-rights share price in each of the following cases:

1. Current price: $250p$
Offer price: $150p$
Basis: 1-for-1

2. Current price: $250p$
Offer price: $150p$
Basis: 1-for-3

3. Current price: $250p$
Offer price: $150p$
Basis: 1-for-10

Issues where lots of new shares are issued (*eg* number 1 in the previous question) are known as “heavy” issues. Issues where only a few shares are issued (*eg* number 3 in the previous question) are known as “light” issues.

Impact on statement of financial position

We will study the statement of financial position (also known as the balance sheet) in detail in Chapter 8. At this stage, you need to remember that the share capital shown in the accounts is the nominal value of the issued share capital (number of shares \times par value of the share). If the company raises more than this because the shares are sold above their par value, this is shown in the share premium account, which is part of the company’s reserves.

For example, if a company raises an additional £70m from a rights issue of 100 million shares of par value 25p, then the issued share capital would increase by £25m and the share premium account in the reserves would increase by £45m.



Question 6.6

Describe the impact on the statement of financial position of the company making the first rights issue in the previous question. Assume that the cash raised from the issue will be held in cash (which appears in current assets in the statement of financial position). Before the rights issue, its statement of financial position appeared as follows:

	<i>£m</i>
Non-current assets	250
Current assets	<u>100</u>
	350
Reserves	200
25p ordinary shares	<u>150</u>
	350

Possible courses of action for shareholders

There may be several reasons why a shareholder chooses not to accept the rights, such as not having available cash, or not wanting to increase their exposure in that company, or not wanting to throw good money after bad (in the case of an ailing company).

In these cases, shareholders can sell their rights. What they would sell is their nil-paid right. The theoretical market value of the nil-paid right is the difference between the ex-rights share price and the rights issue price. This should compensate the shareholder for the loss of value in the original holding.

Terminology recap

Let us assume a company's shares are trading at a price of 100p before the company announces a rights issue. Immediately after a company has made an announcement that it intends to have a (say) 1 for 1 rights issue at a subscription price of 50p, we can think of an "old" share as being equal to a "new" share plus the right to subscribe for another new share at the subscription price of 50p. The right to buy a new share is called a "*nil-paid*" right and can be sold independently of the share itself.

The theoretical price of the new shares after the issue is:

$$\frac{1 \times 100 + 1 \times 50}{1 + 1} = 75p$$

75p can be thought of as the value of the “new” share – *ie* the value of a share in the company after the rights issue has been completed. This is referred to as the “*ex-rights price*” of the share. The value of the *nil-paid right* is therefore:

$$\text{ex-rights price} - \text{rights issue price} = 75p - 50p = 25p$$

and these *nil-paid rights* can be sold separately.

The holder of a share prior to the issue therefore still holds shares with a value of 100p, comprising of a new share (now worth the *ex-rights price* of 75p) and the *nil-paid right* (worth 25p). Immediately after the rights announcement the shares are normally traded as a bundle of a new share plus the nil-paid right (*ie* they are not stripped and sold separately). The market price of this bundle is known as the “*cum-rights*” share price.



Example

Prior to a rights issue, shares in Growkwik plc were 100p. New shares were offered on a 1-for-1 basis at 50p. The ex-rights price was 75p (*ie* the theoretical price).

Shareholder 1 (has lots of spare cash and likes Growkwik):

Original holding of 1,000 shares had market value of £1,000.

Shareholder takes up the rights, so spends £500 buying another 1,000 shares.

Market value of 2,000 shares at 75p is £1,500.

Increase in market value of holding = amount spent.

Shareholder 2 (has little spare cash but wants to maintain value of holding in Growkwik at £750⁽¹⁾):

Original holding of 750 shares had market value of £750.

Sells 500 nil-paid rights (out of total of 750 nil paid) at 25p each, raising £125.

Uses £125 to buy 250 of the new shares at 50p each.

Market value of 1,000 shares at 75p is £750.

No net expenditure and no change in the value of the holding in Growkwik.

Shareholder 3 (keen to reduce holding in Growkwik):

Original holding of 10,000 shares had market value of £10,000.

Sells all 10,000 nil paid rights at 25p each, raising £2,500 cash.

Market value of 10,000 shares shareholder 3 is left with at 75p is £7,500.

Decrease in market value of holding = amount raised through selling rights.

Note (1) To do this Shareholder 2 will need to increase the number of shares he owns as the price of his existing shares has fallen from 100p to 75p.

The example shows that, in theory, a shareholder should be indifferent to a rights issue, whether or not the shareholder is able to take up the rights. The result holds regardless of the size of the discount.

These examples ignore any adverse movement in the share price that may occur through any adverse market sentiment and increased supply of shares on the market (caused, for example, by the actions of Shareholders 2 and 3).

Are rights issues always at a discount to the market price?

Yes, unless something goes wrong.

When the issue is announced, the price must be at a discount or else no shareholders would take up their rights. However, in exceptional circumstances, there may be a collapse in the share price between the announcement date and the completion of the issue, such that the offer price is no longer at a discount to the market price.

Underwriting of rights issues

Rights issues don't have to be underwritten, particularly if the new shares are offered at a large discount. However, most rights issues are underwritten and the discount set at about 10% to 20% of the current share price.

As with an offer for sale, having an issue underwritten means that various institutions agree to buy all the shares that are not taken up in the market. The risk for the underwriters is that the issue is a flop, and they are obliged to buy millions of shares, possibly at a level above their market value. In return for accepting this risk, the underwriters will receive a fee of the order of 1% of the money to be raised.

Is underwriting needed?

No!

The advantage to the issuing company of having an issue underwritten is that it is certain to raise the desired amount of extra money.

However, companies could avoid the need to have an issue underwritten by setting an offer price that is very low compared to the market price. This is called a “deep discount”. In this case, unless there was a total disaster, all the rights would be taken up either by shareholders or by other investors who purchase the nil-paid rights from the shareholders.

In order to raise as much money as a less discounted rights issue could raise, a deep discount rights issue needs to be “heavier”, but this poses no real problems. In the past, Barclays Bank and Prudential have both used deeply discounted rights issues to avoid the need for underwriting.

The only problems with deep discount issues are:

- selling rights can count as a disposal for capital gains tax purposes. The bigger the discount, the higher the price of the nil-paid rights. A deep discount issue can increase CGT liabilities for those investors who choose to sell their rights
- companies are not allowed to issue shares below their par value. This places an upper bound on the size of the discount
- deep discount issues are sometimes used by companies who were unable to get underwriters to accept the risk. Therefore, a deep discount issue can be interpreted by investors as a sign of weakness.

What happens if a shareholder does nothing following a rights issue?

The Stock Exchange usually insists that companies sell shares in respect of all the rights which were not exercised on behalf of shareholders, and then share out the benefit of the premium over the rights subscription price amongst those investors who didn't exercise their rights.

2.3 Scrip issues

Introduction

To the logical student actuary, scrip issues (also known as “bonus” or “capitalisation” issues) will appear rather bizarre.



A scrip issue (sometimes called a “capitalisation” or “bonus” issue) is where the company gives free shares to all ordinary shareholders in proportion to their existing holding. No payment is required from the shareholders.

For example, a 1-for-2 scrip issue means that for every two shares held, investors are given a free share.

The basic impact of a scrip issue should be:

- **new shares are created**
- **no money is raised**
- **the fundamental value of the whole company is unchanged**

- **the price per share should fall in proportion to the increase in the number of shares**
- **the total value of each investor's holding should be unchanged**
- **shareholders' reserves in the statement of financial position are converted to share capital (hence the name capitalisation issue).** Retained earnings fall and share capital increases.

Scrip issues are essentially just a book-keeping exercise.



Example

The statement of financial position for Loadsashares plc just before a scrip issue is (in £000s):

Non-current assets	1,381
Current assets	245
Debenture	150
Share capital (25p)	500
Reserves	976

The current price per share is £1.56. As there are two million shares in issue, the market capitalisation of the company is £3.12m.

The directors of Loadsashares decide to have a 1-for-2 scrip issue. Each shareholder gets one new share for each two held. This will have the following effects:

- market capitalisation should stay at £3.12m (there's no new value)
- there will be three million shares
- the price per share will be £1.04 (*ie* $2/3 \times £1.56$)
- an investor who held two shares at £1.56 each now has three at £1.04 each
- some of the reserves in the statement of financial position will have been capitalised.

The new statement of financial position, ignoring the expenses of the issue, will be:

Non-current assets	1,381
Current assets	245
Debenture	150
Share capital (25p)	750
Reserves	726

Effectively, a scrip issue is a bit like a rights issue at 0p. This is where you should be asking “what’s the point of a scrip issue?”. This is a perfectly reasonable question. Scrip issues don’t *appear* to achieve very much. This is because they *don’t* achieve very much!

Purpose of scrip issues

The arguments to support scrip issues are largely psychological.

Marketability

By having more, lower priced shares, the marketability is improved. In fact, unless the price per share had got very big (over £1,000, say), it’s hard to see that this argument is really relevant. Even for the very smallest share transactions, investors should be indifferent between 25 £20 shares and 250 £2 shares. However, apparently UK investors prefer share prices in the range 50p to £10. There might be some mysterious psychological factor for UK shareholders so that they think that ten £2 shares are better value than one £20 share.

Something for nothing

Shareholders might like the idea of being given extra shares free of charge (and that this factor outweighs the fact that each share should drop in value proportionately!). **Hence the name bonus issue.**

Past profitability

From the example on the previous page, you will see that the scrip issue has converted some of the reserves into share capital (*ie* some of the reserves have been “capitalised”). **Scrip issues can take place only if there are sufficient reserves to be capitalised.** **This means that scrip issues tend to be associated with successful companies which have built up large reserves from retained profits.** Also, the marketability argument that a share price is getting too high (also described as too “heavy”) will apply only to shares that have been successful and risen in price.

Therefore, scrip issues tend to be associated with successful companies, so this provides a further positive psychological factor. **Success implies that scrip issues are possible, so scrip issues are taken to imply success.**

Future confidence

The minimum price at which a rights issue can occur is the par value of the shares. Yet rights issues must occur at a discount. Therefore, a rights issue is only possible if the current share price is above the par value of the shares.

A scrip issue reduces the price of a share. Therefore, having a scrip issue may reduce a company's ability to have a future rights issue if its share price declined following the scrip issue. So, if the directors decide to have a scrip issue, they must be confident about the company's future prospects. Investors who read this contorted logic into a scrip issue may view a scrip issue as a sign of good news!

Increased dividends

Some companies have a habit of having light scrip issues (eg 1 for 10) and subsequently keeping the same dividend per share. In these cases, a scrip issue may lead to, or be a sign of, higher dividends. In other words, a bigger proportion of profits will be paid out as dividends. If shareholders think that they can use the dividends more profitably than the company can, this is another "good news" aspect of a scrip dividend.

More reasonable rate of dividend

This argument depends upon companies *not* maintaining dividends per share!

If dividends are expressed as a percentage of the nominal value the figure may seem excessive. This could cause public relations problems, or problems with employees who feel that dividends are too high. This could be avoided by a scrip issue.

Trustee status

It is a requirement of the Companies Act 1985 that a company must have a minimum issued share capital of £1m before it can act as a trustee. A scrip issue converts reserves into share capital, so may allow a company to meet this requirement. The problem here is not one of investor psychology, but of the way in which the law was written.

The downside

In the author's opinion, the arguments against scrip issues seem to have a little more substance than the arguments in favour:

Cost to the company

The administrative costs such as issuing new shares and informing shareholders are met by the company. Many of the shareholders would have been able to suggest alternative uses for the thousands, or perhaps millions, of pounds used up in this way.

Cost to everyone else

Whenever records of dividends or share prices are needed, for example for investment research or CGT calculations, care is needed to eliminate the artificial effect of a scrip issue. Note that HMRC is *not* so stupid as to allow the reduction in share price caused by a scrip issue to reduce a taxable gain!

Impact on share price

On theoretical grounds, an *n-for-m* scrip issue should reduce the share price from *P* to:

$$P \times \frac{m}{m+n}$$

This assumes that the market is totally indifferent to the scrip issue. The actual change in the share price might move slightly one way or the other:

- **up slightly if the psychological factors win through, or**
- **down slightly if the market decides that the cost of the issue outweighs the benefits.**

In both cases, the word *slightly* should be emphasised. In any event, other events that may coincidentally occur on the day that the scrip issue takes place might cause more significant share price movements than either of these two adjustment factors.

In the long term the share price following a scrip issue might move up more quickly than the rest of the equity market. Some research seems to support this view. However, this is probably not *because* of the scrip issue. It is more probably based on the link between successful companies and scrip issues, and the fact that successful companies tend to carry on being successful.



Question 6.7

Calculate the theoretical share price after each of the following scrip issues:

1. Current price: $250p$
Basis: 1-for-1
2. Current price: $250p$
Basis: 1-for-3
3. Current price: $250p$
Basis: 1-for-10

What is a scrip dividend?



A scrip dividend means that a company pays shareholders a dividend by giving them new shares rather than cash.

There are two cases:

- everyone has to accept the scrip dividend: This *is* just like a scrip issue (companies use scrip dividends of this type when they can't afford to pay a dividend but don't want to admit it!). You will end up with more shares worth less each.
- there is a *choice* between a scrip dividend and a cash dividend: Unlike a scrip issue, the scrip dividend option is worth as much as the cash dividend. Those investors that accept the scrip dividend have more shares, but the market value of the shares will not have been forced down. They have gained as much as if they had taken the cash. Really it is like a normal dividend being paid followed by a rights issue.

We will study scrip dividends in more detail in Chapter 16.



Question 6.8

Give reasons why a company would want to have:

- (i) a rights issue
- (ii) a scrip issue.

**Question 6.9**

What do you think happens to the features of a futures or options contract if there is a rights issue or a scrip issue?



In the past, examination questions on rights and scrip issues have been a mixture of calculation questions (*eg* effect on the share price, shareholder or the statement of financial position) and discussion questions (*eg* factors to consider when embarking on a rights or scrip issue; stages involved, advantages and disadvantages).

End of Part 1

What next?

1. Briefly **review** the key areas of Part 1 and/or re-read the **summaries** at the end of Chapters 1 to 6.
2. Attempt some of the questions in Part 1 of the **Question and Answer Bank**. If you don't have time to do them all, you could save the remainder for use as part of your revision.
3. Attempt **Assignment X1**.

Time to consider – “learning and revision” products

Marking – Recall that you can buy *Series Marking* or more flexible *Marking Vouchers* to have your assignments marked by ActEd. Results of a recent survey suggest that attempting the assignments and having them marked improves your chances of passing the exam. Students have said:

“The marking was extremely useful. It gave detailed comments on where I lost marks, how to improve exam technique and how to get the balance of breadth and depth right. This was exactly what I was looking for – thank you!”

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Chapter 6 Summary

Obtaining a stock exchange quotation

A company may decide to obtain a *quotation* on the Stock Exchange:

- in order to raise extra capital
- to make it easier for future issues of capital
- to provide an exit route for its existing shareholders
- to make its shares more easily valued and marketable.

Many new quotations and issues are dealt with by an *offer for sale*. This may be at a *fixed price*, or *by tender*. In an offer for sale by tender, the shares are allocated at a *strike price*, which is paid by all the successful applicants, no matter how much more they had bid. Issues are *underwritten* by an *issuing house*.

Issues can also be arranged by an *offer for subscription* or by a *placing*. If the company does not need to raise any new finance, it may opt for an *introduction* to a stock exchange listing.

Issues made by companies already quoted

Companies can raise more money from their existing shareholders by offering them a *rights issue*. A rights issue reduces the share price and increases both the share capital and reserves of the company.

A company can use a *scrip issue* to increase the number of shares in issue without raising any extra finance. A scrip issue reduces the share price, and, whilst keeping the total share capital and reserves unchanged, it increases the share capital and reduces the reserves.

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Chapter 6 Solutions

Solution 6.1

Primary markets provide for the initial raising of funds through the issue of securities. Secondary markets provide for dealing in securities once they are issued.

Solution 6.2

Reasons for seeking a stock exchange listing:

- To raise capital for the company.
- To make it easier for the company to raise further capital.
- To give existing shareholders an “exit route”.
- To make the company’s shares more easily valued and marketable.

Possible disadvantages:

- It is expensive and time-consuming.
- Original owners have no control over the future owners of the company.
- A takeover bid is possible.

Solution 6.3

The main methods are:

1. offer for sale at a fixed price
2. offer for sale by tender
3. offer for subscription
4. placing
5. introduction.

Solution 6.4

(i) A

(ii) A

(iii) C

(iv) C

(v) D

(vi) C

(vii) D

(viii) C

Solution 6.5

In each case, we equate what the investor starts out with (*i.e.* m shares worth $250p$ plus some money) to what they end up with (*i.e.* $m+n$ shares worth the new price).

Let the theoretical ex-rights share price be P .

$$\begin{aligned} 1. \quad 2P &= 250 + 150 \\ P &= 200 \end{aligned}$$

$$\begin{aligned} 2. \quad 4P &= 250 \times 3 + 150 \\ &= 900 \\ P &= 225 \end{aligned}$$

$$\begin{aligned} 3. \quad 11P &= 250 \times 10 + 150 \\ &= 2650 \\ P &= 241 \end{aligned}$$

Solution 6.6

Working:

Current number of $25p$ shares = $600m$
 Number of new shares issued = $600m$
 Nominal value of new shares = $\text{£}150m$
 Cash raised = $\text{£}900m$
 Expenses involved in rights issue unspecified.

Effect:

Current assets increase by $\text{£}900m$ less expenses
 Ordinary share capital increases by $\text{£}150m$
 Reserves (*i.e.* share premium account) increases by $\text{£}750m$ less expenses

If we ignore expenses, the new statement of financial position will look like this:

	<i>£m</i>
Non-current assets	250
Current assets	<u>1000</u>
	1250
Reserves	950
$25p$ ordinary shares	<u>300</u>
	1250

Solution 6.7

Again we equate what the investor starts out with (*i.e.* m shares worth $250p$ each) to what investors end up with (*i.e.* $m+n$ shares worth the new price).

Let the theoretical share price be P .

1. $2P = 250$
 $P = 125$
2. $4P = 250 \times 3$
 $P = 188$
3. $11P = 250 \times 10$
 $P = 227$

Solution 6.8

- (i) A company would have a rights issue in order to raise some extra capital. The reasons for needing this extra money might include:
- the company needs more cash in order to survive
 - to reduce the company's debt/equity gearing
 - for day to day needs
 - to finance a programme of expansion
 - to buy another company.
- (ii) A scrip issue will not raise any more money for the company, and will not alter the fundamental value of the company. The reasons for a scrip issue are largely psychological:
- marketability may be improved by having more shares priced at a lower price
 - shareholders may like to be given extra shares free of charge
 - scrip issues provide a way of capitalising past profits and so are associated with successful companies
 - a scrip issue may reduce the scope for the directors to declare a rights issue, so can indicate that the directors are confident about the company's future
 - dividends: if dividends per share stay the same, then shareholders will feel good about getting extra money. If they fall in proportion to the scrip issue, they may seem to be at a more reasonable rate.
 - a company may wish to increase its issued share capital in order to gain trustee status.

Solution 6.9

As far as possible, the derivatives exchange will try to eliminate the impact of these changes on people with a derivative position. For example, following a 1-for-1 scrip issue, the exercise price of a traded option would be halved, and the position of each option holder (*ie* the number of shares the option holder has the option to buy or sell) would be doubled.

Chapter 7

Introduction to accounts



Syllabus objectives

- (ix) *Describe the basic construction of accounts of different types and the role and principal features of the accounts of a company.*
- 1. *Explain why companies are required to produce annual reports and accounts.*
- 2. *Explain the fundamental accounting concepts which should be adopted in the drawing up of company accounts.*

0 Introduction

This is your introduction to the accounting part of the course. In Part 2 of the course, we introduce the main accounts (the statement of financial position, the income statement, the cashflow statement and the statement of changes in equity), and learn how to generate the accounts from the trial balance. In Part 3 of the course, we learn how to analyse accounts to assess the performance of a company.

In this introductory chapter, we consider the need for accounts, the regulation of accounts, accounting standards, the auditors' report and accounting concepts.



The examination is likely to test your *knowledge* of accounting standards and key definitions and your *understanding* of the need for accounting information, the key accounting concepts and the subjectivity inherent in accounts.

1 The accounting framework

Each year a company will publish four main types of accounting statement:

1. an *income statement* (part of a *statement of comprehensive income*), showing the income, expenses and hence shareholders' profits for the year
2. a *statement of financial position* (also known as a *balance sheet*), showing the assets, liabilities and shareholders' funds at the end of the year
3. a *cashflow statement* to show where the cash has come from and how it has been spent
4. a *statement of changes in equity* to show how the composition of equity has changed over the year.

We look at each of these accounts in Chapter 8.

Companies are required to produce a set of annual reports and accounts in an attempt to fulfil the needs of the various users of accounting information.

1.1 Users



It has been suggested that financial statements have four groups of users:

- **equity investors (ie both actual and potential shareholders)**
- **loan creditors (both long-term and short-term)**
- **employees**
- **business contacts (ie customers and suppliers).**

The accounts have many other uses, and will be used by:

- a stock exchange to ensure that certain requirements are met
- the management themselves as a source of information
- the tax authorities as a starting point in the calculation of the tax liability
- stock analysts as a source of financial information
- credit rating agencies in order to assess the creditworthiness of the company.

The members of each of these groups has a legitimate interest in the financial statements as follows:

equity investors	Investment decisions require information about profits and cashflows. Analysts are constantly preparing and updating forecasts of performance. The annual report provides an opportunity to “fine tune” these forecasts. Existing shareholders also require information about the transactions authorised by the directors for stewardship purposes.
loan creditors	Lending decisions involve the measurement of the risk of default. A lender wants to know whether a business can generate sufficient cash to repay any loan. The lender will also wish to ensure that the business has an adequate asset base to meet its obligations in the event of failure. To this end, loan agreements often contain restrictive covenants which are based on figures from the accounts. Covenants specify a value for a summary statistic, such as a gearing ratio (which measures debt as a proportion of long-term finance).
employees	Employees are interested in the enterprise's ability to pay salaries and also to offer job security. Accounting information is, however, of limited value for such decisions. The cashflow statement will be useful, as will indicators of profitability.
business contacts	Business contacts are interested in continuity of sales (to customers) and of materials and services (from the suppliers). Their interest is, therefore, similar to that of the shareholders. They may also use accounting information to try to gain some insight into the company's pricing and trading policies.



Question 7.1

Why might the holder of a loan stock issued by a company wish to have a restrictive covenant, based on some accounting ratios?

The annual report of a large company will, therefore, have a wide readership. In addition to the “legitimate” users described above, the financial statements will also be read by:

- **government agencies (including the tax authorities)**
- **competitors**
- **potential predators.**

The relationship between the management of a company and the various users listed above can be complex. At best there is likely to be a degree of mistrust. For example, shareholders might be concerned that the directors will act in their own best interests even when this would be to the detriment of the company.



Example

A director who has various share options maturing in 6 months' time is faced with a decision on whether or not to make a provision for a debt owed to the company that seems unlikely to be repaid. If he provides for it, this year's profit will be below the previous year's and the share price will fall. If he chooses to wait until the interim profit statement before announcing the provision, the profit will be above that expected for this year and the share price will rise (until the announcement!) and allow him to exercise his share options. In such a situation the director might be inclined to take a rosier view of a potential liability, and decide not to make a provision in the accounts for a potential loss.

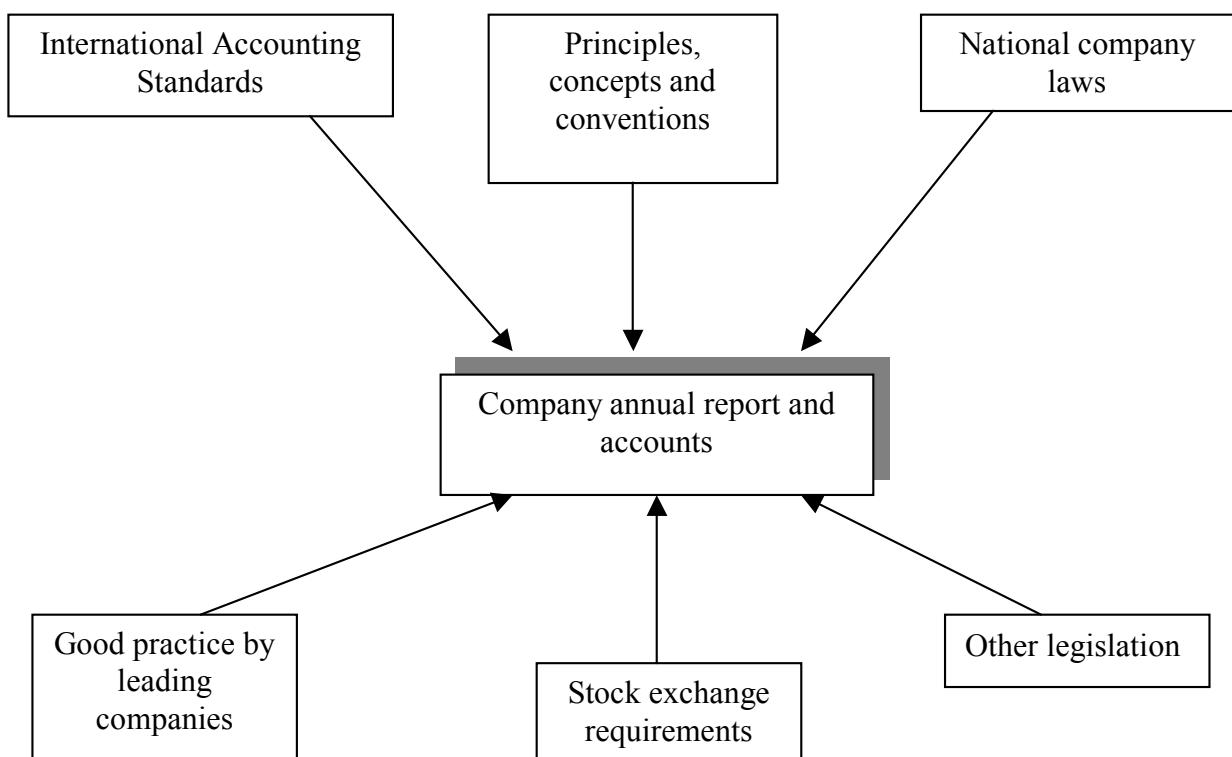
The above example is rather extreme! In practice, a single director will not determine accounting policies. Independent non-executive directors are in place to prevent or reduce the possibility of something like this happening. Nevertheless, suspicion does exist.

At worst there will be outright hostility. For example, the directors are unlikely to volunteer information about the company's performance if that could be used by a potential competitor. Management might, therefore, be tempted to withhold information or to distort any figures which they do publish.

1.2 Sources of regulation

The credibility of published financial statements is protected by the imposition of regulations from a diverse range of sources.

The diagram below (which is part of Core Reading) illustrates the breadth of the body of regulation that affects a limited company which is listed on a stock exchange. A detailed knowledge of these rules is beyond the scope of this syllabus.



Broadly, the rules can be broken down into those which require specific accounting treatment or disclosures, because of national laws or a stock exchange's listing rules, and those which deal with the manner in which these numbers could be calculated – mainly the professional accounting standards and the concepts and conventions.

For example, in the UK, the Companies Act 2006 requires that companies should state the amount charged for depreciation, but the rules concerning the calculation of depreciation are to be found in International Accounting Standard 16 *Property, plant and equipment*.

The fact that there is such a network of sources of regulations and regulators can make the preparation of financial statements a rather complicated undertaking. Fortunately, there is a reasonable amount of articulation between the various rulebooks.

1.3 Statutory requirements

In many countries, national legislation may be in place to dictate what kind of information should be published in financial statements. For example, in the UK, the Companies Act explicitly requires a number of documents.



The Companies Act explicitly requires companies to produce:

- a balance sheet showing the financial position on the last day of the company's financial year (International Accounting Standards require that this be entitled the "statement of financial position")
- an income statement for the financial year (International Accounting Standards require that an extended form of this statement be entitled the "statement of comprehensive income")
- detailed disclosures which are normally presented as a series of notes to the accounts
- a directors' report
- an auditors' report.

For simplicity, in these notes we will often refer to the "statement of financial position" by its more common and user-friendly name, the "balance sheet". This terminology is also used in past papers, other ActEd materials and in the real world.

Small companies have much less onerous requirements and are not required to submit audited accounts.



Question 7.2

What is the purpose of requiring that the accounts of a company should be inspected and signed off by a professional accountancy firm?

The form and content of the income statement and the statement of financial position will be discussed in Chapter 8.

The auditors' report will be considered in Section 4 of this chapter. Here, we just consider the contents of the directors' report.

Directors' report

The main items that a directors' report must contain are:

- certain detail about the company's activities over the previous year, and likely events in the coming twelve months. Opinions are expressed by the directors.
- a brief summary of the financial decisions that the directors have made, including the proposed dividend, the amount of shareholders' profits retained by the company, charitable donations made by the company and details of any of the company's own shares that have been purchased during the year.
- details of persons who were directors during the year, their shareholdings and their other interests in the company.

In the UK, listed companies also have to include in their directors' report additional information required by the Stock Exchange such as a geographical analysis of turnover and average time to pay creditors.

The Companies Act's accounting requirements run to dozens of pages of detailed rules. There is, however, one overriding requirement. That is that the financial statements must give a "true and fair view". The Act does not define truth and fairness and so the phrase must be interpreted in terms of normal English usage. There is, however, a growing body of evidence that this is a term of art and that it has a technical meaning for accountants.



Question 7.3

Give the accepted interpretation of "true and fair view".

To a large extent, the truth and fairness of the statements can be determined by whether they comply with all of the rules and regulations which were outlined above. It is, however, necessary to exceed the formal disclosure requirements or to deviate from the rules governing calculation if doing so would enable the company to give a true and fair view. This requirement to look beyond the codified rules appears to give the concept of truth and fairness an independent existence.

Directors must consider whether, taken in the round, the financial statements that they approve are appropriate. Similarly, auditors are required to exercise professional judgement before expressing an audit opinion. As a result, it will not be sufficient for either directors or auditors to reach such conclusions solely because the financial statements were prepared in accordance with applicable accounting standards.

**Question 7.4**

The sole director of a company is considering how to state the holding of a \$1 million loan to his brother's company. If his brother's company continues to service the loan, his own company is solvent, however if his brother defaults, his own company is bankrupt.

Does a "true and fair view" dictate that he values the loan at book cost, at market value, or at zero in his accounts?

Some companies will be subject to other legislation specific to their type of industry. For example, in many countries there are specific rules relating to specialised businesses such as insurance companies, banks, pension funds and charities.

2 ***The International Accounting Standards Board (IASB)***

2.1 ***The role of the IASB***



The International Accounting Standards Board (IASB) is a body that develops, issues and withdraws accounting standards. The standards that are issued by the IASB are called International Financial Reporting Standards (IFRSs).

The International Accounting Standards Board (IASB) was set up in April 2001. Its predecessor, the International Accounting Standards Committee (IASC), issued International Accounting Standards (IASs). These are still in effect unless replaced by an IFRS.

International standards relate to companies and other kinds of entities which prepare accounts intended to provide a true and fair view.

The IASB has no authority to require compliance with its accounting standards. However, many countries require the financial statements of publicly traded enterprises to be prepared in accordance with IFRSs, and (where necessary) to give particulars of any material departure from those standards and the reasons for it.

For example, from 1 January 2005, all listed UK limited companies have been obliged to use International Accounting Standards for consolidated accounts. Many UK companies are electing to use the international standards in place of the UK ones and so these are the ones likely to be met in practice. The rest of this chapter (and Part Two as a whole), reflects the terminology and format from the international standards.

The IASB collaborates with national accounting standard setters in many countries in order to ensure that its standards are developed with due regard to international and national developments. International accounting standards have helped both to improve and harmonise financial reporting around the world.

IFRSs are used in many countries in the world including Singapore, Hong Kong, Russia, most European countries under the jurisdiction of the European Union, and Australia.



Question 7.5

Why could national accounting standard committees be driven in a particular direction by international committees?

2.2 *The case for and against international standards*

The system for producing standards and keeping them up to date is fairly elaborate, and expensive to operate. Some of the arguments which are made for and against accounting standards include the following:

Arguments FOR	Arguments AGAINST
They eliminate, or at least reduce, variations between companies in the way they prepare accounts.	The sets of rules contained in the standards may not be appropriate to all companies in all circumstances.
The discussion process leading up to a standard being issued focuses attention on particular areas for debate about accounting practice.	Standard-setting may not be entirely objective (some standards in the past have been the subject of government pressure or industry lobbying).
They oblige companies to disclose more information than that required by national laws.	Standards often allow more than one alternative treatment, which negates the attempt to ensure conformity between companies.
They allow some degree of flexibility in a way that legislation often does not.	Some standards are so general as to be meaningless, while others are far too detailed



The arguments above relate on the whole to international accounting standards, but they could be modified to discuss the case for and against accounting standards generally.

Whatever the arguments for and against accounting standards, there is no doubt that they have greatly improved accounting practice. Before their introduction, different companies in similar circumstances were following completely different accounting policies, leading to different and incompatible results. In the 1960s, there was a series of financial scandals that drew the public's attention to the flexibility of the accounting rules at that time. In several cases where takeovers occurred, different accountants produced radically different results for the same company. The accountancy profession was publicly criticised and this led to the formation of the UK's first accounting standard-setting body.

3 ***Typical contents of an annual report***

As an example, the annual report of a company listed on the UK Stock Exchange can easily run to 60 or 70 pages. Much of this is “promotional” material which is published on a voluntary basis. The core of the report is, however, subject to the stringent rules imposed by the Companies Act 2006 and the detailed regulations imposed by the accountancy profession, as discussed above.

There is no need to learn the detailed content of a typical annual report.

Indeed the content varies widely from company to company and from industry to industry. In many financial industries, much of the content explains various financial ratios such as capitalisation and margin. The notes often have intricate information on risk and risk management which can only be understood by industry specialists.

It is, however, almost impossible to make any sense of the rules governing the construction of accounts in a vacuum. The best way to obtain some understanding of the contents of the financial statements is to obtain one or two sets. Most large companies will have financial statements (and annual reports) available on their websites.

The table on the following page gives details of the content found in one company's annual report.

The annual report of a particular UK-based multinational ran to 96 pages. This comprised:

Page	
1	Contents
2–3	The directors' biographical details.
4	A page of “highlights” of financial statements including the profit and dividend figures and some key trends.
5	An analysis of turnover & profit by product area and geographical area.
6–9	The chairman's statement to members, including a personal review of the year gone past and the company's future.
10–11	A map showing the company's world-wide operations.
12–13	Statistics showing a thirty-year financial record.
14–48	A review of operations comprising a series of descriptive analyses of each of the company's main business segments.
49–52	Disclosure of matters relating to corporate governance issues such as directors' remuneration.
53–59	The directors' report, which is actually a list of miscellaneous disclosures required by the Companies Act 2006.
60–61	A statement of the accounting policies which were used in compiling the statement of comprehensive income and statement of financial position. This might typically detail how the company values its assets, translates its foreign earnings, recognises its income and depreciates its stock.
62–66	The accounting statements themselves: statement of comprehensive income, statement of financial position, cashflow statement, statement of changes in equity, etc.
67	A statement of the directors' responsibilities for the financial statements and the auditors' report.
68–90	Notes to the accounts. These might typically show further detail on certain items, like the capital gains realised, the costs and expenses of the business, and management salaries, <i>etc.</i> A long-term (often 5-year) summary of results is also included.
91–96	A list of the company's principal UK and overseas subsidiaries.

4 ***The auditors' report***

In the UK, every company above a certain size (in terms of turnover, assets or number of employees) is required by the Companies Act 2006 to appoint auditors to hold office from one annual general meeting to the next. The auditors must report to the shareholders on the published accounts.

Auditors are elected by the shareholders and shareholders approve the auditors' fee.



The auditors must comment on whether, in their opinion, the statement of financial position and income statement have been properly prepared in accordance with the Companies Acts and relevant accounting standards, and whether, in their opinion, the accounts give a true and fair view.

The fundamental purpose of the audit report is to add credibility to the financial statements.

4.1 The contents of an auditors' report

The auditors' report must contain:

1. a title, identifying the person or persons to whom the report is addressed
2. an introductory paragraph identifying the financial statements audited
3. separate sections, appropriately headed, dealing with:
 - (a) respective responsibilities of directors and auditors
 - (b) the basis of the auditors' opinion
 - (c) the auditors' opinion on the financial statements
4. the manuscript or printed signature of the auditors, with the address
5. the date of the auditors' report.

The section described under 3(a) above clarifies the directors' responsibility to ensure that financial records are properly kept, and that financial statements are prepared in accordance with suitable accounting policies. The auditors' responsibilities will be to form an independent opinion based on those records and statements.

The section described under 3(b) makes it clear how the auditors arrive at an opinion.
A typical audit report for a UK listed company reads as follows.

INDEPENDENT AUDITORS' REPORT TO THE SHAREHOLDERS OF XYZ PLC

We have audited the group and parent company financial statements (the "financial statements") of (name of entity) for the year ended ... which comprise [state the primary financial statements such as the Group and Parent Company Income Statements, the Group and Parent Company Balance Sheets, the Group and Parent Company Cash Flow Statements, the Group and Parent Company Statements of Change in Shareholders' Equity] and the related notes. These financial statements have been prepared under the accounting policies set out therein. We have also audited the information in the Directors' Remuneration Report that is described as having been audited.

Respective responsibilities of directors and auditors

The directors' responsibilities for preparing the Annual Report, the Directors' Remuneration Report and the financial statements in accordance with applicable law and International Financial Report Standards (IFRSs) as adopted by the EU are set out in the Statement of Directors' Responsibilities.

Our responsibility is to audit the financial statements and the part of the Directors' Remuneration Report to be audited in accordance with relevant legal and regulatory requirements and International Standards on Auditing (UK and Ireland).

We report to you our opinion as to whether the financial statements give a true and fair view and whether the financial statements and the part of the Directors' Remuneration Report to be audited have been properly prepared in accordance with the Companies Act 2006 and Article 4 of the IAS Regulation. We also report to you if, in our opinion, the Directors' Report is not consistent with the financial statements, if the company has not kept proper accounting records, if we have not received all the information and explanations we require for our audit, or if information specified by law regarding directors' remuneration and other transactions is not disclosed.

We review whether the Corporate Governance Statement reflects the company's compliance with the nine provisions of the FRC Combined Code specified for our review by the Listing Rules of the Financial Services Authority, and we report if it does not. We are not required to consider whether the board's statements on internal control cover all risks and controls, or form an opinion on the effectiveness of the group's corporate governance procedures or its risk and control procedures.

We read other information contained in the Annual Report and consider whether it is consistent with the audited financial statements. The other information comprises only [the Directors' Report, the unaudited part of the Directors' Remuneration Report, the Chairman's Statement, the Operating and Financial Review and the Corporate Governance Statement]. We consider the implications for our report if we become aware of any apparent misstatements or material inconsistencies with the financial statements. Our responsibilities do not extend to any other information.

Basis of audit opinion

We conducted our audit in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures in the financial statements and the part of the Directors' Remuneration Report to be audited. It also includes an assessment of the significant estimates and judgements made by the directors in the preparation of the financial statements, and of whether the accounting policies are appropriate to the group's and company's circumstances, consistently applied and adequately disclosed.

We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements and the part of the Directors' Remuneration Report to be audited are free from material misstatement, whether caused by fraud or other irregularity or error. In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements and the part of the Directors' Remuneration Report to be audited.

Opinion

In our opinion:

- the financial statements give a true and fair view, in accordance with IFRSs as adopted by the European Union, of the state of the group's and the parent company's affairs as at and of the group's and the parent company's profit [loss] for the year then ended;
- the financial statements and the part of the Directors' Remuneration Report to be audited have been properly prepared in accordance with the Companies Act 2006 and Article 4 of the IAS Regulation; and
- the information given in the Directors' Report is consistent with the financial statements.

Registered auditors

Date

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Address

The wording of this audit report contains a number of caveats. These are, however, buried in the text of the document and require a very careful reading.

For example, the word “opinion” crops up in several places. This is a warning that the preparation of the statements and the collection and evaluation of audit evidence all involve subjective judgement.

There are even more subtle hints. For example, the fact that the report is addressed to the members of the company is meant to warn other potential readers that the auditor does not accept any duty of care for their use of the financial statements and also that the audit work was planned to satisfy the needs of the shareholders and so could be inappropriate for other purposes.

4.2 *Variations on the standard report*

The wording of the standard report can be modified if the auditor wishes to highlight areas of uncertainty or is unable to express an unqualified opinion that the financial statements give a true and fair view. There are various degrees of qualification:

- emphasis of matter paragraphs
- qualified opinion
- disclaimer of opinion
- adverse opinion

and these are described briefly below.

Emphasis of matter paragraphs

If there is a significant uncertainty which has been disclosed in the accounts, the auditor should point this out for the sake of emphasis. That means that it is unnecessary to issue a qualified audit report because the financial statements give a true and fair view. Management has disclosed the problem and the auditor has taken care to ensure that the shareholders have read the disclosure.

Qualified opinion

The auditor would issue a qualified opinion in circumstances where a restriction has been placed on the evidence that the auditor can access or where the auditor disagrees with the treatment of a matter. A qualified opinion effectively states that the financial statements give a true and fair view “except for” the problem that has been described in the body of the audit report.

Disclaimer of opinion

If the auditor is faced with such extreme uncertainty about the financial statements that it is impossible to express an opinion then the auditor would issue a disclaimer instead (“we are unable to form an opinion ...”). This is such an extreme form of qualified audit report that it should only be used very sparingly and in cases where it is unavoidable.

Adverse opinion

The auditor issues an adverse opinion in extreme cases of disagreement where the financial statements have been rendered so misleading that it must be stated that they do not give a true and fair view. Again, this form of qualified report should be used sparingly and only when it is absolutely necessary.

If a company fails to comply with the Companies Act, the directors can be required to pay for the preparation of a revised set of accounts.



Question 7.6

Why would a company want to avoid receiving anything other than an unqualified opinion on its accounts?

4.3 The regulation of auditors

The auditor must belong to one of the recognised supervisory bodies who have registered with the Department of Business, Innovation and Skills. In practice, the vast majority of company auditors are firms of chartered accountants. The supervisory bodies are responsible for the supervision and discipline of all of the registered auditors whom they accredit. There is a system of visitation and monitoring of standards and firms which do not achieve a satisfactory standard may have their registration withdrawn.

The accountancy profession also regulates the practice of audit by the publication of auditing standards. The Auditing Practices Board (APB) issues: International Standards on Auditing (ISAs) (UK and Ireland), Practice Notes and Bulletins. If auditors do not comply with standards they may be subject to action from their recognised supervisory body. For example, ISA 700 sets out the standard wording of the audit report as illustrated above.

There have been two major fears about auditors in recent years:

- conflicts of interest (if the auditing firm also acts in an advisory role to the company)
- familiarity threats (if the auditor has audited the accounts of a company for many years).

There is new ethical guidance, which all professional bodies have now adopted. There is an overriding requirement for auditors to be *conceptually independent* of their clients. However, the decision as to whether or not an auditor is independent is – at least in the UK – a matter which is down to the individual auditor to determine, in the light of their own professional judgement and in the light of a prescribed “threats and safeguards” approach.



Question 7.7

Give arguments for and against the following statement: “It should be compulsory that the auditors of a company should be changed at least once every five years”.

5 Accounting concepts

Accounting standards are based on concepts and conventions which have gradually come together and evolved over many years since bookkeeping and accountancy came into being. In more recent years accounting standards bodies have attempted to put more cohesion behind these concepts and conventions.

For example, the International Accounting Standards Board published IAS 1 “Presentation of Accounting Statements” and IAS 8 “Accounting Policies, Changes in Accounting Estimates and Errors”.

Accounting Standards have placed greater emphasis on neutrality, rather than prudence, and there has also been a move away from historical cost towards “fair values”.

In very broad terms, this means revaluing assets (and liabilities) in the statement of financial position at the end of each accounting period. Any loss on revaluation should be included in that period’s income statement. Any gain on revaluation is taken to the revaluation reserve in the statement of financial position, where it is held until the gain is realised (ie the asset is sold). A consequence is volatility in the financial statements and so this move is controversial.

We will discuss revaluation further in Chapters 8 and 9.



The 11 accounting concepts we discuss in detail are:

- the cost concept (often called “historical cost”)
- the money measurement concept
- the business entity concept
- the realisation concept
- the accruals concept
- the matching concept
- the dual aspect concept
- the materiality concept
- prudence
- the going concern concept
- consistency.

As you read each concept, don't just memorise the text – try to visualise what the consequences of the concept would be if you were drawing up the accounts of a small manufacturing company, billing customers, receiving invoices from suppliers and trying to complete quarterly accounts at the same time.

5.1 **The cost concept**

The cost concept has been presented as one of the cornerstones of accounting for a very long time. Under that concept, non-current assets generally appear in the statement of financial position at their original cost less depreciation to date, subject to a possible impairment write-down.

For most non-current assets such as machinery, manufacturing properties, computers *etc*, the cost concept dictates that any expenditure in acquiring them is not taken as a cost in the year in which the asset is purchased. Instead an amount of depreciation is calculated each year and taken as a cost through the income statement. The asset is placed on the balance sheet, but its value is written down year by year as the original cost is depreciated to zero.



Example

If a bond is purchased at £70 per £100 nominal, a strict reading of the cost concept suggests that it should be held in the books at this price until it is sold or matures. However a more appropriate policy might be to increase the book value gradually from £70 to £100 over the period to maturity. This avoids a large capital gain on redemption. This is what is referred to as “amortised cost”, where amortisation refers to the gradual “death” of the asset!

This would still be classed as a book value basis of accounting.

This cost convention ignores changes in the purchasing power of money and can produce different values for identical items, but simplifies the task of maintaining bookkeeping records because the original cost of an asset is normally a straightforward matter to determine.

The cost concept is being gradually phased out in order to provide more scope for realism in the financial statements. For example, tangible non-current assets such as property, plant and equipment can be shown at their fair value rather than their historical costs. That creates the risk of dispute over the accuracy of the resulting figures because there are rarely transparent and visible markets to enable the fair value of, say, a specific office block in London, Edinburgh or Kuala Lumpur to be observed. Fair values will usually involve a degree of judgement and will frequently be open to challenge.

The movement from cost to fair value indicates that the accountancy profession is constantly reviewing the advantages and disadvantages of competing approaches. For example, cost was favoured in the past because it is generally a defensible and reliable measure. There is now greater reliance on fair values because they offer a more relevant measure of the value of the resources controlled by the company.

For example, it would be over-prudent to allow land to remain at original cost in the balance sheet if it is worth 10 times what the company paid for it. That is why “fair values” are permitted for such assets.

5.2 *The money measurement concept*

Accounting statements restrict themselves to matters which can be measured objectively in money terms. Again, this simplifies accounting enormously. It also means that a statement of financial position will rarely give even a rough approximation of the value of the business because it will exclude such items as the values of the company’s customer base, its workforce and its brand names.

5.3 *The business entity concept*

The affairs of the business are kept separate from those of the owners. This is perfectly valid in the case of a limited company, which has its own legal identity. It would, however, also apply to sole traders and partnerships where the business does not have a separate legal form.

It seems common sense that the financial transactions of a business entity are maintained separately from those of the owner. However it is useful to state it as an accounting concept.

5.4 *The realisation concept*

Income is recognised as and when it is “earned”. It is not, therefore, necessary to wait until the customer settles his or her bill. This avoids the fluctuations in reported income which might arise if everything was accounted for on a cash basis. It can also create the impression that the business is performing well when, in fact, it is in danger of running out of cash. A business might report income long before the related cash inflows which may be a particular problem for a growing business.

This concept runs alongside the accruals concept by emphasising the fact that profit should be recognised in the period it is earned, rather than when the financial settlement takes place. If a company has sold its products or services, then the sales should be recognised in the accounts. The fact that the company might not have received payment is an entirely separate concern. The profitability of the business is measured through the income statement and the cashflow is dealt with through the cashflow statement and the provision for bad debts.

5.5 ***The accruals concept***

Expenses are recognised as and when they are incurred, regardless of whether or not the amount has been paid. Again, this avoids the random allocation of costs to periods depending on whether the bill happens to have been paid or not.

Suppose for example, that on 1 February, a drug company pays the quarterly rental on its development laboratories for the period February, March and April, then completes its accounts for the year to March. The company would be justified in allocating only two thirds of the rental payment in the period to the end of March.



Question 7.8

Would it be appropriate to spread the costs of a failed drug development over a 5-year period?

5.6 ***The matching concept***

Income and expenses which relate to each other should be matched together and dealt with in the same income statement. From the above two concepts this should be for the period in which the amounts were earned/incurred.

The *matching concept* is a mixture of the realisation concept and the accruals concept. Expenditure incurred in generating the income for a period should be recorded as incurred over the same period, *ie* the expenditure is matched to the income.

5.7 ***The dual aspect concept***

The dual aspect concept recognises that every transaction or adjustment will affect two figures. For example, the purchase of inventory for cash will increase the asset of inventory and reduce the asset of cash. This concept forms the basis for the double entry bookkeeping system.

We discuss this concept later when we introduce double-entry bookkeeping and the trial balance.

5.8 ***Materiality***

There is little point in providing information which is so detailed as to be unintelligible. The statements can, therefore, be made clearer by showing totals such as “administrative expenses” instead of listing every item which makes this heading up. Similarly, there is very little point in making minute adjustments which have no real effect on the overall picture portrayed by the financial statements. Thus, accountants might report rough approximations for certain costs rather than waste time calculating more precise figures. What is, or is not, material however does depend to some extent on the emphasis which the company will put on the relevant figures.

It is important to note that all transactions in accounts are recorded in an accurate manner. The materiality concept affects the presentation of accounts when, for example, some rounding is required on accruals or an error is discovered that is deemed too small to warrant reworking the accounts.

Materiality enters almost every aspect of accountancy. It is relevant in deciding whether to publish accounts in millions rather than to the exact dollar, whether the extra effort required to split administration costs by country is justifiable (or whether some broad percentage could be applied to the overall costs), or whether the extra costs of a fire in one factory should be detailed separately in the accounts. The key question which is asked in each case is “would the extra disclosure add to the reader’s understanding of the business?”

In some cases the materiality principle has to be interpreted carefully. For example, if a financial company is fined by the regulator for breaching some guidelines, the fine should be disclosed. It is the fact that the company is fined that is important for shareholders to understand, even if the amount of the fine is negligible.

5.9 Prudence

The preparers of the financial statements should avoid presenting an unduly optimistic set of results. Thus, the lowest *reasonable* figure should be stated for profit or for any of the assets. The highest *reasonable* figure should be stated for any liabilities. This means that there is very little danger of the figures lulling anybody into a false sense of security by overstating the company's strengths. However, it is not permitted to include deliberate margins in the financial statements by understating assets or revenues or by overstating expenses or liabilities. Prudence should only be applied in situations where there is uncertainty.

This means that:

- provision is made for all known liabilities, expenses and losses, whether the amount is known with certainty or is a best estimate in the light of the information available
- profits are not anticipated
- profits are only recognised by inclusion in the income statement when realised in the form of cash or of other assets, the ultimate cash realisation of which can be assessed with reasonable certainty.

5.10 The going concern concept

It is usually assumed that a business will continue indefinitely in its present form. This concept acts as a justification for the limitations imposed by the cost concept because there is little harm in reporting historical figures for value if the assets concerned are unlikely to be sold in the immediate future.

The going concern concept means that the enterprise "will continue in operational existence for the foreseeable future".

If the alternative to publishing accounts on a "going concern" basis is to present them on the basis that the company is to be wound up, then the going concern basis has much to recommend it. A winding-up basis is not at all representative of the state of a company (unless it is about to be wound up!).

For example, specialised machinery can be given a non-zero value even if it would be worthless if the business were to cease trading.

Directors are required to report that “the business is a going concern”. If they are in doubt, they should not prepare accounts on a going-concern basis. A series of disclosures is required in these circumstances. The auditors will be required to comment on the statement that “the business is a going concern” if they feel that it does not reflect the message of the financial statements.

5.11 Consistency

The figures published by the company should be comparable from one year to the next. Accounting policies should not, therefore, be changed from one year to the next unless there is a very good reason for doing so. Any changes should be highlighted and their impact explained.

The numerical effect of such a change on the company’s results for the year must be shown.

The consistency concept states that accounting treatment of like items should be consistent within each accounting period and from one accounting period to the next. Often when a company does alter its accounting treatment of a particular item – usually because its contribution to profit has become much more important than before, and the previous treatment is no longer acceptable – it will rework its previous-year profits on the new basis for comparison purposes.



A student recommended this way of remembering the 11 concepts:

MCMMC BRAD PG!

5.12 Bringing the concepts together

Taken individually, each of the concepts would appear to be little more than common sense. Most are designed to make the statements easier to prepare (eg the money measurement concept) while other are designed to make the statements more useful (eg accruals produces more meaningful profit figures). When taken together, however, the concepts often conflict with one another and this makes their application confusing for accountants and readers of financial statements alike.



Question 7.9

Last year, the *XYZ* company sold £100,000 worth of goods. It received payment for £70,000 of these during the last year, and expects to get paid £25,000 in the future in respect of the remainder. *XYZ* does not expect to receive the remaining £5,000 because the person who owes this money has been declared bankrupt.

How much should *XYZ* show in its accounts as sales for last year?

The most obvious conflicts are between the concept of prudence and the going concern and realisation concepts.

It seems incongruous to attempt to present a prudent view while assuming that the business has an almost unlimited useful life. Similarly, it is hardly prudent to assume that a transaction will result in a positive outcome without first waiting to ensure that the income will actually be received.



Example

On 1 January a sole trader withdraws £100 from the company bank account and lends it to an employee for one year at a rate of interest payable monthly over the calendar year. When preparing its income statement at the end of the financial year in March it can apply the accounting principles in various ways:

1. Applying the realisation concept, it could record the interest payments monthly as they are earned by the company.
2. Applying the prudence concept, it could record the interest payments only when they are received.
3. Applying the materiality concept, it could treat the loan as a loss in petty cash when the loan is made and a profit if and when it is repaid.

IAS 8 states that in the absence of a specific rule to specify an appropriate accounting policy, the company should select policies on the basis that they yield information that is both relevant and reliable.

Information is relevant if it informs decisions taken by users of the financial statements.

Information is reliable if it has the following attributes:

- it provides a faithful representation of the entity's financial position, financial performance and cashflows
- it reflects the economic substance of transactions, other events and conditions, and not merely their legal form
- it is neutral and free from bias
- it is prudent
- it is complete in all material respects.

There can sometimes be a conflict between relevance and reliability. For example, valuing assets at cost is very reliable because the cost is a historical fact. Unfortunately, cost is unlikely to be very relevant to most decisions. Valuations tend to be more useful, but they can be unreliable unless they can be based on clear and observable market prices which are rarely available in the real world.

The concept of substance over form deals with many of the ways in which financial statements can be distorted.

For example, the legal substance of a long-term lease is that the user of an asset pays an annual fee to the owner. Legally, the asset does not belong to the user and there was a time many years ago when financial statements would simply have shown the fee as an expense in the income statement. However, the economic substance is that the user has acquired the risks and rewards associated with using the asset. On that basis, the statement of financial position should treat the lease as an arrangement under which the asset has been purchased and the annual lease payments should be viewed as the repayment with interest of the capital sum used to purchase the asset.

This was the basis for the accounting treatment of finance leases described in Chapter 2.



In addition to many multiple choice questions, short questions have appeared on all aspects of this section of the course in past examinations. For example:

“Discuss the interests of four user groups of financial statements and explain why some of the groups’ interests may conflict.” (September 2001)

“Identify three accounting concepts and explain how each affects the content of the financial statements.” (April 2002, adapted)

“Describe the role of the external auditor in financial reporting.” (April 2005)

“Describe the purpose of the standard setting system that regulates the preparation of published financial statements.” (April 2009)

“A company has entered into an unusual transaction that is not covered by any specific accounting standard. As a consequence, the directors are unsure how to account for this in the annual report and are tempted to choose the treatment that gives the highest reported profit. Explain how the directors should go about selecting an appropriate accounting policy for this transaction.” (April 2010)



Chapter 7 Summary

Companies publish accounts each year in order to report back to their shareholders. Accounts show how shareholders' funds have been used to generate profits.

The main *users* of accounting information are:

- equity investors
- loan creditors
- employees
- business contacts.

Regulations governing the preparation of accounts are of two main types:

- those concerning specific disclosures (mainly covered by the national laws and stock exchange rules)
- those concerning the manner in which items should be valued (mainly covered by professional standards and conventions).

In the UK, *statutory requirements* are based on the Companies Act 2006. Companies must produce:

- a statement of financial position (the balance sheet)
- a statement of comprehensive income (the income statement)
- detailed disclosures (or notes to the accounts)
- a directors' report
- an auditors' report.

The *auditors' report* must state whether or not, in the opinion of the auditors, the accounts have been properly prepared and give a true and fair view of the state of the company's affairs. The wording of the standard report can be modified where the auditors want to highlight some uncertainty or are unable to give an unqualified opinion.

The categories are:

- emphasis of matter paragraphs
- qualified opinion
- disclaimer of opinion
- adverse opinion.

All listed UK limited companies must use international accounting standards for consolidated accounts.

The *International Accounting Standards Board* (IASB) is the body that develops, issues and withdraws international accounting standards. New standards that are issued by the IASB are called *International Financial Reporting Standards* (IFRS). Older standards are called *International Accounting Standards* (IAS).

A company's accounting policies must be *relevant* and *reliable*. The accounts must conform to various *accounting concepts*. The full list of eleven concepts is:

- **Money measurement**
- **Cost**
- **Materiality**
- **Matching**
- **Consistency**
- **Business entity**
- **Realisation**
- **Accruals**
- **Dual aspect**
- **Prudence**
- **Going concern.**

Chapter 7 Solutions

Solution 7.1

The value of the loan to the holder depends on the company's ability to pay the interest on the loan and to repay the capital at maturity. If the company were unrestricted, it could borrow more money after the loan issue, thereby increasing the amount of debt interest to service, and increasing the amount of capital it is required to pay.

By restricting the company with a covenant to a certain amount of debt, or a certain minimum interest cover on the loan, the lender is ensuring the future security of his investment.

In addition, the advantage of basing the restriction on accounting ratios is that the calculation will be both consistent and objective.

Solution 7.2

Published accounts are only useful if their content can be relied upon to be a true and fair view of the company's trading position and prospects. As such it is important to have the numbers signed off by an "independent" professional.

The auditors are appointed by the shareholders and report to them, so the auditors are completely independent of the directors.

Should the auditor have doubts about the quality of the information, or about the manner in which it has been presented, then he or she is obliged to comment on any deficiencies. This helps to ensure that the directors of the company have an incentive to control the company in a manner that will be favourably viewed by shareholders.

Solution 7.3

There is no recommended interpretation. The concept is deemed so fundamental that it cannot be summarised. It is argued that the promulgation of accounting standards are the accounting profession's interpretation of a "true and fair view". In the end it is left in the hands of directors, accountants, auditors and the courts to determine what constitutes a true and fair view.

Solution 7.4

The concept of true and fair view cannot be rigorously applied in this way. Running a business involves a large human element, which cannot be mathematically or scientifically prescribed. The director must make his own decision as to the likelihood of default and take all possible steps to ensure that his decision is based on all the available information. He can then:

- value the loan in a manner consistent with the rest of the accounts and make a disclosure about the likelihood of default and the consequences in the notes
- value as above, but make a provision to reflect his opinion on the likelihood of default
- write the loan off as a prudent measure – this would occur in the situation that his brother's company is on the verge of bankruptcy. However in these circumstances his own company would no longer be a going concern and the concept of true and fair would have to be reinterpreted.

Solution 7.5

More and more of the world's largest companies are multinational. That applies to their spread of business, trade partners, shareholders, regulators, and to the actual markets on which their shares trade. When a company wishes its shares to trade on a particular stock market, its accounts must first comply with the local accounting standards. Likewise, if its accounts are to be used by its trading partners abroad, they have to be in a form which allows comparison with other similar companies in the market.

Rather than produce accounts in every local standard, most multinational companies would choose to have a global standard that applies in all countries. The support for such a standard has given IASs and IFRSs enormous power over the last decade. For national standard-setters to depart from these global standards is futile, because companies will choose to report on the global standard (which guarantees access to all markets) rather than the national one (which guarantees access to only one market).

Solution 7.6

Anything that reflects badly on the company can reduce its credit rating and increase its cost of borrowing. Anything that reflects badly on the management team controlling the company can lead to them being replaced or taken over.

Management will therefore, for personal and corporate reasons, wish to avoid receiving anything other than an unqualified set of accounts.

Solution 7.7

Arguments for:

There is an inherent problem with the concept of auditing in that the auditing company is paid for its work by the company it is expected to pass comment on. In order to ensure that the auditor's opinion is not swayed by the desire to keep the client, it would be wise to force a change on a regular basis. Likewise from the company's point of view, if an auditor audits the accounts for a long period, it may be too close to the company, and not "see the wood for the trees".

Arguments against:

It is arguable that an auditor builds up expertise in the financial accounts of a company over the years. It should therefore get better at auditing the accounts as the years go by.

In addition, there are remarkably few big auditing firms, and it may be argued that rotation of auditing firms would not increase the independence of the opinion, only the expense and the bureaucracy.

There is no legal or professional onus in the UK for auditing firms to rotate – after recent consultation, it was decided that this did not hold any real benefits for clients and was impractical, given the restricted nature of competition in the listed company audit market. However, under the new ethical guidance, there is a presumption for listed companies, that the engagement partner (the actual auditor) should rotate after five years and should not return to the engagement until a period of five years has elapsed. However, some degree of flexibility in the timing may be necessary if, for example, the person's continuity is especially important because there will be major structural changes in the client company, or if the auditing firm is very small. Where rotation does not occur, other safeguards should be applied to reduce the threat to an acceptable level, eg the use of a professional accountant not associated with the auditing team.

Solution 7.8

NO. It would not be consistent with either the prudence principle or the accruals principle. If the drug has failed, then the next 5 years do not have anything to do with the expenditure – it should be recognised immediately.

Solution 7.9

Prudence means that the amount of £5,000 should *not* be included in the total figure for “sales”. The accruals concept means that the £25,000 that will be paid in the future can be included. Therefore one answer is £95,000. An alternative solution, more in line with best accounting standards, would be to show sales of £100,000 with a deduction of £5,000 as a provision for bad debts.

Chapter 8

The main accounts



Syllabus objectives

- (ix) *Describe the basic construction of accounts of different types and the role and principal features of the accounts of a company.*
3. *Explain the purpose of a:*
- *statement of financial position*
 - *statement of comprehensive income*
 - *cashflow statement*
- and of the notes to the accounts.*
4. *Construct simple statements of financial position and income statements; understand and interpret cashflow statements.*

0 Introduction

We now move on to examine the main accounts. We will look at the purpose and construction of the statement of financial position, the income statement, the cashflow statement and the statement of changes in equity. We will also consider the notes to the accounts.

As in the previous chapter, for simplicity, in these notes we will often refer to the “statement of financial position” by its more common and user-friendly name, the “balance sheet”. This terminology is also used in the syllabus, past papers, other ActEd materials and in the real world.

This chapter can be difficult. There are lots of new terms to learn. Once you have read and understood how to compile a set of accounts, you need to practise drawing up a set of accounts for yourself. There are lots of questions in the Question and Answer Bank.



The examination is likely to test your *knowledge* of key definitions eg current assets; your *understanding* of key concepts eg the accruals concept; and your *ability to construct* the main accounts and parts of them.

1 **The statement of financial position**

The statement of financial position summarises the company's financial position. It must be remembered that the statement of financial position (the balance sheet) is a snapshot of events at one point in time.

Effectively, the statement consists of two lists:

1. **a list of everything owned by the business**
2. **a list of the various sources of finance used to fund these acquisitions.**

Everything of value which is owned by a business is called an “asset”. Finance can be provided by the owners of the business (“equity”) or by third parties (“liabilities”).

Logically, everything owned by the business must have been paid for by someone. Similarly, all amounts invested in or loaned to the business must be represented by something.



There is, therefore, a simple relationship between assets, liabilities and equity:

$$\text{Assets} = \text{Equity} + \text{Liabilities}$$

This is called the “balance sheet equation”.

The statement of financial position format shown on the following page complies with the international standards.

In practice, there are three main formats in which the statement of financial position is written:

- $\text{Assets} = \text{Equity} + \text{Liabilities}$
- $\text{Assets} - \text{Liabilities} = \text{Equity}$
- $\text{Non-current assets} + \text{Net current assets} = \text{Equity} + \text{Long-term liabilities}$

where:

$$\text{Net current assets} = \text{Current assets} - \text{Current liabilities}$$

Statement of financial position for XYZ Ltd as at 31/12/YY

ASSETS

Non-current assets

Property, plant & equipment	x
Intangible assets	x
	<u>x</u>

Current assets

Inventories	x
Trade receivables	x
Other current assets	x
Cash	x
	<u>x</u>
Total assets (#)	<u>x</u>

EQUITY AND LIABILITIES

Share capital	x
Other reserves	x
Retained earnings	x
Total equity	<u>x</u>

Non-current liabilities

Long-term borrowings	x
Long-term provisions	x
Total non-current liabilities	<u>x</u>

Current liabilities

Trade and other payables	x
Short-term borrowings	x
Current portion of long-term borrowings	x
Current tax payable	x
Short-term provisions	x
Total current liabilities	<u>x</u>

Total liabilities

x

Total equity and liabilities (#)

x

The amounts shown as (#) would be the same (*ie* the balance sheet balances!). Some of the categories may not mean much to you at this stage. We explain them in the rest of this section.

1.1 Non-current assets

The distinction between non-current and current assets has more to do with the motive behind their acquisition than their nature. Non-current assets usually have long lives and are bought with the intention of using them in the business.

Non-current assets are often known as *fixed assets*.

Tangible Assets

There is usually a great deal of information about the figure for tangible non-current assets which are property, plant and equipment.

Tangible non-current assets are generally valued at cost less depreciation. Depreciation is discussed in Chapter 9. We give a very brief example here to demonstrate the concept.



Example

Four years ago, a company purchased a machine for £130,000 which was estimated to have a useful life of twelve years, after which it would have a residual scrap value of £10,000. The value of the machine to be shown in the statement of financial position, using the “straight line” method of depreciation is:

$$\begin{aligned} &= 130,000 - 4 \times \frac{130,000 - 10,000}{12} \\ &= £90,000 \end{aligned}$$

The straight line method and the declining balance method of depreciation will be discussed in Chapter 9.

Notice that the value of the asset is recorded at cost *less* accumulated depreciation to date.

Depreciation has very little to do with reflecting the “true” value of the assets in the statement of financial position. Instead, it is an attempt to write the cost of the assets off as an expense over their estimated useful life.

Not all tangible assets depreciate in value. Most companies assume that land (but not buildings) has an infinite life. Land is often revalued in the statement of financial position.

Intangible Assets

Intangible non-current assets are non-current assets that literally cannot be touched, ie are not physical in nature. The most common type of intangible asset is goodwill. This arises when a company buys another company for more than the value of the target company shown in its accounts, its book value. The difference between the price paid and the book value is the goodwill.

The book value of the target company is: total assets *less* total liabilities, *ie* the equity.

Possible intangible assets include research and development costs, concessions, patents, trade marks and brand names.

To qualify as an intangible, the asset must be identifiable, and the company must have the power to obtain economic benefits from it. Intangible assets can be acquired by separate purchase, as part of a business combination or by internal generation. Once treated as an asset, intangible assets may be recorded either according to the cost model or according to the revaluation model, *ie* at fair values, if there is an active market.

Research and development costs

Under IAS 38, research expenditure must be treated as an expense and development costs can only be capitalised if commercial feasibility is established.

Concessions, patents

A company can buy the rights over a particular product or discovery. A few companies show such rights as an asset. A television company that owns the franchise to broadcast over a certain period of time might class this expenditure as an intangible.

Trade marks and brand names.

Similarly, a few companies claim that their trade marks and brand names are valuable assets which should be shown in the statement of financial position.

Under IAS 38, brand names, publishing titles and customer lists that are internally generated should not be recognised as assets. Those businesses that have recognised internally generated brands in the past are required to eliminate them from their statements of financial position.



Question 8.1

Give an example of an intangible asset that a recording company might have on its statement of financial position.

Investments

Non-current asset investments may consist of interests in other companies, in the form of shares, loan stock, debentures, or conventional loans.

Investments will be shown under the non-current assets heading only if the company intends to hold those investments for a reasonable period of time, say more than a year. Most companies do classify most of their investments as non-current assets.

They are normally shown at market value. We discussed the problem of valuing financial assets when discussing the cost concept in Chapter 7 (Section 5.1).



Question 8.2

How might financial assets sometimes be valued in the statement of financial position?

Revaluation

The problems associated with the valuation of assets at cost less depreciation can be reduced slightly by the regular revaluation of non-current assets, most notably land and buildings.

We will discuss revaluation in detail in Section 2.10 and in Chapter 9.

Thus, the total in the statement of financial position for non-current assets may consist of a mixture of costs and valuations, dating from a variety of accounting periods, and all less depreciation charged since the date of acquisition or valuation. The figure will, therefore, have an arithmetic precision but will usually be absolutely meaningless for decision-making purposes.

1.2 Current assets

Current assets are cash and items which will be converted into cash in the normal course of business.

Inventories (Stocks)

In accounts, the term inventories (or stocks) includes raw materials, consumables, work in progress and finished goods awaiting sale. Inventories are shown in the statement of financial position at the lower of cost and net realisable value (ie expected sale value).

Trade receivables (Debtors)

Trade receivables (or debtors) are the amounts which the company is owed by its customers. The trade receivable heading may also include amounts due under bills of exchange receivable.

Other current assets

Under current assets, the other current assets heading might include, for example, money held on short-term deposit.

Revaluation

The figures for inventories and trade receivables should be adjusted to take into account any anticipated losses due to obsolescence or deterioration in the case of stocks, and the likelihood of default in the case of trade receivables.

1.3 Equity

Equity is the amount contributed by the shareholders in the form of shares and in the form of reserves. It may simply be referred to as *capital* or as the *Shareholders' Fund*. Shareholders' equity is the net value of the company, *ie* its assets less its liabilities.

Shareholders' equity can arise in a number of different ways. Some is contributed directly in the form of payments made for the purchase of shares (share capital and share premium). Most of the remainder will be generated from trading activities. This consists of profits which have not been distributed in the form of dividends or share buybacks (retained earnings).

In brief the equity (or shareholders' capital) comprises:

- share capital – the nominal value of the shares issued
- other reserves:
 - share premium account – the amount raised above the nominal value of the shares issued
 - the revaluation reserve – the amount by which the non-current assets have been increased in value
- the retained earnings – the amount of profit ploughed back or retained by the business.

When assets are revalued upwards, the non-current assets in the statement of financial position increase in value. There must, therefore be a corresponding increase in the equity of the business. This is normally shown in the revaluation reserve.

1.4 Liabilities

Liabilities are analysed according to their date of maturity.

Current Liabilities

Balances which are due within one year are classified as “current”.

Net current assets (or *working capital*) is defined as current assets *less* current liabilities. It therefore shows the amount that the business has in cash or near-cash having deducted the claims on that cash in the form of current liabilities. This term is not usually used in the statement of financial position, but it is widely used to indicate the liquidity of the business.

We now describe the subheadings that might be expected under the heading “Current Liabilities”.

Trade payables (or creditors)

As with trade receivables (debtors), the amounts are always included in the statement of financial position at their face value, *not* at their present value. This includes amounts owing for goods already received, electricity bills owing *etc.*

Short-term borrowings

Any overdraft (negative current account balance) is shown at face value. The amount shown is the amount actually overdrawn, *not* the maximum overdraft limit that the company might have agreed with its bankers. Short-term borrowings could also include bills of exchange payable.

Current portion of long-term borrowings

Loans are usually entered in long-term liabilities, but they will be entered in current liabilities if they have to be repaid within one year.

Current tax payable

A company may have a provision for “deferred tax”. This is tax which will become payable, but not in the year being reported on. If it has to be paid within a year, then it is a current liability.

Non-current liabilities

Liabilities which are not due within one year are classified as non-current (or long term).

Long-term borrowings

This includes finance leases, medium-term bank loans, long-term unsecured loan stock, debentures and Eurobonds. All loan stock is shown at its nominal (or par) value. Most loans are issued at the nominal value or below. Any difference between the cash actually raised and the nominal value will be allowed for as part of the residual item, under the heading “other reserves”. If the bank (or other institution) charges a fee, this reduces the cash raised and is deducted from the “other reserves”.

Long-term provisions

The figure in respect of long-term provisions will include the estimated liabilities in respect of deferred taxation and other matters such as pension commitments. These differ from the term loans and obligations under finance leases (included in long-term borrowings) in that the actual amounts and timing of these payments are subject to some uncertainty. They are, nevertheless, liabilities and should be shown as such in the statement of financial position.

A company may show a provision for future pension costs if it has failed to set aside sufficient funds to meet its pension scheme's liabilities. Exactly what pension costs need to be provided for is beyond the scope of the syllabus.

In addition to the above, the company can have Contingent Liabilities.

Contingent liabilities

Where the liability is only a potential one – not even *likely* – it is not shown on the statement of financial position, although such “contingent liabilities” must be disclosed in the notes to the accounts. Examples of contingent liabilities include guarantees given on goods sold and potential court claims.



Question 8.3

Classify each of the following items, which can appear in a financial statement, as a non-current asset (NA), a current asset (CA), a non-current liability (NL), a current liability (CL) or as capital (C):

- Cash
- Trade receivable
- Building
- Tax due
- Trade payable
- Land
- Inventories
- Ordinary Shares
- Debenture



Question 8.4

The following data was taken from the records of ABC plc and relates to the values of the company's assets, liabilities and equity at 31st December 2012.

Organise the items to form the company's statement of financial position (its balance sheet) as at 31st December 2012.

	£000s
Inventories	135
Trade payables	65
Machinery (cost)	347
Machinery (accumulated depreciation)	132
Cash	56
Long-term loans	289
Ordinary share capital	200
Trade receivables	195
Tax provision	67
Retained earnings	230
Land	350
Other reserves	100

2 **The statement of comprehensive income**

The main (and examinable) component of the *statement of comprehensive income* is the *income statement* (formerly and commonly known as the *profit and loss account*).

The income statement

The first part of the statement, starting with revenue and concluding at profit after tax, can be described as the “income statement”. This draws together the various revenues and expenses.



The income statement provides an insight into a company’s trading activities. It compares the income generated from trading with the costs associated with earning that income, the difference being the profit or loss for the year.

Other comprehensive income

The second part of the statement of comprehensive income is concerned with “other comprehensive income”. The only part of this that is examinable is “gains on revaluation” (which is covered briefly later in this chapter and in more detail in Chapter 9).

The following is an income statement that complies with the international standards.....

Revenue	X
Cost of sales	(X)
Gross profit	X
Other operating income	X
Distribution costs	(X)
Administrative expenses	(X)
Operating profit	X
Finance income	X
Finance costs	(X)
Net profit before tax	X
Tax expense	(X)
Profit after tax	X
Other comprehensive income	
Gain on revaluation	X
Total comprehensive income	X
Earnings per share for profit attributable to equity holders	X

A dividend of xp per share was paid to ordinary shareholders during the year.

We now look at each item in detail.

2.1 Revenue

Revenue is recorded when it is *earned* (not necessarily when it is received) in accordance with the realisation concept. Revenue can be called *turnover* or *sales*.

The cost items (which follow) are usually recorded as they are *incurred* (not necessarily when they are paid) in accordance with the accruals concept.

2.2 Cost of sales

Cost of sales reflects the raw material, components, wages and salaries expended in producing the goods sold. Changes in stock levels (both finished goods and raw materials) will need to be included, as will the charges for depreciation (see Chapter 9).

According to the matching concept, only the costs incurred in generating the sales must be included in the account.



Question 8.5

A shop buys £20,000 worth of goods during 2012. It began the year with £2,000 worth of stock and ended the year with £7,000 of stock. Assuming there are no other items to be included in the cost of sales, what is the shop's cost of sales?

The cost of sales can be found as:

$$\begin{array}{l} \text{Cost of stock sold:} \\ \text{opening stock} \\ + \text{purchases} \\ - \text{closing stock} \end{array} \quad \left. \right\} \quad \begin{array}{l} \text{Cost of stock sold could} \\ \text{be calculated as:} \\ \text{purchases} \\ \text{less increase in stock} \end{array}$$

+ Wages and salaries of production staff
+ Depreciation of non-current assets

2.3 Distribution costs and administrative expenses

Distribution costs include costs associated with sales, distribution and advertising. Administrative expenses include associated wages and salaries and directors' remuneration. These costs are sometimes called overheads. They are not strictly related to production. In the short run, their value will not normally change with the level of production.

In practice, it is sometimes difficult to distinguish between costs related to production (direct costs) and those not related to production (indirect costs). For example, electricity might be used to power the production machinery or to heat and light the offices. Depreciation of equipment sometimes arises from wear and tear and thus from production, but sometimes it arises from obsolescence or simply from the passage of time.



In an exam question, if necessary, make an assumption about whether a cost is direct or indirect and say why you have made that assumption.

2.4 **Finance income**

This will include income from investments such as rent from property, interest on bonds, dividends from shares.

2.5 **Finance costs**

This category includes interest payments made on loans. It is important that these costs are seen clearly in the income statement so that investors can see the scale of the interest payments and the company's ability to pay them.

2.6 **Tax expense**

The tax charge in the income statement arises because companies pay corporation tax on their adjusted net profit figures. The adjustments to net profit may be disputed by the tax authorities and may be revised after the publication of the accounting statements. The estimate for corporation tax forms the core of the charge in the income statement, although there are usually additional charges.

The tax charge in a company's accounts rarely equals exactly:

$$(\text{corporation tax rate}) \times (\text{pre-tax profit})$$

There are a variety of reasons for this (most of which were discussed in Chapter 3), but the main reasons are:

- the tax authorities will calculate the income statement a second time using official "capital allowance" rates instead of depreciation charges for non-current assets. This will produce a different profit and thus a different tax charge. Likewise, some of the expenses that a company brings in to its income statement might not be allowable in a tax computation.
- a company will sometimes have disputes or negotiations with the tax authorities over tax issues, and these can cause tax to be "provided for" rather than "paid" while the dispute is settled.
- carried forward losses from previous years can reduce the current year tax bill.

Details of the adjustments made to accounting profit to arrive at taxable profit were given in Chapter 3 Section 2.

Where a company believes its current-year tax figure does not reflect its long-term tax liability, it will create a provision for deferred tax in the statement of financial position.

2.7 Categories of profit



The profit figure is normally calculated in three stages:

1. **Gross profit** is the difference between the selling price of the goods and services which provide the basis for the company's main trading activities and the cost of sales.
2. **Operating profit** is usually defined as profit earned after all expenses except finance costs (interest).
3. **Net profit before tax** is the operating profit adjusted for financing (interest) costs and income. **Profit after tax** is this net profit after deduction of tax.

The gross profit figure gives an insight into the company's pricing policies. The difference between cost and selling prices represents the contribution toward the non-trading expenses and profit.

Another version of the net profit figure that is useful is *net profit before tax and interest*, ie operating profit plus finance income.

These distinctions will become important when we come to analyse the accounts in Part 3 of the course.

2.8 Earnings per share

Companies are obliged to calculate the earnings per share (EPS) figure and disclose it on the face of their income statements. EPS is equal to the earnings attributable to the ordinary shareholders (usually, profit after tax) divided by the number of ordinary shares in issue.



Earnings is the profit that is available for distribution to the ordinary shareholders.

If the company raises all its share capital from ordinary shares, the earnings available for distribution to the ordinary shareholders will be equal to the amount of *profit after tax*.

If the company raises some share capital from preference shares, then earnings will be *net profit after tax after the deduction of preference dividends*.

We will examine earnings per share in more detail in Part 3 of the course.

2.9 **Realised capital gains (and losses)**

If the company sells an asset for an amount different from the value of the asset shown in its financial statements, it has made a capital gain (or loss). This *realised* capital gain (or loss) is added to (subtracted from) the company's operating profit. Realised capital gains from the company's sale of assets (net of losses) are subject to capital gains tax, which, for companies, is levied at the corporation tax rate. The details for calculating corporation tax and capital gains tax were given in Chapter 3 (Section 3).

2.10 **Other comprehensive income**

This account was introduced in January 2009. It includes income and expenses that are not recognised in profit or loss and yet help to give a comprehensive picture of the income of the organisation.

Some adjustments to book values go directly to equity balances rather than being reported in the income statement. For example, a gain on the revaluation of property will go to the revaluation reserve. Any such gains are not shown in the income statement, but they are shown in the statement of other comprehensive income. The total for other comprehensive income reflects increases in shareholder wealth, whether arising from profit or from the recognition of some other gain.

Other comprehensive income includes:

- the change in the revaluation reserve arising from the revaluation of property, plant, equipment and intangible assets
- the change in the fair value of available-for-sale financial assets and investments
- the gains/losses from translating financial statements of a foreign operation (currency translation differences)
- actuarial gains/losses on defined benefit pension schemes
- losses/gains on cashflow hedges
- tax relating to components of other financial income.

The totals are carried forward to the reserves (and hence to the statement of financial position) and are also shown in the statement of changes in equity.



The most likely item that you will have to deal with is the first in the list.

Revaluation

Revaluation of non-current assets (such as land and property) is the practice of recording non-current assets at market or fair value. For example, a building could be revalued at £2m (from £1m), so the value of the company's assets in the statement of financial position increases by £1m. How is this treated in the financial statements?

If the asset is used in the company's business:

- the *revaluation reserve* (in the equity section of the statement of financial position) is increased by £1m and so the balance sheet remains balanced
- there is no impact on the income statement
- the £1m would also be shown as a *gain on revaluation* in the “other comprehensive income” section at the bottom of the statement of comprehensive income.



The treatment of unrealised gains on assets held as investments is more complicated, but, fortunately, beyond the requirements of the syllabus.

What if the revaluation is downwards rather than upwards?

If the asset is used in the company's business, then any downward revaluation is charged as an expense in the income statement *unless* it reverses a previous upward revaluation, in which case it is charged against the revaluation surplus for that asset.



Question 8.6

The following data relates to Zip plc for the trading year ending 31st December 2012.

	£000s
Advertising expenses	50
Revenue	1,135
Stock at 31st December 2011	25
Interest paid	14
Interest received	5
Depreciation of machinery	25
Stock at 31st December 2012	38
Wages and salaries of production staff	161
Wages and salaries of distribution staff	278
Wages and salaries of administration staff	40
Purchases	300
Directors' remuneration	135
Dividends paid in respect of year ending 31 December 2011	30

Produce the company's statement of comprehensive income for the year, assuming:

- corporation tax is 24%
- the company proposes a payout ratio of a third, *i.e.* to distribute a third of this year's earnings to shareholders
- the number of ordinary shares in the company is 200,000
- at the end of the year, the company's property was revalued at £525,000, an increase of £22,000 from its previous value.

3 **The cashflow statement**

The cashflow statement is not a requirement of the UK Companies Act. However it is a Financial Reporting Standard (FRS 1) and an International Accounting Standard (IAS 7) and has been since 1992.

3.1 **Why is the cashflow statement needed?**

To show cash movements

The income statement and statement of financial position do not provide a sufficient insight into movements in cash balances. This is unfortunate because even profitable companies will collapse if they are not sufficiently liquid. Hence the cashflow statement is important to supplement the income statement and statement of financial position.

The bank balance is, of course, disclosed in the statement of financial position. It is easy to see whether the balance has changed since the end of the previous year. It is, however, difficult to identify the major causes of such changes. Shareholders and other readers require a more structured description of the cashflows.

The cashflow statement is intended to answer the following types of question:

- Why has the bank overdraft increased, despite the company having had a profitable year?
- Is the company capable of generating cash, as opposed to profit, from its trading activities?
- What was done with the loan which was taken out during the year?

Cashflow statements show where the money has come from, and where it has gone. They ignore the accruals concept.

Cash is important

Very few businesses could survive a prolonged cash outflow. It is often this rather than lack of profits which causes companies to file for bankruptcy.

Cash may also be important for the opposite reason. Because most companies ought to be able to earn a higher rate of return on their assets than on cash, a company that passively holds large amounts of cash may not be making the best use of its resources. So, a clear statement of a company's cashflow position allows shareholders to check whether the company is being run efficiently (*ie* not holding too much cash) as well as checking on solvency (*ie* holding too little cash). Cashflow statements help focus on the changes in a company's holdings of cash.



Cashflows are important, but only because the entity needs cash to survive. The main reason for being in business is to earn a profit.

Cashflows should be monitored to ensure that, say, expansion of the business does not force it into a cash deficit, but a strong cash inflow is not an end in itself. If a business has too much cash then it may actually be desirable to put that money to some good use by investing in productive assets or even by repaying loans. If there are no such opportunities then it may even make sense to make a sizeable payment to the shareholders as a dividend or the repurchase of shares.

Profit is not the same as cash

The profit figure for the year is unlikely to bear any resemblance to the increase or decrease in the company's bank balance or total for working capital over that period. Several entries in the income statement, such as depreciation, do not involve a payment or receipt of cash. Furthermore, the income statement recognises credit sales and purchases before any cash changes hands. Conversely, many receipts and payments, such as the proceeds of share issues and loan repayments, have no immediate impact on profit. It is possible for a company to trade profitably and still run into liquidity problems.

A company can be very successful and profitable in terms of the income statement, yet not be able to find enough cash to finance its day-to-day activities. The company could be selling its goods in large quantities but building up large amounts of trade receivables (debtors) and overdrafts as the company pays its suppliers and its other expenses but its customers are slow to pay their bills.

The increase in a company's cash holdings will differ from the accounting profits shown in the income statement. The main reason for this difference is the application of the accruals principle.



Question 8.7

Give an example of how the accruals concept can cause the cashflow statement and the income statement to differ from one another.



Question 8.8

State the immediate effect of each of the following events on a company's pre-tax accounting profit and on its holdings of cash:

- (a) the purchase of a non-current asset for cash
- (b) selling goods on credit at a price above cost
- (c) purchasing raw materials on credit at a price above their realisable value
- (d) increasing the depreciation charge
- (e) an upward revaluation of inventories held
- (f) the issue of loan capital or new shares for cash
- (g) selling an investment (capital gain = 0)
- (h) being assessed for, and paying tax
- (i) paying dividends
- (j) paying a creditor.

Less subjective nature of cashflow statement

The preparation of a cashflow statement is open to less interpretation than the preparation of the income statement. For example:

1. “profits” in an income statement can be distorted if adjustments are made directly to the statement of financial position, without a corresponding entry in the income statement.
2. in determining “profits” subjective judgements are often needed, eg
 - how much provision should be made for bad debts?
 - which method of depreciation should be used?
 - how should we value stocks?
 - how should we interpret the accruals concept?

In contrast, there is much less interpretation involved in preparing a statement of cashflows. Either you have spent the cash or you haven't.

**Question 8.9**

Explain in detail how and why the following items can be interpreted in different ways when companies report their profits.

- (i) valuation of inventories (stocks)
- (ii) assessment of depreciation.

3.2 The structure of a cashflow statement

There are three sections to the cashflow statement:

- cashflows from *operating activities* – starting from operating profit and reconciling operating profit to cash
- cashflows from *investing activities* – acquisitions and disposals of long-term assets and other investments not included in cash equivalents
- cashflows from *financing activities* – changes in the size of equity capital and borrowings.

The following is an example of a cashflow statement:

	£000s
Cashflows from operating activities	
Cash generated from operations	33,100
Interest paid	(9,200)
Tax paid	<u>(14,500)</u>
Net cash generated from operating activities	<u>9,400</u>
Cashflows from investing activities	
Purchases of property, plant and equipment	(9,800)
Proceeds from sale of property, plant and equipment	6,400
Purchases of intangible assets	(3,000)
Loans granted to related parties	(1,300)
Loan repayments received from related parties	100
Interest received	<u>1,200</u>
Net cash used in investing activities	<u>(6,400)</u>
Cashflows from financing activities	
Proceeds from issuance of ordinary shares	1,000
Proceeds from borrowings	8,500
Repayments of borrowings	(10,000)
Dividends paid to company's shareholders	<u>(11,000)</u>
Net cash used in financing activities	<u>(11,500)</u>
<i>Net (decrease)/increase in cash, cash equivalents and bank overdrafts</i>	<i>(8,500)</i>
Cash, cash equivalents and bank overdrafts at beginning of the year	30,000
<i>Cash, cash equivalents and bank overdrafts at end of the year</i>	<i>21,500</i>

The details of the calculation of cash generated from operations would normally be shown as a note. (See next section.)

We will look at the three sections of the statement in turn.

Net cash generated from operations

This shows that the company generated cash inflows of £9.4m from its trading activities.

The starting point for this figure is the operating profit from the income statement. Various adjustments have to be made in order to find the cash generated from operating activities.

The cash generated from operations is determined as:

Operating profit	33,000
Adjustments for:	
Depreciation	18,000
Changes in working capital:	
• Inventories	(7,000)
• Trade and other receivables	(1,500)
• Trade and other payables	(9,400)
Cash generated from operations	33,100

The operating profit figure in the income statement includes an accounting adjustment in respect of depreciation. The cashflow related to that expense occurred when the non-current assets were purchased.

Depreciation has been added back in to the operating profit before calculating the “cash generated from operating activities” because depreciation is not a cash item.

The company's trading activities also include transactions involving inventories (stock), trade receivables (debtors) and trade payables (creditors). These can affect cashflows without affecting profits. If, for example, the company received £100 from its debtors at the start of the year, made sales of £1,000 during the year and was owed £150 at the year end it would have received cash from its debtors of £100 + £1,000 – £150 = £950. Thus, it would report income of £1,000 even though cash takings were less because some of the sales had resulted in an increase in debtors rather than an inflow of cash.

Two more deductions must be made – interest paid and tax paid – in order to arrive at *net* cash generated from operating activities.

The other headings on the statement deal with cashflows which arise from non-trading activities: investing activities and financing activities.

Investing activities

These can include the following:

- purchase and sale of non-current assets, property, plant and equipment plus intangible assets, like patents
- receipts of interest and dividends from investments
- transactions involving “liquid” assets other than cash, such as short-term investments in securities.

Financing activities

These can include the following:

- payment of dividends to the company's shareholders
- cashflows arising from the repayment of loans and from fresh borrowing and the issue of shares.

The cashflows are classified according to the broad headings of operating activities, investing activities and financing activities. The boundaries of those classifications are not that clearly defined (for example, the payment of tax can be shown under any of the three headings). It is, however, possible to see how the net cash inflow or outflow for the year is broken down into categories such as:

- cash received from customers and paid to suppliers (operating)
- cash applied by purchasing property, plant and equipment and raised from its disposal (investing)
- cash raised from borrowing and issuing shares and applied to repayments and repurchases (financing).



Note that the syllabus requires an *understanding* and ability to *interpret* cashflow statements; you are not required to *construct* them. However, it is worth constructing a few so that you can understand them well.

The key to interpreting a cashflow statement is to look at the financial position both before and after the period. The cashflow statement is a useful means of determining whether the cash balances have increased or decreased and explaining those movements. It is impossible to tell whether that increase or decrease was desirable without considering the closing balances to check that the financial position is solvent.



Question 8.10

Using the information given below, draw up LoadsaMoney's cashflow statement for 2012 and comment on the cash movements and the final cash position.

During 2012, LoadsaMoney had the following items of income and expenditure:

	£
increase in stocks of finished goods	13,500
staff cost	47,300
income from WaddsaCash dividends	4,200
turnover	362,000
tax paid	49,120
increase in cash	23,780
dividends paid	15,000
increase in work-in-progress	2,100
interest received on 3-month bank deposit	3,500
interest paid on loan stock	5,500
2012 sales for which payment not yet received	71,000
payments for 2011 sales received in 2012	63,000
2012 raw material purchases not yet paid for	37,000
2011 purchases paid for in 2012	40,000

The company bought 3 bank note printing machines in January 2012 for £35,000 each. The total depreciation charge for 2012 was £22,450.

On 1 January 2012, the company had £50,000 in cash and £98,000 in a three-month bank deposit. By 31 December 2012, it had a £73,780 in cash and £95,000 in three-month bank deposit.

LoadsaMoney's operating profit for 2012 was £191,850.

4 Statement of changes in equity

A further requirement of the international standards is a statement of changes in equity. This summarises the changes in the capital and reserves attributable to equity holders of the company over the accounting period, and so reconciles the amounts shown in the statement of financial position at the start and end of the period.

An example for a one-year period is given below:

	<i>Attributable to equity holders of the company</i>			<i>£000</i>
	<i>Share capital</i>	<i>Other reserves</i>	<i>Retained earnings</i>	<i>Total equity</i>
Balance at 1 January 20X1	30,000	10,000	15,000	55,000
Fair value gains and (losses), net of tax:				
Land and buildings		2,000		2,000
Depreciation transfer, land and buildings		(750)		(750)
Net income/(expense) recognised directly in equity		1,250		1,250
Profit for the year			5,000	5,000
Total recognised income for 20X1	1,250	5,000	6,250	
Dividends paid			(3,000)	(3,000)
Issue of share capital	10,000			10,000
Balance at 31 December 20X1	40,000	11,250	17,000	68,250

Notice the revaluation of land and buildings is recognised in the “other reserves”.

4.1 Dividends paid

The final earnings for the year may be used to pay dividends. It would be unusual for the company to distribute all of the profit in this way. The remainder is “retained” within the business as part of the owners’ equity and transferred to the retained earnings part of the statement of financial position.

The amount of dividend being *proposed* to the shareholders is included in the draft accounts presented for the approval of shareholders at the Annual General Meeting.

Once the dividends are *approved* at the AGM, an approved set of accounts can be drawn up.

When dividends are *paid* they appear as a note beneath the income statement and will be deducted from the cash balance and from the retained earnings in the equity section of the statement of financial position as shown in the statement of changes in equity. They will also show up in the cashflow statement and in the notes to the accounts.

Question 8.11

Produce a statement of changes in equity for 2012 for Planet plc, given the following equity sections of the statements of financial position for 31 December 2011 and 31 December 2012 plus notes.

	<i>31 December 2011</i>		<i>31 December 2012</i>
	<i>£000s</i>		<i>£000s</i>
Share capital (50p shares)	800	Share capital (50p shares)	1,000
Other reserves	200	Other reserves	400
Retained earnings	<u>500</u>	Retained earnings	<u>600</u>
Total equity	1,500	Total equity	2,000

Notes:

1. During the year, 400,000 new shares were issued @75p.
2. On 30 June 2012, the company's land was revalued. Its book value at the time was £500,000. This increased to £600,000 at fair value. This increase is recognised in the revaluation reserve. There has been no depreciation since the revaluation.
3. The profit after tax for 2012 was £120,000.
4. Dividends for 2011 of £20,000 were paid during 2012.

5 Notes to the accounts

As noted in Chapter 7, UK legislation requires companies to produce accounts which include detailed disclosures – appropriate explanatory notes and additional information. These are normally presented as a series of notes to the accounts.

The notes will cover:

- details of the accounting policies used in preparation of the financial statements
- detailed analysis of totals shown in the statement of financial position
- detailed analysis of income statement items
- details of post-balance sheet events.

In addition, companies will normally disclose, voluntarily, additional information designed to help the readers of the accounts to gain a true and fair view of the position of the company.



In the past, this area of the course has been examined by a variety of questions. Multiple-choice questions have often been used to test definitions and classifications. Short questions have sometimes been asked about the difference between profit and cash. Long (20-mark) questions have often been asked on the construction of income statements and statements of financial position. Candidates have usually been given information drawn from a trial balance (see Chapter 10) and asked to construct particular accounts.



Chapter 8 Summary

The statement of financial position

The *statement of financial position (balance sheet)* is a snapshot of a company's financial position at a moment in time. It shows what the company owns (its assets), what it owes (its liabilities) and the shareholders' equity.

$$\text{Equity} + \text{Liabilities} = \text{Assets}.$$

The *assets* are made up of non-current assets, both tangible *eg* machinery and intangible *eg* trademarks, and current assets (cash and items that can be quickly converted into cash *eg* inventories (stocks), trade receivables (debtors)).

The *liabilities* are made up of non-current liabilities (amounts falling due after one year) and current liabilities (amounts falling due within one year).

Equity consists of share capital, other reserves and retained earnings.

The statement of comprehensive income

The *income statement* component of this shows the profit or loss generated by the company over a period of time, usually a year. The income statement is prepared according to the realisation and accruals concepts.

The *gross profit* is found by deducting the cost of sales from the turnover.

The *operating profit* is found by deducting expenses (excluding interest) from the gross profit.

The *net profit before tax and interest* is found by adding finance income.

The *net profit before tax* is found by deducting finance costs.

The *net profit after tax* is found by deducting tax.

The *earnings* of the ordinary shareholders, *ie* the *profit attributable to equity holders*, is the net profit after tax *less* preference dividends (if any).

Total comprehensive income is found by adding *other comprehensive income*, *eg* gains on revaluation.

The cashflow statement

Cashflow statements show where the money has come from and where it has gone. The accruals concept is ignored.

There are three sections to the cashflow statement:

- cashflows from *operating activities*
- cashflows from *investing activities*
- cashflows from *financing activities*.

Statement of changes in equity

The *statement of changes in equity* shows how the composition of equity (share capital, other reserves and retained earnings) has changed over the year.

Chapter 8 Solutions

Solution 8.1

A recording company might have the following intangible assets:

- the recording artists it has signed and paid for, who are contracted to sell their albums through that company, would be classed as intangible assets.
- any marketing company it may have purchased in the past would have been bought at well above book value (advertising companies tend to be largely human capital, and sell at well above their net asset value). This would be held on the statement of financial position as an intangible.

Solution 8.2

Most financial assets, *eg* shares in other companies or property, are recorded at fair value (broadly market value). This is because the cost concept could give unreasonably unrealistic values. Redeemable fixed-interest assets may be valued at amortised cost, *ie* its value may be changed in line with the time to expiry.

Solution 8.3

Cash *CA*, Trade receivable *CA*, Building *NA*, Tax due *CL*, Trade payable *CL*, Land *NA*, Inventories *CA*, Ordinary Shares *C*, Debenture *NL*.

Solution 8.4*Statement of financial position for ABC plc at 31st December 2012*

	£000s
ASSETS	
Non-current assets	
Machinery	
Cost	347
Accumulated depreciation	<u>(132)</u>
Land	<u>350</u>
	565
Current assets	
Inventories	135
Trade receivables	195
Cash	<u>56</u>
	<u>386</u>
Total assets	<u>951</u>
EQUITY AND LIABILITIES	
Ordinary share capital	200
Other reserves	100
Retained earnings	<u>230</u>
Total equity	<u>530</u>
Non-current liabilities	
Long-term borrowings	289
Current liabilities	
Trade payables	65
Tax provision	<u>67</u>
	<u>132</u>
Total liabilities	<u>421</u>
Total equity and liabilities	<u>951</u>

Solution 8.5

The cost of sales is only the cost of stock sold. This is found as follows:

Opening stock	£2,000
+ Purchases	£20,000
- Closing stocks	(£7,000)
Cost of sales	<u>£15,000</u>

Solution 8.6*Statement of comprehensive income for Zip plc for the year ending 31st Dec 2012*

	£000s
Revenue	1,135
Cost of sales	
Cost of stock sold:	
Opening stock	25
Purchases	300
less Closing stock	(38) 287
Wages and salaries of production staff	161
Depreciation of machinery	<u>25</u> <u>(473)</u>
Gross profit	662
<i>Distribution costs:</i>	
Advertising expenses	50
Wages of distribution staff	278 328
<i>Administrative expenses:</i>	
Wages of administrative staff	40
Directors' remuneration	135 <u>175</u> <u>(503)</u>
Operating profit	159
Finance income	5
Finance cost	<u>(14)</u>
Net profit before tax	150
Tax expense	<u>(36)</u>
Profit after tax	114
Other comprehensive income	
Gains on revaluation	<u>22</u>
Total comprehensive income	<u>136</u>
Earnings per share for profit attributable to equity holders	57p

Notes to the accounts:

1. The company's property was revalued and increased in value by £22,000.
2. A dividend of £30,000, *ie* 15p per ordinary share, was paid during the year in respect of the year ending 31 December 2011.
3. The company proposes to make a dividend payment of £38,000, *ie* 19p per ordinary share, in respect of the year ending 31 December 2012.

Solution 8.7

The following is only one of a number of possible examples.

Let us assume that a company pays a fee of \$10 million to a marketing company to advertise its product over the coming 12 months. Let us also assume that the company's accounting year runs from 1st January to 31st December, and that the date of the deal is 1st July.

The payment of the fee is clearly a distribution cost and should be shown as such in the income statement. The payment of the fee would have an immediate cashflow effect which would fall into the cashflow statement in the current financial year. However, by the accruals principle, the expense should be recognised over the period of the contract, *ie* over the period which the company expects to benefit from the expenditure. It will therefore be accrued over the coming 12 months, and \$5 million will fall into this year's income statement and \$5 million into the next financial year.

So cash will fall by \$10 million, but the income statement for the year will show an expense of \$5 million.

Solution 8.8

	<i>Event</i>	<i>Pre-tax profits</i>	<i>Cash</i>
a	the purchase of a non-current asset for cash	No change	Reduced
b	selling goods on credit	Higher	No change
c	purchasing raw materials on credit	Lower	No change
d	increasing the depreciation charge	Lower	No change
e	an upward revaluation of inventories held	Higher	No change
f	issue of loan capital or new shares for cash	No change	Higher
g	selling an investment (capital gain = 0)	No change	Higher
h	being assessed for, and paying tax	No change	Lower
i	paying dividends	No change	Lower
j	paying a creditor	No change	Lower

Comment: cash and profits are not the same!

Solution 8.9

The main problem is that profits are directly influenced by the value placed on inventories (stocks) and depreciation, yet the assessment of these is, to an extent, subjective.

(i) ***Valuation of inventories (stocks)***

- *Increase in inventories* is included within a company's income statement, so a large increase in inventories over a particular year may lead to an increase in profits even though sales revenue has not increased.
- If inventories are valued on a First In First Out (FIFO) basis, their value will increase with inflation. The distortion mentioned above will be enhanced by this factor.

Note: A FIFO basis indicates the method by which a company calculates its cost of materials. If a certain amount of stock is disposed of as a result of selling the company's product, then the company can either take the cost of that stock as being the cost of the most recently purchased stock (Last In First Out) or the cost of the oldest stock (First In First Out). Best accounting practice suggests the use of FIFO.

- Does the method of inventory valuation really give a *true* and realisable value of the inventories held at any one point in time? If it does not, then any figure for *increase in inventories* shown in an income statement may be questionable.

(ii) ***Assessment of depreciation***

- The assumptions made about an asset may not be true to life, eg a lorry with an expected useful life of ten years may, in reality, need to be replaced after seven years. The depreciation charge during the 7 years would then not reflect the true cost of using the asset.
- The method of calculation may not be appropriate to the asset. For example, many companies use the straight line method of depreciation for their vehicles because they would expect the vehicles to be used at a reasonably constant rate. However, as any car owner will know, this type of depreciation is not necessarily the most appropriate. A new car can depreciate fastest during the first 5 minutes after its purchase.

Solution 8.10

Cashflow statement for LoadsAMoney 2012

£

Cashflows from operating activities

Cash generated from operations *	187,700
Interest paid	(5,500)
Tax paid	<u>(49,120)</u>

Net cash generated from operating ac

Cashflows from investing activities	
Purchases of machinery	(105,000)
Interest received	3,500
Dividends received	<u>4,200</u>
Net cash used in investing activities	(97,300)

Cashflows from financing activities

Equity dividends paid	<u>(15,000)</u>
Net cash used in financing activities	(15,000)

Net increase in cash/cash equivalents and bank overdrafts

20,780

Cash/cash equivalents and bank overdrafts at beginning of the year

148,000

Cash/cash equivalents and bank overdrafts at end of the year

168,780

* Cash generated from operations is:

Operating profit		191,850
<i>plus</i> Depreciation		22,450
<i>less</i> Increase in inventories (stocks)	(13,500 + 2,100)	(15,600)
<i>less</i> Increase in trade receivables (debtors)	(71,000 – 63,000)	(8,000)
<i>less</i> Decrease in trade payables (creditors)	(37,000 – 40,000)	<u>(3,000)</u>
Cash generated from operations		187,700

Comments:

- The cash balance has increased by £20,780 from £148,000 to £168,780 (an increase of £23,780 in cash and a decrease of £3,000 in a three-month bank deposit). We do not know whether this is a “reasonable” cash position because we do not have sufficient information about the company’s other assets and its liabilities. However, it seems high in relation to the company’s annual turnover of £362,000.
- It seems strange that the company has increased the amount held in cash and decreased the amount held on three-month deposit, since the latter earned interest of £3,500 in 2012.
- The company has generated £133,080 from its operating activities; and has spent £97,300 on investing activities and £15,000 on its financing activities. The company is in the fortunate position of being able to finance new investment (the purchase of the printing machines) with the cash generated from just one year’s operating activities! To generate cash overall in a year of self-financed high investment is relatively unusual.
- The key to the company’s healthy cash position is its operating profit of £191,850, which translates into a cash contribution of £133,080. During the year, it has used cash in building up stock and work-in-progress, increasing its trade receivables and decreasing its trade payables. Although not causing a cash problem this year, the company should check that its stock levels are not unreasonably high, that its credit terms for customers are not unreasonably generous, and that it is making the best use of available credit from suppliers.
- The company’s net profit before tax and interest is £199,550 (£191,850 + £3,500 + £4,200). As a percentage of its turnover, this is 55%, so this company seems to be well-named – it is both profitable and cash-rich!
- The company paid £5,500 in interest on loan stock. In future years, if its cash position continues to be as favourable, it might not need to take out any new loans and will therefore save the interest payments.
- The company paid £49,120 in tax. This represents about 25% of the company’s net profit before tax and interest.

- The company has earned relatively little from investing in activities outside the business. In future years, it would seem to make sense to expand the business, but if further growth is unlikely, it could consider investing in a range of financial assets. Alternatively, it could reward the shareholders with more generous dividends or by buying back some shares.

Solution 8.11

Statement of changes in equity for 2012

	<i>Attributable to equity holders</i>			<i>£000s</i>
	<i>Share capital</i>	<i>Other reserves</i>	<i>Retained earnings</i>	<i>Total equity</i>
<i>Balance at 31 December 2011</i>	800	200	500	1,500
Fair value gains on land and buildings		100		100
Profit for 2012			120	120
Total recognised income for 2012		100	120	220
Dividends paid			(20)	(20)
Issue of share capital during 2012	200	100		300
<i>Balance at 31 December 2012</i>	1,000	400	600	2,000

Chapter 9

Depreciation and reserves



Syllabus objectives

- (ix) *Describe the basic construction of accounts of different types and the role and principal features of the accounts of a company.*
9. *Explain how depreciation is treated in company accounts.*
10. *Explain the function of the following accounts:*
- *share capital*
 - *other reserves*
 - *retained earnings.*

0 *Introduction*

This is a short chapter containing a more detailed discussion of depreciation and reserves.



The examination is likely to test your *understanding* of the purpose of depreciation and the nature of reserves, your *ability to calculate* depreciation and reserves, and your *ability to evaluate* a company's policy on depreciation or reserves.

1 Depreciation

1.1 What is the purpose of depreciation?

Depreciation adjustments are required because virtually all non-current assets have finite useful economic lives. Land is an exception and is usually revalued rather than depreciated over time.

The income statement needs to show the cost of using non-current assets – not the value of non-current assets purchased during the year. There are two reasons for this:

1. If a company buys an asset which it still owns at the end of the year, the company has not lost the whole amount spent. The real loss is the difference between the value of the asset at the start of the year (or the cash the company used for its purchase) and the value of the asset at the end of the year.
2. The amount spent on non-current assets can vary considerably from year to year. The income statement would not therefore give a true picture of a company's *underlying* long-term profitability if expenditure on non-current assets was allowed to distort profits from year to year.

So instead of showing expenditure on non-current assets, companies show the amount by which their assets have depreciated over the year. Depreciation measures the amount of the capital stock that has been used up during the year.



Depreciation is defined as the measure of the wearing out, consumption or other reduction in the useful economic life of a non-current asset, whether arising from:

- the passage of time, or
- obsolescence through technological or market changes.

The first, and most important, aspect of this definition is that depreciation adjustments are not attempts to reflect the value of non-current assets in the statement of financial position. Rather, the purpose is to charge the purchase price of the company's non-current assets in the income statement in a systematic way. Depreciation is, therefore, an application of the matching concept referred to earlier in Chapter 7.

The definition of depreciation also makes it reasonably clear that the manner in which an asset's life diminishes varies according to the nature of the asset.

- A financial asset, such as a lease on some property, has a life span which is fixed in terms of time.
- Physical assets are likely to wear out through use and are likely to deteriorate more rapidly when they are used more heavily.
- Some assets, such as computers, are more likely to be overtaken by new technology long before the end of their physical lives.

Ideally, these differences should be reflected by having different bases for depreciation which reflect the nature of the assets. In practice, the cost of calculating depreciation in this way would involve such detailed record keeping of usage and output that the charge is usually based on the passage of time.

Thus, a new asset might be purchased for say £1,000. Management might estimate that it will have a useful life of five years (or that normal wear and tear will bring it to the end of its useful physical life in five years' time), at which time it will be sold for scrap for, say, £100. This raises the question of the most appropriate way to spread that £900 loss of value over the next five income statements.

The simplest method is called the straight line basis.

1.2 The straight line basis



This charges equal amounts every year as follows:

$$\frac{\text{Cost} - \text{Estimated residual value}}{\text{Estimated useful life}}$$

That would give a charge of

$$\frac{1,000 - 100}{5}$$

$$= £180 \text{ per annum.}$$

The straight line basis can also be expressed by charging a percentage of cost. If it was assumed that the estimated residual value was immaterial then the charge could be calculated as 20% of cost per annum, where the cost is the original cost of the asset.

Intangible assets may also suffer depreciation. Depreciation of intangible assets can be calculated in the same ways as depreciation of tangible assets. For example, a company's purchase of the right to use the name *Waterloo Bears* for the next 20 years at a cost of £60,000 will suffer depreciation of £3,000 each year (*ie* based on the straight line method of depreciation with no residual value).

1.3 The reducing balance method

The reducing balance method is the other common method of charging depreciation. This charges a fixed percentage of "book value" (*ie* cost less depreciation to date) each year so that the whole cost is charged over the life of the asset.



The depreciation rate is calculated as follows:

$$1 - \sqrt[n]{\frac{\text{Estimated residual value}}{\text{Cost}}}$$

where n is the estimated useful life in years.

Thus, the rate to be applied to our example would be:

$$1 - \sqrt[5]{\frac{100}{1,000}}$$

= 37% (rounded and expressed as a percentage)

The depreciation charged for a particular year under this method will be the value of the asset at the beginning of the year multiplied by the rate of depreciation. The *charge to the income statement* of depreciation on a particular non-current asset will therefore fall each year under the reducing balance method.

That means that the first year's depreciation will be $\text{£1,000} \times 37\% = \text{£370}$, leaving a book value of £630. The second year's depreciation will be $\text{£630} \times 37\% = \text{£233}$ and so on.

Notice that the depreciation rate is the effective rate of discount, which you might have studied in Subject CT1.

Over the life of the asset, the following pattern would emerge:

Year	Book value at start of year	Depreciation	Book value at end of year
1	1,000	370	630
2	630	233	397
3	397	147	250
4	250	92	158
5	158	58	100



Question 9.1

Consider the following non-current assets:

- factory, initial cost £250,000, estimated useful life 25 years, no residual value
- two vans, initial cost £15,000 each, estimated useful life 6 years, no residual value
- machinery, initial cost £122,000, estimated useful life 11 years, estimated residual value £13,750.

The factory was bought 7 years ago. The vans and the machinery were all bought at the beginning of 2012.

The factory and the vans are depreciated using the straight line method. Depreciation on the machinery is worked out using the reducing balance method.

Calculate the company's total depreciation charge for 2012.

One advantage of the reducing balance method is that it tends to charge a heavier proportion of the cost of the assets when they are new. This might make the depreciation charge in the income statement more relevant because most of the charge will be based on the cost of newer, more recent assets. The straight line method weights assets equally, regardless of their age, which can be a drawback when the cost of assets is rising because of inflation.

In practice, it is common for companies to assume that all assets of a particular class will last a "standard" life (eg four years for vehicles and ten years for manufacturing plant). These rates will be based on experience and will reflect the general patterns observed by that company. The errors which creep in because some assets are depreciated too slowly will tend to cancel those which arise because others are depreciated too rapidly.

Clearly, management has a considerable amount of discretion over the amount to be charged for depreciation in any given year. The estimates of useful life and residual value will affect both the income statement charge and the valuation in the statement of financial position. The selection of either straight line or reducing balance depreciation will also have an impact.

A company cannot however change its depreciation policy from year to year without good cause. Companies also disclose a great deal of information concerning their depreciation policies which gives the reader a lot of information about the non-current assets and their book values over the accounting period.

Thus, companies are required to provide a considerable amount of detail about their non-current asset balances:

	Freehold Land and buildings £000	Leasehold Land and buildings £000	Plant and Machinery £000	Total £000
Cost or Valuation				
1 January 20X0	200	100	50	350
Additions	10	2	4	16
Disposals	(7)	(6)	(8)	(21)
31 December 20X0	203	96	46	345
Depreciation				
1 January 20X0	30	20	16	66
Charge for year	4	8	5	17
Disposals	(3)	(2)	(4)	(9)
31 December 20X0	31	26	17	74
Net Book Value				
31 December 20X0	172	70	29	271
1 January 20X0	170	80	34	284

**Question 9.2**

Why do disposals represent a negative in the depreciation calculation table above?

This information would be supplemented by a detailed statement of the accounting policies used in deriving the figures. Anyone reading this note will, therefore, be able to make some rough estimates of the effects of using a particular accounting policy and might, therefore, be able to change the figures to make them comparable with those of another company. It also permits some crude estimates of the proportion of the assets' useful lives which have been consumed to date. That might make it possible to predict major events such as the issue of fresh share capital or the raising of a loan with which to invest in non-current assets.

**Question 9.3**

You are examining a company's statements of financial position for two years in order to understand what has happened to the non-current assets over the period. Given the selected items from the statements of financial position and additional data, calculate the amount received from the sale of non-current assets.

	<i>31 July 2013</i> £000s	<i>31 July 2012</i> £000s
Non-current assets:		
Cost	3,976	3,465
Depreciation	<u>1,245</u>	<u>1,033</u>
	2,731	2,432

Additional information:

- During the year, the company paid £900,000 for new equipment.
- The depreciation allowance for the year is £432,000.
- The company made a loss on the disposal of non-current assets of £50,000.

2 Capital and reserves

The statement of financial position lists the assets owned by the company and the liabilities which are owed to third parties. The residual amount is called capital or equity and belongs to the shareholders.



Equity can arise in three main ways:

- by the sale of shares to the shareholders
- by certain adjustments, such as the revaluation of non-current assets
- by the retention of profit after tax.

2.1 Share capital and share premium



Question 9.4

How would you calculate the nominal value of a company's issued share capital?

Shares carry a “nominal” value for bookkeeping purposes. This does not, however, necessarily reflect the market value of the company and it is possible that the company will be able to find buyers who would be willing to pay rather more.

Ordinary shares are always issued at or above their par value. Any excess money raised over their nominal value is shown under the heading “share premium account”, which is part of “other reserves”.

For example, when it was formed, a US company issued half a million fully paid \$0.25 shares at a price of \$0.37 each. The nominal amount of \$125,000 ($\$0.25 \times 500,000$) is shown under the heading “called up share capital” and the extra \$60,000 raised ($\$0.12 \times 500,000$) under the heading “share premium account”.



The difference between the nominal value of the shares and the amount paid for them is called the “share premium account”. It is not permissible to issue shares at a discount.

The share premium account can also be used for:

- the preliminary expenses of forming a company
- the expenses and commissions incurred in any issue of shares
- any profit or loss on the issue of loan stock
- any premium paid on the redemption of loan stock
- the expenses of issue of loan stock.

These items will be added/charged to the share premium account as and when necessary.

Effectively, the share premium account is just a part of the company's share capital, but its value is included in "Other reserves" in statement of financial position format used in Chapter 8. It shows the excess of shareholder investment over the nominal value of the shares.

2.2 **Revaluation reserve**



Despite the cost concept, it is common practice to revalue land and buildings in the statement of financial position.

If, for example, the company owned a factory which had cost £300,000 and had been depreciated by £70,000 it would be valued at a net book value of £230,000 in the statement of financial position. If the company's advisers valued the property at, say, £400,000 then this could be reflected in the financial statements by restating the depreciation to date as zero and replacing the "cost" of £300,000 with a "valuation" of £400,000.

Simply increasing the book value of assets by £170,000 would throw the statement of financial position out of balance. This is rectified by increasing the "revaluation reserve" by £170,000.

The amount of the revaluation reserve is included in "Other reserves" in the statement of financial position format used in Chapter 8.



Question 9.5

Where else would you expect to see this £170,000 mentioned in this company's accounts?



Gains on revaluation are the one exception to the statement (in Chapter 8) that “other comprehensive income” will not be examined in this subject. If a gain on revaluation is recognised in any year then the profit for the year is calculated as before, but the gain on revaluation is then shown as one element of “other comprehensive income”.

The annual depreciation is then based upon the revalued amount. The valuation will be written off over the estimated useful life of the asset. It is acceptable for the company to revise its expectations as to the expected useful life at the time of the revaluation.

The following example shows revaluation through the revaluation reserve.

To illustrate the effect of revaluation, assume that the company which owned the factory had no other assets. Its statement of financial position entries before and after the revaluation might be made up as follows:

	31 December 20X0 before revaluation (£)	31 December 20X0 after revaluation (£)
Non-current assets		
Factory (cost)	300,000	400,000
Factory (depreciation)	(70,000)	–
	230,000	400,000
Total assets	230,000	400,000
Share capital	25,000	25,000
Other reserves		
Share premium	15,000	15,000
Revaluation reserve	–	170,000
Retained earnings	90,000	90,000
Total equity	130,000	300,000
Non-current liabilities		
Long-term borrowings	100,000	100,000
Total non-current liabilities	100,000	100,000
Total liabilities	100,000	100,000
Total equity and liabilities	230,000	400,000

The second statement certainly appears much stronger. Assets are now four times greater than non-current liabilities instead of just over twice as great. Equity has more than doubled. And yet all that has happened is that the company has decided to restate the basis for the valuation of its assets.

**Question 9.6**

What is the case for and against fair value accounting for all assets and liabilities, *ie* the annual revaluation of assets and liabilities in the accounts?

2.3 *Retained earnings*



The balance on the retained earnings reserve is normally the aggregate amount of profits earned during the lifetime of the company, less amounts paid out of profits for tax and dividends.

Normally the balance on the retained earnings reserve provides all of the company's distributable reserves. Company law restricts dividends by linking the maximum payout to distributable reserves in order to protect the interests of creditors. Otherwise the directors could use all of a failing company's remaining assets to pay a massive dividend to its shareholders. Doing so would act against the interests of the company's creditors and lenders.

In the preceding example, the maximum dividend payment would be £90,000 and this is not affected by the fact that equity increases as a result of the revaluation.



Question 9.7

Goright plc is in the process of preparing its statement of financial position for 31 December 2012. So far, the items (valued at 31 December 2012 unless otherwise stated) are:

	£000s
Non-current assets at cost	547
Accumulated depreciation (31st December 2011)	50
Current assets	165
Long-term loans	200
Share capital	300
Share premium	50
Revaluation reserve	30
Retained earnings (31st December 2011)	55

For the year to 31 December 2012:

- the depreciation figure in the income statement is £12,000
- the profit after tax is £30,000
- the directors distributed half of the company's earnings to its shareholders in the form of a dividend.

The company's accountants take the view that the company's non-current assets should be revalued at £600,000.

Prepare the statement of financial position for Goright plc at 31 December 2012:

- (i) without revaluation of the non-current assets
- (ii) with revaluation of the non-current assets.



Chapter 9 Summary

Depreciation

Depreciation shows the cost of using non-current assets. It measures the amount of capital stock that has been used up over the year due to wear and tear, passage of time or obsolescence. The value of the assets may be written off evenly over a number of years using the *straight line method*. Alternatively a constant rate of depreciation may be used, using the *reducing balance method*.

Share capital and reserves

There are three main items in the share capital and reserves.

- *Share capital* is the nominal value of the shares issued.
- *Other reserves* include:
 - (a) the share premium account, which records the additional amount raised from the share issue in excess of the nominal value
 - (b) the revaluation reserve, which records the increase in the value of non-current assets if non-current assets are revalued upwards.
- *Retained earnings* records the profit retained in the business to date.

This page has been left blank so that you can keep the chapter summaries together for revision purposes.

Chapter 9 Solutions

Solution 9.1

Factory: annual depreciation charge (using the straight line method):

$$\frac{250,000}{25} = 10,000$$

Vans: annual depreciation charge (using the straight line method):

$$\frac{2 \times 15,000}{6} = 5,000$$

Machinery: using the reducing balance method, we first need to calculate the rate of depreciation r :

$$122,000 \times (1 - r)^{11} = 13,750$$

$$r = 0.18$$

so the depreciation for the first year

$$= 0.18 \times 122,000$$

$$= 21,960$$

Thus, total depreciation charge for the year

$$= 10,000 + 5,000 + 21,960$$

$$= £36,960$$

Solution 9.2

A non-current asset that has been in the company's books for some time will be valued at cost (*i.e.* the full purchase cost) less some amount of depreciation. When that asset is sold, the full purchase cost of the asset is deducted from the non-current asset account, and the amount of the depreciation to date-of-sale is deducted from the depreciation account – *i.e.* negative depreciation!

Solution 9.3

For the assets that were sold, we need to find out their book value. Firstly, find out their value at cost.

The non-current assets at cost were £3,465,000 in 2012 and £3,976,000 in 2013. During this year, £900,000 was spent on non-current assets and an unknown value of non-current assets at cost (x) were disposed of. Thus:

$$\text{£3,465,000} + \text{£900,000} - x = \text{£3,976,000}$$

$$x = \text{£389,000}$$

Secondly, find the depreciation attached to the assets that were sold.

The accumulated depreciation to the 31st July 2012 was £1,033,000, and the accumulated depreciation to the 31st July 2013 was £1,245,000. During the year, the company's assets depreciated by £432,000, but some assets with accumulated depreciation attached to them (y) were sold. Thus:

$$\text{£1,033,000} + \text{£432,000} - y = \text{£1,245,000}$$

$$y = \text{£220,000}$$

Thirdly, find the book value of the assets that were sold. This amounts to:

$$x - y = \text{£389,000} - \text{£220,000} = \text{£169,000}$$

Finally, we find the amount received from the sale of these assets.

We are told that these assets were sold at a loss of £50,000. Thus, the assets were sold at £50,000 less than their book value, *i.e.* they were sold at £119,000.

Solution 9.4

The nominal amount of issued share capital

$$= \text{number of shares issued} \times \text{par value of shares}$$

Solution 9.5

In addition to appearing in the revaluation reserve in the balance sheet, the £170,000 would also be shown as a gain on revaluation in the “other comprehensive income” section at the bottom of the statement of comprehensive income.

It would also appear in the statement of changes in equity.

Solution 9.6

Case for:

- Readers of accounting information may want to know the current market value of the company's assets and liabilities.
- More realistic valuation of the company's capital will give a more realistic rate of return on capital.
- Fair values are a better basis for decision making than historical costs. They offer a more realistic view of the net worth of the business. This would be useful when selling assets, merging or being taken over.
- Company would, by increased allowance for depreciation, be conserving adequate funds for the replacement of the assets.
- Company could obtain more loan finance on the basis of the increased value of its assets.
- If a company's assets have fallen in value, this indicates poor stewardship of the company's assets and should be reflected in the income statement.

Case against:

- Fair values are not a better basis for decision making unless all items in the statement of financial position are measured at fair values. At the moment some measurements are made at fair value and others at historical cost.
- Fair values increase the risk of misunderstanding on the part of existing or potential investors. Although the fair value of an asset is broadly its market value, the net fair value of the balance sheet will not necessarily equate to the market value of the company because of internally generated goodwill in the form of intangible assets, such as the value of the customer base.
- Properly qualified regulated professionals will be required to undertake the revaluation if fair values are to be relied on.
- How reliable is the data on fair values? Where there is a well-defined market in the asset, this is not a problem, but for illiquid assets and liabilities it may be necessary to use a model, such as one based on the present value of future income. The models used, and the assumptions made within those models, will differ across companies, causing problems for auditors.

Solution 9.7(i) ***Without revaluation of the non-current assets***

Statement of financial position for Goright plc at 31st December 2012 (£000s)

Non-current assets:

Cost	547
Depreciation	(62)
	485
Current assets	<u>165</u>
Total assets	<u>650</u>

Share capital and reserves:

Share capital	300
Other reserves:	
Share premium	50
Revaluation reserve	30
Retained earnings	<u>70</u>
	450
Long-term loans	<u>200</u>
Total equity and liabilities	<u>650</u>

(ii) ***With revaluation of the non-current assets***

Statement of financial position for Goright plc at 31st December 2012 (£000s)

Non-current assets:

Cost	600
Depreciation	<u>0</u>
	600
Current assets	<u>165</u>
Total assets	<u>765</u>

Share capital and reserves:

Share capital	300
Other reserves:	
Share premium	50
Revaluation reserve	145
Retained earnings	<u>70</u>
	565
Long-term loans	<u>200</u>
Total equity and liabilities	<u>765</u>

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Chapter 10

Generating accounts



Syllabus objectives

- (ix) *Describe the basic construction of accounts of different types and the role and principal features of the accounts of a company.*
- 4. *Construct simple statements of financial position and income statements; understand and interpret cashflow statements.*

0 Introduction

In Chapter 8, we studied the structure of the main accounts. In this chapter, we are going to learn how to construct the balance sheet and the income statement from information contained in the trial balance.

Once you have read and understood how to compile a set of accounts, you need to practise drawing up a set of accounts for yourself. There is an exam-style question at the end of the chapter and there are lots more questions in the Question and Answer Bank.



The examination is likely to test your *ability to construct* the main accounts.

1 The trial balance

1.1 Description of the trial balance

The double-entry system of bookkeeping is used to create a number of balancing *accounts*. These accounts are held together in a *ledger*, and all of the accounts can be used to create a trial balance. The *trial balance* is simply a list of all the accounts in the ledger and the balances in each account.

The trial balance leads directly to the production of a balance sheet and an income statement.



You will not be required to construct a trial balance but you do have to know how to use a trial balance to construct a balance sheet and an income statement.

The trial balance can be presented in a number of ways:

1. as a simple list of numbers
2. as a list of positive and negative numbers adding to zero
3. as two columns (debits and credits) giving the same total.

If it is presented as a list of numbers, you are given no clue as to whether the accounts are debits or credits. If it is presented as a list of numbers adding to zero, the credit items are positive and the debit items are negative. The credit items consist of revenue (for the income statement) and liabilities and capital (for the balance sheet); and the debit items consist of expenses (for the income statement) and assets (for the balance sheet).

As an example, assume that the following balances have been extracted from the books of JK plc, as at 31 March 20X1:

	£000
Administrative expenses	150
Advertising	70
Cash at bank	10
Trade payables (Creditors)	45
Trade receivables (Debtors)	115
Directors' remuneration	75
Interest on long-term loans	4
Inventory at 31 March 20X0	130
Investment income	18
Investments (short-term)	350
Long-term loans	200
Ordinary dividend paid (see note 7 below)	30
Ordinary share capital, issued and fully paid	700
Plant and machinery – cost	210
Plant and machinery – depreciation at 31 March 20X0	95
Premises – cost	950
Premises – depreciation at 31 March 20X0	20
Purchases	600
Retained earnings at 31 March 20X0	236
Sales (Revenue)	1,760
Shareholder reserves	50
Wages and salaries – administrative staff	160
Wages and salaries – manufacturing staff	190
Wages and salaries – sales staff	80

Additional information:

1. Inventory at 31 March 20X1 was valued at £185,000.
2. Provision is to be made for administrative expenses owing at 31 March 20X1 amounting to £12,000.
3. Premises are to be depreciated at the rate of 2% on cost, and plant and machinery at 25% reducing balance.
4. Advertising paid in advance at the end of the year amounted to £9,000.
5. Corporation tax based on the year's profit is estimated at £15,000.
6. The company's ordinary share capital is 700,000 £1 ordinary shares, fully paid.
7. The ordinary dividends paid are the dividends for the year to March 20X0.

The trial balance above has been presented as a list of numbers. This could be rewritten as two columns (debits and credits) giving the same total as follows:

	<i>Debits</i>	<i>Credits</i>
Administrative expenses	150	
Advertising	70	
Cash at bank	10	
Trade payables (Creditors)		45
Trade receivables (Debtors)	115	
Directors' remuneration	75	
Interest on long-term loans	4	
Inventory at 31 March 20X0	130	
Investment income		18
Investments (short-term)	350	
Long-term loans		200
Ordinary dividend for 20X0 paid	30	
Ordinary share capital, issued and fully paid		700
Plant and machinery – cost	210	
Plant and machinery – depreciation at 31 March 20X0		95
Premises – cost	950	
Premises – depreciation at 31 March 20X0		20
Retained earnings at 31 March 20X0		236
Purchases	600	
Sales (Revenue)		1,760
Shareholder reserves		50
Wages and salaries – administrative staff	160	
Wages and salaries – manufacturing staff	190	
Wages and salaries – sales staff	80	
	3,124	3,124



It is useful to have an understanding of debits and credits because sometimes it is difficult to know how to treat particular items in the trial balance. For example, if “interest” were listed in a trial balance, how would it be treated? Without further information you would not know whether this “interest” referred to interest coming in (*ie* investment income) or interest going out (*ie* interest payments). By reference to the column in which the item is placed, you will be able to tell. If it is in the debit column (with all the other expense items), it must be “interest paid”; if it is in the credit column (with sales revenue), it must be “interest received”.

If you are presented with a simple list of items in the trial balance and you are not sure how to treat an item, you could rewrite it as two columns and check that the two columns add to the same number.

1.2 Awkward items in the trial balance

Depreciation

Non-current assets pose a slight problem. This is because of an issue called depreciation which was discussed in Chapter 9. For now, it is worth noting that it is the net figure which is shown in the statement of financial position for each category of non-current assets. Thus, the value of premises is £950,000 – £20,000 = £930,000.

Notice that when the trial balance is presented as a list of credits and debits, the fixed asset at cost is recorded as a debit item and the depreciation is recorded as a credit item. You can think of the depreciation as an item that reduces the value of the non-current assets: it is the net figure that is important.

Notice that the trial balance does not contain information on this year's depreciation. Thus, the book value of the premises at the *beginning* of this accounting year is £930,000. This year's depreciation is given in a note at the bottom of the trial balance. You will need this year's depreciation for the income statement and you will also need it to find the book value of the non-current assets at the *end* of the accounting year for the balance sheet.

Retained earnings

Notice that the retained earnings reserve is for the *beginning* of the accounting year. The accounts are updated in the trial balance when the income statement is drawn up. The retained profit for the period is added to the retained earnings reserve in order to complete the balance sheet. If the trial balance were to be re-drawn after the income statement had been completed it would show a retained earnings reserve at 31st March 20X1 and all of the revenue/expense items such as sales and administration expenses would be set to zero.

Inventories (Stocks)

Notice that the figure for inventories at the *beginning* of the accounting year (*ie opening inventory*) is included in the trial balance. Inventories are a current asset of the business, but the opening inventory is not used in the end of year balance sheet. The figure for *closing inventory* is noted below the trial balance. This figure is needed for the end of year balance sheet. Both opening inventory and closing inventory are needed, along with purchases of new inventory, to find the cost of inventory sold for the income statement.



Inventory is commonly called stock(s). You will see stock (and hence opening stock, closing stock, cost of stock used *etc*) mentioned in past papers, ActEd notes and in the real world.

Adjustments for the accruals concept

Remember that the income statement records cost items when they are incurred (even if the company has not yet paid for them or has paid for them in advance). Notes will be made at the bottom of the trial balance to take account of any adjustments necessary. For example, if corporation tax is incurred in this accounting year, it should be in this year's income statement, even if it has not yet been paid. It will be recorded as a current liability in the statement of financial position if it has not been paid.

Dividends

Any question on this topic should make it clear whether the dividend paid in the trial balance relates to the current year or to the previous year. Dividends paid will be shown as a note at the bottom of the income statement, deducted from the retained earnings in the statement of financial position, disclosed in the notes to the accounts and will affect the statement of changes in equity and cashflow statement.

2 **Constructing financial statements**

The preparation of a set of financial statements can be an extremely complex affair. Degree courses in accountancy would devote at least one class every year to this topic and it would then be a major component of the professional courses taken by trainee accountants after graduation. This section is, therefore, intended to give only a brief overview of the mechanics of preparing an income statement, statement of financial position and understanding and interpreting a cashflow statement.

2.1 ***The income statement and statement of financial position***

For the sake of clarity, the income statement is one component of the statement of comprehensive income. The income statement is the section that deals with revenues and expenses and calculates the profit after tax. The components of “other comprehensive income” that are combined with the profit after tax are not examinable in the CT2 syllabus (apart from gains on revaluation – see Chapters 8 and 9) and so the remainder of this text will refer to the income statement rather than the statement of comprehensive income.

The income statement and statement of financial position are prepared from the underlying bookkeeping records. All transactions are recorded during the year and are entered into a double entry bookkeeping system. This generates a table called a trial balance.

As we have seen, the trial balance consists of accounts that are needed for the income statement (*i.e.* revenue and expenses) and accounts that are needed for the statement of financial position (*i.e.* assets, liabilities and capital).



Every figure in the trial balance is used once in the preparation of either the income statement or the statement of financial position.



Question 10.1

Label each of the accounts listed in the trial balance on page 3:

- (i) as capital (C), liability (L), asset (A), revenue (R) or expense (E) account
- (ii) as an entry in the statement of financial position (B) or in the income statement (I).

The income statement (set out in the same format as in Chapter 8, Section 2) would be prepared by extracting the income and expense figures and rearranging them as follows:

JK plc	
Income statement for the year ended 31 March 20X1	
Revenue	£000
Cost of sales	1,760
Gross profit	(783)
Distribution costs	977
Administrative expenses	(141)
Operating profit	(397)
Finance income	439
Finance costs	18
Net profit before tax	(4)
Tax expense	453
Profit after tax	(15)
Profit for the year attributable to equity holders of the company	438
Earnings per share for profit attributable to equity holders	438
	63 pence

In order to prepare these reported figures, supplementary working needs to be done, as follows:

Workings	£000
<i>Cost of sales</i>	
Opening inventory	130
Purchases	600
Closing inventory	(185)
Depreciation – premises	19
Depreciation – plant and machinery	29
Wages and salaries	<u>190</u>
	<u><u>783</u></u>
<i>Distribution costs</i>	
Advertising	70
Less – prepaid	(9)
Wages and salaries	<u>80</u>
	<u><u>141</u></u>
<i>Administrative expenses</i>	
Administrative expenses	150
Add – accrual	12
Directors' remuneration	75
Wages and salaries	<u>160</u>
	<u><u>397</u></u>

The remainder of the figures are reorganised to give a statement of financial position (set out in the same format as in Chapter 8, Section 1):

JK plc	
Statement of financial position at 31 March 20X1	
	£000
ASSETS	
Non-current assets	997
Current assets	
Inventories	185
Trade receivables	115
Other current assets	359
Cash	10
	<hr/>
	669
Total assets	1,666
EQUITY AND LIABILITIES	
Share capital	700
Other reserves	50
Retained earnings	644
Total equity	1,394
Non-current liabilities	
Long-term borrowings	200
Total non-current liabilities	200
Current liabilities	
Trade and other payables	57
Current tax payable	15
Total current liabilities	72
Total liabilities	272
Total equity and liabilities	1,666

In order to prepare these reported figures, supplementary working needs to be done, as follows:

Workings	£000s		
<i>Non-current assets</i>	Cost	Aggregate depreciation	Net book value
Premises	950	39	911
Plant and machinery	210	124	86
	1,160	163	997
 <i>Other current assets</i>			
Investments (short-term)	350		
Pre-paid expense	9		
	359		
 <i>Retained earnings</i>			
Retained earnings at 31 March 20X0	236		
Retained earnings for year to 31 March 20X1	438		
Dividends paid	(30)		
	644		
 <i>Trade and other payables</i>			
Creditors (trade payables)	45		
Administrative expenses	12		
	57		

2.2 ***The cashflow statement***

The cashflow statement reports the cash paid during the accounting period for non-current assets, raw materials, wages, etc (rather than matching the consumption of those resources to the sales generated) and the cash received from customers (rather than the sales made). It also includes cash received from owners and lenders.

In order to prepare a cashflow statement, you will need:

- details of all cash transactions that have taken place over the year, or
- the start and end-year balance sheets and the income statement for the year.

An example of a cashflow statement was given in Chapter 8, Section 3.

2.3 ***The statement of changes in equity***

The statement of changes in equity summarises the changes in the capital and reserves attributable to equity holders of the company over the accounting period.

In order to prepare a statement of changes in equity, you will need the equity section of the start and end-year balance sheets, with detailed notes.

An example was given in Chapter 8, Section 4.

**Question 10.2**

Define the following terms:

- (i) trial balance
- (ii) cashflow statement
- (iii) statement of financial position
- (iv) income statement
- (v) statement of changes in equity.



The following question is typical of the trial balance questions asked in previous examinations.

Read the question very carefully. Since each item on the trial balance is used only once, in either the income statement or the balance sheet, you could make a note by the side of each item (I or B), and tick off each item as it is used.

Read the notes below the trial balance carefully and work out the impact of each note on the accounts. Each note will have two effects on the accounts.



Question 10.3

The following information has been extracted from the accounting records of Aztec plc:

Trial Balance at 31 July 2013

	£000	£000s
Administration costs	800	
Marketing expenses	500	
Bank		700
Trade receivables (debtors)	1,300	
Factory – cost	23,300	
Factory – depreciation		1,800
Factory running costs	1,200	
Directors' remuneration	600	
Interim dividend paid	100	
Interest	1,680	
Long-term loans		12,000
Machinery – cost	15,000	
Machinery – depreciation		8,000
Manufacturing wages	1,700	
Purchases	1,600	
Retained earnings at 31 July 2012		980
Sales		13,000
Sales salaries	1,600	
Share capital (50p shares)		13,000
Inventories at 31 July 2012	700	
Trade payables (creditors)		600
	50,080	50,080

Notes:

- (a) The corporation tax charge for the year has been estimated at £300,000.
- (b) At the year-end the directors had the factory professionally revalued. The valuer's report estimates the value of the property at £25,000,000. This value is to be incorporated into the balance sheet.
- (c) Depreciation for the year is charged at 1% of cost for the factory and at 20% of the reducing balance for the machinery.
- (d) Inventories at 31st July 2013 were valued at £550,000.
- (e) After the year-end, an invoice for £100,000 was received for marketing costs incurred in the period 1 April – 31st July 2013.

Prepare Aztec plc's statement of comprehensive income for the year ended 31 July 2013 and the statement of financial position as at that date.

End of Part 2

What next?

1. Briefly **review** the key areas of Part 2 and/or re-read the **summaries** at the end of Chapters 7 to 10.
2. Attempt some of the questions in Part 2 of the **Question and Answer Bank**. If you don't have time to do them all, you could save the remainder for use as part of your revision.
3. Attempt **Assignment X2**.

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Chapter 10 Summary

The double-entry system of bookkeeping is used to create a number of balancing *accounts*, held together in a *ledger*. The *trial balance* is simply a list of all the accounts in the ledger and the balances in each account. The *income statement* and the *balance sheet* are derived from the information in the trial balance.

Debit items in the trial balance are expense items for the income statement and assets for the balance sheet. *Credit items* in the trial balance are revenue items for the income statement and capital and liabilities for the balance sheet.

Notes at the bottom of the trial balance give information on:

- inventories at the end of the year, *ie* closing stock
- this year's depreciation
- adjustments for the accruals concept.

Each figure in the trial balance is used once in the preparation of the income statement and the balance sheet.

This page has been left blank so that you can keep the chapter summaries together for revision purposes.

Chapter 10 Solutions

Solution 10.1

	CLARE	B/I
Administrative expenses	E	I
Advertising	E	I
Cash at bank	A	B
Trade payables (creditors)	L	B
Trade receivables (debtors)	A	B
Directors' remuneration	E	I
Interest on long-term loans	E	I
Investment income	R	I
Investments (short term)	A	B
Long-term loans	L	B
Ordinary dividend for 200X–1 paid	C***	B***
Ordinary share capital, issued and fully paid	C	B
Plant and machinery – cost	A	B
Plant and machinery – depreciation at 31 March 200X–1	A*	B
Premises – cost	A	B
Premises – depreciation at 31 March 200X–1	A*	B
Retained earnings at 31 March 200X–1	C	B
Purchases	E	I
Sales	R	I
Shareholder reserves	C	B
Stock at 31 March 200X–1	E**	I
Wages and salaries – administrative staff	E	I
Wages and salaries – manufacturing staff	E	I
Wages and salaries – sales staff	E	I

- * Depreciation *reduces* the value of the non-current assets.
- ** Opening stock, together with closing stock and purchases, is used in the income statement to arrive at a figure for the cost of stock sold (an expense). Closing stock is a current asset and appears in the end of year balance sheet.
- *** Dividends paid reduce the amount of capital on the balance sheet.

Solution 10.2(i) ***Trial balance***

A summary of all the accounts in the ledger, showing the balance on each account.

(ii) ***Cashflow statement***

A summary of all the transactions which lead to movements of physical cash. The result should reconcile to the movement in the bank balance over the period.

(iii) ***Statement of financial position***

A summary of all the assets, liabilities and capital of the entity, valued according to an appropriate set of accounting policies at a particular time.

(iv) ***Income statement***

A summary of all the revenue earned and expenses incurred by a company over a period of time.

(v) ***Statement of changes in equity***

A summary of changes in the capital and reserves attributable to equity holders over the accounting period.

Solution 10.3

The statement of comprehensive income for Aztec plc for the year ending 31st July 2013

	£000
Sales	13,000
Cost of sales ¹	<u>(6,283)</u>
Gross profit	6,717
Distribution costs ²	(2,200)
Administrative expenses ³	<u>(1,400)</u>
Operating profit	3,117
Finance costs	<u>(1,680)</u>
Net profit before tax	1,437
Tax	<u>(300)</u>
Net profit after tax =	1,137
Profit for the period attributable to equity holders of the company	
Other comprehensive income:	
Gains from revaluation ⁴	<u>3,733</u>
Total comprehensive income	<u>4,870</u>
EPS for profit attributable to equity holders	4.4p

An interim dividend of £100,000, ie 0.4p per share was paid during the year.

Notes:

1. Cost of sales:	3. Administrative expenses:	
Opening stock	700	Administrative costs
Purchases	1,600	Directors' remuneration
less Closing stock	(550)	Total
Factory running costs	1,200	
Manufacturing wages	1,700	4. Gains from revaluation:
Depreciation of factory	233	(See Note 7)
Depreciation of machinery	<u>1,400</u>	
Total	6,283	
2. Distribution costs:		
Marketing	600	
Sales salaries	<u>1,600</u>	
Total	2,200	

Statement of financial position for Aztec plc as at 31 July 2013
£000

ASSETS

Non-current assets ⁵	30,600
Current assets	
Trade receivables	1,300
Inventories	<u>550</u>
	<u>1,850</u>
Total assets	<u>32,450</u>

EQUITY AND LIABILITIES

Share capital	13,000
Retained earnings ⁶	2,017
Revaluation reserve ⁷	<u>3,733</u>
Total equity	18,750
Non-current liabilities	
Long-term loans	12,000
Current liabilities	
Creditors	600
Overdraft	700
Marketing bill owing	100
Tax provision	300
	<u>1,700</u>
Total liabilities	<u>13,700</u>
Total equity and liabilities	<u>32,450</u>

Notes:

5. The non-current assets are calculated as follows:

Factory (revalued)	25,000
Machinery ($15,000 - 8,000 - 1,400$)	<u>5,600</u>
Total	30,600

6. The retained earnings = $980 + 1,137 - 100 = 2,017$

7. The revaluation reserve is the new value of the factory at the end of the year less its book value prior to revaluation (ie $25,000 - (23,300 - 1,800 - 233) = 3,733$).

Chapter 11

Group accounts and insurance company accounts



Syllabus objectives

- (ix) *Describe the basic construction of accounts of different types and the role and principal features of the accounts of a company.*
- 5. *Understand the structure and content of insurance company accounts.*
- 6. *Explain what is meant by the terms subsidiary company and associated company.*
- 7. *Explain the purpose of consolidated accounts.*
- 8. *Explain how goodwill might arise on the consolidation of group accounts.*

0 Introduction

In Part 2 you learned about the accounting framework and how accounts are compiled. In the first chapter of Part 3 we consider two particular types of accounts.

Firstly, we look at how accounts are produced by groups of interrelated companies. Here the accounts need to show not only the financial position of each company within the group, but also the picture for the group as a combined economic entity. Notice that the syllabus requires you to *explain the purpose* of consolidated accounts: you are not required to *construct* consolidated accounts.

In the second section of the chapter, we look at the accounts of insurance companies, where the complex nature of the business necessitates special features in the accounts.



The examination is likely to test your *knowledge* of terms such as subsidiary company, your *ability to calculate* goodwill, and your *understanding* of the construction of group accounts and insurance company accounts.

1 **Consolidated financial statements**

Large organisations are often organised as groups of interrelated companies. There are a number of reasons why this may be so. Historically, the companies within the group could have been acquired as going concerns. The management of the controlling company could have felt that there were political or marketing considerations which would have made it unwise to transfer the assets of the controlled company to the acquirer and to liquidate the purchased company itself.

1.1 **Subsidiary companies**



The company which holds the controlling interest in the others is known as the “holding company”. The companies which are controlled by the holding company are known as “subsidiaries”. Collectively, a holding company and its subsidiaries are known as a “group”.

A controlling interest can arise in a number of ways. The most obvious would be where the holding company owns a majority of the voting rights. It is, however, possible to control the subsidiary in other ways. A holding company could hold less than half of the voting shares but still have the right to appoint or remove directors holding a majority of the voting rights at board meetings or it could have some other right to exercise a dominant influence over the subsidiary (eg by holding a “golden share” in the subsidiary or by entering into a contract giving it the right to exercise control).

Let us take the example of two companies, H (for holding) and S (for subsidiary). If Company H owns 100% of the shares of Company S, Company S is said to be a wholly owned subsidiary. Where the holding is less than 100%, Company S is said to be partially owned.

1.2 **Consolidated statements of financial position**

Legally, the companies in the group retain their independence. In many cases, however, the business activities of the group members are closely related to one another, with group members supplying others with products or components or different group members manufacturing complementary product ranges. It is also common for group members to provide fellow members with finance.

Even in the case of industrial conglomerates, where there is no direct link between the businesses of the members, all of the companies are under the control of the same senior management. It would be illogical for most purposes to view the group as being anything other than a single economic entity. The shareholders of the holding company will certainly be more interested in the performance of the group as a whole than they will be in that of the holding company taken on its own.

Decisions on how to structure a company can be complex, and are discussed at length in the many corporate finance and management books. The desire is to promote some form of competition between the various managers of the subsidiary companies and to split the group into manageable, semi-autonomous units, but at the same time to have a spirit of co-operation between all sections of the conglomerate.

The holding company is required to publish a set of consolidated financial statements which reflect the economic reality of the group's existence.

These statements comprise a consolidated income statement and statement of financial position. These statements must comply with the format and disclosure requirements which apply to individual companies.

Basically, consolidation is a process of totalling the various items in the income statements and statements of financial position of the individual group members. However, it must always be borne in mind that the purpose of the exercise is to present the statements as if the group was a single economic unit. Certain balances in the statements of the individual group members arise from relationships within the group and must be cancelled out before the figures can be meaningfully combined.

For example, H Ltd acquired 10,000 shares in S Ltd on 31 December 20X0. The statements of financial position of the two companies at that date were as follows:

	<u>H Ltd</u>	<u>S Ltd</u>
	£000	£000
Non-current assets	8	6
Investment in S Ltd	10	–
Current assets	<u>12</u>	<u>10</u>
Total assets	<u>30</u>	<u>16</u>
Share capital (£1 shares)	20	10
Current liabilities	<u>10</u>	<u>6</u>
Total equity and liabilities	<u>30</u>	<u>16</u>

We can imagine that the statement of financial position of H *before the purchase of S* looked very much as it does at present, except that instead of having a £10,000 investment, it would have had an extra £10,000 of cash in current assets. From the above it can be seen that H Ltd now owns the whole of S Ltd, *ie* it owns £10,000 worth of S shares, which corresponds to the amount of the issued share capital of Company S. In fact the amount of the investment could be more or less than the par value of the share capital. If H had paid substantially in excess of the £1 per share nominal value for the S shares, then the excess payment could be included as goodwill in the balance sheet of H Ltd. The example above assumes that this was *not* the case. Goodwill is discussed further in the next subsection.

Company S has no reserves built up from previous years' earnings. Were this the case, the amount paid by H for 100% of S would almost certainly differ from the amount of the share capital alone. The amount paid by H would be comparable to the net asset value, *ie* total capital and reserves in the statement of financial position of S.

If this group is looked at from the outside, it can be seen that the directors of H Ltd control non-current assets with a book value of £14,000 (*ie* £8,000 + £6,000) and current assets of £22,000 (*ie* £12,000 + £10,000). The group has current liabilities of £16,000. The calculation of the book value of the group's assets and liabilities is, therefore, a simple matter of adding across the statements.

Before doing so, however, it is necessary to cancel out any internal relationships which arise within the group. For example, the holding company shows an asset of £10,000 in respect of its investment in the subsidiary. This is matched by a capital balance of £10,000 which appears in the subsidiary's statement of financial position.

In other words, if we were to simply add all the entries in both statements of financial position together, we would encounter some double counting problems. The £10,000 which appears as an investment in H's statement of financial position is the value of owning Company S and all of the surplus assets that Company S possesses. However if we have added across both statements of financial position, all the assets of S are already accounted for in the balance sheet of H, so the investment double counts these assets. It would be removed in a set of consolidated accounts.

If we were to add the share capital liabilities together we would be reflecting the liability to S's shareholders in H's accounts. However S's shareholders are now H's shareholders. Since H's shareholders already own all of the assets on H's statement of financial position there is no need to include that either.

Once these have been offset against one another, the consolidated statement of financial position would appear as follows:

H Group	£000
Non-current assets	14
Current assets	<u>22</u>
Total assets	<u>36</u>
Share capital (£1 shares)	20
Current Liabilities	<u>16</u>
Total equity and liabilities	<u>36</u>

The process of identifying and cancelling internal relationships can become more complicated in practice. Such problems are, however, beyond the scope of this syllabus.

The holding company would also prepare a consolidated income statement. The principles are the same as for the statement of financial position in that any transactions between group members would have to be cancelled before totalling across the statements.

1.3 Goodwill on consolidation

Defining goodwill

In many takeovers, the amount that H has to pay to S's shareholders exceeds the balance sheet value of the share capital and reserves of Company S. In this case, a balancing item known as "goodwill" is needed. This is a consequence of the way in which the consolidated statement of financial position for a holding company with a subsidiary is drawn up.



Goodwill is calculated as:

$$\text{cost of acquisition} - \text{book value of shares acquired}$$

The *cost of the acquisition* is the value of any cash paid out, plus the market value of any shares or debt paid out, to S's shareholders.

The *book value of shares acquired* means the value of the proportion of the share capital and reserves that Company H owns as a result of the acquisition.

According to FRS 7, the assets and liabilities of a newly acquired undertaking should be brought into the consolidated statement of financial position at their *fair values at the date of acquisition*.

From a group perspective the net assets of the subsidiary at the date of acquisition become net assets of the group *at the date of acquisition* rather than when acquired by the individual subsidiary. Therefore, the historical cost principle should be applied at the date of acquisition and an estimate made of what it would cost a purchaser to acquire the individual assets and liabilities of the subsidiary at the date of investment by the group. So, effectively, the subsidiary's assets are revalued immediately before the acquisition by the holding company.

Taking the example above, let us assume that the fair value of the net assets of S is equal to the nominal value of S's share capital (*ie* £10,000), and that H has acquired 100% of the shares of S for £11,000 (rather than £10,000). Goodwill would be £1,000.

Why would a company pay more for another company than it is worth? Remember that the balance sheet only values certain assets – some, notably the value of the skilled workforce and the customer base, are excluded from the balance sheet. The company pays extra to acquire these “off balance sheet” assets.

As we have seen, **any amount paid in excess of the nominal value of the shares and reserves acquired by a holding company is known as “goodwill”. In theory, this is the amount which the holding company is paying for such intangibles as the reputation of the subsidiary, its customer base and its loyal workforce.**

Goodwill is often called “goodwill cost of control”. You can understand this intuitively as the extra amount paid in order to persuade S's shareholders to part with their shares, over and above the value of the shares acquired.

Accounting for goodwill

Goodwill as a non-current asset

Goodwill is normally shown as a non-current asset in the consolidated statement of financial position.

Using our example above, the amount shown as an investment in H's balance sheet would be £11,000 rather than £10,000 and presumably H would have less cash as a result, so the current assets would be £11,000 (rather than £12,000). Now if we try adding both balance sheets together we find that the book value of the assets of S are not equal to the amount of the investment shown in H's accounts. The difference is goodwill and remains on H's balance sheet after the consolidation. The statements of financial position would look as follows:

	<u>H Ltd</u> £000	<u>S Ltd</u> £000	<u>Consolidated</u> £000
Non-current assets (incl goodwill)	8	6	15
Investment in S Ltd	11		
Current assets	11	10	21
Total assets	30	16	36
Share capital (£1 shares)	20	10	20
Current liabilities	10	6	16
Total equity and liabilities	30	16	36

Non-current assets have a value of £15,000 that includes £1,000 of goodwill on consolidation.

Splitting up goodwill

New accounting guidelines state that “goodwill” ought to be broken down into its constituent parts where possible, eg brand names, patents.

IFRS 3 deals with the accounting treatment of goodwill. Under IFRS 3, if a business is acquired it is necessary to record all separately identifiable intangibles. Many assets which would previously have been treated as part of goodwill must now be identified and valued separately. Valuing these assets can be a complex matter in many cases and will often require specialist advice.

Variations in the treatment of goodwill

Normal prudent accounting practice has been to write off goodwill over a period less than or equal to the useful life of the asset. This could be very hard to determine.

However, under IFRS 3 goodwill is no longer amortised (depreciated) but is instead subject to an annual impairment testing.

If, in the example above, the calculation of goodwill had resulted in a negative amount it would have indicated that H had purchased assets cheaply, enhancing the residual value of H. Therefore the negative amount would be added to the “other reserves” item (so that “other reserves” increase). This is just like the residual item of shareholders’ capital and reserves being increased by “profit” on the issue of shares (which increases “share premium account”) and retained profit from the income statement (which increases “retained earnings”).

Goodwill on the purchase of an associate

The accounting item “goodwill” does *not* appear in the consolidated balance sheet when an “associate” (see Section 1.5) is purchased. The value of the associate is taken to be whatever it cost. Hence, there is no need for a goodwill item to appear in the consolidated balance sheet, because the value of the associate will be balanced exactly by the amount of money or loan stock or shares which the holding company has paid out. However, companies do show the goodwill element of an associate acquisition in a note to the accounts.



Question 11.1

Statement of financial positions (in £s) for Company A and Company B are shown below. Shares in Company A have a par value of 50p, and those in Company B a par value of 25p.

	<u>A</u>	<u>B</u>
Non-current assets	200	100
Current assets	600	440
Share capital	300	160
Reserves	400	80
Current liabilities	100	300

Calculate the goodwill cost of control assuming that Company A’s shares are priced at par, and that B’s shareholders are offered 1 share in A for every 1 share in B when A acquires:

- (i) 100% of Company B
- (ii) 75% of Company B.

1.4 Non-controlling interests

Defining non-controlling interest

It is unnecessary for the holding company to own all of the subsidiary's share capital in order for it to exercise control. In most circumstances, the holding company will have control if it owns 50% or more of the shares or if it can otherwise control the subsidiary company. Given that the directors of the holding company control all of the subsidiary's assets, it would not be appropriate to consolidate only that percentage which the holding company can claim to own. This leaves the problem of accounting for the portion of the subsidiary's finance which is provided by the other shareholders.



The value of the share capital and reserves provided by the subsidiary's minority shareholders is called the "non-controlling interest".

Accounting for non-controlling interest

The minority interest must be shown separately in the statement of financial position, in the equity section, after the capital and reserves attributable to equity holders. An example is:

EQUITY	£
<i>Capital and reserves attributable to equity holders of the company</i>	
Share capital	40,000
Other reserves	15,000
Retained earnings	<u>80,000</u>
	135,000
<i>Non-controlling interest</i>	<u>10,000</u>
<i>Total equity</i>	<u>145,000</u>

Let's take another example. Suppose that Mr X decides that he wants to expand his business by acquiring 80% of the business of his friend Mr Y. The statements of financial position of the two businesses are as follows:

<i>all figure in \$</i>	<i>Mr X</i>	<i>Mr Y</i>
Assets		
Cash	50	200
Trade receivables	<u>200</u>	<u>50</u>
Total assets	<u>250</u>	<u>250</u>
Equity and liabilities		
Capital (\$1 nominal)	50	200
Reserves	<u>100</u>	<u>50</u>
Equity	<u>150</u>	<u>250</u>
Loan	<u>100</u>	<u>0</u>
Total equity and liabilities	<u>250</u>	<u>250</u>

Mr X pays \$240 for his 80% stake in the business of Mr Y and raises this cash by increasing his loan from \$100 to \$340.

We can say the following:

- Mr X has acquired 80% of the shares in Mr Y's business = 160 shares of \$1 each
- The value of his 80% holding is $80\% \times (\$200 + \$50) = \$200$
- The goodwill included in his payment is:

$$\text{cost of acquisition} - \text{book value of shares acquired} = \$240 - \$200 = \$40$$

- The non-controlling interest retained by Mr Y has a value of:

$$\$250 - \$200 = \$50$$

To complete a consolidated set of accounts we can consider that Mr X owns and controls all of the assets in both companies, but that Mr Y has provided some of the capital for the combined company in the shape of his non-controlling interest.

We can now consolidate both statements of financial position and eliminate internal relationships.

<i>all figures in \$</i>	<u>Mr X</u> <u>Unconsolidated</u>	<u>Mr Y</u>	<u>Mr X</u> <u>Consolidated</u>
Assets			
Shares in Mr Y	240		0
Goodwill			40
Cash	50	200	250
Trade receivables	<u>200</u>	<u>50</u>	<u>250</u>
Total assets	<u>490</u>	<u>250</u>	<u>540</u>
Equity and liabilities			
Capital (\$1 nominal)	50	200	50
Reserves	<u>100</u>	<u>50</u>	<u>100</u>
Capital and reserves attributable to equity holders of the company	150	250	150
Minority interests			50
Total equity	<u>150</u>	<u>250</u>	<u>200</u>
Loan	<u>340</u>	<u>0</u>	<u>340</u>
Total equity and liabilities	<u>490</u>	<u>250</u>	<u>540</u>

To reach the final column we have done the following:

- added the cash of both companies together
- added the goodwill to the consolidated balance sheet (this would be held under “intangibles” in the non-current asset category)
- added all other categories together such as trade receivables together
- added the book value of Mr Y’s minority shareholding as part of the equity of the consolidated company.

Notice that the share capital and reserves of Mr Y’s company disappear – to include them would be double counting these liabilities as discussed earlier.

1.5 Associated companies

Along with holding companies and subsidiaries, there is a third type of group member.



An associated undertaking is one which is not a subsidiary, but which is subject to significant influence (but not control) by the holding company.

There is normally a presumption that significant influence would arise if the holding company owned more than 20% of the associate's voting rights. For most purposes, it is adequate to assume that a holding of between 20% and 50% of S's shares will make S an associate company of H.

The fact that the holding company can merely exert influence means that it would not be appropriate to include the value of its assets in the consolidated financial statements. By the same token, it would be inappropriate to treat the associate as a simple investment.

Instead, compromise is reached by including the holding company's share of the associate's results in the consolidated income statement – regardless of whether it actually receives these by way of dividend. The consolidated statement of financial position includes the holding company's share of the associate's assets and liabilities. The entries in both the income statement and statement of financial position are single line entries, which state the total amounts attributable to associate companies.



Question 11.2

A plc owns shares in three companies, B Ltd (40% shareholding), C Ltd (100% shareholding) and D Ltd (25% shareholding). A plc has a contractual right to appoint two thirds of the board of B Ltd. A plc has used its voting rights to appoint all of the directors of C Ltd. Which companies are subsidiaries of A plc and which are associates?

1.6 Interpretation of consolidated financial statements

One should always be aware of the artificial nature of the group structure. Strictly, the group has no legal identity. It is impossible to enter into a contract with a group. Any relationships will be with one or more of the group's members.

In theory, it would be possible for a group member to collapse without receiving any support from the other group members. In practice a large group would find it almost impossible to permit a subsidiary to fail without compensating the company's creditors because of the adverse publicity which such an action would create. It is also possible to insist on a formal guarantee from the holding company as a condition of granting a loan to a group member.

Any support between group members could be constrained by the fact that some subsidiaries may be located overseas and subject to exchange restrictions or other local regulations which prohibit the remittance of funds back to head office. Alternatively, minority shareholders might be able to block transactions which would be damaging to their particular company even though they were potentially beneficial for the group as a whole.

It is also notable that the accounting techniques associated with consolidated financial statements have recently been one of the most controversial areas for regulators.



Question 11.3

Define the following terms:

- (i) holding company
- (ii) subsidiary company
- (iii) associated undertaking
- (iv) non-controlling interest.



In the past, examination questions on this topic have mainly been quite factual. For example:

“Explain how a holding company would construct a set of consolidated financial statements.” (April 2002)

“Explain the purpose of consolidated financial statements.” (April 2004)

However, some past questions have been more thought-provoking, for example:

“One of the biggest problems arising from the preparation of consolidated financial statements is the identification of subsidiaries and associates. Explain how holding companies identify subsidiaries and associates.” (September 2006)

Multiple-choice questions have sometimes required an interpretation of the definitions of subsidiary and associate companies, and also the calculation of goodwill.

2 Insurance companies

2.1 Introduction

Insurance companies are effectively subject to the same reporting regime as any other type of limited company. As for other companies, a statement of financial position and an income statement must be produced.

Up until this point we have concerned ourselves with the statements of companies where the owner of the entity is clearly defined, and the concept of a profit was relatively intuitive. For example, if a company buys raw materials for \$100 this action in itself would not generate a profit. As such it would not appear in the income statement of a typical company. When those raw materials are processed and become saleable goods and are subsequently sold for \$200, then the profit-making transaction is registered in the income statement.

With an insurance company, nothing is quite so clear-cut. When a policy is sold, the policyholder pays the company a premium and the company incurs sales and administration expenses. However, at this point the company does not know for sure how much profit it will make on the policy as the policy may last for many years, during which time the company will have to pay claims and incur expenses and further premiums may be paid. To allow for these future cashflows, the company will set up an estimated liability in its statement of financial position.

The amount of profit that is shown in the income statement for this first year will depend upon the size of the liability in the balance sheet and could be either negative or positive. A conservative approach may be adopted in estimating the liability to avoid too much profit being made at the start of the policy when there is still a lot of uncertainty. Further profits or losses will come through in future years as cashflows on the policy occur and as the expected value of the liability is updated each year.



The preparation of insurance company accounts is complicated by two special features:

- **The underlying contracts (liabilities) fall due outside the accounting period and are uncertain in size.**
- **Premature transfer of “profit” to shareholders may endanger the financial stability of the company and the ability to meet future liabilities.**

In order to address these features, insurance accounts contain special features.

This section looks at the special features of insurance company accounts. We consider both general insurance (short-term insurance, eg car or buildings insurance) and long-term insurance (eg life insurance).

2.2 ***Estimation of liabilities and timing of profit***

Estimated values for future liabilities have to be assessed, either on a statistical basis or by expert judgement. For long-term (life and pensions) business this is often entrusted to actuaries. Premiums already received in respect of such liabilities need to be identified and held until such time as the liabilities have expired. Additional sums may have to be set aside to meet any anticipated worsening in claims experience or any failure by third parties to honour their commitments towards meeting eventual liabilities.

As a consequence, the provisions made for future liabilities are likely to be conservative in nature, with the result that current profit is under-stated. This conflicts with the basic accounting principle that the accounts should show a “true and fair” view of the position of the company.

This feature is exacerbated by the profit profile of the majority of long-term contracts, whereby business written initially causes a financial strain due to the costs of setting up the contracts and establishing adequate initial reserves. However, the product design will provide for these initial costs to be subsequently recovered, and will also aim to provide an overall return to the company. The question arises as to when (and how) this profit should be reported.

This feature of life insurance business is known as *new business strain*, which refers to the typical pattern of cashflows on a life insurance policy where the expense outgo (on sales and administration) is concentrated in the first one or two years of a policy. This, combined with the fact that liabilities (sometimes referred to as *reserves*) need to be set up on the policy to allow for future claims, usually leads to losses in the first year. However, looking at the entire term of the policy, the premiums should be sufficient to give an overall profit.

A further problem is introduced by the taxation environment whereby particular classes of business may operate under different tax rules (for example general insurance is taxed differently from long-term insurance). This may require that the overall activities of the company are allocated to separate sub-funds for tax purposes.

2.3 Income statement

The income statement for an insurance company is divided into *technical* and *non-technical* accounts.

In general, all items relating to the main insurance business are shown in the technical account. This is divided further into separate accounts for general and long-term business.

The non-technical account then brings together the profits from the two types of business and adds in any profit made on other non-insurance business. To this is added other items such as the investment return on investments other than those supporting the insurance business and tax on profit to give the overall profit to shareholders.

Thus, the income statement will typically appear in three forms – separate revenue (“technical”) accounts for general insurance and long-term insurance businesses and a “non-technical” income statement.

Technical accounts

Each revenue account will take the form:

- Earned premiums (net of reinsurance)**
- + **Investment income**
- + **Realised capital gains**
- **Claims incurred (net of reinsurance) or benefits payable**
- **Net operating expenses incurred (including investment expenses)**
- Balance on revenue account**

where the investment income and realised capital gains are those earned on the investments held to cover the insurance liabilities. There may need to be transfers from the reserves to cover the actual liabilities which are payable.

There may be additional items in the revenue account depending, for example, on company practice, accounting standards, regulatory requirements, or the purpose of the accounts. For general insurance these could include any change in the claims equalisation provision (a type of reserve used to smooth out fluctuations in claims from year to year). For long-term business, they could include transfer to (or from) the “fund for future appropriations” (ie all funds the allocation of which – either to policyholders or shareholders – has not been determined by the end of the financial year). This can be thought of as a special type of reserve applicable to life-insurance business.

For general insurance or long-term business, unrealised gains or losses on investments might be included.

Non-technical account

The balances on the revenue accounts are then transferred to the “non-technical” income statement.

The non-technical account takes the form:

- Balance on general insurance revenue account**
- + **Balance on long-term insurance revenue account**
- + **Investment income**
- + **Realised and unrealised gains (losses) on investments**
- + **Profit (or loss) from other ordinary activities before tax**
- **Tax on profit (or loss) from all activities**
- Profit or loss for the financial year**

where investment income and capital gains are those earned on investments relating to shareholders' funds / free reserves. (See Section 2.4 for further discussion of the investment split.)

“Other ordinary activities” would be other business activities of the company that are not general or long-term insurance business.

2.4 Statement of financial position

Remember the balance sheet equation:

$$\text{Assets} = \text{Liabilities} + \text{Equity}$$

We can see that some of the assets of the business cover the liabilities and some of the assets cover the equity capital (or shareholders' fund or free reserves).

The statement of financial position contains the usual items plus, typically, these additional entries:

Assets

- **Assets held to cover insurance liabilities** – Insurance companies consider the nature of their liabilities and invest in appropriate assets. For example, long-term insurers tend to invest in medium- and long-term assets whereas general insurers tend to have a large proportion of short-term assets.
- **Assets representing free reserves** – The shareholders' fund or free reserves is the value of the share capital and reserves of the business. The greater the free reserves, the more freedom the company has in its investment policy – for example, it could invest in long-term assets that yield a greater return.
- **Reinsurers' share of technical provisions** – If the insurance company is using reinsurance, then some of its claims will be paid by its reinsurer. This means that the liabilities that it holds can be adjusted. This adjustment can be made by showing an asset in the balance sheet.
- **Debtors (trade receivables) arising out of direct insurance operations (policyholders, shareholders)** – *eg* amounts owed to the company by policyholders or sales intermediaries.
- **Debtors (trade receivables) arising out of reinsurance operations** – *ie* amounts owed to the company by reinsurers.
- **Prepayments** (*ie* amounts paid in advance) **and accrued income** (*ie* income that has accrued on a bond since the last coupon payment).

Liabilities

- **Fund for future appropriations** – This is the special type of reserve applicable to life-insurance business mentioned in the section on the income statement.
- **Technical provisions:**
 - **long-term insurance business provisions including the actuarially estimated value of the company's liabilities including bonuses already declared and after deducting the actuarial value of future premiums.**

- **general insurance business provisions, including unexpired risk reserves and outstanding claims reserves.** The unexpired risk reserve is to cover the claims and expenses that are expected to emerge from an unexpired period of cover. The outstanding claims reserve is to cover the claims and expenses for all outstanding claims that have not yet been settled.

Shareholders' Fund

In insurance company accounts, the assets less the liabilities equals the shareholders' funds.

Insurance company accounts will be considered in more detail in the relevant Specialist subjects.

Similar issues arise with respect to pension scheme accounts. Again, the relevant Specialist subjects will address these.



Question 11.4

State where the following items appear in the accounts of an insurance company. Use the following abbreviations: R for revenue account; I for the non-technical income statement; A for assets; L for liabilities; and S for shareholders' fund.

- (i) revaluation reserve
- (ii) investment income earned on investments relating to insurance liabilities
- (iii) balance on general insurance revenue account
- (iv) unexpired risk reserve
- (v) reinsurers' share of technical liabilities.



This work on insurance company accounts was new to Subject CT2 in 2005 and so far (up until April 2013) only one two-mark multiple choice question has been asked on this topic. Be prepared for questions on the special problems of preparing insurance company accounts and on the differences between insurance company accounts and normal company accounts.

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Chapter 11 Summary

Group accounts

Consolidated accounts are needed when one company owns a substantial proportion of another company. These accounts reflect the operations of the whole group owned by the parent or holding company.

Subsidiary company

Company S is said to be a subsidiary company of Company H when Company H has a *controlling interest* in Company S. Company H might hold the majority of the shares of Company S or might control the board of directors of Company S in some other way.

If Company H owns 100% of the shares in Company S, S is referred to as a wholly owned subsidiary. If H owns less than 100% of the shares in S, S is referred to as a partially owned subsidiary. The portion held by other shareholders is termed “the non-controlling interest”.

Consolidated accounts must be produced for the holding company and its subsidiaries.

Associated company

Company A is an associate of Company H if Company H has an investment in the shares of Company A that gives Company H a *significant influence* over the operating and financial policy of Company A. For most purposes, it is adequate to assume that a holding by H of between 20% and 50% of A's shares will make A an associate of H.

The consolidated income statement and statement of financial position of the group include single line entries showing the holding company's share of the associate's income, assets and liabilities.

An investment

Where a holding is too small to be an associate (*ie* less than 20%) it is shown as an investment in Company H's statement of financial position. Consolidated accounts are not produced.

Unconsolidated accounts

Each company within a group of companies will have its own (unconsolidated) set of accounts. Within these accounts, Company H's holding in other companies will simply be shown as an investment in H's statement of financial position. The income received by way of dividends will appear in the income statement.

The subsidiary and associate companies' own accounts will not be affected by the fact that Company H holds a certain proportion of the shares.

Goodwill

Goodwill represents the excess of the value paid for a subsidiary company over the value to the predator company of the share of assets purchased. It can also be called goodwill cost of control. It is shown in the consolidated statement of financial position of the group.

Non-controlling interest

In the consolidated statement of financial position, the value of the subsidiary's share capital and reserves that is owned by minority (non-controlling) shareholders is shown separately in the equity section, after the capital and reserves attributable to equity holders.

Insurance companies

Insurance companies complete their accounts in a manner comparable to other limited companies. However the nature of their liabilities is such that there is often a conflict between prudence and the need to provide a true and fair view of the company's likely profitability.

The income statement is divided into *technical* and *non-technical* accounts. In broad terms, the technical or revenue accounts show the profit made on the main insurance business and is split into a general business account and a long-term business account. The non-technical account adds in other sources of profit to show the profit attributable to shareholders.

The statement of financial position has a similar format to a normal balance sheet, but includes additional items such as the various types of actuarial reserves, and assets and liabilities relating to reinsurance.

Chapter 11 Solutions

Solution 11.1

(i) ***Company A acquires a 100% share of Company B***

B's share capital is worth 160 and the shares have par value 25p, so the number of shares in B is:

$$\frac{160}{0.25} = 640$$

A therefore needs to offer 640 of its own shares, with a value of $640 \times 0.50 = 320$.

The total value of B to A is the value of 100% of its share capital and reserves, ie

$$160 + 80 = 240$$

The goodwill cost of control is the difference between the value of A's shares given to B's shareholders and the value of A's holding in B, ie

$$\text{goodwill cost of control} = 320 - 240 = 80$$

(ii) ***Company A acquires a 75% share of Company B:***

We know that B has 640 shares. A is acquiring 75% of these, ie 480 shares. A needs to offer 480 of its own shares to B's shareholders. The value of these shares is:

$$480 \times 0.50 = 240$$

The value of 75% of B to A is

$$(160 + 80) \times 0.75 = 180$$

Therefore the goodwill cost of control is

$$240 - 180 = 60$$

Solution 11.2

C Ltd is a subsidiary because A Ltd controls a majority of voting rights.

B Ltd is also a subsidiary because A Ltd controls a majority of the board.

D Ltd is an associated company.

Solution 11.3(i) ***Holding company***

A company which holds shares in other companies.

(ii) ***Subsidiary company***

A subsidiary is a company controlled by a holding company. This control may be through holding a majority of voting rights or by being able to appoint or remove directors holding a majority of voting rights at board meetings.

(iii) ***Associated undertaking***

An associated undertaking is one which is not a subsidiary, but which is subject to significant influence by the holding company. There is normally a presumption that significant influence would arise if the holding company owned more than 20% of the associate's voting rights.

(iv) ***Non-controlling interest***

The non-controlling interest is the value of the share capital and reserves provided by the subsidiary's minority shareholders.

Solution 11.4

- (i) S (The shareholders' fund comprises share capital and reserves. Reserves include the revaluation reserve.)
- (ii) R
- (iii) R (the bottom line) and carried forward to I
- (iv) L
- (v) A

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Chapter 12

Interpretation of accounts



Syllabus objectives

- (x) *Interpret the accounts of a company or a group of companies and discuss the limitations of such interpretation.*
1. *Calculate and explain priority percentages and gearing.*
 2. *Calculate and explain interest cover and asset cover for loan capital.*
 3. *Describe the possible effects of interest rate movements on a highly geared company.*
 4. *Calculate and explain price earnings ratio, dividend yield, dividend cover and EBITDA.*
 5. *Explain net earnings per share.*
 6. *Calculate and explain accounting ratios which indicate:*
 - *profitability*
 - *liquidity*
 - *efficiency.*

0 Introduction

In Chapters 9 and 10 you have seen how accounts are compiled and in Chapter 3 you have seen how tax is calculated. Yet you are studying to become an actuary, not a tax accountant. The knowledge you have gained in the previous chapters needs to be applied to areas of more direct actuarial interest. One area where your knowledge of accounts can be used is in the analysis of company accounts. Such analysis is useful for two specific areas in which actuaries are involved:

- the appraisal of companies for investment purposes
- understanding the way in which the financial institutions which employ actuaries present their results.

This chapter introduces many of the tools needed to analyse accounts for these purposes (further analysis is introduced in subjects at the specialist level). This chapter contains definitions of several key accounting ratios with which you are expected to be familiar.

Accounting ratios are a useful way to make comparisons between companies. In particular, by using a *ratio* rather than a single number, it is possible to make comparisons which are not distorted by the size of the companies. Ratios are practical tools used by investment analysts *eg* when deciding which share to purchase. Consequently, there is often no “right” definition of a particular ratio. Indeed, often there is no “right” ratio to look at in a particular case. In this chapter and the next we set out the most important ratios, in the form(s) in which they are most commonly used. If you read other notes/textbooks you should *expect* to find differences, although these should usually be on points of minor detail.

In this chapter, we start (in Sections 1 to 4) by focusing on loan capital and the type of analysis primarily relevant to investors in loan capital. In particular, we look at measures to assess the security of loan capital. We mentioned these briefly in Chapter 4 when we were looking at the characteristics of company debt from the point of view of the investor. This section of the course should help to fill in any gaps of understanding from Chapter 4.

In sections 5 to 9, we turn our attention to measures appropriate to the shareholders.

To illustrate ratio calculations, we will use the accounts set out below for Cover-up Limited, a supplier of specialist equipment and technical advice to governments. From time to time you will need to refer back to the next two pages. It may be useful to mark them so that you can find them easily as you work through the chapter.



The examination is likely to test your *knowledge* of accounting ratios (you will have to know the definitions and how to calculate them), but more importantly, it will test your *understanding* of the ratios and their limitations (you will have to explain what they mean or could mean) and your *ability to evaluate* policies (you will have to offer possible courses of action for the company).

Corporation tax

As mentioned in Chapter 3 (Taxation), for ease of calculation, we will assume a corporation tax rate of 30% in this chapter, unless otherwise stated.

Income statement for Cover-up Ltd for the year 2012

	£000s
Revenue	250,000
Cost of sales:	
Cost of stock used:	
Raw materials purchased	95,000
Decrease in stocks of finished goods and work-in-progress	<u>7,000</u>
	102,000
Depreciation	<u>30,000</u>
	132,000
	<u>(132,000)</u>
Gross profit	118,000
Administrative expenses and other overheads	(85,000)
Operating profit	33,000
Finance income	<u>2,000</u>
Net profit before interest and taxation	35,000
Finance costs	<u>(9,950)</u>
Net profit before taxation	25,050
Tax	<u>(8,267)</u>
Net profit after taxation =	16,783
Profit for the period attributable to equity holders of the company	<u>16,783</u>
<i>EPS for profit attributable to equity holders</i>	<i>10.5p</i>

Notes to the accounts:

1. The company proposes to make a dividend payment of £6,000,000, ie 3.75p per ordinary share, in respect of the year ending 31 December 2012.

Statement of financial position for Cover-up Ltd as at 31 December 2012

	£000
ASSETS	
Non-current assets	
Intangible assets	20,000
Tangible assets	75,000
	95,000
Current assets	
Inventories	42,000
Trade receivables	60,000
Cash	14,000
	116,000
Total assets	<u>211,000</u>
EQUITY AND LIABILITIES	
Called up share capital (160 million shares @ 25p)	40,000
Retained earnings	20,000
Other reserves	10,000
Total equity	<u>70,000</u>
Non-current liabilities	
10% unsecured loan stock 2018	25,000
11% subordinated loan stock 2016	19,000
9¾% mortgage debenture 2017	16,000
9½% Eurosterling 2016	40,000
Total non-current liabilities	<u>100,000</u>
Current liabilities	
Trade payables	32,000
Taxation	9,000
Total current liabilities	<u>41,000</u>
Total liabilities	<u>141,000</u>
Total equity and liabilities	<u>211,000</u>

1 Measuring risk associated with loan capital

In general, if a company has a high level of operating profit in relation to the annual interest due on its loan capital, the loan interest should be secure. The higher the ratio of profits to interest payments, the more scope there is for profits to deteriorate before a company will default on its loan capital interest payments.

We can also consider what happens if the company *does* default on its interest payments. Whether the loan stock holders get any money back depends on whether the available assets of the company are sufficient to meet the claims of the loan capital holders. To assess this, investors in loan capital can look at the ratio of the available assets to the amount of the loan stock. A high ratio gives scope for future reductions in the value of the company's available assets without endangering the asset security for the loan capital. So assets and income are important in this context.

The two ratios used to measure this are called the asset cover and the interest cover.

Loan capital

Shareholders will normally regard loan capital as a mixed blessing. It is a cheap source of finance for the company because it normally carries a relatively low risk for the lender.



Question 12.1

Explain the remark "loan capital normally carries a relatively low risk for the lender".

This means that the shareholders will normally expect to enjoy a higher rate of return from their investment in share capital if the company is partly financed by borrowing. The alternative would be that additional finance would have been raised by the sale of additional shares, thereby diluting the returns enjoyed by the original shareholders.

There is, however, a downside to this. The security enjoyed by the lenders has the effect of increasing the risk attributable to the shareholders. This is partly because the interest has to be paid regardless of whether the company is making profits and partly because the greater the proportion of the company's assets that are financed by debt, the greater the risk that there will be nothing left for the shareholders if the company fails.

There are a number of ratios which can be used to measure the risks borne by the shareholders because of the company's borrowing policy. These should not be confused with the risks which arise because of any volatility in the underlying business itself.

2 **Interest cover and interest priority percentages**

2.1 **Interest cover**



Interest cover on an issue of loan capital is defined to be profit on ordinary activities before interest and taxation divided by the annual interest payments due on that issue of the loan capital and on all prior ranking loan capital.

$$\text{Interest cover} = \frac{\text{profit on ordinary activities before interest and taxation}}{\text{annual interest payments due on that issue of loan stock} + \text{all prior loan stock}}$$

Crudely, it measures the number of times that the company could pay its interest out of profit before tax and interest. The higher this multiple, the less likely that the company will run into difficulty.

Interest cover is sometimes known as income cover. To calculate the interest cover on the different types of loan capital issued by Cover-up Ltd, we need first to split up the “interest payable on long-term debt”. **The interest payable on a particular issue of debt can be calculated from the nominal amount outstanding and the interest rate shown in the financial statements.**

Below we set out the split of interest in order of priority. The mortgage debenture (highest ranking) comes first. The unsecured loan stock and Eurosterling will probably rank equally. The subordinated loan stock will rank lowest.

Calculation of interest cover for Cover-up Ltd

Interest on 9¾% mortgage debenture	1,560	(0.0975 × 16,000)
Interest on 10% unsecured loan stock	2,500	(0.10 × 25,000)
Interest on 9½% Eurosterling	3,800	(0.095 × 40,000)
Interest on 11% subordinated loan stock	<u>2,090</u>	(0.11 × 19,000)
	9,950	

$$\text{Interest cover on mortgage debenture} = \frac{35,000}{1,560} = 22.4\times$$

$$\text{Interest cover on unsecured loan stock} = \frac{35,000}{(1,560 + 2,500 + 3,800)} = 4.5\times$$

$$\text{Interest cover on Eurosterling} = \frac{35,000}{(1,560 + 2,500 + 3,800)} = 4.5\times$$



Question 12.2

Calculate the interest cover for the subordinated loan stock.

It is normally considered risky if the company cannot cover interest at least three or four times. This is, however, a very crude rule of thumb. If, for example, the company has a stable, predictable stream of profits then it could afford to operate with a lower interest cover. In addition, there should normally be a trade-off between lower security and a higher expected return.

The main limitations of interest cover are that it does not consider how volatile profits are, nor does it take account of the length of time for which the loan is outstanding. For example consider the likelihood of default on the following two loan stocks:

1. a 25-year loan stock issued by a company with profits that fluctuate greatly from year to year with an interest cover of 5×.
2. a 5-year loan stock issued by Sainsbury (stable profits) with an interest cover of 2×.

It is likely that the second is much safer than the first, despite the lower interest cover figure.

To take account of this, an investor is likely to modify the 3 \times or 4 \times rule of thumb depending upon the stability of profits and the term of the loan stock being analysed.

It is also sensible to calculate the average interest cover from the last few years' accounts, rather than rely only on the latest set of accounts. This will enable the analyst to make some allowance for the volatility of profits.

Finally note that default by the company on *any* of its loan stock may result in the company winding up. This may be bad news for all of the other loan stock holders (particularly if the company's assets are insufficient to repay all of the loan capital). So it is common practice to calculate interest cover on *all* the company's issues of loan capital, not just the particular issue that an investor is considering purchasing.



Question 12.3

A student accountant comments that “since a company can pay interest on a loan stock even when profit before interest and tax is negative, it is meaningless to calculate interest cover”.

How would you reply to this?

2.2 Interest priority percentages



Interest priority percentages show the slice of profit on ordinary activities before interest and tax which covers the annual interest payments due on each issue of loan capital.

If the interest cover for the loan stock in question is x and the interest cover for the loan stock immediately prior in ranking to the one in question is y , then the interest priority

percentage for the loan stock is $\frac{1}{y}$ to $\frac{1}{x}$.

For each issue of loan capital there will be a lower and upper interest priority percentile. The lower percentile is calculated as the inverse of the cover figure for the previous highest-ranking issue. The upper percentile is calculated as the inverse of the cover figure for the issue of loan stock being considered. This may seem complex, but it will become clear when you work through an example.

This statistic is more relevant to lenders. If the company has, say, given some lenders a fixed charge or a mortgage over specific assets then these loans will be repaid before loans with floating charges. Unsecured loans will be repaid after these. This ranking will be relevant to a lender who has to decide whether the other loans that the company has taken out will affect the risk of a further investment.

Calculation of interest priority percentages for Cover-up Ltd

<i>Issue of loan capital</i>	<i>Interest cover (see above)</i>	<i>Interest priority percentages</i>
Mortgage debenture	22.44×	0% to 4.5%
Unsecured loan stock	4.45×	4.5% to 22.5%
Eurosterling	4.45×	4.5% to 22.5%

Note: 2 decimal places are shown here because interest cover is being used as an intermediate calculation.



Question 12.4

Calculate the interest priority percentages for the subordinated loan stock.

We can interpret the priority percentages in the above example as follows.

Given a figure of £35,000 available to pay the interest on the loan capital:

- the first 4.5% of this amount is needed to meet the interest on the highest ranking loan capital (the mortgage debenture)
- the next 18% (of the £35,000) is needed to pay the interest on the next highest ranking loan capital (the unsecured loan stock and the Eurosterling)
- the next 6% is needed to pay the interest on the lowest ranking loan capital (the subordinated loan stock).

3 Asset cover and asset priority percentages

3.1 Asset cover



Asset cover on an issue of loan capital is usually defined to be:

$$\frac{\text{total assets less current liabilities less intangible assets}}{\text{loan capital plus prior ranking debt}}$$

This amount will usually represent a conservative estimate of the amount of money available to meet the loan stockholders' demands for repayment if the company were to wind up. The assumption is that assets other than intangibles will be converted into cash at their book values, while intangible items are likely to be worthless on winding up. This is, of course, dependent on the nature of the business and its assets. A valuable brand name or patent might well be worth more than all of the company's other assets put together. Current liabilities are assumed to be repaid before the stockholders even though they may rank below the loan capital.

It is standard practice to regard a class of loan which has an asset cover less than two or two and a half times as high risk.

An alternative definition of asset cover which is often used in practice is:

$$\frac{\text{total assets less current liabilities less intangible assets}}{\text{total loan capital}}$$

However, we will be using the first definition in the following examples.

For Cover-up Ltd, total assets less current liabilities less intangible assets equals £150,000 ($211,000 - 41,000 - 20,000$).

The idea is that the assets could be converted into cash at the balance sheet value. However, intangible items (eg goodwill) are likely to be worthless on winding up, so they are excluded. Current liabilities are assumed to be repaid before the stockholders even though they may rank below the loan capital. The reason for this is that companies getting into trouble may find it difficult to get credit from their suppliers and might have very low current liabilities by the time loan stock holders have the company wound up.

Calculation of asset cover figures for Cover-up Ltd

$$\text{Asset cover on mortgage debenture} = \frac{150,000}{16,000} = 9.4\times$$

$$\text{Asset cover on unsecured loan stock} = \frac{150,000}{(16,000 + 25,000 + 40,000)} = 1.9\times$$

$$\text{Asset cover on Eurosterling} = \frac{150,000}{(16,000 + 25,000 + 40,000)} = 1.9\times$$



Question 12.5

Calculate the asset cover for Cover-up's subordinated loan stock.

The main limitation of asset cover is that the current value shown in the statements of financial position for assets might not reflect their realisable market value if the company is wound up. The going concern concept means that there is no particular need to carry assets at their market values.

The minimum of 2× cover gives a safety margin, but an arbitrary one. Also, like interest cover, capital cover does not take account of the term of the loan stock.

An investor is likely to modify the 2× rule of thumb depending upon the likely realisable value of the assets, the term of the loan stock being analysed and the adequacy of the interest cover.

3.2 Asset priority percentages



Asset priority percentages show the slice of total assets less current liabilities less intangible assets which is available to cover the nominal value of each issue of loan capital. For each issue of loan capital there will be a lower and upper percentile. The lower percentile is calculated as the inverse of the cover figure for the previous highest-ranking issue. The upper percentile is calculated as the inverse of the cover figure for the issue of loan stock being considered.



Question 12.6

Calculate the asset priority percentages for Cover-up's subordinated loan stock and interpret the figures.

4 Gearing



Gearing refers to the relative proportions of long-term debt and equity finance in a company. High gearing means that the company has a high level of debt financing.

In the US, gearing is known as “leverage”.

There are many different ways of defining gearing. The common feature is that high gearing means that the company has a high ratio of debt finance (*eg* loan capital) to equity finance (*ie* share capital and reserves).

Gearing can be measured using the statement of financial position figures for debt and equity. Alternatively, the figures from the income statement showing the amount of income being paid to debt and earned by equity each year can be used. Three main ratios under each type are considered below. The definitions will be illustrated using the data for Cover-up Ltd given earlier.

4.1 Asset gearing

Asset gearing is also known as “capital gearing”.



There are two commonly used definitions of asset gearing, either:

$$\frac{\text{borrowings}}{\text{equity}} \quad \text{or} \quad \frac{\text{borrowings}}{\text{borrowings} + \text{equity}}$$

The term “borrowings” will usually include all forms of long-term loan capital (loan stock, Eurobonds, debentures *etc*). Some analysts also include any part of an overdraft or other short-term borrowing which seems to be a permanent feature of the company’s capital structure.

The term “equity” in this definition means the book value of the ordinary shares ie “capital and reserves”. It is normal to deduct the amount of any intangible assets from this quantity. By doing this, we are effectively “writing off” intangible assets against reserves, which is what a lot of firms do anyway. This is sensible since we need to be consistent between companies, only some of which choose to show intangible assets in their statement of financial position. For example, it is much easier to deduct goodwill from the minority of companies that show it, than to add an unknown amount of goodwill to the statement of financial position of those companies that do not show goodwill.

The treatment of preference shares varies. Usually they are included as part of borrowings rather than as part of equity because they carry a fixed rate of dividend and because their holders are repaid before ordinary shareholders in the event of default. This is appropriate if you are analysing gearing from the perspective of ordinary shareholders. **This means that they are more like liabilities when viewed from the perspective of the ordinary shareholders.** The treatment of preference shares within related ratios, such as interest cover, needs to be consistent.

A company whose gearing reached 40% using the second of the above formulae would normally be regarded as high risk.

Where the data is available, and depending on the purpose of the calculation, some analysts like to use market values of loan stock and share capital instead of the statement of financial position values.



Example

Using the first definition given above (*ie* borrowings to equity), asset gearing for Cover-up is calculated as:

$$\frac{25,000 + 19,000 + 16,000 + 40,000}{40,000 + 20,000 + 10,000 - 20,000} = \frac{100,000}{50,000} = 200\%$$

So Cover-up is pretty highly geared by most measures.



Question 12.7

Calculate asset gearing for Cover-up using the second definition of gearing (*ie* debt to total capital).

The reasons for gearing increasing risk can be illustrated with the following example involving two identical companies, one financed by 4 million ordinary shares of £1, the other by 2m shares and £2m of 12% loan stock:

Average year

	<u>Lowgear</u>	<u>Hightgear</u>
Earnings before interest and tax	540,000	540,000
Interest	0	(240,000)
Earnings before tax	540,000	300,000
Tax (30%)	(162,000)	(90,000)
	<u>378,000</u>	<u>210,000</u>
No of shares	4m	2m
Earnings per share (pence)	9.45p	10.5p

(Note: See Section 5.1 for a definition of earnings per share (EPS) if needed.)

Thus, the shareholders benefit from gearing in an average year because the interest rates are relatively low (note that 12% would *not* on its own be considered low, but in comparison to the return enjoyed by the equity shareholders who contributed £4 million capital of $\frac{540,000}{4,000,000} = 13.5\%$, the interest rate *can* be considered low) and because the company enjoys the benefit of tax relief on the loan interest.

We now consider the effect if the profits double:

Good year

	<u>Lowgear</u>	<u>Hightgear</u>
Earnings before interest and tax	1,080,000	1,080,000
Interest	0	(240,000)
Earnings before tax	1,080,000	840,000
Tax (30%)	(324,000)	(252,000)
	<u>756,000</u>	<u>588,000</u>
No of shares	4m	2m
Earnings per share (pence)	18.9p	29.4p
Times average year's EPS	2.0 ×	2.8 ×

In a good year, earnings before interest and tax have doubled. This results in a doubling of the returns to shareholders in the low-gearled company. The high-gearled company has, however, had its shareholders' return increase 2.8 times. This is because of the effects of the fixed payment of interest on the half of the long-term finance which comes from borrowing.

However, if profits halve...

Bad year

	<u>Lowgear</u>	<u>Highgear</u>
Earnings before interest and tax	270,000	270,000
Interest	0	(240,000)
Earnings before tax	270,000	30,000
Tax (30%)	(81,000)	(9,000)
	<u>189,000</u>	<u>21,000</u>
No of shares	4m	2m
Earnings per share (pence)	4.725p	1.05p
Times average year's EPS	0.5 ×	0.1 ×

The gearing effect is even more pronounced when the company has a poor year. In this case, halving the earnings before interest and taxation halved the shareholders' return in the ungeared company. The highly geared company's return was reduced to one tenth that of a normal year.

The gearing ratio is important because increasing the proportion of debt in the company's long-term finance tends to accentuate any volatility in the underlying business. This would tend to increase the total risk for shareholders. In extreme cases, where it might force the company to risk default, it might also create some risk for lenders.



An associated ratio used by financial analysts is the **shareholders' equity ratio**

$$\frac{\text{shareholders' equity} - \text{intangibles}}{\text{total assets} - \text{current liabilities} - \text{intangibles}}$$

This is similar to the second definition of asset gearing, but this ratio looks at the proportion of finance provided by equity, rather than the proportion provided by debt. **The higher this ratio, the stronger the financial position of the organisation. The lower the proportion, the more possibility of the organisation becoming over-dependent on outside providers of capital** (ie sources of finance other than shareholders).

The term *shareholders' equity* in this definition means the statement of financial position value of the capital and reserves. It is normal to deduct the amount of any intangible assets.



Question 12.8

Calculate the shareholders' equity ratio for Cover-up.

4.2 Income gearing



The most commonly used definition of *income gearing* is:

$$\frac{\text{interest on borrowings}}{\text{profit on ordinary activities before interest and tax}}$$

“Interest on borrowings” will usually include all forms of interest payable on debt (ie on loan capital, and on overdrafts).



Question 12.9

Define “a highly-gearred company”.

The treatment of preference shares again varies. When they are included as part of “interest on debt”, they should be grossed up at the company’s rate of corporation tax. So the definition would be:

$$\frac{\text{interest on borrowings} + \frac{\text{preference dividends}}{(1 - \text{corporation tax rate})}}{\text{profit on ordinary activities before interest and tax}}$$

You may wonder why we are grossing up dividends at the corporation tax rate. The answer is that we are assessing how much interest cost the company is bearing. The cost to the company of £x of preference dividends at the before tax level is £x/(1 - t) (assuming a corporation tax rate of t).



Question 12.10

Calculate income gearing for Cover-up Ltd.

5 Ratios involving share information

We will look at the following sets of ratios for shareholders:

- ratios involving share information
- profitability ratios
- liquidity ratios
- efficiency ratios.

Investors in ordinary shares are entitled to receive dividends, which may be very large relative to the issue price of the shares if the company is successful. Equally, the dividends may not be paid at all if the company is unsuccessful. Whilst ordinary shareholders may look at the cover and gearing ratios we have covered so far, income and capital cover will not be their main concern. Instead **they will want to know about a company's profitability, efficiency, earnings for ordinary shareholders and dividends.**

5.1 Earnings per share



In principle, earnings per share is a simple concept:

$$\text{earnings per share} = \frac{\text{earnings on ordinary activities}}{\text{number of issued ordinary shares}}$$

Within this context, earnings on ordinary activities are usually taken to mean earnings for ordinary shareholders.

The earnings per share (EPS) ratio is the amount of profit that has been earned for each ordinary share. It is customary to calculate this ratio by taking the net profit after taxation and, since it is concerned with the ordinary shareholders' position, it excludes any preference dividend – ie the payments in respect of preference dividend are deducted from the earnings before the calculation of the ratio.

Businesses whose shares are publicly traded are required to disclose two versions of earnings per share.

Basic earnings per share

This is calculated by dividing the net profit or loss for the period attributable to ordinary shareholders by the weighted average number of ordinary shares outstanding during the period. The net profit or loss attributable to ordinary shareholders is after taxation, minority interests, extraordinary items and preference dividends.

Diluted earnings per share

The basic EPS takes into account only those equity shares in issue that were outstanding during the period. However, a company may have entered into obligations that could dilute the EPS in the future. In such cases, the basic EPS should be adjusted for the effects of all dilutive potential ordinary shares. The calculation should be made on the assumption that any conversion rights or options had been exercised in full on the first day of the accounting period. (If the date of issue of the securities giving rise to the rights or options is later, a weighted average calculation should be performed.)



Example

A company has earnings on ordinary activities of £75m for the year ending 31 December 2010. During the year, there were 500m ordinary shares in issue. On 1 July 2010, £50m of convertible loan stock was issued, with the option to convert into ordinary shares in 2017. Under the conversion terms, if all of the loan-stock holders take the option to convert, 100m new ordinary shares will be issued.

The earnings per share for 2010 are $\frac{\text{£ } 75,000,000}{500,000,000} = 15p$ per share.

Since we had 500,000,000 shares for 6 months and a potential 600,000,000 for the second six months, the weighted average number of shares allowing for conversion rights is:

$$0.5 \times 500,000,000 + 0.5 \times 600,000,000$$

Therefore, the *diluted* earnings per share are

$$\frac{\text{£ } 75,000,000}{(0.5 \times 500,000,000 + 0.5 \times 600,000,000)} = 13.6p \text{ per share}$$

There are various other ways of calculating EPS. For example, some companies provide additional EPS figures that exclude exceptional items or exclude discontinued operations.

It is difficult to see why the EPS ratio should command so much attention. The number of ordinary shares is, after all, a meaningless number. A company wishing to raise £1m of share capital could, for example, issue 1m £1 shares, 2m 50 pence shares or 10m 10 pence shares.

It is important as it is used as the basis for the calculation of the Price / Earnings (P/E) ratio.



Question 12.11

A company's pre-tax profits have doubled over the past 4 years but EPS have hardly grown at all. Give two reasons why this might have occurred.

5.2 Price earnings ratio



$$\text{price earnings ratio} = \frac{\text{market price of an ordinary share}}{\text{earnings per share}}$$

The earnings per share figure used in this ratio can be historical or prospective.

The Financial Times (FT) publishes price earnings (PE) ratios using the current market share price and the reported net earnings per share from the most recent 12-month period over which the company has reported (where possible, interim accounts are used to update earnings taken from end-year accounts). This is known as an "historical" PE ratio.

Most investment analysts will calculate a PE ratio based on their best estimate of the company's earnings over the *next* 12 months (but still using the current market price). This is known as a "prospective" PE ratio.

Where companies have convertible shares, warrants or share options that may at some point be converted into new shares, it is common to calculate the PE ratio on a "full conversion basis" using diluted earnings per share.

The market price of the share encapsulates everything that the market knows about the company. Relating this to earnings gives an insight into the market's opinion of the company's performance. If the price earnings ratio is high then that would suggest that the company is relatively attractive when considered as a source of revenues. This might imply that the market believes that the company is a relatively low risk investment or that earnings will grow rapidly in the future.

If the P/E ratio of a share is high relative to other, similar companies (taking the above factors into account) it *may* mean that the share is overvalued.

Use of the price earnings ratio

Earnings are the amount of money generated by the company for its shareholders. These are of fundamental importance in determining the income a shareholder receives and also the potential for growth of the company.

The price earnings ratio shows how many times bigger the price of a share is than the earnings that the share produces. There are two main reasons why investors might be prepared to pay a bigger multiple of the earnings for one share than for another share:

1. they expect earnings to grow rapidly, so they are really paying for expected high future earnings
2. the earnings are considered to be less risky.

To use this ratio sensibly, you should consider the likely growth prospects of the company, and thus derive the PE ratio that you think the share *should* have. The share is then expensive (cheap) if the actual PE ratio is higher (lower) than your estimated PE ratio.

One way of estimating the PE ratio that a company should have is to consider what is normal for the industry to which the company in question belongs. A company whose shares have a PE above the norm for the industry may be considered expensive (or to have better than average growth prospects).

In theory (and almost certainly in practice) the P/E ratio will vary as a result of changes in the share price. Unfortunately, many directors behave as if the relationship has been inverted. They seem to assume that the P/E ratio is fixed (or is at least “sticky”) and that the share price can be improved by overstating the EPS.

5.3 Dividend yield



$$\text{(gross) dividend yield} = \frac{\text{gross dividends per share}}{\text{market price of an ordinary share}}$$

Note that we have defined the dividend yield using **gross dividends**, where “gross dividends” means including the 10% tax credit. (This is in contrast to the PE ratio which used *net* earnings.) Since the UK government has removed the right of tax-exempt investors to reclaim the tax credit (other than through a few tax-exempt savings vehicles) the concept of gross dividend yield has become more theoretical than practical.

Use of gross dividend yield

In theory, the value of a share is the discounted present value of the proceeds you obtain from owning it. If you hold it forever, the present value of a share can be taken to be the discounted value of all future dividends. Thus dividends are of key importance to shareholders.

The dividend yield measures the amount of current income (dividends) an investor receives per unit of investment (the share price). A *low* dividend yield may mean that:

1. investors expect dividends to grow rapidly, or
2. the share is overvalued.

Note that the gross dividend yield cannot be interpreted as the expected return on a share because it shows only part of the return for an investor – it ignores any potential capital gain (or loss).

5.4 Dividend cover



$$\text{dividend cover} = \frac{\text{earnings per share}}{\text{dividends per share}}$$

Dividend cover can be calculated on either a net basis or on a gross basis (where “gross dividends” in the UK means including the 10% tax credit).

Note that this way of calculating cover is not directly comparable with the interest cover used for loan capital.

**Question 12.12**

Why is it not entirely consistent?

The inverse of the dividend cover is the payout ratio.



$$\text{payout ratio} = \frac{1}{\text{dividend cover}} = \frac{\text{dividend per share}}{\text{earnings per share}}$$

Use of dividend cover

Dividends are paid out of earnings. In the long run, a company will not be able to maintain dividends if they are not covered by earnings. In contrast, a company with a high level of dividend cover has more scope to increase dividends in the future.

So, for a given dividend yield on a share, a high dividend cover figure suggests better value for money than a share with low dividend cover.

Note that there is a relationship between the PE ratio, the dividend yield and dividend cover.

If we use the definition based on net dividends (ie the dividend actually paid) the relationship is:



$$\frac{\text{market price}}{\text{earnings per share}} \times \frac{\text{net dividend per share}}{\text{market price}} = \frac{\text{net dividend per share}}{\text{earnings per share}}$$

ie PE ratio \times $\text{net dividend yield}$ $=$ payout ratio

5.5 EBITDA

The income statement (as introduced in Chapter 8) shows how operating profit reflects revenue less the cost of sales, distribution costs, administrative expenses and other operating income. The operating profit plus finance income is sometimes referred to as earnings before interest and taxation (EBIT).

The figure does, however, allow for depreciation and amortisation charges. Some analysts feel that these are not well measured in income statements, since the amounts charged are based on subjective analysis and may therefore be seen as discretionary. They prefer to focus on earnings before interest, taxation, depreciation and amortisation (EBITDA). This is often referred to as “cashflow from operations”.

(The evaluation of depreciation charges was covered in Chapter 9. Amortisation is a similar exercise in respect of intangible assets such as goodwill, advertising and research and development, R&D.)

EBITDA can be used to calculate an alternative version of earnings per share. This can then be used to compare different companies or to look at trends over time for a particular company if tax, depreciation or amortisation might otherwise distort the comparison.



Question 12.13

Copies of the income statement and the statement of financial position for Cover-up Ltd are provided on pages 4 and 5.

Calculate the following ratios for Cover-up Ltd, given that its current share price is 200p.

- (i) EPS
- (ii) EBITDA per share
- (iii) PE ratio (using net earnings)
- (iv) gross dividend yield
- (v) dividend cover on a net basis.

Assume that the dividend proposed is approved and paid.



Question 12.14

A UK company made £5m pre-tax profit last year. It paid a dividend for the year of £0.02 per share. It has 100m shares in issue currently priced at £1.

Assuming corporation tax is charged at 30%, calculate:

- (i) earnings per share
- (ii) dividend cover
- (iii) gross dividend yield
- (iv) PE ratio.

5.6 Net asset value per share



The formula for net asset value per share is:

$$\frac{\text{ordinary shareholders' equity} - \text{intangible assets}}{\text{number of issued ordinary shares}}$$

Comments on definition

“Ordinary shareholders’ equity” means called up share capital, other reserves including share premium account and revaluation reserve and retained earnings.

In other words, “ordinary shareholders’ funds” means all of capital and reserves, excluding preference capital and minority interests.

If a company has convertible preference shares or convertible loan capital, it is normal to re-work the statement of financial position assuming that conversion occurs immediately (whether or not immediate conversion is in fact possible). Net asset value calculated like this is known as “fully diluted” net asset value.

Intangible assets are excluded because they are treated differently by different firms and also because they may be worth nothing if the company is wound up.

Purpose

This shows the book value of the tangible assets backing each share, net of all liabilities to non-ordinary shareholders. It is approximately what the ordinary shareholders would receive for each share they hold if the company was immediately wound up (assuming the book values are reliable).

The main problem with the ratio is that the book values in historical cost accounts do not necessarily reflect the true value of the assets. For a highly geared company, the net asset value is the small difference between two big numbers, tangible assets and liabilities. So problems of inaccurate valuation of assets become particularly acute.

Often, net asset value will be compared to the share price. If the net asset value is much greater than the share price, then the shares may be undervalued. Net asset value per share is particularly useful when looking at property companies and investment trusts where the share price should be closely related to the net asset value (because the value of such a company is generally just the value of the underlying assets). Indeed, the *FT* shows net asset value for investment trusts, but not for other companies.

Net asset value is also used in take-overs. Part of what you buy when you take over a company is the target company's assets. So the net asset value gives a guide as to what should be paid (or possibly the *minimum* fair value). If a company's share price is *below* the net asset value, it may be worthwhile taking over the company simply to acquire its assets cheaply.

If a company is about to be liquidated, the share price *might* be closely related to the net asset value. However, the realisable value of the assets for a company in liquidation will often be a long way below the value placed on them in the statement of financial position. Remember from Chapter 7 that accounts are compiled, and assets are valued, on the assumption that the company will be a going-concern.

For many companies the share price is a lot bigger than the net asset value. This may show that the share price is more dependent upon the company's ability to generate profits (*eg* due to a good image with its customers and/or good management) than the value of the assets. For many companies, it is the discounted value of future dividends that determines the share price, not the net asset value. A good example might be an advertising agency (or any other "people" based industry) where the value of the firm's tangible assets may be tiny. However, a low asset value relative to the share price *may* suggest that the share price is too high.

Variations

Most analysts can partially overcome the problem of historical cost values. They do this by replacing the balance sheet value of land with the market value (remember that this needs to be disclosed in the directors' report if it is not shown in the statement of financial position). The move away from historical cost towards fair value accounting is reducing the extent to which these kinds of adjustments by users of the accounts are necessary.

Some analysts, particularly in the US, always divide net asset value per share by the company's share price, to make the comparison between book value and market value explicit. If this ratio is less than 1, it means the market value exceeds the book value.



In the examination, you might be asked to discuss which ratio or ratios would be most appropriate for a particular purpose. For example:

“A company could be valued by taking the company’s latest profit figure and multiplying it by the price/earnings ratio of a quoted company in a similar line of business or it could be valued at the net asset value according to the statement of financial position. Explain the relevance of each of these methods.” (April 2005, adapted)

6 ***Introduction to other accounting ratios***

There are four main groups of ratios:

1. **Those which measure profitability**
2. **Those which measure liquidity**
3. **Those which measure business efficiency**
4. **Those which relate to the business' financial structure (as discussed above).**

We have already discussed the ratios which relate to financial structure (gearing, etc) earlier in this chapter.

In the following sections we look at ratios from the first three groups in the list above. These will help to indicate how successful the company is in various parts of its operations. The ratios we look at are:

- Profitability
 - return on capital employed
 - profit margin
 - asset utilisation ratio
- Liquidity
 - current ratio
 - quick ratio (also called acid test or liquidity ratio)
- Efficiency
 - stock (inventory) turnover ratio
 - debtors turnover ratio
 - creditors turnover ratio.

Unfortunately, for many ratios, there is no agreed definition and many variations are used. The approach given in these notes is:

1. to give *a* definition of the ratio (this will usually be the definition most widely used in past exams)
2. to explain the *purpose* of the ratio
3. to *comment* on the terms used in the definition and mention any problems with calculating it
4. to mention the more common *variations* of the definition (where appropriate).



We give more detail in this section than the syllabus strictly requires. The reason for this is that for you to be able to:

- “calculate” the ratio (for different firms, using different accounting terminology),

and

- “explain” what the ratio means,

you need to “understand” what the ratio means. So, bearing in mind the syllabus objectives, read the following notes to develop an understanding of the ratios. *Do not* try to remember all the detail given in these notes.

7 Profitability ratios

The profitability ratios are used to check that the company is generating an acceptable return for its owners. A number of benchmarks can be used: previous years' figures, ratios calculated for similar businesses, industry averages, etc. Management should consider the reasons for any ratios which are poorer than expected to see whether they imply that performance could be improved.

7.1 Return on capital employed

Definition

Return on capital employed is the most important profitability ratio – indeed it is often referred to as the “primary ratio” or “return on investment”. It measures the relationship between the amount invested in the business and the returns generated for those investors.

The calculation of return on capital employed is complicated by the fact that capital employed can be measured in a number of different ways. It is vitally important that the figure for “return” is calculated in a consistent manner with that for “capital employed”.



The two main formulae for return on capital employed are:

$$\frac{\text{net profit before tax and interest}}{\text{share capital} + \text{reserves} + \text{long-term debt}} \times 100$$

and

$$\frac{\text{net profit before tax}}{\text{share capital} + \text{reserves}} \times 100$$

The first formula defines capital employed in terms of the total amount invested in the company, both by shareholders and lenders. In order to be consistent, the figure for return must show the total amount generated on behalf of these investors. That is why interest has been added back.



The important thing is consistency between denominator and numerator. The two main rules to obey are:

- (i) if, and only if, an asset is included in the denominator, should the income it gives rise to be included in the numerator.
- (ii) if a liability is deducted from the denominator the income paid to it should be deducted from the numerator.

Comments on definition

This ratio is normally expressed as a percentage.

The term “before interest” means before interest payable but *after* interest receivable.

Note that the denominator (often called “capital employed”) is virtually the same figure as is used when calculating asset cover. The definition above uses “share capital plus reserves plus long-term debt” which equals “total assets less current liabilities”. Ignoring the intangibles, the two definitions are the same.

The ratio is dependent upon the value placed on the assets. Note that assets revalued upwards might lead to a higher denominator *and* a lower numerator, since the depreciation charge would probably increase in future years.

The denominator would normally be taken as the latest available figure, although arguably taking the start year figure is sensible because the resulting figure could then be considered as a true effective rate of return.

Purpose

The ratio can be used to indicate how efficiently managers of different firms are using the funds at their disposal. It is therefore useful when comparing companies for investment. The ratio can be compared with the cost of borrowing.

A decrease in the ratio would be cause for concern and further investigation eg have profit margins fallen, have sales fallen or has capital increased without any increase in profits? Return on capital employed is likely to decrease during recessions, and increase during booms.

Managers of companies often use return on capital employed (ROCE). For example:

- The ratio can be compared with the cost of borrowing. If the return on capital employed is likely to be stable, then further borrowing will be a good (bad) idea if the rate of interest payable on new borrowing is lower (higher) than the return on capital employed.
- Return on capital employed can be calculated for parts of a business. If a particular branch activity produces a very low (high) return on capital employed, then funds should be diverted away from (towards) that activity.

Variations

Just as with asset cover, a valid variation on the definition of capital employed would be to include any long-standing overdraft.

If an overdraft is not included in the denominator, any interest payable on the overdraft should ideally be deducted from the numerator. Where an overdraft is included in the denominator, any interest payable on the overdraft should appear in the numerator. However, the information needed to identify interest paid on an overdraft as opposed to other interest payments may not always be available.

Other common variations include:

- not deducting current liabilities (*ie* using “total assets” or “total equity plus liabilities”)
- using the average capital employed figure from the start and end-year balance sheets
- using the market value of the company’s capital (share and loan capital) as the denominator
- deducting intangibles from the denominator.



The ROCE can be broken down into two “secondary” ratios:

(i) **asset utilisation ratio**

$$\frac{\text{revenue (turnover)}}{\text{share capital} + \text{reserves} + \text{long-term debt}}$$

reflecting the intensity with which assets are employed and:

(ii) **profit margin (or return on sales ratio)**

$$\frac{\text{net profit before tax and interest}}{\text{revenue (turnover)}}$$

This is an attempt to look at the profits made per unit of sales. It is normal to multiply the answer by 100 to express it as a percentage.

You can see that ROCE is the product of these two ratios as follows:

$$\begin{aligned} \text{ROCE} &= \frac{\text{net profit before tax and interest}}{\text{share capital} + \text{reserves} + \text{long - term debt}} \\ &= \frac{\text{revenue}}{\text{share capital} + \text{reserves} + \text{long - term debt}} \times \frac{\text{net profit before tax and interest}}{\text{revenue}} \\ &= \text{asset utilisation ratio} \times \text{net profit margin} \end{aligned}$$

This shows that a fall in the ROCE can result from two main sources: a fall in the profit per unit of sales (measured by the profit margin) or a fall in the sales generated by the assets. Once management has identified the general cause, more ratios can be examined, such as administration costs per unit of sales, or sales generated by the fixed assets. Having identified the cause, management can suggest a number of policies, eg pricing policy, advertising, cost control.

7.2 Profit margin

Variations

We have seen the definition of the net profit margin above. It is also possible to calculate other sorts of profit margin, *eg* the gross profit margin or the operating profit margin. **Operating profit is sometimes called trading profit.** Remember that operating profit does *not* include interest receivable. This means that the operating profit margin is of limited use for most financial companies.

Some analysts look at operating profit *before* depreciation has been deducted.

Purpose

Profit margins are useful when analysing the profit made per unit of sale. The difference between the gross profit margin and the operating profit margin is accounted for by expenses as a percentage of revenue.

Low margins relative to other firms in the industry may indicate a wide range of things, for example:

- **a more down market product range**
- **a “low margin high volume” marketing strategy**
- **an attempt to increase market share**
- **poor management/excessive costs**
- temporarily low profits and/or high costs (*eg* as a new product is launched)
- subnormal profits are being made, so that the firm will exit the industry in the long run.

Changes in the profit margin from year to year will also be of interest to analysts. Such changes could indicate changes in any of the items mentioned above.

Clearly, it is impossible to tell whether a high ratio is good or bad without some further information to provide context. A higher ratio could be achieved by increasing selling prices. Unfortunately, that could also have the effect of over-pricing the company’s products relative to its competition.

It is also important to bear in mind that different accounting policies can lead to different profitability ratios. For example in the IT software industry, a great deal depends on the company’s policy of writing off unsuccessful or out-of-date software development costs. One company can seem very much more profitable than another simply because the latter is prudently writing off development costs on software it believes to be out of date.

Likewise, different industries exhibit vastly different profit margins. In the retailing industry, turnover can be high and profit margins will often be narrow. However in the drug industry, the margin on a successful patented drug is much higher.

Many analysts use the profit margin and an estimate of future sales to derive a profits forecast:

$$\text{operating profit margin} \times \text{estimated revenue} = \text{estimated operating profit}$$

7.3 Asset utilisation ratio

As we have seen in Section 7.1, this is defined as:

$$\frac{\text{revenue}}{\text{share capital} + \text{reserves} + \text{long-term debt}}$$

Purpose

This measures the revenue that has been generated by the company's assets. If this has fallen, the company should investigate the reasons. Perhaps the company has increased its assets but has not used them efficiently; perhaps the company has encountered production problems; or perhaps the problem lies in marketing – perhaps revenue has fallen because of a rise in price, a fall in advertising, increased competition or a general economic recession.

This ratio should be investigated alongside the net profit margin. A company might adopt a “pile 'em high and sell 'em cheap” strategy which would give the company a high asset utilisation ratio but a low net profit margin.

8 Liquidity ratios

While it is important for a business to be profitable, profit is not sufficient on its own to guarantee survival. There must be sufficient liquid assets available to ensure that short-term commitments can be met. Otherwise the company could be forced into liquidation.

8.1 Current ratio



$$\text{current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$

Purpose

This ratio is used to assess whether the company will be able to pay its bills over the next few months. It provides a comparison of an estimate of the amount of money due to be received in the short term with an estimate of the amount of money to be paid.

Liquidity is important. Many potentially profitable firms have been wound up because they have had insufficient cash to meet their short-term liabilities. Many more companies have had to go to their shareholders to raise extra cash when liquidity has become a problem.

Normally, a low ratio might indicate that a company may have problems paying its creditors. An excessively high ratio may indicate that the management has too much money tied up in unproductive short-term assets such as excessive stocks or idle cash balances. “Too high” will vary according to the nature of the industry, eg whether large stocks are needed or what the normal credit terms are for doing business with suppliers and customers in that industry.

It is difficult to know exactly what a low or high figure is for a particular company. Different industries can have very different “normal” levels. In general, a ratio of 2:1 is considered to be optimal. This could, however, be excessive for businesses which have rapid turnover of stock and steady cash inflow (a supermarket being the classic example). By the same token, a ratio of 2:1 might be inadequate for a business which has irregular cash inflows. Because of this, many analysts use the ratio to look at trends over a number of years. A sudden change would be cause for further investigation.

The company’s creditors may also be very interested in using the current ratio to assess a firm’s short-term solvency.

Comments on definition

The term “current liabilities” will usually be taken to mean “creditors falling due within one year”. The figures in the statement of financial position will only include those assets and liabilities which exist at that date.

There is no guarantee that the time span of the current assets is the same as the time span of the current liabilities. So a company with an apparently satisfactory current ratio might still have trouble paying a liability due tomorrow. In particular, inventories are included in the numerator, but it may take some time to complete and sell the finished product, and then await payment.

As with all ratios, the current ratio’s usefulness depends upon the reliability of the values shown in the accounts. In particular, the value placed on inventories will depend upon the accounting methods used. The current ratio may therefore be slightly misleading when used to compare different firms.

The crucial liquidity factor for many companies is the size of any as yet unused overdraft limit that they have agreed with their bankers. However, this is something that only a few companies choose to report. The current ratio is therefore a very crude indicator of a company’s ability to meet its short-term debts.

Consistency is achieved by including items in the denominator which are likely to be paid within the same span as those items in the numerator, usually a year.

Variations

The Companies Acts do not require a company to show the split of “provisions for liabilities and charges” between those due within a year and those due in more than one year. Treatment of this item varies. It would be normal to leave out provisions for liabilities and charges in an exam. However, if the information is available (eg the company chooses to give the split anyway), then such items due to be paid within a year could be included in “current liabilities”.

8.2 Quick ratio



$$\text{quick ratio} = \frac{\text{current assets} - \text{inventories (stocks)}}{\text{current liabilities}}$$

The quick ratio is also known as the acid test, or the liquidity ratio.

Purpose

This is another ratio aimed at looking at short-term liquidity. The quick ratio considers what would happen if all creditor and debtor accounts were settled immediately. It focuses on readily realisable cash. The idea is that only cash and trade receivables (debtors) can be quickly turned into cash, but any of the current liabilities could become payable within a few months.

A quick ratio of much less than one *might* be a sign that the company may struggle to pay its creditors. However some companies are able to survive with a ratio of much less than one – their customers pay in cash, but they agree and continually roll-over, say, 90-day credit terms with their suppliers without any problems. Again, it is often departures from the normal level of the ratio rather than the absolute level of the ratio which will interest analysts.

As with the current ratio, true solvency is often more dependent upon agreements with bankers, than on the ratio.

Variations

Any marketable investments could be included in the numerator. However, these are often ignored in practice (and in exams) since the information to decide on the marketability of an investment may not be available.

9 Efficiency ratios

The efficiency ratios are related to the liquidity ratios. They give an insight into the effectiveness of the company's management of the components of working capital. These ratios tend to be multiplied by 365 and so expressed as a period of time.

9.1 Stock (inventory) turnover period

The stock turnover period is defined as:



$$\text{stock (inventory) turnover period} = \frac{\text{stocks (inventories)}}{\text{cost of sales}} \times 365$$

Purpose

This is an attempt to assess how much stock the company holds in relation to the scale of the company's operations. The ratio attempts to show how long stock is held for on average. If we ignore the difference between the selling price of a good and the cost of producing it, a stock turnover period of, say, 1/12 of 365 days would suggest that the average item of stock is held for one month.

A stock turnover period that is less rapid (*i.e.* longer) than other companies in the same industry might indicate an inefficiently large stock holding. An increasing ratio might indicate that sales were slowing down resulting in stockpiling of unsold goods.

Note that **this ratio will vary enormously between businesses.** (Think of the likely differences in the stock turnover ratios of a ship builder and a fresh fish retailer!)

Note that stock turnover cannot be used when considering a financial institution such as a bank. The term "stocks" in this context is meaningless, as is the term "turnover".

Comments on definition

Stocks (inventories) include finished goods, work-in-progress and raw materials.

One difficulty with the ratio is that the figure for stocks may be subject to seasonal variation. So using end-year statement of financial position values is potentially misleading. There is very little that an analyst can do about this. **Also, the value placed on stocks will depend upon the accounting method used.**

The figure for inventories comes from the statement of financial position, and the revenue figure from the income statement. Some analysts will use the latest available figure for inventories, others will use an average of the start and end-year figures.



Question 12.15

Why is it a good idea to use an average of the start and end-year statement of financial position figures for inventories when calculating the stock turnover period?



Question 12.16

What does the inverse of the stock turnover period (multiplied by 365) tell you?

A variation on the definition of stock turnover period is to use sales revenue as the denominator, *ie*:

$$\text{stock (inventory) turnover period} = \frac{\text{stocks (inventories)}}{\text{sales revenue (turnover)}} \times 365$$

9.2 Debtors turnover period



$$\text{debtors turnover period} = \frac{\text{debtors (trade receivables)}}{\text{credit sales}} \times 365$$

Purpose

This is a measure of the average length of time taken for debtors (trade receivables) to settle their balance:

Again, it is desirable for this period to be as short as possible. It will be better for the company's cashflow if debtors pay as quickly as possible. It can, however, be difficult to press for speedier payment. Doing so could damage the company's relationship with its customers.

Comments on definition

This ratio indicates the average number of days credit that is extended to customers paying by credit. Note that “credit sales” refers only to that part of the total sales of the company which were transacted on credit, excluding the sales for cash.

If the company sells goods for cash and for credit then it is important to divide the debtors figure by credit sales only.

It is not always possible to calculate this ratio because the split between sales for credit and sales for cash is not often published. In some cases it will be realistic to assume that all sales are negotiated with some form of credit.

In this case the ratio can be simplified to

$$\text{debtors turnover period} = \frac{\text{trade receivables (debtors)}}{\text{sales}} \times 365$$

If sales cannot be broken down (into cash and credit sales) **then the ratio will be distorted.**

However if the proportion of cash versus credit sales remains constant from year to year, the figures for different years can be compared, even if there is a theoretical distortion.

9.3 Creditors turnover period

A similar ratio can be used to assess creditors:



$$\text{creditors turnover period} = \frac{\text{creditors (trade payables)}}{\text{account purchases}} \times 365$$

Purpose

This ratio indicates the average number of days credit that a company has from its suppliers. A high ratio indicates that the company is taking a long time to pay its bills. This may be because it has been able to obtain a long credit period from its suppliers, which will be of benefit to its cashflow.

Comments on definition

“Account purchases” are purchases of supplies on credit.

It is not always possible to calculate this ratio, as account purchases may not be available from published information. In some cases it will be reasonable to assume that all purchases involve some form of credit and so use total purchases instead. (Recall from Chapter 8 that total purchases can be calculated as the sum of inventory used and the increase in stock over the year.)



Question 12.17

- (i) Calculate the following for Cover-up Ltd:
 - (a) net asset value per share
 - (b) current ratio
 - (c) quick ratio
 - (d) stock turnover period
 - (e) profit margin
 - (f) return on capital employed
 - (g) debtors turnover ratio (assume 80% of the sales are for credit)
 - (h) creditors turnover ratio (assume all purchases are for credit).
- (ii) Interpret each of the figures you have calculated for each ratio. You can exclude (a).



A long (20-mark) examination question might provide you with accounting information for two companies or for one company for two years. You might be asked to evaluate the performance of the company (or companies) with the help of ratio analysis. Remember to *comment* on the ratios as well as *calculate* them!



Chapter 12 Summary

Interest cover on an issue of loan capital is defined to be the profit on ordinary activities before interest and taxation divided by the annual interest payments due on that issue of the loan capital *and* on all prior ranking loan capital.

Interest priority percentages show the slice of profit on ordinary activities before interest and tax which covers the annual interest payments due on each issue of loan capital.

Asset cover on an issue of loan capital is defined to be total assets less current liabilities less intangible assets all divided by the loan capital plus prior ranking debt.

Asset priority percentages show the slice of total assets less current liabilities less intangible assets which is available to cover the nominal value of each issue of loan capital.

Gearing refers to the relative proportions of long-term debt and equity finance in a company. High gearing means that the company has a high level of debt financing.

There are two commonly used definitions of *asset gearing*, either:

$$\frac{\text{borrowings}}{\text{equity}} \quad \text{or} \quad \frac{\text{borrowings}}{\text{borrowings} + \text{equity}}$$

An associated ratio is the *shareholders' equity ratio*:

$$\frac{\text{shareholders' equity} - \text{intangibles}}{\text{total assets} - \text{current liabilities} - \text{intangibles}}$$

The most commonly used definition of *income gearing* is:

$$\frac{\text{interest on borrowings}}{\text{profit on ordinary activities before interest and tax}}$$

Ratios involving share information

$$\text{earnings per share} = \frac{\text{earnings on ordinary activities}}{\text{number of issued ordinary shares}}$$

$$\text{price earnings ratio} = \frac{\text{market price of an ordinary share}}{\text{earnings per share}}$$

$$(\text{gross}) \text{ dividend yield} = \frac{\text{gross dividends per share}}{\text{market price of an ordinary share}}$$

$$\text{dividend cover} = \frac{\text{earnings per share}}{\text{dividends per share}}$$

$$\text{net asset value per share} = \frac{\text{ordinary shareholders' equity} - \text{intangible assets}}{\text{number of issued ordinary shares}}$$

Profitability ratios

$$\text{return on capital employed} = \frac{\text{net profit before tax and interest}}{\text{share capital} + \text{reserves} + \text{long-term debt}}$$

$$\text{profit margin} = \frac{\text{net profit before tax and interest}}{\text{revenue (turnover)}}$$

$$\text{asset utilisation ratio} = \frac{\text{revenue (turnover)}}{\text{share capital} + \text{reserves} + \text{long-term debt}}$$

Liquidity ratios

$$\text{current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$

$$\text{quick ratio} = \frac{\text{current assets} - \text{inventories (stocks)}}{\text{current liabilities}}$$

Efficiency ratios

$$\text{stock (inventory) turnover period} = \frac{\text{stocks (inventories)}}{\text{cost of sales}} \times 365$$

$$\text{or } \frac{\text{stocks (inventories)}}{\text{revenue}} \times 365$$

$$\text{debtors turnover period} = \frac{\text{debtors (trade receivables)}}{\text{credit sales}} \times 365$$

$$\text{creditors turnover period} = \frac{\text{creditors (trade payables)}}{\text{account purchases}} \times 365$$

This page has been left blank so that you can keep the chapter summaries together for revision purposes.

Chapter 12 Solutions

Solution 12.1

To explain the term “low risk” we have to look at all the possible risks to the investor and explain why the risk is low.

Default risk	Loan stock capital ranks higher in the event of a wind-up than equity and preference shares. In this respect it can be described as relatively low risk.
Market risk	Because the income flow is fixed and the security is better than equities, it is generally the case that the market price of debt securities is more stable than that of equity capital. Therefore the market risk is relatively low.
Reinvestment risk	This is the risk that the income from the investment cannot be reinvested to give the same level of yield as the initial investment. The risk of lower yielding reinvestment is arguably the same for loan capital as for equity.

Overall the risk is clearly lower.

Solution 12.2

$$\text{Interest cover} = \frac{35,000}{1,560 + 2,500 + 3,800 + 2,090} = 3.5 \times$$

Solution 12.3

It is true that a company can pay interest on a loan stock even when profit before interest and tax is negative, but only if it has the spare cash (or an overdraft facility) available. If the losses persist, the company might run out of cash and default on the loan.

The long-run success of a company depends upon it making profits. It is therefore sensible to consider the company's profits (and hence interest cover) when assessing whether or not to invest in the company. This is particularly the case since there is no better, simpler alternative of assessing the company's likely future success.

Solution 12.4

The interest cover figure for the unsecured loan stock and Eurosterling issues is $4.45\times$.

The interest cover figure for the subordinated loan stock is $3.52\times$.

The interest priority percentages for the subordinated loan stock are therefore:

$$\frac{1}{4.45} \text{ to } \frac{1}{3.52} \quad ie \quad 22.5\% \text{ to } 28.4\%$$

Solution 12.5

$$\text{Asset cover} = \frac{150,000}{16,000 + 25,000 + 40,000 + 19,000} = 1.5\times$$

Solution 12.6

The asset cover for the unsecured loan stock and Eurosterling issues is $1.85\times$.

The asset cover for the subordinated loan stock is $1.50\times$.

The asset priority percentages for the subordinated loan stock are therefore:

$$\frac{1}{1.85} \text{ to } \frac{1}{1.5} \quad ie \quad 54.0\% \text{ to } 66.7\%$$

This means that, if the company were wound up, the first 54% slice of the company's assets would go towards covering the company's liabilities to the holders of the mortgage debenture, unsecured loan stock and Eurosterling issue. The next 12.7% slice of the company's assets would go to the holders of the subordinated loan stock.

Solution 12.7

$$\text{Asset gearing} = \frac{100,000}{100,000 + 50,000} = 66.7\%$$

Solution 12.8

$$\text{Shareholders' equity ratio} = \frac{70,000 - 20,000}{170,000 - 20,000} = 33.3\%$$

Solution 12.9

A highly geared company is a company that has a high ratio of debt finance to equity capital.

Solution 12.10

$$\text{Income gearing} = \frac{9,950}{35,000} = 28.4\%$$

Solution 12.11

Possible reasons would include acquisitions by the issue of shares and a higher tax charge than in earlier years.

Solution 12.12

Interest cover and asset cover as defined earlier are calculated by dividing the total income (or assets) available by the loan stock + all prior debt. To be consistent, when calculating dividend cover, we would have to calculate the total income available to equity shareholders + all prior ranking capital (debt, preference,...) and divide by the dividends on ordinary shares + all prior capital. This is *not* what is done.

Solution 12.13

$$(i) \quad \text{EPS} = \frac{16,783}{160,000} = 10.49p$$

$$(ii) \quad \text{EBITDA per share} = \frac{35,000 + 30,000}{160,000} = 40.63p$$

$$(iii) \quad \text{PE ratio} = \frac{\text{market price of an ordinary share}}{\text{earnings per share}}$$

$$= \frac{200}{10.49} = 19.1 \times$$

(iv) We first need to find the gross dividend:

$$\text{gross dividend} = \frac{\text{net dividend}}{1 - 0.10} = \frac{6,000}{0.9} = 6,667$$

$$\text{so, gross dividend yield} = \frac{6,667 \times 100}{160,000} \times \frac{1}{200} = 0.021 \text{ or } 2.1\%$$

(v) dividend cover on a net basis:

$$\frac{\text{net earnings}}{\text{net dividends}} = \frac{16,783}{6,000} = 2.8 \times$$

Solution 12.14

(i) Post-tax profits is $5m \times (1 - 0.3) = 3,500,000$. Divided between $100m$ shares, this gives earnings per share of $3.5p$.

$$(ii) \quad \text{Dividend cover} = \frac{3.5}{2} = 1.75 \times$$

$$(iii) \quad \text{Gross dividend yield} = \frac{\left(\frac{2}{0.9} \right)}{100} = 2.22\%$$

(iv) The price earnings ratio is $100/3.5 = 28.6$

Solution 12.15

Stock turnover is one of the accounting ratios that use a combination of figures from the statement of financial position and figures from the income statement. The statement of financial position is a set of figures that are correct on a particular date, whereas the income statement covers a period of time (normally a year). Some analysts therefore use an average figure for this item in the statement of financial position in order to attempt to reconcile this discrepancy in timing between the two sets of accounts.

Solution 12.16

The inverse of the stock turnover period tells the analyst how many times the stock is turned over in an accounting period.

Solution 12.17

(i)(a) net asset value per share:

$$\text{NAV per share (using £000)} = \frac{70,000 - 20,000}{160,000} = 31p$$

$$(i)(b) \text{ current ratio} = \frac{116,000}{41,000} = 2.8$$

$$(i)(c) \text{ quick ratio} = \frac{116,000 - 42,000}{41,000} = 1.8$$

$$(i)(d) \text{ stock turnover period} = \frac{42,000}{132,000} \times 365 = 116 \text{ days}$$

$$(i)(e) \text{ profit margin} = \frac{35,000}{250,000} = 14\%$$

$$(i)(f) \text{ return on capital employed} = \frac{35,000}{170,000} = 20.6\%$$

$$(i)(g) \text{ debtors turnover period} = \frac{60,000}{0.8 \times 250,000} \times 365 = 110 \text{ days}$$

$$(i)(h) \text{ creditors turnover period} = \frac{32,000}{95,000} \times 365 = 123 \text{ days}$$

- (ii)(b) The current ratio gives an estimate of the company's liquidity. It compares money due to be received soon with money due to be paid soon. The figure of 2.8 indicates that Cover-up is able to cover its short-term debt.
- (ii)(c) The quick ratio also gives a measure of liquidity. It uses only the cash or near-cash items in the statement of financial position (as stocks may take a while to sell). A ratio of 1.8 indicates that the company is solvent.
- (ii)(d) The stock turnover period shows how quickly the company is selling its output. The figure indicates that the company is turning over its inventory every 116 days *i.e.* approximately every four months.
- (ii)(e) The profit margin looks at profits per unit of sales. The figure of 14% can be compared with other firms in the same industry.
- (ii)(f) Return on capital employed represents how efficiently the firm's capital is being used to make profits. It can be compared with the opportunity cost of the capital, and also with the figure for other firms in the same industry. A ROCE of 20.6% would seem to cover the cost of capital.
- (ii)(g) The debtors turnover period indicates the number of days credit that is extended to customers who request payment on credit. The ratio of 110 days is quite high, indicating that the company is not operating its credit control function effectively.
- (ii)(h) The creditors turnover period is also quite high at 123 days. Cover-up may have been able to negotiate good credit terms from its suppliers.

Chapter 13

Limitations of accounts



Syllabus objectives

- (x) *Interpret the accounts of a company or a group of companies and discuss the limitations of such interpretation.*
- 7. *Discuss the shortcomings of historical cost accounting.*
- 8. *Discuss the limitations in the interpretation of company accounts.*
- 9. *Discuss the ways that reported figures can be manipulated to create a false impression of a company's financial position.*

0 *Introduction*

In Chapter 12, you have learned how to analyse accounts using a number of measures that may be calculated from company accounts. In this chapter we consider some of the difficulties of using and interpreting accounting information.



Your *understanding* of the limitations of accounts is likely to be tested at the end of a ratio analysis question. Be prepared also for a link with the regulation of accounts, covered in Chapter 7.

1 **The shortcomings of historical cost accounting**

Historical cost accounting tends to overstate profits during times of inflation.

1.1 **Valuation of stock**

Increase in stock values: the time lag between the purchase of an item of stock and its eventual sale means that companies are constantly understating costs of sales. If, for example, an item is purchased for £1 and sold for £1.50 the company will record a profit of £0.50. If, however, the cost of replacing that item of stock has increased to £1.30 then the “real” profit on the transaction is only £0.20. This will tend to overstate profits.

Looked at another way, part of the cost of selling a good is the reduction in the remaining stocks. This reduction will be calculated on a historical cost basis – understating the true cost of replacing the item used up *ie* profits will be overstated.

1.2 **Depreciation**

The depreciation charge will be calculated using the historical cost of the assets. This will tend to overstate profits.

If inflation is positive, straight line depreciation over 10 years on a machine purchased, say, 7 years ago will be less than on an identical machine purchased, say, 2 years ago. The difference will be particularly significant when inflation is high. In both cases the amount charged will be less than 10% of the cost of replacing the asset today.

1.3 **Interest payments**

A company may receive interest on its investments, and pay interest on its loan capital. In times of inflation, part of the interest payment is really compensation for the erosion of the real value of capital. For a company that pays out more interest than it receives, profits will tend to be understated in times of high inflation. For a company that pays out less interest than it receives, profits will tend to be overstated in times of high inflation.

In inflationary times, the real value of a loan decreases, so the borrower pays back less in real terms. Therefore the borrower gains and the lender loses in inflationary times.

1.4 ***Consistency over time***

Profits and asset values might be increasing in money terms. But it would not be immediately obvious how much was due to a real increase in the scale of a company's operations and how much was simply due to inflation. Comparison between years is therefore difficult when using historical cost accounts. Note that this sort of criticism applies to many items where values have to be compared over time.

2 ***Limitations in the interpretation of accounts***

The limitations of accounts will, in part, depend upon the way that the accounts are to be used. Before reading this section, turn back to the start of Chapter 7 where the range of possible uses of published accounts are set out. Using what you know about accounts already, try and identify the major limitations for each possible use.

Almost every number in a set of accounts may be suspect in some respect. We will discuss the main limitations under the following (to an extent overlapping) subheadings:

- Subjectivity – or are the numbers correct?
- Appropriateness – or “correct” for what purpose?
- Comparison between firms.
- Some limitations of ratio analysis.
- Accuracy of figures.

2.1 ***Subjectivity***

Although regulations give a lot of guidance as to what are acceptable accounting principles, firms still use a range of different methods to arrive at the figures to put in their accounts. For example:

Inventory valuation

Inventory can be valued in a number of ways, eg first-in-first-out or weighted average. It seems unlikely that every firm chooses the “best” method of valuing their stock.

Depreciation

Firms have a large choice as to the depreciation method used. Any method will at best approximate the true pattern of the reduction in the value of a firm’s non-current assets.

Revaluation of assets

Some firms revalue their assets when the asset values increase, others do not. However, note that the directors' report does have to disclose the market value of land if this differs significantly from the balance sheet value. **Arguably firms that do not revalue assets are showing the wrong figure.** On the other hand, companies can claim that according to the concept of prudence, they should show assets at a prudently low value, and only take account of any revaluation when the asset is sold. There are many such debates on accounting policies. In recent years, there has been a move towards revaluing assets and liabilities at the end of each accounting period.

Intangible assets

These **are often particularly hard to value.** A great deal of subjectivity is involved in putting a value on a brand name, for example. Many companies don't even try to value intangible assets.

The significance of accounting policies is that they provide limits to the entries in the accounts that are subject to the exercise of judgement and a check against arbitrary, excessive or unjustifiable adjustments where no other yardstick is available. They provide a consistent framework for periodic reporting of the results and the financial position of a business.

2.2 **Appropriateness of the figures used**

The figures presented in the accounts may not be the most appropriate for the purposes of a particular user of the accounts.

Going concern

The value of many assets would be much lower on a wind-up basis than on the on-going basis usually assumed.

Present values

The amounts shown for trade receivables and payables (debtors and creditors) are their face values, not their true present values.

Depreciated cost not economic value

Non-current (fixed) assets are shown at their (depreciated) historical cost. Arguably, the value to a firm of an asset should be the (discounted) value of the future profit stream that the asset is expected to produce.

Accuracy

Giving a true and fair view does not mean that the accounts are absolutely accurate. Many items in the accounts will be estimated.

End-year values

The statement of financial position shows end of year values, but for many purposes it is more meaningful to use average values, for example when looking at the level of stocks that a firm holds.

2.3 ***Differences between firms***

Many users of accounts wish to compare different firms:

Comparability

Many of the problems above (eg stock valuation, depreciation method) are worrying not just because the figures may be wrong, but since different firms use different methods. This makes reliable comparisons between firms very difficult.

Creative accounting

A few firms may deliberately set out to mislead by choosing the accounting policies that will maximise reported profits.

Formats

The choice of accounting formats can mean that different firms can produce sets of accounts which are difficult to compare.

Level of aggregation

Some firms show more detailed splits of items than other firms. For example, one firm might give details of different types of stock, another may just show one aggregate figure for stocks. When making comparisons between firms, the least disaggregated item across all firms will be the lowest level at which the accounts can be analysed.

2.4 Some limitations of ratio analysis

Ratio analysis is a very useful technique for the interpretation of financial statements. It does, however, have its limitations. Some of these are outlined below:

Diverts attention

It diverts attention from the figures and statements themselves. It is important to look at aspects such as the sheer size of the company under consideration. A larger company will have more bargaining power and may be able to enjoy economies of scale. It is also important to look at information in the notes which is not usually reflected in the ratios. If someone is suing the company for damages this will be disclosed in a note stating the amount claimed and possibly giving an indication of the expected outcome. There will not be any mention of the matter in the statement of financial position itself.

Appropriate comparison?

Comparisons can be affected by different accounting policies or by other external factors. If, for example, two haulage companies use different methods for the calculation of depreciation then any ratios based on their financial statements might not be comparable. Similarly, two similar businesses could be affected to different extents by currency movements. A vehicle distributor selling Japanese cars will be exposed to movements in the value of Yen to a much greater extent than a distributor of British cars.

Different industries

There could be peculiarities of the trade which make it difficult to interpret certain ratios. A property company, say, might appear to have a very low return on capital employed. One reason for this is that the value of the properties shown in the statement of financial position will be updated on a regular basis, thus increasing capital employed. This will make it difficult to compare results with a business whose assets have not been revalued.

Creative accounting

The statements could have been deliberately distorted by so called creative accounting. This involves the deliberate abuse of the subjectivity inherent in accounting to select accounting policies or make assumptions which tend to bias the figures in the direction chosen by management.

Creative accounting is discussed further in Section 3.

2.5 Accuracy of the figures

Out of date

The figures reported will necessarily be out of date by the time they come to be published and read.

Window dressing

Some firms have been known to delay transactions so that they occur just after the year end, or to advance other transactions so that they are included in the end-year accounts. This then means that the company's accounts can give an accurate view of the underlying figures, yet still mislead when compared with other firms or over different periods.

Forecasting

Although they are only meant to serve as a historical record, **accounts are widely used as a means of predicting the future. Interpreting accounts for this purpose is full of problems. For example:**

- no indication is given of the firm's plans for the future
- no real idea is given of how sustainable the existing profit figures are.



Question 13.1

List the problems of interpreting company accounts under the following headings:

- subjectivity
- appropriateness of figures used
- comparisons between firms
- accuracy of figures.

3 **Manipulation of reported figures**

Accounting methods can be used to enhance the image of a firm and make it look better than it is. Such practice will make the current reported profitability a poor indicator of future profitability. Note that the manipulation may involve *inflating* current operating income (via an increase in booked sales or a decrease in expenses) or *reducing* current operating income (in order to increase future earnings). The latter may be encouraged by the use of executive incentives linked to future performance.

In theory, one of the reasons why the audit process is in place is to prevent such manipulation occurring. However, given the level of subjectivity permitted in accounts, sometimes manipulation of figures can still take place whilst complying with accounting policies and standards.

Accounting practices that can lead to such misstatements include:

- inappropriate depreciation of tangible assets
- inappropriate amortisation of intangible assets
- inappropriate valuation of stocks and inventories
- inappropriate valuation of future liabilities (including pension provisions)
- unwarranted revaluation of tangible assets
- creating intangible assets of questionable true worth
- omitting contingent liabilities
- “prebooking” of anticipated sales revenues.

Scrutiny of the trends shown by items in the accounts may assist to identify manipulation, as can consideration of the current status of the company (and, therefore, the need to manipulate the reported financial position).

It must be stressed that such manipulation of reported figures may be illegal and certainly would be contrary to the professional standards expected of accountants and auditors.

**Question 13.2**

Whilst waiting in the queue for the cinema one day you overhear the person behind you making the following statement:

“The use of company accounts in investment decision making is fundamentally flawed. In particular, the market value of the company’s assets may bear no relationship to the balance sheet values. Therefore there is little point in using either the accounts or the ratios derived from them.”

Comment briefly on this statement.



A question on the limitations of accounts might be asked at the end of a ratio analysis question. For example:

“Describe the limitations of your analysis in (i), explaining why the directors should seek additional information before making a final decision.” (April 2001)

Here, you would probably discuss the subjectivity in the accounts, the difficulties of making comparisons between companies, and the important matters that are not revealed in the accounts.

Be prepared also to link this material with that in Chapter 7. For example:

“Explain whether it would be possible to restate profit by artificially depressing the depreciation charge.” (September 2002)

“The directors of a limited company receive an annual bonus that is linked to reported profit. Explain how unscrupulous directors could go about overstating the reported profit without risking the legal and other penalties that would be imposed if they falsified the financial statements.” (April 2010)

In this sort of question, you would probably discuss the potential for producing misleading accounts, along with the regulatory, legal and ethical issues that would serve to safeguard the accounts.

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Chapter 13 Summary

There are a number of limitations to the use and interpretation of accounts. These include:

- the *subjectivity* inherent in financial statements (and the possibility of *creative accounting*)
- the concern about the *accuracy* of accounting information
- the concern about the *appropriateness* of accounting information
- the problems of using accounting information to make *comparisons* between companies
- the problems of using *ratio analysis* to judge performance
- the concern about what's *missing* from the financial statements.

The *historical cost accounting* convention causes additional problems with the interpretation of companies' results in times of high inflation.

Readers of accounts should be alert to the possibility that the accounts have been deliberately *manipulated* to give a particular impression.

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Chapter 13 Solutions

Solution 13.1

Problems of interpreting company accounts

Subjectivity

- inventories can be valued in a number of ways
- long-term contracts can be dealt with in different ways
- there is a wide choice of methods of calculating depreciation
- some firms revalue their non-current assets periodically; others do not
- intangible assets may or may not be shown in a company's accounts; their true value is difficult to determine.

Appropriateness of the figures

- should assets be valued on a going-concern or a wind-up basis?
- should assets be shown at historical cost or at their long-term economic value to the company?
- some items in the accounts will be estimated
- the balance sheet shows end-year values, but average values may be more appropriate for some purposes.

Comparisons between firms

- it is difficult to compare similar items between firms when they have used different calculation methods
- creative accounting may be a problem with some firms
- the choice of accounting formats may make it difficult to compare the accounts of different companies
- different companies will show different levels of detail.

Accuracy of figures

- the figures in the accounts will be out of date by the time they are published
- firms can delay or advance transactions to manipulate the accounts for a particular year
- accounts are often used for forecasting even though they are meant purely as a historical record.

Solution 13.2

The nugget of truth in the statement is that company accounts are prepared on a historical cost basis, and so take no account of inflation. Companies may from time to time revalue their assets, and show the new values in their balance sheets, but they are not usually obliged to do so. Similarly, companies' depreciation charges will be based on the historical cost of their assets. These charges are likely to underestimate the true cost of using non-current assets.

However, our cinemagoer goes a little too far (as speakers in this kind of question tend to!).

Company accounts contain (at least) the following items:

- statement of financial position
- statement of comprehensive income
- cashflow statement
- directors' report
- auditors' report.

Each of these items can be useful in generating a picture of the company.

Accounting ratios are useful for making comparisons:

- (a) of the company over time
- (b) with other companies.

Because of the variations in accounts from one company to another, ratios cannot be expected to give definitive answers. They do, however, give valuable indicators as to aspects which may need further investigation.

Finally, what better source of quantitative information is there, however imperfect the accounts may be?

Chapter 14

Financial institutions



Syllabus objectives

- (viii) *Describe the major types of financial institution operating in the financial markets.*
1. *Describe the main features of the following institutions and analyse their influence on the financial markets:*
 - *central banks*
 - *investment exchanges*
 - *investment banks.*
 2. *Describe the role played in financial markets by each of the following institutions:*
 - *clearing banks*
 - *building societies*
 - *investment trusts*
 - *unit trusts*
 - *investment management companies*
 - *self-administered pension funds*
 - *life insurance companies*
 - *general insurance companies.*

0 Introduction

In Parts 1, 2 and 3, you have come across various types of financial institutions and the securities in which they trade. In this final chapter of Part 3 we take a more rigorous look at the different types of financial institutions operating in the financial markets. This chapter covers:

- **The main features of the following institutions and analyses their influence on the financial markets:**
 - **central banks**
 - **investment exchanges**
 - **investment banks.**
- **The role played in financial markets by each of the following institutions:**
 - **clearing banks**
 - **building societies**
 - **investment trusts**
 - **unit trusts**
 - **investment management companies**
 - **self-administered pension funds**
 - **life insurance companies**
 - **general insurance companies.**

Section 1 covers government agencies including the Bank of England and the Debt Management Office.

Section 2 covers the Stock Exchange, Section 3 covers the derivatives exchanges and Section 4 covers other institutions.



There is a lot to learn in this chapter. Your *knowledge* of financial institutions is likely to be tested through multiple choice or short questions. This material was re-introduced into the CT2 course for the 2010 examinations. It was frequently examined in old Subject 108.

1 **Government agencies**

1.1 **The Bank of England**

The Bank of England was established in 1694 when the UK issued the first tranches of the national debt so that England could fund its military activities in France. The Bank was nationalised in 1946. In this section we set out the main functions of the Bank of England. The detailed role that it plays in the various investment markets is then considered in the following section.

The Bank is run by a court of directors, most of whom are non-executive (they do not work full time for the Bank).

Functions of the Bank of England

The Bank of England is the United Kingdom's central bank. Traditionally, it carries out government policy, issues bank notes and acts as a banker to the commercial banks.

The Bank of England is an agent of the UK government. It does not, in general, decide on its own policy (this is the job of the Treasury), although it will give advice on policy.

Since 1997, responsibility for setting official interest rates has rested with the Bank of England. The Bank's Monetary Policy Committee judges what interest rate is necessary to meet the inflation target set by the UK government, and implements this decision through its interaction with investment markets and control of the money supply.

Its other main functions are:

- acting as the “lender of last resort”
- acting as the bankers' bank (this allows easy daily settlement of inter-bank debt eg money that Barclays owes to Lloyds)
- providing settlement systems
- maintaining the UK's foreign reserves, and using them to influence exchange rates.

The Bank of England used to act as a normal commercial bank, but nowadays concentrates on its role as central banker. It still runs a few accounts for its own past and present employees.

Most of the regulatory functions previously carried out by the Bank were transferred to the Financial Services Authority (FSA), while the government's debt and cash management activities are the responsibility of the Debt Management Office (DMO), a part of the Treasury.

In April 2013 the government abolished the FSA and established three new regulatory bodies:

1. **Financial Policy Committee (FPC), responsible for macro-prudential regulation**

The FPC is responsible for considering issues affecting economic and financial stability across the financial system, rather than directly regulating individual firms.

2. **Prudential Regulation Authority (PRA), responsible for micro-prudential regulation of systemically important firms, including banks, insurers and certain investment firms**

Prudential regulation is mainly concerned with the solvency and liquidity of firms, to ensure that they are able to meet their obligations to their customers.

3. **Financial Conduct Authority (FCA), responsible for the conduct of business regulation of all firms, the prudential regulation of all firms not authorised by the PRA and some market conduct regulatory functions.**

Conduct of business regulation is mainly concerned with how firms deal with their customers, *eg* selling products, managing their investments, providing information.

The FPC and PRA are part of the Bank of England. The FCA is a separate institution.

1.2 Influence of the Bank on investment markets

The Bank of England and the money markets

The term "money markets" covers bank deposits and short-term securities such as Treasury bills and bills of exchange. The Bank of England intervenes directly in the market for short-term securities with the primary aim of influencing interest rates. It also seeks to encourage the development of private sector markets in which banks (and other market participants) can manage their liquidity, and to foster efficiency and competition in these markets.

**Question 14.1**

What do you think the term “interbank rate” mean, and how will it normally relate to the Treasury Bill rate?

Controlling short-term interest rates

Short-term interest rates are a powerful tool for controlling the level of activity in the economy. The Bank of England uses its purchases and sales of bills to influence short-term interest rates.

For example, if the Bank of England wants base rates to be 4%, it will be prepared to buy and sell bills at a price that is equivalent to an interest rate of about 4%. Other banks are then likely to set their own interest rates at 4%. Although there is no obligation on the banks to set their own base rates at the official level, in normal market conditions, they usually do.

A bank’s base rate is the rate of interest that forms the basis for variable interest rate loans. For example, a small business might take out a loan from a high street bank at “3% over base”. If the bank’s base rate fell from 4% to 3.5%, the rate of interest charged on the loan would fall from 7% to 6.5%.

If the official base rate were 4%, but one commercial bank set its rate at 3%, that bank would find that a lot of institutions would want to borrow money from it at 3%. It would quickly run out of cash and need to borrow itself at the market rate of 4%. Not a good idea!

Similarly, if a commercial bank offered a high rate of interest of 5%, say, it would find that other institutions would want to deposit money with it. It would then need to do something with its spare cash, *ie* lend to other banks at 4%. This is also a not a good idea.

So, in practice, the Bank of England does have effective control over short-term interest rates. The Bank of England is not obliged to accept the bids and offers it receives from the commercial banks for cash. If it is not happy with the bids and offers it receives, the Bank can simply step back from the money market and set the rate at which it will act as lender of last resort. In these circumstances the commercial banks have no option but to deal with the Bank of England on its terms. This rarely happened until Northern Rock was forced to do so in 2007 at the outset of the banking crisis.

Providing liquidity

Every day some of a bank's customers withdraw money and write out cheques whilst others deposit money or repay loans. Often most of the money withdrawn from one bank will find its way into another bank. For example, on a particular day, Barclays may have a net inflow of money whilst Lloyds has a net outflow. Under these circumstances Lloyds may have to borrow from Barclays. Alternatively, the banks can use the deposits that they hold with the Bank of England to transfer money from one bank's account to another.

In its money market operations, the Bank of England satisfies the marginal liquidity demand of the banking system as a whole through open market operations conducted transparently in high credit quality market instruments.

The Bank of England achieves **this predominately through transactions conducted under sale and repurchase (repo) agreements at a two week maturity.**

A “repo agreement” is where an asset is actually sold to one party, and a simultaneous agreement made for the other party to buy it back at a fixed price at a fixed date in the future.

By providing the liquidity needed by the banking system for settlement of money market transactions, the Bank acts as the marginal supplier of money to the banking system, enabling effective system-wide liquidity management in normal market conditions.

A lack of liquidity in the banking system as banks stopped lending to each other was a fundamental problem in the banking crisis, resulting in significant and unprecedented market intervention by the Bank of England in 2008/9.

The currency market

The government maintains large amounts of gold and foreign currencies, collectively known as the “foreign reserves”. By selling foreign reserves in return for sterling, the Bank of England can decrease the supply of sterling and so increase its price in terms of other currencies. Similarly, if the government feels that sterling is overvalued, the Bank of England can sell sterling (thus increasing the foreign reserves) to force the exchange rate down.

This method of intervention is becoming less common with central banks. The volume of funds invested on behalf of private investors is so great, and can be moved at such short notice, that central banks can no longer “fight” against the market in the way they used to. On 16 September 1992 (“Black Wednesday”), the Bank of England learned to its cost that hedge fund speculators had so much money at their disposal that the Bank could not reverse sterling’s fall as the currency was being forced out of the European exchange rate mechanism.

Providing information to the investment markets

The Bank of England publishes a great deal of information which will be of interest to investors in the financial markets, and thus indirectly influences the markets.

The Bank compiles and publishes a range of monetary and financial statistics. These include domestic banking statistics, external finance statistics and international banking statistics. This information can be found at <http://www.bankofengland.co.uk>.



Question 14.2

Briefly summarise the Bank of England's role in the money markets.

1.3 The Debt Management Office

New issues of Treasury bills

The Debt Management Office (DMO) is now responsible for issuing Treasury bills which are used to cover the government's short-term funding needs. Treasury bills are issued in a weekly auction.

This used to be one of the roles of the Bank of England.

The gilt-edged market

New issues

When the government has a Public Sector Net Cash Requirement it will instruct the DMO to sell gilts, using various means such as:

- **auctions.** Auctions are the primary method now used for public offerings of conventional gilts. Bids are invited and investors pay what they bid. Alternatively, investors can make an “uncompetitive” bid and pay the average price for the issue.
- **tap stocks.** Tap stocks are sold to gilt-edged market makers (GEMMs, see below). When a new issue is under-subscribed, the DMO will try to sell the stock over a period of time to the GEMMs.
- **syndication.** Syndication, where an issuer appoints a group of banks to manage the sale of bonds, is also used extensively for the sale of gilts. In the case of new gilt issues, the DMO is the issuer and appoints a group of investment banks to manage the sale of the gilts on its behalf.

In 2002/03 the government needed to sell £26bn worth of gilts. In the height of the credit crunch, this peaked at £228bn in 2009/10. The projected figure for 2013/14 is £151bn. By issuing this amount of debt, the government has a major influence on the market.

Buying gilts

Rather than having to find £3bn or more on a day when a gilt matures, the DMO tends to buy gilts in the market in the weeks and months before maturity. At times the government buys additional gilts back because it is running a Public Sector Debt Repayment (ie a negative PSNCR). The government had a PSDR in the period 1998-2001 and was therefore issuing less in gilts than it was redeeming in each year. Gilt yields were low in this period due to low inflation, but the PSDR had the effect of further reducing yields on gilts below the already low levels.

Regulation

There are about 15 gilt-edged market makers (known as GEMMs or primary dealers) who are allowed to make a market in gilts.

The regulator licences GEMMs and imposes certain requirements on them. In return, GEMMs are allowed certain privileges. For example:

- **only the GEMMs can buy, sell or borrow existing gilts directly from the Bank of England and the DMO.** GEMMs borrow gilts by, in effect, buying the gilt now and simultaneously agreeing to re-sell it at a later date.
- **they are given a favourable tax treatment.**

The Bank of England is also partly responsible for monitoring GEMMs (eg checking that they have adequate capital backing to meet the risks they take on such as agreeing to sell gilts they don't own).

Most GEMMs are part of large international investment-banking groups.

Settlement

While the Bank of England has designed and built a settlement system for gilts and Eurobonds, responsibility for keeping the main register of owners of gilts is now in the hands of CREST.

(See the section on the roles of the Stock Exchange below for more on CREST.)

Quantitative easing

Quantitative Easing (QE) is a monetary policy used by some central banks to increase the supply of money. It usually involves both a direct increase in the money supply and a knock-on effect from the fractional reserve system, increasing the money supply further, although it can involve just making changes to the fractional reserve system.

In the UK, the Bank of England has used QE to mitigate the effect of the credit crunch.

The “fractional reserve system” of banking is studied in Subject CT7. Briefly, it refers to the fact that banks hold only a proportion of their customers’ deposits as readily available reserves. This enables the bank to use the rest of customers’ deposits, for example to provide loans to borrowers. Through changing the minimum fraction of deposits that needs to be held in reserve, the central bank can influence the money supply.

QE often involves the purchase of government bonds as follows:

- **The central bank credits its own account with money it creates out of nothing (“ex nihilo”).**
- **It then purchases financial assets, for example, government bonds, quasi-government debt, mortgage-backed securities and corporate bonds, from banks and other financial institutions in a process referred to as “open market operations”.**

By purchasing these assets from the private sector, the central bank is increasing the amount of money in the hands of the private sector. It is also increasing the demand for these assets and so reducing the yields available on them. Lower yields should lead to lower borrowing costs.

The increased money supply and lower borrowing costs should encourage more spending and investment by consumers and firms.

- **It can also involve changing the reserve requirements for banks which, through the fractional reserve system, would increase the money supply.**

2 **The Stock Exchange**

The Stock Exchange is an association of stock-broking firms which grew out of trading carried on in London's coffee houses in the seventeenth century. It is controlled by an elected council, and members' behaviour in investment business is governed by a detailed rule book.

The Stock Exchange has two key roles, the second being a crucial factor in allowing the first to happen:

1. **raising new finance for companies and governments (the “primary” or “new issue” market)**
2. **providing a secondary market for investors.**

The Stock Exchange brings together lenders and borrowers. In order of importance, the main lenders are:

- **pension funds**
- **life insurance offices**
- **individuals**
- **general insurance companies**
- **unit trusts**
- **investment trusts.**

A significant proportion of the value of the UK stock market is now owned by non-UK investors. UK private individuals were once the most important group, but have declined in importance as nowadays they are more likely to invest indirectly through an institutional investor, such as a unit trust.

Securities dealt on the Stock Exchange

The Stock Exchange is mainly concerned with the long-term capital markets. It does not cover money market transactions. Nor does it cover foreign exchange transactions, futures or options contracts.

The types of securities that are quoted on the London Stock Exchange are:

- **gilts, local authority bonds, bulldogs (sterling-denominated bonds issued by an overseas borrower in the traditional UK bond market)**
- **ordinary shares, preference shares, debentures, unsecured loan stocks and Eurobonds** (although most Eurobond trading actually occurs through the investment banks, rather than through the Stock Exchange).



Question 14.3

How does a bulldog differ from a Eurobond?

In terms of market value, ordinary shares are the most important. In terms of turnover, gilts are the most important because equities are usually held for longer periods than gilts.

The markets

The Stock Exchange runs the following markets:

- **gilt-edged market**
- **UK fully listed securities**
- **alternative investment market (AIM)**
- **overseas securities.**

Many overseas firms, particularly large European firms, are listed in their own domestic markets (eg Rome, Paris, Frankfurt) and also have a listing in London. In many cases the *majority* of trading in these shares occurs through the London Stock Exchange, rather than through their own domestic exchanges.

2.1 **The roles of the Stock Exchange**

Providing a market

A market is a place where buyers and sellers can come together.

The London Stock Exchange (LSE) operates two dealing systems:

1. **The quote-driven competing market maker system, for which prices are disseminated via the Stock Exchange Automated Quotations (SEAQ). Each market maker enters quotes into SEAQ for each security that they deal in. SEAQ then displays all the quotes in each security to brokers, and to institutional investors. Dealing is carried out over the telephone between member firms.**
2. **The order-driven electronic system called the Stock Exchange Electronic Trading Service (SETS). SETS currently operates for some 200 FTSE stocks. Member firms display their bid and offer orders on the system and matching orders are executed automatically.**

Trading in international securities takes place through an order-driven system similar to SETS. AIM stocks and less liquid main market stocks are traded using a separate Stock Exchange service (SETSqx).

SEAQ quotes the lowest offer price (*ie* at which a market maker will sell) and the highest bid price (*ie* at which a market maker will buy). A quote of “545–7” indicates that the market maker is currently prepared to buy the security at £5.45 or to sell it at £5.47.

In the equity market, quotes on SEAQ for many stocks are “firm” *ie* the market maker must be prepared to deal at the prices they show. In the gilts market the prices are only indicative. A broker or investor would need to telephone the GEMM to check prices.

Regulating the market

The Stock Exchange is a recognised investment exchange under the Financial Services and Markets Act 2000. It is responsible for ensuring that business takes place in an orderly manner and that investors are afforded proper protection. The Stock Exchange is also the UK’s “competent authority” for securities listing under European Community directives.

Regulating members of the Stock Exchange

Brokers and market makers are members of the Stock Exchange and therefore have to follow the Stock Exchange's rules. The Stock Exchange is particularly interested in trading practices and professional standards eg market makers in particular stocks *must* give quotes at which they are prepared to buy and to sell *at all times*.

The market operates a “dual capacity” system where a member firm can carry out more than one function. For example, a firm may have both brokers and market makers. This gives rise to possible conflicts of interest (eg an investor asks a broker which shares are good value, and the broker decides to recommend the shares that his market-making colleague happens to have too many of). To stop this, “*Chinese walls*” exist so that members of a firm acting in different capacities do not talk to each other. In addition, in all deals a broker is subject to the Financial Services Act’s “best execution” rule, and compliance officers have to be employed by each firm to keep everyone in check.

Regulating transactions

An important feature of the Stock Exchange is that the price, time and volume of all trades have to be reported soon after they have occurred. This reporting means that it will be possible to check whether the “best execution” rule has been followed, and whether insider dealing may have occurred.

Regulating companies

A company wishing to have its securities quoted on the Stock Exchange must meet the regulator's requirements for listing. In addition, quoted companies must fulfil certain requirements. For example, a quoted company must produce an interim six-monthly report (whereas the Companies Act only requires an annual report).

Settlement of trades

When one investor has agreed to sell (or buy) a security to (or from) another investor or a market maker, the registrar needs to be informed, the share certificate or bond needs to be transferred, and money needs to change hands. These administrative processes are known as “settlement”.

This is the less exciting, but essential, part of stock markets. The details of the process are different for gilts and for equities. Companies are responsible for keeping their own register, although in practice they will usually get an investment bank or a clearing bank to act as their registrar.

Settlement for equities

Under the system of “rolling settlement” any share transaction agreed on a particular day will be settled three working days later. This is done using a computerised system called CREST, which records the holding of securities and the settlement of trades. CREST allows shareholders to hold and trade shares in electronic rather than (as previously) paper form.

Settlement for gilts

Gilt transactions have to be settled the day after the deal is made. In comparison to equity settlement, this is so astonishingly quick that the Stock Exchange refers to it as “cash” settlement.

Buyers and sellers deal directly with each other, rather than through a third party.

Providing investors with information

The Stock Exchange also publishes information which may be of interest to investors. Much information can be accessed via its website <http://www.londonstockexchange.com>.

The Stock Exchange Daily Official List (SEDOL) shows details such as price and volume of transactions in all the securities listed on the Stock Exchange. It is prices in the official list that HM Revenue and Customs recognises when calculating capital gains.



Question 14.4

What are:

- (i) GEMMs
- (ii) SEAQ
- (iii) CREST
- (iv) SEDOL



Question 14.5

Give the four main roles of the Stock Exchange.

3 **The derivatives exchanges**

Derivative contracts, which draw their value from that of an underlying asset (eg coffee), security (eg BP shares) or an index (eg FTSE 100), are primarily used to hedge risks, or for speculation.

Derivative contracts are traded either directly between two parties, called Over-The-Counter (OTC contracts), or are traded via an exchange, such as NYSE Liffe, and are called exchange-traded contracts.

Credit risk is a major factor in an OTC market and so regulators are trying to reduce the counterparty risks through the use of central clearing systems and the holding of capital in respect of derivative transactions.

Derivatives exchanges provide an efficient, transparent and orderly trading environment for trading in derivatives.

NYSE Liffe, is Europe's largest exchange by value of business traded, bringing together the five European derivatives markets of Amsterdam, Brussels, Lisbon, London and Paris. It is a market for a variety of derivatives products including interest rates, bonds, equities, indices, commodities and swaps, and it trades \$2,900 billion every day – that's \$40 million a second!

4 Institutional investors

4.1 Investment banks

What they are

Investment banks were previously known as *merchant banks*. Years ago merchant banks were exactly what the name suggests – bankers to merchants. In the 19th century a lot of trade was carried out using bills of exchange. When companies wanted to have trade bills accepted, it was the merchant banks, with their intimate knowledge of the merchants, who were best able to assess the credit risk and were thus most successful at accepting bills. This came to dominate their business. Then someone invented the cheque book, bankers' drafts and telegraphic cash transfers.

As the use of bills of exchange declined merchant banks found something else to do instead. In fact, they found lots more things to do, which is why they are now known as investment banks. **Investment banks specialise in giving financial advice to companies and in fund management. The roles played by a typical investment bank are:**

Financial advisers to companies

- **give advice on takeover and merger strategies and defences**
- **give advice on investment projects**
- **give advice on the best ways to raise capital**
- **act as issuing houses** (most issuing houses are part of an investment bank)
- **arrange underwriting of new issues**
- **issue Eurobonds**

Fund management

- **provide management for unit trusts and for investment trust companies**
- **manage pension funds and large private investment portfolios**
- **organise the Eurobond market** (*ie* match up deals and act as market makers)

Money market operations

- **accept (*ie* guarantee) bills of exchange**
- **hold Treasury bills and local authority bills**
- **run some bank accounts and issue certificates of deposit**

Other

- **provide both short-term and long-term finance to companies (eg through lease agreements)**
- **act as trustees (eg for debenture issues)**
- **act as counterparties / brokers for Over-The-Counter (OTC) derivative contracts, a facility used mainly by pension funds and insurance funds.**

In the last 20 years, investment banks have significantly expanded their activities and influence in global financial markets. Many rely heavily on borrowing and trade extensively in complex derivative products generating significant profits. However, in 2008, the credit crunch and banking crisis resulted in the collapse of Lehman Brothers and bail-outs of many other US investment banks by the US government.

4.2 Clearing banks

What they are

Clearing banks carry out a multitude of roles, although their distinguishing feature is that they obtain the bulk of their finance from private individuals through high street outlets, and provide means for customers to transfer money to third parties (eg cheque books and bankers' drafts).

These distinguishing features are being challenged, firstly by telephone and internet banking (eg firstdirect) reducing the need for high street outlets, and secondly by building societies, which now offer many of the traditional clearing bank money transfer services.

Most of a bank's funds come from current accounts, deposit accounts and savings accounts. Typically customers can withdraw their money from these accounts with no notice, with a week's notice and with three months' notice respectively.

Banks then advance bank loans which may have terms of a few years. However, banks will also lend a lot of money on shorter terms to maintain adequate liquidity. For example, banks lend to customers on overdrafts (in theory recallable immediately) and buy money market instruments (liquid, and mostly with terms to maturity of only a few months).

Many retail banks moved heavily into lending (personal loans, mortgages and credit cards), relying on wholesale funds from the investment markets to fund these activities. The distinction between retail and investment banks became increasingly blurred. The credit crunch placed huge pressures on these business models resulting in the near collapse of several high profile UK banks and subsequent re-capitalisation and part-nationalisation by the UK government.

UK taxpayers now own a significant proportion of many of the main British banks. Many other well-known British banks are owned by overseas banks.

Role played in the investment markets

Banks do a lot, so they inevitably affect lots of different investment markets. They are active in money markets, derivative markets (particularly swaps and currency forward markets), equity markets, bond markets, and many others.

Money market deposits

The banks dominate the money markets. Banks requiring cash are the main source of demand for short-term deposits. Banks with excess cash are the biggest suppliers of money to be deposited. This activity is needed so that each bank can balance the total amount of money it has deposited with the total amount of money it has lent out.

Deposits can be for any term from overnight to one year and occasionally beyond. The shorter terms tend to be the most active. The deposits are usually at a fixed rate of interest for the full term, but variable rate deposits are also used.

The banks usually deal through specialist money brokers who monitor the whole market to find the best rates. The rate at which one bank is prepared to lend to another is known as LIBOR (“London Inter Bank Offered Rate”). LIBOR is the benchmark money market rate of interest. A LIBOR rate for overnight, one-week, one-month etc is determined at 11am each day. You may also come across “LIBID” (London Inter Bank Bid Rate) which is the rate that banks are prepared to pay to borrow at. The difference between the two rates represents the profit margin for the money brokers.



Question 14.6

Which rate will be the lower – LIBOR or LIBID?

Certificates of deposit

Banks originally developed certificates of deposit to attract funds from large companies who might be prepared to deposit money with a bank for, say, one year so long as the company could get the money back early if it needed to. The company could, unlike a normal deposit, sell its deposit to another investor if it needed the cash. The advantage to the company is that a one-year certificate of deposit would pay a higher interest rate than keeping the money on “overnight” deposit. The advantage to the bank is that it can be certain to keep the money for the full term.

Certificates of deposit have proved to be an ideal way for one bank to lend to another. The borrower was certain that it could keep the money for the full term, whilst the lender could have instant access to the cash by selling the certificate to another investor.

The majority of certificates of deposit represent surplus funds of one bank being deposited with another bank. This is another investment market that the banks dominate.

Eurodeposit markets

A Eurodeposit is any currency deposited outside its country of origin (eg dollars held in a London bank). Just as there is a market in sterling deposits, so there is an active market in London in Eurocurrencies (eg Eurodollars, Euroyen). Again, **the banks' need to balance surpluses and deficits means that they are the dominant force in the Eurodeposit markets.** These markets are also called the “Eurocurrency” markets – a term that should not be confused with the currency markets (*ie* currency exchange markets).

The bill markets

The banks are also quite important in the bill markets. **Banks quite often buy and sell Treasury bills, bills of exchange and local authority bills.** Again, the trade can occur in either direction as banks try to maintain a balance between their lending and their borrowing (it is inefficient not to use money, and dangerous to run short of it).

Gilt market

Banks also hold some spare cash in gilts. Due to their need for liquidity, almost all of their funds are invested in short-dated gilts, and much of that is in gilts within one year of maturity. They hold a limited amount of medium-dated gilts (five to 15 years) and virtually no longer-dated gilts.

Overall, banks are one of several major players in short-term gilts and therefore exert some influence on the market. Their influence at longer terms is negligible.

Other

Banks are a key competitor in the market to take deposits from retail customers. A retail customer is the person on the street, as opposed to the “wholesale” markets for institutions that we have been discussing so far. The other competitors are the building societies and the government (through National Savings). To a lesser extent, they are in competition with unit trusts, investment trusts, the property market, life assurance and personal pensions for the private sector’s longer-term investments.

Banks are increasingly playing a role as a middleman in the unit trust, investment trust, life assurance and personal pensions markets. They give advice to customers on which product to choose, and often have their own in-house unit trust or pension plan.

Banks also exert a small influence on the equity markets and debt market when they want to raise long-term capital (but their ratio of long-term capital to short-term finance is very low). When they issue debt it tends to be a *subordinated* loan stock. This means that the loan stock holders rank *after* the bank’s depositors.



Question 14.7

Compare and contrast investment banks and clearing banks in the following areas:

- customers
- services offered
- source of income
- use of income.

4.3 Building societies

What they are

Before 1986 there was a very clear distinction between UK banks and building societies. Building societies, unlike banks:

- did not offer cheque accounts
- only lent long-term to finance private individuals’ house purchases
- were mutual organisations *ie* owned by their depositors, not by shareholders.

The 1986 Building Society Act greatly increased the range of activities that building societies could take on. Most building societies now offer cheque accounts and carry out a wider range of lending. Many demutualised to become public limited companies listed on the Stock Exchange and have, as a result, turned into banks and subsequently merged with other retail or investment banks (for example, Abbey National demutualised to become a bank before being bought (rescued) by Spanish bank Santander). The most well-known remaining UK building society is Nationwide.

Consequently, **the role of building societies is similar to that of banks, although there are some differences:**

- **building societies have not entered the commercial money markets to the same extent as banks**
- **building societies' lending is dominated by house-purchase mortgages**
- **building societies both individually and collectively are smaller, and thus exert less influence than banks on the markets.**

They channel private individuals' excess short-term cash to private individuals who need to borrow to buy a house.

Building societies grant house-purchase mortgages and some personal loans. Surplus cash is invested in:

- **short-dated gilts and local authority bonds**
- **other banks and building societies (particularly using certificates of deposit).**

Role played in investment markets

Building societies' actions in the investment market are similar to those of banks. However, they are smaller and have a lower proportion of their funds invested in money market instruments. **Building societies have a little influence on short-dated gilts and certificates of deposit, but negligible influence on the other markets.** In particular, they are much less active in Eurocurrency, swap and bill markets than the banks.

Building societies are in competition with banks in the retail deposit market, and to an extent in the investment trust/unit trust/pensions/life assurance advice markets.

As mutuals, **building societies do not have shares. However, they do raise some long-term debt capital. Unusually for non-government borrowers, some of this has been in the form of index-linked bonds so that building societies are relatively important in what is a very small market.**

4.4 Investment trusts

What they are

Despite the name, **an investment trust is a company** and not a trust. Unlike other companies, they are set up to invest money rather than to sell a good or service. It might be better if they were called *investment companies* as they are in the USA.

Most investment trusts are listed on the Stock Exchange. They raise equity and debt capital. The money raised is often invested in the shares of other UK companies. A number of investment trusts buy other assets such as gilts, property and overseas equities.

Investment trusts provide the opportunity for small investors to own a share of a big, well-diversified, and professionally managed portfolio. The investor owns shares in the investment trust. In turn, the investment trust owns the underlying assets. Some institutional investors also invest in investment trusts, particularly where the investment trust invests in specialist areas such as smaller Japanese equities.

The main parties in an investment trust are:

- ***Board of directors*, who are responsible for the policy of the company.**
- ***investment managers*, who manage the investments for the investment trust.**
- ***shareholders*, who buy and sell the shares in the investment trust company in the same way as they would in any other company.**

When investors sell a share, they do so to another investor. The total number of shares in issue for an investment trust does not change (unless the company has a rights issue). For this reason, an investment trust is sometimes called a “closed-end fund”. This is in contrast to a unit trust (an “open-ended fund”) where buying and selling of units results in units being created or destroyed (see later in the chapter).

Pricing

The price of a share in an investment trust is determined by supply and demand. Investors can “see through” an investment trust to the underlying assets. For example, how much would you pay for 1% of the ordinary share capital of an investment trust with a net asset value of £10m? You should be thinking “about £0.1m”. **In practice, many investment trusts stand at a discount to their net asset value.**

The most important reasons for the discount to the net asset value include:

- **Management charge.** The value of the underlying assets is the present value of the future stream of income that those assets will produce. However, the value of the investment trust might be thought of as the present value of the income stream after deduction of the management charges. Often the management charge will be 0.5% of the value of the assets, which may well be 10% of the annual *income* from the fund.
- **Marketability.** A small investment trust investing in shares of large companies will provide a less marketable investment than the underlying assets. But note that the shares of a large investment trust investing in property, unquoted equities etc will be *more* marketable than the underlying assets.

A typical discount is about 10%, but it can be as much as 40% or more.

Split capital and other variations

The shares in most investment trusts are like the shares in any other company. The shareholder is entitled to a share of the income through dividend payments and an equivalent share in the company's residual value should it wind up.

Some investment trusts have a set winding up date, and are known as "limited life" trusts. This helps eliminate the discount because investors know that the market price should tend to the net asset value by the winding up date.

For some of the limited life investment trusts the capital structure might be split so that there are two or more types of shares aimed at investors with different tax positions eg:

- **capital shares receive the residual capital value on wind-up and little or no income (good for taxpayers with a high marginal rate of income tax)**
- **income shares receive income and little or no capital on winding up (good for non-tax payers).**



Question 14.8

Why might taxpayers with a high marginal rate of income tax have a preference for capital shares?

Role in investment markets

An investment trust will have a specific objective which will determine which investment market the investment trust influences. It might be anything from “balanced” (*ie* a general mix of assets chosen according to what the investment manager fancies) to something quite specialist (*eg* floating rate Euroyen investments).

In general, investment trusts are small. There are about 400 approved investment trusts investing in the UK Stock Market, but collectively they only represent about 4% of equity investment. Most investment trusts are *approved*. This gives the investment trust exemption from capital gains tax. But an investor may still have to pay capital gains tax on realised capital gains due to the growth in the investment trust’s share price.

A number of investment trusts specialise in investing in assets such as commercial property and overseas assets that small investors would find difficult to invest in directly.

A few investment trusts try to track a Stock Market index such as the FTSE 100. This type of index-tracking fund offers investors the benefits of diversification and reduced management fees and dealing costs.



Question 14.9

List the main features of an investment trust and explain why they exist.

4.5 Unit trusts

What they are

A unit trust performs much the same role as an investment trust. However, unlike investment trusts, **unit trusts are trusts in the legal sense** (*ie* they are set up under trust law using a trust deed). They have to be authorised by the Financial Services Authority before they can offer their units to the public. As with investment trusts, **unit trusts are set up and run by a management company**.

Unit trusts are not companies. They are not quoted on the Stock Exchange. Units are bought from and sold to the management company, not from other investors. The only money that unit trusts raise is the money that investors pay for units. They do not raise equity or debt capital.

Like investment trusts, unit trusts allow small investors to invest in a professionally managed portfolio of shares with a specific investment objective. There are more restrictions on what an authorised unit trust can invest in than for an investment trust. Consequently, almost all invest only in quoted securities (mainly shares).

The main parties involved are:

- A **management company**, which runs the trust. They set up the trust, get authorisation from the regulator, advertise the trust, carry out all necessary administration and control the investment of the funds. Their aim is to make a profit from the charges levied. Many life insurance companies act as unit trust managers. The name of the management company will usually appear in the name of the trust (eg “Jupiter European Fund”).
- The **trustees**, who are responsible for checking that the trust is run according to the terms of the trust deed. The trustee will be a company such as a clearing bank or an investment bank that is independent of the management company.
- The **investors**, who buy units in the trust, hoping that they turn out to be a good investment.

Pricing

The basic idea of how units are priced is quite simple. However, there are a couple of practical complications. First, let us look at the basic idea.

The price of the units is calculated by the managers to be:

$$\frac{\text{market value of assets}}{\text{number of units}}$$

Now for the two complications:

Bid-offer spread

In order for the management group to meet its expenses and make a profit, it makes an initial charge of, typically, 6% of the funds invested. The way that this is expressed is to define an “offer” price which is higher than the “bid” price. Units are sold by the management company at the offer price, but bought back at the lower “bid” price.

Example

A unit trust has an offer price of $50.00p$ and a bid price of $47.52p$. If you invest £10,000 in the trust you will be allocated 20,000 units. If you immediately cash in your investment you will receive £9,504 back.

Bid and offer pricing

Unit trust managers have to calculate the value of the units using the formula given above. However, they can choose how the figure “market value of assets” is calculated. They can calculate it as the cost of buying new assets (*ie* use the price at which they would buy the underlying shares and add on stamp duty and stockbroking commission). **This is called “offer pricing”. Alternatively, they can calculate it as the cost of destroying units** (*ie* use the lower price at which they would sell the underlying shares and *deduct* stockbroking commission). **This is called “bid pricing”.**

Furthermore, the managers can choose to move between “offer” and “bid” pricing. Normally, they will use offer pricing if the unit trust is expanding *ie* units are being created, and bid pricing if the trust is contracting *ie* units are being destroyed.

The result is that someone who buys units in a unit trust that is expanding will buy at the highest price (the offer price on an offer pricing basis). If they later sell at the lowest price (the bid price on a bid pricing basis), the effective bid-offer spread may be more like 10% (considerably more than the figure publicised), as shown in the following example.

Note that, by definition, it is more common for units to be bought at times when the trust is expanding, and for units to be sold at times when a trust is declining.

Example

A unit trust currently with 20,000,000 units has total assets of £12,000,000 valued at mid-market prices. The current cost of buying the assets held by the trust using the offer price of the underlying assets and allowing for dealing costs (commission and stamp duty) would be £12,250,000. If the assets were sold, they would realise £11,800,000. Given this information and assuming a 6% bid-offer spread we can construct the following table.

	<u>Bid price</u>	<u>Offer price</u>
Bid pricing basis	59.00p	62.77p (<i>ie</i> $\frac{59}{0.94}$)
Offer pricing basis	61.25p	65.16p

Someone who buys units (offer price) when the trust is expanding (offer pricing) and later sells units (bid price) when the trust is declining (bid pricing) will suffer an effective spread of 10%.

Alternatively, someone who buys units (offer price) when the trust is declining (bid pricing) and later sells units (bid price) when the trust is expanding again (offer pricing) will suffer an effective spread of only 2%.

Role in investment markets

Like investment trusts **the role of unit trusts depends upon their specific objectives**. These show the same sort of variation as investment trusts (subject to the stricter restrictions on their investments).

In general, individual unit trusts are even smaller than investment trusts. However, there are about 2,400 authorised unit trusts investing in the UK Stock Market, managing around £400bn of investments.

4.6 Open-ended investment companies (OEICs)

Open-ended investment companies (OEICS) have characteristics of both investment trusts (they are companies with a single share price) and unit trusts (new shares are created when money is invested, with the price reflecting the net asset value of the fund).

Like investment trusts, OEICs are companies that issue shares on the London Stock Exchange, and that use the money raised from shareholders to invest in other companies. Like unit trusts, they are open-ended which means that when demand for the shares rises the manager just issues more shares. With an investment trust, if demand exceeds supply, the response may be a rise in the share price. The price of OEIC shares is determined like a unit trust, with the key factor being the value of the underlying assets of the fund. But in contrast to unit trusts, there is no bid/offer spread with OEICs, so the price of the shares should be the same whether you are buying or selling. OEICs were launched in the UK in 1997 and since then many unit trusts have switched to become OEICs.

OEICS are the preferred legal form over unit trusts for new open-ended investment vehicles.



Question 14.10

Complete the following sentences by adding the correct beginning:

- ... is a closed end fund
- ... are determined by the market
- ... may have specific investment objectives
- ... may borrow by means of equity and debt capital
- ... is regulated by trust law
- ... are determined using bid and offer pricing
- ... may have a set winding-up date.

Possible beginnings:

- Unit prices ...
- A unit trust ...
- Prices of shares in an investment trust ...
- An investment trust ...
- Both unit trusts and investment trusts ...

4.7 ***Investment management companies***

Investment management companies (often referred to as *fund managers*) perform a range of activities centred around the core service of investing client assets:

- “front office” functions (buying and selling investments, formulating stock selection and asset allocation decisions, research, cash management)
- “back office” functions (including custody, transaction processing and settlement, stocklending).

Firms are increasingly “unbundling” some of these services and outsourcing an increasing number of functions, in order to focus on the core service of investment.

Role in investment markets

As noted above, investment management companies are primarily involved in buying and selling investments and formulating stock selection and asset allocation decisions. In many countries, investment management companies handle immense volumes of assets. The industry is also, typically, very concentrated with a small number of firms dominating the market. Short-term fund performance is often a key factor in attracting and retaining clients.

UK institutional investors own more than half of the quoted equities. The principal institutional investors are occupational pension funds and life insurance companies. Most occupational pension schemes are organised on a trust basis, with a board of trustees responsible for the determination of asset allocation. Since many trustees lack the necessary expertise, most trusts use investment consultants and employ fund managers.

The fund management industry in the UK is huge, managing assets of over £4,200bn, for domestic and overseas clients, in the year 2011. Recently, the trend has been for pension funds to switch from using a single fund manager to using a number of specialist fund managers for different classes of assets. This has enabled smaller firms to specialise and to co-exist with the larger firms. However the majority of UK pension assets are controlled by just a small number of top management firms.

As a result, concern has been expressed that fund managers have become too influential in determining asset allocation and the direction of capital. Issues cited include:

- **herd-like behaviour**
- **excessive focus on short-term results**
- **“churning” of portfolios (to generate commission)**
- **overpayment (and hidden payments) for research**
- **closet “passive” investment (while charging “active management” fees)**
- **insufficient attention to corporate governance issues**
- **insufficient allocation to “new” asset classes (such as private equity / venture capital).**

In 2000, the Government commissioned a review to consider whether or not the investment decision-making of institutions was being distorted. In March 2001, the resulting Myners' Report on institutional investment in the UK highlighted some of the problems mentioned above and suggested principles for dealing with these problems.



Question 14.11

Recommend four ways to reduce the problems outlined above.

4.8 Self-administered pension schemes

What they are

Many employers set up pension schemes as part of the benefits provided for their workforce. The aim of the pension fund is to provide pensions for the workforce when they retire. The range of size of pension schemes is enormous, ranging from the NHS pension scheme with assets of more than £35bn to newly established schemes with only a few members.

A self-administered pension scheme is one that is responsible for its own investment strategy. In other words, this is any pension scheme that does *not* hold an insurance company's contract as its sole asset (schemes that do are sometimes called “insured” schemes).

Almost all private sector schemes are “funded” ie the employer (and usually employees too) make contributions over the working lives of members. So, by the time a member retires, a fund has been built up out of which their pension can be paid. Pension funds are normally set up under trust law.

There are two basic types of scheme as follows:

- 1 **Defined benefit schemes: where the member’s pension is determined by a specific formula** and not by the investment performance of the scheme. **Members contribute to the scheme at a set rate and the employers make up the difference required to finance the benefits (the “balance of cost”).** For example, a pension of 1/60th of a member’s “final salary” (eg average salary in the three years before retirement) may be granted for each year that the member has worked for that employer.
- 2 **Defined contribution schemes: where there is a set rate of employer and member contributions, paid into members’ individual funds.** The pension payable is determined by a) the size of the fund and b) annuity rates at the date of retirement.

In the UK, defined contribution schemes are becoming more common. Many existing defined benefit schemes are switching to defined contribution for future service and most new schemes are defined contribution arrangements.

The main parties involved in a pension scheme are:

- **Employer, who sets up the pension scheme. Will make contributions either at a set rate (defined contribution scheme) or at a rate determined periodically by an actuary (defined benefit scheme).** The employer is ultimately responsible for making good any shortfall in funding that may occur in a defined benefit scheme.
- **Employee, who will usually make contributions as well. Will eventually receive benefits,** eg by either retiring and drawing a pension, dying before retirement and receiving a lump sum benefit, or transferring money to another pension scheme.
- **Trustees, who are responsible for checking that the trust is run according to the terms of the trust deed and trust law. Their primary responsibility is to ensure that members’ pensions are safeguarded.** The trustees will consist of members of the company’s management and workforce.
- **Fund managers, who invest a self-administered scheme’s assets.** The fund managers may either be the scheme’s own “in-house” team whose sole responsibility is to work for that fund, or (more commonly) an external fund management team. Many investment banks run fund investment management teams. There are also a number of specialist fund management companies.

A typical fund invests mostly in UK equities, longer dated conventional gilts and company debt. There will be some investment in overseas securities. A small proportion of the assets might be invested in property, money market investments and index-linked gilts. Due to the shift from defined benefit to defined contribution schemes, together with volatile equity markets, the proportion of pension funds' assets invested in equities is falling.

Role played in investment markets

Collectively, pension funds are the most important investors in gilts and equities. However, in recent years equity holdings have fallen to reflect the decline of pension provision and the move away from investing in UK equities.

A pension fund's liabilities are long-term. For example, a 30-year old member of a scheme will be making contributions for a pension that may still be in payment in 50 or more years' time. The extent of the liability depends upon the level of "final salaries" in, say, 30 years' time. This in turn depends mainly on inflation over the next 30 years. A pension fund's assets will reflect the long-term, inflation related, nature of the liabilities.

In the fixed interest markets, pension funds tend to buy longer-dated and to an extent medium-dated stocks to meet their liability to pensions already in payment. They also usually buy high coupon stocks because these offer slightly higher gross redemption yields than lower coupon stocks.



Question 14.12

List the interested parties in a defined benefit pension scheme

4.9 ***Life insurance companies***

What they are

Life insurance companies may either be limited companies, or mutual organisations owned by their “with-profit” policyholders. The type of ownership makes little difference to the role they play in investment markets. What really matters is the type of policies that they sell.

Policies may either be *savings* orientated or *protection* orientated. Often, policies combine both. For example, “endowment” policies provide a sum assured payable on death, or a lump sum if you survive to the end of the term. It is the savings policies which give rise to most of the money held by life offices.

Policies may be *without-profit*, *unit-linked* or *with-profit*. This is probably the most significant split as far as investment policy is concerned. Without-profit policies give a fixed benefit (eg a sum assured of £50,000 payable on death). The amount paid out under a unit-linked policy is determined by the value of underlying assets, similar in nature to a unit trust. Under a with-profit policy, policyholders share in the profits (or “surplus”) of the office, which comes mostly from investment performance. However, rather than receive a cash dividend, with-profit policyholders have the sum assured under their policy increased by “bonuses”.

Policies may be taken out for various purposes. The most common types of business are *life assurance* (eg endowments and term assurance) and *pensions business* (ie approved personal pensions and insured group pension schemes, including pensions in payment).

Life insurance companies pool mortality and investment risks by channelling savings into the long-term capital markets.

Role played in investment markets

A typical fund invests largely in a mixture of UK equities and fixed interest securities. It may also invest in overseas securities, property, money market investments and index-linked bonds.

Collectively, life insurance companies are the second most important investors in gilts and equities after pension funds.

A life company's liabilities are medium- to long-term. The majority of without profits liabilities and the accrued guaranteed part of with-profits liabilities are fixed in monetary terms. Some without-profits liabilities may be guaranteed in terms of an index of prices or similar, ie the benefits are directly linked to that index. The future bonus part of with profits benefits needs to satisfy policyholders' reasonable expectations in the context of treating customers fairly. In effect, this means that part of the liabilities is inflation related.

Legislation requires life companies to maintain an excess of assets over liabilities. The need to meet this "capital adequacy" requirement means that many companies have to choose assets which match their liabilities quite closely. Some companies have large free assets (ie a large surplus of assets over liabilities) and therefore have more investment freedom.

In the fixed interest markets, life companies tend to buy long-dated and some medium-dated stocks, to match the terms of their liabilities.

Many life insurance companies offer investment-linked products. The most common such type is unit-linked business, the benefits of which are determined directly by the value of the investments underlying the contracts. The company will normally offer a range of different fund options for its unit-linked policyholders. Some products may instead be partially or fully linked to an investment index (such as the FTSE 100), eg guaranteed equity bonds.

Many life insurance companies invest in derivatives. This is usually done for the purposes of hedging market risks, but also can be used to provide or increase exposure to equities as an alternative to direct investment.

4.10 General insurance companies

What they are

Like life insurance companies, general insurance companies may either be limited companies or mutual organisations but this makes little difference to the role they play in investment markets.

General insurance companies **provide cover by pooling a variety of risks**. They write policies to cover a variety of risks. For example:

- *Motor, marine and aviation insurance* paying out in case of fire, theft, accident and personal injury.
- *Buildings insurance* paying out in case of fire, impact and subsidence.
- *Buildings contents insurance* paying out in case of fire, theft and accidental damage.
- *Personal accident* paying out in case of injury or death from accident.
- *Liability insurance* to cover legal expenses and liability.

UK general insurers sell a lot of policies covering risks in overseas countries.

Role played in investment markets

A typical insurer invests mainly in short-dated fixed interest and money market investments. They may also invest quite large amounts in UK equities and overseas securities (the latter to back non-sterling policies).

General insurance companies are less important in medium and long-term investment markets than life companies because they offer short-term cover rather than savings. However, they write lots of business and so are important investors in short-dated gilts and fairly important in UK equities.

There are two key characteristics of general insurance business that are relevant to their role in investment markets.

1. ***short-term.*** Almost all policies provide cover for one year, and most claims are settled within a few months or a year or two.
2. ***variable claim amounts and number.*** General insurers are vulnerable to catastrophes (eg a hurricane or an oil rig disaster) which can result in a large number and/or very large payments.

A general insurer's liabilities are almost all short-term (although some liability insurance claims may take a longer time to settle). General insurers are required to keep an excess of assets over liabilities. This, together with the variability of their claim outgo, means that they do not want to take much investment risk.

The majority of a general insurer's liabilities are in place to indemnify the policyholder for the loss suffered. The amount paid out will represent money values when the claim is settled. Sometimes losses can take a significant time to reach final settlement, eg bodily injury claims, and so insurers will seek an element of inflation-linking in the assets supporting these liabilities (index-linked gilts, equities and maybe property).

In the fixed interest markets, general insurers tend to buy short-dated and some medium-dated gilts.



Question 14.13

Complete the following sentences by adding the correct middle and end:

1. Pension funds ...
2. Life insurance companies ...
3. General insurance companies ...

Possible middles:

- ... tend to invest in long dated and medium dated stocks in the fixed interest market ...
- ... tend to invest in short dated and some medium dated stocks in the fixed interest market ...
- ... usually buy high coupon stocks ...

Possible ends:

- ... because their liabilities are almost all short-term.
- ... because they offer slightly higher gross redemption yields.
- ... because their liabilities are medium to long-term.

End of Part 3

What next?

1. Briefly **review** the key areas of Part 3 and/or re-read the **summaries** at the end of Chapters 11 to 14.
2. Attempt some of the questions in Part 3 of the **Question and Answer Bank**. If you don't have time to do them all, you could save the remainder for use as part of your revision.
3. Attempt **Assignment X3**.

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This page has been left blank so that you can keep the chapter summaries together for revision purposes.

Chapter 14 Summary

The *Bank of England* is the UK's central bank. Its main functions are:

- executing *monetary* policy on behalf of the government, ie controlling interest rates and the money supply
- providing the liquidity needed by the banking system and acting as the “lender of last resort”
- maintaining the UK's foreign reserves, and using these to influence exchange rates
- acting as the bankers' bank
- settlement of trades

The *Debt Management Office* has responsibility for managing the national debt and selling/buying back Treasury bills and gilts for the government.

The *Stock Exchange* has two key roles:

- raising new finance for companies and governments
- providing a secondary market for investors

The Stock Exchange provides a market for the trading of securities. It regulates that market and provides procedures for the settlement of trades carried out in the market. It also provides investors with information.

Derivatives exchanges provide markets for derivative products such as futures and options.

Investment banks perform a wide variety of roles including giving advice to companies and helping companies raise finance.

Clearing banks channel the private sector's excess short-term cash to private sector and institutional borrowers.

Building societies channel private individuals' excess short-term cash to private individuals who need to borrow to buy a house.

Investment trusts are companies whose business it is to invest money. Some investment trusts have a set winding-up date. Their capital structure may be split between *capital shares* and *income shares*.

Unit trusts are regulated by trust law. They are not companies. They channel investors' money into the UK and overseas stock markets. Unit trusts and investment trusts may have specified investment objectives. They provide an opportunity for small investors to own a share of a big, well diversified and professionally managed portfolio.

Open-ended investment trusts have characteristics of both investment trusts (they are companies with a single share price) and unit trusts (new shares are created when money is invested, with the price reflecting the net asset value of the fund).

Investment management companies (or fund managers) perform a range of services for their clients. The main ones are buying and selling assets and formulating stock selection and asset allocation decisions.

A *self-administered pension scheme* is one that is responsible for its own investment strategy. It does not hold an insurance company's contract as its sole asset. Collectively, pension schemes are the most important investors in the UK gilt and equity markets.

Life insurance companies pool mortality and investment risks by writing long-term policies. They also channel savings into the long-term capital markets.

General insurance companies write short-term policies to cover a variety of (non-life) risks. They sell a lot of policies to cover risks in overseas countries.

At a glance summary of financial institutions

Institution	Investment banks	Clearing banks	Building societies	Pension schemes
Role	Advise companies and help companies raise finance.	Channel private sector's excess short-term cash to private sector and institutional borrowers.	Channel private individuals' excess short-term cash to private individuals to borrow to buy a house.	Channel savings for retirement into the long-term capital markets.
Source of funds	Receive fees for advice, underwriting commission, fund management, Eurobond dealing, trusteeship, and bill acceptance. Borrow money by running banking accounts and issuing certificates of deposit.	Deposits by private individuals and by companies. Borrow from other banks when they are short of cash.	Deposits from private individuals with a small, but increasing, amount from the money and bond markets.	Contributions from employers and employees only. No borrowings.
Application of funds	Invest in bills and provide loans and leases to companies.	Grant loans and overdrafts to customers. Surplus cash invested in other banks (using certificates of deposit), short-dated gilts and local authority bonds, other banks and building societies (using certificates of deposit). Treasury bills.	Grant house-purchase mortgages and some personal loans. Surplus cash is invested in short-dated gilts and local authority bonds, other banks and building societies (using certificates of deposit).	Typical fund invests in UK equities and longer-dated gilts and company debt. Also some investment in overseas securities. Small proportion of the assets invested in property, money market investments and index-linked gilts.

At a glance summary of financial institutions

Institution	Investment trusts	Unit trusts	Open-ended investment companies	Life insurance companies	General insurance companies
Role	Pooled investment vehicle, channels investors' money into the Stock Market and other (mainly long-term) assets.	Pooled investment vehicle which channels investors' money into the UK and overseas stock markets.	Pooled investment vehicle, channels investors' money into the Stock Market and other (mainly long-term) assets.	Pool mortality and investment risks by channelling savings into the long-term capital markets.	Provide cover by pooling a variety of risks.
Source of funds	Private individuals and some institutions buy shares. Also raise debt finance.	Private individuals and some institutions buy units. Unit trusts do not borrow.	Private individuals and some institutions buy shares. Also raise debt finance.	Premium income from policyholders. Do not usually borrow money.	Premium income from policyholders. Do not borrow money.
Application of funds	Invest mainly in the longer-term markets: UK equities, UK gilts and other fixed interest, overseas equities, property.	Most unit trusts invest mainly in longer-term quoted securities: UK equities, UK gilts and other fixed interest, overseas equities, property.	Invest mainly in the longer-term markets: UK equities, UK gilts and other fixed interest, overseas equities, property.	Typical insurer invests in a mixture of UK equities and fixed interest securities. May have some investment in overseas securities, property, money market investments and index-linked gilts.	Typical insurer invests in short-dated fixed interest and money market investments. May also invest quite large amounts in UK equities and overseas securities (to back non-sterling policies)

Chapter 14 Solutions

Solution 14.1

The interbank market is not surprisingly the market of short-term borrowing and lending between banks. Interbank rates are quoted for most terms of borrowing and lending up to a year, with the most activity occurring between the overnight rate and about three-month lending. Banks use this market to square their positions during the day by lending to one another.

Because a bank is normally a very high quality borrower, and exposes the lender to very low levels of credit risk, the rates available in this market tend to be only a fraction above those available in the Treasury Bill market (where the borrower is the government).



In 2008 during the credit crunch, as banks became concerned about the creditworthiness of other banks, the interbank market dried up causing liquidity concerns for many banks. The interbank rate rose dramatically while base rates fell. On 30 September 2008, the interbank rate was 6.3%, 130 basis points over the Bank of England base rate of 5%!

Solution 14.2

The term “money markets” covers bank deposits and short-term securities.

The Bank:

- buys/sells Treasury bills and other short-term securities in exchange for cash, thus providing liquidity to the banking sector
- controls the level of short-term interest rates.

Solution 14.3

A bulldog is an unsecured loan stock issued in the UK market in sterling and traded on the London Market, but issued by a foreign borrower. For example, a large European company such as the European Investment Bank might borrow sterling on the bulldog market in the UK. Issues are usually large, marketable and very secure (even though they are “unsecured”).

A Eurobond is also an unsecured loan stock, issued by a large multinational institution. The key difference is that the Eurobonds trade outside the country whose currency was borrowed. For example, the Eurosterling market is not traded or regulated in London. The European Investment Bank might borrow sterling in the Eurosterling market, or US dollars in the Eurodollar market, but these bonds would not be traded in the UK or the US respectively. This lack of supervision and regulation has been the key to the Eurobond market's success, making it cheap, quick and easy to raise finance.

Eurobonds are normally in bearer form, whereas bulldogs are normally registered.

Solution 14.4

- (i) Gilt-edged market makers, who make a market in gilts (UK government bonds)
- (ii) The Stock Exchange Automated Quotation system – an electronic information system for buyers and sellers in the gilts, listed and AIM markets. It lists the prices available for each quoted security.
- (iii) A computerised system which tracks trades and holdings of equities on the London market. It allows investors to hold and trade electronically in such securities.
- (iv) The Stock Exchange Daily Official List, which summarises all the dealings in listed securities each day. SEDOL prices are used by the HMRC when calculating capital gains.

Solution 14.5

- 1 The Stock Exchange provides both a new issue and a secondary market for buyers and sellers of equities and other securities.
- 2 The Stock Exchange regulates the market. It is responsible for ensuring that business takes place in an orderly manner, and that investors have proper protection. It makes and applies rules for its members (*ie* brokers and market makers), for the reporting of transactions, and for the conduct of listed companies.
- 3 The Stock Exchange deals with the settlement of trades. For equity trades, the CREST system is used. In the gilt market, however, buyers and sellers deal directly with each other.
- 4 The Stock Exchange provides information for investors, *eg* via the Daily Official List.

Solution 14.6

LIBID will be the lower. This is the rate that banks are willing to borrow at. So if you place money in the interbank market with another bank, you will receive the LIBID rate. You would expect this to be lower than the rate at which you are able to borrow from a bank (LIBOR) otherwise you could borrow from the bank and place it immediately back with them and make a profit!

Solution 14.7

	Investment banks	Clearing banks
Customers	Companies and institutional investors	Individuals and companies
Services offered	<ul style="list-style-type: none"> (i) advice on takeovers and mergers (ii) advice on investment projects (iii) act as issuing houses (iv) underwriting new issues (v) issuing Eurobonds (vi) fund management (vii) accept bills of exchange (viii) provide long-term and short-term finance to companies (ix) act as trustees 	<ul style="list-style-type: none"> (i) provide current account facilities to individuals and companies (ii) lend and borrow on short-term deposit (iii) issue certificates of deposit (iv) arrange currency and interest swaps (v) act as middlemen in pensions, unit trust and life assurance markets
Source of income	<ul style="list-style-type: none"> (i) Fee income from advice, underwriting commission, fund management <i>etc</i> (ii) Borrow money via certificates of deposit 	Money deposited by private individuals and companies. Can also borrow from other banks.
Use of income	Money invested in bills and used to provide loans and leases to companies.	Loans and overdrafts to customers. Invest surplus cash in certificates of deposit, short dated gilts and local authority bonds, bills of exchange and Treasury bills.

Solution 14.8

Taxpayers with a high marginal rate of income tax will be obliged to pay this rate on any income they receive. However, the taxpayer may be able to time the incidence of any capital gains to utilise their capital gains allowances, hence avoiding tax. Capital gains may also be taxed at a lower rate than income.

Therefore, these taxpayers may have a preference to receive their return in the form of capital gains, rather than income.

Solution 14.9

An investment trust is a company by law. It is owned by the shareholders, each of whom owns a part share in the asset portfolio owned by the investment trust. The portfolio is managed by investment managers, who deduct their management fee in the form of an annual management charge, often about 0.5% of the fund each year.

Shares are priced by supply and demand on the stock exchange, and shares are often priced at a discount to the net asset value of the trust (where net asset value in this context is the market value of the assets in the portfolio, divided by the number of shares in the company).

They exist because small investors want to invest small sums in the stock market, but want to get the benefits of a large diversified portfolio. They also wish to benefit from the management ability of the fund management group, and often choose their trust according to the perceived quality of the investment manager.

Investment trusts also offer access to specialist markets such as commercial property or overseas markets where private investors (or indeed small institutional investors) would find it difficult to invest themselves directly.

Solution 14.10

An investment trust ... is a closed end fund.

Prices of shares in an investment trust ... are determined by the market.

Both unit trusts and investment trusts ... may have specific investment objectives.

An investment trust ... may borrow by means of equity and debt capital.

A unit trust ... is regulated by trust law.

Unit prices ... are determined using bid and offer pricing.

An investment trust ... may have a set winding-up date.

Solution 14.11

Some of the recommendations of the Myners' Report are given below.

- Investment decisions should be taken only by those competent to do so.
- Trustees should arrange for formal assessment of their advisers' performance and of any decision-making delegated to them.
- Pension funds, with their fund managers, should set appropriate benchmarks and consider whether the construction of the index benchmark creates incentives to follow sub-optimal investment strategies.
- Funds should consider whether passive or active management is appropriate for each asset class.
- Funds should provide managers with a clear statement of the period of time over which their performance will be judged.
- Trustees should promote good corporate governance in the companies in which they invest.
- Fees to pension funds should be inclusive of external research and other service costs.

Solution 14.12

- Employees (past and present)
- Employer
- Fund manager
- Trustees

Solution 14.13

1. Pension funds ... usually buy high coupon stocks ... because they offer slightly higher gross redemption yields.
2. Life insurance companies ... tend to invest in long-dated and medium-stocks in the fixed interest market ... because their liabilities are medium to long-term.
3. General insurance companies ... tend to invest in short-dated and some medium-dated stocks in the fixed interest market ... because their liabilities are almost all short-term.

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Chapter 15

Weighted average cost of capital



Syllabus objectives

- (vi) *Discuss the factors to be considered by a company when deciding on its capital structure and dividend policy.*
- 1. *Describe the effect that the capital structure used by a company will have on the market valuation of the company.*
- 2. *Describe the effect of taxation on the capital structure used by a company.*
- (vii) *Define what is meant by a company's cost of capital and discuss how its cost of capital interacts with the nature of the investment projects it undertakes.*
- 1. *Describe how to calculate a company's weighted average cost of capital.*

0 Introduction

In Part 1 of the course we discussed company ownership, company finance and taxation. Having studied the construction and analysis of accounts in Parts 2 and 3, we now return to the issue of finance. The role of the financial manager is to raise finance, use it for profitable ventures and earn a satisfactory return for the providers of finance. In this part of the course we investigate this role.

The fulfilment of the role of financial managers requires that they:

- structure and restructure the capital of the company to cope with, and to benefit from, the changes in the industry and the changing requirements of the owners
- have the strategic vision that will steer the company in the future into profitable and growing markets
- keep the shareholders informed of the company's progress
- manage the income payments from the company to the shareholders and bondholders in a way that is efficient from the company's viewpoint and, within this framework, maximises the wealth of shareholders.

In Chapter 16 we will look at one important aspect of the role of the financial manager, *ie* the financing decision (how should the funds be raised?). We also look at the related issue of deciding how much of the company's earnings it should pay out in dividends to the shareholders.

In Chapters 17 and 18 we will look at the other key aspect of the role of the financial manager, *ie* the investment decision (what real assets should the firm invest in?).

The financial manager should choose to invest in projects that increase shareholder value. Chapters 17 and 18 look at specific methods of project appraisal, such as the net present value method. Some of the work on project evaluation will be familiar to those of you who have studied or are studying Subject CT1. For example, the net present value method involves estimating future cashflows from the project and discounting them to find the net present value.

In this chapter we consider an issue that is relevant to both decisions. The weighted average cost of capital (WACC) is the average cost of raising finance for the business. It might vary with the gearing (the debt/equity mix) of the company and so it is relevant to the financing decision. It could also be used as the discount rate in the net present value calculations and so it is relevant to the investment decision.

The later part of this chapter uses the *capital asset pricing model* (CAPM) which will be covered in more detail in Subject CT8.



In the past, the examination has tested *knowledge* of and the *ability to calculate* the weighted average cost of capital and the *ability to analyse* the effect of factors such as gearing and tax on the weighted average cost of capital.

Corporation tax

As mentioned in Chapter 3 (Taxation), for ease of calculation, we will assume a corporation tax rate of 30% in this chapter, unless otherwise stated.

1 **Introduction**

1.1 **The importance of the weighted average cost of capital**

The role of the financial manager is to raise finance through an appropriate blend of debt and equity (the financing decision) and to use the funds to invest in suitable projects (the investment decision). The goal of the financial manager is to increase shareholder value. They achieve this by investing in profitable projects.

It is now generally accepted that discounted cashflow techniques for evaluating projects are far superior to the use of simple payback approaches or accounting rates of return. The shareholder value-added approach enhances these techniques further. However, to use these techniques requires the calculation of the project cost of capital. In the absence of a suitable discount rate NPV and IRR approaches have no meaning. Project appraisal methods are considered in Chapters 17 and 18.

Provided that the project achieves the expected return and that, when adjusted for the risk of that project, the return is in excess of the company's weighted average cost of capital (WACC), the shareholders are better off than before.

So, in order to choose appropriate projects, the company must know its weighted average cost of capital since this will be used as the discount rate in the project appraisal process.

In this chapter, we are going to find out what determines the weighted average cost of capital. In particular, we will ask: does the financing decision (*ie* the debt/equity balance) affect the cost of capital? If it does, there is a link between the financing decision and the investment decision. Additionally, if the value of the company is regarded as the discounted value of its future profits, then, if the financing decision affects the costs of capital, then it affects the value of the company too.

1.2 Defining the weighted average cost of capital

Although there are many methods of financing a company, they broadly fall into just the two camps of equity or debt.

The *WACC* is defined as follows:



$$\begin{aligned} WACC &= \frac{\text{Market value of debt}}{\text{Market value of debt} + \text{equity}} \times \text{net cost of debt} \\ &\quad + \frac{\text{Market value of equity}}{\text{Market value of debt} + \text{equity}} \times \text{cost of equity} \end{aligned}$$

Note that here we are dealing with the *market value* of the equity and debt rather than the *book or accounting* value.

Remember that the cost of equity is the total return that is expected by individuals who invest in the shares, not simply the dividend yield.

In Chapter 12 we looked at “gearing”, which we defined as:

$$\frac{\text{book value of debt}}{\text{book value of debt} + \text{book value of equity}} \text{ or } \frac{\text{book value of debt}}{\text{book value of equity}}$$

where the book value of the equity is the accounting value of the share capital plus reserves.

Note that in this chapter we deal with market values. Thus ‘gearing’ would be defined as:

$$\frac{\text{market value of debt}}{\text{market value of debt} + \text{market value of equity}} \text{ or } \frac{\text{market value of debt}}{\text{market value of equity}}$$

where the market value of the equity would be the number of issued shares times the market price of each share.

The cost of debt and the cost of equity

Notice that the *net* cost of debt appears in the formula, where:

$$\text{net cost of debt} = \text{gross cost of debt}(1-t)$$

where t is the rate of corporation tax.

Interest payments on debt finance are tax deductible. They appear before the tax line on the income statement.

The cost of equity, which is discussed further below, will tend to be higher than the cost of debt in part due to the more favourable tax treatment of debt. This has led to considerable debate over determining the correct cost of capital to use because the weighted average cost of capital (WACC) will be very sensitive to the ratio of debt to equity on a company's balance sheet.



Question 15.1

If a company's dividend yield is 4% and the gross redemption yield on its debt is 10%, what can you say about the company's rate of return on debt and its rate of return on equity?



Example

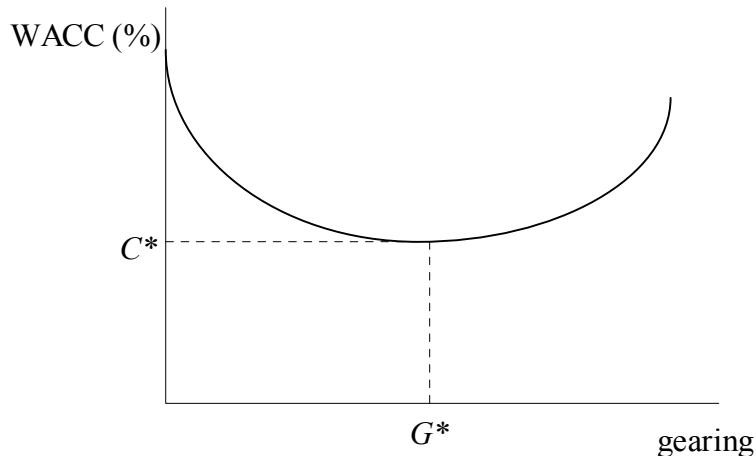
Growmore plc has debt with a market value of £100 million trading at a gross redemption yield (GRY) of 10% in the market, and £100 million market value of equity. Analysis suggests equity investors are expecting 12% per annum from their investment. Its weighted cost of capital, assuming no tax is paid, could be said to be 11% (*ie* weighted average of the cost of equity and the gross cost of debt).

If the company can earn 11% return on its assets, it can give a 10% return to the loan capital providers and a 12% return to the equity capital providers. This is the essence of a weighted cost of capital calculation.

1.3 Theoretical background

The traditional view

In the traditional school the emphasis was on determining the amount of debt a company could safely carry without risking bankruptcy in a severe recession. Debt is cheaper than equity finance, so as gearing increases, the WACC should fall. However, increasing the proportion of debt finance increases the risk to shareholders so shareholders demand a greater return for this increased risk. Therefore beyond a certain level of gearing, the downward effect on the WACC of increasing the debt finance in the business will be more than offset by the increase in the return required by shareholders. In this case the graph of the WACC against gearing would be U-shaped.



The WACC is lowest at C^* when gearing is at G^* .

This is potentially very important. It means that changing the capital structure could change the profitability of investment projects and result in a change in the value of the company.

Modigliani and Miller

In the late 1950s and early 1960s the traditional school was attacked by Modigliani and Miller (MM) who held that gearing was irrelevant and that each increase in debt carried a compensating increase in the cost of the equity.



A key concept in Corporate Finance is expressed in Modigliani and Miller's first irrelevance proposition: The market value of any firm is independent of its capital structure.

Modigliani and Miller argued that, under certain assumptions, gearing has no effect on the value of the company. Their view was that the value of the company lies in its *ability to produce profits*, not in the way that it is financed – in other words, that the market value of a company is determined primarily by its *investment decisions* and not by its *financing decisions*. This proposition allows complete *separation* of investment and financing decisions.

How did they arrive at this view?

They began with a simple model with the following assumptions:

- there are no taxes
- unlimited personal and company borrowing is possible at the same rate of interest
- debt is risk-free
- there are no agency costs
- there are no information asymmetries.

The arguments in the MM model revolve round the concept of risk and return. When a company is financed by equity alone, the shareholders only face *business risk*. As debt increases in the business, shareholders face increased *financial risk* as returns become more volatile.

If there are two companies with the same business risk and the same annual earnings but with different capital structures and different market values, then by exploiting arbitrage possibilities, the values of the two companies will become equal.



Question 15.2

What is meant by “exploiting arbitrage possibilities”?



The following question is hard and you will not be expected to do this sort of question in the examination. However, it is very useful if you really want to understand the essence of the MM model.



Question 15.3

Suppose we have two companies A and B with the same business risk and annual operating profit of £1m, and the following capital structures:

	A	B
Equity	$10m$	$8m$
8% debt		$\frac{4m}{12m}$

You are going to show how arbitrage can make the value of the companies equal.

Mr Jones has £400,000 to invest. Investing in these two companies and borrowing and lending in the risk-free market are the only choices available.

- (i) What will Mr Jones earn if he puts all his savings into Company B?
- (ii) What will Mr Jones earn if he puts all his savings into Company A?
- (iii) Company A is ungeared and Company B is geared. The gearing of a portfolio is a measure of its risk, so a portfolio of Company A's shares is less risky than a portfolio of Company B's shares. Mr Jones can increase the riskiness of a portfolio that includes Company A's shares by borrowing £X in the risk-free market (which is assumed to be available to both companies and individuals at the same rate) and using all the available funds (£400,000 + £X) to invest in Company A's shares. Find the value of X that makes the two investment portfolios equally risky.
- (iv) For this value of X compare the expected returns from each of the two investment portfolios.
- (v) What will happen to the market prices of the shares in Company A and in Company B?
- (vi) Assuming that Company B's shares take all the adjustment, how far will the market price of Company B's shares fall? Explain.

So, the value of a company is independent of its financing decision.

Let's examine the *effect of gearing on the WACC*.



Question 15.4

Following arbitrage, suppose the two companies A and B ultimately have the same market value as shown below.

	A	B
Equity	$10m$	$6m$
8% debt		$\frac{4m}{6m}$
		$\underline{10m}$

Find the WACC for each company, given that the operating profit is £1m.

The MM model predicts that for companies with the same business risk and the same earnings, the WACC is the same, regardless of gearing.

Let us now consider the *effect of gearing on the return to equity*.

In the last question you will have found that the return to equity in Company A is 10% and the return to equity in Company B is 11.33%.

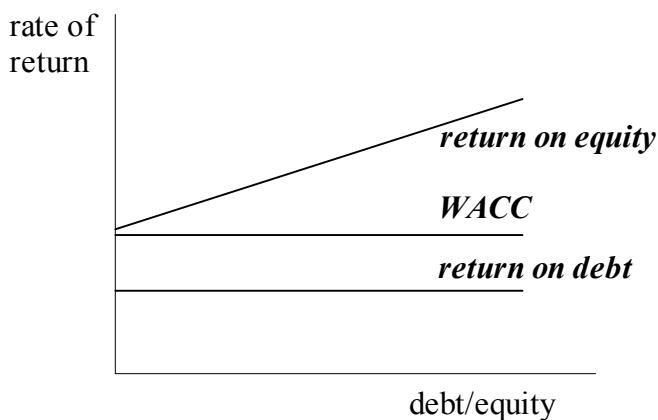


This is the basis of Modigliani and Miller's second irrelevance proposition: The expected rate of return on the common stock of a leveraged firm increases in proportion to the debt-equity ratio, expressed in market values.

Leverage is the term used in the US for gearing, so a leveraged firm is a geared firm, *ie* one that has some debt finance. Common stock refers to the company's ordinary shares.

We can see from our answer to Question 15.4, that the return to equity in Company B is higher than the return to equity in Company A by just enough to offset the higher proportion of the cheaper debt.

The following graph shows the rates of return on debt and equity for a single company as its gearing ratio increases.



Modigliani and Miller argued that the WACC remains constant as gearing increases. As gearing increases, the cost of equity increases by just enough to offset the increasing proportion of the cheaper debt.

You might think that if the expected rate of return is higher for a more highly geared structure (such as Company B's), the value of the company might increase with gearing. However, let us examine the *pattern of returns*.

In Questions 15.3 and 15.4, we assumed an operating profit of £1m. What would happen to the rates of return if operating profit were higher, or lower? Suppose operating profit could be as low as £0.5m or as high as £2m. The following tables show the possible returns.

Company A

Earnings available for shareholders (£m)	0.5	1.0	2.0
Equity (£m)	10	10	10
Return on equity (%)	5%	10%	20%

Company B

Earnings available for shareholders (£m)	0.18	0.68	1.68
Equity (£m)	6	6	6
Return on equity (%)	3%	11.33%	28%

So, although the more highly geared structure offers a higher return on equity, it also offers a higher risk. These two features cancel out to leave the price and the value of the shares unchanged.

Additionally we could argue that increasing the gearing does not give the shareholders a pattern of returns that they could not have achieved themselves by borrowing money and buying more shares.

This thinking was further developed by the Capital Asset Pricing Model (CAPM) which attempts to provide a coherent framework for understanding the interaction of risk and return. This model will be studied in detail in CT8. We will use its main conclusions in our further study of WACC.



Question 15.5

Suppose Growmore plc (see example on page 5) raises a further £50 million of debt finance in order to buy back shares with a value of £50 million.

According to MM, what would be the impact on Growmore's WACC?

Later theories

The MM theorems are a cornerstone of finance. The subsequent development of the theory of corporate finance can be described essentially as exploring the consequences of relaxing the strong MM assumptions.

The effect of tax

Interest payments on corporate debt are tax deductible, so debt finance for firms is essentially subsidised by the state, thus making debt finance more attractive.

Whilst the original MM paper argued that the cost of capital should not be dependent on the level of gearing adopted by the company, they subsequently developed an after-tax formulation.

The after-tax version examined the tax advantages of debt finance. Whereas the initial model suggested that the value of the pie is independent of how the pie is split (between debt and equity), the introduction of tax implies that there is a third slice, *ie* the government's slice. The tax system provides a tax shield (*ie* a reduction in tax) so that the value of the geared firm is the value of the ungeared firm plus the tax shield. This could suggest that firms should become 100% debt financed if we ignore other considerations!

However, Miller later found that when personal income taxes as well as corporate taxes are taken into account, the gain from a company increasing its gearing is reduced, eliminated or even negative.

The effect of different borrowing rates

If we allow for companies being able to borrow at lower rates of interest than individuals, then it means that individuals would not be able to replicate the returns from a more highly geared company by borrowing and buying more shares themselves (as MM assumed). Firms that borrow could be seen as performing a valuable function for their investors. (This point is enhanced by the fact that companies receive tax relief on their borrowings but individuals do not.)

Also, corporate rates tend to vary inversely with the size of the firm.

This implies that the WACC would decrease with increased gearing, particularly for large firms.

The effect of restricted debt capacity

The MM analysis assumed that increased debt can be raised at the same cost as before, but of course the debt is not risk-free. Loan capital providers would reassess the required return on the company's debt given the new, more highly geared and risky structure, *ie* the credit rating of the company would decrease.



Example

Suppose Growmore plc's existing and new debt are likely to trade on a level of (say) 10.25% GRY to compensate for the higher risk of default attaching to the company's debt. The equity holders have also increased their required return (to 14%) to reflect the greater risk of default and the greater volatility of the highly geared company (as discussed above). Then the cost of capital for the company would be:

$$WACC = \frac{150 \times 10.25\% + 50 \times 14\%}{200} = 11.2\%$$

ie higher than before!

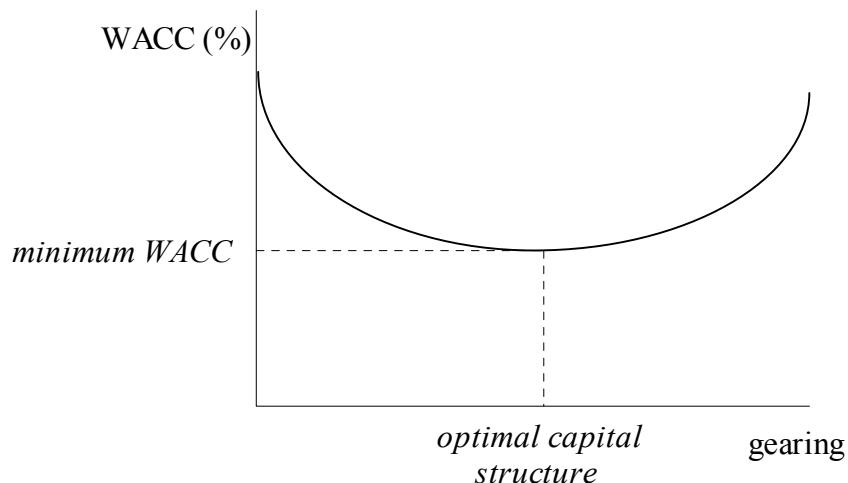
Therefore, in practice, an increase in gearing, beyond the company's debt capacity, could increase the company's WACC.

Effect of other assumptions

Work on relaxing other assumptions is beyond the requirements of the CT2 course.

Conclusion

Putting the above arguments together suggests that increasing the level of debt in the business will initially reduce the WACC as the company takes advantage of the lower cost of debt and the tax relief on debt finance. However, as debt finance increases, both equity holders and debt holders will require a higher rate of return. There will be a point at which the costs of increasing the gearing begin to outweigh the benefits and the WACC begins to increase, *i.e.* there will be an optimal capital structure.



In 1998, Myers suggested that although an optimal capital structure does exist, there is *no golden rule*: the optimum varies from firm to firm and from industry to industry. We shall study capital structure in more detail in Chapter 16.

We shall now study the cost of equity and the cost of debt separately in Sections 2 and 3 and subsequently put them together in the WACC in Section 4.

2 Cost of equity

2.1 Introduction

The cost of equity represents the opportunity cost of capital – the rate foregone by shareholders investing in the project rather than investing in alternative securities.

Risk and return

It seems reasonable that the market should reward the additional risk being taken by the equity holders. (There are investors who enjoy the gamble and opportunity to make money by beating the odds so there is no guarantee that all prefer a steady return and price to a volatile one.)

What is certain is that there are many investors who are effectively excluded from investment in equities because they cannot afford much in the way of a downside potential. So one would expect a premium on equities due to supply and demand considerations.



Question 15.6

Discuss the following two statements:

1. “Company A and Company B are identical companies except for the fact that only people with surnames that begin with an ‘M’ can hold the shares of Company B. Supply/demand issues will therefore cause the price of shares in Company B to fall below those of Company A. The expected return from shares in Company B will be higher than from those of Company A.”
2. “Many investors shy away from equity investment because the risks involved are too high, therefore the expected return from equities is higher than that from debt.”

Formula



The conventional approach to the cost of equity is to state it as:

$$\text{Cost of Equity} = \text{Risk-free rate} + \text{Equity risk premium}$$

The risk-free rate can be regarded as the return required from a risk-free asset such as a government bond. (Government bonds are often known as gilt-edged securities or gilts.)

The equity risk premium is the additional reward required by equity holders to cover the additional risk of holding shares rather than risk-free bonds.

Evidence

An obvious starting point would be to look back at historic rates of return on securities. In practice it is usual to use market indices, or bundles of representative securities, for this purpose.

Choice of the historical period

It is a matter of record that equities have performed better than fixed interest investments over any sufficiently long-term period. This is true of many stock markets worldwide. However, there is considerable volatility in price levels and on an inflation-adjusted basis there have been occasions where if one bought at a peak, it has taken 15 years for the equity portfolio to have got back to the same position.

In respect of past performance, most commentators would suggest that data taken from as long a period as possible should be used, provided that it is adequately homogenous. Clearly, if the nature of the constituents within the portfolio being analysed have changed substantially, then some sub-set of the data might be more appropriate.

Over much of the early 1990s, the return on long bonds almost matched that of equities in many markets. This was caused by a reduction in the perceived threat of inflation.

It should be borne in mind that the performance of equities over the last two decades has been partly due to a re-rating as opposed to simply the sum of the dividend yield and the dividend growth that has been achieved over the period. It is true that the dividend yield plus dividend growth would still have been higher than the yield on bonds over this period, but equity prices now trade on between 30 and 50 times their dividend compared to 20 times their dividend in the early eighties. This has been a major contributor to the performance over the period.

It may be possible to enhance the data available by using results taken more frequently, eg monthly rather than annual returns. However, it is important to interpret such data with care in order to eliminate explicit bias (such as seasonal elements) as well as statistical factors (such as the measure of volatility).

Real and nominal rates

One source of heterogeneity can be removed if real, rather than nominal, rates are analysed. Thus while the risk-free rate can be defined on a nominal basis (in which case one might use a conventional fixed-interest gilt rate of a term similar in length to the project), alternatively one can work using real returns, in which case the yield on index linked gilts can be used.

However, removing the actual inflation experienced will not address the issue of the inflation risk premium contained in the rates observed. Remember that the inflation risk premium is the additional return required by investors as compensation for an uncertain inflation rate. For this reason, it is probably more appropriate to decompose the historical data into two elements – the risk-free rate (usually taken as the return on Treasury Bills or other short-term government loans) and the risk premium (the additional return provided by the security or index under consideration). By establishing the average risk premium from historic data, we can estimate the future required opportunity cost as being the current (or expected) risk-free rate plus the expected (average) risk premium. Even so, many practitioners would adjust the risk premium to reflect their views about the relevance of past experience to future conditions.

Clearly, the choice of a real, rather than a nominal, rate will need to be reflected in the nature of the cashflows projected for discounting. Real cashflows should be discounted at a *real* rate of return, while *nominal* cashflows will need a *nominal* rate for discounting.

We shall assume here that we are concerned with the determination of a real discount rate which is to be used in conjunction with cashflows determined on the basis of present day money values excluding the effects of future price inflation. For some purposes, however, notably when the financing of the project is being considered, it may be more appropriate to allow for future price inflation in the cashflows and (where appropriate) in the financing payments. In this case a nominal discount rate equal to the real rate compounded with the assumed average rate of price inflation should be used. This may give a different result if some of the cashflows would not increase with price inflation.

Typical results

One of the most accessible studies in the UK is the Barclays Equity Gilt study. Looking at dividend yield and growth, this study calculates the historic return on equity as 5% real. Assuming a risk-free real rate of 1.5–3%, this suggests an equity risk premium of 2–3.5%.

The calculation of 5% referred to above is based on a period from 1899 to the present and it effectively looks at the growth of an index assuming reinvestment of dividends over that period and adjusted for inflation. If one simply calculates the average return, investing £1 each year and averaging the result, then the apparent return of equities would be higher. The reason for this is a direct result of the volatility of equities as in an index fund if the market halves then only half the amount is available for investment the following year. Mathematically, the long-term index return is like a geometric mean and the average annual return like an arithmetic mean. The arithmetic mean will always be greater than the geometric mean.

The above discussion is to warn the reader off any attempt for extreme accuracy where risk and uncertainty are involved. It is more important to grasp the principles than to follow a mathematical formula. At the end of the day the discount rate we use will only need to be roughly right as its main purpose is to help rank projects and not to price them exactly. As in all actuarial work, it will be consistency of approach and application of judgement that are of prime importance.

2.2 *The capital asset pricing model (CAPM) and risk*

Risk and volatility

Next it is necessary to compare the individual company and the market indices from which the historic returns were computed.

We need to find the cost of equity for a *particular* company. This cost comprises the two parts: the risk-free return and the equity risk premium for this particular company. We want to find out what return the shareholders of a particular company require. This will be related to the risk they perceive in the company's shares.

A market portfolio of equities suffers a relatively high degree of volatility. The standard deviation of annual returns of the UK stock market on a real basis is around 20%. It is equally clear from one day's observation of the stock market that not all shares move in the same direction at the same time and to the same degree.

As is well known, diversification reduces risk. Specifically, the variance (or standard deviation) of the returns experienced by individual stocks are different to (and usually greater than) the market as a whole. This is a consequence of the fact that the individual stock returns are, typically, not perfectly correlated.

Thus the portfolio variance is given by:

$$\sum_i \sum_j x_i x_j \rho_{ij} \sigma_i \sigma_j$$

where x_i , x_j are the proportions of stock i and j held, σ_i and σ_j are the standard deviations of stock returns and ρ_{ij} is the correlation coefficient between the returns on stocks i and j . This formula gives the variance of a sum of correlated random variables.

This begs the question as to what the performance volatility of an individual share is compared to the market average.

The CAPM provides a coherent theoretical framework for examining this issue.

The CAPM is only valid within a special set of assumptions. These include the following:

- investors are rational (they aim to maximise expected satisfaction) and risk-averse (they would reject a fair gamble)
- investors can borrow or lend unlimited amounts of a risk-free asset at the constant risk-free rate
- the market is efficient (lots of buyers and sellers, perfect information *etc*)
- the volatility of returns is a good measure of risk.

Although these (and other) assumptions are rarely met, CAPM is one of the most frequently used models of risk and return.

The CAPM divides the volatility of a stock's price into two parts, the specific risk and the systematic risk.

Specific risk

The meaning of specific risk can best be described using an example. A company is in the business of property development on greenfield sites (tutt, tutt). Each project involves estimating the market value of the finished property, estimating the costs involved in constructing the property and tendering a bid for the project such that the company achieves an overall return in excess of its weighted average cost of capital.

The company will be exposed to problems such as labour shortages, land/environmental problems and poor project management. On the other hand, there may be some upside risks such as good relationships with the town planners helping to smooth the planning procedure.

Another example of a specific risk a company might face is the risk of damage to the company's reputation if its products are endorsed by a famous personality who becomes the subject of some scandal.

The CAPM assumes that all shareholders hold a large, well-diversified portfolio of shares. Some companies might suffer downside risks while others benefit from upside risks. The specific risk of a portfolio of shares reduces rapidly as the number of shares in a portfolio increases from one to two to three, *etc.* Eventually by the law of large numbers you will diversify away all the specific risk in the portfolio.



Specific risk is risk that can be eliminated by diversification.

Shareholders who hold a diverse portfolio of shares will not therefore be concerned about earning a return to compensate for a company's specific risk.

Systematic risk

If shareholders hold a fully diversified portfolio of shares, they can remove all of the specific risk. However each company is still exposed to a high degree of systematic risk. Systematic risk would be the risk of being fully exposed to the economy in general. Many events can affect the market as a whole, such as movements in interest rates, inflation or currency fluctuations, and cannot be diversified away by having many shares. These events will influence the success of all of the companies.



Systematic risk or market risk cannot be diversified away.



Question 15.7

Suppose you are offered the following business deal. You have to throw a fair die a specified number of times (the number of throws is subject to negotiation). You will receive (or pay if negative) the difference between 4 and your *average* score, x , *i.e.* $(4 - x)$ times one dollar for each throw of the dice.

- (i) What would be the systematic risk if the project involves throwing the die:
 - (a) three times
 - (b) one million times?
- (ii) What would be the specific risk if the project involves throwing the die:
 - (a) three times
 - (b) one million times?



In theory, the specific risk can be diversified away on a large well spread portfolio leaving the systematic risk, which is the volatility of the individual share compared to the market as a whole which cannot be eliminated by diversification.

Shareholders who hold a diversified portfolio of shares and are considering buying a particular company's shares are therefore only interested in earning a return for that company's systematic risk. We will now look at systematic risk in more detail.

2.3 Systematic risk

There are good reasons why we are left with a considerable degree of systematic risk. Let us consider the possible sources of systematic risk.

Sources of systematic risk

Business or trade cycle

There is an underlying cycle of business activity which will tend to affect all businesses at the same time. Different business sectors may be hit earlier or later in the business cycle and so sector diversification is important. Diversification overseas will also help as not all economies move in the same cycle. Even with overseas diversification there is a considerable degree of systematic risk because the whole international economy is highly interdependent today.

Interest rates

Interest rates are a second economic influence that affects all businesses. They will affect different businesses to different degrees depending on their level of borrowing, creating specific risk. International business will be affected in different ways as interest rates can vary considerably from country to country due to currency uncertainties and the state of the local economy.

Inflation

Closely linked to interest rates is the rate of inflation. Inflation can affect companies in different ways but generally, rising inflation will depress profits short-term. However, in the long run price rises restore margins and profits have kept pace with inflation. No company can expect to escape the impact of inflation so it is a systematic risk.

Tax

Tax, especially changes in tax, can have an impact on price levels and affect all companies. This only applies to taxes that have an impact on all companies. Some taxes, eg a sales tax on beer, will affect only those companies selling beer.

Currency

Currency movements will affect all companies trading in the affected countries to different degrees.

Freak events

International crises, wars, embargoes can all affect the global economy in a way that everyone is affected.

One may speculate that natural events or man made events could cause major unpredictable systematic effects. The tsunami in the Indian Ocean in 2004 had a major impact on some countries' economies. Global warming could have a major economic impact.

This list is not exhaustive, but it does show that there are strong grounds for saying that there will be risk in equity prices that is systematic and not specific to individual companies.

**Question 15.8**

List 5 more sources of systematic risk for a fully diversified equity investor in the UK market.

Beta as a measure of systematic risk

We have said that shareholders are only interested in earning a return for the systematic risk, because they will diversify away the specific risk.

We have also said that all companies are exposed to systematic risk because they are all exposed to the market. However, some companies are more exposed to the market than others and therefore are exposed to a greater proportion of the systematic risk in the market.

We can compare individual stocks with the overall market by assessing the ***beta*** (β) of the stock.



For company i :

$$\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$$

where σ_m^2 is the variance of the market index and σ_{im} the covariance between the individual stock's return and that of the market.



An alternative expression for beta is:

$$\beta_i = \rho_{im} \frac{\sigma_i}{\sigma_m}$$

where ρ_{im} is the correlation coefficient between the individual company's stock return and that of the market, and σ_i and σ_m are the standard deviations of the company's stock return and the market index respectively.

A value of beta in excess of 1 indicates a stock that has, historically, amplified the return of the whole market (positive or negative). A beta close to zero would indicate a stock that provided a more stable return than the market as a whole. A negative beta would signify a stock whose performance was counter cyclical, offsetting the overall market experience.



Thus, beta can be regarded as a measure of the systematic risk associated with a particular stock.

If a stock has a beta of 2 in CAPM terminology, then for every percentage point performance achieved by the market *above the risk-free rate of return*, the stock would be *expected* to achieve 2 percentage points extra return. For every 1% return below the risk-free rate of return achieved by the market, the stock or portfolio would be expected to achieve a return of 2% below the risk-free return. This stock is more volatile, *ie* more risky, than the market as a whole.

Implications for the cost of equity

If the stockmarket prices risk efficiently, then a stock that has a higher standard deviation of return (riskier) should be priced to offer a correspondingly higher return. For each percentage point of extra return achieved by the market above the risk-free rate, the stock would be expected to return β_i times that extra return.

Remember that the:

$$\text{cost of equity in the market} = \text{risk-free return} + \text{equity risk premium}$$

We can estimate the cost of equity for a particular company as being:

$$r_f + \beta(r_m - r_f)$$

where r_f is the risk-free rate and $(r_m - r_f)$ is the market risk premium.

So the cost of equity for company i (r_i) is:

$$r_i = r_f + \beta_i(r_m - r_f)$$



The key result of the Capital Asset Pricing Model is that for a single stock:

Cost of equity for stock = Risk-free rate + Equity risk premium × Beta for stock

Notice that $(r_m - r_f)$ is sometimes called the market risk premium and sometimes the equity risk premium. Examiners usually call it the equity risk premium.



Question 15.9

If the risk-free rate of return is 3% and the equity risk premium is 5%, what is the cost of equity for:

- (i) Company A with a beta of 1.7
- (ii) Company B with a beta of 1
- (iii) Company C with a beta of 0.4?

CAPM states that an investor will require a higher return to invest in a more volatile and risky stock ($\beta > 1$) compared to the diversified market portfolio.



Question 15.10

If the risk-free rate of return is 5%, the equity risk premium derived from the market is 7% and Fryday plc, an ungeared company (which pays no tax), has a beta of 1.2, what would be:

- (i) the expected return from the market
- (ii) the expected return from shares in the company
- (iii) the cost of capital used by the management in evaluating projects?

Adjusting beta for gearing

The beta of a company's shares, and hence the cost of equity, is affected by the company's existing gearing. If the gearing were to change, then the volatility of returns would change, and hence the beta would change. In certain situations, we can calculate the effect of changing the gearing on beta by using the following formula:



$$\text{Geared beta} = \text{ungeared beta} \times \{1 + \text{debt:equity ratio} \times (1 - \text{tax rate})\}$$

This involves a formula relating a “geared” beta with an ungeared beta.

The derivation of this formula is not required for CT2.

This formula relies on the fact that all debt issued by the company can be issued at the risk-free rate. This is seldom the case. However, it gives an approximate result where this is not the case.

Further complications arise when we look further down the tax chain, because the formula assumes that investors receiving their returns in the form of bond interest or equity dividends apply the same criteria. Of course these two types of income stream are taxed differently in the hands of investors (see Chapter 3), so investors apply different criteria and require different returns from each type of asset.

**Example**

Fryday plc is ungeared and has a beta of 1.2. Assuming a corporation tax rate of 30%, what would the beta of the company's equity shares become if it issued an amount of debt equal to 50% of its market capitalisation and used the cash raised to repay half of the existing equity shares?

$$\begin{aligned}\text{Geared equity beta} &= \text{Ungeared Beta} \times [1 + (\text{Debt:Equity ratio}) \times (1 - t)] \\ &= 1.2 \times [1 + (1)0.7] \\ &= 2.04\end{aligned}$$

**Question 15.11**

Calculate Fryday plc's new WACC in a taxed situation, assuming that the new debt:equity ratio is 1:1 and that the gross cost of debt is 5%.

**Question 15.12**

Suppose Led plc has debt:equity ratio of 2:3, a beta of 1.2 and is taxed at 30%. How would the beta change if the debt:equity ratio increased to 3:2?



Notice that the company's current value of beta incorporates the effect of its current level of gearing. If the gearing changes, you must find the new beta in two stages: find the ungeared beta first and then find the new beta for the new level of gearing.

Measuring beta

Historical returns

If historical returns are available over a number of periods, we can define:

r_i to be the actual measured returns for stock i , and

r_m to be the market returns over the same periods,

\tilde{r}_i to be the average of the measured returns of stock i

\tilde{r}_m to be the average of the measured returns of the market

$\hat{\sigma}_m$ to be the estimated standard deviation of the market returns

$\hat{\sigma}_{i,m}$ to be the estimated covariance between the returns of stock i and returns of the market

We can then find:

$$\hat{\sigma}_m^2 = \frac{\sum_j (r_{mj} - \tilde{r}_m)^2}{n-1}$$

$$\hat{\sigma}_{i,m} = \frac{\sum_j (r_{ij} - \tilde{r}_i) \times (r_{mj} - \tilde{r}_m)}{n-1}$$

and hence estimate:

$$\hat{\beta}_i = \frac{\hat{\sigma}_{i,m}}{\hat{\sigma}_m^2}$$



Question 15.13

Show that if the price movements of a stock are perfectly positively correlated with the market and have the same standard deviation as the market, then the expected return from that stock must be equal to the expected return from the market.

Regression

Alternatively we can estimate β_i by regressing the share's returns against returns on the market index. The regression fits the best estimate of beta in the model:
$$r_i = r_f + \beta_i(r_m - r_f).$$

Quick method

The beta measures the “additional return achieved by the market above the risk-free return”. However in practice, given the imprecise nature of such analyses, the risk-free return on a short-term basis (daily or weekly) is set equal to zero. So if, over short time periods, the stock is observed on average to change by 60% of the market’s change, it is said to have a beta of 0.6.

However, note that estimates of a company's beta, derived from regressing the company's stock price performance on that of the market, will vary with the period over which the estimation is made. Additionally, an internal estimate for beta will typically span a wide range of values, due to the high standard error associated with the regression.

Using an industry beta

One way of improving the estimate is to use an *industry* beta based on a group of similar companies.

By “similar” we mean more than that they are all engaged in similar activities, as the nature of their activities will only affect the *business* risk of the company or industry. Geographic areas of operation will be important, but we also need to ensure that they face similar *financial* risk – that is, that they have similar capital structures. Crude values of beta derived from historic observations will be influenced by *financial leverage (or gearing)*, and this needs to be allowed for in our calculations.

Different companies have different levels of gearing. Since gearing affects beta, in estimating its own beta, a company will need to adjust the industry beta to allow for any difference in gearing between itself and the industry as a whole.

There is some controversy over the correct value of betas for different sectors. They are not necessarily stable over time. By the time the observation period is over, the market, the economic environment and the particular companies being observed have all changed, so the beta estimated using past data will not necessarily be a good estimate of the current or future value of beta.

2.4 Market derived real discount rate

An alternative (approximate) way to calculate the cost of equity is to look at the dividend yield and add this to the forecast future real growth rate of dividends.

This is based around the discussion earlier in this course, where we established that a holder of an equity share receives an income stream and a capital gain caused by growth in the share price. So an investor who paid P for an equity share will receive an annualised return on this investment equal to

$$\frac{\text{annual dividend income}}{P} + \frac{\text{expected share price growth per annum}}{P}$$

$$= d + g$$

where d is the dividend yield and g is the annual rate of growth in share price.

We showed earlier that the price of a share will grow each year in line with the growth in the dividend payable. In other words g will in fact be the annual rate of growth in dividends.



Thus the total expected return from investing in a share is the dividend yield plus the growth in dividends.

If the market as a whole is made up of many rational investors, then the overall expected return from an equity share ($d + g$) will be equal to the overall required return by all the investors. This is one of the basic functions of the market – to find the equilibrium price at which investors' required returns are matched by their expected returns. (Presumably if the expected return was greater than the required return overall, rational investors would buy the shares until the price rose sufficiently to make the two equal!)

3 Cost of debt

Having looked at the cost of equity, **we now need to consider the cost of the debt capital used by the company**, which is the other component of the WACC.

3.1 Marginal or average cost?

In deciding the relevant cost one needs to assess whether it is the marginal cost (ie the cost of raising further debt) or the average cost (ie the average cost of the existing plus new debt) that matters. Marginal cost adds new complexity. If new debt is being raised to help finance a project then it would be reasonable to use the marginal cost.



Question 15.14

Discuss the statement: "If new capital is being raised to help finance a project then it would be reasonable to use the marginal cost."

3.2 Determinants of the cost of debt

The cost of debt will vary from company to company depending on its credit worthiness, often expressed as a credit rating. The cost of debt will be related to the credit rating. The lower the credit rating the more the company will have to pay for debt.

What do the credit rating and the cost of debt depend on?

Interest and asset cover

The debt carrier will look at the security provided and the key components of this will be the cover provided in the form of net assets to amount at risk and profits before tax and interest to debt interest. The credit rating agencies will assess risk of default that will depend on the level of interest cover and the volatility of the profit stream.

An investor in debt securities will worry about the company's ability to repay the nominal amount of the loan at maturity or earlier in the event of a wind-up, and will worry about the company's ability to pay the interest payments on the debt. These were discussed in Chapter 12 where we looked at accounting ratios.

As a reminder, this risk can be measured by looking at:

$$\text{Asset cover} = \frac{\text{total assets} - \text{current liabilities} - \text{intangible assets}}{\text{loan capital} + (\text{all prior charges})}$$

and

$$\text{Interest cover} = \frac{\text{profit on ordinary activities before interest and taxation}}{\text{annual interest payments due on that issue of loan stock} + \text{all prior loan stock}}$$

Gearing

The marginal cost of debt will increase as the level of debt is pushed up because of the adverse effect on the company's credit rating.

Beta

The beta can therefore have a direct effect on the credit rating since a high beta will indicate more volatile profits. The level of gearing itself will increase the beta. There comes a point where taking on further debt increases the average cost of capital because of these secondary effects.

Tax

The cost of debt capital can usually be offset against profits and serve to reduce the effective cost of debt.

We discussed this earlier – the Government pays $t \times$ (the gross bond income) on behalf of the company.

A new company may not yet be in the position of making profits and so is at a disadvantage. In assessing the cost of debt it is necessary to make an assumption as to when profits will arise. A reduced rate of tax deduction to reflect the deferment may be used.

Thus:



Net cost of debt = Cost of debt depending on rating of company $\times (1 - \text{tax rate})$

4 Weighted average cost of capital

4.1 The calculation of WACC

We shall just recap on the main points derived in this chapter.

The Weighted Average Cost of Capital (WACC) is calculated by looking at the mix of debt and equity actually employed and so will result in a value below the cost of equity. The relevant formula is:



Weighted Average Cost of Capital

$$= \frac{(\text{Cost of Equity} \times \text{equity capital} + \text{Net Cost of Debt} \times \text{debt capital})}{\text{Total Capital}}$$

The *cost of equity* is the required return by shareholders when they invest in the equity shares. That is

$$\text{cost of equity} = \text{risk-free rate} + \text{geared beta} \times \text{equity risk premium}$$

When using the formula above it is important to remember the effect of gearing on the riskiness (and hence the required return) from an equity share. The expected return from equity (*i.e.* the cost of equity) rises as gearing increases. This reflects the increased risk of default and increased volatility of return. To find out the effect on the cost of equity of increased gearing, first find the effect on beta by the following formula:

$$\text{geared beta} = \text{ungeared beta} \times \{1 + \text{gearing} \times (1 - \text{tax rate})\}$$

and then find the effect on the cost of equity.

The *net cost of debt* is the gross expected return by bondholders that are currently holding the bonds – *i.e.* the gross redemption yield – adjusted for the favourable treatment of debt finance in the corporation tax system. That is:

$$\text{net cost of debt} = \text{gross cost of debt} \times (1 - \text{tax rate})$$

Remember that the gross cost of debt depends on the company's credit rating.

The weighting factors are the market values of the various components of capital.

The above formula can be used to estimate the WACC at different debt:equity ratios.

**Question 15.15**

Spire plc has a debt:equity ratio of 1:1. The risk-free rate of return is 4%, the equity risk premium derived from the market is 6% and the gross cost of debt is 4%. Its beta is 1.5 and assume any profit is taxed at 30%.

- (i) Calculate its weighted average cost of capital.
- (ii) Spire is concerned about its high debt:equity ratio. If Spire were to repay all debt, what would be the required return to equity?
- (iii) Spire decides against repaying all debt but instead embarks on a rights issue in order to reduce its debt:equity ratio from its current position of 1:1 to a new position of 1:3. Calculate its weighted average cost of capital after the rights issue.

State any assumptions that you make.

4.2 Uses of WACC

WACC is a consideration in the determination of the capital structure of the company (the financing decision) and in the capital project appraisal process (the investment decision).



Examination questions on this topic have, in the past, often asked for calculations (as above). These questions are sometimes linked with a discussion of the gearing decision (covered in Chapter 16) since the effect of a change in gearing on the cost of capital is clearly an important consideration in the gearing decision, but not the only one. More often, these questions have been linked with project appraisal (covered in Chapters 17 and 18) since the main use of WACC is as the discount rate in a net present value calculation.



Chapter 15 Summary

Cost of capital

The cost of capital is important for both the financing decision and the investment decision.

The weighted average cost of capital (WACC) is found as follows.

WACC

$$= \frac{(cost\ of\ equity \times equity\ capital + net\ cost\ of\ debt \times debt\ capital)}{total\ capital}$$

Modigliani and Miller

According to Modigliani and Miller's first irrelevance proposition, the market value of any firm is independent of its capital structure. According to their second irrelevance proposition, the expected rate of return on the company's shares increases in proportion to the debt-equity ratio, expressed in market values.

These propositions are only valid under certain assumptions, in particular in a world with no taxes.

CAPM

The CAPM offers many useful results, which can be used to evaluate a company's WACC.

The *beta* of a company is a measure of the systematic risk inherent in its profit stream. It reflects the volatility of the company's share price and how the share price returns are correlated with the returns from a fully diversified portfolio (the market). The expected return from a share is related to its volatility (and beta) by the following formula:

$$cost\ of\ equity = risk-free\ rate + beta \times equity\ risk\ premium$$

where the beta is appropriate for the equity shares, and allows for the company's level of gearing.

The tax system rewards the issue of debt and therefore the *net cost of debt* to a company will be $(1 - t) \times the\ gross\ cost\ of\ debt$.

Risk

The risks of investing in a company's shares (or a project) can be divided into two types:

1. Specific risk the risk that the return from one company's shares (or one project) may differ from the overall expected return from a well-diversified portfolio containing many such shares (or many projects)
2. Systematic risk the risk that cannot be eliminated via diversification.

Chapter 15 Solutions

Solution 15.1

The initial cost to the company of issuing debt is clearly higher than the initial cost of issuing equity (4% relative to 10%).

However the equity shareholders are accepting a greater risk, and must therefore be expecting a greater return. This greater return must be expected in the form of capital growth through retained earnings and increasing dividends. If the equity investors are pricing the equity correctly (and we should assume that they are) then the dividends will increase at a sufficient rate that the overall return to equity holders will be greater than 10%. Thus the ultimate cost to the company will be greater than 10%.

The cost of equity should be greater over the long term.

Solution 15.2

Arbitrage is the buying and selling of financial assets in order to make a profit from known pricing anomalies.

Solution 15.3

- (i) Mr Jones could buy 5% of Company B's equity with his £400,000, and so will earn 5% of Company B's income after interest payments, *i.e.* 5% of £680,000 = £34,000.
- (ii) Mr Jones could buy 4% of Company A. He would then earn 4% of Company A's income, *i.e.* 4% of £1m = £40,000.
- (iii) To maintain the same risk, Mr Jones would have to gear up to reach the same debt:equity ratio as Company B, *i.e.* 1:2. Mr Jones could therefore borrow £200,000 at 8% to put with his £400,000 and therefore buy 6% of Company A.
- (iv) £600,000 of Company A's shares would allow Mr Jones to earn £60,000. After paying interest on his loan of £16,000, he would earn £44,000. A portfolio of Company B's shares would earn £34,000 (see (i)).

- (v) Since he could earn £44,000 from Company A for the same level of risk as he takes in earning £34,000 from Company B, Mr Jones will want to buy Company A's shares. If all other investors are selling Company B's shares and buying Company A's shares, the market price of Company B's shares will fall and/or the market price of Company A's shares will rise. The process will continue until there are no further opportunities for arbitrage profits.
- (vi) Assuming that Company B's shares take all the adjustment, Company B's shares will fall until they are worth £6m.

Why £6m?

When the shares are worth £6m, 5% of Company B's shares will buy only 3% of Company A, *ie* £300,000. To achieve the same level of gearing as Company B, Mr Jones would have to borrow £200,000 at 8% and hence own 5% of Company A. This would give a return of £50,000, and so, after paying interest, he would earn £34,000 – the same as he would earn if he held Company B's shares.

Solution 15.4

Company A is financed entirely by equity. If income is £1m, and its share capital is £10m, the return to equity is 10%. The WACC is therefore 10%.

Company B has 60% of its finance in the form of equity and 40% in debt.

The return to equity is $(£1m - £320,000)/6m = 11.33\%$

The return to debtholders is 8%.

So the WACC is:

$$(0.6 \times 11.33\%) + (0.4 \times 8\%) = 10\%$$

So the WACC is the same, regardless of gearing.

Notice that the return to equity holders in Company B is higher than the return to equity holders in Company A by just enough to offset the higher proportion of the cheaper debt.

Solution 15.5

The obvious conclusion would be that the weighted cost of capital would fall, because the company is now financed by £150 million of 10% debt and £50 million of 12% equity.

However this argument is flawed because the required return of equity investors would not remain constant if the company structure were changed in this way. The company is now much more highly geared and the returns to equity investors are likely to be much more volatile. In fact so much more, that the equity investors will require an expected return of 14% in order to hold the shares. The cost of capital is unchanged, being a mixture of £150 million of debt capital providers requiring 10% and £50 million of equity capital providers requiring a return of 14%.

Solution 15.6

“Supply/demand issues will therefore cause the price of the shares in Company B to fall below those of Company A”

This statement is clearly false. If the two investments are identical, then any difference in price would cause investors to arbitrage the two companies. This assumes that there are enough rational investors in the country with surnames that begin with ‘M’ to hold all the shares, which there are!

“The expected return from shares in Company B will be higher than from those of Company A”

If the shares in Company B were standing at a price below those of Company A then this statement would be correct. However we have discounted the possibility that the shares of Company B would fall below the price of shares in Company A, therefore the statement is irrelevant in this context.

“... the expected return from equities is higher than that of debt”

This statement is correct. If only a restricted subset of investors can tolerate the risk of investing in equities, then the expected return offered by the investment would have to be higher to attract the investors.

The reason that Statement 2 is correct is that the supply/demand issues are caused by the *risk characteristics* of the two investments. If the supply/demand issues are caused only by a temporary disruption to the market equilibrium, then there should be no long-term effect on the ratings of the two companies.

Solution 15.7

- (i) There is no *systematic* risk in the project, whether it involves three throws of the dice or one million throws.
- (ii) If only three throws of the dice are made there is a *specific* risk that the project may yield a loss. This is a specific risk though, and could be diversified away if many such projects were undertaken (or if the die is thrown many times). The law of large numbers guarantees that ultimately the thrower will achieve an average result of 3.5 and an average profit of \$0.5 per throw.

Solution 15.8

There are many possibilities, including:

- further economic integration with the European Union
- political upset or turmoil
- bad winter weather(!)
- assassination
- war
- banking crisis
- rapid changes in the economic or industrial environment
- any sudden change in investors' confidence levels.

Solution 15.9

$$(i) \quad r_A = 3\% + 1.7(5\%) = 11.5\%$$

$$(ii) \quad r_B = 3\% + 1(5\%) = 8\%$$

$$(iii) \quad r_C = 3\% + 0.4(5\%) = 5\%$$

Solution 15.10

$$\begin{aligned} \text{(i) Market return} &= \text{risk-free return} + \text{equity risk premium} \\ &= 5\% + 7\% = 12\% \end{aligned}$$

$$\begin{aligned} \text{(ii) Equity share return} &= \text{risk-free return} + \text{beta} \times (\text{equity risk premium}) \\ &= 5\% + 1.2 \times 7\% = 13.4\% \end{aligned}$$

(iii) Cost of capital should be 13.4% as above to meet investors' expectations. This of course assumes that no tax is payable, and that a project that yields a return of 13.4% would offer the same return to equity shareholders.

Solution 15.11

The example has shown that the new beta will be 2.04. The new cost of equity is therefore:

$$5\% + 2.04(7\%) = 19.28\%$$

The net cost of debt will be:

$$5\% \times (1 - 0.3) = 3.5\%$$

Thus the new WACC will be:

$$\frac{1}{2}(19.28\%) + \frac{1}{2}(3.5\%) = 11.39\%$$

Solution 15.12

We need to find the ungeared beta first. Using the formula:

$$\beta_g = \beta_u \times \left(1 + \frac{D}{E} (1 - t) \right)$$

and substituting values:

$$\begin{aligned} 1.2 &= \beta_u \times \left(1 + \frac{2}{3} (1 - 0.3) \right) \\ &= \beta_u \times 1.4667 \end{aligned}$$

$$\Rightarrow \beta_u = 0.8182$$

Therefore the new geared beta is:

$$\begin{aligned} \beta_g &= 0.8182 \times \left(1 + \frac{3}{2} (1 - 0.3) \right) \\ &= 0.8182 \times 2.05 \\ &= 1.6773 \end{aligned}$$

Solution 15.13

If the stock and the market are perfectly correlated ($\rho_{i,m} = 1$) and have the same standard deviation ($\sigma_i = \sigma_m$), then:

$$\sigma_{i,m} = \rho_{i,m} \sigma_i \sigma_m$$

$$\sigma_{i,m} = 1 \times \sigma_i \times \sigma_m = \sigma_m^2$$

$$\text{so } \beta_i = \frac{\sigma_{i,m}}{\sigma_m^2} = 1 \text{ and so } r_i = r_f + \beta_i (r_m - r_f) = r_m.$$

Alternatively:

$$\beta_i = \rho_{i,m} \frac{\sigma_i}{\sigma_m} = 1 \times \frac{\sigma_m}{\sigma_m} = 1 \text{ and so } r_i = r_f + \beta_i (r_m - r_f) = r_m$$

Solution 15.14

If a company raises a significant amount of new finance to undertake a project, then the overall structure of the company will be altered. It is likely that the overall risk characteristics of its earnings will be altered. In this respect the WACC calculated for the company before it undertook the expansion will no longer be relevant, and the expectations of equity investors may change. It is necessary to re-evaluate the company's WACC bringing the new risks into account.

As such, the actual cost of raising the new capital might be a useful indicator of the new cost of capital. Investors providing new capital to the company will focus on the risk characteristics of the company after the expansion. Their expected return will therefore be consistent with the risks involved in the new expanded company. The costs of the new capital will therefore provide an estimate of the company's new WACC. For example, if additional debt is raised, interest cover and asset cover will fall, credit rating may fall and the cost of debt could rise.

If the project is being financed out of existing capital, we cannot identify a marginal bit that is being used, so the capital being used costs the same as all the company's capital. However, it may be necessary to use a different WACC. This would depend on whether the new project is a departure from the normal profile of the company. However if this is not the case, the old WACC can be used.

Solution 15.15

(i) *Spire plc's weighted average cost of capital*

$$\text{Spire plc's cost of equity} = \text{risk-free return} + \text{beta} \times (\text{equity risk premium})$$

$$= 4\% + (1.5 \times 6\%) = 13\%$$

$$\text{Spire plc's net cost of debt} = \text{gross cost of debt} \times (1 - t)$$

$$= 4\% (0.7) = 2.8\%$$

$$\text{Thus Spire plc's WACC} = (0.5 \times 13\%) + (0.5 \times 2.8\%) = 7.9\%.$$

(ii) ***The required return to equity if Spire plc were to repay all debt***

To find the new required return to equity, we need to find the ungeared beta.

Since debt can be raised at the risk-free rate, we can use the following formula:

$$\beta_g = \beta_u \times \left(1 + \frac{D}{E}(1-t)\right)$$

to find the ungeared beta. Thus:

$$\begin{aligned} 1.5 &= \beta_u \times \left(1 + \frac{1}{1}(1 - 0.3)\right) \\ &= \beta_u \times 1.7 \end{aligned}$$

$$\Rightarrow \beta_u = 0.88235$$

Thus the new cost of equity would be:

$$4\% + (0.88235 \times 6\%) = 9.29\%$$

(iii) ***The weighted average cost of capital following the rights issue***

To find the new required return to equity, we need to find the new geared beta.

$$\begin{aligned} \beta_g &= \beta_u \times \left(1 + \frac{D}{E}(1-t)\right) \\ &= 0.88235 \left(1 + \frac{1}{3}(1 - 0.3)\right) \\ &= 1.08823 \end{aligned}$$

Thus the new cost of equity will be:

$$4\% + (1.08823 \times 6\%) = 10.53\%$$

Assuming the net cost of debt remains at 2.8%, then the new WACC can be found.

$$\text{Spire plc's WACC} = (0.75 \times 10.53\%) + (0.25 \times 2.8\%) = 8.6\%.$$

Chapter 16

Capital structure and dividend policy



Syllabus objectives

- (vi) *Discuss the factors to be considered by a company when deciding on its capital structure and dividend policy.*
1. *Describe the effect that the capital structure used by a company will have on the market valuation of the company.*
 2. *Describe the effect of taxation on the capital structure used by a company.*
 3. *Discuss the principal factors that a company should consider in setting dividend policy.*
 4. *Discuss alternative ways of distributing profits, such as buybacks.*
 5. *Discuss the effect that the dividend policy will have on the market valuation of a company.*

0 Introduction

This chapter has two main sections.

In Section 1, we investigate the gearing decision, *ie* the ratio of debt to equity in the company's capital structure. This is explored under the following headings:

- the capital structure
- the aims of the financial manager
- the assets of the business and their financing needs
- changes in the capital structure
- theoretical background to the gearing decision
- factors affecting the gearing decision in practice.

In Section 2, we investigate the dividend decision under the following headings:

- the fundamentals of dividend policy
- other methods of rewarding shareholders
- the market and dividends.



In the past, the examination has tested *knowledge* of the factors affecting the gearing and dividend decisions; *understanding of the implications* of a particular gearing or dividend decision on the market valuation of a company; and the *ability to evaluate* the appropriateness of the gearing and dividend decisions of a particular company.

Corporation tax

As mentioned in Chapter 3 (Taxation), for ease of calculation, we will assume a corporation tax rate of 30% in this chapter, unless otherwise stated.

1 Capital structure

1.1 Components of capital structure

The components of the capital of a limited company are:

- equity capital
- short and medium-term debt
- long-term debt

as described in Chapters 2 and 4.

When we discuss a company's capital structure, we are mainly concerned with the debt-equity decision that the company takes. The proportion of debt to equity is measured by the *gearing* ratio.

1.2 The aims of the financial manager

The financial managers of a company seek to maximise the return to the owners of the equity, within the parameters that the latter set out. These involve:

- the variability of anticipated returns (having regard to the nature of the business)
- the owners' desire for immediate profit rather than future high growth
- the degree to which risk should be carried by the owners

The management of a company can control the variability of the profits of the company by, for example:

- increasing or decreasing the gearing (ratio of debt to equity capital)
- negotiating clauses in the contracts with suppliers which remove certain risks from shareholders
- taking out insurance against certain risks and the use of export guarantees
- other risk management measures including financial risk control and financial hedging using derivatives.



Question 16.1

Describe how each of the above might affect the expected return to shareholders.

- **the willingness (or otherwise) of the owners to put additional capital into the business**
- **their willingness to see a reduction in the proportion of the business which they own**

When a company wishes to raise further capital for expansion, the existing shareholders normally have pre-emptive rights that give them the right to participate in the issue.

These rights give existing shareholders the opportunity to maintain their proportional shareholding in the company, and hence their voting rights and their degree of control over the company. If they do not wish to contribute any additional finance, they have two options:

- (i) shareholders can attempt to stop the issue through their existing control. This is hard to do in medium to large companies because the shares are so diversely owned, and organising any combined action is notoriously difficult. Or
- (ii) shareholders can accept a “dilution” of their holding by selling their nil-paid rights. (See Chapter 6.) This means that other investors are able to buy shares, and the proportion of the company held by the original shareholders reduces (although its value should remain the same).



Question 16.2

Why do regulations require that shareholders have pre-emptive rights?



Question 16.3

Greedy AG is quoted on the US Stock Exchange and has raised new finance on numerous occasions in the last 2 years. Following its announcement that it is to have a further rights issue, an investor decides that he is no longer willing to commit fresh funds to the company. Calculate what proportion of the company he will own and the value of that holding (assuming no unexpected share price movements) if he does *nothing* at all during the rights issue. The details are as follows:

Stock price: \$3 per share

Rights details: a one for 2 at \$2.50 per share

Current holding: investor holds 1 million shares representing 1% of the company.

1.3 Assets and their financing needs

Assets of a business can be divided into:

- **non-current assets such as land, property, plant, equipment and “intangibles”**
- **current assets such as inventories, work-in-progress, debtor balances, cash (and equivalents).**

Intangibles are assets that you can't physically lay your hands on, such as copyrights, patents, trademarks and goodwill. These were discussed in Chapter 8.

The following table gives examples of the sorts of non-current and current assets that may be found in the accounts of a typical car dealership:

<i>Current Assets</i>	<i>Non-current Assets</i>
Cash	Cash register
Spare parts	Petrol Pumps
Tyres and Batteries	Tow vehicle
Debtors	Land & Buildings

Current assets form the working capital of the business and a certain level of these will have to be permanent for a business to survive. Also, in cyclical businesses current assets will fluctuate with the cycle in that industry. Thus both non-current and current assets have to be financed on a long-term basis.

1.4 Changing the capital structure

The need for change

In most cases, the need for change in capital structure arises from the desire to expand the business or enter into new or additional capital projects.

Another reason for changing capital structure is where the business finds itself with excess cash that it cannot profitably utilise, and so it returns this to shareholders by way of a share “buyback”.

Companies may also wish to deliberately pursue a particular level of gearing. For example, a company might raise debt finance to fund a share buyback operation in order to increase its gearing.

We will assume, however, that a company is raising finance to fund expansion.

Retained earnings

Retained profits are the simplest and most accessible source of finance. However:

- **Shareholders may demand immediate release of profits as dividends.**
- **There may not be sufficient accumulated funds to finance projects when required.**

Retained earnings tend to be “slow and steady” in nature, accruing gradually over the years. The opposite is often true of expansion projects and takeovers, which can be very “lumpy” in nature. It can also be the case that the profits of a growing company are accounting profits and do not accrue in the form of cash. This can make it difficult to use such profits to finance projects.



Question 16.4

Explain why accounting profits for a financial year might not equate to the increase in the cash balance.

Equity finance

Due to the cost, delay and unpopularity of raising new equity finance (particularly for comparatively small sums), other forms of finance are typically used – at least initially.

Other forms of finance

Most businesses can choose alternatives such as borrowing, lease of assets, sale and leaseback or the use of trade credit to finance turnover. (Sale and leaseback is where the owner of an asset sells it to an institutional investor who then leases it back to the original owner. In this way the owner releases the capital tied up in the asset.)

However, these alternative financing solutions have their drawbacks. Leased assets may become of lower value than expected before the expiry of the lease (due to innovation or a change in business strategy).

Sale and leaseback forgoes flexibility and the possible future appreciation in the value of the property.

Borrowing to finance projects is, therefore, typically required.



Example

WrongTurn Ltd owns a prime property in the centre of London which it uses as office space and to house its distribution activities. The building is larger than it requires and it has leased part of the building out to another tenant.

In order to repay all of its debt, the management decides to arrange a sale and leaseback with a bank, under which the bank accepts to buy the building at a 20% discount to the current market value, and in return the company will pay a rent which is 20% less than the current market rent for such office space.

After 5 years the company reviews the decision and finds:

- (i) the value of the building has risen by 70%.
- (ii) the company has expanded and requires extra space. Unfortunately it can no longer remove the other tenant from the building. It may have to consider moving to a different location and losing the benefit of the sub-market rent.
- (iii) It has surplus cash in the balance sheet, which is earning money market rates of interest. It would like to invest this in the business if it could find the floor space.

The moral is that the decision whether to buy an asset or lease an asset can have very real implications for a company and should not be taken lightly. There will be arguments for both routes, and often considerable pressure on the company to adopt one approach. Only with hindsight is it possible to determine which approach was correct.

The use of these alternative forms of finance is constrained by:

- **the nature of the business and its assets**
- **the degree of gearing considered acceptable**
- **the effects of taxation**

and these are reflected in the credit-worthiness rating of the business.

1.5 Theoretical background to the gearing decision

In Chapter 15 we discussed the theories of Modigliani and Miller.



Question 16.5

What do these theories say about the effect of capital structure on:

- (i) the market value of a company
- (ii) the WACC?

If gearing were completely irrelevant as the MM theories suggest, we would see that gearing ratios varied *randomly* between industries and between firms within industries. Yet we don't see this. We find, for example, that particular industries are highly geared while others are lowly geared. This suggests that gearing is important and that companies adjust their gearing until it is appropriate. According to Myers, there is an optimal capital structure but there is no golden rule: the optimal capital structure might be different for different industries and for different firms within an industry.

So how can an optimal capital structure be explained? The determinants of the gearing decision lie mainly in the assumptions of the MM theory.



Question 16.6

Modigliani and Miller made a number of assumptions. The following were the most important:

- there are no taxes
- individuals can borrow at the same rate as companies
- debt is risk-free.

What are the implications of relaxing each of these assumptions?

If you cannot remember the discussion of the MM theory and the relaxation of its assumptions, refer back to Section 1 of Chapter 15. You will notice that some of the other assumptions of the model are relaxed and therefore put forward as determinants of the gearing decision in the discussion below.

1.6 Factors affecting the gearing decision in practice

The nature of the business and its assets

Some businesses – for example, banks and property companies – will use a high proportion of debt financing due to the nature of their assets (loans to customers, leased properties). Others – for example mineral prospectors or IT developers – will have very limited tangible assets and will need to rely on equity finance. Most businesses, however, lie between these two extremes.

In the case of high-risk businesses or businesses with very little asset backing (like advertising agencies), banks are often unwilling to accept the types of risk involved in the company. An IT company for example may not be able to provide the long-term guarantees required by the bank to enable the bank to provide the finance, at least on the terms the company is willing to pay. Many companies have very little in the way of physical assets to pledge as collateral for the loan (management consultants for example). Their assets tend to be in the form of human capital. In such cases the terms of the loan may be prohibitively expensive for the company to bear.

Financial risk

As a business expands its gearing – the ratio of debt to equity – the costs of financial failure rise. In the end, losses can wipe out not merely the assets financed by the loans, but also those financed by the equity, at which point the business is bankrupt.

This must be balanced against the *higher expected return* for the shareholders.

Consider the following two scenarios for a property company, Company X:

(figures in £ millions)	Scenario 1	Scenario 2
Assets		
Property	10	20
Cash	1	1
Total	11	21
Liabilities		
Share capital	2	2
Loan stock	9	19
Total	11	21

Scenario 1 shows a geared company that has raised £2 million from shareholders and a further £9 million in the form of debt. It has used these funds to buy assets worth £11 million. Scenario 2 differs from Scenario 1 only in the amount that the company has borrowed in the form of debt.

Under Scenario 1, it would require a £2 million (or 20%) devaluation of property to wipe out the value of the investment of the equity investors. In other words, if the value of property fell by 20%, the property and cash assets that the company owns would be worth £9 million, which is just sufficient to pay the bondholders.

In Scenario 2 only a 10% drop in the value of the property portfolio is needed to wipe out all of the equity investors' value.

The potential reward for investors is greater under Scenario 2 because equity shareholders gain more for each percentage point that the property portfolio increases in value. They will also gain from the fact that the financing cost of debt will be lower than the return the company is generating on its assets, so even if property prices do not rise, equity shareholders will get a higher return. However most investors would *require* a greater prospective return from their investment to warrant taking the increased risk of Scenario 2. As such, the price they would be willing to pay for the equity may well need to be lower – *ie* the price of the equity could fall in the secondary market.

The greater the debt, the less likely it is that the available assets (possibly realised in “distress” circumstances) will be able to pay off all the creditors in full. In addition, the holders of the equity will become concerned that, should the business hit a bad patch, the interest burden will be such as to leave nothing for them.

The cost of debt and equity

Debt finance is cheaper than equity finance because debtholders bear a lower risk than shareholders. Also interest on debt finance is tax deductible whereas dividend payments are not. However, as gearing increases, the cost of both debt and equity increases as the risk increases to both lenders and shareholders.

Thus lenders will wish to consider the burden of existing debt before providing further funds. Credit rating agencies monitor the financial status of major companies (and others, on request). The down-rating of a company can have a major impact on the cost of its existing debt and its ability to borrow more.

Companies have rolling overdraft facilities and short-term finance agreements with banks that are often specifically linked to the company's published credit rating (Standard & Poors, Moody's or Fitch IBCA are among the largest rating companies). Thus, a down-rating can have an immediate effect on the cost of borrowing. More obviously, when a company rolls over its medium and long-term loans, the interest rate it will need to pay to attract investors will be directly affected by investors' perception of its long-term credit worthiness. Many investors are happy to let the credit rating agencies do this work for them, and accept their judgement.

Companies often refer to the risk to their business caused by such a down-rating as "reputation risk".

Availability of finance

This is very much linked with the last point. The company may wish to raise a particular form of finance but the providers of debt or equity might be unwilling to provide it (or perhaps are only willing to provide it at very high rates of return).

For example, if a particular project is large in comparison to the business as a whole, the lender may not be prepared to lend the *amount* of capital required, and may wish to add *covenants* to the loan agreement restricting the amount of further debt the company can raise.



Question 16.7

Explain why a bank might be unwilling to finance the whole of a project, despite the fact that it considers the project to be profitable and secure.

Where the providers are institutions, rather than individuals, there may be *rules* restricting investment in companies with high levels of gearing.

Control of the business

Shareholders may not wish to see their control in the business *diluted* by increases in equity. In this case, they could either take up any rights issues offered, or, if they did not wish to or could not afford to take up any new rights, they could try to persuade the company to raise the funds in an alternative way.

It is thought that managerial incentives and hence *agency costs* might change with gearing. As debt increases, management might be less willing to invest in risky projects. Agency costs, *ie* costs of monitoring management, might rise steeply beyond a certain level of gearing.

The market view

The stock market will consider every aspect of a company in making the assessment of worth that culminates in a share price. If the capital structure does not appear consistent with the other features of that assessment, the price will change to take that into account.

For example:

A high-growth company that is highly geared

Consider a medium-sized company in an industry with numerous growth opportunities that is already highly geared compared with its rivals. The value of shares may be diminished by the market's expectations that the shareholders will be asked to put up more funds. In a static or low-growth industry the converse will apply since a highly geared company is making more efficient use of the shareholders' funds.

It is argued that high-growth companies need *financial slack*, ie a cushion of equity, enabling them to raise more debt finance easily when investment opportunities present themselves. High-growth companies therefore tend to be lowly geared.

Taking our property company (Company X) from the example on page 9, there are three possible outcomes following the increase in borrowing as the company moves from Scenario 1 to Scenario 2. One of the following may occur:

- (i) Adding further debt to the company's financial structure is likely to reduce the interest cover of the existing debt. (We defined interest cover in Chapter 12.) Investors could become worried that the company may soon be forced to come to the market to raise more equity finance, because it can no longer finance the *interest* burden of the new debt. Any increase in the supply of equity would depress the current value of the existing equity.
- (ii) Equity shareholders may become worried about the prospective volatility of *market prices* of property and their effect on the residual value of the company. Due to fears that the chances of a 10% down-valuation in property prices (ie sufficient under Scenario 2 to bankrupt the company) are quite high, the value of the equity might fall.

- (iii) Provided the property market was predicted to be quite stable investors might be quite glad of the additional gearing. The equity shareholders will receive better returns from a slow and steady increase in property values under Scenario 2. The addition of debt will also make the structure of the company more tax efficient and offer higher returns to equity shareholders (this is discussed later in the chapter). Therefore the equity shares may appreciate in value because the new structure is better suited to the investors' desired risk profile.

A cyclical industry

The most efficient company will have a high debt to equity ratio when activity is at its peak, but will be structured so that this debt can be reduced greatly as the trough approaches. In a downturn, activity will reduce and the company will need less capital. Profits and therefore interest cover will fall, so it is desirable to reduce debt finance. **Here it is the term structure of the loan capital that will influence the valuation of the equity.**

An industry facing decline

In an industry facing decline, the management will need to diversify or go out of business. If the company diversifies, it will be capital-hungry and will also need to adapt its capital structure to that of the industry to which it is seeking to move while reducing (by liquidation, if necessary) exposure to the business in decline. If closure of the company is chosen, then the less debt in the capital structure the better.

Often declining industries can be used as “cash cows” to finance the diversification into newer areas, reducing the requirement to raise further capital elsewhere. Because the management has no desire to channel profits into further investment in the old industry, they can take profits as cash and use them for investment elsewhere.

“People” businesses

Consider the case of so called **“people” businesses, where the skills and abilities of certain groups of staff and management are in very short supply and are essential to the competitive success of the business. It may be necessary to reward some individuals by stock options or other similar schemes. However, excessive use of such arrangements can have an adverse effect on the valuation of the company’s shares.**

Share options, for example, can have a very dilutive effect on the company's earnings. The directors or management of the company are given the right to buy shares in the company at prices which might be well below the current market price – however the value of these options need not be reflected in the company's balance sheet. When these options are exercised, the money paid to the company per share can be quite low, but a normal share is created. The company's earnings are therefore divided between an ever-increasing number of shares, reducing the earnings per share growth.



Example

Microsoft issued share options worth billions of dollars to staff, none of which showed up on the balance sheet.



Question 16.8

Why might investors be concerned about the market value of outstanding share options in a company?

Companies in high-growth but high-risk industries

Some companies operate in high-growth but high-risk industries such as biotechnology or deep-sea oil exploration. Loan capital is unlikely to be available, but shareholders will need to be rewarded for the risks they must bear in the absence of cashflow to fund dividends.

Conclusion

The more a company's capital structure fits the market perception of the company's prospects, the higher the shares will be rated. There are no simple rules of thumb – everything in the market's knowledge of the business and its managers will contribute to the share price.

Notice that here we allow for *information asymmetries*. The managers will know more about the company than its shareholders. The market price of the shares will depend on the signals received by the shareholders about the company from the managers.

This concern about the market reaction can affect management's decision making. An issue of debt is often seen by the market as a sign of confidence on the part of management, whereas an issue of equity is often thought to indicate that shares are overvalued. This has led Myers to believe that there is a preferred *pecking order*: companies are likely to choose internal finance first, then debt, and finally equity.

Taxation

The main features of company taxation (as discussed in Chapter 3) imply that:

- (i) **Interest payments are tax deductible**, so the tax payable is consequently reduced.
- (ii) **Capital allowances on new plant and equipment are deductible**. In other words companies can reduce their tax liability in respect of the capital allowances on the plant and equipment they own. The amount and the structure of these allowances will influence a company's desire to invest in such equipment, which will influence their requirement for more finance.
- (iii) **Lease of plant and equipment receives tax relief**. As above the amount of relief available will influence a company's financing decisions.
- (iv) **Property rental payments receive full relief and some features of industrial buildings have capital allowances (although at a much lower rate than plant)**.

This means that the cost of the risk borne by shareholders arising from their company's debt is diminished by the reduction in corporation tax, whereas profits attributable to shareholders' funds do not benefit from such relief.

If a company borrows in the form of debt and buys assets that generate profits, the equity shareholders will benefit from:

- the fact that the payments of debt interest serve to reduce the tax liability
- the fact that the assets themselves attract allowances which can reduce the tax liability.

In effect, the taxpayer is subsidising the use of debt in the capital structure.

In addition, where a company is owned by taxpaying individuals, these individuals may not be able to obtain tax relief on their own borrowings. Thus, such companies cannot expect their shareholders to borrow in order to provide the company with extra equity capital (other things being equal).



Question 16.9

What is meant by "individuals may not be able to obtain tax relief on their borrowings"?

1.7 An illustration

We can demonstrate some of the above concepts using the income statement of WrongTurn Ltd, a company in a stable, low-growth industry. The company has investigated a potential project it would like to undertake. It requires £5 million of additional capital.

Estimated income statement for WrongTurn Ltd for the year ended 31 December 2011

(figures in £)

Operating profit	1,000,000
Interest payable on loan stock (£5 million @ 10%)	(500,000)
Profit before tax	500,000
Tax @ 30%	(150,000)
Profit after tax (Earnings)	350,000
<i>Earnings per share</i>	<i>25p</i>
The company made dividend payments of £196,000, ie 14p per share on 1.4 million shares, in respect of the year ending 31 December 2011.	
Increase in retained earnings	154,000

The following analysis makes use of some accounting and investment ratios that you met in Chapter 12. It might be quite obvious what these ratios represent, but if not, remind yourself of them by revisiting the relevant sections in these chapters.

If the shares currently stand in the market at a price of £2 per share and the dividend is the only dividend paid during the year we can find:

$$\text{net dividend yield} = \frac{\text{net dividend per share}}{\text{share price}} = 7\%$$

The *return on equity capital* for the shareholders (using market capitalisation as a proxy for share capital and reserves) is

$$\begin{aligned} &= \frac{\text{earnings attributable to equity shareholders}}{\text{market value of equity shares}} \\ &= \frac{350,000}{1,400,000 \times 2} = 12.5\% \end{aligned}$$

where the *market value* (or market capitalisation) of the equity shares

$$= \text{number of equity share} \times \text{share price}$$

(7% is the return in the form of immediate dividend yield and the remainder (of the 12.5%) is in the form of dividend growth through retained earnings.)

The company estimates that the project will give a return of 12% on the capital raised – *ie* on £5 million of capital invested, it would yield £600,000 per year. However, this could be as low as a 2% return (£100,000) or as high as a 22% return (£1,100,000).

Scenario 1

WrongTurn could raise the capital through an additional tranche of the loan stock @10%. Assuming additional income of £600,000 the income account for the coming year might then look as follows:

<i>(figures in £)</i>	
Operating profit	1,600,000
Interest payable on loan stock (£10 million @ 10%)	<u>(1,000,000)</u>
Profit before tax	600,000
Tax @ 30%	<u>(180,000)</u>
Profit after tax (Earnings)	420,000
<i>Earnings per share</i>	<i>30p</i>
The company made dividend payments of £196,000, <i>ie</i> 14p per share on 1.4 million shares, in respect of the year ending 31 December 2011.	
Increase in retained earnings	224,000

We have made a small leap of faith here in assuming that the company could issue more unsecured loan on the same terms as the existing debt, *ie* at 10% Gross Redemption Yield (GRY). In the real world a further issue would doubtless reduce the credit worthiness of the loan and lead to an increase in the GRY of the entire issue, including the new tranche.

This analysis also assumes that the equity share price does not move in response to the expansion.

**Question 16.10**

Repeat these calculations for the situation in which the income from the project is £100,000 and £1,100,000.

**Question 16.11**

If WrongTurn Ltd were to follow this route (Scenario 1), give three possible effects on investors' attitudes towards the shares, and explain what might happen to the share price under each scenario.

Scenario 2

Alternatively WrongTurn could raise the finance through an issue of equity. Assuming they were sold at the current price of £2 per share (though it would be more usual to issue new shares at a price below the current market price), £5 million would require the issue of an additional 2.5 million shares.

<i>(figures in £)</i>	
Operating profit	1,600,000
Interest payable on loan stock (£5 million @ 10%)	<u>(500,000)</u>
Profit before tax	1,100,000
Tax @ 30%	<u>(330,000)</u>
Profit after tax (Earnings)	770,000
<i>Earnings per share</i>	<i>19.74p</i>
The company made dividend payments of £546,000, ie 14p per share on 3.9 million shares, in respect of the year ending 31 December 2011.	
Increase in retained earnings	224,000

Again this analysis assumes that the share price does not move in response to the expansion.

Comparing Scenario 2 with Scenario 1, we can see that WrongTurn has paid £150,000 *more in tax* on its profits, simply because of the way in which it has chosen to finance the expansion.

**Question 16.12**

Repeat these calculations for the situation in which the income from the project is £100,000 and £600,000.

Compare your answers with those obtained in Question 16.10. What do you conclude?

**Question 16.13**

Give three possible scenarios for the share price if WrongTurn Ltd were to take this route (Scenario 2), and give a justification of each one.

There is therefore a powerful tax incentive for a company to borrow (or finance assets through a lease, etc) when it needs capital for expansion. However, the costs of some partial failure of the business can exceed the tax benefit that has been obtained in respect of the project and its financing. The greater the debt of a business the less likely it is that the available assets (sold in “distress” circumstances) will be able to pay off all the creditors in full if the business fails. (Remember the example of the property company, Company X on page 9.)

Thus as a business increases its gearing, the costs of financial failure rise. Financial managers of a company can use as a yardstick the maximisation of the (positive) gap between tax benefit and the distress cost of failed projects.

This could be measured by the change in shareholder value. So for example in the case of WrongTurn above, an estimate might be made of the effect on the share price under both the scenarios. Whichever is most likely to lead to a higher share price, is by definition the option which shareholders feel happiest with. Shareholders may prefer an issue of more debt because of the utilisation of the tax benefit and the higher prospective return to shareholders of the geared strategy. Alternatively, the preferred route for shareholders might involve the issue of shares because, despite the lower prospective return and tax disadvantages, the feel-good factor of the lower gearing and the reduced volatility of earnings may be more appealing in the current circumstances.

**Question 16.14**

Bearing in mind all the points discussed in this chapter, list the main factors that help to determine the proportions of finance raised by debt and equity.



This type of question has been popular with examiners, usually applied to a particular scenario. There have also been questions that concentrate on a particular aspect of capital structure, such as the tax implications of a particular source of finance or the effect of the capital structure on the share price.



Factors influencing the gearing decision are:

- asset structure of the business
- financial risk
- cost of raising and servicing the capital
- availability of debt and equity finance
- effect on control of the company
- market view
- taxation.

2 ***Dividends – the shareholders' reward***

2.1 ***Fundamentals of dividend policy***

Dividends can be seen as a financing decision – money paid out by way of dividend is no longer available for investment in the business. This is particularly true of unlisted companies since:

- the company does not have the option of raising further funds in the stock market
- the borrowing powers of unlisted companies tend to be more restricted.

On the other hand, shareholders in such companies have the converse problem – they cannot sell some shares in the market to replace dividend income.

In general, the choice for a company's board (and its shareholders) is between immediate income and the prospect of higher income at some future date. The latter will, in a listed company, be reflected in capital appreciation as the market takes that prospect into account.

Factors influencing the decision on dividend policy include:



The factors influencing the dividend decision include:

- stock markets
- cash reserves
- tax
- growth opportunities
- stability and consistency.

Stock markets

Stock markets display significant adverse reactions to announcements of dividend cuts. Managers therefore tend to conservatism in good years, particularly in cyclical industries and for smaller companies (especially those that are new to the market).



Question 16.15

The stock market is often accused of being too focused on the short term. If this is true, how could this have a negative effect on a company's long-term growth prospects?

Cash reserves

Companies with large cash reserves that fear a takeover bid may well distribute generously in order to both encourage shareholder loyalty and limit the size of the “cash pile”. There are two principal issues in this decision:

1. A higher dividend may increase the lower support level for the share price. Many stock market analysts compare shares to one another on the basis of dividend yields. Stock market analysts will find the share relatively more attractive if the dividend yield is higher.
2. In addition, a cash pile is seen by investors as a sign of weakness. Some companies try to label it as a “war chest” – cash held in anticipation of a large aggressive takeover bid – in the hope that the market will continue to believe that some big value-adding manoeuvre is imminent. Shareholders invest in companies to get exposure to a certain type of risk. If they wished to invest it in cash or other investments, they would choose to do it themselves through direct investment, rather than let the company do it for them. So the thinking is that if the company can't use the money they should give it back to shareholders. Shareholders can then find another company that has some ideas and that can use the cash! Cash piles are generally perceived poorly.

Tax

Companies with a large proportion of non-taxpaying shareholders may feel it appropriate to distribute a large proportion of earnings.

In general, non-taxpaying shareholders will wish to receive much of their return in the form of income, rather than reinvesting the profits in the company to give a capital gain. These shareholders will be on relatively low incomes and thus would like to receive additional income in the form of dividends. This will lead to a bias towards higher payouts from companies whose shareholder base contains a higher proportion of non-taxpaying shareholders. Remember from Chapter 3 that under the imputed tax system (as used in the UK) most taxpayers pay no more tax on the dividends they receive. However, under this system, higher-rate taxpayers may pay extra tax on the gross value of their dividend so they might prefer to be rewarded in the form of a capital gain because part of any capital gain (up to the capital gains allowance) is tax-free.

Growth opportunities

Companies in high-growth industries may find that the demands for capital investment to maintain competitive advantage exceed their capacity to borrow on satisfactory terms and may prefer to pay low dividends rather than making frequent rights issues.

Many internet companies pay no dividend at all, and often have negative net cashflow. It is the promise of superior growth in the future that makes these companies attractive, not a high dividend yield. So paying a dividend to the sort of investor who invests in such companies makes little sense.

Stability and consistency

Since companies with high dividend policies tend to attract investors who seek high payouts (and similarly for low dividend policies and preferences) any move from one category to the other will cause adverse market reaction as investors readjust their portfolios.



Question 16.16

What sort of investors might have a preference for low payout policies?

A change of dividend policy can have significant repercussions for a company's market rating and its capacity to raise finance. We consider the effect of dividend policy on the market in Section 2.3



Question 16.17

Are there any legal constraints on the amount of dividend that can be distributed?

2.2 Other methods of reward

Introduction

In addition to regular dividends, usually paid quarterly or half-yearly, one-off extra or special dividends may be paid occasionally.

Alternatives to cash dividends include:

- **scrip, stock or share dividends**
- **share buybacks.**

Occasionally, companies may offer non-cash dividends in the form of product samples or discounts on services. For example, shareholders of Cadbury Schweppes plc receive free entry into Cadbury World!

Often companies will offer an *automatic dividend reinvestment plan*. This may include the issue of new shares at a discount to market price (partly to reflect the saving in underwriting costs). Shareholders are offered the opportunity to reinvest their dividends in the company's shares, which are offered at a discount.

We shall look at scrip dividends and share buybacks in more detail in the following two sections.

Scrip or stock dividends

The effects of scrip issues were discussed in Chapter 6. We also discussed scrip dividends briefly in Chapter 6.



Stock or share dividends are paid in the form of extra shares, rather than cash.

Such a dividend will be shown in the company accounts as a transfer from retained earnings to equity capital.

Scrip dividends are defined as either "pure", where the shareholder has no option to take cash, or as a scrip alternative to a cash dividend.

If a shareholder has the right to receive 1 new share for every 20 she holds, this is equivalent to a 5% dividend yield. Some tax issues do arise, since the authorities require that the value of the new shares allocated are treated as taxable income.

Effect on the company

These methods of distribution are of benefit to companies that either have no cash with which to pay a dividend because of long-term expansion, or to companies that have traditionally paid a dividend, but which because of unusual circumstances are unable to pay one at present. If they expect to resume paying dividends in the future, and wish the dividend yield to be continuous through these hard times, they may pay a scrip dividend.

From the company's point of view, the scrip dividend retains funds to be used for investment or to reduce borrowings and, hence, to improve earnings. The capital base will increase and this will improve the company's financial capacity. The shareholder base may be increased by attracting investors who prefer scrip dividends.



Question 16.18

A company is debating whether to pay no dividend or to pay a scrip dividend. Which option would you expect to lead to a faster appreciation of the share price over time?

Effect on the shareholder

From the shareholder's point of view there are fewer benefits.

Tax will normally be payable as if cash had been taken but, as no cash is received by the shareholder, this must be funded out of other resources. The scrip issue only benefits those shareholders who wish to increase their holdings, as they will avoid brokerage and other acquisition costs and may also benefit from a marginally more favourable price. On the other hand, the practice considerably complicates the computation and recording of capital gains.

Share buybacks



If a company has accumulated large amounts of unwanted cash, or if it wishes to change its capital structure by replacing equity with debt, it will generally undertake a *share repurchase* or *buyback* exercise.

The procedure

The company announces that it intends to buy back a certain number of its own shares.

This may be implemented by:

- **purchase of shares in the open market, often by a gradual programme over a period of time**
- **a fixed price offer**
- **a tender offer (either a *Dutch* or *uniform price* auction)**
- **repurchase by direct negotiation with a major shareholder.**

The most common method is for the company to announce its intention of buying its shares in the open market.

If the company repurchases a stated number of shares at a fixed price (typically at a significantly higher price than the current market value), the shareholders are informed of the company's intention and are free to accept the offer or not.

If a *uniform price auction* is used, the company asks shareholders how many shares they are prepared to sell and at what price. For example, shareholder A is willing to sell 10,000 shares at £2, shareholder B is willing to sell 15,000 at £3 and shareholder C is willing to sell 20,000 shares at £4. The company will then calculate a price at which it can buy the number of shares it wishes to buy. If it wishes to buy 25,000 shares, it will pay £3 per share to shareholders A and B.

If a *Dutch auction* is used, the company states a series of prices at which it is prepared to repurchase shares. Shareholders reply to this offer, informing the company of how many shares they are willing to sell at each price. The company then calculates the lowest price at which it can buy the required number of shares.

Effects on the shareholders

Often, for simple supply/demand reasons the share price rises on such an announcement. However, this is not always the case. Investors invest in a company with the intention of being exposed to a certain type of risk (and hopefully a certain return). The company is essentially forcing some investors to sell their shares and invest elsewhere.

Such an announcement can also be seen as a sign of weakness by investors, who may think as follows: “*the company has no ideas or innovative projects with which it can generate a return that lives up to my expectations?!?*” On the other hand, some might argue that it is good to reduce the stockpile of cash, since it will not have been earning a great rate of return.

There are also tax issues to consider. Some investors might be happy to realise a capital gain if they have not used their capital gains allowance because they will pay no tax on the capital gain. However other investors may be forced into realising capital gains at times when they would rather not, for example if their year’s allowance is already used up or if they don’t have a capital gains allowance, such as UK companies. Share buybacks have been a common way of rewarding shareholders in the United States because, until recently, shareholders had to pay income tax on dividend income on top of the corporation tax paid by the company on its profits. (We discussed the treatment of dividend income in Chapter 3.)

Share buybacks can benefit private shareholders to the extent that the tax treatment of capital gains is more favourable than that of dividends. The effect on the company’s earnings per share should be beneficial, since the cash held is probably only earning a deposit rate of interest – much less than its industrial assets. The value of the remaining shares should, therefore, improve. However, investing institutions prefer to make their own buy/sell decisions and receive no tax benefit from a share buyback, so this alternative is more frequently carried out by companies with a high proportion of individual shareholders.

2.3 The market and dividends



The market value of a company is the market's valuation of future dividends (unless there are expectations of takeover or winding up and the distribution of residual assets).

In many cases, such as internet based companies and high-tech stocks, the first prospect of a dividend payment can be many years in the future. Under these circumstances it becomes very hard to value companies by this method.

If no outside loan capital is available and the company has better investment opportunities than its shareholders, then the payment of dividends will, by reducing the business' ability to take advantage of these situations, be detrimental to the market value of the company.



Question 16.19

Justify this statement using the following scenario. Assume you invest £1 million in a company, "PayOut plc". PayOut can earn 14% return on assets before tax and pays tax at the rate of 30% on profits. Assume that the expected net return to you from an investment in the stock market as a whole is 7%.

Test the above hypothesis over a 3-year period by looking at the accumulated value of your investment, firstly assuming that PayOut pays no dividend, and secondly assuming that it pays shareholders 50% of its earnings after tax as a dividend.

However, as long as loan capital is available to the company on tolerable terms, this restriction does not apply (and even after this is exhausted there is always the possibility of a rights issue).

Looking at the dividend question from the point of view of the shareholder, it is a reasonable assumption that the purchaser of shares takes into account some expectation of a dividend policy. If this expectation is not fulfilled, it will change the investor's relative valuation of the share.

A consistent dividend policy is, therefore, important in building a clientele of investors, and an unanticipated change can act adversely on perceptions of the company's worth. It follows that investors will move to shares where dividend policy is compatible with (or acceptable in) their tax position.



Question 16.20

A large well-established company has run upon hard times. Having had robust and increasing profits for the last 10 years, half of which it has paid in the form of dividends, it has been hit by recession in 3 of the 4 industrial areas in which it operates. The directors are keen to maintain investor loyalty, and are afraid of a takeover by another company. However they accept that the profits in the current financial year will be zero.

State what further information you would require in order to set the dividend policy for the coming year.

The financial management of a company must, therefore, consider carefully the likely effect on investor perception of any dividend announcement – particularly if it can be construed as a change in dividend policy. If a change should be necessary, it is imperative that the reasons are well explained in good time – shareholders will generally accept decisions made clearly, in good time and for the long-term benefit of the shareholders. Any efficient market will take its cue from the statements and actions that enter the public domain, not from what a company's managers wish or think.



Question 16.21

Give three possible courses of action for the management of the company described in Question 16.20 above.



In the past, examination questions on dividend policy have been quite interesting. For example, following a trial balance question involving the construction of an income statement and a statement of financial position, this question was asked:

“Comment on the notable features of Z plc’s dividend policy.” (September 2001)

Remember to use your checklists of points to help you generate ideas to answer these questions. In this case, Z plc was paying dividends when it had made a loss in that year. Is this allowed? Yes, because the retained earnings exceeded the dividend payment. Why would the company do this? The company might aim for consistency and might want to avoid an adverse market reaction. Have they the cash? What are the implications for the company’s liquidity? Could the company have used the funds in a more useful way, eg reinvested the funds to increase profitability and growth?



Chapter 16 Summary

Capital structure

The management has a great deal of flexibility as to how a company's capital should be structured. Although the principal aim of the management is to focus on how the *assets* of the company are used to create wealth, it is also important that they manage the *capital structure* in a suitable manner. This normally means controlling the amount and maturity of company borrowings.

According to *Modigliani and Miller's* first irrelevance proposition, the market value of any firm is independent of its capital structure. However, this theory is only valid when certain assumptions are made. When these assumptions are relaxed, we see the reasons for different levels of gearing.

Debt finance is advantageous in a world with tax. Debt finance costs are deducted from pre-tax profits, thereby reducing the amount of tax payable. In addition, the assets purchased generate capital allowances, which can serve to reduce the *tax liability* yet further.

Increased debt brings the increased *risk* of coping with an increase in interest rates, a recession, a fall in asset values and winding up the business.

Also, as the level of gearing rises, the *service cost* of the debt will rise due to the added risk of default. The *return on equity* will no longer benefit from further gearing.

Raising funds through the issue of equity causes *dilution* of the existing shareholders' holding in the company.

Additional debt finance may not be *available* if the company is already highly geared or has few tangible assets.

Ultimately, the *market* will reflect its view on the capital structure through the company's share price.

Dividend policy

Key factors in the dividend decision are:

- stock market
- cash (cash rich companies might give a generous dividend or might buy back shares; cash poor companies might give no dividend or perhaps a scrip dividend)
- tax
- growth opportunities
- stability and consistency.

Other ways of rewarding shareholders include scrip dividends and share buybacks.

The key decisions in a perfect market should be based around the obvious statement that *“the financial managers of a company should seek to maximise the return to the owners of the equity, within the parameters that the latter set out”*.

Chapter 16 Solutions

Solution 16.1

Increasing gearing

This would be expected to increase the volatility of the expected return. Because of the beneficial effect of debt on the company's tax charge (to be discussed later in the chapter) it would also be expected to increase the return on equity.

Supplier contract negotiation

Removing risks would be expected to decrease the volatility of the return to shareholders. This can only be done by transferring some of the risks to the suppliers. One would expect there to be a cost involved, which might reduce the return to shareholders.

Insurance

As above, this should reduce the risk and volatility of return experienced by shareholders, but might reduce the absolute expected return to shareholders.

Risk management and financial risk control

If carried out at no cost this should have a beneficial effect on the volatility of profits without reducing the expected return. Extra risk through bad risk management does not necessarily lead to extra returns!

Solution 16.2

Shareholders have few controls on the managers of their company in the modern world. Even the ultimate sanction of voting the current management team out of their positions requires shareholders to find another management team that can step in. If the management were also free to raise capital and give away rights to future profit streams whenever and to whomsoever they choose, then the amount of control is further reduced.

If a company is successful, the shareholders will want to benefit from that success. Pre-emptive rights give shareholders the right to maintain a proportional holding of a company in order to benefit from the company's growth. It allows them to maintain their voting rights as a proportion of the company.

Solution 16.3

Value of investor's holding before issue = $3 \times 1m$ = \$3 million

$$\text{Expected price of shares after issue} = \frac{(3 \times 2) + (2.5 \times 1)}{2 + 1}$$

$$= \$2.83 \text{ per share}$$

$$\text{Value of nil-paid rights} = 2.83 - 2.5 = \$0.33$$

If the investor does nothing, the nil-paid rights will be sold on his behalf and he will be given the sum of $500,000 \times 0.33 = \$166,000$ in cash.

His holding of shares will be worth \$2,833,000.

His proportion of the company (previously 1%) will fall to:

$$1\% \times \frac{(\text{number of shares in issue before rights})}{(\text{number of shares in issue after rights})}$$

$$= 2/3 \% \text{ of the company.}$$

Solution 16.4

Accounting profits are concerned only with the overall income created by a business during a year, not the cashflow. This was discussed in Chapter 8. Some of the most obvious areas where accounting profits and cashflows would differ would be:

- (i) Non-current assets. These would be depreciated through the income statement over the useful life of the asset. However the cashflow would occur on the day that the asset is purchased and paid for.
- (ii) Debt. If a company raises cash by increasing its borrowings it does not treat this cash as a profit. The income statement is largely unaffected. However such action would obviously bring in a lot of cash resources.

- (iii) Debtors and other current assets. If a company sells a product, the profit of that trade is reflected in the income statement, whether it is paid for or not. If the purchaser of the goods has not yet paid, the forthcoming payment is booked under debtors in the current assets category of the balance sheet. The cashflow however would not occur until the outstanding debt was settled by the payment of cash.

Solution 16.5

- (i) Modigliani and Miller argued that, under certain assumptions, the market value of a company is independent of its capital structure. Their view was that the market value of a company is determined primarily by its *investment decisions* and *not* by its *financing decisions*. This proposition allows complete separation of investment and financing decisions.
- (ii) Modigliani and Miller argued that the WACC is constant as gearing increases. Raising the proportion of debt (which is cheaper than equity) does not reduce a company's WACC because in response to an increase in debt, the cost of equity increases by just enough to compensate for the increased volatility in earnings and to keep the WACC constant.

Solution 16.6

If interest payments on corporate debt are tax deductible, this implies that debt finance for firms is essentially subsidised by the state. This implies that the market value of the company increases with gearing and the WACC falls.

If firms can borrow more cheaply than individuals, then firms that borrow could be seen as performing a valuable function for their investors. This implies that the market value of the company increases with gearing and the WACC falls.

If the cost of debt increases with gearing, this implies that an increase in gearing, beyond the company's debt capacity, could decrease the value of the company and increase the company's WACC.

Solution 16.7

A bank will control its credit exposure in a number of ways. It will consider:

- (i) the amount of each loan as a proportion of its own share capital
- (ii) the amount of each loan as a proportion of the borrowing company's share capital
- (iii) the total amount of all similar loans (*ie* in the same sector or industry) on the bank's books as a proportion of both of the above.

Constraint (ii) is likely to be the one that bites in the case of this loan because it represents a large proportion of the company's business.

Solution 16.8

The market value of the outstanding options will be approximately equal to:

(current market value of the shares given away)

– (the amount the directors will have to pay in order to subscribe for those shares)

It can be seen that when the directors exercise their options, new shares will be created. These new shares give the right to participate in the future profits of the company, and as such have the same value as existing shares. However only the subscription amount will be received by the company, which may be a lot less than the market value of those shares. There will be “dilution” to the extent that the amount received is less than the market value of the shares issued.

Solution 16.9

Essentially, when a company borrows money, it can treat the interest payments on the debt as a cost in the construction of its income statement. This will reduce the company's tax liability. If you as an individual borrow money from the bank and invest it in some security or asset, you will not be allowed to reduce the income or gains accruing from the asset by the amount of the loan interest payments before calculating your tax. Therefore income and gains are taxable in full, and any loan interest payments that have to be made come out of post-tax earnings. How unfair!

Solution 16.10

	<i>2% return</i>	<i>22% return</i>
Operating profit	1,100,000	2,100,000
Interest payable on loan stock (£10 million @ 10%) <u>(1,000,000)</u>		<u>(1,000,000)</u>
Profit before tax	100,000	1,100,000
Tax @ 30%	<u>(30,000)</u>	<u>(330,000)</u>
Profit after tax (Earnings)	70,000	770,000
<i>Earnings per share</i>	<i>5p</i>	<i>55p</i>
The company made dividend payments of £196,000, ie 14p per share on 1.4 million shares, in respect of the year ending 31 December 2011.		
Increase/(decrease) in retained earnings	(126,000)	574,000

Solution 16.11

Three possible outcomes are:

- (i) The business was already quite highly geared before the additional borrowing. With the additional gearing in the form of the new debt, shareholders may become concerned about whether or not the company can continue to service the *interest burden*. We are told that the industry is stable, but we are not told whether the loan has a long, medium or short-term maturity date. What will the interest rate be when the company has to repay and refinance the loan? In order to carry that risk, investors may require a higher prospective return – ie they will buy the shares at a lower price.
- (ii) The business is relatively stable with low growth and low profit volatility. Investors may be happy to have the additional gearing. It gives them a *higher prospective return* immediately (the project adds value) and gives them increased exposure to any upside risks for the company.
- (iii) In the event of a wind-up, the assets of the company would first be used to repay the bondholders. Clearly the further gearing reduces the chances of the equity holders receiving anything in these circumstances. Given that this is a large project relative to the company as a whole, the chances of failure must be uppermost in investors' minds. If they are concerned about the reduced *capital cover*, the equity price may fall.

Solution 16.12

	<i>2% return</i>	<i>22% return</i>
Operating profit	1,100,000	2,100,000
Interest payable on loan stock (£5 million @ 10%)	<u>(500,000)</u>	<u>(500,000)</u>
Profit before tax	600,000	1,600,000
Tax @ 30%	<u>(180,000)</u>	<u>(480,000)</u>
Profit after tax (Earnings)	420,000	1,120,000
<i>Earnings per share</i>	<i>10.8p</i>	<i>28.7p</i>
The company made dividend payments of £546,000, ie 14p per share on 3.9 million shares, in respect of the year ending 31 December 2011.		
Increase/(decrease) in retained earnings	(126,000)	574,000

The volatility of returns is far greater in the more highly geared situation (Scenario 1).

Solution 16.13

Three possible outcomes are:

- (i) The industry is low growth, and the gearing of the company is reduced under this scenario. The investors may feel that the company is not making the best use of the capital. Their *prospective return* has been reduced. This may cause the shares to fall in value.
- (ii) The gearing of the company could have been considered too high in the first place. The extra share capital reduces the risk of the company not being able to *finance its interest payments*. This could be perceived as positive and the share price would rise.
- (iii) The increased *marketability* of the shares may be a positive feature, and the share price may rise.

The additional supply of equity could have a short-term effect on the value of the shares, and drive the price down. This would only be a *short-term* effect, and has little to do with the fundamental value of the shares themselves.

Solution 16.14

You might have included any of the following:

1. Assets. What non-current tangible assets does the business have to support debt finance?
2. Risk and return. What level of risk are the management and shareholders prepared to take? The higher the gearing the greater the risk (of coping with interest payments in a recession or a decline in the value of the company's assets, and of low returns to shareholders in the event of a wind-up). Will increased debt increase the returns to the shareholders?
3. Cost. Debt finance is cheaper but the cost increases with gearing.
4. Control. Are the existing shareholders willing to reduce their level of control by allowing more shareholders to share power with them? Will increased gearing affect agency costs?
5. Availability. Are shareholders prepared to buy more shares? Are creditors prepared to lend the company more? Relevant factors here would be the company's current level of gearing, the perceived risk inherent in the company's business, the assets of the business, the company's record and its prospects.
6. Market view. The gearing decision must be appropriate for the business. For example, a declining industry should be lowly geared.
7. Tax. Debt finance is more tax-efficient.

Solution 16.15

If the stock market is focused on the short term, it is possible that investors will reward companies that pay high dividends with a high share price. Companies will therefore err on the side of returning too much to shareholders, rather than focusing on the payout ratio that best suits their business. This may be bad for the company's long-term prospects.

Solution 16.16

Investors who may have a preference for companies with low payout ratios:

- investors who prefer capital gains to income from a tax point of view
- investors who have no current need for cash
- investors who believe the company can reinvest the cash better than they can
- investors who are also managers of the company, and want resources now.

Solution 16.17

You may remember from Chapter 8 that companies are not allowed to pay out in dividends more than they have in their retained earnings from the current and previous years. This is to protect creditors in the event of the company being wound up.

Solution 16.18

The “no dividend” option allows the company to retain all of its earnings, and involves no dilution of earnings (reduction of earning per share) through the issue of new shares. It would therefore lead to the fastest capital appreciation.

Solution 16.19***Scenario 1 – the company retains 100% of earnings (payout ratio = 0%)***

Suppose the company has assets of A , and is paying tax at the rate of T on profits.

The value of the assets after n years would be: $A(1 + (1 - T) \times 0.14)^n$

In the given circumstances, this would be $1,000,000(1 + 0.7 \times 0.14)^3$

$$= £1,323,753$$

(We assume the market value of the investment would rise accordingly.)

Scenario 2 – the company pays half its earnings to shareholders (payout ratio = 50%)

The retained earnings at the end of one year would be: $\frac{A \times (1-T) \times 0.14}{2}$

The value of assets at the start of the next year would be: $A(1 + \frac{(1-T) \times 0.14}{2})$

After n years the value of the assets be: $A \left(1 + \frac{(1-T) \times 0.14}{2}\right)^n$

The following table shows the retained earnings and dividends rolled up over a three year period:

Time	Assets at start of year	Retained earnings at end of year	Dividend paid at end of year	Dividend rolled up @ 7%
0	1,000,000	49,000	49,000	56,100
1	1,049,000	51,401	51,401	54,999
2	1,100,401	53,920	53,920	53,920
3	1,154,321			
			Total	£ 165,019

The investor's total wealth is £1,154,321 + £165,019 = £1,319,339

The accumulated amount under Scenario 1 is greater than under Scenario 2.

This results from the fact that dividends paid out only roll up at 7% but “retained dividends” would roll up at $0.7 \times 14\% = 9.8\%$.

Solution 16.20

Addition information required includes:

- Can the company afford to pay a dividend?
- Are the profits going to recover to their former level, and if so when?
- Does the authority exist to pay scrip dividends in order to preserve cash?
- Are other companies in the sector experiencing hard times, and if so, what are they paying?

Solution 16.21

Any three of the following will suffice:

- Maintain the dividend despite the fall in profits.
- Declare a scrip dividend equal in size to the previous actual dividend.
- Declare a postponement of dividend payments until the company has restructured and is profitable again.
- Estimate the sustainable long-term profitability of the company, which can be achieved in the coming year or two. Scale the previous dividend down to reflect this lower expectation in the future. This allows investors to gauge the likely long-term earning capacity of the company (in the directors' opinion).

Chapter 17

Capital project appraisal (1)



Syllabus objectives

- (vii) *Define what is meant by a company's cost of capital and discuss how its cost of capital interacts with the nature of the investment projects it undertakes.*
- 2. *Discuss the different methods used for project evaluation.*
- 3. *Describe methods commonly used to evaluate risky investments including probability trees, simulation and certainty equivalents*
- (xi) *Show how financial techniques can be used in the assessment of capital investment projects.*
- 1. *Discuss the principal methods that may be used to determine the viability of a capital project.*

0 Introduction

Recall from Chapter 1 that companies use real assets to carry out projects in order to generate profits for their shareholders. Indeed, a company can essentially be thought of simply as a collection of projects. Projects can be large or small, and some projects can be the product of many smaller projects. Before proceeding with a particular project, however, it should be thoroughly appraised in order to determine if it is likely to be profitable and hence worth undertaking. It is the nature of the appraisal of capital project that we discuss in this and the following chapter.

In order to acquire the assets to undertake projects the company must raise finance, either from retained earnings, short-term borrowing or via the issue of long-term capital. Thus, the basic requirement of a capital project is that the returns from the project should exceed the cost of the capital employed to generate those returns. If this is seems likely to be the case, then the company should undertake the project on behalf of its shareholders, as to do so will add value to their investment. A key element of any project appraisal is therefore to assess whether this is in fact likely to be the case. However, as the returns from projects are always uncertain, so project appraisal can only ever indicate the likely profitability of a project and cannot give definite answers.

The structure of this chapter is as follows.

Section 1 first defines exactly what we mean by a capital project and then discusses some of the key concepts underlying capital project appraisal.

In Section 2, we consider some of the main methods typically used to evaluate the likely profitability of projects in practice. These include discounted cashflow techniques, such as *net present value (NPV)* and the *internal rate of return (IRR)*, which might be familiar to you if you have studied or are studying Subject CT1. In addition a number of other methods are discussed.

In Section 3, we consider how to interpret the result of the numerical evaluation of the project and how we can gain a fuller understanding of the viability of a project by the use of simulation techniques.

Chapter 17 is concerned mainly with the methods of investment appraisal. Chapter 18 will consider in more detail two crucial concerns in the investment appraisal process:

1. calculating the required rate of return for a project *ie* choosing the discount rate to be used
2. how to analyse and deal with risks – including their identification, quantification and mitigation.

You will meet, and use, this material again in Subject CA1, in particular.



In the past, the examination has tested *knowledge* of the different methods of project evaluation and the *ability to analyse* the relative merits of these methods.

1 **Introduction to capital project appraisal**

1.1 **Definition of a capital project**



By a capital project we mean any project where there is initial expenditure and then, once the project comes into operation, a stream of revenues less running costs. A capital project does not have to involve the construction of a physical asset.

The key feature of a capital project is really that it involves the creation of a new asset or the transformation of an existing asset into a different asset. In this context, asset refers to anything that will generate future positive cashflows for its owner. Capital projects therefore exclude the transfer of ownership of an existing asset – *eg* the purchase of an ordinary share in an existing company.



Question 17.1

Give three examples of capital projects, as defined above.

New projects undertaken by a company requiring significant resources over and above the normal budget will typically be subject to some form of cost justification to show that the expected benefits exceed costs. When the costs exceed the benefits over more than a very short term one quickly needs a mechanism to incorporate the time value of money to consider the value of any project or how alternative projects compare. Capital will be required to finance these projects and there will be a cost in supporting that capital. The cost of capital is a measure of this cost expressed as an annual rate of interest.

The cost of capital shows the price at which investors are willing to buy in to the risks (and returns) that the company offers. The determination of a suitable required rate of return for a project based on the cost of capital is discussed in detail in the first section of Chapter 18. We shall see that the discount rate chosen should reflect the systematic risk of the project.



Example

Entrepreneur A approaches the bank with a low-risk business proposal and is offered finance at 10% *pa* for the project. Entrepreneur B approaches the bank with a different project and is offered finance at 15% *pa* for the project. What does this tell us about the two projects?

Apart from the obvious conclusion that B has not sold himself as well as A, and should consider giving up his entrepreneurial career and apply for a job in the bank, there are a number of conclusions we can draw. First we ask the question: is the bank looking for 50% extra return from Project B compared to Project A? – probably not.

The bank has to achieve a certain return for its shareholders, and it will consider all projects equally. The bank clearly perceives Project B as carrying higher risks, either of complete failure or of not achieving the stated returns. Therefore the bank charges a higher return to compensate for the risk of future defaults.

1.2 Initial appraisal

Before proceeding with a full-scale time-consuming and costly detailed project appraisal, the company's project analysts will usually undertake a quick initial appraisal.

The main purpose of the initial appraisal of a proposed capital project is to ascertain whether the project is likely to satisfy the criteria which have been established by the sponsoring organisation for projects it is prepared to authorise and hence whether it is worth carrying out a detailed appraisal.

A key word here is *likely*. If the initial appraisal suggests that the project is likely to satisfy the relevant criteria, only then will a more detailed appraisal be undertaken to confirm or reject these provisional results. The sponsoring organisation may have a single set of predetermined criteria, or the criteria may be varied according to the particular project concerned, *eg* a “low-risk” project might be required to produce an internal rate of return of 15% *pa* compared to 25% *pa* for a “high-risk” project.



Question 17.2

Describe what you believe to be the meanings of “high-risk” and “low-risk” in the above statement.

These criteria will typically be expressed in terms of the financial results expected and (sometimes) the risk that these results may not be achieved. However, there may be many additional criteria in practice, including:

- **achieving synergy or compatibility with other projects undertaken by the sponsor,** eg the development of a new product that can be sold in conjunction with an existing product.
- **satisfying “political constraints”, both within and without the sponsoring organisation.** Is it acceptable or even desirable in the eyes of senior management and/or even political representatives, either or both of whom may need to give approval before the project can proceed?
- **having sufficient upside potential**
- **using scarce investment funds or management resources in the best way.** Although the particular project may appear profitable, there may be other even more profitable projects or uses for the available funds.

In other words, the main criteria by which to judge the attractiveness of the project are the usual ones of risk and expected return, together with an assessment of how far the project is likely to satisfy any other objectives that the investor might wish to achieve. For example, how well does the project fit into the overall project portfolio? Are there any spin-off effects for other projects – perhaps in the form of reduced average costs, once these are spread across the two projects?

During the appraisal process it will be necessary to investigate the risks involved in the project and come to a view on the best course of risk mitigation, having regard to the costs involved. The remaining risks will need to be listed for the benefit of sponsors, lenders and investors, so that they can take these risks into account in the decision-making process.

We will discuss the analysis and mitigation of specific risks in detail in the second part of Chapter 18.

Since detailed analysis is an expensive process, it is necessary for the analysis to be iterative, getting into the more complex evaluations only once it is clear that the effort is justified.

With each subsequent and more detailed analysis of the viability of the project, the financial model of the project is made increasingly complex and sophisticated, so as to generate more accurate projections of the likely financial outcomes of the project. For example, making more accurate – or indeed any – allowance for factors such as:

- tax
- risk
- the sensitivity of cashflows to different economic scenarios.

In this way, the level of uncertainty attaching to the appraisal is reduced.

1.3 **Definition of project**

The first step is to define the project and its scope carefully and to assess its likely length of operating life for the purpose of the appraisal.

Points to note here are that:

- The definition and scope of the project must be unambiguously set out and agreed by the various parties involved and should include careful reference to any interactions with existing projects.
- The length of the project might itself be one of the criteria by which it is judged.

The *scope* of a project might include:

- the specific objectives of the project
- the principal activities in each stage of the project, *eg* construction of asset, use of asset
- the aims, scope and timing of investment and the stages of the investment cycle
- the key financial and other parameters (at each stage of the process)
- the way in which the outcome of the project is to be measured, *eg* NPV, IRR
- the success criteria of the project, *eg* a positive NPV based on 12% *pa*
- to whom (or which departments) the goals of the project apply (and who should not be affected)
- the exact responsibilities of the various people in the project team
- the responsibilities of the management team to whom the project will report
- time limits beyond which the project team's responsibilities and powers will not extend
- a list of connected issues for which the project team is *not* responsible.

It is hard to generalise, however the failure of many projects occurs because the scope of the project was not specified clearly enough. Consequently during the project, the individual goals and responsibilities may become unclear and confused and the project will fail to meet its targets.

1.4 **Evaluation of cashflows**

There should then be an evaluation of the most likely cashflows for:

- **capital expenditure**
- **running costs**
- **revenues**
- **termination costs.**

This will often be based upon the best point estimates of each of the main cashflows involved.

These cashflows should be expressed in terms of present day money values and should exclude financing costs such as interest, depreciation, effects of price inflation, etc. However, if any of the cashflows are expected to increase in real terms (eg in line with wages rather than prices), this must be taken into account. The cashflows should allow for any consequential effects on the sponsor's other activities or costs.

The initial appraisal is usually based upon *real* values for the cashflows – the cashflows perhaps being easier to interpret if expressed in present-day money values – discounted using appropriate risk-adjusted real discount rates. Again any interactions or synergies with existing projects must be allowed for appropriately. For example, sharing of costs, by-products or spin-offs.

Accurate definition and evaluation of the most likely cashflows is crucial to the success of the subsequent work, as these constitute a baseline. Great care must be taken, with all the assumptions made being carefully documented.



Question 17.3

A software company is assessing whether or not to develop a “second generation” financial modelling package for insurance companies. What synergies with other products might it need to consider as part of its project appraisal?

2 Methods of project evaluation

Using these cashflows, the next step is to make a very crude initial evaluation of the likely financial result of undertaking the project. A discounted cashflow approach is normally used.

The two main discounted cashflow approaches are:

1. net present value
2. internal rate of return.

2.1 Net present value (NPV)



The NPV method models all the cashflows of a project until termination and discounts these back to the present day using the cost of capital.

NPV is therefore an example of a *discounted cash flow* (DCF) approach to project evaluation.

If the result is positive then the project will improve shareholder returns since it earns a rate of return greater than the weighted average cost of capital (*ie* a return greater than the opportunity cost of the funds provided by the shareholders and debtholders).

As we have said, initially a crude analysis is performed with the most likely values of the cashflows. However, the company can allow for risk within the NPV method.

Risk is best allowed for in the model explicitly so that the company will look at the weighted average NPV of a range of scenarios. The company would need to bear in mind its risk tolerance in deciding how to finance the project. The discount rate used could be different for different types of project.

For example, a high discount or hurdle rate might be used for projects that are deemed to have a high degree of systematic risk. In addition, we will see below that companies may deliberately use high hurdle rates in order to identify those projects that are particularly profitable. If this is the case then it does not mean that a project is loss-making simply because it fails to meet the hurdle rate. It simply means that the project is not as profitable as it needs to be to meet the company's criteria.

We will discuss the determination of the required rate of return for a project in detail in the first section of Chapter 18.



Question 17.4

WrongTurn Ltd is analysing two projects, the first of which (Project A) gives the following estimated cashflows at the end of each of the coming years (a negative or bracketed number indicates cash spent by the company, and a positive number indicates cash earned):

Time in years	0	1	2
Cashflow (in \$ millions)	(4)	2	4

The second project (Project B) gives the following cashflows:

Time in years	0	1	2
Cashflow (in \$ millions)	(2)	15	(14)

If the company sets a hurdle rate of 20% *pa* for its projects, which of the above projects pass the test?



Question 17.5

On further analysis of Project A, WrongTurn finds that the risk involved in the cashflows comes primarily from one source of uncertainty, which it analyses further. The cashflow at the end of Year 2 has a high risk of not materialising. In fact there is a 25% chance that the cashflow will simply not happen, and a 75% chance that it will in fact be earned.

If the company wishes to analyse Project A using its cost of capital (15% *pa*) rather than an arbitrarily high hurdle rate of 20% *pa*, how can this be achieved? (We will refer to this project after allowance for the reduced expected cashflow at time 2 as Project C.)

Some companies take a more relaxed view for small expenditures and demand a higher rate for large expenditures.

The calculation of the NPV for a project should be straightforward for a student who has passed Subject CT1. What is new, and is examinable in Subject CT2 is:

- how to derive the data using the information given in the question
- how to calculate an appropriate rate of interest to use in the calculation
- how to analyse and allow for the risks indicated in the question
- how to interpret the results of the analysis.

Obviously, in order to test these skills, questions will require the student to calculate NPVs from time to time.

2.2 *Internal rate of return (IRR)*

Definition



This is essentially the same in method of calculation as the NPV, the difference being that rather than discounting at the cost of capital, a solution is found for the interest rate that gives the project a zero NPV.

The method has the benefit of highlighting the return achieved by the project. If this is higher than the cost of capital then the project may proceed.

If a project has an IRR which does not satisfy the company's criteria, this does not mean that the project is loss-making. It simply means that it is not profitable enough to satisfy the minimum requirements (for example, a cost of capital requirement) set by the company.

The simplest method of finding the IRR by hand is to plot the NPVs at various discount rates on a graph and estimate where the graph crosses the x -axis.

Problems

However there are practical problems with the IRR approach.

1. Nonsense results may be obtained if the initial capital is small giving very high positive (or negative) solutions, two solutions or no solution at all.



Question 17.6

Calculate NPVs at discount rates of 5% pa, 20% pa, 100% pa and 1,000% pa for Project C using the weighted mean of the two possible scenarios, ie use a final cashflow of +3. Do the same for Project B.

Using the information given, estimate the IRR of both projects.

Plot the NPVs on a graph against the discount rate and comment on the implications.

2. Whereas the average net present value of a range of scenarios can be found simply by summing the value multiplied by the probability of the scenario, the same is not true for the internal rate of return.
3. It should be noted that the IRR equation can sometimes have multiple solutions, especially if there are net negative cashflows at some points during the operating life of the project or at termination. This has helped to make it less popular than the NPV as a measure of project worth.

Despite these problems, the internal rate of return can provide a single convenient tool.

One main advantage of the IRR is that it provides a rate of return for the project. As such it is intuitively easy to understand for non-experts.



Question 17.7

Show that by participating in both Project C and Project B, one achieves an NPV (at a discount rate of 15% pa) equal to the simple sum of the two individual NPVs for projects.

Show that the IRR for the combined project is not simply the weighted sum of the two IRRs.

2.3 Annual capital charge



This method expresses the capital outlay as an annual charge, thus writing off the capital steadily over a period of years. This charge may then be offset against the benefits and if the net result is positive the project or capital expenditure proceeded with.

This method is valuable in that it can show the impact on the company's profit stream of an investment. The short-term impact on earnings may be highly sensitive, as it is very visible.

The annual capital charge is similar in concept to the depreciation charged through the balance sheet. The initial capital expenditure is amortised over a specified period and offset against the profits from the project as they accrue. There are then a number of ways of using the resulting *net* earnings figures. They can be simply accumulated to establish the year in which the project moves in to profit, or they can be added to the company's other forecast earnings to see the overall impact on the reported figures. Clearly this is most useful when the other earnings in the reported profits are depreciated on a consistent basis.

This method works well looking at capital expenditure on machinery or plant and benefits from being simple and easily understood. It should not be ruled out just because there are more complex methods available.



Question 17.8

Project D involves an initial investment of 10. It is estimated that the project will generate subsequent cashflows of +3, +3½, +4 and +4 at times $t = 1, 2, 3, 4$. Calculate the net cashflows after allowing for an annual capital charge using a 4-year amortisation period.

2.4 Shareholder value approach



Shareholder value represents the present value of all expected current and future cashflows available to shareholders.

The shareholder value method is based on but extends the NPV approach. The method has the important distinction that it is looking at the company from the point of the external shareholder and less on the internal issues governing the attractiveness of a project. It is, therefore, a holistic method rather than an incremental method focusing only on the project itself.

The way the method works conceptually is very simple. The total value of the company is examined on a “before and after” basis. The way the company is valued currently by the market needs to be understood.

This is where the human element comes in. It is notoriously difficult to say what “investors” in general are looking for in a company’s shares.

Depending on the sector, price earnings ratios or price to net asset ratios may give an indication of how a company stands in relation to its competitors. Comparison of key figures such as these with competitors will help determine a company’s standing in the market. The difference in rating is the value being placed by the market on the management’s ability to grow the business profitably. If they have high confidence then the capitalisation of the company will be high in relation to its peers.

Recall that investment ratios were discussed in detail in Chapter 12. Amongst the most important ratios with regard to shareholder value are the price earnings ratio and the gross dividend yield.



Question 17.9

Define the price earnings ratio and the gross dividend yield.



Question 17.10

Company A and Company B are quoted in the same industrial sector. The following observations can be made of the two companies:

	Company A	Company B
Current market price	200p	300p
Historical gross dividend	10p	20p
Historical earnings per share	20p	35p

A financial analyst in Company A is considering using the “shareholder value” method to assess a project. She is wondering what the above information indicates about how the market perceives the company relative to its competitors.

- (i) Draw your own conclusions based on the data above.
- (ii) Give reasons why the above analysis might be tenuous.

The value added approach then adds in the new project or company purchase and looks at all the valuation issues above to see what the impact is. The impact on net asset value, future earnings and debt cover may all be calculated relatively easily by adding in to the company model the cashflow scenarios developed for the NPV method. The important element of the value added process now comes into action for it has to look at the impact of the new project on the rating of the company.

Issues to be evaluated would include:

- impact on ranking versus competitors
- possible competitor reactions and change in level of competition
- impact on perception of management
- impact on analyst perceptions
- impact on debt rating
- enhancement or dilution of earnings
- impact on dividend policy
- impact on stock beta.

The addition of a new project to the business could have an impact on the whole way the business is perceived and so fundamentally alter the share rating. The value added approach tries to look dispassionately at the before and after positions and the result measured is the increase in value of the shares to the current investors.

This is clearly a subjective decision, as many business decisions are. However, the method has the advantage of allowing numerate managers to mix the rigorous financial calculations and cashflow projections with the uncertainties of the market, and emerge with a decision that fits with the strategic direction of the company and adds shareholder value.

The shareholder value added approach has exciting possibilities for actuaries as it is inherently very complex and will benefit from careful mathematical modelling of all the interactions and feedback loops to ensure all the ramifications of the project have been thought of. It gives clear-sighted management the opportunity to adopt exciting new policies that are well received by the stock market which might have been overlooked if one merely evaluated projects on a narrow basis looking only at the project itself.

The disadvantage of such a method is that it involves rating the project on a number of different criteria, some of which may be perceived as more important and some less. When debating the pros and cons of a number of projects, there may be no clear winner or loser. It may be a matter for discussion which factors should be rated most highly in the analysis.

In addition, the stockmarket itself is prone to changing its focus regularly. Companies that are valued on the basis of net asset value one year, suddenly become valued on their prospects for growth the next. This can add complexity, but does not undermine the methodology.

2.5 Payback

In many small companies it is cashflow that is crucial and so the speed at which a project can recoup its initial investment is vital. For a small fast growing company that will find it hard to raise debt and whose shareholders are already stretched, payback becomes the crucial factor.

Payback period



The payback period is defined as the time it takes for the accumulated cashflow to become neutral.

The project with the faster payback period will be preferred. Alternatively, the method can be used to identify the project that generates the most funds over a specific time period, say 3 years.



Question 17.11

Under what circumstances might a company be more interested in looking for the project that generates the most funds over a 3-year period, rather than the project that has the shortest payback period?

The method is of relatively little value where payback terms are much over three years.

This is because it does not allow for discounting.

Nevertheless, in view of its simplicity it continues to be a popular method.

We demonstrate the above concept using the following example.

Example

Time in years	0	1	2	3	4	5
Cashflow (\$ millions)	(4)	(3)	2	4	3	2
Cumulative cashflows	(4)	(7)	(5)	(1)	2	4

The table above describes the expected cash inflows and outflows in respect of a project.

The payback period would be found by looking at the cumulative cashflows, and estimating the time at which it changes from negative to positive.

This looks to happen around one third of the way through Year 4. So the payback period is about 3.33 years, assuming continuous cashflows.

Question 17.12

Under what circumstances might the payback method be applicable?

2.6 Nominal returns

This is a variant of the payback method where one simply compares the ratio of cash generated to cash consumed over a period. It can give a quick idea of the relative profitability of projects and is an adequate approach where the ratio can quickly be seen to be high. Again, the term over which such an evaluation is made should be short.

Example

For the project in the example above, the nominal return over a 4-year period is $9/7 \approx 1.3$.

The method is normally used (and is better suited) to projects that involve a single cash outflow in the first year and an inflow in subsequent years.

2.7 Strategic fit

Strategic fit will normally form a part of every project evaluation as every project should fit logically with the business, building on its areas of expertise, resources or customer base. Sometimes a new departure into a business sector cannot be justified on purely financial grounds but it is being taken because of a view being taken on the way the industry is moving.

Often projects cannot be analysed on financial grounds, and can only be subject to *qualitative analysis*.



Example

A retailing company is considering offering *free internet connection* to its customers, the costs are real and tangible, but the benefits are largely qualitative for the foreseeable future. The decision could be analysed as follows:

Costs:

Installing network	\$6m
Maintenance costs	\$0.2m pa (inflation linked)

Revenues:

Advertising/banners	\$0.05m pa (inflation + 6% (or maybe +60%) growth)
---------------------	--

Qualitative benefits:

Future prospects of internet	<i>very high</i>
Brand recognition	<i>medium</i>
Customer appreciation	<i>selective, but very high</i>
Strategic fit	<i>long-term future of internet shopping bright</i>

The qualitative benefits of the move might outweigh the obvious costs in the short term. It could certainly take a long time for the NPV to become positive – longer than the current management of the company would be willing to look at. However the strategic decision could be made to acquire a presence in the internet industry, and this could be deemed a worthwhile investment.

There are parallels with the methods outlined above when one takes into account a range of scenarios. The difference here is that one is picking a particular future business scenario and developing a business response on the assumption that this future projection holds good. Such an investment can reap huge rewards if the future goes as predicted and there are opportunities to be gained by being ahead of the pack. If things do not turn out as expected the project has to be carefully monitored to limit the potential downside.

In the example above, the case for continuing to offer free internet connection would have to be regularly and thoroughly reviewed. Factors we might need to consider include:

- Are the costs on track and still justifiable?
- Is the business justification for the direction still valid?
- Can we monitor the results of the “qualitative” benefits and convert them into anything close to hard cash?
- Having monitored the experience, should we be building up or reducing our investment?
- What is the response of our competitors to our project?

In the insurance industry over the last ten years we have seen massive changes in distribution methods and many of the investments made could only be justified on strategic grounds.

Of course most projects *can* be analysed using projected cashflows, and one can take the view that the investment must justify itself. Even the changes to insurance product distribution networks can be justified if one looks sufficiently long term, and is willing to make the heroic assumptions that are required.

However, when the parameters become more “guesswork” than science, and the variability of the inputs becomes too high, it is often better to accept that it is a purely subjective decision, and make the decision on that basis. Even in these circumstances, there is always a place for good technical analysis, and there are always areas in which the concepts and methods discussed in this chapter can add value.

So if a business “does the right thing” then the required return comes as a by-product and is not the deciding factor. There is scope for actuaries to develop more sophisticated models that build in explicitly these “difficult to quantify” benefits. Indeed, any project may bring with it intangible benefits that it may be possible to value if sufficient thought is given to the exercise.

2.8 **Opportunity cost**

It is all too easy to put up a project that may satisfy the business criteria for acceptance but not be the best way of proceeding. There may be some alternative opportunity that is even better that has not been considered.

The opportunity cost method asks “What alternative ways could we spend this money and what return would be achieved?”

Thus, even if a project does satisfy the criteria applied by the company it might not be the best opportunity available to the company. Recall that one of the sponsor's criteria in Section 1.2 required that the project be the best use of scarce management time and resources. It is therefore always worth looking at all the available projects before making a decision, and choosing the one that best satisfies the financial and qualitative criteria.

Apart from this method proving useful to help identify better alternatives, it can also on occasion justify spending when there is surplus capital that cannot for some reason be invested to earn the cost of capital return. It may be in the company's interest to invest in this project as long as it yields a better return than alternatives with a similar risk profile even if under the true cost of capital.

It is often the case that a company will identify a project it believes would strengthen its position in the industry. However it cannot justify the expenditure using a cost of capital analysis. If the company has capital available to invest, it has two options:

1. reject the project and continue searching for projects that do satisfy the internal rate of return requirement
2. test the rejected project using a lower cost of capital.

The company must consider the return it will get if it rejects the project but can find no other project to invest in and therefore invests the surplus cash in the money markets. If the IRR of the project is higher than money market returns, then it might be better to undertake the project than to simply leave the funds invested in money market deposits.

If the management decide that there is a risk that an alternative will not be found quickly, and that the money will lie idle for some time, it may be that the opportunity cost of not undertaking the initial project is large. They should begin the project as an alternative to investing in the money market.

It should be remembered that returning capital to shareholders is an option, but there are frictional costs if the company finds itself wanting to raise new capital at some future point.

**Question 17.13**

How might a company return funds to shareholders?

This is not really a new method as all the items could be incorporated in the main methods; it is the focus of attention on alternatives that is the difference.

2.9 Hurdle rates

Again, this is not a new method but can be incorporated in the methods above. The emphasis is that the company sets a target rate of return, or a hurdle rate. This could typically be quite high and well in excess of the true cost of capital. For example, a company might set a target return on capital of 20% in order to concentrate minds on only the most profitable projects. Only projects with a positive NPV discounted at 20% or an IRR in excess of 20% would get past the first screening.

In reality, the project champion is likely to emphasise the potential upside to demonstrate the high return, understating the risk. The actual achieved return on accepted projects is therefore liable to come in well below the business plan.

The approach has the advantage of exposing the really high potential projects which, if managed well, will bring in high returns. The flip side is that many excellent more low-risk projects that would deliver good returns above the cost of capital (but below the hurdle rate) will never be considered.

Clearly if a company intends to look only at projects that deliver returns in excess of 20% it will get a combination of:

- extremely high-risk projects, which may if successful give a superior return
- projects presented by over-ambitious project managers who dearly want their project to get the go-ahead. They therefore underestimate the risks and overstate the returns in the project submission.

The rates actually being used by companies of different sizes have been surveyed. This showed an average IRR hurdle rate of 17.1%, which is very high compared with the long-term achieved returns on equity.

**Question 17.14**

Why might the use of high hurdle rates be common in industry?

2.10 Receipts/costs ratio

Another measure, which is not often employed but which can sometimes be useful is the receipts/costs ratio, defined as:

$$\frac{NPV \text{ of the gross revenues}}{NPV \text{ of the capital and running costs}}$$

This indicates the level of profit as a proportion of costs and is therefore related, but different, to the concept of the profit margin encountered in the financial analysis of companies. It can therefore be used to rank competing projects where there is a constraint on the total amount of funds available for investment.



Question 17.15

What are the major difficulties with using the IRR and the payback period as project appraisal techniques?

3 Results of the evaluation

3.1 Initial result

Normally the result of an NPV calculation would be regarded as satisfactory if it was positive and the result of an IRR calculation would be regarded as satisfactory if it exceeded a predetermined “hurdle rate” set by the sponsor. The payback period would be regarded as satisfactory if it was less than a predetermined period set by the sponsor.

The choice of the discount rate used with the NPV or the hurdle rate with which the IRR is compared is therefore crucial – likewise the choice of payback period.



Question 17.16

Why is the choice of the discount rate used with the NPV so important?

The results of these calculations will provide a crude initial appraisal of the financial viability of the project.

However, there are a number of simulation techniques that can be used to obtain a fuller understanding of the viability of the project.

3.2 Simulation

Sensitivity analysis



Having modelled the project for the purposes of evaluation, we may wish to apply sensitivity analysis to see how the value of the project changes with differing future conditions. We take each key assumption in turn and assess the effect on NPV of the most optimistic and pessimistic results occurring.

A broad idea of the sensitivity of the results to varying assumptions can be obtained by assuming that all the costs are (say) 10% higher than the most likely values and all the revenues are (say) 10% worse than the most likely values.

However, it is important to understand the impact of each individual assumption, so for sensitivity analysis, we take each key assumption in turn.

In this way, we can identify which are the variables that have the greatest effect on the outcome of the project, thereby determining where more information is needed (and when forecasts are inappropriate, confused or inconsistent).

To demonstrate this, consider the following example.

Example

	Inflation		Consumer spending		Borrowing costs	
	Low	High	low	high	low	High
Assumption	less 2%	Plus 2%	less 2%	plus 2%	less 2%	Plus 2%
Net effect on NPV in \$ millions	-1.5	3.2	-6.2	4.5	2.5	-8.9

Having completed the central NPV estimate for a particular project we now wish to test the sensitivity to the key assumptions – these being *inflation*, *consumer spending* and *borrowing costs*.

The results shown in the table above demonstrate that the project would benefit from higher inflation and higher consumer spending, but that the key exposure on the downside is an increased cost of borrowing. The results demonstrate how the profitability is affected by movements in the underlying parameters.

However, the results give no indication of the interaction between the variables. For example an increased cost of borrowing may well occur at times of high inflation, but the reader is given no idea of this interaction.

Scenario testing

However, sensitivity analysis does not allow us to consider the interrelationships between input variables.



To do this, we need to employ scenario testing, where we consider some plausible combinations of input values and see what effect these have on the project.

Scenario testing (often called *stress testing* in the financial world) involves choosing particular scenarios or combinations of factors to which the project or institution may be exposed. The effect of the combination of events is then modelled and investigated, showing the overall resulting financial gain or loss for the company.



Example

For the above project, the results of a scenario test might look like this:

<i>Scenario</i>	<u>Gain/(Loss)</u>
Inflation + 2%, cons spending + 1%, borrowing + 3%	– S1.5 m
Inflation – 2%, cons spending + 3%, borrowing – 2%	+ S4.1 m
<i>etc</i>	

It can be seen that these scenarios can be chosen to show particular combinations of events – perhaps those to which the profitability of the project is highly exposed. Alternatively the scenarios can be chosen to show particular circumstances that the company management believes to be highly likely to occur. Or perhaps the company is already exposed to these parameter scenarios through other projects that it has undertaken, and wants to be clear on the implications of yet further exposure to the same risks.



Question 17.17

Describe why it might be important to perform both a sensitivity test and a scenario test on the results of a project.

But even scenario testing will involve a limited number of plausible combinations, which may or may not include the most optimistic and pessimistic values. To consider all possible combinations we need to use (*Monte Carlo*) simulation.

Monte Carlo simulation

Here we look at the entire distribution of possible project outcomes. In order to do this we need to:

- ***model the project* (usually on a computer), allowing for interdependencies and serial correlations**
- ***specify probabilities* for the distribution of the key variables (possibly investigated by the use of sensitivity testing)**
- ***simulate the cashflows* many times using values extracted randomly from the distributions of possible variable inputs**
- ***record and order the outputs to assess their probability distributions.***

But note that this process is critically dependent on:

- **an appropriate model design**
- **appropriate assessment of the probability distribution of the inputs.**

The former is a particular problem when the model builder is not experienced in the field being modelled.



Monte Carlo simulation involves creating a model, into which all the variabilities and correlations of the input criteria are entered. The model then runs a large number of simulations to obtain a spread of results.

The resulting chart may look like this:

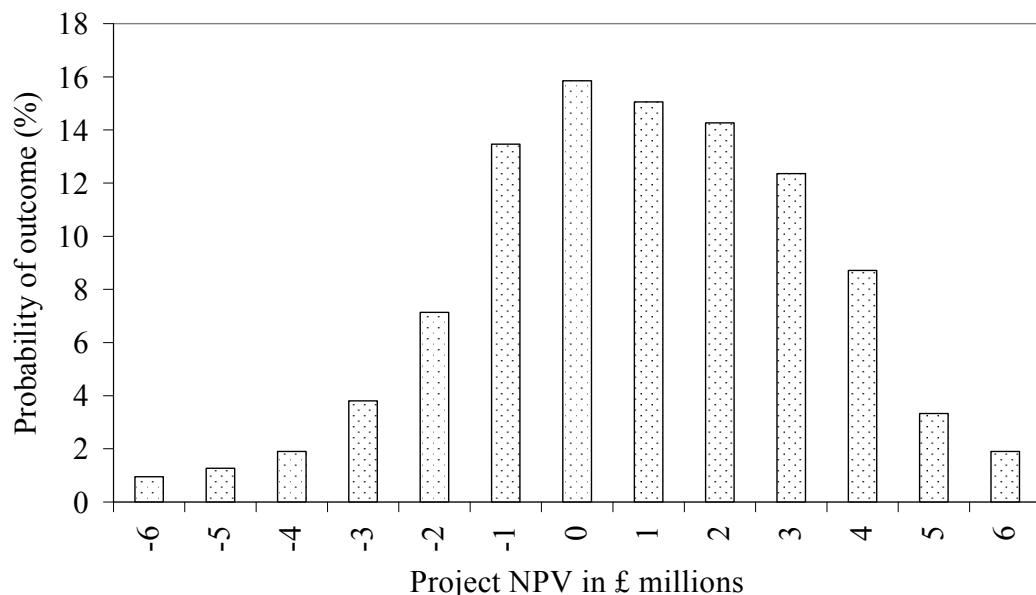


Figure 1: Results of Monte Carlo simulations

From the chart we can identify the mean profit, the spread around that mean, and the shape of the profitability chart, which here appears to be negatively skewed (due to the long lower tail).

Financial modelling software can be purchased that has been specifically designed for carrying out Monte Carlo simulation. Indeed, the process is so complicated that many models, each specific to a particular sector of a particular industry, have been designed.

**Question 17.18**

What are the main advantages and disadvantages of performing a Monte Carlo simulation as part of a project appraisal?

Scenario testing and Monte Carlo simulation are complex and therefore expensive. They are unlikely to be performed at an early stage in the project appraisal process. However, sensitivity analysis is simple, and therefore cheap, and could quite easily be used alongside the initial evaluation of cashflows.

(See also Chapter 18 Section 5 for further discussion of scenario testing and stochastic modelling.)

3.3 Results of the analysis

The results obtained might, if very unsatisfactory, suggest that further analysis is not worthwhile without some fundamental redesign of the project. If, however, the results appear satisfactory, it is not sufficient to stop there, and a proper risk analysis should be undertaken as indicated in Chapter 18.

3.4 A note about tax

In the initial stages of the analysis it will usually be sensible to exclude the negative cashflows resulting from corporation tax, since these will depend (among other things) on the method of finance adopted and it is an unnecessary complication to rework the tax every time the NPV is reworked during the analysis.

At the final stage, when the investment submission is being prepared, the negative cashflows arising in respect of corporation tax can be evaluated (allowing for appropriate timelags in the collection of the tax) and discounted in order to arrive at a suitable deduction from the NPV.

In practice we will be interested in the NPV of a project net of any tax payments, or equally the net-of-tax IRR.

The above is an example of the process whereby successive iterations of the appraisal process can introduce more complex and hence realistic modelling of the project.

**Question 17.19**

What is the main difficulty associated with the use of the NPV method of project appraisal?



In the past examination questions seem to have concentrated on the relative merits of different methods of investment appraisal. For example:

“Explain why the net present value criterion is superior to other methods of investment appraisal.” (September 2001)

If you consider the strengths and weaknesses of other methods and contrast them with the NPV, you should be able to make some good points. For example, the NPV considers all cashflows (whereas the payback method does not); the NPV considers the size of the project (whereas the payback and the internal rate of return do not) *etc.*

In April 2010, a long question outlined a project in detail and initially asked students to “calculate the net present value of the project” using a specified discount rate.

This page has been left blank so that you can keep the chapter summaries together for revision purposes.



Chapter 17 Summary

Capital project appraisal

A *capital project* involves an initial expenditure and then, once the project comes into operation, a stream of revenues less running costs.

An *initial appraisal* assesses whether the project is likely to satisfy the *sponsor's criteria*, such as:

- achieving synergy or compatibility with other projects undertaken by the sponsor
- satisfying “political constraints”, both within and without the sponsoring organisation
- having sufficient upside potential
- using scarce investment funds or management resources in the best way.

The first step of the appraisal is to *define the project* and its scope carefully and to assess its likely length of operating life for the purpose of the appraisal.

There should then be an *evaluation of the most likely cashflows*, expressed in terms of present-day money values, for capital expenditure, running costs, revenues and termination costs.

Methods of project evaluation

The *net present value (NPV)* method models all the cashflows of a project until termination and discounts these back to the present day using the cost of capital. A positive result indicates that the project will improve shareholder returns.

The *internal rate of return (IRR)* is the interest rate that gives the project a zero NPV. This is compared with the cost of capital.

The *annual capital charge* expresses the capital outlay as an annual charge, thus writing off the capital steadily over time. This charge may then be offset against the benefits.

The *shareholder value approach* attempts to assess the impact of the project on the value of the company as a whole from the point of view of shareholders.

The *payback period* measures the time it takes for the accumulated cashflow from the project to become neutral.

Nominal returns compares the ratio of cash generated to cash consumed over a period.

Strategic fit assesses how the project fits in with the rest of the company's business, building on its areas of expertise, resources or customer base.

The *opportunity cost method* asks "What alternative ways could we spend this money and what return would be achieved?"

Companies sometimes assess the profitability of a project against a *hurdle rate* of return.

The *receipts/costs ratio* is defined as:

$$\frac{NPV \text{ of the gross revenues}}{NPV \text{ of the capital and running costs}}$$

Results of the evaluation

Normally the result of a NPV calculation would be regarded as satisfactory if it was positive and the result of an IRR calculation would be regarded as satisfactory if it exceeded a predetermined "hurdle rate" set by the sponsor.

These results offer a crude initial appraisal of a project. To gain a fuller understanding of the viability of a project, *simulation techniques* can be used.

Sensitivity analysis takes each key assumption in turn and assesses the effect on the NPV of the most optimistic and pessimistic results occurring.

Scenario testing involves changing plausible combinations of input values and seeing what effect these have on the project.

Monte Carlo simulation attempts to look at the entire distribution of possible project outcomes via numerical simulation. It is critically dependent on an appropriate model design and appropriate assessment of the probability distribution of the inputs.

If the results from an initial cashflow analysis are very unsatisfactory, then further analysis is unlikely to be worthwhile without some fundamental redesign of the project. If, however, the results appear satisfactory, then a proper risk analysis should take place.

The analysis is usually refined to allow for complications such as corporation tax only at its later stages.

Chapter 17 Solutions

Solution 17.1

Examples of capital projects include the:

- construction of fixed capital assets, *eg* new factories or aeroplanes
- setting up of a new business
- modernisation of an existing asset, *eg* a computer system, or a business
- redevelopment of an existing asset, *eg* a property
- merging of two companies.

Solution 17.2

Most projects can be analysed in terms of cash inflows and cash outflows. A *high-risk* project might be one in which the cashflows cannot be predicted with any degree of certainty. Another way of describing the above would be to say that the graph of NPV (on the x -axis) against the probability of each outcome (y -axis) would show a wide spread of outcomes for the project. A *low-risk* project might show a narrow spread of results with a high certainty of a profitable outcome.

Solution 17.3

A potentially beneficial spin-off is that companies who buy this new financial modelling package might also buy other modelling packages from the software company in the future. On the other hand, sales of this new financial modelling package might simply replace sales of the software company's existing "first generation" financial modelling package. Both of these possibilities would need to be allowed for in the project appraisal.

Solution 17.4

Both!

At 20% the NPV of Project A is:

$$NPV_A = -4 + \frac{2}{(1+0.2)} + \frac{4}{(1+0.2)^2} = 0.44$$

and of Project B is:

$$NPV_B = -2 + \frac{15}{(1+0.2)} - \frac{14}{(1+0.2)^2} = 0.78$$

Solution 17.5

By allowing more precisely for the final cashflow, it can be determined that the expected value of the payment would be $0.25 \times 0 + 0.75 \times 4 = 3$. Reworking the equation with a final payment of 3 and a discount rate of 15% pa gives:

$$NPV_C = -4 + \frac{2}{(1+0.15)} + \frac{3}{(1+0.15)^2} = 0.008$$

i.e the project satisfies the requirement (just!)

Alternatively one can analyse the project as a weighted average of two scenarios, namely:

$$NPV_C^1 = -4 + \frac{2}{(1+0.15)} + \frac{4}{(1+0.15)^2} = 0.76$$

with a 75% chance of occurring, and:

$$NPV_C^2 = -4 + \frac{2}{(1+0.15)} = -2.26$$

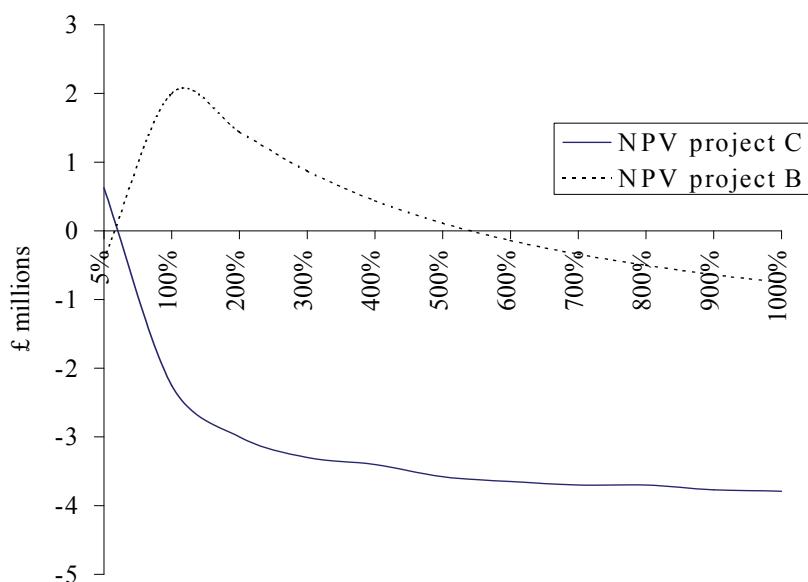
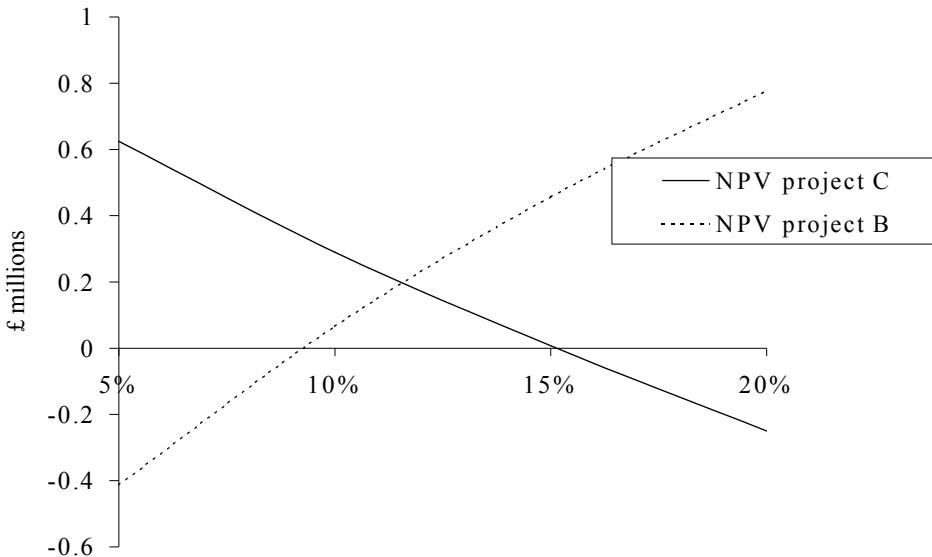
with a 25% chance of occurring.

The value of the average is:

$$0.25 \times (-2.26) + 0.75 \times 0.76 = 0.008$$

Solution 17.6

The following graphs show plots of the NPVs for a variety of discount rates. The first over a restricted range of rates (5% to 20%) and the second graph over a less restricted range (up to rates of 1000% pa).



The results show that Project C is a typical project that has a positive NPV at low rates of interest. The NPV for the project falls as the discount rate rises and eventually falls below zero around the IRR of 15%

Project B however is loss-making at low rates of interest, and only when the discount rate is sufficiently high (greater than 9%) does it become profitable.

It can be seen that Project B has a further solution for the IRR equation ($NPV_B = 0$). This occurs at a discount rate of around 540%.

Trying to summarise this in words is not easy, however:

- Using very low rates of discount, the project is loss-making, largely because the sum of the two payments in year 1 and 2 amounts to +1 million, which is not sufficient to offset the initial payment at time 0 of – 2.
- At modest rates of discount the project is profitable because the rate of discount and the one-year time gap between the two large payments combine to give us a positive value – sufficient to overpower the initial payment.
- At very high rates of discount, the final two payments become negligible in size, leaving only the initial payment to influence the present value calculation. Therefore the project has a negative value again.

Solution 17.7

The combination of the two projects gives cashflows of:

Year	0	1	2
Cashflow (in millions)	(6)	17	(11)

This is profitable at most discount rates up to 83% at which point it becomes loss-making. Clearly 83% is no combination of 15% and 9%. It is more plausible that it could be a combination of 15% and 540%, however this is not the case. The result is more easily demonstrated using two projects, each of which has only *one* IRR solution.

Solution 17.8

Writing off the 10 initial investment over a 4-year period, implies an annual capital charge of $2\frac{1}{2}$. So the net cashflows after the annual capital charge are $+\frac{1}{2}$, $+1$, $+1\frac{1}{2}$ and $+1\frac{1}{2}$ at times $t = 1, 2, 3, 4$.

Solution 17.9

$$\text{Price earnings ratio} = \frac{\text{market price of an ordinary share}}{\text{earnings per share}}$$

$$\text{Gross dividend yield} = \frac{\text{gross dividend per share}}{\text{market price of an ordinary share}}$$

Recall that:

- earnings is the profit earned by the company after tax and is therefore the amount available for distribution to the ordinary shareholders
- the dividend is the amount actually distributed to shareholders.

The price earnings ratio therefore shows the multiple of earnings that shareholders are prepared to pay for a particular share. The gross dividend yield shows the amount of dividend received per unit of investment (the share price). It is usually expressed as a percentage.

Solution 17.10(i) ***Tentative conclusions***

	Company A	Company B
Gross dividend yield	5%	6.7%
PE Ratio $\left(= \frac{\text{price per share}}{\text{earning per share}} \right)$	10	8.6

We can say in general that Company A is rated more highly than Company B. Investors are willing to pay a higher multiple of its historical earnings to buy the share. The substantially higher dividend yield for Company B is simply a factor of the higher payout ratio of Company B, *ie* Company B pays a higher proportion of its earnings in dividends. The immediate conclusion is that Company A is regarded more highly than Company B in the eyes of investors, perhaps because investors see greater potential in Company A.

This puts Company A under greater pressure to demonstrate this potential in profitable projects. If a project earned the same return in Company A as it did in Company B this would cause the market to think that they had overestimated the potential of Company A. It will in general be harder for Company A to find projects that are beneficial at the current share price.

In the time of the high-tech boom in the UK, many companies had extremely high PE ratios, reflecting the confidence shareholders had in these companies. There was a great deal of pressure on these companies to find projects to justify the high share price.

(ii) ***Reasons why the analysis might be tenuous***

Against this it should be mentioned that:

1. although the companies are in the same sector, they may not be directly comparable
2. the historical earnings and dividends may be affected by one-off factors
3. the companies may be valued by investors on various other grounds that are not mentioned in the question, *eg* market share, brand recognition, *etc.*

Solution 17.11

- (i) The company has limited resources over the coming 3 years and so might be less interested in the total payback period, and more interested in the amount of funds earned over the critical 3-year period.
- (ii) The company has a finite period over which to prove itself and so might be more interested in the amount of funds generated, rather than the speed of payback.
- (iii) The company has a large amount of short-term outstanding debt that needs to be serviced.

Note that focusing on the amount of funds generated may involve overlooking better projects. It may be that a company turns down a small project with a 2-year payback period in favour of a larger one that happens to generate more funds over 4 years. This may well generate more funds over the specified 4-year period, but the company will have a lower return on capital because it did not select the smaller project.

Solution 17.12

Payback period would be applicable when:

- the size of the project does not warrant deeper analysis such as discounted cashflow techniques
- the hurdle rate (explained later in the chapter) is low enough such that discounting makes little impact
- the project occurs over a short period of time where discounting is not warranted and would make little impact
- the cashflows themselves are so uncertain that the additional rigour of discounting makes no sense or introduces spurious accuracy.

Solution 17.13

It might use share or stock buybacks, or alternatively simply pay a much larger dividend. It is also possible for companies to pay an exceptional dividend to shareholders, however the tax-inefficiency of this route means that it is seldom followed.

Solution 17.14

There are many reasons:

- (i) They are simple to compute and understand.
- (ii) Often the uncertainties in a project can best be modelled by a simple (say) 5% pa compound probability (cashflows at the end of the first year have a 0.95 chance of occurring, in year two they have a 0.95² chance of happening, etc). In such circumstances the hurdle rate can be viewed as a 15% cost of capital rate and a 5% uncertainty rate, rather than a 20% hurdle rate.
- (iii) Companies often have more than sufficient projects to be getting on with. If a further project is to be accepted, and use up valuable scarce resources, it has to be a really profitable one. Hence the high hurdle rate.

Solution 17.15

The main problems with the *IRR* are that:

- the equation from which it is found may have no solution or multiple solutions
- it ignores the “scale” of the project. Thus, a small project with a high IRR but lower “value”, may be accepted ahead of an alternative larger project with a lower IRR, but a “higher” value.
- it ignores the timing of the receipt of future positive net cashflows.

The *payback period* ignores:

- the time value of money – although this can be overcome by use of the discounted payback period
- cashflows beyond the cut off date.

Solution 17.16

If the negative cashflows associated with a project mostly precede the positive cashflows, then the use of too high a discount rate will lead to the rejection of some projects that are actually likely to be profitable (when assessed against an appropriate discount rate). In addition, if the high return projects tend to be riskier, then this will lead to the acceptance of a preponderance of risky projects. It may also lead to a bias towards short-term projects, as long-term cashflows will be “over-discounted”.

Conversely, use of too low a rate will lead to the acceptance of some potentially unprofitable projects.

Solution 17.17

A sensitivity test shows the effect that an individual parameter has on the final result. By holding all other parameters of a model constant and varying the input parameter in question it is possible to gauge the effect on the overall profitability of the project.

However in many cases, a variation in one parameter should lead to a variation in another. For example, if interest rates and inflation and earnings growth are parameters of a model, then it is unlikely that inflation is going to vary without affecting the other two parameters. It is more useful to test the scenario under which all three move in a consistent manner.

It is also the case that parameters may have offsetting or hedging effects on one another. For example, a seemingly risky exposure to high inflation may actually be reduced by a correlated exposure to interest rate movement. What the project would lose as a result of higher inflation, it would gain by higher interest earnings on cash balances. These can also be modelled using scenario testing.

Solution 17.18

Advantages include:

- increased understanding of the project parameters
- greater information on the results including not just the average expected profit, but also the spread of possible outcomes around the mean and the shape of the distribution of such outcomes (fat-tailed, skewed, *etc*)
- identification of outliers – *ie* combinations of events that can be particularly harmful to the NPV of the project (these can show up as bumps on the probability distribution).

Disadvantages include:

- increased workload, which might not be justifiable
- spurious accuracy
- errors caused because of the complexity, leading to a wrong result.

Solution 17.19

The main difficulty associated with the use of the NPV is selecting the appropriate risk discount rate at which to calculate the NPV. The choice of the discount rate is discussed in the first part of Chapter 18.

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Chapter 18

Capital project appraisal (2)



Syllabus objectives

- (vii) *Define what is meant by a company's cost of capital and discuss how its cost of capital interacts with the nature of the investment projects it undertakes.*
3. *Describe methods commonly used to evaluate risky investments including probability trees, simulation and certainty equivalents*
4. *Discuss the issues in establishing the required rate of return for a capital project.*
- (xi) *Show how financial techniques can be used in the assessment of capital investment projects.*
2. *Discuss the factors underlying the choice of discount rate within project assessment including:*
- *the assumptions and limitations in the use of the weighted average cost of capital*
 - *the allowance for leverage*
 - *the allowance for risk.*
3. *Discuss the methods that may be used for identifying the risks that may be present for different types of project.*
4. *Discuss suitable techniques for ascertaining the probability of occurrence of different risks over varying timescales and the financial impact of occurrence.*
5. *Discuss suitable techniques for ascertaining the distribution of the possible financial outcomes of a capital project.*

0 Introduction

This chapter continues and concludes the discussion concerning capital project appraisal.

Firstly, in order to assess the likely profitability of a project using the discounted cashflow techniques discussed in the previous chapter, we need to determine an appropriate risk discount rate or hurdle rate. This is considered in the Section 1 of this chapter, where it is suggested that our choice should reflect both the opportunity cost of capital and the degree of systematic risk inherent in the project. This section draws on ideas covered in Chapter 15.

In Section 2, we consider a general approach for dealing with the risks that will be present in any project, a risk being any factor that may lead the actual timing and/or amounts of the cashflows generated by the project to differ from our estimates. The approach described is based on the Risk Assessment And Management Of Projects (RAMP) methodology developed jointly with the Institute of Civil Engineers.

In Sections 3, 4, 5, 6, 7 and 8 we look in detail at the identification of risk, the analysis of risk, the distribution of net present values, other ways of appraising risky projects, risk mitigation and finally, the investment submission.

You will meet, and use, this material again in Subject CA1, in particular.



This chapter could be the focus of a 20-mark question. You are likely to be tested on *your ability to calculate and discuss the appropriateness* of a particular discount rate in project appraisal, and *your knowledge and understanding* of risk analysis.

1 Choice of discount rate

1.1 The basic theory

Background

The use of the cost of capital to calculate the net present value in screening projects ensures that projects are only entered into that will enhance the return to shareholders, provided that the cost of capital is adjusted to reflect the project risk.

Recall from Chapter 1 that the cost of capital is usually defined as the rate of return that investors forego by investing in the particular project in question, which in practice is equal to the rate of return available on other similar projects. Here “similar” refers to the level of systematic risk involved.

The historical costs of the company's existing capital is irrelevant. What is important is the current cost of raising incremental capital for the company in order to carry out the project.

In other words, the cost of raising additional finance to fund the project via a rights issue or a new issue of debt, based upon *current* required rates of return in the marketplace.

One way of looking at this cost is that it is the rate of return which needs to be earned on the capital if the existing shareholders are to be no better or no worse off. As a consequence of which the value of the company's existing shares would remain unchanged.

It may be incorrectly thought that one should look at the sources from which the incremental capital for the project will actually come. Hence if all the capital were to be raised from internal reserves or by a rights issue, the cost of capital would be equal to the total rate of return which could be expected to be earned by the shareholders on their existing shares. If, however, the whole of the capital were to be raised from fixed-interest borrowing, it would be the net cost of that borrowing after allowing for tax reliefs and likely future inflation, which would need to be taken as the cost of capital. If part of the capital were raised through equity and part through borrowing, we would need to look at the weighted average cost.



Question 18.1

Explain what is meant by the expression “it would be the net cost of that borrowing after allowing for tax relief, which would need to be taken as the cost of capital” in the above paragraph.

However, it can be convincingly argued that it is irrelevant where the actual finance for the particular project under consideration is coming from, and that what matters is the company's normal cost of raising new capital, taking this as a weighted average where the weights are based on the optimum capital structure for the company as between equity and debt. (If the company's capital structure is not currently optimal, it could be made optimal through a separate decision.)

Weighted average cost of capital

As we learned in Chapter 15, a company's weighted average cost of capital (WACC) can be defined as:

$$\begin{aligned} WACC &= \frac{\text{Market value of debt}}{\text{Market value of debt} + \text{equity}} \times \text{net cost of debt} \\ &\quad + \frac{\text{Market value of equity}}{\text{Market value of debt} + \text{equity}} \times \text{cost of equity} \end{aligned}$$

The WACC is a weighted average of the cost of debt and equity capital of the company. Or equivalently, it can be regarded as the rate of return that must be achieved if the existing shareholders are to be no better or no worse off. As such it therefore represents the rate of return that should be used to discount the future cashflows generated by the company from the various projects that it undertakes.



Hence, if the company is able to generate a rate of return in excess of its WACC from a particular project, then that project:

- has a positive net present value calculated at the WACC and offers a return to the shareholders in excess of the WACC
- will increase the value of the company, where this is calculated as the net present value of all of its future cashflows, and therefore make the shareholders better off.

All else being equal, the project should therefore be undertaken.

An additional complication, is that for any particular company the WACC *may* vary with capital structure, *i.e.* the split between debt and equity capital. Whether or not this is the case is a matter of dispute and is likely to depend upon the various characteristics of the company in question.

If the WACC *does* vary with the level of gearing, then the optimal capital structure will be that which minimises the WACC – the cost of financing the company’s projects – and hence maximises the value of the company. It is this optimal and minimum WACC that should then be used to value the company.

If the proposed project has the same degree of systematic risk as the existing company – which can be thought of simply as a portfolio of projects – then its undertaking will not change the company’s overall degree of systematic risk. Consequently, if the risk characteristics of the company are unchanged, then so should be the rates of return required by investors in the company and hence also the WACC. It is therefore this minimum level of WACC that should be used to value new projects with the same degree of systematic risk as the existing company.

It can be argued that this should be the case regardless of exactly how the project in question is to be financed. The decision to finance the project – or indeed the company as a whole – in a manner that is inconsistent with the company’s minimum WACC is independent of the choice of WACC used to discount the cashflows from the project and should not therefore influence that choice.

The cost of debt capital should be taken as the cost in real terms of new borrowing by the company. This is calculated by taking an appropriate margin over the current expected total real return on index-linked bonds, having regard to the company’s credit rating, and multiplying by $(1 - t)$, where t is the assumed rate of corporation tax.

This is because interest payments of C say, are paid out of pre-tax profits. Hence the effective cost to shareholders, in terms of the reduction in the post-tax profits that are available to pay dividends, is only $(1 - t) \times C$.

The cost of equity capital should be taken as the current expected total real return on index-linked bonds plus a suitable margin to allow for the additional return which equity investors seek to compensate them for the risks they run.

Here we normally have in mind *government* index-linked bonds.



Question 18.2

What are these additional risks?

This gives a real discount rate, to be applied to cashflows expressed in present day monetary values, or adjusted by the assumed future inflation rate and used with cashflows in nominal terms.

1.2 **Allowing for systematic risk**

As we learned in Chapter 15, the beta of any asset, such as a company's shares, is defined as:

$$\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$$

where σ_{im} is the covariance between the individual stock's return and that of the market and σ_m^2 is the variance of the market index. It is a measure of the systematic risk inherent in the asset. Betas can be estimated from historical data on investment returns.

The beta measure relates to the company's (or industry's) existing activities. We need to consider whether the risk associated with any proposed project is consistent with the company's existing risk profile.

This is because the appropriate cost of capital to use in decision making is the rate of return offered by equivalent investment alternatives, *ie* with the same level of systematic risk.

Note that by “the risk associated with any proposed project” we do not mean the (diversifiable) specific risk regarding the project’s outcome. If we are unsure about our cashflow projections, we need to refine them and to make allowance for possible unfavourable outcomes in calculating the expected cashflows that will be discounted. Such uncertainty is not incorporated into our analysis by simply increasing the value of beta (and the resulting cost of capital).

Suppose, however, that the company is considering a project with a degree of systematic risk higher than is usual for its projects.

“Systematic risk” is that part of the return on a project that cannot be eliminated by investing in the same type of project many times over, nor by diversification, because investing in a number of projects cannot reduce this part of the variability to zero. Systematic risk can vary from one project type to another. Systematic risk should be allowed for by varying the discount rates used in the model.



Thus if the systematic risk for a particular project is thought to be higher than is usual for a company's projects, **the discount rate used should be greater than that which the company normally employs.**

For example, an international company might apply a higher discount rate to projects located in countries with unstable political regimes.

A suitable upward adjustment is therefore made to the cost of capital discussed above in order to reflect the higher level of systematic risk. There is more than one way of determining the value of the adjustment to be applied.

Look at other companies

One guide might be to consider the discount rates which would be appropriate for use by any companies which habitually engage in such projects, using the above methodology. In practice such data may be hard to obtain and there may be no alternative but to make an arbitrary addition to the discount rate.

Another problem here is that those companies that habitually engage in such projects may have more a greater experience of such projects and hence be better able to mitigate the inherent risks involved. If this is the case, then a slightly *higher* discount rate than that used by other companies might actually be appropriate.

CAPM-based approach

The CAPM model can be used to estimate the returns required from different capital assets (including a capital project). The following equation relates the required return on any asset or project p to the return on the market:

$$r_p = r_f + \beta_p(r_m - r_f)$$

where:

$$\beta_p = \frac{\sigma_{pm}}{\sigma_m^2}$$

and σ_{pm} is the covariance between the individual project's return and that of the market, r_f is the risk-free rate of return and r_m is the market return.

This required rate of return can then be used as a risk discount rate to price the project. The project beta measures the systematic risk of the project and thus the above equation will give a higher/lower risk discount rate for projects with a higher/lower level of systematic risk.

Note that CAPM and the security market line are discussed in more detail in Subject CT8.

Factors influencing beta in practice

We would expect to adjust our historic value of beta when we feel that investors would see the project as being more (or less) risky than the typical company venture.

If for example a company were to analyse all new projects at its current WACC, it may find that a large number of rather risky projects seem to be satisfying the hurdle and all safe projects are failing. This is only to be expected as risky projects will necessarily offer a higher expected rate of return, and give a positive NPV using the company's WACC.

However, if the company were to continue undertaking such projects, believing that the extra return will benefit the shareholders, it will find that its shares will not rise in value. The reason being that the riskiness of the shares will rise as the new risky projects are added to the portfolio, and the shareholders' required return will rise in line with the actual returns.

In other words, shareholders will get higher returns, but they will simultaneously require higher returns!



Ultimately, this will be a matter for judgement, but issues to consider include:

- **cyclical – does the outcome of the project depend strongly on the state of the economy and the business cycle?**
- **operating leverage – does the project involve a high proportion of fixed (as opposed to variable) costs?**

Positive answers to either of these questions will suggest a higher value should be used for beta.

At every stage of the economic cycle people need to eat, hence the profits of a large supermarket chain will not be as exposed to the economic cycle as those of a hotel chain or a company offering luxury goods. This is what we mean by "cyclical". Some industries simply have higher systematic risk by nature.

Operating leverage has a similar effect to financial leverage. If a project has high fixed costs, the return from that project will be more volatile than the return from a similar project with variable costs. A similar result is obtained if a company has costs that can be "disposed of" when times are bad.

For example, if a company has a high proportion of temporary staff, it can reduce its costs when turnover falls. Hence, although the company appears to have high fixed costs, they are in fact variable in nature.

1.3 Practical experience

Many companies apply the same cost of capital to all projects. This can lead to wrong decisions being made if the systematic risk of different projects is substantially different. This will particularly be the case if the company involves itself in a project outside its usual area of activity. In these cases, a project beta should be estimated from which a project cost of capital can be derived.



Question 18.3

The equity shares of a company have a beta of 1. The company is considering a project which will double the size of the company and requires extra equity finance. The project is also expected to be twice as risky as the market at present. In deciding what rate to use when evaluating the project, which of the following two possible approaches should the company adopt?

- A Calculate the beta for the project alone, and use this beta along with the market and risk-free rates of return to reach a rate of return for the project.
- or
- B Analyse the company as a whole, considering how the company will look after it takes on the project (*ie* incorporating the new project into the company's overall portfolio of projects). Estimate the beta of the resulting company, and use the market and risk-free rates of return to estimate a new *overall cost of capital* for the company. This rate should be used to evaluate the project.

It has been found that use of different costs of capital can lead to internal friction within a company which can, along with the complexity of the method, mean that the theoretically correct approach is often ignored.



Question 18.4

Why might the use of different costs of capital for different projects lead to friction?

1.4 Other factors to consider

It is not uncommon for companies to use very high discount or hurdle rates when appraising proposed projects. However, the use of a discount rate which is too high could distort the relative weights placed on the short term and on the longer term, thereby leading to mistaken decisions.

A higher discount rate places lower relative weights on cashflows farther into the future. Its use may therefore lead to, or indeed reflect, too “short-termist” an approach to capital projects.

It may be assumed, mistakenly, that the deliberate use of a very high discount rate provides a contingency margin which reduces the need for a rigorous risk analysis. However, this leads to the danger of the incorrect acceptance of a risky project with a high apparent NPV or the incorrect rejection of a low-risk project with a negative NPV, which would have a positive NPV if this were calculated on a lower but more appropriate discount rate.



Question 18.5

Consider two projects, A and B, each of which requires an initial investment of 100. Project A produces a certain cashflow of 300 in 5 years' time. B yields a series of level cashflows at the end of years 1 to 5 inclusive, the value of which is equally likely to be 0 or 90. Which project is the more suitable investment if the appropriate risk discount rate is 15% pa?

Suppose instead that a risk discount rate of 20% is used. Which project would then be preferred?

Thus, grossly distorted discount rates are inappropriate and could be dangerous. On the other hand, too much precision is unnecessary since the results of NPV calculations are not usually very sensitive to small changes of, say, 1% pa in the discount rate. In any case it would usually be appropriate to carry out the NPV calculations on two alternative discount rates (say 6% and 10% pa real), and if both results are satisfactory, then there is no need to worry too much about determining the most appropriate discount rate precisely.



Question 18.6

How should a company choose a suitable discount rate to evaluate a project?

2 Risk analysis – an overview

With any project there are risks and these can be divided into two types:

1. Systematic: “in the system” and which affect the whole area of the business into which the project falls, eg price of land for a building project.
2. Specific: “specific to the project” and which can be diversified away by the company, eg the risk of a cold summer reducing ice-cream sales diversified by also selling hot dogs.

We have seen how the discount rate should allow for systematic risk. Risks specific to the project should be determined by a risk analysis of the project. In practice it may sometimes be difficult to determine into which of these two categories a risk should fall, but the temptation to classify too many risks as systematic to reduce the analytical work should be resisted.



When we use the word “risk”, we mean either an event which leads to a variation from the most likely outcome in either direction (eg the risk of the structure collapsing) or the probability of occurrence of such an event.

Many risks are “downside”, in that they involve a worsening of the outcome of the project if they occur, but the analysis should also take account of possible upside variations in the same way. For example, there may be a “risk” that sales are higher than anticipated because of an economic upturn.

If, however, we are more concerned with downside than upside risk, then we may wish to allow for this in our risk analysis, perhaps by attaching a greater weight to “bad” than to “good” outcomes.



In order to deal with the risks inherent in a given activity, we first need to *identify* them. We then need to *analyse* them, by estimating the frequency of occurrence and the consequences if they occur. We must then consider the possibility of *mitigating* the downside risks, by reducing the frequency of occurrence or reducing the adverse consequences if they do occur, or both.

The next step is to consider the costs of possible mitigation options, to see whether they are financially viable or not, and then to select the best combination of mitigation options. The remaining or residual risks are the ones which must be accepted by the sponsors and/or investors.

At this point a decision is needed on whether to proceed with the project or not. If the project is undertaken, the residual risks need to be controlled using a series of measures which include:

- **regular monitoring of the risks**
- **plans for dealing with foreseeable and unforeseeable crises**
- **appointment of risk custodians**
- **regular management reviews.**



Question 18.7

What are the three main steps that must be taken in order to deal with the risks inherent in a given activity?

3 Identification of risks

It is important that all risks in a project are identified and evaluated. A methodology for Risk Assessment and Management of Projects (RAMP) has been developed jointly between the Faculty and Institute of Actuaries and Institute of Civil Engineers. This describes how this can be achieved in practice.

The steps necessary to achieve an effective identification of the risks (upside as well as downside) facing the project can be summarised as follows:

- **Make a high-level preliminary risk analysis to confirm that the project does not obviously have such a high risk profile that it is not worth analysing further,** eg there is a 50% chance that it will collapse losing all of the initial investment. This will normally be done as part of the initial project appraisal.
- **Hold a brainstorming session of project experts and senior internal and external people who are used to thinking strategically about the long term.** The project team here might include actuaries, accountants, management consultants and various other experts depending upon the exact nature of the project concerned, eg engineers, marketing analysts, computer analysts etc.

The aim will be to identify project risks, both likely and unlikely, to discuss these risks and their interdependency, to attempt to place a broad initial evaluation on each risk, both for frequency of occurrence and probable consequences if it does occur, and to generate initial mitigation options and discuss them briefly.

- **Carry out a desktop analysis to supplement the results from the brainstorming session, by identifying further risks and mitigation options, using a general risk matrix, researching similar projects undertaken by the sponsor or others in the past (including overseas experiences), and obtaining the considered opinions of experts who are familiar with the details of the project and the outline plans for financing it.**
- **Carefully set out all the identified risks in a risk register, with cross references to other risks where there is interdependency.** High levels of correlation between individual risks will lead to a higher overall variance of the investment returns from the project, as the individual risks are less likely to cancel each other out.

3.1 Risk matrices

These are helpful in the identification and analysis of risks. By imposing a standardised structure on the process of risk analysis, they help to ensure that no factors are overlooked. The basic idea is to construct a table or tables with different generic categories and sub-categories of risk as the column and row headings.



One method by which to categorise risks is first according to the *cause of the risk* and secondly according to the *stage of the project* at which the risk arises. These two categorisations can therefore be used as the column and row headings in the risk matrix.

Subheadings could then be used to subdivide the risks into more tightly defined subcategories, eg splitting the natural causes of risk into various types such as weather, earthquake etc.

By systematically considering each of the cells of the matrix in turn, the risks actually inherent in any particular project can be identified. The matrix allows the project manager to examine each risk throughout the duration of the project, and think about the “risk causes” that might exacerbate the risk. Having thus identified the various risks and their causes, their characteristics and importance can then be identified and documented in the matrix. As the project advances through each stage, the project manager can then use the matrix to ensure that the causes of risk are considered and mitigated where they represent a significant risk.

The categorisation of risks into different types may also aid with the identification of *interdependencies*. For example, two risks with the same cause, eg an economic cause such as higher than expected inflation, are more likely to be interdependent, than a risk with an economic cause and one that results from a natural cause.

An example of a risk matrix might be as follows:

	<i>Cause of risk</i>		
	Business	Economic	Project
Promotion of concept	demand failure compensation safety standards	currency fluctuations cost inflation	technical innovation
Design	loss of intellectual property rights		
	non compliant design professional negligence		
Project	long approval delay		
	etc		

Causes of risk

A risk matrix suitable for the above purposes would consist of a square table, with the following column headings relating to cause of risk:

- political
- business
- economic
- project
- natural
- financial
- crime.



Question 18.8

What sub-categories might be included under political risks?



Question 18.9

Consider a capital project involving the expansion overseas of a financial consultancy business. Give examples of the risks this project may face.

Risks in the successive stages of the project

The rows of the table would relate to the risks in successive stages of the project:

- promotion of concept
- design
- contract negotiations
- project approval
- raising of capital
- construction
- operation and maintenance
- receiving revenues
- decommissioning.

Each of these main headings would have a number of subheadings; for example, natural might have sub-columns headed:

- weather
- earthquake
- fire or explosion
- ground conditions.

Design might include the following risks, each of which would have its own row in the table:

- failure to meet specified standards
- professional negligence.

The example shown earlier is only a small extract of the whole risk matrix. Each cell in the matrix would be considered in detail and a note, cross or a remark would be entered to remind the risk manager of the risk to be considered at that point in time.

The matrix would act as a reminder to the analyst to consider particular types of risk which may not have been sufficiently considered. The cells in the matrix can be ticked off to show whether the risk in question applies to the particular project, with a cross reference to the appropriate entry in the risk register.

Some of the risks identified will probably be such that no realistic estimates can be made of probability of occurrence or likely consequences, and it may be that some such risks can be regarded as being systematic rather than probabilistic and hence already taken into account in the discount rate.

It should be emphasised that risks of very serious or disastrous events, however uncertain or however low the probability of occurrence, should never be ignored on the grounds that an allowance has been made for them in the discount rate. Such risks should always be the subject of searching analysis, and any which cannot be eliminated should be highlighted in the final report.

An example here might be the collapse or bankruptcy of one of the partner companies in the project.

**Question 18.10**

Jubiloil plc is considering building a new oil pipeline from Siberia to Japan. The company has approached you as a consulting actuary to identify and analyse the risks involved in the project. They are confident that the market for oil is strong and will get stronger as economic growth continues in the Far East. The pipeline will be built under land and sea and will pass through islands en route to Japan. Environmentalists have been concerned about the threat of pollution from oil slicks and the threat to an endangered species of whale that feeds on the sea bed under which the pipe will be laid. The area is prone to seismic activity. Jubiloil plc is seeking finance from international financial institutions including the European Bank for Reconstruction and Development.

- (i) Describe the steps necessary to achieve an effective identification of risks facing Jubiloil's project.
- (ii) Describe briefly five major risks facing the project.

4 Analysis of risks

Having *identified* the risks inherent in the project, the next step is to attempt to quantify their impact upon the financial returns yielded by the project. Before proceeding, however, it is important to make sure that nothing has been missed out of the appraisal process thus far. This is one reason why comprehensive documentation of every stage of the appraisal is of the utmost importance.

Once the identification process is regarded as complete, the project team will review the work done to date. This will be followed by an analysis of the risks, to ascertain the frequency of occurrence and the consequences if the risk event occurs. The analysis will concentrate on the independent risks and regard the dependent risks as consequences of them.

The risks could be classified according to four different dimensions:

- *Frequency of occurrence* or *risk level* – the perceived likelihood that the particular risk will occur. The categories used might, for example, vary from “very likely” to “very unlikely”, with associated numerical values, eg probability ranges such as “>50%”, down to “< 0.01%”.
- *Impact* – the effect on the cashflows. The occurrence of a risk with a major negative impact upon the project could lead to its cancellation. At the other end of the scale, the impact might only be a slightly increased cost or a short delay in completion.
- *Degree of dependence* – on other separately identified risks. Categories here could range from “very high degree” to “very low degree”.
- *Controllability* – the extent to which the impact of the risk can be mitigated or managed. Here the categories could range from “can be completely mitigated” to “very uncontrollable”. The cost of control might also be considered here.

The risk(s) in each cell of the risk matrix are therefore essentially awarded a score for each of the above dimensions, and the most important risks in terms of their likely financial impact are thereby identified. In this respect, the most crucial aspect of risk is probably the absolute magnitude of the financial impact.

A guide to the frequency of occurrence will be obtained by consulting experts in each risk. It might be possible for the expert to give a probability distribution of the risk. The analysis will be supplemented by a study of the statistics available, if any, from other projects.

4.1 Financial consequences of risks

The financial consequences if the event occurs will be expressed in present day money values, ie after removing the effects of inflation.



Question 18.11

Why are present-day money values used?

It will often consist of a range of possible values, for which it may be appropriate to use the mid-point, or perhaps a simple probability distribution for the purpose of further analysis. The result will be discounted to its net present value.

In principle, the expected NPV of the risk in question will be derived by summing a series of expected NPVs in respect of all future years covered by the analysis. The expected NPV for a potential future year will be the probability of occurrence of the event in that year (derived from the estimated frequency of occurrence) multiplied by the NPV of the resulting incremental or decremental cashflows if the event occurs in that year.

The approach can be illustrated as follows. Consider a particular risk relating to an n -year project. Define:

C_t = net present value in year t of the cashflows arising given that the risky event occurs in year t

v^t = appropriate discount factor to calculate the present value at time zero of cashflows arising in year t (reflecting the risk discount rate for the project)

p_t = probability that the risky event occurs in year $t = 1, \dots, n$.

Then the net present value of the expected cashflow(s) arising from the risk in year t (given that the risk occurs) is equal to:

$$NPV_t = C_t v^t$$

and the expected net present value of the particular risk is then found by summing over the lifetime of the project, namely the years, $t = 1, \dots, n$, to obtain:

$$ENPV = \sum_{t=1}^n p_t NPV_t = \sum_{t=1}^n p_t C_t v^t$$

Additional points to note are that:

- An occurrence of the risky event in year t , may give rise to cashflows in both year t and also in subsequent years. Thus, C_t is the net present value of these cashflows *evaluated in year t* . For example, if:

$$C_{it} = \text{cashflow arising in year } i = t, \dots, n, \text{ as a consequence of the risky event occurring in year } t.$$

Then we might calculate C_t as:

$$C_t = \sum_{i=t}^n C_{it} v^{i-t}$$

- We might also estimate C_{it} from a simple probability distribution of the possible values that the consequent cashflows could take in any year. In practice, any such probability distribution is likely to be very simple. Hence a single point estimate of the possible cashflow, C_{it} – perhaps the midpoint of the range of possible values should the risk occur – is often used.
- This approach is versatile, as it allows the analyst to use:
 - different values of p_t in respect of different future years, reflecting the fact that the likelihood of the risky event may vary over time.
 - different assumptions concerning the cashflows that arise should the risky event occur in any particular year t , reflecting the fact that the financial consequences of the risky event may vary over time.



Example

Consider a three-year project in which all cashflows are assumed to occur at the end of each year and a risk discount rate of 10% *pa* is used to evaluate the project.

A particular risk may occur at the end of one of the three years, but it can occur only once in the lifetime of the project.

If it occurs at the end of Year 1, which event has a probability of $\frac{1}{4}$, the consequent cashflows are 1 at the end of each of the three years.

If it occurs at the end of Year 2, which event has a probability of $\frac{1}{2}$, the consequent cashflows are 2 at the end of each of Years 2 and 3.

If it occurs at the end of Year 3, which event has a probability of $\frac{1}{4}$, the consequent cashflows is 3 at the end of Year 3.

Consider the first possibility; if the risk event does occur at the end of Year 1, then the present value *at time 1* of the consequent cashflows is:

$$C_1 = 1 \times v^0 + 1 \times v^1 + 1 \times v^2 = 2.7355$$

The present value of these cashflows *at the start of the project* is thus:

$$NPV_1 = C_1 v^1 = 2.7355v = 2.4869$$

If the risk event occurs at the end of Year 2, then the present value *at time 2* of the consequent cashflows is:

$$C_2 = 2 \times v^0 + 2 \times v^1 = 3.8182$$

The present value of these cashflows *at the start of the project* is thus:

$$NPV_2 = C_2 v^2 = 3.8182v^2 = 3.1555$$

Finally, if it occurs at the end of Year 3, then the present value *at time 3* of the consequent cashflows is:

$$C_3 = 3 \times v^0 = 3$$

The present value of these cashflows *at the start of the project* is thus:

$$NPV_3 = C_3v^3 = 3v^3 = 2.2539$$

Weighting each of the above by the probability that the risk event actually occurs at the end of each year then gives the overall expected net present value of this particular risk as:

$$\begin{aligned} ENPV &= p_1NPV_1 + p_2NPV_2 + p_3NPV_3 \\ &= \frac{1}{4} \times 2.4869 + \frac{1}{2} \times 3.1555 + \frac{1}{4} \times 2.2539 \\ &= 2.76 \end{aligned}$$

Care must be taken to ensure that the method of calculating the expected NPV of each risk is consistent with the method chosen to calculate a distribution of NPVs for the project as a whole (see Section 5).

The risks will then be prioritised for further analysis. In general the risks with low expected NPVs will be discarded, with the intention of allowing for them in a general contingency allowance later. For example, by means of a one-off global deduction from the overall expected NPV of the project.

However, any risks which would have very serious or disastrous consequences, but where the expected NPV is low because the probability of occurrence is small, would be retained for further analysis along with the risks having higher expected NPVs.



Question 18.12

What types of risk events might have very serious or disastrous consequences, but a low expected NPV?



Question 18.13

For the project described in Question 18.10, describe how the risks could be analysed.

5 **Obtaining a distribution of NPVs in practice**

In Chapter 17 Section 3, we looked at the two principal ways in which a range of the NPVs for the project as a whole may be obtained.

5.1 **Scenario analysis**

The first is to construct a series of future scenarios, each representing a combination of possible outcomes for the major risk events and each having its own probability of occurrence, obtained by combining the probabilities of the various independent component risks. The outcomes selected for the purpose of the scenario analysis will in practice often be the mid-points of a range of possible values.

For example, if there is an 80% chance that the capital cost will lie between £40m and £42m, and a 20% chance that it will lie between £42m and £50m, one might model two sub-scenarios, the first having a capital cost of £41m with an 80% probability and the other having a capital cost of £46m with a 20% probability. If each of these 2 sub-scenarios for capital cost were to be combined with (say) 4 sub-scenarios on gross revenue and 3 sub-scenarios on running costs, we would generate a total of $2 \times 4 \times 3 = 24$ scenarios.

Hence, if each of the sub-scenarios has an attaching *independent* probability of occurrence, these probabilities can be multiplied together to obtain the probabilities of each of the 24 independent scenarios arising. If we then evaluate the NPV that will arise under each of the 24 scenarios, we can weight these NPVs accordingly in order to calculate the expected NPV of the project as a whole.

One method of obtaining the distribution of NPVs is therefore to estimate separate distributions of outcomes for:

- capital costs
- operating costs
- receipts

and then to combine the resulting distributions thus obtained to get the distribution of NPVs.

It is sometimes possible for simple scenario analysis to be carried out without using a computer at all. For each scenario the probability of occurrence and the NPV if it occurs are calculated. Assuming that the scenarios cover all possible outcomes, at least in principle, the result will be an approximate probability distribution of the NPVs of the project.



Example

Consider a potential project with a lifetime of five years, in which the initial investment is 120. We will assume that the net annual cashflow (X) is received at the end of each year and is the same for each of the five years, and that the risk discount rate is 15% pa. So the NPV is calculated as:

$$NPV = -120 + Xa_{\bar{5}} @ 15\%$$

The value of the net annual cashflow (X) depends on the assumptions made about market growth (high/medium/low) and market share (high/medium/low).

The following table shows the various scenarios along with the assumed probability of occurrence, the assumed net annual cashflow and the NPV of the project.

<i>Market growth outcome</i>	<i>Market share outcome</i>	<i>Probability of scenario</i>	<i>Net annual cashflow of project (X)</i>	<i>NPV of outcome</i>
high	high	1/16	70	114.65
high	medium	1/8	52.5	55.99
high	low	1/16	35	-2.67
medium	high	1/8	60	81.13
medium	medium	1/4	45	30.85
medium	low	1/8	30	-19.44
low	high	1/16	50	47.61
low	medium	1/8	37.5	5.71
low	low	1/16	25	-36.20

The expected NPV of the project is then found by multiplying each NPV by its associated probability and then summing over all possible scenarios – ie:

$$NPV = \frac{1}{16} \times 114.65 + \frac{1}{8} \times 55.99 + \dots + \frac{1}{16} \times (-36.20) = +30.8$$

Thus, in this case, the expected NPV turns out to be about +30.8, and so the project would appear to be profitable. According to the table, it will in fact be profitable in six of the nine possible scenarios – when a medium or high market share is achieved – and with probability $\frac{3}{4}$.

5.2 ***Stochastic modelling***

The other main method is to build a computer-based stochastic model, in which the various risks are modelled and a series of simulations is then run in order to get a probability distribution of the NPVs.

This approach may give a better overall feel for the variability of the possible financial outcomes. The possible outputs of such a model might include the distributions of:

- NPVs
- profits (or revenues and costs separately) in each future year
- events (eg profitable years and unprofitable years)
- times to events (eg the time until total receipts exceed total expenditure – the payback period).

5.3 ***Relative merits of the two approaches***

Although it may appear that the second method would be superior, practical experience has shown that the results from a stochastic model cannot always be relied upon with sufficient confidence to justify the effort and expense involved.

When building a stochastic model, the most difficult data to estimate reliably are the correlation coefficients linking the various input parameters. It is not hard to imagine that if your input parameters for a model were:

- (1) German interest rates
- (2) US inflation
- (3) the failure of your German market supplier
- (4) the failure of your US marketing company

then probabilities of each event of each might be hard to estimate in the first place. Whilst the correlation between (1) and (2) might be obtained through analysis of historical financial data, the correlations between (1) and (3) would be hard to estimate, and between (3) and (4) might be no more than guesswork.

More seriously, there is the danger of losing sight of key factors and assumptions in looking at the output from such a model, whereas the effort of working up a scenario analysis by hand often forces the analyst to concentrate on the important risks and assumptions. Despite this, however, a comparatively simple stochastic model may well be useful to simulate one specific project activity, where the assumptions underlying the model, and its limitations, can be kept clearly in view.

5.4 Unfavourable NPVs

Having arrived at a probability distribution of NPVs for the project as a whole, it will often be found that some of the resulting NPVs are “unfavourable”, ie they are unacceptably low or negative. Some of these unfavourable NPVs may have low probabilities of occurrence attached to them, and the sponsor may be prepared to accept these risks. In other cases, however the NPV may be so unfavourable that even with a low probability of occurrence it is unacceptable.

For example, the financial consequences of an earthquake on a bridge building project may be enormous, perhaps even threatening the solvency of the company. The consequent and unacceptably high downside risk, might then mean that the project is not considered viable, even though the:

- project has a positive expected NPV
- probability of the risk occurring is very small.

It is for this reason that the assessment of the impact of each risk is particularly important.

6 ***Other methods of appraising risky projects***

So far, we have suggested that the specific risk in a project can be evaluated by considering the probability distribution of the NPVs. **A number of other methods are used to evaluate projects. Two are discussed below:**

6.1 ***Certainty equivalents***

The use of a risk discount rate for establishing the present value of future project cashflows combines the two elements of time value of money and the level of risk associated with the cashflow. As the level of risk may vary according to the nature of the particular item being assessed, we should strictly use a different risk discount rate for each element. To avoid this, we replace the individual (risky) projected cashflows with their *certainty equivalents* – that is, the projected element of the cashflow adjusted for risk alone.

In this way we produce a series of “certain” cashflows that can then be discounted at a uniform rate of return.



Certainty equivalents can be used to replace the individual risky projected cashflows and then discounted at a uniform rate of return.



Example

Suppose a project will produce two cashflows, one at the end of Year 1 and another at the end of Year 2. The cashflows are respectively \$10 million and \$20 million. The company estimates that the uncertainty surrounding the amount of the first cashflow is quite low, but the uncertainty surrounding the amount of the second is relatively high.

The company can either:

1. discount both using some arbitrarily high rate of discount (25% pa?) to reflect the average level of risk,
or:
2. assess the value of the certainty equivalent cashflows and discount these at an appropriate rate of return. This might involve decreasing the first payment by 5% and the second by 15%, and discounting both at the rate of return of 12% pa.

**Question 18.14**

Calculate the two outcomes for the result in the previous example.

6.2 Probability trees

Often a project consists of a number of investment decisions spread over time, where the choices available at any point will depend on the decisions made at earlier stages so that the initial decisions made will restrict the future choices (but do not irrevocably bind us to future actions). At the same time, later decisions can be made with the benefit of earlier experience and of the conditions prevailing at the time.

The probability tree technique allows us to investigate projects that have such a structure, particularly where the estimated probability of future events can be refined in the light of initial experience.

We produce a probability tree by:

1. mapping the possible choices, beginning from the initial project decision and branching out to represent all the possible subsequent options
2. assigning estimated cashflows associated with each future possible choice
3. estimating the probabilities associated with each future cashflow
4. using standard expected value calculations, incorporating both the time value of money and the probabilities, to assess the optimal choices in each future time period *based on the knowledge of the intervening events*
5. working backwards from the latest decision point to the present day in order to establish the best (*i.e* highest NPV) route to follow at the outset.



Probability trees can be used to model projects where the choices available at any point in time will depend on the decisions made at earlier stages of the project.

An example of such an analysis follows, based on the construction of an office block (if permission is granted) on a plot of land that is available for purchase.

This type of analysis lends itself to projects where clear-cut events occur and new information is gained as the project progresses. After each of these events has passed, it will be possible to assign better probabilities and NPVs to the subsequent branches in the light of the information gained. It might also be possible to reassess branches that have not been chosen to see if the decision was correct – although if there is no chance of revisiting the decision it is seldom worthwhile.



Example

A company can purchase a plot of land for £5 million, following which it will apply for various types of planning permission. The company has a number of options available to it. Each stage of the project might take 6 months to a year to complete, and decisions have to be made at the end of each stage.

The diagram opposite shows the probability tree that describes the options.

Analysing the outcomes assuming that office permission is granted we can see that it is likely that the company will build a *large* office block. The potential profit from a large office, assuming that there is an 80% chance of finding tenants, is:

$$(80\% \times 20 + 20\% \times 3) = \text{£}16.6 \text{ million.}$$

whereas that of a small office is:

$$(80\% \times 12 + 20\% \times 6) = \text{£}10.8 \text{ million.}$$

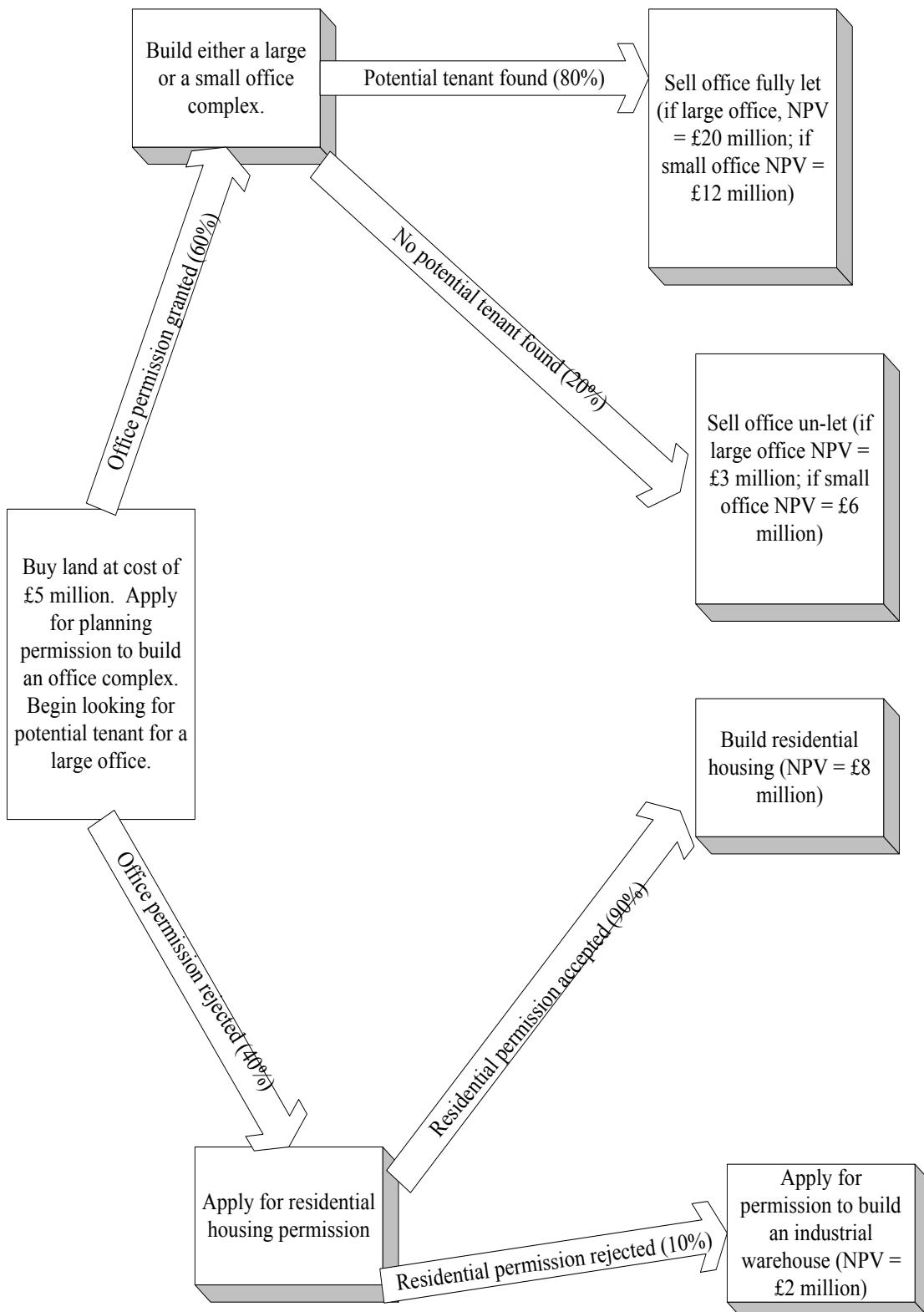
On the assumption that a large office will be chosen, the potential worth of the entire project, including the outcomes if office permission is rejected, is:

$$60\% \times 16.6 + 40\% \times (90\% \times 8 + 10\% \times 2) = \text{£}12.9 \text{ million}$$

Including the initial investment of £5 million for the land, this will lead to an expected £7.9 million profit overall.

After 6 months, when both the planning permission and the results of the tenant search are received, another decision can be made. Let us suppose that permission has been granted.

The company will now have to decide whether to build a small or a large office. On the basis of its market research it may adjust the probabilities of finding a tenant before taking the next step. If the probabilities are now assessed to be 20% in favour of finding a tenant, and 80% against, then the decision would be turned on its head, and the company would be advised to build a small office complex.

**Figure 1: Probability tree for construction project**



The following two sections on risk mitigation and the investment submission do not contain any new Core Reading. Section 2 of this chapter gave an overview of the *whole* process of dealing with risk and Sections 3, 4 and 5 gave details of *some* of the stages involved in the process. The following two sections complete the picture. You might find it interesting, though it is not compulsory reading! If you decide to give it a miss, return to the notes on page 37 for a final question covering the whole of the project appraisal process.

7 Risk mitigation

Once the risks in a risk matrix have been classified and analysed, we can consider how they might be mitigated.



Risk mitigation is aimed at reducing either the probability that a risk occurs and/or the financial impact should it occur.

7.1 Ways of mitigating risk

For each of the major risks, consideration would now be given to identifying the main options for mitigating the risks.



Question 18.15

Describe six methods by which it might be possible to mitigate risks.

Each option for mitigating a particular risk will be evaluated, assessing:

- likely effect on frequency, consequence and expected value
- feasibility and cost of implementing the option – the cost of implementing the option will normally reduce the expected NPV of the project
- any “secondary risks” resulting from the option – a strategy that reduces one element of risk, could introduce an additional, but less important, element of risk, eg insurance introduces the small risk that the insurer could go bust
- further mitigating actions to respond to secondary risks, eg arranging insurance with a number of insurers instead of just one.
- the overall impact of each option on the distribution of NPVs and hence on the variance of potential profitability of the project.

The amount of work involved at this stage of the analysis can sometimes be considerable, especially in relation to the secondary risks and their mitigation, which may necessitate recycling through the whole process.

7.2 ***The financial consequences of risk mitigation***

The result of adopting a particular option ought to be to reduce the downward volatility of the NPVs but in addition it will normally either:

- increase the expected NPV, or
- decrease the expected NPV.

In the former case, the mitigation option is entirely beneficial and should be built in to the project. This is because risk has been reduced and expected return increased. Consequently the project has been unambiguously made more attractive.

In the second, and more normal, case, judgement will have to be exercised on whether the mitigation option in question should be adopted. In this more usual case, risk has been reduced at the expense of a reduction in expected return.

Indeed it will be a matter for judgement, which is the best combination of mitigation options, so as to achieve the most acceptable resulting distribution of NPVs. This should have regard not only to the views of the sponsor but also the likely reactions of prospective lenders and investors – remembering that the lenders in particular will be more concerned with downside than upside variability.



Question 18.16

Consider a capital project involving the upgrading of an office IT platform. Give examples of how the risks associated with this project might be mitigated.

8 The investment submission

A decision will now need to be taken on whether the project should proceed. The investment submission which is to be used as a basis for this decision should assume that the best possible combination of mitigation options will be implemented. It should show the expected NPV (allowing for both upside and downside risk and for an appropriate contingency margin to cover probabilistic risks which have not been fully analysed) and the probability distribution of NPVs.

The residual risks should be fully identified and analysed, and particular attention paid in the submission to any remaining risks which (even if they have a low or uncertain probability of occurrence) could have a serious or catastrophic effect on the outcome of the project as a whole. The method by which it is proposed to finance the project should be specified, and an analysis provided showing the likely effect on investors after taking account of expected price inflation, borrowing, tax, *etc.*



The aim of the investment submission should essentially be to discuss how the project relates to the sponsor's criteria for judging whether or not to proceed with a project.



Question 18.17

List the six main criteria against which the sponsor may judge whether or not to undertake the project.

The decision makers will need to pay attention not only to the submission but to a range of intangible considerations which are necessarily outside the scope of the formal analysis. Such considerations might include:

- allowance for any likely bias or possible approximations in the estimates
- “hunch” – any gut feelings or instincts that cannot be quantified, perhaps based on previous experience. Care should be taken, however, to ensure that these do not override the results of the formal appraisal process.
- knowledge not in the possession of those who have prepared the submission
- last-minute developments – that have arisen since the preparation of the submission documents, including any new information that has come to light,
- doubts about feasibility or quality of implementation
- overall project credibility, *etc.*

They will also wish to consider whether the upside potential has been estimated realistically. Finally, judgement will be required on whether, taking all these aspects into account, the project meets the sponsor's criteria (see Section 2) sufficiently to justify a decision to proceed.

If the decision is taken to proceed with the project, then it is important that all aspects of the project are reviewed regularly, to assess its ongoing profitability. Comparison of actual outcomes with those projected within the project appraisal also enables the updating of the appraisal assumptions and will assist with better future modelling of both this and other projects.

Should the project be rejected, it is important to bear in mind that circumstances may change in such a way that it becomes appropriate to start the project at a later date. For example, an economic upturn may enhance the projected profitability of the project to the extent that it is deemed viable at a future date.

Thus, in each time period we could think of the decision to be made as a choice between:

- starting the project now
- deferring the start of the project until *at least* the next time period, at which point we will revisit the choice in the light of the conditions then prevailing.

**Question 18.18**

Describe the stages involved in the project appraisal procedure.

This page has been left blank so that you can keep the chapter summaries together for revision purposes.



Chapter 18 Summary

Calculating the required rate of return for a project

The use of the cost of capital to calculate the net present value in screening projects ensures that projects are only entered into that will enhance the return to shareholders, provided that it is adjusted to reflect the project risk. The required rate of return should therefore reflect:

- the weighted average cost of capital
- the degree of systematic risk associated with the project.

The weighted average cost of capital can be calculated as:

$$WACC = \frac{\text{Market value of debt}}{\text{Market value of debt} + \text{equity}} \times \text{net cost of debt}$$

$$+ \frac{\text{Market value of equity}}{\text{Market value of debt} + \text{equity}} \times \text{cost of equity}$$

Systematic risk is that part of the return on a project that cannot be eliminated by investing in the same type of project many times over, nor by diversification. The systematic risk of a project p is measured by beta, which is defined as:

$$\beta_p = \frac{\sigma_{pm}}{\sigma_m^2}$$

If the systematic risk for a particular project is thought to be higher/lower than is usual for a company's projects, then in theory the discount rate used should be greater/lower than that which the company normally employs.

Adjusting the discount rate

A suitable adjustment to the discount rate might be based on:

- looking at the discount rates appropriate for use by any companies which habitually engage in such projects
- an arbitrary addition
- the degree of cyclical risk associated with the project
- the operating leverage of the project.

Dealing with specific risks

Risks may be upside as well as downside. In order to deal with them we need to:

- identify them
- analyse them
- mitigate the downside risks
- control any residual risks.

The steps necessary to achieve an effective *identification of the risks* include undertaking a *high-level preliminary risk analysis*, holding a *brainstorming session*, carrying out a *desktop analysis*, setting out all the identified risks in a *risk register*, and ensuring that *upside risks* as well as downside risks are covered.

A *risk matrix* can be used to systematically identify risks categorised according to the cause of risk and the stage of the project.

Causes of risk can be classified as political, business, economic, project, natural, financial and crime.

The *stages of a project* include promotion of concept, design, contract negotiations, project approval, raising of capital, construction, operation and maintenance, receiving revenues and decommissioning.

The *analysis of risks* aims to ascertain the *frequency of occurrence* and the *consequences* if the risk event occurs.

In order to judge the *financial consequences of each risk*, the expected NPV for each risk can be calculated.

Obtaining a distribution of NPVs

A probability distribution for the NPVs for the project as a whole can be obtained using either scenario analysis or stochastic modelling.

Other methods of dealing with risky projects

Certainty equivalents can be used to replace the individual risky projected cashflows and then discounted at a uniform rate of return.

Probability trees can be used to model projects where the choices available at any point in time will depend on the decisions made at earlier stages of the project.

Chapter 18 Solutions

Solution 18.1

The funds required to service the debt of a company are deducted from the profit before tax, and therefore reduce the amount of tax a company has to pay. Viewing this from a different angle it can be said that the government is in effect paying to bond investors an amount equal to the tax on the fixed interest debt payments.

Issuing debt is a more tax-efficient way of raising capital than raising equity.

Solution 18.2

The main additional risks are the:

- uncertainty relating to the level of future income payments
- additional volatility of the share price as compared to index-linked bonds
- additional default risk of the shares, with regard to the income and capital payments, as compared to index-linked bonds
- lack of perfect inflation protection.

Solution 18.3

Each undertaking must be valued on its own merits. If the project involves twice the market risk, then it should only be undertaken if it offers the appropriate amount of return, *ie* the return that would be required if the project stood in the market as a separate entity. Option A is the only one that offers this.

Solution 18.4

It might lead to friction because different rates of return could mean the go-ahead or the shelving of various projects. These rates would have to be determined by management, and views on the riskiness or not of a project might not be consistent between managers. Feelings could be hurt and accusations of politics would emerge if certain projects were allowed to proceed purely because of the use of a lower risk discount rate.

Solution 18.5

With a risk discount rate of 15%, the NPV of project A has a certain value of 49.2, whereas the NPV of project B takes values of -100 and 201.7 with equal probability. Hence, B has an expected NPV of about 50.8. Thus, B has a slightly higher expected NPV, but in view of the much higher level of risk involved, A may well be the more suitable investment. A fairer comparison would use a higher risk discount rate for B, in order to reflect the extra risk involved.

If 20% is instead used, then the numbers become 20.6 for project A and 34.6 for B. Thus, the higher risk discount rate leads to an even stronger preference for the more risky project – because the duration of the cashflows is shorter.

Solution 18.6

The starting point in this decision must be the weighted average cost of capital (WACC). The WACC is the weighted average of the returns required by investors on the debt and equity of the company. It represents the opportunity cost of the resources invested in the company, *ie* what the resources could earn in a similarly risky venture. If we discount cashflows from a project at the WACC, then a positive net present value means that the project would increase shareholders' wealth.

Since the WACC will be affected by gearing, the company should use the WACC at its optimal capital structure, regardless of how the project is actually financed. This separates the financing decision from the investment decision. (If the company's capital structure is not optimal, it could be made optimal through a separate decision.)

If the proposed project has the same degree of systematic risk as the company as a whole, then the WACC is the appropriate discount rate to use.

However, if the degree of systematic risk is different from the company as a whole then the WACC should be adjusted up or down to reflect the higher or lower degree of systematic risk of the project compared with the average of the company's projects.

The discount rate could be found by:

- reference to past similar projects
- reference to the discount rate used by companies that usually invest in this sort of project (though allowance must be made for any differences in gearing)
- using an estimated beta for the project β_p and the capital asset pricing model, where the required return from the project is:

$$r_p = \text{risk-free return} + (\beta_p \times \text{equity risk premium})$$

and the beta of the project measures the covariance of the project returns and market returns as a proportion of the variance of market returns.

The beta of the project will be affected by the cyclicalities of the project returns (do the returns depend on the state of the economy and the business cycle?) and operating leverage (does the project involve a high proportion of fixed costs?).

Solution 18.7

The three main steps that must be taken in order to deal with risks are:

1. identify the risks
2. analyse the risks – by estimating the frequency of occurrence and the financial impact should a particular risk occur
3. mitigate the risks – in order to reduce the frequency of occurrence and the financial impact should a risk occur.

Solution 18.8

The sub-categories could include:

- government
- public opinion
- environmental objections
- legislation
- wars, crime etc
- public relations.

Solution 18.9

There is no uniquely correct answer here. Possible examples could include:

- political risk arising from a lack of co-operation from the overseas government and financial regulators
- business risk arising from a lack of experience of the way business is conducted in the overseas country
- economic risk arising from a slowdown in economic activity in the overseas country.

Solution 18.10(i) ***Identification of risks***

The steps necessary to achieve an effective identification of the risks (upside as well as downside risks) facing the project can be described as follows:

- *High-level preliminary risk analysis* to confirm that the project does not obviously have such a high risk profile that it is not worth analysing further
- *Brainstorming session* of project experts, eg actuaries, accountants, management consultants, oil experts, engineers etc.

The aim will be to identify all project risks and make an initial judgement of their likelihood, severity and interdependency.

- *Desktop analysis* to supplement the above by identifying further risks (using a risk matrix), researching similar projects, and consultation with experts.
- Set out all the identified risks in a *risk register*, with cross references to other risks where there is interdependency.

(ii) ***Five major risks facing the project***

- *Political risks*, eg some governments might be hostile to the pipeline and may not allow the company to pass through its borders or they might impose constraints or additional taxes on company. Environmentalists concerned about pollution and wildlife might disrupt the project.
- *Natural risks* arising from earthquakes and bad weather, eg typhoons, could delay the building of the pipeline, could destroy it or could cause widespread pollution and destruction of wildlife.
- *Project risks* arising from the level of difficulty in construction of the pipeline being greater than anticipated or the failure of technology.
- *Financial risks* arising from the difficulties in raising finance and the possible withholding of funds until concerns of the financiers have been addressed.
- The *economic risk* associated with unpredictable and possibly large changes in the world oil price from its current level, and also from unpredictable fluctuations in the value of local currencies (in which local costs are denominated) and in the US dollar (in which oil is priced), both against sterling (the domestic currency).

Solution 18.11

Present-day money values are used for the financial consequences because future cashflows are easier to interpret if they are expressed in terms of current money values. For example, it may be easier to appreciate the size of a cashflow in 5 years' time if it is expressed as £100 in today's money as opposed to £130 in 5 years' time's money.

Solution 18.12

The types of risk events that might have very serious or disastrous consequences, but a low expected NPV include:

- extreme natural disasters such as earthquakes
- extreme stock market collapses, which might have a severe impact on the financing of a project
- extreme political risks, such as the outbreak of war.

Solution 18.13

The risks that are identified can be analysed according to:

- *The frequency of occurrence or risk level*, ie the perceived likelihood that the particular risk will occur.
- *The financial impact*, ie the effect on cashflows.
- *The degree of dependence* – on other separately identified risks.
- *Controllability*, ie the extent to which the impact of the risk can be managed.

The analysis is conducted in conjunction with experts in each risk and using any available statistics on similar past projects.

The financial consequences if the event occurs are normally expressed:

- in present-day money values, ie after removing the effects of inflation
- in terms of a range of possible values.

The results are then discounted to give net present values (NPVs) using a real risk discount rate. Where a range of values is given with a probability distribution, the expected net present value figures can be found.

The risks will then be prioritised for further analysis. In general the risks with low expected NPVs will be discarded, with the intention of allowing for them in a general contingency allowance later, for example, by means of a one-off global deduction from the overall expected NPV of the project.

However, any *strategic* risks that would have very serious or disastrous consequences, but where the expected NPV is low because the probability of occurrence is small eg earthquakes or other infrequently occurring extreme natural disasters, would be retained for further analysis along with the risks having higher expected NPVs.

Solution 18.14

Discounting at 25% gives:

$$\frac{10}{1.25} + \frac{20}{1.25^2} = £20.8 \text{ million}$$

Using certainty equivalent values gives:

$$\frac{10 \times 0.95}{1.12} + \frac{20 \times 0.85}{1.12^2} = £22.0 \text{ million}$$

Solution 18.15

Six possible methods by which to mitigate risk include:

1. *avoiding the risk*, eg by redesigning the project. In certain circumstances the only way to avoid the risk may be by not proceeding with the project.
2. *reducing the risk*, by either reducing the probability of occurrence or the consequences or both, eg by modifying the design or building in safety margins or procedures.
3. *reducing uncertainty*, eg through further research or a feasibility study – to gain more precise estimates of the possible future cashflows or the impact of each risk.
4. *transferring risk*, eg by engaging a sub-contractor on a fixed price contract.
5. *insuring risk* – by paying a premium to pass on some of the risk to an insurance company.
6. *sharing risk* with another party, especially where the other party is able to control the risk to some extent. For example, a project might be undertaken as part of a syndicate rather than in isolation.

Solution 18.16

Again, there is no one correct solution. Examples of the sorts of ideas you may have generated are:

- Reducing the risk, eg by refining the plan and performing the upgrade in phases hopefully enabling any problems to be identified and addressed on a smaller scale.

- Reducing uncertainty via further research to gain more precise estimates of the possible likelihood and impact of each risk, eg by contacting other users of the intended hardware and/or software to investigate any issues they have faced.
- Transferring risk by employing external consultants to perform the upgrade on terms that include technical support and backup if problems occur.

Solution 18.17

The six main criteria against which the sponsor may judge whether or not to undertake the project were discussed in the previous chapter. They are:

1. the expected financial results
2. the financial risks
3. achieving synergy or compatibility with other projects undertaken by the sponsor
4. satisfying “political constraints”, both within and without the sponsoring organisation
5. having sufficient upside potential
6. using scarce investment funds or management resources in the best way.

Solution 18.18

The project could be appraised using the following steps:

Initial appraisal

We would first need to make a feasibility study to determine whether the project is worth appraising in full. We would need to see if the project satisfied the project sponsor's requirements before advancing to the next stage.

There will be financial criteria to meet, (*eg* is the project likely to earn a hurdle rate of return?) and also non-financial criteria, including:

- political objectives – is the project acceptable or desirable to the sponsors, senior management and other interested parties?
- upside potential – is there enough of it to make the project worthwhile?
- synergy – does the project achieve synergy with other projects undertaken by the sponsor?
- opportunity cost – is the project the best use of scarce investment funds or management expertise?

If it satisfies the requirements above, we would undertake a detailed appraisal.

Detailed appraisal

- Define the project and its scope to ensure that the project's objectives and the roles and responsibilities of the project team are clarified.
- Estimate cashflows by estimating the most likely cashflows for revenues, initial capital expenditure, running costs, termination costs.
- Evaluate cashflows by measures such as the net present value (NPV), internal rate of return (IRR), discounted payback period and receipts-costs ratio. To calculate the NPV, determine a suitable discount rate. The discount rate should reflect the systematic risk of the project. Sensitivity testing could be performed to check the sensitivity of the results to the assumptions, *eg* the initial capital expenditure, the discount rate.
- Conduct a risk analysis. Identify all risks (upside and downside) by using brainstorming and desktop analysis techniques. From the risk matrix, analyse each risk with respect to frequency, severity, interdependency and mitigation options. Calculate the expected NPVs of the risks.
- Evaluate cashflows allowing for the specific risks of the project. Obtain a distribution of NPVs for the project by scenario analysis or stochastic modelling.

Investment submission

Write up all the above in the investment submission.

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Chapter 19

Glossary

Syllabus objectives

- (i) *Demonstrate a knowledge and understanding of the principal terms in use in investment and asset management.*

0 Introduction

This final chapter defines the principal terms used in investment and asset management. Some of these terms you will be familiar with and some relate to concepts that will be elaborated in later subjects, particularly Core Applications and ST5. You may wish to refer back to this glossary at a later stage.

1 **Glossary of principal terms**

Accrued interest

The amount of interest that has accrued on a bond since the last coupon payment. If a bond is quoted *ex-dividend*, accrued interest is negative.

American option

An option that can be exercised on any date before its expiry.

Arbitrage

The simultaneous buying and selling of two economically equivalent but differentially priced portfolios so as to make a risk-free profit.

Bear market

A period of time during which investors are generally unconfident and stock market prices decline. (Compare with *bull market*.)

Bearer document

A document that proves ownership of a security and where the interest and the redemption proceeds must be claimed by the bearer or holder. There is no register of the owners of the security.

Benchmark

A standard or model portfolio against which a fund's structure and performance will be assessed.

Beta value

A measure of a stock's volatility relative to movements in the whole market. Usually defined as the covariance of the return on the stock with the return on the market, divided by the variance of the market return.

Bid price

The price at which a market maker offers to buy a security.

Bill of exchange

A bill of exchange is an invoice which is endorsed by an investment bank and which can be sold to a discount house to raise short-term finance. Where the endorser is an “eligible” bank the bill is known as an “eligible bill of exchange”. In the case of an “eligible bill” the bill of exchange is a very secure investment.

Bulldog

A sterling denominated *foreign bond* issued by an overseas borrower in the traditional UK bond market.

Bull market

A period of time during which investors are generally confident and stock market prices increase. (Compare with *bear market*.)

Callable bond

A bond containing provisions that allow the issuer to buy it back at a predetermined price at certain times during its life. (Compare *puttable bond*.)

Call option

The right, but not the obligation, to buy a specified asset on a set date in the future for a specified price. (Compare with *put option*.)

Capital cover

A calculation made for loans issued by companies. The capital cover is the number of times that the assets of the company (excluding intangibles and after notionally paying current liabilities) cover the amount of the loan (including prior ranking loans).

Cash settlement

A procedure for settling a *futures* or *options contract* in cash rather than by delivering the underlying asset.

Certificate of deposit

A certificate issued by a bank showing that a stated sum of money has been deposited for a specified time at a specified rate of interest. Certificates of deposit can be traded (*ie sold*) by the original depositor.

Chinese walls

Regulations intended to prevent conflicts of interest in integrated security firms.

Clean price

The price of a bond without allowance for accrued interest. (Compare *dirty price*.)

Clearing house

A firm that guarantees the performance of the parties in an exchange-traded derivatives transaction.

Commercial paper

A generic term for short-term debt issued by companies. (The terms “paper” or “notes” are often used when referring to short-term debt.) Commercial paper is a single name form of short-term borrowing used by large companies. It comes in the form of bearer documents for large denominations which are issued at a discount and redeemed at par.

Convertible security

A security which may be converted into something else (usually into shares in the same company) on specified terms.

Corporation tax

Tax on company profits.

Counterparty

The opposite side in a financial transaction.

Coupon

The (usually six-monthly) interest payments on a bond.

Covenant

An agreement that is legal and binding on the parties involved. The expression is often used in association with corporate debt, because the borrower is bound to the terms of the agreement. The expression is also used in property investment because the tenant or lessee is bound to the terms of the lease agreement. In fact the meaning of covenant has been extended in the context of property investment so that it *usually* refers to the quality of the tenant, *e.g.* a tenant with a good covenant is a good quality tenant who is unlikely to break the terms of the agreement.

Credit rating

A rating given to a company's debt by a credit-rating company as an indication of the likelihood of default. Top rating is usually AAA. Credit ratings are much used and are generally highly reliable.

Credit risk

The risk that the counterparty to an agreement will be unable or unwilling to make the payments required under the agreement.

Cum-dividend

The state of a security where the purchaser of a bond or share is entitled to the next coupon or dividend. Opposite of *ex-dividend*.

Custodian

The keeper of security certificates and other assets on behalf of investors.

Dealing costs

The usual expenses of dealing in securities – commission, *stamp duty* and any regulators' levies.

Debenture

A loan made to a company which is secured against the assets of the company. Debentures usually have a floating charge over the assets of the company so that debenture holders rank above other creditors should the company be wound up. Debentures with fixed charges are called mortgage debentures.

Depreciation

An accounting convention whereby firms write down the value of their assets over time.

Derivative instrument

A financial instrument with a value dependent on the value of some other, underlying asset.

Dirty price

The price of a bond allowing for accrued interest. (See *clean price*.)

Dividend cover

The number of times that the dividend payments are covered by earnings for the relevant period. Defined as: earnings per share ÷ dividend per share. It is the inverse of the payout ratio. Care needs to be taken that the tax treatment of the earnings and dividend figures are consistent.

Dividend yield

The running yield (dividends ÷ share price) on an equity.

Emerging market

Stock markets in developing countries such as China, Mexico, Singapore etc. They offer high expected returns due to rapid industrialisation. They are also very risky markets.

Eurobond

An international bond issued by a company or government, often in a currency other than the currency of the borrower. The bonds are traded internationally through banks, and not in the traditional bond markets.

European option

An option that can only be exercised at expiry.

Ex-dividend

Where the purchaser of a bond or equity is not entitled to the next coupon or dividend payment. Instead the seller receives the next coupon or dividend payment. (See *cum-dividend*.)

Exercise price

The price at which an underlying security can be sold to (for a put) or purchased from (for a call) the writer or issuer of an option (or option feature on a security). Also known as strike price.

Fair prices

Market prices that are impartial to both buyer and seller. Often determined by reference to a model.

Financial gearing

The expression “gearing” or “financial gearing” is often used to refer to the impact on the profits for a company caused by fixed-interest borrowing. For a financially highly geared company a small change in the total profits might have a very large proportionate impact on the profits for shareholders. A company with lots of fixed-interest borrowing is “highly geared”.

Fixed charge

The assignment of specified assets of a company or an individual as security for a debt. (Compare with *floating charge*.)

Floating charge

The assignment of all the assets of a company or an individual as security for a debt. (Compare with *fixed charge*.)

Floating-rate note (FRN)

A Eurobond with a variable rate of interest. FRNs are usually medium-term bonds.

Forward contract

A contract to buy (or sell) an asset on an agreed basis in the future.

Forward interest rate

The m year forward rate at the start of year n is the interest rate expected to apply for m years from the start of year n .

Free float

That proportion of the equity of a company available for trading by the public on a stock market.

Freehold

The freeholder of land is in practice the absolute owner of it in perpetuity.

Futures contract

Like a *forward contract*, this is a contract to buy (or sell) an asset on an agreed basis in the future. However, futures contracts are standardised contracts that can be traded on a recognised exchange.

Gearing

The ratio of debt to equity. Often referred to as *financial gearing*.

Gilt

A debt security issued by the British Government that pays regular coupons.

Hedging

Action taken to protect the value of a portfolio against a change in market prices. Hedging involves holding offsetting positions in assets or portfolios the values of which are expected to respond identically to market changes.

Hurdle rate

A target or minimum rate of return used in Capital Project assessment.

Immunisation

Ensuring that the discounted mean term of assets equals that of the liabilities and that the spread of the assets is greater than the spread of the liabilities. This means that a uniform change in interest rates will cause the reinvestment rate and capital value on assets to move in opposite directions so that a fund does not make a loss.

Index-linked gilt

A bond issued by the British Government for which the interest payments and the final redemption proceeds are linked to movements in the RPI.

Index-linked security

A security whose redemption value and / or coupon payments are adjusted to reflect inflation.

Index tracking

An index tracking fund (or an “index fund”) is an investment fund with the specific objective of tracking a particular index. The fund manager can either hold all the stocks in the index in the appropriate proportions (known as “full replication”) or use some mathematical model to choose a smaller sample of stocks which will perform as closely as possible to the index.

Inflation risk premium

The difference between the yield on a fixed income bond and the sum of the guaranteed real yield and the expected inflation rate on a similar index-linked bond. It is required as compensation for the uncertainty in the real return on the bond by investors with index-linked liabilities. Under the inflation risk premium theory the yield curve will tend to slope upwards because investors need a higher yield to compensate them for holding longer dated stocks which are more vulnerable to inflation risk than shorter dated stocks.

Interest cover

A calculation made for loans issued by companies. The income cover is the number of times that the profit of the company (before interest payable and tax) covers the interest on the loan (including the interest on prior ranking loans).

Internal rate of return

The discount rate at which the Net Present Value of a series of cashflows is zero.

Introduction

A method of obtaining a listing for an unquoted company which already has a large number of investors owning its shares. No new capital is raised by this means. It can also happen when a share is listed on a different stock exchange or when a merger of two existing companies occurs and a new holding company is formed.

Investment trust

Investment trusts are public companies whose function is to manage shares and investments. They have a capital structure in the same way as other public companies and can raise both loan and equity capital. Most have quoted shares allowing small investors to gain exposure to the portfolio held by the investment trust.

Junk bond

A bond which does not meet the usual requirements of income cover and capital cover for institutional investors.

Leasehold

A lease is an agreement which allows one of the parties (the leaseholder) the use of a specified portion of a building for a specified period in return for some payment.

Leverage

The US term for *gearing*.

Linked-internal rate of return

This return is produced by calculating the internal (ie money-weighted) rates of return for successive short periods and compounding them to give an annual rate of return. If cashflows in or out of the fund are not very large and/or the rate of return does not vary much between cashflows, the linked internal rate of return provides a reasonable approximation to the time-weighted rate of return. The shorter the period chosen the closer it becomes to the time-weighted rate of return.

Liquidity preference

The liquidity preference theory is based on the generally accepted belief that investors prefer liquid assets to illiquid ones. Investors require a greater return to encourage them to commit funds for a longer period. Long-dated stocks are less liquid than short-dated stocks, so yields should be higher for long-dated stocks.

Listing

An endorsement from market authorities that securities and their issuers meet specified criteria (the Listing Rules). A necessary prerequisite for the securities to be traded on the market.

Local authority bills

Short-dated debt securities issued by UK local authorities. The investment characteristics are similar to Treasury Bills but yields are slightly higher due to the lower marketability and marginally higher risk of default.

Long

A long position in an asset means having an economic exposure to the asset. In futures and forward dealing the long party is the one who has contracted to take delivery of the asset in the future. (Compare *short*.)

Margin

The collateral deposit required by a *clearing house* to minimise the risk of default by the *counterparties*.

Market capitalisation

The total value at market prices of the securities at issue for a company, or a stock market, or a sector of a stock market.

Market risk

Market risk is the risk relating to changes in the value of a portfolio due to movements in the market value of the assets held.

Marking to market

The practice of revaluing an instrument to reflect the current values of the relevant market variables.

Matching

Arranging assets and liabilities so that the cashflows generated by the assets can be expected to meet the liability payouts, either because the assets generate income of the right amount at the right time or because the market values of the assets are linked to the market values of the liabilities appropriately.

Mortgage debenture

A mortgage debenture is a long-term corporate debt security normally secured by a fixed charge on specified properties and ranks ahead of ordinary debentures offering the highest degree of security among corporate bonds.

Net asset value per share

The book value of the shareholders' interests in a company, usually excluding intangibles such as goodwill divided by the number of shares in issue.

Nominal value

This term refers to an amount of stock. It is the amount specified on the stock certificate. Dealings in bonds are carried out in amounts of nominal.

Offer for sale

A method of issuing shares of a previously unquoted company. The issuing house, often an investment bank or specialised department of a stockbroker or clearing bank, underwrites the whole issue of the shares at a fixed price and offers them on to the public at a slightly higher price.

An offer for sale may be made by tender. A minimum price is set and the public is invited to subscribe at this or a higher price. All shares are then issued at a common price – the strike price – which just satisfies the number of shares on offer. Any subscriber offering below the strike price will not receive any shares.

Offer for subscription

A method of issuing shares of a previously unquoted company. The shares in the company are offered directly to the public. There is no underwriting. This method could be used in conjunction with a tender offer instead of a fixed price.

Offer price

The price at which a market maker is prepared to sell a particular security.

Open ended investment company (OEIC)

An investment vehicle very similar to an *investment trust* but with the open ended characteristics of a *unit trust*.

Operational gearing

Companies with high fixed costs and low marginal costs are said to have high “operational” gearing. A small change in sales gives a big change in profits for such companies.

Operational risk

Operational risk is the risk of loss due to fraud or mismanagement within the fund management organisation itself.

Option

The right to buy or sell an asset.

Option premium

The price paid for an option.

Ordinary share

A share in the equity capital of a company. Ordinary shareholders have the right to receive all distributable profits of the company after debt holders and preference shareholders have been paid. They also have the right to attend and vote at general meetings of the company.

Over the counter (OTC) option

Privately negotiated derivative contracts offered by dealers directly to end-users.
(See *Traded options*.)

Partly paid shares

Shares may be issued on a “partly paid” basis which means that the shareholders pay only part of the cost of the share initially and pay the rest later (perhaps by instalments). This was common with some privatisation issues where one of the aims was to secure many private shareholders.

Par value

The par value of a share is its nominal value. New shares cannot be issued at below the par value. They may be issued on a “partly paid” basis or a “fully paid” basis (see *Partly paid shares*). A share premium may be payable in addition and, if so, this share premium will be payable in full at the outset, even if the shares are issued on a “partly paid” basis.

Par yield curve

A plot of coupon value on the y-axis against term to redemption on the x-axis. For each term, the coupon that would be required for a fixed-interest bond of that term to be issued at par is plotted.

Payback period

The time period it takes for an investment to generate sufficient incremental cash to recover its initial incremental capital outlay in full.

Payout ratio

Dividends divided by earnings per share. The inverse of *dividend cover*.

Placing

A new issue method where shares are placed with institutional clients of the issuing house rather than being offered to the public. Costs are low, as no underwriting is needed. Also known as selective marketing.

Preference share

A particular class of shares which generally rank ahead of ordinary shares. Preference shareholders are normally entitled to a specified rate of dividend and, unlike ordinary shareholders, are not entitled to residual profits. Although part of a company's share capital, from an investment perspective preference shares are much more like fixed-interest bonds.

Price earnings ratio

The ratio of a share's price to its net earnings.

$$PER = \frac{\text{ordinary share price}}{\text{earnings per share}}$$

The earnings per share used can be historic or prospective.

Privatisation

The sale of state assets or businesses, often to reduce government debt.

Put option

The right, but not the obligation, to sell a specified asset at a specified price at specified times. (Compare with *call option*.)

Puttable bond

A bond where the holder has the right to sell it back to the issuer at certain predetermined times for a predetermined price. (Compare *callable bond*.)

Real yield

The yield on an investment after inflation has been allowed for. Often approximated as the difference between the yield realised and the rate of inflation over the corresponding period.

Redemption

The return to an investor of the capital value of a bond or other security. Redemption may take place on a fixed date or on one of a series of specified dates. The bond may include an option for the borrower to choose the date or for the lender to choose. The capital amount repaid may be fixed or index-linked.

Redemption yield

The gross redemption yield (the word *gross* is often omitted), or yield to maturity, is the rate of return at which the discounted value of all future payments of interest and capital is equal to the “dirty” price of the bond. The net redemption yield allows for taxation of the amounts received by the investor.

Retail price inflation

The measurement of price changes at the retail (consumer) level.

Return on capital employed (ROCE)

Profit before interest and tax divided by capital employed, expressed as a percentage. An indicator of a company’s efficiency in generating profit from its asset base.

Rights issue

A rights issue is where a company issues further shares, at a given price, to existing shareholders in proportion to their existing shareholdings. For example, a 1-for-5 rights issue allows each shareholder to buy one new share for each five currently held. The purpose is for the issuing company to raise more money.

Risk discount rate

The rate of interest used to discount anticipated cashflows from capital projects in Net Present Value calculations.

Risk premium

The additional return required by investors in order to compensate for anticipated risks.

Running yield

The annual income on an investment divided by its current market value. Important examples are the flat yield on gilts, the gross dividend yield on equities and the rental yield on property.

Scrip issue

A scrip issue (sometimes called a capitalisation or bonus issue) is a further issue of new shares to existing equity shareholders. They receive free a number of shares in proportion to their holdings.

Senior debt

Debt that ranks ahead of all other classes (*subordinated debt*) for repayment.

Share buybacks

Repurchase, by a company, of its own shares in the market. Usually a tax-efficient means of returning capital to shareholders.

Share split

In a share split existing shares are split into two shares of half the original nominal value. No new money is raised and no reserves are capitalised.

Short

A short position in an asset means having a negative economic exposure to the asset. In futures and forward dealing the short party is the one who has contracted to deliver the asset in the future. (Compare *long*.)

Specific risk

The risk of holding a share which is unique to the industry or company and can be eliminated by having a suitably diversified portfolio of shares of differing types of companies. This is sometimes also referred to as alpha, unsystematic or residual risk.

Split capital investment trust

An investment trust where the ordinary share capital consists of income shares and capital shares. Holders of income shares receive all or most of the distributed income while holders of capital shares receive little or no income but receive the residual value of the assets after income shares have been redeemed at a fixed value when the trust is wound up.

Spot interest rate

The n year spot interest rate is the geometrical average of the interest rates that are expected to apply over the next n years. It is the redemption yield on an n -year zero-coupon bond. (See *zero-coupon yield curve*.)

Stamp duty

The tax paid by the purchaser on the transfer of various types of asset, including UK shares.

Subordinated debt

Debt that ranks behind another class (senior debt) for repayment.

Swap

A contract between two parties under which they agree to exchange a series of payments according to a pre-arranged formula.

Systematic risk

The risk of the individual share relative to the overall market which cannot be eliminated by diversification. It is measured by the beta factor. A share with a beta greater than 1 is said to be aggressive, ie the price of the share is expected to do better than the market when prices rise. Conversely, a share with a beta less than 1 is a defensive stock, ie its price will be expected to fall by less than the market when prices fall.

Traded options

Option contracts with standardised features actively traded on organised exchanges. (See over the counter options.)

Treasury bill

A government bill. Usually issued with a term of 91 or 182 days.

Underwriting

The provision of some form of guarantee. In investment, underwriting is where an institution gives a guarantee to a company issuing new shares or bonds that it will buy any remaining shares or bonds that are not bought by other investors.

Unit trust

An open ended investment vehicle whereby investors can buy “units” in an underlying pool of assets from the trust manager. If there is demand for units, the managers can create more units for sale to investors. If there are redemptions (sales by investors), the managers will buy in units offered to them. Unit trusts are trusts in the legal sense.

Unsecured loan stock

A form of long-term corporate debt which is not secured on the borrower's assets.

Warrant

An option issued by a company. The holder has the right to purchase shares at a specified price at specified times in the future.

Weighted average cost of capital

The aggregate return required by the providers of debt and equity capital, allowing for the effects of tax and the risks borne by the capital providers.

Withholding tax

Tax deducted from dividends in investment which are paid to non-resident investors.

Yield curve

A plot of yield against term to redemption. Usually the yield plotted is the gross redemption yield on coupon-paying bonds but other yields can be used. (See *par yield curve*, *zero-coupon yield curve*.)

Zero-coupon bond

A bond where the sole return is the payment of the nominal value on maturity.

Zero-coupon yield curve

A plot of redemption yields against term to redemption for (usually hypothetical) zero-coupon bonds.

**Question 19.1**

Distinguish between:

- (i) an American option and a European option
- (ii) a bill of exchange and commercial paper
- (iii) specific risk and systematic risk
- (iv) a call option and a put option
- (v) credit risk and market risk
- (vi) financial gearing and operational gearing
- (vii) dividend cover and dividend yield
- (viii) fixed charge and floating charge
- (ix) a forward and a future
- (x) an ordinary share and a preference share
- (xi) an offer for sale and an offer for subscription
- (xii) a rights issue and a scrip issue.

2 ***Some concluding thoughts***

Having actively studied the 19 chapters of Subject CT2, you should now have a good understanding of the key principles of finance.

In Part 1 of the course, we studied the ways in which companies can set up and raise finance. In Parts 2 and 3 of the course we studied the construction and analysis of company accounts. In Part 4 of the course we studied the financing decision in more detail and also the investment decision.



There is a lot of bookwork to learn for this exam and you will be tested on your knowledge and understanding of key terms and concepts. Beyond that, you will be required to apply the principles you have learned in a practical context.

As a key part of your revision, remember to refer to the Syllabus Objectives in the Study Guide.

End of Part 4

What next?

1. Briefly **review** the key areas of Part 4 and/or re-read the **summaries** at the end of Chapters 15 to 18.
2. Attempt some of the questions in Part 4 of the **Question and Answer Bank**. If you don't have time to do them all, you could save the remainder for use as part of your revision.
3. Attempt **Assignment X4**.

Time to consider – “rehearsal” products

Mock Exam A / AMP and Marking – There are three separate mock exam papers that you can attempt and get marked. A recent student survey found that students who do a mock exam of some form have significantly higher pass rates. Students have said:

“Overall the marking was extremely useful and gave detailed comments on where I was losing marks and how to improve on my answers and exam technique. This is exactly what I was looking for – thank you!”

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And finally ...

Good luck!

Chapter 19 Solutions

Solution 19.1

(i) *an American option and a European option*

An American option can be exercised on any date before its expiry whereas a European option can only be exercised at expiry.

(ii) *a bill of exchange and commercial paper*

- Both are bearer documents that are issued at a discount and redeemed at par.
- A bill of exchange is a two-name form of short-term borrowing (since the bill is guaranteed by an investment bank) whereas commercial paper is a single-name form of short-term borrowing.
- Commercial paper can only be issued by large companies.

(iii) *specific risk and systematic risk*

- The specific risk of holding a share is the risk that is unique to the industry or company (such as the risk of staff dissatisfaction and disruption) whereas systematic risk is the risk of being exposed to the market (such as the risk of inflation or high/low economic growth).
- Specific risk can be eliminated by having a suitably diversified portfolio of shares of differing types of companies but systematic risk cannot be eliminated by diversification.

(iv) *a call option and a put option*

A call option is the right, but not the obligation, to buy a specified asset on a set date in the future for a specified price whereas a put option is the right, but not the obligation, to sell a specified asset at a specified price at specified times.

(v) *credit risk and market risk*

Credit risk is the risk that the counterparty to an agreement will be unable or unwilling to make the payments required under the agreement. Market risk is the risk relating to changes in the value of a portfolio due to movements in the market value of the assets held.

(vi) ***dividend cover and dividend yield***

Dividend cover is the number of times that the dividend payments are covered by earnings for the relevant period. Dividend yield is the dividend expressed as a percentage of the share price.

(vii) ***financial gearing and operational gearing***

Financial gearing is a measurement of the relative proportions of debt and equity finance that a company uses. A highly geared company has a high proportion of debt finance and therefore finds that a relatively small change in operating profit has a relatively large impact on earnings for shareholders.

Operational gearing is a measurement of the relative proportions of fixed and variable costs incurred by a company. A highly geared company has a high proportion of fixed cost and therefore finds that a relatively small change in sales causes a relatively large change in operating profit.

(viii) ***fixed charge and floating charge***

A fixed charge occurs where specific assets are assigned as security for a debt whereas a floating charge occurs where all assets are assigned as security for a debt.

(ix) ***a forward and a future***

Both are agreements to buy or sell an asset for a fixed price at some fixed date in the future. However, whereas forwards are tailor-made and traded over the counter (OTC), futures are standardised and traded on a recognised exchange.

(x) ***an ordinary share and a preference share***

- Preference shareholders are normally entitled to a specified rate of dividend (rather like debt holders receive a specified coupon rate) whereas ordinary shareholders have no specified rate of dividend.
- Preference shareholders rank above ordinary shareholders (but below debt holders).
- Ordinary shareholders have the right to receive all distributable profits of the company after debt holders and preference shareholders have been paid.
- Ordinary shareholders have the right to attend and vote at general meetings of the company.
- Although preference shares are part of a company's share capital, from an investment perspective, they are much more like fixed-interest bonds.

(xi) ***an offer for sale and an offer for subscription***

- Both are possible methods of issuing shares of a previously unquoted company.
- Both an offer for sale and an offer for subscription could be made at a fixed price or by tender.
- In an offer for sale, an issuing house organises the whole issue of the shares to the public whereas in an offer for subscription the company itself offers the shares directly to the public.
- In an offer for sale, the issuing house underwrites the share issue but with an offer for subscription there is no underwriting.

(xii) ***a rights issue and a scrip issue***

- A rights issue is a further issue of shares, at a given price, to existing shareholders in proportion to their existing shareholdings. A scrip issue is a further issue of free shares, to existing shareholders in proportion to their existing shareholdings.
- A rights issue therefore raises new funds for the company whereas the scrip issue does not.
- A rights issue will increase share capital and reserves, whereas a scrip issue will raise share capital but reduce reserves to leave the total of share capital and reserves constant.

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Part 1 – Questions

Introduction

This Question & Answer Bank is split into five parts. The first four parts of the Question & Answer Bank cover the four parts of the course and the last part contains a set of exam-style questions covering the whole course.

Each part contains:

- multiple-choice questions
- short questions
- long questions.

This is just like the Subject CT2 exam, except that the proportions of each type of question in each part may differ.

In the Subject CT2 exam, the proportions will be:

- multiple-choice questions (2 marks each) – 20%
- short questions (usually 5 marks each but could be 4 - 10 marks) – 40%
- long questions (20 marks each) – 40%.

For each part of the Question & Answer Bank, the questions may require knowledge from earlier parts of the course.

We strongly recommend that you use these questions to practise the techniques necessary to pass the exam. Do not use them as a set of material to *learn* but attempt the questions for yourself under strict exam-style conditions, before looking at the solutions provided.

The distinction represents the difference between active studying and passive studying. Given that the examiners will be aiming to set questions to make you think (and in doing so they will be devising questions that you haven't seen before) it is much better if you practise the skills that they will be testing.

It may also be useful to you if you group a number of the questions together to attempt under timed conditions. Ideally three hours would be set aside but anything from one hour (*ie* 35 marks) upwards will help your time management.

Multiple-choice questions**Question 1.1**

A limited liability partnership differs from a limited company in that:

- A it is not a separate legal entity.
- B there must be one member with unlimited liability.
- C it has no Memorandum or Articles of Association.
- D action cannot be taken against individual members for fraud and negligence. [2]

Question 1.2

Which of the following is NOT true of a public company?

- A The company name must end in “public limited company” or *PLC* or *plc*.
- B The ordinary shares must be quoted on the Stock Exchange.
- C Ordinary shareholders have one vote per share held.
- D The issued share capital must not be less than £50,000. [2]

Question 1.3

Which of the following statements concerning Eurobonds is false?

- A Eurobonds are often issued outside the country of the currency of issue.
- B Eurobonds are often issued outside the country of the borrower.
- C Eurosterling can be issued in London.
- D Eurobonds are only issued in Europe. [2]

Question 1.4

Consider the following definition:

“The lender’s security is a specified asset which the borrower cannot dispose of (without the lender’s permission). The lender can repossess upon default or appoint a receiver to intercept income (eg rent).”

This is a definition of a:

- A Eurobond.
- B warrant.
- C fixed-charge debenture.
- D floating-charge debenture.

[2]

Question 1.5

Investors in the ordinary shares of a company have their liability limited to:

- A the market price of the shares.
- B the fully paid value of the shares.
- C the nominal value of their holding.
- D the capital value of their holding, less any dividends due.

[2]

Question 1.6

Which of the following is often used by companies that are suffering from cashflow problems arising from late-paying customers?

- A hire purchase
- B bills of exchange
- C invoice discounting
- D trade credit

[2]

Question 1.7

A company has issued the following:

- I subordinated loan stock
- II ordinary shares
- III floating-rate notes
- IV floating-charge debentures

Which of the following is the order of priority in the event of a winding-up of the business?

- A I, II, III, IV
- B III, IV, II, I
- C IV, III, I, II
- D IV, I, III, II

[2]

Question 1.8

An investor may buy a call option if she expects:

- A the value of the underlying security to increase.
- B the value of the underlying security to fall.
- C interest rates to rise.
- D a stock market crash.

[2]

Question 1.9

Which of the following is correct?

- A Interest payments are always greater than dividend payments.
- B Interest is paid out of pre-tax profit and dividends are paid out of post-tax profit.
- C Interest is paid on debentures and dividends are paid on unsecured loan stock.
- D Interest is taxable but dividends are not.

[2]

Question 1.10

Which of the following could NOT result in a company obtaining a stock exchange listing?

- A an introduction
- B a rights issue
- C an offer for subscription
- D a placing

Question 1.11

An arrangement whereby a company's shares obtain a quotation on the London Stock Exchange, and most of the shares that are made available are bought by a small number of institutional investors, is known as:

- A a placing.
- B an offer for subscription.
- C an introduction.
- D an offer for sale.

[2]

Question 1.12

“Margin” is:

- A the cost of buying an option.
- B the cost of buying a future.
- C a “deposit” paid to the writer of a future or option by the purchaser.
- D a “deposit” paid to the clearing house by the buyer and seller of a future and the writer of an option.

[2]

Question 1.13

Dividends on preference shares:

- A are a legal requirement on the company.
- B are counted as unfranked investment income.
- C are generally both cumulative and redeemable.
- D are paid at the discretion of the directors.

[2]

Question 1.14

Which of the following is paid last if a company is wound up?

- A Eurobonds
- B mortgage debentures
- C floating-charge debentures
- D preference shares

[2]

Question 1.15

A highly risk-averse investor should NOT invest in ordinary shares because:

- A ordinary shares offer a low expected return relative to other securities.
- B ordinary shareholders have the last entitlement in the event of a winding-up of the company.
- C they offer a low initial yield.
- D shareholders have pre-emptive rights.

[2]

Question 1.16

Under a floating charge:

- A the company may not, in the usual course of business, realise assets which are subject to the charge.
- B a default by the company will make the charge crystallise into a fixed charge.
- C specific assets are available to meet investors' claims if the company defaults on interest or capital payments.
- D security is provided in the event that the borrower defaults on the final capital payment, but not in the event of default on the interest payments.

[2]

Question 1.17

Taxable profits for a company are:

- A unadjusted pre-tax accounting profits.
- B trading profits less capital allowances.
- C unadjusted income (after expenses) plus capital gains.
- D none of the above.

[2]

Question 1.18

Which of the following situations is least likely to give rise to agency costs?

- A a car manufacturing business, which employs managers to carry out day-to-day operations
- B an oil refining business in which the government takes a great interest
- C wage negotiations in which managers have more information than unions
- D a retailing business, which has one owner-manager

[2]

Question 1.19

The main significance of the par value of an ordinary share is that:

- A it is the minimum price at which shares can be traded on the Stock Exchange.
- B it is the minimum price at which shares can be issued by the company.
- C it is the price at which the shares will be redeemed.
- D at prices above the par value a company must have a scrip issue.

[2]

Question 1.20

Which of the following will NOT dilute the value of the equity in a business?

- A warrants
- B Eurobonds
- C convertible loan stock
- D executive stock options

[2]

Question 1.21

Which of the following strategies would NOT help a company to reduce its exposure to rising interest rates?

- A the negotiation of an interest rate swap
- B the purchase of a put option on an interest rate future
- C the purchase of a bond future
- D the sale of an interest rate future

[2]

Questions 1.22 and 1.23 relate to Company XYZ. The statement of financial position of XYZ prior to the rights issue is given below:

<i>(all figures in £000s)</i>			
Non-current assets	400	Share capital	120
Current assets	100	<i>(Ordinary shares of £1)</i>	
		Other reserves	50
		Retained earnings	330
	<hr/> 500		<hr/> 500

The market price of the company's shares is currently £7 per share.

Question 1.22

If the company has a 1-for-3 rights issue at £5, the expected ex-rights price of the shares will be:

- A £7.00
- B £6.50
- C £5.50
- D £5.00

[2]

Question 1.23

Following the rights issue, the company's other reserves will be:

- A £330,000
- B £250,000
- C £210,000
- D £50,000

[2]

Question 1.24

£100 nominal of a convertible bond gives the right to purchase 70 ordinary shares. The market prices of the convertible bond and ordinary shares are £120 and 90 pence respectively. The conversion premium per share is:

- A 81p
- B 125p
- C 129p
- D 171p

[2]

Short questions***Question 1.25***

Describe the role of the financial manager.

[5]

Question 1.26

Explain how businesses are subject to the disciplines of the capital markets.

[4]

Question 1.27

Give three sources of personal income that are tax-free in the UK. Outline other adjustments made to total income in order to arrive at taxable income.

[3]

Question 1.28

Outline the system of capital gains tax as it applies to individuals in the UK.

[4]

Question 1.29

Explain the differences between a sole trader, a partnership, a company and a limited liability partnership.

[10]

Question 1.30

Describe commercial paper. Explain how it differs from a bill of exchange.

[6]

Question 1.31

Ordinary shares are the main way in which UK companies are financed. Describe the main characteristics of ordinary shares and explain their popularity amongst both issuers and investors.

[10]

Question 1.32

Loan stock can be issued in many forms. Describe the generic characteristics of loan stock. [5]

Question 1.33

Describe the investment characteristics of convertible bonds. [5]

Question 1.34

An investor purchases a convertible loan stock convertible to one ordinary share at any time up to 31 December 2012. List the possible courses of action open to the investor, and state circumstances in which each might be appropriate. [5]

Question 1.35

Outline the nature of interest rate swaps. [3]

Question 1.36

Explain how currency swaps differ from interest rate swaps. [2]

Question 1.37

Compare and contrast futures and options. [5]

Question 1.38

Explain the role of the underwriters of a share issue. [5]

Long question**Question 1.39**

You are a director of Piron plc, a large manufacturing company based in the UK. The company produces electronic products for the world market and has branches in Europe and Asia. It is financed by a mixture of equity (ordinary and preference shares) and debt (debentures and unsecured loan stock) finance. The company now wishes to expand its range of products and needs further funds for investment. As a director, you will have to contribute to the discussion of the various financial options open to the company.

- (i) One of the options being considered is a rights issue. Discuss the advantages and disadvantages of a rights issue for Piron plc. [6]
- (ii) The Finance Director has suggested that the company could issue Eurobonds. Discuss the advantages and disadvantages of Eurobonds for Piron plc. [6]
- (iii) List the other financial options available for Piron plc. [3]
- (iv) Describe the factors you will consider when making your decision. [5]

[Total 20]

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Part 1 – Solutions

Solution 1.1

Answer = C

A limited liability partnership is similar to a limited company in that it is a separate legal entity, all its members benefit from limited liability and action can be taken against individual members for fraud and negligence. However, it does not have to produce a Memorandum or Articles of Association. [2]

Solution 1.2

Answer = B

Being a public company is a requirement for obtaining a quotation, but having a quotation is not a requirement for being a public company. [2]

Solution 1.3

Answer = D

The term “Euro” is misleading (although the oldest, and still the main, markets are in Europe). The other statements are all correct. [2]

Solution 1.4

Answer = C

Debentures can be either fixed-charge (or mortgage) debentures or floating-charge debentures. Fixed-charge debentures are secured against a particular asset. [2]

Solution 1.5

Answer = B

Shareholders’ liability is limited to the fully paid-up value of their shares. [2]

Solution 1.6

Answer = C

Invoice discounting is another name for recourse factoring. This provides early payment of a percentage of the value of the invoices by a factor. The supplier retains contact with the customers and when the customers eventually pay their bills, the loan is repaid to the factor, with interest. [2]

Solution 1.7

Answer = C [2]

Solution 1.8

Answer = A

A call option gives the buyer the right to buy the underlying security at a set price. This will be worth doing if the market price on the expiry date is *higher* than the exercise price. If interest rates rise, we might expect the value of shares to fall, so it would not be worth buying a call option. (It might be worth buying a put option, though.) [2]

Solution 1.9

Answer = B

Interest is paid on loan stock, whereas dividends are paid on equity. Interest could be greater than, equal to or less than dividend payments (though the overall return to equity must be greater than the return to debt because equity is riskier for the investor). Interest payments are treated as an expense for the company and are therefore paid out of pre-tax profit. Dividends are paid out of post-tax profit. Both interest and dividends are taxable, though in some countries, *eg* the UK, governments give at least some credit to the recipient for the tax that has already been paid by the company. [2]

Solution 1.10

Answer = B

Rights issues are used by listed companies to raise further capital. The other three method are used for obtaining a listing. [2]

Solution 1.11

Answer = A

All four are methods of obtaining a listing. A subscription and offer for sale are both offers made to the public (directly by the company itself, or via an issuing house respectively). An introduction does not make any shares available. [2]

Solution 1.12

Answer = D

The margin exists to protect the clearing house against credit loss. [2]

Solution 1.13

Answer = D

Preference dividends can be passed in certain circumstances, and they are not a legal requirement. [2]

Solution 1.14

Answer = D

Loan stock holders (Options A, B and C) are always paid before preference shareholders. [2]

Solution 1.15

Answer = B

A is false, and C and D are wrong because these should not prevent a risk-averse investor from investing in ordinary shares. [2]

Solution 1.16

Answer = B

[2]

Solution 1.17

Answer = D

The accounting profits will differ from the taxable profits. Capital allowances are not the only difference between accounting profits and taxable profits. C deals with accounting profits again. [2]

Solution 1.18

Answer = D

Agency costs arise when costs are incurred in the monitoring and influencing of others. When the owner is the manager there is no conflict of interest. [2]

Solution 1.19

Answer = B

A is the market price. C is wrong because shares are not redeemed. D is false because companies do not have to have scrip issues. [2]

Solution 1.20

Answer = B

Eurobonds do not have any effect on the number of shares issued. The other three could all cause an increase in the number of shares and therefore a dilution of the value of the equity in the business. [2]

Solution 1.21

Answer = C

The company could swap a floating interest rate for a fixed interest rate to protect it from rising interest rates.

It could sell an interest rate future. If interest rates rise, the price of the interest rate future falls and thus a profit could be made on the future to offset the rise in interest rates. If interest rates fell, a loss would be made on the future but the company would benefit from the falling interest rates on its loan.

By buying a put option on an interest rate future, it is buying the option to sell. It will exercise this right if interest rates rise.

It would not buy a bond future. If interest rates rise, the price of the bond future will fall. It would make a loss on the future as well as suffering from higher interest rates. [2]

Solution 1.22

Answer = B

The ex-rights price will be given by:

$$\text{Price} = \frac{(3 \times 7) + (1 \times 5)}{(3 + 1)} = \text{£}6.50 \quad [2]$$

Solution 1.23

Answer = C

The company will issue 40,000 new shares in a 1 for 3 rights issue (there are 120,000 shares to start with).

The amount that will be transferred to the other reserves will be:

(the number of shares issued) × (the amount above the par value)

$$= 40,000 \times \text{£}4 = \text{£}160,000$$

This will be added to the £50,000 that exists already in this account. [2]

Solution 1.24

Answer = A

The conversion premium is the extra amount that an investor pays for a share by buying it as a convertible, compared with the cost of buying the share directly.

In this case, the calculation is: $\frac{120}{70} - 0.90 = 81p$. [2]

Solution 1.25

The financial manager is the link between the firm's operations and the financial markets. The firm needs to invest in capital equipment in order to carry out its business operations. To acquire such assets, the company must raise finance from the financial markets. [1]

Therefore the financial manager must make two main decisions:

1. What real assets should the firm invest in? (This is the investment or capital budgeting decision.)
2. How should the cash for the investment be raised? (This is the financing decision.) [1]

The investment decision is complex, important and risky. There are often alternative investment projects, each with uncertain returns over an uncertain lifespan. A wrong decision could have very serious consequences for the firm's fortunes. [1]

The financial manager must get together with many interested parties, such as project managers, production managers, marketing managers, tax experts and legal experts in order to understand the full implications of the investment decision. The financial manager should apply impartiality and realism to the investment decision. [1]

In order to make appropriate financing decisions, the financial manager should have a clear understanding of the options available and the way in which the capital markets work. [1]

[Total 5]

Solution 1.26

Capital markets are continuously expressing their view of the performance of a particular company through the valuations of a firm's shares and bonds. The price of the company's share is the market's perception of the particular firm's current and expected future performance. [1]

If managers are not using the assets of the business effectively, the market will soon know this and its poor perception of the company will be revealed in a lower share price. [1]

One consequence of a falling share price may be a take-over bid as the firm becomes a bargain for a corporate acquirer. Another consequence might be redundancy for the manager. [1]

So, by providing continuous assessment of the firm's performance, the capital markets stimulate efficiency and provide incentives to business managers to improve their performance. [1]

[Total 4]

Solution 1.27

Three sources of income that are tax-free in the UK are:

1. most gambling profits
2. income from ISAs
3. most social security benefits.

Other adjustments that have to be made to total income to arrive at taxable income are:

- the addition of fringe benefits such as cheap mortgages
- the deduction of tax-free expenditure such as contributions to an approved pension scheme and charitable gifts
- the deduction of appropriate allowances, eg personal allowance, age allowance.

[3]

Solution 1.28

A capital gain is the gain made when an asset is sold for more than it cost. [1]

Capital gains on some assets may be exempt. For example, in the UK, private motor cars and a main private residence are free from capital gains tax. [1]

The sale price can be reduced by any expenses associated with the sale. The purchase cost can be increased by any costs associated with the purchase and any expenditure made to enhance the value of the asset during the period the asset was held. [1]

Individuals are usually given an annual allowance. Any taxable gain above this is taxed at 18% or 28%, depending on the individual's taxable income. [1]
[Total 4]

Solution 1.29

Ownership

A sole trader is an organisation owned by one person.

A partnership is owned by two or more people.

A company is owned by its shareholders.

A LLP is owned by its members. [2]

Liability

A sole trader has unlimited liability.

Partners have unlimited liability. Individual partners are jointly and severally liable for the debts of the partnership.

Shareholders of a company have limited liability.

Members of a LLP have limited liability. [2]

Legal identity

A sole trader does not have a legal identity distinct from its owners.

A partnership does not have a legal identity distinct from its owners.

A company is a legal entity distinct from its owners.

A LLP is a legal entity distinct from its owners. [2]

Documentation

A sole trader needs no documentation.

A partnership needs no documentation, though a Partnership Agreement is advisable.

A company must have three formal legal documents (Memorandum of Association, Articles of Association and Form IN01) and be registered at Companies House.

A LLP is advised to have a Partnership Agreement. The LLP must be registered at Companies House. [2]

Disclosure and tax

A sole trader prepares accounts for the tax authorities. He or she pays income tax.
A partnership prepares accounts for the tax authorities. Partners pay income tax.
A company (above a certain size) must publish its accounts. It pays corporation tax.
A LLP (above a certain size) must publish its accounts. Partners pay income tax. [2]
[Total 10]

Solution 1.30

Commercial paper is:

- a short-term promissory note
- issued at a discount and redeemed at par
- a bearer document
- negotiable (*i.e.* tradeable)
- issued by large companies who have to meet certain minimum requirements, for example, be listed on the London Stock Exchange
- single-name paper, *i.e.* the name of the company that owes the money. [Maximum 4]

A bills of exchange differs in that it is:

- issued by any company
- two-name paper, *i.e.* the name of the company that owes the money and the name of the bank or issuing house that is guaranteeing payment. [2]
[Total 6]

Solution 1.31

Ordinary shares are issued by companies at par or nominal value. There is no set date for redemption.

Ordinary shareholders are owners of the company. They have certain rights:

- the right to the residual profits of companies (by way of dividends)
- the right to the residual assets of the company following a winding-up
- the right to vote
- certain other rights (to receive the annual accounts, to speak at general meetings etc). [Maximum 4]

Ordinary shares are attractive to issuers because:

- they are the lowest ranking form of finance issued by companies
- dividends are not a legal obligation of the company and are paid only at the discretion of the directors
- running yields are usually low because of the expected capital gain
- they are attractive to investors (see below). [4]

Ordinary shares are attractive to investors because:

- they should provide a high rate of return. Dividends and capital values are expected to grow over time. Profits are likely to grow due to inflation and therefore shares are likely to offer protection from inflation with a high real rate of return. Due to their residual nature, the level of dividends and the capital value will be more volatile than most investment forms. As a consequence of this risk, the return can be expected to be high. [2]
- they are often highly marketable, though it varies greatly from the shares of a large quoted company to a small family run company whose shares are not quoted. Issues of ordinary shares tend to be large and of a standard type. A wide range of industries may be invested in. Buying and selling of ordinary shares by investors takes place relatively frequently. [2]

[Maximum 10]

Solution 1.32

Bondholders are creditors of the company. They have no voting rights. Their rights are set out in a loan agreement. In most cases a trustee is appointed to look after the interests of the bondholders. The Trust Deed sets out the obligations of the company to the bondholders – for example, bondholders may acquire voting rights in certain circumstances. [1]

A bond gives the holder the right to an annual coupon (usually paid in two instalments) and the redemption of the nominal value after a certain fixed amount of time. [1]

The coupon is usually a fixed proportion of the nominal value. For example, a 5% debenture will pay £5 interest per annum for each £100 of stock. [1]

The market price of the bond varies with the demand for and the supply of the bond. One of the main influences on the price of a bond is the interest rate being offered elsewhere. If interest rates rise, the price of bonds tends to fall. [1]

Most stocks are issued close to par and thus there is rarely much in the way of capital gain expected (although coupons and terms do vary). Consequently they usually provide a higher running yield than equities. However, the overall return on a fixed interest security is likely to be slightly less than from an equity issued by the same borrower due to the greater security of fixed interest investments. [1]

Marketability of corporate bonds tends to be lower than the marketability of the equivalent equity and lower than Government bonds, which are extremely marketable.

[1]

[Maximum 5]

Solution 1.33

Convertible bonds are issues of loan capital, which give the holder the option to convert into equity. The dates and terms of conversion will be fixed at the outset. [1]

The investment characteristics of convertible bonds may be similar to conventional bonds or to ordinary shares or a combination of both. [1]

It depends on whether or not conversion is likely. If conversion is almost certain, a convertible is effectively the same as the underlying share with a different income stream in the period before conversion. If conversion is unlikely, the convertible is very similar to a normal fixed-interest bond. [1]

In all cases the option to convert will have some positive value. This value will be highest when there is most uncertainty as to whether conversion will occur or not. [1]

This uncertainty/option value can be measured by the conversion premium. This is the price paid for an ordinary share by buying a convertible (*i.e.* the effective conversion price per share) *less* the market price of an ordinary share. [1]

The “effective conversion price per share” is given by:

price of convertible ÷ number of shares it converts into

[1]

[Maximum 5]

Solution 1.34

Convert now

Could be appropriate if the value to the investor (after tax) of the dividend is bigger than the loan stock coupon. [1]

Convert later

If interest income is bigger, the investor could wait until the dividend grows to exceed it. He or she might even wait a bit longer than that if dividends were thought to be volatile. [1]

Convert at last possible date

The investor might do this if the interest income remained higher than the dividend throughout the whole life of the loan stock. This would be the correct course of action if the share price was higher than the remaining value of the loan stock. [1]

Sell

The investor might do this if he or she wanted the money and the market value of the convertible loan stock was bigger than the market value of the shares it converted to (which it should be). The sale proceeds might then be reinvested in the shares. [1]

Hold to redemption

Do this if none of the situations described above apply. [1]
[Total 5]

Solution 1.35

Interest rate swaps are deals arranged with banks as the main market makers in an “over-the-counter” market. This means that the arrangements are made on an individual basis: there is no set format or contract for interest rate swaps. [1]

In a swap the two parties agree to swap a series of payments with each other. They are agreements to exchange streams of cashflow. In an interest rate swap, there is no exchange of capital amounts. [1]

In the most common form of interest rate swap one party agrees to pay to the other a regular series of fixed interest payments on the nominal capital for a certain term. In exchange, the second party agrees to pay a series of variable interest payments on the nominal capital based on the level of a short-term interest rate. [1]

[Total 3]

Solution 1.36

Currency swaps are agreements to exchange a series of interest payments and a capital sum in one currency for a series of interest payments and a capital sum in another. [1]

This contrasts with interest rate swaps, where there is no exchange of capital sums. [1]

Solution 1.37

Both futures and options are derivative instruments: their value depends on the performance of an underlying asset. [1]

Both are traded on derivative exchanges, such as LIFFE. [1]

Both are standardised, tradeable contracts. [1]

A future gives the obligation to trade in a specified quantity of a specified asset at a specified price on a specified date. [1]

An option gives the right but not the obligation to trade in a specified quantity of a specified asset at a specified price on or before a specified date. [1]

The buyer and the seller of a future must both deposit margin with the clearing house. With an options contract, only the seller (writer) has to deposit margin. [1]

[Maximum 5]

Solution 1.38

Underwriting is a form of insurance against the risk of an unsuccessful issue. [1]

The company sells all the shares at an agreed price to the issuing house. The issuing house, acting as lead underwriter, agrees to take up any shares that are not subscribed for by the public. [1]

The issuing house will not usually want to retain the entire risk, therefore the lead underwriter will often arrange for sub-underwriters (usually big financial institutions *eg* life offices) to become involved. However, the lead underwriter is still responsible if a sub-underwriter defaults. [1]

In return for underwriting the share issue, the company will pay the issuing house a fee. Alternatively, in the case of an offer for sale, the fee can be included in the difference between the price at which the shares are sold to the issuing house and the price at which they are sold to the public. [1]

If the share issue is fully subscribed, the underwriters make a profit equal to the fee less their expenses. If the issue is undersubscribed, the underwriters are left with the surplus shares. They will sell these in the market at a later date. [1]

[Total 5]

Solution 1.39

(i) *A rights issue*

The company offers further shares to existing shareholders in proportion to their existing holding at a discount to the current share price.

Advantages

- The company receives new capital to finance its expansion plans.
- Equity finance is less risky for the company than debt finance.
- Dividends are paid at the discretion of the directors. There is greater opportunity to plough back profits into the business.
- The shares should be attractive to the shareholders since the business has good prospects for the future. They should be able to be sold at only a slight discount to the current share price. [Maximum 3]

Disadvantages

- The company will have to check that the total share capital after its proposed new issue does not exceed its authorised share capital.
 - The share price will fall. How far it falls depends on the extent of the discount, the number of new shares issued, and the market view of the rights issue.
 - The company will consider the cost of the issue, including underwriting costs (if they choose to have the issue underwritten).
 - There may be adverse shareholder reaction to the issue. Some shareholders may not be able to afford to buy new shares at the time of the issue and will be disappointed to see their control of the company diluted. [Maximum 3]
- [Total 6]

(ii) ***Eurobonds***

Eurobonds are unsecured loans offered to international investors.

Advantages

- Eurobond issues attract investors from around the world.
- Eurobond issues do not come under the tax or legal jurisdiction of any country. This lack of regulation keeps the cost of borrowing down.
- The cost of borrowing may be lower than equivalent borrowing in the UK or a foreign country.
- Eurobonds may be denominated in almost any currency. This would suit Piron plc, which does business in Europe and Asia.
- Eurobonds are a convenient way of borrowing foreign currency without entering overseas financial markets. [Maximum 4]

Disadvantages

- The minimum sum to be raised by Eurobonds is \$75 million. Piron plc may not want to raise as much as this.
- Issues are arranged by a syndicate of investment banks. Piron plc will have to negotiate the arrangements for the issue and the fee to be paid to the arranging banks. [2]
[Total 6]

(iii) ***Other options***

The company could consider:

- debentures
- unsecured loan stock
- subordinated debt
- preference shares
- convertible loan stock
- convertible preference shares. [3]

(iv) ***Factors to consider***

Before making its decision, Piron plc should consider the following:

- the cost of raising the finance. The company should consider the initial issue cost, plus the return that will have to be paid to the investors.
- the tax position. Interest on debt finance is tax deductible, whereas dividend payments are not.
- the risk to the company. Interest on debt has to be paid, whereas dividends are paid at the discretion of the directors. If Piron plc were to hit a bad patch, *eg* political unrest in a country that it deals with, high interest payments could be very difficult to pay.
- the effect on control. Debt holders have no vote, but shareholders do. Piron plc probably has many small shareholders at present so this is not likely to be of great concern to them.
- flexibility of finance. Share capital is usually irredeemable (though share buybacks are possible) whereas debt is redeemable and can be issued at various terms.
- assets held. If the company has few tangible assets, it is difficult to raise debt finance. This is not likely to be a problem for Piron plc since it is a manufacturing company with a substantial and increasing amount of capital equipment.

[Maximum 5]

These factors will be considered in more detail in Part 4 of the course.

Part 2 – Questions

Multiple-choice questions

Question 2.1

The term “current asset” as used in company reports and accounts describes those assets:

- A falling due after less than one month.
- B falling due after less than three months.
- C falling due after less than one year.
- D not intended for continuing use in the company’s activities. [2]

Question 2.2

The term “inventories” as used in company reports and accounts describes:

- A finished goods for resale only.
- B work-in-progress and finished goods for resale only.
- C raw materials, work-in-progress and finished goods for resale only.
- D raw materials and consumables, work-in-progress and finished goods. [2]

Question 2.3

Which of the following is treated as a credit item in the trial balance?

- A wages
- B electricity charges
- C bank overdraft
- D machinery [2]

Question 2.4

Which of the following is responsible for developing, issuing and withdrawing accounting standards?

- A International Accounting Standards Board
- B Auditing Practices Board
- C International Financial Reporting Standards
- D Department of Trade and Industry [2]

Question 2.5

Inventories are valued at the lower of cost or net realisable value. This is an application of which accounting concept?

- A cost concept
- B accruals concept
- C prudence concept
- D realisation concept

[2]

Question 2.6

What are non-current assets?

- A tangible assets with an expected life of more than one year
- B tangible assets which are not held for sale in the normal course of business
- C assets which are not held for sale in the normal course of business
- D machines, factories and other immobile assets which are not intended for resale

[2]

Question 2.7

Which of the following is true?

- A Depreciation adjustments are attempts to reflect the value of non-current assets in the statement of financial position.
- B Depreciation adjustments ensure that funds are available for the eventual replacement of the asset.
- C Depreciation using the straight line method tends to charge a heavier proportion of the initial cost of the assets when they are new.
- D Depreciation is a measure of the wearing out or consumption of a non-current asset over time.

[2]

Question 2.8

An increase in the value of a non-current asset recognised in the revaluation reserve would NOT:

- A increase the equity of the company.
- B make the statement of financial position look stronger.
- C increase the profit of the company.
- D increase the other comprehensive income.

[2]

Question 2.9

The following figures were taken from a company's accounts:

	2011	2010
Operating profit	£20,000	£25,000
Depreciation	£5,000	£5,000
Working capital (inventories + trade receivables – trade payables)	£8,000	£4,000

What is the company's cash inflow from operating activities for the year ended 2011?

- A £19,000
- B £21,000
- C £25,000
- D £29,000

[2]

Question 2.10

Which of the following statements most accurately describes the main purpose of the external audit of a limited company?

- A To review the company's accounting systems and related internal controls.
- B To assist the directors to prepare the company's annual financial statements.
- C To express an opinion on the truth and fairness of the company's annual financial statements.
- D To prevent and detect fraud within the company.

[2]

Question 2.11

ACE plc has authorised share capital of £750,000. On 1 July 1998 it issued its first 400,000 £1 ordinary shares for £1.50 each. On 30 March 2007, the company decided to raise more capital through making a one-for-five rights issue. All the existing shareholders took up their rights. What should appear as the nominal value of ACE plc's share capital in its accounts for the year ended 30 June 2007?

- A £600,000
- B £480,000
- C £720,000
- D £900,000

[2]

Question 2.12

The following items is NOT found in a cashflow statement under the heading “cashflows from investing activities?

- A issue of ordinary share capital
- B receipts from sales of non-current asset investments
- C payments to acquire tangible non-current assets
- D receipts from sales of tangible non-current assets

Question 2.13

Which of the following is NOT required as part of a listed company's annual report and accounts?

- A directors' report
- B income statement and statement of financial position
- C auditors' report
- D chairman's statement

[2]

Question 2.14

The XYZ company bought a new machine for £80,000. The assumed useful life of the machine is 10 years. At the end of this time, its estimated scrap value is £5,000. The company charges depreciation on this machine using the reducing balance method.

The value of the machine in XYZ's statement of financial position after two years is:

- A £22,005
- B £45,948
- C £60,000
- D £65,000

[2]

Question 2.15

Which of the following is NOT a current liability?

- A trade receivables
- B trade payables
- C overdraft
- D provision for tax (to be paid in six weeks)

[2]

Question 2.16

“Expenses are recognised when they are incurred. It is not necessary to wait until the bills are paid.” This statement refers to the:

- A realisation concept
- B accruals concept
- C going concern concept
- D money measurement concept

[2]

Short questions***Question 2.17***

- (i) List the elements of a set of financial statements that are required under the Companies Act and state the one overriding requirement of the financial statements. [3]
- (ii) A company's accounts should comply with various accounting concepts. Outline the cost concept and the going concern concept. [2]
- [Total 5]

Question 2.18

Explain why the going concern assumption may simplify the preparation of financial statements. [5]

Question 2.19

Describe the different opinions that a company's auditors may give on the company's financial statements and the circumstances in which each might be appropriate. [7]

Question 2.20

Explain the role of each of the following items in a company's report and accounts:

- (i) the statement of financial position [2]
- (ii) the income statement [2]
- (iii) the auditors' report. [2]
- [Total 6]

Question 2.21

The published accounts of a United Kingdom manufacturing company for a particular year showed the following:

- (a) operating profit of £5,000,000
- (b) 10% depreciation on assets valued at £1.5 million
- (c) interest of 5% on a loan stock with a nominal value of £2 million
- (d) entertainment expenses of £300,000
- (e) net investment income of £180,000 from dividends on ordinary shares of other United Kingdom companies.

Assuming that:

- 1. the tax authority calculated that the capital allowances for the year came to £400,000
- 2. the tax authority judged that only half of the company's entertainment expenses were "allowable"
- 3. the first $\frac{3}{4}$ of the accounting year fell into a financial year in which corporation tax was 31%, and the remainder into a financial year in which corporation tax was 30%,

calculate the company's total corporation tax bill for that accounting year.

[7]

Question 2.22

State whether each of the following statements is true or false, giving reasons for your answers:

- (i) The income statement shows the cash generated by a company over the last year. [3]
 - (ii) It is possible to calculate the market value of the shareholders' interest in a company from data shown in its statement of financial position. [3]
 - (iii) A change in accounting policy that reduces a company's depreciation charge by £1 million will usually increase the post-tax profits attributable to ordinary shareholders by £1 million. [3]
 - (iv) A provision is a potential liability which had not materialised as a liability by the date of the statement of financial position, *eg* payments that might become due in respect of guarantees given to banks, or goods sold under warranty. [3]
- [Total 12]

Question 2.23

Define the following accounting terms:

- (i) authorised capital [2]
 - (ii) depreciation [2]
 - (iii) revaluation reserve [2]
 - (iv) non-current assets. [2]
- [Total 8]

Question 2.24

A company's income statement shows that it has generated substantial profits but its cashflow statement indicates that it has suffered a large outflow of cash during the same period. The figures are reliable and free from distortion.

Explain whether this set of circumstances warrants any major concern. [5]

Long questions**Question 2.25**

At 31 December 2011 the statement of financial position of a company was as follows:

	£	£
ASSETS		
Non-current assets		
Cost	300,000	
less depreciation	(90,000)	
	210,000	
Current assets		
Inventories	62,500	
Trade receivables	10,650	
Cash	<u>12,825</u>	
	<u>85,975</u>	
Total assets	<u>295,975</u>	
EQUITY AND LIABILITIES		
Ordinary share capital	100,000	
Reserves	<u>39,350</u>	
Total equity	139,350	
Non-current liabilities		
12% Debenture loan	150,000	
Current liabilities		
Trade payables	<u>6,625</u>	
Total liabilities	156,625	
Total equity and liabilities	<u>295,975</u>	

During 2012 the following items appeared in the company's accounting records:

	£
sales	190,750
increase in cash	3,950
increase in inventories	9,250
increase in trade payables	2,250
decrease in trade receivables	1,700
rent of factory	30,000
costs of raw materials	45,000
salaries and wages	55,000
miscellaneous expenses	2,750
purchase of non-current assets	40,000

The non-current assets are being depreciated on a straight line basis over a period of ten years including the year of purchase. During 2012 interest was paid on the debenture stock but no dividends were paid on the ordinary share capital. Assume the rate of corporation tax is 30%, but the company did not pay its tax during 2012.

Prepare:

- (i) the income statement for 2012 [6]
 - (ii) the statement of financial position as at 31 December 2012. [8]
- [Total 14]

Question 2.26

At 31 July 2011 the statement of financial position of BOLD PLC was as follows:

	(£000s)
ASSETS	
Non-current assets	
Freehold land and buildings	2,000
Other non-current assets	<u>700</u>
	2,700
Current assets	
Inventories	400
Trade receivables	300
Cash	<u>120</u>
	<u>820</u>
Total assets	3,520
EQUITY AND LIABILITIES	
Ordinary shares of 20p	1,200
Retained earnings	<u>930</u>
Total equity	2,130
Non-current liabilities	
12% Mortgage	1,000
Current liabilities	
Trade payables	190
Tax	<u>200</u>
	390
Total liabilities	<u>1,390</u>
Total equity and liabilities	<u>3,520</u>

The following information is available for the year to 31 July 2012 (£000s):

sales	1,000
decrease in cash	95
increase in inventories	50
decrease in trade receivables	130
decrease in trade payables	90
wages, rent <i>etc</i>	210
cost of raw materials	395
cost of building extension to freehold buildings	200
depreciation of freehold land and buildings	32
other depreciation	93
tax paid	110
Payment of dividend declared for year ending 31 July 2011	100

Assuming a corporation tax rate of 30%, prepare:

- (i) the income statement for the year ending 31 July 2012 [5]
- (ii) the statement of financial position as at 31 July 2012 [8]
- (iii) the statement of changes in equity for the year ending 31 July 2012. [3]
[Total 16]

Question 2.27

Shown below is the statement of financial position dated 31 December 2010 for Bodgit & Fixit, a manufacturing firm making tools and DIY equipment:

	£	£
ASSETS		
Non-current assets		
Factory	675,000	
Machinery	<u>125,000</u>	
	800,000	
Current assets		
Inventories	85,000	
Trade receivables	25,000	
Cash	<u>40,000</u>	
	<u>150,000</u>	
Total assets	<u>950,000</u>	
EQUITY AND LIABILITIES		
Issued ordinary shares of 50p	250,000	
Other reserves:		
Share premium account	100,000	
Revaluation reserve	<u>80,000</u>	
	180,000	
Retained earnings	<u>87,000</u>	
Total equity	<u>517,000</u>	
Non-current liabilities		
8% Convertible loan stock 2015	200,000	
10% Debentures 2019	<u>150,000</u>	
	350,000	
Current liabilities		
Trade payables	34,000	
Bank loan	30,000	
Tax payable	<u>19,000</u>	
	<u>83,000</u>	
Total liabilities	<u>433,000</u>	
Total equity and liabilities	<u>950,000</u>	

During 2011, the following occurred:

	£
sales	555,000
increase in inventories	17,000
purchases of raw materials	112,000
staff costs	85,000
electricity costs	91,000
advertising & delivery costs	59,000
cash payments received	447,000
increase in trade payables	25,000
dividends paid	12,000
tax paid	13,000
increase in cash	39,000

You are also given the following information:

- (a) The company repaid its bank loan on 5 January 2011.
- (b) The factory was originally purchased in December 1999. In 2010 it was revalued and its remaining life estimated to be 10 years at which time it would be worth zero. The annual depreciation charge for 2010 was based on the revalued figure and the revaluation of the factory was included in the 2010 revaluation reserve.

The machinery was purchased in 2010 for a price of £150,000. It is being depreciated to zero over a period of six years.

- (c) The first conversion date for the 8% CULS was 15 December 2011. £100,000 nominal was converted. The conversion terms were 2 shares for every £5 nominal of convertible stock. Interest was paid before conversion took place.
- (d) The directors were concerned about the level of trade receivables and decided to set up a provision for bad debts equal to 10% of the trade receivables outstanding at the end of the accounting year.

Assuming a tax rate of 30%, draw up the statement of comprehensive income for 2011 and the statement of financial position dated 31 December 2011 in a form suitable for publication. [20]

Question 2.28

The following information has been extracted from the bookkeeping records of Perso plc:

Trial balance as at 31 December 2012

	£000	£000
Bank	12	
Trade payables		187
Trade receivables	245	
Land and buildings – cost	1,300	
Land and buildings – depreciation		195
Interest	65	
Loan		450
Plant and machinery – cost	800	
Plant and machinery – depreciation		140
Retained earnings at 31 December 2011		215
Raw materials purchased	502	
Advertising	30	
Directors' remuneration	45	
Sales		1,175
Share capital		700
Other reserves		180
Inventories at 31 December 2011	6	
Salaries – factory staff	112	
Salaries – administration	125	
	<hr/> <hr/> 3,242	<hr/> <hr/> 3,242

Notes:

- (1) Depreciation is to be charged on the following bases:

Buildings – on a straight line basis, assuming a residual value of £100,000 on 31 December 2016. The book value of the buildings on 31 December 2011 was £555,000.

Plant and machinery – 20% of reducing balance.

- (2) No dividend was paid in relation to the 2011 accounting year. There was no change in the issued share capital during 2012.

- (3) The corporation tax charge has been estimated at £12,000 for the year. No tax was payable in respect of the 2011 accounting year.
- (4) Inventories at 31 December 2012 were £8,000.
- (5) In the statement of financial position at 31 December 2011, trade payables were £131,000, trade receivables were £199,000, cash at bank was £6,000 and loans were £750,000.
- (i) Prepare Perso plc's income statement for the year ended 31 December 2012 and its statement of financial position as at that date. These should be in a form suitable for publication insofar as this is possible from the information provided. [14]
- (ii) Prepare Perso plc's cashflow statement for the year ended 31 December 2012.

Note: You will not be asked to construct a cashflow statement in the exam, but you might find it useful to have the experience.

[6]
[Total 20]

Part 2 – Solutions

Solution 2.1

Answer = D

Oddly enough not defined strictly as falling due in less than one year!

[2]

Solution 2.2

Answer = D

[2]

Solution 2.3

Answer = C

The credits on the trial balance include revenue items from the income statement and equity and liabilities from the statement of financial position. A bank overdraft is a current liability.

[2]

Solution 2.4

Answer = A

[2]

Solution 2.5

Answer = C

According to the prudence concept, assets should not be overestimated. If there is some uncertainty about the value of the inventories (eg Easter eggs after Easter!) and it is felt that the sale value is lower than the cost value then the lower (net realisable) value should be used in the statement of financial position.

[2]

Solution 2.6

Answer = C

Non-current assets may be tangible or intangible. They may also be mobile (*eg* a lorry).

[2]

Solution 2.7

Answer = D

Depreciating an asset is not an attempt to estimate its value in the sense that it can be sold at this price. It will not ensure that funds are available to buy a replacement. The straight line method charges the same proportion of the initial cost of the assets each year. Depreciation represents the wearing out or the using up of the asset over a period of time.

[2]

Solution 2.8

Answer = C

The value of the non-current asset would increase and there would be an increase in the revaluation reserve. The equity of the company is the shareholders' fund, *ie* capital and reserves, so the equity would increase too. The profit would not increase in this case, though the gain would be shown as other comprehensive income. Profit would increase if the increase in the value of the asset were recognised in the income statement.

[2]

Solution 2.9

Answer = B

The cash inflow from operating activities is found as follows:

Operating profit	£20,000
<i>plus</i> depreciation	£5,000
<i>less</i> increase in working capital	<u>(£4,000)</u>
	£21,000

[2]

Solution 2.10

Answer = C

The wording of a typical auditors' report is:

"In our opinion, the financial statements give a true and fair view, in accordance with IFRSs as adopted by the European Union, of the state of the group's and the parent company's affairs as at and of the group's and the parent company's profit [loss] for the year then ended; the financial statements and the part of the Directors' Remuneration Report to be audited have been properly prepared in accordance with the Companies Act 2006 and Article 4 of the IAS Regulation; and the information given in the Directors' Report is consistent with the financial statements."

[2]

Solution 2.11

Answer = B

Before the rights issue, the nominal value of the company's share capital is:

$$\text{£1} \times 400,000 = 400,000.$$

After a 1-for-5 rights issue, the nominal amount of share capital will be:

$$400,000 \times \frac{6}{5} = 480,000 \quad [2]$$

Solution 2.12

Answer = A

The issue of ordinary share capital would be under the heading "cashflows from financing activities". In a cashflow statement, "cashflows from investing activities" refers to purchases or sales of non-current assets, including investments that are non-current, *i.e* investments that the company intends to hold for more than a year. [2]

Solution 2.13

Answer = D

In practice D often accompanies the report and accounts, but it is not a legal requirement. [2]

Solution 2.14

Answer = B

We first need to calculate the depreciation rate, r .

$$80,000(1-r)^{10} = 5,000$$

$$(1-r) = \sqrt[10]{\frac{5}{80}} = 0.75785$$

$$r = 0.24214$$

After 2 years, the value of the machine in the statement of financial position is:

$$= 80,000 (0.757858)^2$$

$$= 45,948$$

[2]

Solution 2.15

Answer = A

Trade receivables are a current asset of the business.

[2]

Solution 2.16

Answer = B

[2]

Solution 2.17(i) ***Requirements of the Companies Act***

Companies must produce:

- a statement of financial position
- an income statement
- detailed disclosures which are normally presented as notes to the accounts
- a directors' report
- an auditors' report.

The overriding requirement is that the financial statements must give a true and fair view.

[½ for each of the six points, total 3]

(ii) ***Accounting concepts***

According to the *cost concept*, non-current assets should be valued at cost less depreciation. [1]

According to the *going concern* concept, accounts should be prepared on the assumption that the business will continue indefinitely in its present form. [1]

[Total 2]

Solution 2.18**Comment**

This is a CT2 past exam question (April 2007).

It is a tough question that was very poorly answered in the exam. Be aware that similar questions could be asked about other accounting concepts, ie as well as fairly standard bookwork questions about the concepts, the examiners can ask for more detailed answers about how a concept affect accounts in real life.

The going concern concept, where it is assumed that a business will continue indefinitely in its present form, acts as a justification for the limitations imposed by the cost concept because there is little harm in reporting historical figures for value if the assets concerned are unlikely to be sold in the immediate future. [1]

This simplifies the preparation of financial statements because:

- there is no need to make difficult (and spurious) estimates of the market value of all the company's assets and liabilities, because we assume that they are not about to be sold imminently [1]
- not claiming to estimate market values also leaves the preparers and auditors of the accounts less open to challenge in the event that their estimates prove to be incorrect [1]
- non-current assets that are purchased can be depreciated on a straight-line basis over the useful life of the asset, because we assume that the asset will continue to be used for its useful life [1]
- potential errors in short-term estimates can be tolerated because the figures will resolve themselves over time [1]
- inventory, which often has zero value in reality, can be included in the financial statements at original cost until it is used and generates revenue. [1]

Often the principle of going concern is at odds with the principle of prudence (if assets are overvalued as a result of the going concern principle). If directors are in doubt that the company is a going concern they should indicate this fact and the accounts should not be drawn up using this principle. [1]

[Maximum 5]

Solution 2.19

An *unqualified opinion* is a statement that, in the opinion of the auditors:

- the financial statements and the part of the Directors' Remuneration Report to be audited have been properly prepared in accordance with the Companies Act and Article 4 of the IAS Regulation; [½]
- the financial statements give a true and fair view, in accordance with IFRSs as adopted by the EU, of the state of the group's and the company's affairs; and [½]
- the information given in the Directors' Report is consistent with the financial statements. [½]

The wording of the standard report can be modified if the auditor wishes to highlight an uncertainty or is not able to express an unqualified opinion that the accounts give a true and fair view. [½]

There are various degrees of qualification:

Emphasis of matter paragraphs

[½]

If there is a significant uncertainty which has been disclosed in the accounts, the auditor should point this out for the sake of emphasis. That means that it is unnecessary to issue a qualified audit report because the financial statements give a true and fair view. Management has disclosed the problem and the auditor has taken care to ensure that the shareholders have read the disclosure. [1]

Qualified opinion

[½]

The auditor would issue a qualified opinion in circumstances where a restriction has been placed on the evidence that the auditor can access or where the auditor disagrees with the treatment of a matter. A qualified opinion effectively states that the financial statements give a true and fair view "except for" the problem that has been described in the body of the audit report.. [1]

Disclaimer of opinion

[½]

If the auditor is faced with such extreme uncertainty about the financial statements that it is impossible to express an opinion then the auditor would issue a disclaimer instead ("we are unable to form an opinion ..."). This is such an extreme form of qualified audit report that it should only be used very sparingly and in cases where it is unavoidable. [1]

Adverse opinion

[½]

The auditor issues an adverse opinion in extreme cases of disagreement where the financial statements have been rendered so misleading that it must be stated that they do not give a true and fair view. Again, this form of qualified report should be used sparingly and only when it is absolutely necessary

[1]

[Maximum 7]

Solution 2.20(i) ***The statement of financial position***

The statement of financial position in the report and accounts is a summary or snapshot of the assets, liabilities and capital of a company at the end of the accounting period.

[1]

The assets of the business are the things that are owned by the business. Finance for these assets is provided by:

- the owners of the business (capital), and
- those who have lent money to the business either directly, *eg* loan stock, or indirectly, *eg* trade payables (liabilities).

[1]

(ii) ***The income statement***

The income statement shown in the report and accounts is a summary of the trading of a company over the last accounting period, which is usually a year.

[1]

The revenue received from trading is compared with the costs associated with earning this revenue. The difference is the profit (or loss).

[1]

(iii) ***Auditors' report***

The role of the auditors' report is to comment on:

- whether, in the opinion of the auditors, the financial statements and the part of the Directors' Remuneration Report to be audited have been properly prepared;
- whether, in the opinion of the auditors, the accounts give a true and fair view;
- whether the information given in the Directors' Report is consistent with the financial statements.

[1]

There are four possible modifications to the standard report:

1. emphasis of matter paragraphs
 2. qualified opinion
 3. disclaimer of opinion
 4. adverse opinion.
- [1]
[Total 6]

Solution 2.21

Operating profit	5,000,000
<i>add back</i> depreciation	150,000
<i>add back</i> half of entertainment expenses	150,000
<i>deduct</i> capital allowances	400,000
<i>deduct</i> interest paid	100,000
Adjusted profit	4,800,000

[1 mark for each adjustment, total 4]

In the UK, companies pay no more tax on the dividend income received.

[1]

Therefore, the company's corporation tax liability

$$= (\frac{3}{4} \times 0.31 + \frac{1}{4} \times 0.30) \times 4,800,000$$

$$= £1,476,000$$

[2]

[Total 7]

Solution 2.22

- (i) ***Statement (i)***

FALSE.

[1]

The income statement is drawn up using the realisation and accruals concepts. Cash amounts are not necessarily shown.

[1]

For example, “depreciation” and “change in value of inventories” are shown but do not represent actual cashflows. Other items, *eg* “sales” are shown at a value that may differ from the actual cash amounts paid/received.

[1]

(ii) ***Statement (ii)***

FALSE. [1]

The statement of financial position shows accounting values only. These relate to accounting conventions rather than market values. [1]

Share capital is shown in the accounts as the number of shares multiplied by the *nominal* value of a share. The market value is calculated by multiplying the number of shares in issue by the market price per share. [1]

(iii) ***Statement (iii)***

TRUE. [1]

This will increase operating profit and hence pre-tax profit by the amount of the reduced depreciation. [1]

The tax charge will not change since tax is based on capital allowances, rather than on the depreciation shown in the accounts. Shareholders' earnings will therefore also increase by the amount of the reduced depreciation. [1]

(iv) ***Statement (iv)***

FALSE. [1]

The question is discussing a “contingent liability”, which would be included as a note to the accounts. [1]

A provision is either:

- an amount written off to provide for depreciation
 - an amount retained for a liability or loss that is either likely to occur, or certain to occur but uncertain as to the amount or timing. [1]
- [Total 8]

Solution 2.23(i) ***Authorised capital***

This is the maximum amount of share capital which the company's directors can issue (or commit themselves to the possibility of issuing through conversion rights) including all the company's shares currently in issue. [1]

It is the nominal amount of share capital of the company written into the Memorandum of Association though the amount can be increased by the passing of a resolution by the shareholders. [1]

(ii) ***Depreciation***

Depreciation is a measure of the wearing out or using up of a non-current asset over time. [1]

It is a notional charge in the income statement to allow for the cost of using the asset over the accounting period. [½]

In the statement of financial position it reduces the value of the non-current assets, and the charge on the income statement reduces the retained earnings and the tax due. [½]

(iii) ***Revaluation reserve***

The revaluation reserve is held as part of the company's equity, *ie* the capital and reserves, to reflect any upwards revaluations of the company's land and buildings. [1]

If, for example, the company's land was purchased in 1990 at £100,000 but is revalued now at £500,000, then the process of revaluation increases the non-current assets of the company by £400,000 and increases the revaluation reserve by £400,000. [1]

(iv) ***Non-current assets***

Non-current assets are assets that are held for a long time by the business and are used by the business to produce goods and services for sale. They are not sold in the normal course of business. [1]

There are three types of non-current assets:

1. Tangible non-current assets, *eg* machinery, vehicles, buildings and land.
 2. Intangible non-current assets, *eg* patents, goodwill, trademarks.
 3. Investments, *eg* shares in other companies, government bonds. [1]
- [Total 8]

Solution 2.24

This is a CT2 past exam question (September 2008).

Profit could look healthier than cash because:

- the full value of goods and services sold on credit is credited under sales revenue, and will therefore contribute to profit, even though cash may not be received for some time [1]
- inventories (the stock of materials, components, work-in-progress and finished goods) are only treated as a cost when they are used to produce the goods sold, so the build up of inventories will reduce cash by more than it will reduce profit. [1]

In addition, cash balances are affected by items that do not affect the income statement. For example, cash could decrease because of changes in investment, eg the purchase of a non-current asset. [1]

Is it a cause for concern?

It is quite normal for a new business to show substantial profit and yet experience large cash outflows as it invests in new equipment, builds up stock and sells on credit, and so the discrepancy between the profit position and the cash position may not be a cause for concern. [1]

However, many profitable businesses fail because they run out of cash and/or exceed their overdraft limits. If a business cannot pay its workers or buy supplies, it cannot last very long, even if it is potentially very profitable. Therefore, although a discrepancy between profit and cash is inevitable and not a problem in itself, a large cash outflow is potentially a cause for concern. [1]

Companies should forecast and monitor their cash positions and should take action to remedy any unplanned shortages. [1]

[Maximum 5]

Solution 2.25**Comment**

For this and subsequent accounts questions, start with the total mark, deduct 1 marks for the first mistake and 1 mark for each subsequent mistake, down to a minimum of 0. Where possible follow through mistakes to see whether or not you are using correct principles, and only deduct further marks for further mistakes.

(i) **Income statement for 2012**

	£	£
Revenue		190,750
Cost of sales:		
raw materials	45,000	
less increase in inventories	(9,250)	
salaries/wages	55,000	
depreciation ¹	<u>34,000</u>	
	<u>(124,750)</u>	
Gross profit		66,000
Expenses:		
rent of factory	(30,000)	
miscellaneous expenses	<u>(2,750)</u>	
Operating profit		33,250
Finance costs ²		<u>(18,000)</u>
Net profit before tax		15,250
Tax at 30%		<u>4,575</u>
Profit for the year attributable to equity holders		<u>10,675</u>

No dividends were paid to ordinary shareholders in the year.

Notes:

1. $(300,000 \text{ cost of old assets} + 40,000 \text{ purchase}) \times 10\%$
2. $12\% \times £150,000$

NB Wages and salaries are assumed to vary directly with output and therefore are included in the cost of sales. You could argue that they are an overhead in which case you would include them as an expense.

[6 for income statement and notes]

(ii) ***Statement of financial position as at 31 December 2012***

	£	£
ASSETS		
Non-current assets		
Cost ¹	340,000	
less Depreciation ²	<u>(124,000)</u>	
	216,000	
Current assets		
Inventories ³	71,750	
Trade receivables ⁴	8,950	
Cash ⁵	<u>16,775</u>	
	<u>97,475</u>	
Total assets	<u>313,475</u>	
EQUITY AND LIABILITIES		
Ordinary share capital	100,000	
Reserves ⁶	<u>50,025</u>	
Total equity	150,025	
Non-current liabilities		
12% Debenture loan	150,000	
Current liabilities		
Trade payables ⁷	8,875	
Tax provision	<u>4,575</u>	
	<u>13,450</u>	
Total liabilities	<u>163,450</u>	
Total equity and liabilities	<u>313,475</u>	

Notes:

1. £300,000 carried forward, plus £40,000 purchased this year.
2. £90,000 from last year's statement of financial position plus £34,000 from this year's income statement.
3. £62,500 from last year's statement of financial position plus £9,250 increase in inventories.
4. £10,650 carried forward from last year, less this year's decrease of £1,700.
5. £12,825 from last year's statement of financial position plus £3,950 increase in cash.
6. £39,350 carried forward from last year's statement of financial position plus £10,675 from this year's profit.
7. £6,625 carried forward from last year, plus this year's increase of £2,250.

[8 for statement of financial position and notes]

Solution 2.26

- (i) **Income statement for BOLD PLC for 2012**

	£000s	£000s
Sales		1,000
Cost of sales:		
raw materials	395	
less increase in inventories	(50)	
depreciation	<u>125</u>	(32 + 93)
	<u>(470)</u>	
Gross profit		530
Expenses:		
wages and rent	<u>210</u>	
Operating profit		320
Finance costs	<u>(120)</u>	(1,000 × 0.12)
Net profit before tax		200
Tax @ 30%	<u>(60)</u>	
Profit for the year attributable to equity holders		<u>140</u>

A dividend totalling £100,000 was paid to ordinary shareholders during the year in respect of the year ending 31 July 2011.

[5 for the income statement]

(ii) ***Statement of financial position for BOLD PLC as at 31 July 2012***

(£000s)

ASSETS**Non-current assets**

Freehold land and buildings ¹	2,168
Other non-current assets ²	<u>607</u>
	2,775

Current assets

Inventories	450
Trade receivables	170
Cash	<u>25</u>
	645
Total assets	<u>3,420</u>

EQUITY AND LIABILITIES

Ordinary shares of 20p	1,200
Retained earnings ³	<u>970</u>
Total equity	2,170

Non-current liabilities

12% Mortgage	1,000
--------------	-------

Current liabilities

Trade payables	100
Tax ⁴	<u>150</u>
	250

Total liabilities	<u>1,250</u>
--------------------------	---------------------

Total equity and liabilities	<u>3,420</u>
-------------------------------------	---------------------

Notes:

1. $2,000 + 200 - 32$
2. $700 - 93$
3. $930 - 100$ (dividend paid) + 140
4. $200 + 60 - 110$

[8 for the statement of financial position and notes]

(iii) ***Statement of changes in equity for BOLD PLC for 2012***

	<i>Attributable to equity holders</i>			<i>£000s</i>
	<i>Share capital</i>	<i>Other reserves</i>	<i>Retained earnings</i>	<i>Total equity</i>
<i>Balance at 31 July 2011</i>	<i>1,200</i>		<i>930</i>	<i>2,130</i>
Profit for 2012			140	140
<i>Total recognised income for 2012</i>			<i>140</i>	<i>140</i>
<i>Dividends paid</i>			<i>(100)</i>	<i>(100)</i>
<i>Balance at 31 July 2012</i>	<i>1,200</i>		<i>970</i>	<i>2,170</i>

[3 marks]

Solution 2.27***Statement of comprehensive income for Bodgit & Fixit for the year ending 31 December 2011***

	£	£
Sales		555,000
Cost of sales:		
raw materials	112,000	
less increase in inventories	(17,000)	
depreciation ¹	<u>100,000</u>	
		<u>(195,000)</u>
Gross profit		360,000
Expenses:		
staff costs	85,000	
electricity	91,000	
advertising & delivery costs	59,000	
provision for doubtful debts ²	<u>13,300</u>	
		<u>(248,300)</u>
Operating profit		111,700
Finance costs ³		<u>(31,000)</u>
Net profit before tax		80,700
Tax @ 30%		<u>24,210</u>
Profit for the year attributable to equity holders		<u>56,490</u>
Other comprehensive income		<u>0</u>
Total comprehensive income		<u>56,490</u>

A dividend totalling £12,000 was paid to ordinary shareholders during the year.

Notes:

1. To calculate the depreciation on the factory, we need to know the value of the factory at the start of 2010. At the end of 2010, after one year's depreciation (out of 10) the factory was worth 675,000, or 9/10^{ths} of the starting value. Hence the 2010 starting value is $675,000 \times 10/9 = 750,000$. The annual depreciation is 1/10th of 750,000 = 75,000.

The depreciation charge for the machinery will be $1/6 \times 150,000 = 25,000$.

2. $10\% \times [25,000 + (555,000 - 447,000)]$
3. $0.08 \times 200,000 + 0.1 \times 150,000$

[8 for income statement with notes]

Statement of financial position for Bodgit & Fixit at 31 December 2011

	£	£
ASSETS		
Non-current assets		
Factory	600,000	675,000 – 75,000
Machinery	<u>100,000</u>	125,000 – 25,000
	700,000	
Current assets		
Inventories	102,000	85,000 + 17,000
Trade receivables	133,000	25,000 + (555,000 – 447,000)
Provision for bad debts	(13,300)	10% × 133,000
Cash	<u>79,000</u>	40,000 + 39,000
	<u>300,700</u>	
Total assets	<u>1,000,700</u>	
EQUITY AND LIABILITIES		
Issued ordinary shares of 50p	270,000	see Note 1
Other reserves:		
Share premium account	180,000	see Note 1
Revaluation reserve	<u>80,000</u>	
	260,000	
Retained earnings	<u>131,490</u>	87,000 + 56,490 – 12,000
Total equity	<u>661,490</u>	
Non-current liabilities		
8% Convertible loan stock 2015	100,000	200,000 – 100,000
10% Debentures 2019	<u>150,000</u>	
	250,000	
Current liabilities		
Trade payables	59,000	34,000 + 25,000
Tax payable	<u>30,210</u>	19,000 + 24,210 – 13,000
	<u>89,210</u>	
Total liabilities	<u>339,210</u>	
Total equity and liabilities	<u>1,000,700</u>	

Notes:

1. The number of new shares issued as a result of the conversion was:

$$100,000 \times 2/5 = 40,000$$

As the par value of the shares is $50p$, the issued share capital needs to increase by £20,000. The share premium account increase by:

$$(100,000 - 20,000) = 80,000.$$

[12 for statement of financial position with notes]

Solution 2.28

- (i) **The income statement and statement of financial position**

The income statement for Perso plc for the year ending 31 December 2012

	£000
Sales revenue	1,175
Cost of sales:	
Cost of stock sold ¹	500
Depreciation of buildings ²	91
Depreciation of plant and machinery ²	132
Salaries – factory staff	<u>112</u>
	<u>(835)</u>
Gross profit	340
Administrative expenses:	
Salaries – administration	125
Directors' remuneration	<u>45</u>
	<u>(170)</u>
Distribution costs	<u>(30)</u>
Operating profit	140
Interest	<u>(65)</u>
Net profit before tax	75
Tax	<u>(12)</u>
Profit for the year attributable to equity holders	<u>63</u>

No dividends were paid to ordinary shareholders during the year.

Notes:

1. Cost of stock sold = opening stock + purchases – closing stock

$$= 6 + 502 - 8 = 500$$

2. Buildings depreciation = 20% (555 – 100) = 91

$$\text{Plant and machinery depreciation} = 20\% (800 - 140) = 132$$

[7 for income statement and notes]

Statement of financial position for Perso plc as at 31 December 2012

(£000s)

ASSETS**Non-current assets**

Land and buildings – cost	1,300
Plant and machinery – cost	800
Depreciation ¹	<u>(558)</u>
	1,542

Current assets

Inventories	8
Trade receivables	245
Cash	<u>12</u>
	265

Total assets 1,807**EQUITY AND LIABILITIES**

Share capital	700
Other reserves	180
Retained earnings ²	<u>278</u>

Total equity 1,158**Non-current liabilities**

Loan stock	450
------------	-----

Current liabilities

Trade payables	187
Tax	<u>12</u>
	<u>199</u>

Total liabilities 649**Total equity and liabilities** 1,807

Notes:

1. Total depreciation to date on:

$$\text{buildings} = 195 + 91 = 286$$

$$\text{plant and machinery} = 140 + 132 = 272$$

2. Retained earnings = 215 + 63 = 278

[7 for statement of financial position and notes]

(ii) ***The cashflow statement***

The cashflow statement for Perso plc for the year ending 31 December 2012

	£000
Cashflows from operating activities	
Cash generated from operations ¹	371
Interest paid	(65)
Tax paid	<u>0</u>
Net cash generated from operating activities	<u>306</u>
Cashflows from investing activities	0
Cashflows from financing activities	
Repayment of loan capital	(300)
Increase in cash over the year	<u>6</u>

Notes:

1. Calculated as follows:

Operating profit	140
+ depreciation	223
- increase in inventories	(2)
- increase in trade receivables	(46)
+ increase in trade payables	<u>56</u>
Cash generated from operations	<u>371</u>

[6 for cashflow statement and notes]

Part 3 – Questions

Multiple-choice questions

Questions 3.1 to 3.6 are based on the following figures taken from a company's published report and accounts:

current assets	19,000
current liabilities	17,000
inventories	11,000
inventories last year	12,000
long-term debt	9,000
revenue	25,000
cost of sales	7,000
distribution costs	3,000
administrative expenses	2,500
net asset value	80,000

Question 3.1

The capital gearing ratio is:

- A 0.1125
- B 0.1375
- C 0.1429
- D 0.50

[2]

Question 3.2

The current ratio is:

- A 0.47
- B 0.89
- C 1.12
- D 1.76

[2]

Question 3.3

The quick ratio is:

- A 0.47
 - B 0.89
 - C 1.12
 - D 1.76
- [2]

Question 3.4

The stock turnover period using average levels of inventory over the year is:

- A 102 days
 - B 223 days
 - C 599 days
 - D 850 days
- [2]

Question 3.5

The operating profit margin is:

- A 12%
 - B 50%
 - C 64%
 - D 72%
- [2]

Question 3.6

The return on capital employed is:

- A 10%
 - B 14%
 - C 50%
 - D 139%
- [2]

The next three questions are based on the following figures from the accounts of ABC Ltd:

	£ 000
Sales	200
Inventories at the beginning of the year	30
Inventories at the end of the year	20
Purchases	130
Administrative expenses	15
Trade receivables	40
Prepayments	3
Cash	17
Bank overdraft	12
Trade payables	10
Accruals	2

Question 3.7

The average stock turnover period of ABC Ltd in days is:

- A 36 days
- B 46 days
- C 65 days
- D 78 days

[2]

Question 3.8

ABC Ltd's current ratio is:

- A 2.5 : 1
- B 3.3 : 1
- C 3.5 : 1
- D 4.0 : 1

[2]

Question 3.9

Assume that company ABC Ltd has in issue 200,000 ordinary shares of 50p each. During the year, it paid a dividend of 4.5p. Calculate ABC Ltd's dividend cover. (Ignore taxation.)

- A 2.5 times
- B 3.1 times
- C 5.0 times
- D 6.7 times

[2]

Question 3.10

A Ltd paid £400,000 for 200,000 shares in B Ltd. B Ltd's share capital was 250,000 £1 ordinary shares, and at the time of the share purchase it had reserves of £125,000. Calculate the goodwill associated with this purchase.

- A £25,000
- B £100,000
- C £200,000
- D £275,000

[2]

Question 3.11

Filton plc has shares in three companies. It has a 35% holding in Worthington Ltd and has a right to appoint 6 of the 10 directors. It has a 55% holding in Bartley Ltd and has used its voting rights to appoint all of its directors. It has a 25% holding in Dudley Ltd and has a right to appoint 3 of the 10 directors. Which are subsidiaries of Filton plc?

- A Dudley Ltd, Worthington Ltd and Bartley Ltd
- B Worthington Ltd and Bartley Ltd
- C Bartley Ltd only
- D Dudley Ltd only.

[2]

The next three questions refer to PRP Ltd. The following details were extracted from the company's accounting records:

Pre-tax profit	57,000
Tax paid	1,200
Depreciation	2,100
Inventories held at the beginning of the year	42,100
Inventories held at the end of the year	46,500
12% Loan stock	15,000
Revenue	103,250
Share capital and reserves	425,000
Non-current assets	55,000

Question 3.12

PRP's return on capital employed was:

- A 12.68%
- B 12.95%
- C 13.36%
- D 13.84%

[2]

Question 3.13

Relative to its revenue, PRP's average stock turnover period was:

- A 149 days
- B 154 days
- C 157 days
- D 160 days

[2]

Question 3.14

The figure for “net cash generated from operating activities” shown in PRP's cashflow statement was:

- A £51,700
- B £53,500
- C £56,500
- D £58,800

[2]

Question 3.15

Which of the following would NOT explain why the PE ratio of a particular company may stand above the average PE ratio of other companies?

- A the company's shares are overvalued
- B earnings are perceived to be relatively risky
- C historical earnings are unusually low
- D potential earnings growth is very high

[2]

Question 3.16

Which of the following items does NOT occur in the revenue account of insurance company accounts?

- A earned premiums
- B claims incurred
- C investment income on investments relating to shareholders' funds
- D realised capital gains on investments held to cover insurance liabilities

[2]

Question 3.17

Investment trusts are:

- A trust funds set up in order to invest money in Stock Exchange investments
- B trust funds set up in order to invest in unit trusts
- C companies which may be quoted on the Stock Exchange
- D companies which are not allowed to be quoted on the Stock Exchange

[2]

Question 3.18

Which of the following institutions would not normally lend money in the London money markets?

- A clearing banks
- B the Bank of England
- C investment banks
- D the Stock Exchange

[2]

Question 3.19

Which of the following statements about a unit trust is true?

- A It is a closed-ended investment.
- B It is a company.
- C It has a trust deed.
- D The price typically stands at a discount to NAV.

[2]

Question 3.20

Which of the following is NOT a UK regulator?

- A PRA
- B FCA
- C FPC
- D DMO

[2]

Short questions

Question 3.21

You will not be required to construct consolidated statements in the examination, but you could be asked to explain **how** they are constructed. The first part of this question might be useful in helping you understand how to construct such statements.

Company X recently bought a 100% holding in Company Y for £4 million cash. Immediately prior to the acquisition the two separate statements of financial position were as follows.

<i>(all figures in £ millions)</i>	<i>Company X</i>	<i>Company Y</i>
Non-current assets	10	4
Current assets	<u>7</u>	<u>2</u>
Total assets	17	6
Share capital	6	2
Reserves	<u>3</u>	<u>1</u>
<i>Total equity</i>	<i>9</i>	<i>3</i>
Non-current liabilities	5	2
Current liabilities	<u>3</u>	<u>1</u>
<i>Total liabilities</i>	<i>8</i>	<i>3</i>
<i>Total equity and liabilities</i>	<i>17</i>	<i>6</i>

- (i) Draw up the consolidated statement of financial position for Company X following the acquisition. [5]

 - (ii) Company X only managed to buy 70% of Company Y (for £2.8 million cash), leaving 30% of Company Y in the hands of minority shareholders. Describe how non-controlling interests are treated in a consolidated statement of financial position. Explain why they are treated in this way. [5]
- [Total 10]

Question 3.22

Explain what is meant by a subsidiary company. [2]

Question 3.23

Explain the main weaknesses of historical cost accounts in times of high inflation. [4]

Question 3.24

Discuss the main limitations of ratio analysis. [6]

Question 3.25

Company A takes over Company B. Immediately before the take-over, Company B's statement of financial position appeared as follows:

<i>Company B</i>	<i>£000s</i>
Non-current assets	240
Current assets	190
Ordinary share capital (10p shares)	60
Reserves	250
Long-term debt	120

The terms of the offer made to B's shareholders for every nine shares held in B were:

- 3 shares (50p market value each) in A *plus*
- 90p cash *plus*
- 2 £2 convertible preference shares in A (valued at par).

The terms of the conversion on the £2 preference shares are 5 ordinary shares for each £2 preference share.

Calculate the goodwill which will initially appear in A's consolidated accounts as a result of the offer assuming:

- (i) conversion does not take place [5]
 - (ii) full conversion. [3]
- [Total 8]

Question 3.26

Outline the main similarities and differences between investment trusts and authorised unit trusts. [10]

Long questions**Question 3.27**

The long questions on ratio analysis in the examination usually ask you to analyse a set of accounts. This question is a useful introduction.

For each of the following accounting or investment ratios:

- (i) net asset value per share
 - (ii) profit margin
 - (iii) current ratio
 - (iv) return on capital employed
- (a) define the ratio [4]
- (b) explain what the ratio might indicate [8]
- (c) suggest reasons why the ratio might be misleading or meaningless as far as shareholders are concerned. [8]
- [Total 20]

Question 3.28

Shown below is the statement of financial position for 31 December 2011 of *Kwaint Kountry Kitchens*, a chain of cookshops in the home counties.

Statement of financial position for Kwaint Kountry Kitchens for 31 December 2011

	£
ASSETS	
Non-current assets	
Land and buildings	800,000
Current assets	
Inventories	425,000
Cash	125,000
Trade receivables	<u>28,000</u>
	578,000
Total assets	1,378,000
EQUITY AND LIABILITIES	
Share capital (£1 par value)	700,000
Other reserves	200,000
Retained earnings	<u>225,500</u>
Total equity	1,125,500
Non-current liabilities	
12% Unsecured Loan Stock 2016	150,000
Current liabilities	
Trade payables	51,000
Tax due	26,500
Overdraft	<u>25,000</u>
	102,500
Total liabilities	252,500
Total equity and liabilities	1,378,000

During 2012, the following events occurred:

- In January, the company bought shares in *Kevin's Kookware* for a consideration of £400,000. This was financed by the issue of £200,000 nominal of 8% Convertible Unsecured Loan Stock 2018, and £100,000 nominal of 10% Debentures 2020. The loan stock were issued at par. The remaining £100,000 was paid for out of cash.
 - In January, the company also acquired the exclusive rights to sell the new “Muesli Meadow” design of kitchenware, for a price of £100,000. It proposes to show these rights as an asset in its statement of financial position, and to depreciate these rights by the straight line method over 10 years.
 - The company’s operating profit for 2011 was £243,000, on revenue of £1,215,000. Revenue increased by 3% in 2012, and operating profit was £120,000. The company paid the interest on its loan stocks in full.
 - The company’s total tax charge for 2012 was £18,000. It paid tax of £32,000 during the year. The dividends it paid amounted to £32,000.
 - Inventories increased by £4,500 and trade receivables increased by £10,000. Trade payables increased by £17,000. The company reduced its overdraft by £15,000 and reduced its cash balance by £90,500.
 - The company’s non-current assets consist of shops and land. The land was valued in 2009 at £200,000 and is not subject to depreciation. The shops were purchased previously for £1 million and are being depreciated using the straight line method over 10 years.
- (i) Prepare the statement of financial position for 31 December 2012. [8]
- (ii) Comment on the company’s performance during 2011 and 2012, using appropriate ratios to support your argument. You should address the aspects of profitability, liquidity and efficiency. [9]
- [Total 17]

Question 3.29

Using the following financial information to calculate appropriate ratios, comment on Light Fantastic UK's sources and uses of cash over the year. [10]

Statements of financial position for Light Fantastic UK at 31st December 2011 and 31st December 2012

	2011	2012
	£000	£000
<i>Assets</i>		
Non-current assets		
Non-current assets (at original cost)	302	344
Depreciation to date	(86)	(110)
Current assets		
Inventories	41	35
Trade receivables	21	25
Cash	43	45
Total assets	321	339
<i>Equity and liabilities</i>		
Share capital (25p ordinary shares)	45	50
Share premium account	21	24
Retained earnings	96	110
Total equity	162	184
Non-current liabilities		
Loan stock	140	130
Current liabilities		
Trade payables	7	17
Tax payable	12	8
Total liabilities	159	155
Total equity and liabilities	321	339

Notes:

1. Depreciation for 2012 amounted to £28,000.
2. New machinery was bought during 2012 for £50,000.
3. A machine was sold at its book value of £4,000 during 2012.
4. Dividends for 2011 of £12,000 were paid in 2012.

Items from the income statement for the year ending 31st December 2012

	£000
Sales revenue	251
Operating profit	47
Finance costs	10
Profit before tax	37
Corporation tax	11
Profit after tax	26

The cashflow statement for Light Fantastic UK for the year 2012

(£000s)

Cashflows from operating activities

Cash generated from operations ¹	87
Interest paid	(10)
Tax paid	<u>(15)</u>
Net cash generated from operating activities	62

Cashflows from investing activities

Purchase of machine	(50)
Sale of machine	<u>4</u>
Net cash used in investing activities	(46)

Cashflows from financing activities

Proceeds from share issue	8
Repayment of loan	(10)
Dividends paid	<u>(12)</u>
Net cash used in financing activities	(14)

Net increase in cash, cash equivalents and bank overdrafts 2

Cash, cash equivalents and bank overdrafts at beginning of the year 43

Cash, cash equivalents and bank overdrafts at end of the year 45

Notes

1. Cashflows from operations:

Operating profit	47
<i>plus</i> depreciation	28
<i>plus</i> decrease in inventories	6
<i>less</i> increase in trade receivables	(4)
<i>plus</i> increase in trade payables	<u>10</u>
	87

Question 3.30

The following information has been extracted from the accounting records of Witchita plc.

Trial balance at 30 September 2012 (in £000s)

Bank	50
Factory (cost)	3200
Factory (depreciation)	200
Inventories as at 1 October 2011	110
Trade receivables	120
Trade payables	150
Sales revenue	800
Interest	27
Machinery (cost)	570
Machinery (depreciation)	240
Patents	16
Purchases	260
Salaries	151
Rent, rates and insurance	90
Administration costs	57
Share capital	2000
Retained earnings at 1 October 2011	621
Loan stock – 5% 2019	540
	<hr/>
	4601
	<hr/>
	4601

- Notes (a) Closing inventory on 30 September 2012 was valued at £80,000.
- (b) The tax charge for the year has been estimated as £25,000.
- (c) No dividends were paid during the year. The directors propose to pay a dividend of £24,000.
- (d) Depreciation on property is charged at 1% of cost; depreciation on machinery is charged as 20% of the reducing balance; and half of the outstanding balance on intangible assets is written off each year.

- (e) At the end of the year the directors had the factory professionally revalued. The value of the site is now estimated to be £3.1 million. The company's practice is to account for revaluations through a revaluation reserve in the statement of financial position.
- (i) Prepare Witchita plc's statement of comprehensive income for the year ended 30 September 2012 and its statement of financial position at that date. These should be in a form suitable for publication. [14]
- (ii) Analyse and discuss the liquidity position of the company and its operating efficiency. [6]
- [Total 20]

Question 3.31

You work for the finance director of a manufacturing company, Drummer plc. Extracts from Drummer plc's financial statements for 2011 and 2012 are shown below. Over 2012 there has been a restructuring of the distribution network and a large marketing initiative to increase sales. The sales director has reported that the project has been a great success overall and that sales have risen by 25%.

- (i) Explain whether you agree with the sales director's conclusion. Support your answer with appropriate ratios. [16]
 - (ii) Following the announcement of the 2012 financial results, the share price of Drummer Limited is 145p. A year before, the price was 141p. Briefly analyse the market's reaction to the company's performance. [4]
- [Total 20]

Drummer plc***Income statement***

	<i>2012</i>	<i>2011</i>
	<i>£000</i>	<i>£000</i>
Revenue	56,000	45,000
Cost of sales	<u>46,750</u>	<u>37,400</u>
Gross profit	9,250	7,600
Expenses	<u>6,200</u>	<u>4,700</u>
Operating profit	3,050	2,900
Interest received	3	15
Interest payable	<u>560</u>	<u>140</u>
Profit before taxation	2,493	2,775
Taxation	<u>748</u>	<u>833</u>
Profit attributable to equity holders	<u>1,745</u>	<u>1,942</u>

A dividend of £486,000 was paid to ordinary shareholders during 2012 in respect of the 2011 financial year.

Drummer plc*Statements of financial position*

	<i>31 Dec 2012</i> £000	<i>31 Dec 2011</i> £000
ASSETS		
Non-current assets	30,250	24,000
Current assets		
Inventories	4,250	2,000
Trade receivables	7,350	5,550
Bank	-	600
	<u>11,600</u>	<u>8,150</u>
Total assets	<u>41,850</u>	<u>32,150</u>
EQUITY AND LIABILITIES		
Equity		
Share capital (25p shares)	3,000	3,000
Reserves	<u>24,141</u>	<u>22,832</u>
Total equity	<u>27,141</u>	<u>25,832</u>
Non-current liabilities		
Long-term loan	8,000	2,000
Current liabilities		
Bank overdraft	25	-
Trade payables	5,936	3,485
Taxation	748	833
	<u>6,709</u>	<u>4,318</u>
Total liabilities	<u>14,709</u>	<u>6,318</u>
Total equity and liabilities	<u>41,850</u>	<u>32,150</u>

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Part 3 – Solutions

Solution 3.1

Answer = A

$$\text{Capital gearing (or simply gearing)} = \frac{\text{debt finance}}{\text{equity}} = \frac{9,000}{80,000} = 0.1125$$

Notice that net asset value is equivalent to equity, *ie* share capital plus reserves. There are no options for the alternative definitions of gearing. [2]

Solution 3.2

Answer = C

[2]

Solution 3.3

Answer = A

[2]

Solution 3.4

Answer = C

Average stock turnover period is:

$$\frac{\text{average inventory level}}{\text{cost of sales}} \times 365 = \frac{11,500}{7,000} \times 365 = 600 \text{ days}$$

[2]

Solution 3.5

Answer = B

$$\text{Operating profit margin} = \frac{\text{operating profit}}{\text{revenue}} = \frac{(25,000 - 7,000 - 2,500 - 3,000)}{25,000} = 50\%$$

[2]

Solution 3.6

Answer = B

Return on total capital employed (ROCE) is defined as:

$$\frac{\text{net profit before tax and interest}}{\text{long - term debt} + \text{equity}}$$

In the absence of information on interest received, assume this is zero. Therefore net profit before tax and interest is the same as operating profit. Thus:

$$\text{ROCE} = \frac{(25,000 - 7,000 - 2,500 - 3,000)}{89,000} = 14\% \quad [2]$$

Solution 3.7

Answer = C

The question asks for the *average* stock turnover period. This means that the value of inventories should be the average of the start and end year figures (*i.e.* 25).

The cost of sales is:

$$\text{opening inventory} + \text{purchases} - \text{closing inventory} = 30 + 130 - 20 = 140$$

The stock turnover period in days is therefore:

$$= \frac{\text{inventories}}{\text{cost of sales}} = \frac{25}{140} \times 365 = 65 \text{ days} \quad [2]$$

Solution 3.8

Answer = B

$$\text{current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$

In this case current assets consist of closing inventories, trade receivables, prepayments (*ie* payments made for goods that have not yet been received) and cash.

In this case current liabilities (*ie* creditors falling due within one year) consist of overdrafts, trade payables and accruals (expenses which have been incurred in the period but which will be paid for in a later period, *eg* gas bills).

So, the current ratio is:

$$\frac{20+40+3+17}{12+10+2} = 3.33 \quad [2]$$

Solution 3.9

Answer = C

$$\text{Dividend cover} = \frac{\text{Net profit after tax}}{\text{Dividend distributed}}$$

Profits are:

Sales	200
Decrease in inventories	(10)
purchases (of raw materials <i>etc</i>)	(130)
administrative expenses	<u>(15)</u>
	45

Dividend cover is therefore: $45 \div (200 \times 0.045) = 5$

Note that this ignores items on which we have no information. For example, production expenses (other than purchases), distribution expenses and interest paid/receivable as well as taxation. [2]

Solution 3.10

Answer = B

Goodwill is calculated as follows:

$$400,000 - \frac{200,000}{250,000} (250,000 + 125,000) = 100,000 \quad [2]$$

Solution 3.11

Answer = B

The holding company has a controlling interest in its subsidiaries. [2]

Solution 3.12

Answer = C

Return on capital employed is defined as:

$$\frac{\text{net profit before tax and interest}}{\text{long - term debt} + \text{equity}} \text{ or } \frac{\text{net profit before tax}}{\text{equity}}$$

To find the figure for net profit before tax and interest, we need to add the loan stock interest back onto the pre-tax profit.

The calculation is then:

$$\frac{57,000 + (15,000 \times 0.12)}{425,000 + 15,000} = 13.36\%$$

The other definition of return on capital employed, *i.e* net profit before tax/ equity, is not offered as an option. [2]

Solution 3.13

Answer = C

Average stock turnover period using revenue as the denominator:

$$= \frac{\text{average stock}}{\text{revenue}} \times 365$$

$$= \frac{44.3}{103.25} \times 365$$

$$= 157 \text{ days}$$

[2]

Solution 3.14

Answer = B

We want to find *net* cash generated from operating activities, which is:

Cash generated from operations
less interest paid
less tax paid

where cash generated from operations is:

operating profit
plus depreciation
less increase in working capital

Operating profit (*ie* profit before interest paid) = $57,000 + 0.12 \times 15,000 = 58,800$.

So cash generated from operating activities is:

$$= 58,800 + 2,100 - (46,500 - 42,100) = 56,500$$

and *net* cash generated from operating activities is:

$$= 56,500 - 1,800 - 1,200 = 53,500$$

[2]

*Since you were given pre-tax profit (*ie* after the deduction of interest), you could have calculated net cash generated from operating activities as:*

$$57,000 + 2,100 - 4,400 - 1,200 = 53,500$$

Solution 3.15

Answer = B

B would lead to a low price and hence a low PE ratio.

[2]

Solution 3.16

Answer = C

The revenue account is concerned with normal insurance business. Investment income on investments relating to shareholders' funds appears on the non-technical income statement.

[2]

Solution 3.17

Answer = C

A is true of unit trusts, not investment trusts.

[2]

Solution 3.18

Answer = D

[2]

Solution 3.19

Answer = C

The other options are true of investment trusts.

[2]

Solution 3.20

Answer = D

The DMO (Debt Management Office) is responsible for the UK government's debt and cash management activities. It is not a regulator.

[2]

Solution 3.21(i) ***Consolidated statement of financial position***

We must first calculate the goodwill involved in the transaction. This can be calculated by comparing the value of the shares or cash paid to acquire Company Y against the book value of the assets purchased:

$$\text{Goodwill} = £4m - £3m = £1m$$

[1]

We can then construct the following consolidated statement of financial position:

<i>(all figures in £ millions)</i>	<i>Company X consolidated</i>	<i>Notes</i>
Non-current assets	15	1
Current assets	<u>5</u>	2
Total assets	20	
Share capital	6	
Reserves	<u>3</u>	
Total equity	9	
Non-current liabilities	7	
Current liabilities	<u>4</u>	
Total liabilities	11	
Total equity and liabilities	20	

Notes:

1. The £1 million goodwill has been added to the non-current assets. [1]
2. The total current assets of X and Y total £9 million. However, £4 million of cash has been paid in respect of the transaction, therefore the remaining current assets would total £5 million. [1]

The assets and liabilities of Company X and Company Y have been added, ... [1]

... after having cancelled out the internal relationship to avoid the double counting of X's investment in Y. [1]

[Total 5]

(ii) ***Non-controlling interests***

Non-controlling (or “minority”) interests are shown as a separate item in a consolidated statement of financial position, in the equity section, after the capital and reserves attributable to equity holders. [1]

Company X has paid £2.8 million cash for £2.1 million worth of share capital and reserves of Company Y, thus paying £0.7 million for goodwill. Minority shareholders own 30% of the value of Company Y (30% of £3m = £0.9m). The consolidated statement of financial position would look as follows:

<i>(all figures in £ millions)</i>	<i>Company X consolidated</i>
Non-current assets	14.7
Current assets	<u>6.2</u>
Total assets	20.9

**Capital and reserves attributable to equity holders
of the company**

Share capital	6
Reserves	3
Non-controlling interests	<u>0.9</u>
Total equity	9.9
Non-current liabilities	7
Current liabilities	<u>4</u>
Total liabilities	11
Total equity and liabilities	20.9

[2]

If a holding company has a controlling interest in a subsidiary company, it holds a percentage of the subsidiary’s shares but it controls all of its assets. Thus it would not be appropriate to simply include the appropriate percentage of net assets (as would be the case for an associate company). Instead, on consolidation, all of the subsidiary’s assets are included (including goodwill) along with a separate item to identify non-controlling interests. [2]

[Total 5]

Solution 3.22

A subsidiary company is one that is *controlled* by a holding company. [1]

The controlling interest can arise in a number of ways:

- The holding company could own a majority of the voting rights. [½]
 - The holding company could hold under 50% of the voting shares but have the right to appoint or remove directors who have a majority of the voting rights at board meetings. [½]
 - The holding company could have some other right to exercise a dominant influence over the subsidiary. [½]
- [Maximum 2]

Solution 3.23

The main weaknesses of historical cost accounts in times of high inflation are:

- The cost of sales is underestimated and therefore profit is overstated. If, for example, an item is purchased for £10 and sold for £15 the company will record a profit of £5. If, however, the cost of replacing that item of inventory has increased to £12 then the “real” profit on the transaction is only £3. [1]
 - If depreciation is calculated using the historical cost of the assets, the depreciation charge will be inadequate and thus again, profit will be overstated. [1]
 - Interest payments will decline in real terms so a company that pays out more interest than it receives will find that its profits will tend to be understated in times of high inflation. [1]
 - Accounts figures are not comparable between years. Profits and asset values might increase in money terms but it is not clear how much of the increase is a real increase and how much is simply due to inflation. [1]
- [Total 4]

Solution 3.24

The main limitations of ratio analysis

- It diverts attention from the figures themselves. The scale of the figures is lost when looking at ratios. Scale is important when analysing a company's performance. For example, a large company can benefit from economies of scale. [1]
 - Ratio analysis also diverts attention from the wider picture. It is also important to look at information in the notes to the accounts and the Directors' Report to gain a fuller view of the conditions in which the company is operating and its overall performance. [1]
 - Ratios are calculated from the figures in the financial statements. They can therefore be affected by the accounting policies used to calculate the basic accounting figures. If, for example, two companies use different methods for the calculation of depreciation then any ratios based on their financial statements might not be comparable. Similarly, if property is frequently revalued, the return on capital employed will be lower. [1]
 - The financial statements on which the ratios are based could have been deliberately distorted by so-called creative accounting. Management could select accounting policies and assumptions that tend to bias the figures. [1]
 - Ratios alone should not be used as a basis for comparison between businesses. As well as different accounting policies, companies might be exposed to different conditions. For example, a company that sells mainly in the domestic market will be more affected by a domestic recession than one that operates throughout the world. [1]
 - When using ratios to make comparisons between businesses it is important to take into account any special conditions that occur in a particular trade. For example, stock turnover would be expected to be lower for an antique shop than a supermarket. [1]
- [Total 6]

Solution 3.25(i) ***Goodwill if conversion does not take place***

Number of shares in B	= $60,000 \div 0.1$	
	= 600,000	[1]
Net asset value of B	= £60,000 + £250,000	
	= £310,000	[1]
Value of A's offer	= $(1/9) \times (3 \times 0.50 + 0.9 + 2 \times 2) \times 600,000$	
	= £426,660	[2]
Goodwill	= Excess of amount paid for B over value of B	
	= £426,660 – £310,000	
	= £116,660	[1]
		[Total 5]

(ii) ***Goodwill if conversion takes place***

Value of A's offer	= $(1/9) \times (3 \times 0.50 + 0.9 + 2 \times 5 \times 0.50) \times 600,000$	
	= £493,330	[2]
Excess paid	= £493,330 – £310,000	
	= £183,330	[1]
		[Total 3]

Solution 3.26*Similarities:*

- Both are collective investments.
- Both offer small investors a diversified portfolio of underlying assets.
- Both provide expert management.
- Both may operate in regions where it is not practicable for individual investors to invest directly.
- In both cases there is a one-off investment cost plus an on-going charge.
- It is possible to make lump sum or regular monthly contributions to either.

[1 per point, maximum 5]

Differences:

	Investment Trust	Unit Trust
Status	a company	a trust
Availability	restricted to number of shares issued (“closed-ended”)	units created / destroyed according to demand (“open-ended”)
Pricing (1)	by action of supply and demand	value of assets ÷ no. of units
Pricing (2)	market’s view of the expense charges and the ability of the managers is reflected in the price	price does not reflect the expenses or the ability of managers. Pricing basis may switch between “bid” and “offer” pricing.
Value	usually at discount to NAV	as for pricing (=NAV)
Gearing?	yes – may have fixed interest borrowing	no – borrowing not allowed
Expenses	usual dealing costs, no initial charge, but annual charge about 0.75% of assets	initial charge about 6%, then annual charge of about $\frac{1}{2}\%$ – $1\frac{1}{2}\%$ of assets
Marketability	varies – might be poor	managers <i>obliged</i> to buy units back
Asset range	usually able to invest in any asset	restricted to authorised assets

[1 per point, maximum 5]

Solution 3.27

(i) **Net asset value per share**

(a)
$$\frac{\text{ordinary share capital} + \text{reserves} - \text{intangibles}}{\text{number of ordinary shares}}$$
 [1]

- (b) Gives the underlying asset backing for the share, and can be compared with the share price (often used in takeovers). If the share price is well below NAV, then it might suggest that there isn’t much scope for share price reduction. This might also suggest that the managers are not highly regarded – as they don’t add any value to the assets. [2]

(c) Misleading/meaningless:

- where values in the statement of financial statements have not been revalued recently
- if the assets contain a large proportion of worthless items (*eg* half-made widgets)
- if the property market is in steep decline
- if the assets are not marketable
- where the main value of the company is not related to the assets (*eg* “people” businesses).

For many firms the market value will be a long way above the net asset value. [2]

[Total 5]

(ii) ***Profit margin***

$$(a) \frac{\text{Net profit before tax and interest}}{\text{Revenue}} \quad [1]$$

It is also possible to calculate a gross profit margin and an operating profit margin.

- (b) Shows profitability. May help indicate efficiency and quality of management. A high ratio might indicate that there is room for competition. It varies a lot between industries. Different levels for companies in the same industry may indicate divergent pricing policies. [2]
 - (c) Not appropriate for banks or insurance companies where there is no clear “revenue”. Also may be misleading for businesses with large contracts that spread over several years (*eg* construction). [2]
- [Total 5]

(iii) ***Current ratio***

$$(a) \frac{\text{Current assets}}{\text{Current liabilities}} \quad [1]$$

- (b) Shows the liquidity or solvency position of the company (*ie* its ability to meet its short-term commitments). A company with a low ratio may be heading for cash problems (particularly if the ratio is decreasing). It can also be used to show efficiency – a low ratio would indicate efficient inventory control. [2]

- (c) Looking at the ratio in isolation may not be sufficiently informative. How do you differentiate between the “efficient” 0.8 from Marks & Spencer and the worrying 0.8 from a company with severe liquidity problems. (The solution may be to look for a stable low figure. However, even a low and reducing figure may simply indicate improving efficiency). No indication is given of the company’s ability to borrow more if it needs to. [2]
 [Total 5]

(iv) ***Return on capital employed (ROCE)***

- (a)
$$\frac{\text{Net profit before tax and interest}}{\text{Long - term debt plus equity}}$$
 (alternative definitions are possible) [1]
- (b) Shows the ability of the company to generate profits from capital. By comparing it with the cost of debt, you can see if extra finance would increase or decrease shareholders’ profits (assuming that marginal capital would be equally profitable). [2]
- (c) Misleading/meaningless:
- where the capital employed is low (or not a major factor of production)
 - where profits are volatile (one year’s results should not be used)
 - where the entries in the statement of financial position do not produce a realistic value of the actual capital being used (*eg* when asset values are out of date, or capital has been raised during the year). [2]
- [Total 5]

Solution 3.28**Comment**

For this and subsequent accounts questions, where possible follow through mistakes to see whether or not you are using correct principles, and award marks where appropriate.

(i) ***Statement of financial position***

In order to draw up the 31 December 2012 statement of financial position, we first need to draft the income statement for 2012:

Operating profit	120,000
Interest on loan stock	<u>44,000</u> $12\% \times 150,000 + 8\% \times 200,000 + 10\% \times 100,000$
Pre-tax profit	76,000
Tax	<u>18,000</u>
Profit for 2012 attributable to equity holders	<u>58,000</u>

[1]

During the year dividends totalling £32,000 were paid to ordinary shareholders.

We can now go ahead with the statement of financial position.

Non-current assets: the shops are being depreciated over a period of 10 years, *ie* at the rate of $\frac{1,000,000}{10} = £100,000$ per year. Similarly, the trademark is also being depreciated over 10 years, at a rate of £10,000 per year. [1]

Statement of financial position for Kwaint Kountry Kitchens for 31 December 2012

	£	
ASSETS		
Non-current assets		
Land and buildings	700,000	800,000 – 100,000
Trademark	90,000	100,000 – 10,000
Investments	<u>400,000</u>	
	1,190,000	[1]
Current assets		
Inventories	429,500	425,000 + 4,500
Cash	34,500	125,000 – 90,500
Trade receivables	<u>38,000</u>	28,000 + 10,000
	502,000	[2]
Total assets	1,692,000	
EQUITY AND LIABILITIES		
Share capital (£1 par value)	700,000	
Other reserves	200,000	
Retained earnings	<u>251,500</u>	225,500+58,000-32,000
Total equity	1,151,500	[1]
Non-current liabilities		
8% Convertible unsecured loan 2018	200,000	
10% Debenture 2020	100,000	
12% Unsecured Loan Stock 2016	<u>150,000</u>	
	450,000	
Current liabilities		
Trade payables	68,000	51,000 + 17,000
Tax due	12,500	26,500 – 32,000 + 18,000
Overdraft	<u>10,000</u>	25,000 – 15,000
	90,500	[2]
Total liabilities	540,500	
Total equity and liabilities	1,692,000	

[Total 8]

(ii) ***Company performance in 2012****Profitability:*

To examine profitability, we will look at the return on capital employed and the profit margin. As we have the information from 2011, we will compare the ratios for the two years.

$$\text{Profit margin 2011: } \frac{\text{net profit before tax and interest}}{\text{revenue}} = \frac{243,000}{1,215,000} = 20\%$$

$$\text{Profit margin 2012: } \frac{120,000}{1,215,000 \times 1.03} = 9.6\% \quad [1]$$

$$\text{ROCE 2011: } \frac{\text{net profit before interest and tax}}{\text{long - term debt + equity}} = \frac{243,000}{1,275,500} = 19.1\%$$

$$\text{ROCE 2012: } \frac{120,000}{1,601,500} = 7.5\% \quad [1]$$

Comments: The profit margin has fallen from 20% to 9.6%. This is mostly because trading profit has halved over the year. We do not have any information to say why this has happened, but it is a matter that requires further investigation.

The return on capital employed has fallen even further, from 19.1% to 7.5%. The fall in operating profits is exacerbated in this case by the increase in the capital employed (share capital and reserves plus debt). This increase comes from the new loan stocks which were issued in order to finance the purchase of the subsidiary. [1]

The new ROCE is lower than the cost of borrowing on the new debentures (10%), so investors in the company will be concerned that the money raised is not being used efficiently. [1]

Efficiency:

Stock turnover period (in days, based on revenue)

$$2011: \frac{\text{stocks}}{\text{revenue}} \times 365 = \frac{425,000}{1,215,000} \times 365 = 128 \text{ days}$$

$$2012: \frac{429,500}{1,251,450} \times 365 = 125 \text{ days} \quad [1]$$

Comments: This has remained reasonably constant over the two years, so there does not appear to be any improvement or deterioration in efficiency. However, we would like to know the equivalent ratio for other firms in the same line of business, to see how *Kwaint Kountry Kitchens* compares. [1]

Liquidity:

$$\text{Current ratio 2011: } \frac{\text{current assets}}{\text{current liabilities}} = \frac{578,000}{102,500} = 5.6$$

$$\text{Current ratio 2012: } \frac{502,000}{90,500} = 5.5 \quad [1]$$

$$\text{Quick ratio 2011: } \frac{\text{current assets less stocks}}{\text{current liabilities}} = \frac{153,000}{102,500} = 1.49$$

$$\text{Quick ratio 2012: } \frac{72,500}{90,500} = 0.80 \quad [1]$$

Comments: Both the current ratio and the quick ratio have decreased over the year. The current ratio was at 5.6, and has dropped slightly to 5.5. At first glance these look like high figures for this ratio, but we would need to compare with other firms in the same industry to make a judgement about this.

The quick ratio has fallen from 1.49 to 0.80. This indicates that if the company were required to settle its short-term debts in a hurry, it would not be able to do so. Investors in the company may be concerned about this. The company would need to check its banking facilities – would it be able to increase its overdraft to cover a “cash crisis”? [1]

The reduction in the quick ratio is largely due to the cash cost of acquiring the trademark and the holding in the subsidiary. If these assets generate good cashflow in the future then the quick ratio may rise again, but the temporary position does feel uncomfortable. [1]

The difference between the current ratio and the quick ratio highlights the fact that the company holds a large quantity of inventory. Indeed, in 2012, over 85% of its current assets were in the form of unsold inventory. Investors in the company might question whether the company needs to change (a) its policy on buying inventory and (b) its pricing policy, in order to reduce this high level of inventory. However, in order to make a more informed comment, we would need to look at the levels of inventory held by similar companies. [1]

[Maximum 9]

Solution 3.29

Operating activities

- £62,000 has been generated from operating activities.
- Inventory levels have decreased, which has generated free cash. [1]
- The stock turnover period is now 51 days $\left(\frac{35}{251} \times 365\right)$.

Less time, space and cash is devoted to inventories, so this will improve the efficiency of the business, as long as there is sufficient stock to meet the needs of the customer. [1]

- There has been an increase in the amount of credit given to customers. The debtors turnover period is now 36 days $\left(\frac{25}{251} \times 365\right)$. [1]
- This use of cash might improve marketing and sales. On the other hand, the company could suffer from “bad debts”. [1]
- The company has obtained more credit from its suppliers. The creditors turnover period is now 25 days $\left(\frac{17}{251} \times 365\right)$. [1]
- This gives the company more time to produce and sell its goods before it has to pay its suppliers. However, this is still low compared with its debtor days. [1]
- Generally, liquidity is high. The current ratio has fallen from 5.5 in 2010 to 4.2 in 2011 and the quick ratio from 3.4 to 2.8 but these are still relatively high. [1]
- Interest of £10,000 has been paid. Interest cover is $4.7\left(\frac{47}{10}\right)$, so the company’s profit covers these payments reasonably well. [1]

Investing activities

- £46,000 has been used in investing activities. Since the company's liquidity position is sound, it could consider investing some of its cash in liquid assets, eg in a three-month deposit, to earn some interest. [1]

Financing activities

- £14,000 has been used in financing activities. The company has raised £8,000 in more equity finance and paid back £10,000 of its debt. [1]
 - As a result its gearing ratio has fallen from 46% $\left(\frac{140}{162+140} \times 100\right)$ to 41% $\left(\frac{130}{184+130} \times 100\right)$. [1]
 - This will reduce the volatility of the company's earnings and increase its asset cover from 2.2 $\left(\frac{321-19}{140}\right)$ to 2.4 $\left(\frac{339-25}{130}\right)$. [1]
 - Dividends of £12,000 were paid. This is 6.6p per share $\left(\frac{12}{45 \div 0.25}\right)$. [1]
- [Maximum 10]

Solution 3.30

- (i) *Statement of comprehensive income and statement of financial position*

***Statement of comprehensive income for Witchita plc for the year ending
30 September 2012***

	£000s
Sales revenue	800
Cost of sales ¹	<u>(396)</u>
Gross profit	404
Expenses ²	<u>(298)</u>
Net profit before tax and interest	106
Interest	<u>(27)</u>
Net profit before tax	79
Tax	<u>(25)</u>
Profit for the year attributable to equity holders	<u>54</u>
Other comprehensive income:	
Gains on revaluation ³	<u>132</u>
Total comprehensive income	<u>186</u>

[2]

No dividends were paid to ordinary shareholders during the year.

Notes:

1. Cost of sales was calculated as follows:

Cost of inventory used:	
depreciation of the factory	32
depreciation of the machinery	66
depreciation of the patents	8
Cost of sales	396

2. Expenses were calculated as follows:

Salaries	151
Rent, rates and insurance	90
Administration costs	<u>57</u>
Total expenses	298

3. Gains on revaluation were calculated as:

Revalued factory	3,100
Book value without revaluation	(2,968)
(3200 – 200 – 32)	
Gains on revaluation	<u>132</u>

Statement of financial position for Witchita plc as at 30 September 2012

ASSETS	<i>£000s</i>
Non-current assets⁴	
Factory	3,100
Machinery	264
Intangibles	<u>8</u>
	3,372
Current assets	
Inventories	80
Trade receivables	<u>120</u>
	200
Total assets	<u>3,572</u>
 EQUITY AND LIABILITIES	
Share capital	2,000
Other reserves ⁵	132
Retained earnings ⁶	<u>675</u>
Total equity	2,807
 Non-current liabilities	
Loan stock – 5% 2015	540
Current liabilities	
Overdraft	50
Trade payables	150
Tax due	<u>25</u>
	225
Total liabilities	765
Total equity and liabilities	<u>3,572</u>

[3]

Notes:

4. Non-current assets are valued as follows (in £000s):

Factory	Revalued	3,100
Machinery	570 – (240 + 66)	264
Intangibles	16 – 8	<u>8</u>
Total		3,372

[2]

5. The other reserves have increased by the increase in the value of the factory over its book value ie $3100 - (3200 - 200 - 32) = 132$. [1]
6. Retained earnings has increased by the year's profit, ie $621 + 54 = 675$. [1]
 [Total 14]

(ii) **Liquidity position and operating efficiency**

The liquidity position of the company can be assessed by considering the current and the quick ratios.

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{200}{225} = 0.89 \times$$

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{stocks}}{\text{Current liabilities}} = \frac{120}{225} = 0.53 \times \quad [2]$$

The current ratio is recommended to be approximately 2×. Witchita's current ratio is therefore below the usual lowest acceptable limit. It means that the company does not have the liquid assets to pay its short-term liabilities. The quick ratio deducts inventories from current assets since these are less easy to turn to cash should the need arise. This ratio is recommended to be approximately 1×. Witchita's quick ratio is therefore also below the usual lowest acceptable limit.

Some businesses, such as supermarkets, do operate on very low liquidity ratios. This might be perfectly safe for a cash-based business. We would need to investigate the nature of Witchita's business before making a judgement. [1]

If we examine the company's current assets and liabilities further, we can see that it is holding approximately 36 days sales in inventory $\left(\frac{stock}{sales} \times 365 \right)$. This tells us that the inventory is being turned over about 10 times each year.

This demonstrates that the company is not holding large amounts of inventory and is operating efficiently. [1]

Assuming that all sales are on a credit basis, we can also see that the company is offering approximately 54 days credit to its customers $\left(\frac{trade\ receivables}{sales} \times 365 \right)$ and that it is receiving approximately 211 days credit from its suppliers $\left(\frac{trade\ payables}{purchases} \times 365 \right)$.

The company is being treated very generously by its suppliers and this free credit, coupled with the much shorter period given to its own customers, is likely to be a very profitable situation for the company. However it is also risky. The suppliers might begin to look for other customers who would pay their bills in the more acceptable period of, say 90 days. [1]

The company also risks bad publicity from their suppliers who might take legal action. The company must also put this figure in its annual report and accounts, so it will be in the public domain. This might discourage others from starting to do business with Witchita. [1]

[Total 6]

Solution 3.31(i) *Analysis of Drummer plc's performance**Profitability*

<i>Ratio</i>	<i>Definition</i>	<i>2011 figures</i>	<i>2012 figures</i>
Return on capital employed	$\frac{\text{net profit before interest and tax}}{\text{share capital} + \text{reserves} + \text{debt}}$	$\frac{2915}{27832}$ = 10.5%	$\frac{3053}{35141}$ = 8.7%
Net profit margin	$\frac{\text{net profit before tax and interest}}{\text{revenue}}$	$\frac{2915}{45000}$ = 6.5%	$\frac{3053}{56000}$ = 5.5%
Asset utilisation ratio	$\frac{\text{revenue}}{\text{share capital} + \text{reserves} + \text{debt}}$	$\frac{45000}{27832}$ = 1.62	$\frac{56000}{35141}$ 1.59
Gross profit margin	$\frac{\text{gross profit}}{\text{revenue}}$	$\frac{7600}{45000}$ = 16.9%	$\frac{9250}{56000}$ = 16.5%

[3 for ratios]

Comments on profitability

Return on capital employed (ROCE) has fallen from 10.5% to 8.7%. The additional profit in 2012 is not sufficient to offset the impact of the higher capital employed coming from the increased borrowing. [1]

The fall in the ROCE can be examined by looking at its two components: the net profit margin and the asset utilisation ratio, the first showing the profit generated by sales, and the second, the sales generated by the assets. [1]

Although gross profit and net profit have risen as a result of the increased sales volumes, both the gross profit margin and the net profit margin have fallen in 2012. This is because the cost of sales and, in particular, expenses have risen proportionately more than sales. [1]

The asset utilisation ratio has fallen very slightly, suggesting that the company is generating slightly less revenue per £ of assets. Although sales revenue has risen by 24%, capital employed has risen by 26%. [1]

Liquidity

<i>Ratio</i>	<i>Definition</i>	<i>2011 figures</i>	<i>2012 figures</i>
Current ratio	$\frac{\text{current assets}}{\text{current liabilities}}$	$\frac{8150}{4318}$ = 1.89×	$\frac{11600}{6709}$ = 1.73×
Quick ratio	$\frac{\text{current assets} - \text{inventories}}{\text{current liabilities}}$	$\frac{(8150 - 2000)}{4318}$ = 1.42×	$\frac{(11600 - 4250)}{6709}$ = 1.10×
			[2 for ratios]

Comments on liquidity:

Both the current and quick ratio have fallen over 2012. The current ratio looks a little on the low side (against a benchmark of 2), but the quick ratio still looks reasonable (against a benchmark of 1). [1]

The cash balance has fallen from £600,000 to £25,000 overdrawn, suggesting some cashflow problems have arisen with the increased sales volumes. This may be a concern if the situation continues to deteriorate. [1]

Efficiency

<i>Ratio</i>	<i>Definition</i>	<i>2011 figures</i>	<i>2012 figures</i>
Stock turnover (1)	$\frac{\text{inventories}}{\text{cost of sales}} \times 365$	$\frac{2000}{37400} \times 365$ = 20 days	$\frac{4250}{46750} \times 365$ = 33 days
<i>or</i>			
Stock turnover (2)	$\frac{\text{inventories}}{\text{revenue}} \times 365$	$\frac{2000}{45000} \times 365$ = 16 days	$\frac{4250}{56000} \times 365$ = 28 days
Debtors turnover*	$\frac{\text{trade receivables}}{\text{revenue}} \times 365$	$\frac{5550}{45000} \times 365$ 45 days	$\frac{7350}{56000} \times 365$ 48 days

*As credit sales are not available, total sales revenue has been used as a proxy.

[2 for ratios]

Comments on efficiency

Both the efficiency ratios have worsened over 2012, in particular stock turnover. This suggests that as the size of the business has grown, the existing systems and processes are not working so well. This might explain part of the drop in profitability. [1]

Gearing

<i>Ratio</i>	<i>Definition</i>	<i>2011 figures</i>	<i>2012 figures</i>
Asset gearing	$\frac{\text{debt}}{\text{debt} + \text{share capital} + \text{reserves}}$	$\frac{2000}{(2000 + 25832)} = 7\%$	$\frac{8000}{(8000 + 27141)} = 23\%$
Interest cover	$\frac{\text{net profit before tax and interest}}{\text{interest payments}}$	$\frac{(2900 + 15)}{140} = 20.8\times$	$\frac{(3050 + 3)}{560} = 5.5\times$

[2 for ratios]

Comments on gearing

Both asset and gearing have increased as a result of the higher level of debt. However the gearing is still within reasonable limits. [1]

Overall comment

Sales have indeed increased by almost 25%. However, the increase in sales has reduced the overall profitability of the company and caused potential cashflow problems. If sales are to continue at this rate, more expense control is needed to return the ROCE to its 2011 levels. [1]

[Maximum 16]

(ii) ***Market reaction***

	<i>Definition</i>	<i>2011 figures</i>	<i>2012 figures</i>
Earnings per share (EPS)	$\frac{\text{earnings}}{\text{number of ordinary shares}}$	$\frac{1942}{(3000/0.25)} = 16.2p$	$\frac{1745}{(3000/0.25)} = 14.5p$
Price earnings (PE) ratio	$\frac{\text{share price}}{\text{earnings per share}}$	$\frac{141}{16.2} = 8.7\times$	$\frac{145}{14.5} = 10.0\times$

[2 for ratios]

Over 2012, earnings per share have fallen from 16.2p to 14.5p, but the price has actually risen from 141p to 145p. This corresponds to an increase in the PE ratio from 8.7 to 10.0. [1]

This suggests that the share is rated more highly than a year ago. This may be because investors believe that the growth in sales may continue and/or the management will bring the profitability back up. [1 for reasonable comment]

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Part 4 – Questions

Multiple-choice questions

Question 4.1

A company's shares have a beta of 0.75. The risk-free rate is 3% and the market risk premium is 5%. The corporation tax rate is 30%. What is the required rate of return on the company's shares?

- A 4.73%
- B 5.00%
- C 5.70%
- D 6.75%

[2]

Question 4.2

Which of the following statements is true?

- A The expected return from a share with a beta of 1.5 is 1.5 times the expected return from a diversified portfolio of shares.
- B Defensive shares are defined as those whose beta is negative.
- C The expected return from a share with a beta of 0.8 is lower than the expected return from a diversified portfolio of shares.
- D A company with a beta of less than 1 should not invest in risky projects.

[2]

Question 4.3

A key difference between the net present value technique and the internal rate of return technique for capital budgeting is:

- A that the net present value is easier to calculate.
- B that they use different cashflows.
- C that they have different reinvestment rate assumptions.
- D that they use different time periods.

[2]

Question 4.4

The net present value method of capital budgeting assumes that cashflows are reinvested at:

- A the firm's cost of capital.
- B the firm's dividend yield.
- C no rate – they are not reinvested.
- D the rate of return of the project.

[2]

Question 4.5

The payback method can lead to the wrong decision being made because:

- A it ignores income beyond the payback period.
- B the payback period is difficult to calculate.
- C the returns in later years are uncertain.
- D of the emphasis placed on the interest factor.

[2]

Question 4.6

Which of the following is most likely to be true?

- A A company's cost of equity will be equal to its weighted average cost of capital.
- B A company's cost of equity will be greater than its weighted average cost of capital.
- C A company's cost of equity will be lower than its weighted average cost of capital.
- D A company's cost of equity will fluctuate around its weighted average cost of capital.

[2]

Question 4.7

Which of the following types of company is most likely to employ a high proportion of equity financing?

- A supermarket
- B property company
- C IT developer
- D bank

[2]

Question 4.8

Which of the following is NOT true about a company with a high beta?

- A It can be described as a “defensive” company.
- B Investors in the company should expect a higher return over the long term than investors in companies with low betas.
- C It has more systematic risk than an average company in the market.
- D Its cost of capital will be higher than that for a company with a low beta. [2]

Question 4.9

Which of the following statements is true?

- A All equity shares would have the same level of systematic risk if all companies had the same level of gearing.
- B Systematic risk can be eliminated by investing in a large diversified portfolio of assets.
- C If a company increases its level of gearing it will increase its level of specific risk.
- D Increasing a company’s gearing can reduce its weighted average cost of capital in a taxed environment. [2]

Question 4.10

Which of the following is NOT a valid reason for using simulation in order to evaluate an investment project?

- A The cashflows are uncertain.
- B The required rate of return might vary during the life of the project.
- C Decision makers are interested in the range of possible outcomes.
- D Decision makers require an accurate forecast. [2]

Short questions***Question 4.11***

You are the finance director for a large retailer. The company owns a large out-of-town shopping centre in a prime location. In order to reduce the debt, one of the directors has suggested that the company should approach a bank to arrange a sale and leaseback on the property, whereby the company will sell the property to the bank for a sub-market price and the company will negotiate a long-term lease on the centre at a reduced rent level.

List the advantages and disadvantages of such a move.

[5]

Question 4.12

A company has recently been aggressively gearing its balance sheet in order to enhance equity shareholders' returns. Its most recent statement of financial position shows total assets less intangibles of \$200 million and debt of \$100 million. Bondholders have complained at the low level of asset cover and demanded that the company refinance through an issue of equity shares in order to improve the bondholders' situation. The company has stated that the assets are still twice as much as would be required to repay the borrowers in full.

Describe the points you would make to both the bondholders and the company with regard to these statements.

[5]

Question 4.13

Your company is seeking finance for expansion.

Your Chief Executive has written to you stating that, in his opinion there should be sufficient funds raised internally through retained earnings to fund business growth over the medium and long term. He has stated that other methods of raising finance are too expensive and should be avoided, but has asked you for your opinion on the matter.

- (i) Explain the main points you would make in your response. [3]

Your Chief Executive seems reluctant to raise funds from an equity issue at the moment. At a recent meeting, he said: “In a recession, share prices fall. Low share prices mean higher required return, which discourages companies from issuing shares. Therefore there are fewer issues in a recession.”

- (ii) Discuss this statement. [4]
[Total 7]

Question 4.14

A UK High Street bank is determining its long-term dividend policy. Describe the factors it might wish to take into account. [6]

Question 4.15

A company proudly announces that its free cash reserves have reached record levels, making it the financially strongest company in its sector.

- (i) Discuss the possible shareholder reactions to the statement. [3]
(ii) List three possible methods by which the company could reduce the cash pile. [3]
[Total 6]

Question 4.16

- (i) Explain how a UK company might carry out a share buyback programme. [4]
(ii) Discuss whether a share buyback is more tax-efficient than paying a large special dividend and is therefore always beneficial to all shareholders. [3]
[Total 7]

Question 4.17

The company you work for has prepared the following table giving the expected net present values for a large project which is under consideration.

Net present values of project using a discount rate of 10%

Inflation estimate	2%				6%			
Duration of construction phase	3 yrs		5 yrs		3 yrs		5 yrs	
Borrowing costs	6%	8%	6%	8%	6%	8%	6%	8%
Expected NPV (in \$ millions)	2	0	(1)	(3)	4	2	2	0

- (i) Explain the benefit of the above analysis over a simple deterministic estimate of the NPV. [2]
- (ii) Describe the weaknesses of the above approach. [2]
- (iii) Explain how you would go about improving the technique shown above. [2]

Having spoken to the Chief Executive, he has indicated that other projects in the company's portfolio are exposed to higher borrowing costs, and that in his opinion the chances of a period of high inflation and higher borrowing costs are much greater than the market expects.

- (iv) Explain what further analysis you would do in the light of this information. [2]
- [Total 8]

Question 4.18

Your company uses a “hurdle rate” to appraise investment projects.

- (i) Explain what is meant by a “hurdle rate” and comment on its usefulness. [3]

Your department is considering two projects. They are identical, except that one is based in a foreign country and the profits will accrue in a foreign currency.

- (ii) Explain which would be more likely to pass the “hurdle” test. [3]
- [Total 6]

Question 4.19

A company is about to make a substantial takeover. The company to be taken over has a different profile from the existing company. The data is summarised in the table below.

	<i>Company</i>	<i>Target (at the proposed takeover price)</i>	<i>Combined</i>
PE ratio	15×	8×	12×
Net dividend yield	2%	5%	3.3%
Gearing	50%	10%	20%
Beta	1.3	0.7	1.0

The Finance Director has asked you to assess the qualitative benefits of the takeover from the point of view of the shareholders using the “shareholder value” approach.

- (i) Describe what information you would request before undertaking the task. [3]
 - (ii) Explain what is likely to be the thrust of your report. [4]
- [Total 7]

Question 4.20

- (i) Explain what is meant by the “payback period”. [2]
 - (ii) Describe the circumstances under which you would consider using the payback period approach to evaluate a project. [3]
 - (iii) Outline the drawbacks of the method. [3]
- [Total 8]

Question 4.21

Your company operates a project appraisal method that is based around a hurdle rate of 18% return. Two projects have been proposed for discussion:

- A Toll bridge over the English Channel

The cashflows have been roughly estimated as being a net outflow of £100 million in each of the first two years, and an annual income thereafter of £40 million payable continuously and increasing at 3% per annum in perpetuity. The data have been estimated as accurately as possible.

- B Project to build an office in the centre of London

The cashflows on this project have been estimated as being a net outflow of £20 million in the first year, a further outflow of £2 million in the second year, and a profit of £36 million at the end of the third year on the sale of the completed building.

The NPV for Project A is £32 million and for Project B is £1.93 million. The IRR for Project A is 21.5% and for Project B is 22%.

Explain which project you favour and why. [4]

Question 4.22

- (i) Define the beta of an asset. [3]
- (ii) Explain how beta can be used to determine the appropriate risk discount rate used to appraise a project. [2]
- (ii) Discuss the main practical difficulty in using betas in this way. [3]
- [Total 8]

Question 4.23

You work for a firm of management consultants that specialises in the appraisal of capital projects. The government of a country that is about to celebrate 100 years of independence has asked you to appraise their proposal to build a Centennial Dome to celebrate the anniversary. The Dome will be built using new construction methods and materials and will be located in an industrial site close to the centre of the capital city. It is expected to cost about \$500m to build – financed in a public-private sector partnership – and is expected to be a major tourist attraction that will attract 3 million overseas and 2 million domestic visitors each year.

- (i) Describe the steps necessary to deal with the risks facing a capital project. [5]
- (ii) Explain how a risk matrix can be used in the risk analysis process. [4]
- (iii) Describe briefly three major risks facing the project. [3]

[Total 12]

Question 4.24

Company X is considering the building of a new toll bridge. In return for financing the bridge, Company X is entitled to receive all of the toll revenues generated in each of Years 3 to 5. (Thereafter ownership of the bridge reverts to the government.)

If the bridge is a success and proves popular with travellers, then toll revenues are estimated to fall within the range of 40 – 50 *pa*. If it is not popular, then revenues will instead lie within the range 20 – 30 *pa*.

The cost of building the bridge is estimated to be 50, and if the weather remains fine it will be completed within one year. Bad weather will cause construction to drag on into year 2, when an additional cost of 20 will be incurred.

Finally, Company X also faces the risk of possible strike action by the workforce. If a strike occurs, it will increase the costs incurred in each year of construction by 20%.

Assuming that:

- the probability that the bridge is a success is 2/3
- the probability of bad weather is $\frac{1}{2}$
- the probability of a strike is also $\frac{1}{2}$ if the weather is good, but only $\frac{1}{4}$ if the weather is bad
- all cashflows are assumed to arise at the start of each year

calculate the expected net present value of the project using a discount rate of 10% *pa* and comment on your results. [9]

Long question

Question 4.25

XYZ is a construction company based in Germany that is involved in infrastructure projects in all parts of Germany. It has been offered the opportunity to become involved in a large new bridge construction project to build one, two or three new bridges over the Rhine.

The construction project has been structured by the government so that the company must build each bridge and operate the tolls for the first 3 years. After that the government will buy, or arrange a buyer for, the bridges on the basis of the volume of cars using the bridge and the level of the tolls.

Your company has made a detailed analysis of the work and the risks involved and you (as financial analyst) have been presented with the following information:

<i>Bridge building project</i>	<i>figures in €millions</i>		
	<i>Scenario 1</i>	<i>Scenario 2</i>	<i>Scenario 3</i>
Bridge A			
Net present value @ 11%	(4)	(1)	20
Internal rate of return	7%	8%	13%
Bridge B			
Net present value @ 11%	(14)	15	32
Internal rate of return	2%	15%	22%
Bridge C			
Net present value @ 11%	18	12	17
Internal rate of return	14%	13%	14%
Core business of XYZ			
Expected return on assets	9%	11%	13%
Total market value of existing company		€100 m	
Beta of the existing company		1	

The data relate to analyses that have been carried out under three scenarios. The company attaches an equal likelihood and an equal credibility to each of the three outcomes. The first relates to the most pessimistic outcome, the second is the central estimate and the third is the most optimistic outcome for inflation, interest rates, toll charges and traffic volumes. The return expected on the company's existing portfolio of projects has also been included. You can assume that the core portfolio is a well-diversified portfolio of projects throughout Germany.

The mean return and the standard deviation of the return on each project, the covariance between the returns on the project and those on the core portfolio and the correlation coefficient between the returns on the project and those on the core portfolio are as follows:

	<i>Mean</i>	<i>Standard deviation</i>	<i>Covariance between returns on project and those on core portfolio</i>	<i>Correlation coefficient between returns on project and those on core portfolio</i>
Bridge A	9.33%	2.62%	0.0004	0.93
Bridge B	13.00%	8.29%	0.00133	0.985
Bridge C	13.67%	0.47%	0	0
Core portfolio	11.00%	1.63%	N/A	1

- (i) Show that the betas of each project are as follows:

	<i>beta</i>
Bridge A	1.5
Bridge B	5
Bridge C	0

[2]

- (ii) The directors have decided that the company should undertake all of the projects together or none at all. They have asked you to make a presentation on the effects on the company were they to successfully tender for these projects. Briefly describe the points you would make in your report under the following headings:
- (a) the effect on the risk structure of the overall company [6]
- (b) the specific and systematic risks involved in the three-bridge project. [4]
- (iii) Describe the additional analyses that might be carried out on the projects before a decision is made on whether to accept any of them. Discuss where possible what these analyses might show. [8]
- [Total 20]

Part 4 – Solutions

Solution 4.1

Answer = D

The required rate of return:

$$\begin{aligned}
 &= (\text{risk-free return}) + \text{beta} \times (\text{risk premium}) \\
 &= 3\% + 0.75 \times 5 \\
 &= 6.75\%
 \end{aligned}
 \quad [2]$$

Solution 4.2

Answer = C

The return from a share with a beta of 1.5

$$= (\text{the risk-free return}) + 1.5 \times (\text{the equity risk premium})$$

So A is incorrect.

Defensive shares are those with low positive betas, not negative betas. B is incorrect

If the beta is 0.8 the expected return on the share is lower than the expected return from a diversified portfolio of shares. C is correct

A company with a low beta is perfectly free to invest in high risk projects if it chooses.
So D is also incorrect. [2]

Solution 4.3

Answer = A

Both methods use the same cashflows and there is no reinvestment assumed in either NPV or IRR calculations. They do not use different time periods. [2]

Solution 4.4

Answer = C

[2]

Solution 4.5

Answer = A

Both the NPV method and the IRR method consider all cashflows throughout the life of the project, but the payback method only considers cashflows up until the end of the payback period. The payback period is easy to calculate. There is no discounting so the interest rate has no role. The fact that future cashflows are uncertain is not so much of a problem for the payback period method as it is for the NPV and IRR methods, since the payback period is less likely to use cashflows further into the future. [2]

Solution 4.6

Answer = B

The cost of equity is generally higher than the cost of debt because shareholders take a bigger risk than holders of company debt and therefore require a higher return. The weighted average cost of capital is a weighted average of the cost of debt and the cost of equity. Thus, assuming the company has some debt finance, the weighted average must be smaller than the cost of equity. [2]

Solution 4.7

Answer = C

It is difficult to obtain debt finance without security in the form of tangible assets. Since an IT developer is unlikely to have many tangible assets, the main form of finance available is likely to be equity finance. [2]

Solution 4.8

Answer = A

A company with a low positive beta is described as a defensive company. [2]

Solution 4.9

Answer = D

Equity shares have various betas. The beta depends on the systematic risk of the underlying business and the level of gearing. Thus, even if all companies had the same level of gearing, some businesses would still have higher levels of systematic risk. A company increasing its level of gearing would increase its systematic, not specific, risk. Systematic risk cannot be eliminated by investing in a large diversified portfolio of assets – it is specific risk that can be diversified away. Increasing gearing can reduce the WACC due to the tax efficiency of debt. [2]

Solution 4.10

Answer = D

Simulation techniques allow the decision makers to assess the effects on the net present value of a change in a range of variables such as the inflation rate or the discount rate. These techniques are useful where the cashflows are uncertain and the decision makers want to see a range of possible outcomes. They would not expect such techniques to give an accurate forecast of the outcome. [2]

Solution 4.11

The *advantages* are as follows:

- It releases cash for other purposes, or for reducing the amount of debt outstanding. [1]
- It releases the company from the obligation of maintaining the building and all of the potential liabilities which go along with owning a building. [1]
- A low rent can be negotiated on a long-term basis, which could suit the company's cashflow requirements. [1]

The main *disadvantages* would be:

- No further gains would accrue through the appreciation in value of the property. [1]
- The lease would be finite, and at some point the company will have to re-negotiate terms. [½]
- If a low rent is obtained, then the quid-pro-quo would be a low market value obtained for the property. [½]
- The company loses the flexibility and control of owning the property. The company will be restricted in what it can do with the property in future, *eg* sub-letting surplus space if the company's business declined. [1]
[Maximum 5]

Solution 4.12

The main points to be made to the *bondholders* are:

- The deeds of the various bonds in issue will document exactly what rights they have to demand capital restructuring in the current circumstances. [1]
- For secured debt such as mortgage debentures, the security of their debt is to a large extent determined by the fixed charge applying to the debt. Only in the event that the asset over which the fixed charge applies is insufficient, do they have an interest in the remaining assets of the company. [1]
- In the event of a floating charge over company assets, the secured bondholders will have an interest in the overall asset cover of the company. [1]
- The terms on which the debt was issued were presumably clear at the time, and the risks were clear to investors. It is not possible to tighten terms or adjust rights and priorities after the event in the light of new trading information. [1]

The main points to be made to the *company* are:

- The recent statement of financial position is only a snapshot of the company's trading position. It is dangerous to assume that the ratios calculated will still apply, or indeed that they will be stable over time. Also, creative accounting can sometimes distort the statement of financial position. [1]
- The values in the statement of financial position are not market values, and in many cases are not designed to be an estimate of market value. Depreciation for example is designed to spread the cost of an asset over its useful life, not to ensure that the residual value in the statement of financial position is close to the asset's resale value. [1]
- Even where the statement of financial position does reflect the market value, the actual value obtained in the event of a liquidation could be a great deal lower. Assets fetch a lot less in the event of a forced sale or when they are sold in an unfavourable economic environment, than their value in a normal economic environment. [1]
- Some assets are specific to a company or an industry and have no resale value. [½]
[Maximum 5]

Solution 4.13(i) ***Retained earnings***

The main points which should be mentioned in the response would be the following:

- Companies can and do raise substantial finance through retained earnings not least because it avoids any costs of borrowing, such as the use of intermediaries, regulatory costs, etc. [1]

However:

- Retained earnings are slow and steady in nature, which is often not suitable for the purpose of funding rapid growth. Acquisitions in particular tend to be of a lumpy nature, and can be funded as required by raising new finance. [1]
 - Growth strategies should not be restricted to the amount of the retained earnings. If the company wishes to expand more rapidly at one point in time, then it should do so through a rights issue or a debt issue. [1]
- [Total 3]

(ii) ***Issuing shares in a recession***

There are in fact several statements within this one statement.

In recessions share prices fall

It is unclear whether the statement refers to particular share prices or share prices in general (an index for example). On the assumption that we are talking about share prices in general, the following is relevant:

This is unarguably the truth. In recessions or as the market approaches a recession and anticipates the effects of it, the earnings growth assumptions applied when valuing companies are reduced. If the market expects lower profits and earnings growth in the medium term, then the overall growth of share prices must also be reduced. If equity investors have the same required return on their investments when they make their investment, yet the expected returns from those shares is reduced, then the price at which those investors are willing to buy the share must be lower, ie the market level must fall. [1]

Lower prices mean higher required return ...

This statement is somewhat flawed. If future growth were to remain constant, and share prices were to fall, then the new expected return on the shares at the lower prices would indeed be higher than before. However, growth assumptions have not remained constant. In fact it is the lowering of future growth assumptions that leads to a fall in share prices. The share prices fall to ensure that the expected return on the new (lower) growth assumptions remains at the same level. [1]

In summary, required returns of investors should in theory remain the same as before the recession. However at the new lower growth assumptions, the shares must be purchased at a lower level to obtain this required return. [1]

... which discourages companies from issuing shares

If expected returns are the same as previously, there should be no discouragement to companies wishing to issue more equity capital. However, during a recession the amount that consumers have to spend grows slowly (or not at all), and this will influence company's expansion plans. In other words many plans may be shelved until consumer sentiment improves, irrespective of whether the expected return from the project is acceptable or not. [1]

Therefore there are fewer issues in a recession.

Empirical evidence suggests that the statement is true. However the reasons for the reduction in activity are not as simple as the statement suggests. The number of issues reduces because of a fall in confidence rather than the increased cost of issuing shares. The purpose of the rights issues may alter:

- more issues are to enable companies to escape cashflow problems and restructure capital to cope with the new bleaker outlook
- fewer issues are connected with takeovers (which generally occur when companies wish to take advantage of optimistic growth forecasts for the economy). [1]

[Maximum 4]

Solution 4.14

The bank might want to take into account any of the following factors:

- The volatility of its profits If profits are stable, the bank may be able to pay out a higher proportion of its profits without there being undue risk that the dividend might have to be cut in subsequent years. [1]
 - The amount of profit it is making and how these profits might change in the future. Greater competitiveness might lead to a squeeze on margins and the need for a reduced dividend. [1]
 - The amounts being paid out by other banks. Peer group pressure is an influence. Companies paying above or below their competitors can open themselves up to criticism and poor comparisons. This can lead to shareholder dissatisfaction and ultimately takeover. [1]
 - Tax effects. The payment of dividends may have advantageous tax consequences, either for the company or its shareholders. [1]
 - The company's historical dividend policy. Consistency is important to shareholders because they buy a certain type of share to suit their own taxation requirements. If the share pays a high dividend one year and a low dividend the next this can be inconvenient for shareholders and cause dissatisfaction. The shareholders will want stability and consistency over time, through good years and bad. [1]
 - The bank's cashflow. Presumably there is plenty of cash available to make the required dividend payments. [1]
 - Alternative options for finance and to what extent the bank is reliant on retained profit to finance expansion. [1]
 - Growth plans. The extent to which the bank wishes to retain profits to fund expansion in different areas, *eg* to set up a telephone banking operation. [1]
 - The stockmarket itself will influence the decision. If a company is paying below what the market believes is acceptable, then the share will be down-rated as a result. [1]
- [Maximum 6]

Solution 4.15(i) ***Shareholder reaction***

The company's situation could prompt two reactions:

1. It might be the case that the shareholders feel comforted by the strong financial situation. If the business environment is uncertain, or if the sector itself is inherently a very risky business, or if financial strength allows the company to do business in markets that it could not otherwise consider, then the cash reserves serve a purpose. In these circumstances the company share price is likely to react positively to the news. [1]
2. If the reserves are invested in financial assets, which the shareholders themselves could invest their money in if they wanted to, then the cash pile is not serving a purpose. The return to shareholders will be reduced by the low-risk strategy adopted by the management, and the reaction is likely to be that the company should look for business opportunities that the shareholders themselves cannot find directly. The return on equity is likely to be depressed by the cash pile and this will be a negative in the eyes of the shareholders. It will indicate that the company has no ideas with which to expand the business, in which case the shareholders will want to find a management team that does have ideas for the business. The share price will react negatively to the news. [2]

[Total 3]

(ii) ***Reducing the cash pile***

The company could reduce the cash pile by:

- Giving higher dividends or special dividends. By paying substantially higher dividends the cash pile might be reduced. This relies on the ability to pay more in dividends than is generated internally as cash, which is not always the case. It also reduces the cash pile only slowly over time. Special dividends would have more effect. [1]
- A share buyback. The company could offer to buy its own shares. This can either be completed by buying the shares in the market from time to time, or by making an open tender to all shareholders to buy a certain number of shares at a certain price (the shares purchased to be determined by drawing lots), or by direct negotiation with a number of larger shareholders. [1]
- A takeover for cash. The company could take over another company for cash. [1]

[Total 3]

Solution 4.16(i) ***A share buyback***

A company could carry out a buyback programme:

- On the open market. The company could instruct its stockbroker to purchase its own shares on the stockmarket. It would have to pay the market price, and if the purchases are made over an extended period of time, the company runs the risk of driving its own share price up, so that the buyback becomes more expensive. [1]
 - By negotiation with a single large shareholder. If there is a large shareholder who wishes to relinquish its shareholding, then the deal could be done privately by agreement between the two parties. [1]
 - Through an offer to shareholders at a fixed price. The company could write to all shareholders offering to buy back shares at a fixed price (usually slightly above the price at which the shares are currently quoted on the stockmarket). Shareholders would have a fixed period of time (*eg* four weeks) during which they would need to decide whether they wanted to accept the company's offer. [1]
 - Through an offer to shareholders by auction. In a uniform price auction, the company would ask each shareholder how many shares they would be willing to sell and at what price, whereas in a Dutch auction, the company would ask each shareholder how many shares they would be willing to sell at a series of set prices. From this information, the company could calculate the lowest price at which it can buy the required number of shares. [1]
- [Total 4]

(ii) ***Tax-efficiency***

A share buyback can be more tax-efficient because that any profit made by the investor when selling the shares back to the company are taxed as capital gains. In general these gains are better for the investor because private investors usually enjoy a capital gains allowance which is often unused. [1]

The other advantage is that the shareholders can choose whether to sell their shares back to the company and realise the gain, or to hold on to the shares and benefit from the fact that the total number of shares in the company will shrink, and the earnings attributable to their shares should rise accordingly in the future. [1]

However there are complications which can lead to the action not being beneficial to all shareholders. The most obvious is that the timing of the capital gains may not be to the shareholder's liking. Shareholders often prefer to manage their gains to fit in with their other realised gains in the tax year. This can be an inconvenience. [1]

The other disadvantage relates to the method chosen to buy the shares back. If the buyback is not through an open offer to all shareholders then it can give specialised treatment to those shareholders who were given the opportunities to sell their shares. If it is done through a general offer to all shareholders it can be expensive to administer, and costly for the company. [1]

[Maximum 3]

Solution 4.17

(i) ***Benefit of this analysis***

The benefit of the analysis is that it indicates the spread of possible results around the central assumption, rather than simply giving the expected NPV of the project. This is useful because it shows that there are circumstances under which the NPV is negative.

[1]

This benefit is obtained relatively quickly and cheaply, and involves very little additional effort. [1]

It enables each member of management considering the investment submission to look at the scenario that best fits his or her individual beliefs. [1]

[Maximum 2]

(ii) ***The weaknesses of this analysis***

One weakness is that no indication is given of the correlation between the parameters which are being varied. For example, high borrowing costs are likely to occur at times when inflation is relatively high. No indication of the effect this has on the likelihood of each scenario occurring is given. [1]

The approach uses one discount interest rate for a number of scenarios. The discount rate should arguably be dependent on the scenario chosen, and should vary accordingly. High inflation scenarios might be associated with higher discount rates for example. [1]

In many cases the best approach is to use real cashflows and discount at a real interest rate, rather than use actual inflation estimates and a nominal interest rate.

[1]

[Maximum 2]

(iii) ***Method of improving the technique***

To improve the technique, a stochastic (Monte Carlo) model should be considered. In such an analysis, the variation in each of the underlying parameters and the correlations between them are considered. [1]

The overall variance of the NPV of the project is then investigated by simulating the cashflows many times using values extracted randomly from the distributions of possible variable inputs. The outcome will be a distribution of possible NPVs and their associated probabilities. [1]

[Total 2]

(iv) ***Further analysis***

Given that the manager has specific scenarios about which he is concerned, a selection of scenario tests should be performed, possibly taking not just this project, but the whole portfolio of projects into consideration. [1]

This will show the overall exposure of the project/company to the specific set of circumstances that the CEO is worried about. The analysis might include inflation forecasts even more pessimistic than the ones shown in the table. [1]

[Total 2]

Solution 4.18

(i) ***The hurdle rate***

The hurdle rate is a discount rate set by management as a target rate of return. Any projects considered by the company must demonstrate that they offer a positive net present value to the company when valued at this rate. [1]

The hurdle rate is typically quite high and well in excess of the true cost of capital. It does serve to highlight profitable projects, by ruling out those which offer inferior rates of return. [1]

It has a tendency to favour high-risk projects, because these will satisfy the artificially high rate of return demanded. It does not allow for the extra risk that may be involved. It will rule out many low-risk projects that would deliver returns above the cost of capital but below the hurdle rate. [1]

It is used widely in industry. Its advantages are that it is quick and simple, and easily understood. It enables management to look at projects from all different parts of the company's business consistently, and avoids the conflict caused by using one rate for one department/business and another rate for a different department/business. [1]

[Maximum 3]

(ii) ***The two projects***

It might be argued that the project in the foreign currency would give a much more risky profit profile. Higher profit variability and higher risk is in general associated with a higher required return. So from one angle it can be suggested that the foreign currency profits, translated into the domestic currency will give a much more volatile profit stream and should be rewarded with a much higher expected return. [1]

However this argument is flawed in this case. The currency-related profit volatility is not caused by additional risk taken on by the investor. It is merely a factor of fluctuating currency translation levels. [1]

If the riskiness of the profit is identical, then the return offered by both projects should be the same. At the end of the day the foreign currency profit can be offered to an investor in the foreign country, and for the foreign investor the risk is exactly the same as the risk of the domestic project to the domestic investor. The expected returns should be the same. [1]

[Total 3]

The exception is of course if the foreign country is less developed and exposes the investor to greater default or political risk than the domestic country. This is not suggested by the question.

Solution 4.19(i) ***Information required***

The following additional information is required:

- What qualities do the shareholders value in the company? Do they buy the shares for the geared exposure to the market that it offers? Do they appreciate the high beta of the share price? [1]
 - How is the management perceived in both companies? If the perception of the target company management is poor and they have obtained positions of responsibility in the new company, then that could have negative implications.[1]
 - Do the shareholders want a higher dividend yield? The earnings profile of the target company is such that the dividend yield of the combined company is likely to be higher. [1]
 - What are the plans for the target company? Have the plans been announced to the public? Perhaps the combined company is to be transformed over the next 12 months into a company that will fit the shareholders' requirements much more closely. [1]
- [Maximum 3]

(ii) ***The thrust of the report***

The thrust of the report may be that the takeover drastically changes the profile of the company. It is possible that many shareholders will no longer want to retain their investment in the company that emerges from the takeover because it is less exciting and less risky than before. [1]

It is possible for the management to plan and announce the plans to convert the company into something more to the shareholders' liking. [1]

It may be that the prospects for the new company are better than before, and that the takeover will be “earnings enhancing” – *ie* that the company can hope for the same earnings growth out of the target company’s assets as it earns from its own. By buying the target company at a lower PE ratio than its own, the combined company will be on a lower PE ratio, and thus should look for a re-rating back to the rating of the original company (15×). [2]

[Total 4]

Solution 4.20(i) ***The payback period***

The payback period of a project is the time taken before the cumulative cashflows arising from the project switch from being negative to being positive. [1]

Most projects will need a large initial capital payment. As the project progresses, profits will hopefully begin to flow, and the cumulative cashflow will become positive. The time at which this occurs is the payback period. [1]

The payback period may be discounted, in which case it is the time at which the present value of the cumulative cashflows becomes positive. [1]

[Maximum 2]

(ii) ***When the payback period is appropriate***

The payback period approach would be appropriate in situations where either:

- a simple method is required because perhaps the project is extremely small and does not warrant further analysis
- the time horizon is very short and discounting will not affect the overall result to any great extent
- the quality of the data does not warrant detailed analysis
- the reader of the report is unable to understand a more complex analysis, and communication becomes more important than mathematical accuracy
- resources are scarce, and do not permit further analysis.

[1 for each, maximum3]

(iii) ***The drawbacks of the payback period***

The drawbacks of the method are:

- no account is taken of the real value of money (not “discounted payback”)
- no account is taken of the cashflows after the end of the payback period
- no measure of internal rate of return is generated to allow the user to make a comparison with other projects
- no measure of net present value is generated to allow the user to make a comparison with other projects.

[1 for each, maximum3]

Solution 4.21

It is difficult to comment on the basis of the information given. However some aspects of the two projects are clear:

- The risk involved in Project A is considerably higher than the risk involved in Project B. The project timescale is longer, the cashflows are larger and the project is intrinsically more complex. [1]
- The data given for Project A will be considerably less accurate than those given for Project B. [1]
- The profits estimated for Project A should have a probability attached to indicate the likelihood of the cashflow being received. This might reduce the overall profit of Project A on a “certainty equivalence” basis. [1]
- Your company is much more likely to have had experience of construction projects similar to Project B than to Project A. Again the risk will be reduced by taking this project. [1]

On balance the difference between the NPVs of the two projects at 18% should be ignored. The uncertainty involved in Project A is not reflected in the figures. [1]

Clearly the NPV of Project A is larger than that of Project B at 18% by a substantial margin. However if the company has a number of other suitable projects, it would be better to use up available resources on a diversified portfolio of B-type projects, than invest it all in the high-risk Project A [1]

[Maximum 4]

Solution 4.22(i) **Beta**

The beta of an asset i is defined as:

$$\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$$

where:

σ_{im} = the covariance between the individual stock's return and that of the market

σ_m^2 = variance of the market index. [1]

Beta therefore indicates the extent to which the return on the individual asset covaries with that on the market for risky assets as whole or equivalently the sensitivity of the return on the individual asset to the return on the market. [1]

As such, it measures the *systematic, non-diversifiable* or *market risk* of the asset – the element of the variability of investment return that cannot be eliminated by diversification. [1]

[Total 3]

(ii) **Use of beta**

If we are able to estimate the beta of a particular capital project, then we can use it to estimate the appropriate risk discount rate to be used in the appraisal of that project from the security market relationship:

$$r_p = r_f + \beta_p(r_m - r_f)$$

where r_p and r_m are the expected returns on the project and the market respectively and r_f is the risk-free rate of return. [1]

r_p , which represents the rate of return that the investor should require given the level of systematic risk in the project, is then used as the risk discount rate. [1]

[Total 2]

(iii) ***Practical difficulty***

The practical difficulty is that we are unlikely to have an accurate estimate of the beta for any capital project, particularly as there is unlikely to be any relevant past history upon which to base it. [1]

In fact, in order to estimate it we might need to estimate the future investment returns under various scenarios, which in turn requires an estimate of beta, *i.e.* there is circularity problem. [1]

One way around this difficulty in practice might be to use an estimated beta for a similar project that is already in existence ... [1]

... though even here the historical data might not be in a form that enables us to estimate the beta with any degree of accuracy and it may also be difficult to determine exactly what constitutes a “similar” project. [1]

[Maximum 3]

Solution 4.23

(i) ***Steps necessary to deal with the risks***

In order to deal with the risks inherent in a capital project, we first need to *identify* them. The steps here will include a preliminary analysis, brainstorming with experts, the use of a risk matrix, desktop analysis and the study of similar previous projects. [1]

Next the risks need to be *analysed*. The aim here is to estimate the frequency of occurrence of each risk and the financial consequences if it occurs, as well as considering any interdependencies between risks. [1]

It will entail further discussion with experts, desk-top analysis and researching of similar previous projects. [1]

We must then consider the possibility of *mitigating* the downside risks, by reducing the frequency of occurrence or reducing the adverse consequences if they do occur, or both. [1]

The next step is to consider the cost of possible mitigation options to see whether or not they are financially viable, and to select the *best combination of mitigation options*. [1]

Finally, it is necessary to *control* the residual risks that are not mitigated. This will involve regular monitoring of the risks and the development of contingency plans. [1]

[Maximum 5]

(ii) ***Risk matrix***

A *risk matrix* is a table used for the *identification* and *analysis* of the risks inherent in a capital project. It provides a systematic method of identifying and characterising risks and thereby reduces the chance that any particular risk will be overlooked. [1]

The main column headings shown relate to the causes of risk *eg* political, business, economic *etc.* [1]

The row headings relate to the different risks that arise in the different stages of the project, *eg* creation of asset, operation of asset. [1]

The risk analysis team considers each cell of the table in turn and identifies the relevant risks. The cells in the matrix can be ticked off to show whether the risk in question applies to the particular project, with a cross reference to the appropriate entry in the risk register. [1]

The characteristics of the risks thus identified can then be analysed. These will normally be assessed according to categories such as likelihood of occurrence, degree of dependence, controllability and financial impact on project. [1]

[Maximum 4]

(iii) ***Three major risks facing the project***

1. The dome may cost a lot more (or less) to build than anticipated, due to failures in the state of the art design and/or the novelty of the methods and materials used (project risk). [1]
2. The actual number of visitors may be very different from that anticipated, due to poor exhibits or a general economic downturn. In particular, the number of overseas visitors may depend on domestic currency fluctuations (project/economic risk). [1]
3. It may prove more difficult or costly than anticipated to raise finance for the project, *eg* if private sector partners are difficult to find or they subsequently run into financial difficulties (financial risk). [1]
4. It may prove more costly than anticipated to clear and decontaminate the industrial site (project risk). [1]

[Maximum 3]

Solution 4.24

Toll revenues

Use the midpoints of each range, so that the expected toll revenue if the bridge is a “success” is 45 in each of years 3 to 5, whereas if it is a “failure”, the revenue is 25 in each of these years. Denote the states “success” and “failure” by “a1” and “a2” in the calculation table below.

Weather

Denote the state “good weather” by “b1”. In this case, the cost in Year 2 is zero. Denote the state “bad weather” by “b2”. In this case, the cost in Year 2 is 20 (assuming no strikes).

Strikes

If there are no strikes, which we denote by state “c1”, the costs are as noted under weather. If there are strikes, which we denote by state “c2”, then the costs are increased to 60 in Year 1, and either 0 (good weather) or 24 (bad weather) in Year 2.

An outcome or “state of the world” is thus denoted by a string of three numbers, and the probabilities, cashflows and NPVs associated with each possible state of the world are summarised in the table below.

<i>State of the world</i>	<i>probability</i>	<i>cashflows in each year</i>	<i>net present value @ 10%</i>
a1,b1,c1	1/6	-50,0,45,45,45	51.74
a1,b2,c1	1/4	-50,-20,45,45,45	33.55
a1,b1,c2	1/6	-60,0,45,45,45	41.73
a1,b2,c2	1/12	-60,-24,45,45,45	19.92
a2,b1,c1	1/12	-50,0,25,25,25	6.52
a2,b2,c1	1/8	-50,-20,25,25,25	-11.66
a2,b1,c2	1/12	-60,-0,25,25,25	-3.48
a2,b2,c2	1/24	-60,-24,25,25,25	-25.30

[5 for a correct table]

Thus, the expected NPV is given by:

$$\frac{1}{6} \times 51.74 + \frac{1}{4} \times 33.55 + \dots + \frac{1}{24} \times -25.30 = 23.4 \quad [1]$$

Comments

The expected NPV is positive, suggesting that the project should be undertaken (all else being equal). [1]

The NPV is positive in the first five states in the table with a total probability of $\frac{3}{4}$. [½]

The most critical of the three risks facing the project is that of low tolls, which has the greatest impact upon the expected NPV and hence the success of the project. The difference between the expected NPVs with low and high tolls is equal to 45.2. [1]

The NPV is always positive if the toll revenue is high (equal to 45). [½]

Bad weather is probably the next most important risk, as two of the three negative results – the two worst results in fact – arise when the weather is bad. In fact, bad weather reduces the expected NPV by an amount equal to either 18 or 22 (compared to the result that would otherwise arise in its absence). Conversely, a strike only reduces the expected NPV by either 10 or about 13.6. [1]

[Up to 3 for sensible comments]

[Total 9]

Solution 4.25(i) ***The betas of the projects***

The betas of the projects can be calculated using the formula:

$$\beta_A = \frac{\sigma_{A,m}}{\sigma_m^2}$$

which for Bridge A gives the value:

$$= \frac{0.0004}{(0.0163)^2} = 1.5$$

The other results are calculated in the same way.

The results can also be checked intuitively by observing that the return from Bridge A seems to move in line with the core portfolio yet slightly more extreme. Bridge B is more sensitive to the three scenarios than the core portfolio, yet Bridge C offers returns which move almost independently of the scenarios. [2]

(ii)(a) ***Risk structure of the company***

Firstly, there are benefits from expanding the company's portfolio (and especially by three projects rather than just one). Investing in a portfolio of projects or assets whose expected returns are not perfectly correlated with one another gives a combination of return and volatility of return which is better than that of the individual assets alone. It is possible to reduce the volatility of portfolio returns without necessarily reducing the expected return. [1]

The three projects in question have correlations with the core portfolio of 0.93, 0.98 and 0. It is clear that, individually, the first two projects do not offer much in the way of diversification for the company, but the third does. [1]

Although it is possible to reduce or remove *specific* risks by diversifying a portfolio, it is not possible to remove *systematic* risks, which affect all the projects in the portfolio.

[1]

Clearly the projects together are more volatile than the company as it stands – ie the standard deviation of the combined project is greater than that of the core portfolio. [½]

We must also consider the size of the projects in relation to the company as a whole. The combined NPV of the projects is in the range €0 million to €69 million with a central estimate of €26 million (based on Scenario 2 – the central estimate). This is relatively large compared to the core portfolio of €100 million. As such the three projects together would exert significant influence on the overall risk structure of the company. If the portfolio is currently a large number of small projects, then undertaking all three bridges may reduce the diversification overall. [1]

The correlations do not give an indication of the overall effect of the project on the company as they do not bring the value of the project into account. It may be necessary to produce a stochastic model to investigate the effect of the correlations and the sizes and variability of the cashflows. [1]

Since the beta of the combined project is higher than that of the existing company the beta of the company is likely to rise. [½]

This can be offset by adjusting other aspects of the company. Perhaps reducing the financial gearing, or disposing of projects that are highly correlated to the new projects. [1]

The projects will take a number of years to complete and then a further 3 years to operate and sell off. This cashflow timetable might alter the company's financial structure. In addition the commitment for such a long period might be longer than the other projects in the portfolio. This in itself is a liquidity risk. [1]

[Maximum 6]

(ii)(b) ***Specific and systematic risks***

Specific

The three bridges are all in the same geographical area (although the Rhine is long as rivers go!). This will expose the company to particular risk in respect of the local economy. These can, however, be diversified away if the project is a part of a larger portfolio. [½]

Being exposed to three similar bridge projects will have risks that relate specifically to this type of construction project. [½]

The specific risk that this type of project is being incorrectly evaluated by the company. [½]

The risk that all three projects are cancelled suddenly by the government or the terms renegotiated. [½]

Particular building difficulties encountered at any one of the construction sites. [½]

Poor quality workmanship (providing the same contractors were not used in all three projects!) [½]

Loss through bad administration of a project. [½]

Risks of environmental groups opposing new bridge construction. These can be diversified away by investing in a portfolio that includes other construction projects. [½]
[Maximum 3]

Systematic risks

An increase in short-term interest rates will affect all projects. [½]

A reduction in economic growth. [½]

A rise in inflation will increase the costs of all projects and cannot be diversified away.
[½]
[Maximum 1]
[Total 4]

(iii) *Additional analyses*

The following analyses would be carried out:

- *Hurdle rate analysis* using a rate in excess of the company's weighted average cost of capital (the company's cost of capital seems to be around 11%?). This would indicate whether the project satisfies a high rate of return requirement. [1]
- Looking at the returns it seems that only Bridge B and Bridge C stand a chance of meeting that goal if a rate of 11% were to be used. [1]
- Alternatively the *rate could be altered to reflect the risk of the project*. For example if the risk-free rate of return is estimated to be 5%, then Bridge A might be evaluated using a rate of interest of:

$$5\% + 1.5 \times (11\% - 5\%) = 14\%$$

where the 11% is assumed to be the company's weighted average cost of capital (which we use as an approximation for the expected return from a well-diversified portfolio of risky assets) and 1.5 is the beta for the project. [1]

- Again it seems clear that few if any of the projects would survive such an analysis, particularly in the case of Bridge B where the very high beta would increase the discount rate to a very high level. [1]
 - A *shareholder value approach* could be taken whereby the overall statistics of the company after taking on the projects could be viewed from the eyes of the existing shareholders, eg looking at the effect on the company's profit volatility, dividend coverage, gearing, and earnings growth could be analysed. [1]
 - An *opportunity cost analysis* might be worthwhile. What would the company do with the funds if the projects were not taken on? [1]
 - Even if the projects satisfy the hurdle rate, a higher rate of return might be available on other similarly risky projects. On the other hand, if the company has surplus cash and the likely return on other similarly risky investments is lower than the expected return on the bridge projects, then the bridge projects might be worthwhile, even if the return is under the true cost of capital. [2]
- [Total 8]

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Part 5 – Revision Questions

This part contains 100 marks of questions testing the material from the whole course. You may like to try these questions under exam conditions as a mock exam.

Question 5.1

Which of the following might act as a lead underwriter in an issue of shares?

- A an investment bank
- B an investment trust
- C a pension fund
- D an insurance company

[2]

Question 5.2

Which of the following are registered instruments?

- A bills of exchange
- B shares
- C commercial paper
- D Eurobonds

[2]

Question 5.3

An advantage of recourse factoring is that:

- A the factor takes over all responsibility for credit analysis of new accounts.
- B the factor must be a listed company.
- C credit risk remains with the supplier.
- D it provides early payment of invoices.

[2]

Question 5.4

Company X based in the UK has an overseas subsidiary, which makes gross profits of £10m. These profits suffer 14% tax in the overseas territory. Assuming that the corporation tax rate is 24% in the UK and that a double taxation agreement is in force with the overseas territory, Company X will have to pay:

- A no further tax on the £8.6m net profit.
- B a further 10% tax on the £10m gross profits.
- C a further 10% tax on the £8.6m net profits.
- D a further 24% tax on the £8.6m net profits.

[2]

Question 5.5

The accounts of HobHey plc show net profits before tax of £2m. The profit after tax was £1.25m. The interest the company paid on its debenture was £0.25m. What is HobHey plc's interest cover?

- A 5x
- B 6x
- C 8x
- D 9x

[2]

Question 5.6

Which of the following is NOT an intangible asset?

- A development costs
- B patents
- C investments
- D goodwill

[2]

Question 5.7

Which of the following appears as an asset in the statement of financial position of an insurance company?

- A reinsurers' share of technical provisions
- B long-term insurance business provisions
- C unexpired risk reserve
- D outstanding claims reserve

[2]

Question 5.8

Which of the following changes in working capital will result in an outflow of cash?

- A decrease in trade payables
- B decrease in inventories
- C decrease in trade receivables
- D increase in other current liabilities

[2]

Question 5.9

Which of the following would you NOT expect to find in the external auditors' report to the shareholders:

- A a statement that the audit was conducted in accordance with international auditing standards
- B a certificate guaranteeing the truth and fairness of the financial statements
- C a statement that the directors were responsible for preparing the financial statements
- D a brief description of the work undertaken by the auditor prior to drafting the report

[2]

Question 5.10

Beta plc is a quoted company. Which of the following is a specific risk that can be diversified away by shareholders?

- A Beta plc is highly geared and it is exposed to increases in interest rates.
- B Beta plc has a great deal of foreign competition and so changes in exchange rates can affect its competitive position.
- C Beta plc's main product line requires a steady supply of a rare mineral that is only found in a region that is politically unstable.
- D Beta plc produces luxury goods, demand for which is highly vulnerable to changes in the economic climate.

[2]

Question 5.11

Discuss the relative merits of raising capital by issuing unsecured loan stock, equity shares or convertible preference shares from the point of view of the issuing company.

[9]

Question 5.12

Distinguish between systematic risk and specific risk and explain their relevance to capital project appraisal.

[8]

Question 5.13

- (i) List four types of financial future that may be used by a manufacturing company. [2]
- (ii) Under what circumstances might a company prefer to use options rather futures? Give an example to demonstrate your answer. [2]
- (iii) Compare and contrast interest rate swaps and currency swaps. [4]

[Total 8]

Question 5.14

Describe five factors that influence a company's decision on the level of dividend that might be appropriate.

[5]

Question 5.15

At its annual general meeting, a company (in which you are a shareholder) announced that it intends to buy back 5% of its shares in the open market. Its share price is currently £2 and its net asset value per share is £1.50.

- (i) Explain what is meant by “buy back 5% of its shares in the open market”, and outline other methods of buying back shares available to the company. [3]
- (ii) List three reasons why a company might buy back its own shares. [3]
- (iii) Describe the effect that buying back shares will have on the company’s net asset value per share. [2]
- (iv) Explain what you think will happen to the company’s share price. [2]

[Total 10]

Question 5.16

The following items have been extracted from the trial balance of Cash-strapped plc for the period 1 January 2012 to 31 December 2012 (*figures in £000s*):

Cash	1
Factory – cost	200
Factory – depreciation	60
Inventories as at 31 Dec 2011	18
Trade receivables	4
Trade payables	3
Revenue	58
Tax due	4
Interest	3
Machinery – cost	150
Machinery – depreciation	125
Trade names	5
Purchases	12
Salaries	14
Rent	6
Other expenses	8
Share capital	100
Retained earnings at 31 Dec 2011	21
Loan stock – 6% 2017	50
	<hr/>
	421
	421

- Notes (a) The rent paid was in respect of the period until the end of June 2013, ie a period of one and a half years.
- (b) The tax charge for the year has been estimated as £3,000.
- (c) The company did not pay any dividends in 2012 in respect of 2011.
- (d) 70% of the company's sales were made for cash.
- (e) Depreciation on property is charged using a straight line basis over 40 years and depreciation on machinery is charged as 20% of the reducing balance. The value of the site was estimated to be £40,000 when the factory was purchased. The company does not intend to depreciate any intangible assets.
- (f) Inventories at the end of the year were the same as they were at the start of the year.
- (i) Prepare an income statement for the calendar year 2012 and the closing statement of financial position as at 31 December 2012. [10]
- (ii) Analyse the profitability, liquidity and efficiency of the company using accounting ratios. [10]
- [Total 20]

Question 5.17

You are the chief executive of a large Australian company that builds residential housing. The details of a potential prestigious development site near the Olympic Village have been analysed and placed before you for a decision. The cost and revenue details of developing the site and selling properties in the development are estimated to be as follows:

Sydney Harbour Plot 5 (all figures in AUS\$ millions)	Year 1	Year 2	Year 3	Year 4
Initial cost of site	30			
Raw material cost	3	4	4	1
Labour and contractor costs	2	4	5	2
Tax due on profits		1	2	3
Revenue from selling properties		5	23	43

All cashflows can be assumed to occur at the end of the year.

You are also given the following information about the company and the equity market in Australia:

Number of issued equity shares	300 million
Market price per share	\$1.50
Risk-free rate of return	4%
Equity risk premium for equity markets	5%
Corporation tax rate	30%
Beta of company's equity shares	1.2

The company currently has sufficient cash resources to undertake the project.

- (i) The company currently has no debt. Calculate the NPV of the project using the company's WACC. [3]
 - (ii) Give two advantages and two disadvantages of using the WACC for such a calculation. [4]
 - (iii) Estimate the project's internal rate of return. [1]
 - (iv) If the company were to alter its capital structure by borrowing \$200 million debt at a rate of 4% and using the proceeds to repay existing equity shares, calculate the company's new cost of capital, and comment on how this would affect the viability of the project. [4]
 - (v) Suggest two sensitivity tests that could be performed on the data that might give useful analytical information. [2]
 - (vi) Describe how you might go about conducting an “opportunity cost” analysis and a “shareholder value” analysis. [4]
 - (vii) An article you read recently suggested that constructing a stochastic model of a project can bring valuable information. List an advantage and a disadvantage of constructing such a model. [2]
- [Total 20]

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Part 5 – Revision Solutions

Solution 5.1

Answer = A

The lead underwriter for an issue of shares might be an investment bank. The lead underwriter often invites other institutions to act as sub-underwriters. [2]

Solution 5.2

Answer = B

Bills of exchange, commercial paper and Eurobonds are all bearer documents. [2]

Solution 5.3

Answer = D

An advantage of recourse factoring is that the factor provides for the early payment of invoices, but a disadvantage is that the supplier retains the credit risk. [2]

Solution 5.4

Answer = B

Company X will pay tax of (the UK corporation tax rate less overseas tax rate) on the whole of its overseas profit. [2]

Solution 5.5

Answer = D

$$\text{Interest cover} = \frac{\text{net profit before tax and interest}}{\text{interest}} = \frac{(2 + 0.25)}{0.25} = 9 \times$$

[2]

Solution 5.6

Answer = C

Investments are not classed under intangibles. They can be either in the current assets or the non-current assets category depending on how long the company intends to hold the investment, but would not be classed as an intangible within non-current assets. [2]

Solution 5.7

Answer = A

The reinsurers' share of the technical provisions can be set against the insurance company's technical liabilities and is therefore an asset to the insurance company. [2]

Solution 5.8

Answer = A

Cash flows out of the company if there is a decrease in trade payables. The company is receiving less credit from its suppliers and banks, and thus is paying out more cash. [2]

Solution 5.9

Answer = B

Auditors never “guarantee” the truth of financial statements. [2]

Solution 5.10

Answer = C

The other risks are systematic, *ie* they result from being exposed to the market. [2]

Solution 5.11*Relative merits of issuing unsecured loan stock*

- Over the long term the cost of this form of capital should be the lowest. Unsecured loans are the least risky of the assets classes mentioned, and as such will offer the lowest return to investors, making them the cheapest capital for the company to service. [1]
 - The initial yield will be the highest for the company because loans do not offer the investor any capital growth. [1]
 - Loan stock will be tax efficient for the company. It may lower the company's weighted average cost of capital. [1]
 - Because there are no voting rights attached, the company is not diluting the control of the company by the existing owners. For small family-owned companies this may be an advantage. [1]
- [Maximum 3]

Relative merits of issuing equity shares

- Because most capital is issued in the form of equity shares, the marketability of equity shares is normally greatest, and it will be relatively easy for the company to raise the finance. [1]
 - Equity shares offer growth in dividends to investors and as such the initial yield (dividend yield) will be lowest. [1]
 - The company will not be bound by any limitations as are sometimes imposed by loan stock holders (limits on further issues of debt, etc) [1]
 - The dividends are not a cost to the company and during difficult times they can be stopped or reduced by the directors. [1]
 - They increase the number of voting participants in the company and spread ownership more widely. This can be an advantage for the company because it makes the shares more marketable and more heavily traded. [1]
- [Maximum 3]

Relative merits of convertible preference shares

- These will have a lower initial yield than unsecured loan stock because they carry an option. [1]
- They pay a fixed amount of franked income which often appeals to certain investors, and as such the company might find that the yield it has to offer to investors is relatively low. [1]
- The company ownership will begin to be diluted many years down the road when convertible holders start to convert their shares. This might be more convenient than the immediate dilution that occurs with issuing equity shares. [1] [Maximum 3]

Solution 5.12

Systematic risk is the element of the variability of investment return that cannot be eliminated by investing in the same type of project many times over, nor by investing in a well-diversified portfolio of different projects. [1]

It stems from factors external to the project in question that affect all projects and assets to some degree, eg the economic cycle. [1]

Specific risk is the element of the variability of investment return that can be eliminated either by repeated investment in a number of similar projects, or failing this by diversification over a number of different projects. [1]

It therefore stems from factors that are internal and hence specific to the particular project, eg cost overruns arising from incorrect forecasts or poor management. [1]

As specific risks can be eliminated through diversification, investors should not be rewarded by any additional expected return for accepting them. [1]

When appraising a capital project, specific risk should be allowed for by specific risk analysis, and an explicit adjustment to the cashflows concerned, allowing for both the upside and downside risk potential. [1]

Only if this is not possible, perhaps because it is difficult to assess the impact of a particular specific risk, should an adjustment to the risk discount rate used to value the project cashflows be considered. [1]

In contrast, the risk discount rate should be adjusted appropriately to reflect the estimated degree of systematic risk inherent in the project, *ie* higher systematic risk implies a higher risk discount rate. [1]

This is because:

- Historical data suggests that investors typically require a higher level of expected return in return for investing in assets with a higher level of systematic risk – given that they cannot diversify it away. [1]
- Increasing the discount rate is consistent with the assumption that risk increases exponentially with time as you look further into the future. Whereas this is unlikely to be the case for a risk that is specific to a particular project, it is a reasonable assumption as regards systematic risk. [1]

[Maximum 8]

Solution 5.13

(i) ***Financial futures***

The types of futures that a manufacturing company might use are:

- bond futures
- short interest rate futures
- stock index futures
- currency futures.

Individual stock futures are also now available on some markets.

[½ each, maximum 2]

(ii) ***Uses of options***

Options allow a company to protect itself against adverse movements in the finance environment while retaining the ability to profit from favourable movements. [1]

Suppose a company was undertaking a project overseas and wished to protect itself against adverse movements in the currency rate. The company could purchase currency options to protect itself against falls in the overseas currency. If the overseas currency strengthens the company will benefit from the stronger currency when translating its profits, and will only suffer the loss of the premium paid to purchase the options. [1]

[Total 2]

(iii) ***Swaps***

Interest rate swaps and currency swaps both involve a series of payments between two parties based on a fixed or floating interest rate and based on a nominal amount of swap.

[1]

Both streams of payments will be in the same currency for an interest rate swap, and the interest payments will usually be fixed versus floating.

[1]

The interest payments on a currency swap will be in two different currencies and can be fixed/fixed, floating/floating or fixed/floating.

[1]

Under a currency swap, the nominal amounts pass between the parties at the end of the swap, whereas under an interest rate swap the nominal amounts are not passed (as they are equal and in the same currency).

[1]

[Total 4]

Solution 5.14

A company will consider the following when deciding on the level of dividend:

- Volatility of profit. Stockmarkets react badly to dividend cuts, therefore directors tend to err on the side of caution so that a cut is not required in hard times.

[1]

- Cash. Cash reserves can be distributed using dividends in situations where the company cannot use the cash and is concerned that another company might launch a take-over in order to get its hands on the cash pile.

[1]

- Tax. Tax will have an effect on the dividend distributed, *eg* companies that are owned by investors paying high rates of income tax will tend to pay small dividends.

[1]

- Company growth. Companies in industries where there are excellent growth opportunities may prefer to retain profit within the company rather than pay it to shareholders.

[1]

- Consistency. Stability and consistency is an attractive quality for shareholders because they know whether the company gives a high or low income yield and can choose particular companies to suit their tax position. If companies change dividend policy regularly, their shares will become unpopular with such investors.

[1]

- Alternative options for finance. Companies with limited options for finance rely heavily on retained profit so will be less generous with dividends. [1]
 - Competition. Companies paying less than their competitors will be subject to unfavourable comparisons. [1]
 - Stockmarket reaction. If the company is paying below what the market believes is appropriate, the shares will be downgraded. [1]
- [Maximum 5]

Solution 5.15(i) ***Meaning and methods***

The statement means that the company intends to instruct a stockbroker to purchase the company's shares in the market from time to time at the ruling price until the stockbroker has purchased 5% of the company's issued shares (on the company's behalf). [1]

As the shares are purchased in the open market the company will cancel them, reducing the shares in issue in a gradual fashion. The company will also pay the stockbroker cash in respect of the shares purchased, thereby reducing the company's cash resources simultaneously. [1]

Alternative approaches include:

- A buyback by offering all shareholders the option to sell their shares back to the company. The offer can be a fixed price offer or a tender offer (either a Dutch or a uniform price auction). [1]
 - A buyback by private negotiation with one or a number of large institutions. This is similar to the method above, but instead of approaching all shareholders, the company attempts to buy the shares from a selected group of large institutions. [1]
- [Maximum 3]

(ii) ***Reasons for buying back shares***

The company has a large amount of cash that it can find no use for and wishes to return it to shareholders. This may help to increase the company's return on capital employed if the cash resources are earning a poor rate of return. [1]

The company wishes to increase its gearing in order to increase the return to equity shareholders, or to make the company's structure more tax efficient. [1]

There may be an “overhang” of stock in the market which is depressing the share price. A buyback operation will help to remove this block and allow the shares to trade at their appropriate level. [1]

[Total 3]

(iii) ***Effect on net asset value per share***

$$\text{Net asset value} = \frac{\text{ordinary share capital} + \text{reserves}}{\text{number of ordinary shares}} \quad [1]$$

This ratio currently equals £1.50.

If the company buys X shares for £2X, then share capital + reserves will fall by the amount of cash spent (£2X), whereas the number of shares in issue will fall by only X. Because the share capital + reserves has fallen by more than 1.5X, the ratio will fall as a result of the buy-back. [1]

[Total 2]

(iv) ***Effect on share price***

The share price might fall because the net asset value per share will fall. [1]

The share price might fall because shareholders think that the management does not have any ideas for using the capital effectively in the current industry. [1]

The share price might rise because investors believe that short-term supply/demand factors will cause a shortage of shares in the market. [1]

The share price might rise because the earnings per share will probably rise (given that the cash held was only earning a deposit rate of interest). [1]

[Maximum 2]

Solution 5.16(i) ***Income statement and statement of financial position******Income statement for Cash-strapped plc for the year 2012***

	<i>£000s</i>	
Revenue	58	
Cost of sales:		
Cost of inventory used	12	Note 1
Depreciation	<u>9</u>	Note 2
	<u>(21)</u>	
Gross profit	37	
Expenses:		
Salaries	14	
Rent and insurance	4	Note 3
Other expenses	<u>8</u>	
	<u>(26)</u>	
Operating profit	11	
Interest paid	<u>(3)</u>	
Net profit before tax	8	
Tax	<u>(3)</u>	
Profit for the year attributable to equity holders	<u>5</u>	

No dividends were paid to ordinary shareholders in the year.

- Notes 1. Cost of inventory used = opening inventory + purchases – closing inventory = 12
2. Depreciation on the factory has been calculated as $\frac{200 - 40}{40} = 4$
and on the machinery as $0.2 \times (150 - 125) = 5$
3. We have charged £4,000 in respect of rent and insurance, which relates to the accounting period. We have paid £2,000 more than this, which has been treated as a current asset.
- [1 deducted for first mistake, $\frac{1}{2}$ deducted for other mistakes, maximum 5]

Statement of financial position for Cash-strapped plc as at 31 December 2012

ASSETS	<i>£000s</i>	
Non-current assets		Note 1
Factory	136	
Machinery	20	
Intangibles	<u>5</u>	
	161	
Current assets		
Inventories	18	
Trade receivables	4	
Prepayment	2	Note 2
Cash	<u>1</u>	
	25	
Total assets	<u>186</u>	
EQUITY AND LIABILITIES		
Share capital	100	
Retained earnings	<u>26</u>	Note 3
Total equity	126	
Non-current liabilities		
Loan stock – 6% 2017	50	
Current liabilities		
Trade payables	3	
Tax due	<u>7</u>	
	10	
Total liabilities	60	
Total equity and liabilities	<u>186</u>	

Notes: 1. Factory = $200 - 60 - 4 = 136$

Machinery = $150 - 125 - 5 = 20$

2. Prepayment of 2013's rent and insurance

3. Retained earnings = $21 + 5 = 26$

[1 deducted for first mistake, $\frac{1}{2}$ deducted for other mistakes, maximum 5]

(ii) ***Analysis of the company using ratios***

We will calculate the following ratios:

Profitability

$$\text{profit margin} = \frac{\text{net profit before tax and interest}}{\text{turnover}} = \frac{11}{58} = 19\% \quad [1]$$

$$\begin{aligned} \text{return on capital employed} &= \frac{\text{net profit before tax and interest}}{\text{equity} + \text{debt capital employed}} \\ &= \frac{11}{100 + 26 + 50} = 6.3\% \end{aligned} \quad [1]$$

Liquidity

$$\text{Current ratio} = \frac{\text{current assets}}{\text{current liabilities}} = \frac{25}{10} = 2.5 \quad [1]$$

$$\text{Quick ratio} = \frac{\text{current assets} - \text{inventories}}{\text{current liabilities}} = \frac{25 - 18}{10} = 0.7 \quad [1]$$

Efficiency

$$\text{Debtor turnover} = \frac{\text{trade receivables}}{\text{credit sales}} \times 365 = \frac{4}{58 \times 0.3} \times 365 = 84 \text{ days} \quad [1]$$

$$\text{Stock turnover} = \frac{\text{inventories}}{\text{cost of sales}} \times 365 = \frac{18}{21} \times 365 = 313 \text{ days}$$

$$\text{or} \quad = \frac{\text{inventories}}{\text{revenue}} \times 365 = \frac{18}{58} \times 365 = 113 \text{ days} \quad [1]$$

Comments

Although the profit margin seems reasonable, the return on capital employed is poor. This indicates that the company is generating profit from its sales but not generating sufficient revenue from the available capital invested in the company. [1½]

The current ratio is slightly above reasonable limits of 1 to 2 (but not enough to worry about), but the quick ratio is considerably lower than this. This could suggest high inventories and/or low levels of trade receivables and cash. This is particularly a worry if it cannot readily convert its inventories into cash at short notice. [1½]

The debtor turnover seems reasonable at 84 days, though it difficult to comment without knowing the area of business in which the firm operates. [½]

The level of inventories at just under a third of a year's sales seems quite reasonable but at 150% of the cost of sales seems rather high. [½]

Since trade receivables do not seem to be too low, the liquidity problem seems to lie with the low level of cash. [½]

[Maximum 4 for comments]

[Total 10]

Solution 5.17

(i) **NPV**

This is fairly straight forward, and can be done using the cashflows provided in the table. The calculation is as follows:

The company has no debt finance, so the WACC is equal to the cost of equity, which is given by:

$$\text{risk-free return} + (\text{beta} \times \text{equity risk premium})$$

$$= 4\% + (1.2 \times 5\%) = 10\% \quad [1]$$

Year	1	2	3	4
Cashflow	(35)	(4)	12	37
NPV @ 10%	(31.8)	(3.3)	9.0	25.3

The total NPV = - \$0.84 million at the WACC. [2]

(ii) ***Using WACC****Advantages*

- Using the same cost of capital across an entire business leads to fewer internal problems. [1]
- It is easy and quick. [1]
- It reflects the overall riskiness of the company's existing portfolio of projects. [1] [Maximum 2]

Disadvantages

- The project may be riskier than other projects in the company's portfolio. In particular it may have more systematic risk than the average project. It should be evaluated using an appropriate return to reflect the higher beta for the project. [1]
- The investors' expectations will change when this large project is added to the portfolio, thus the overall WACC will change. [1] [Total 4]

(iii) ***IRR (by interpolation)***

We have an NPV of -\$0.84 million at 10%. Recalculating using a discounting rate of 8% gives an NPV of \$0.88 million.

Interpolating:

$$\text{IRR} = 8\% + \frac{0.88}{(0.88+0.84)} \times 2\% = \text{about } 9\%$$

Checking this answer: using a discount rate of 9% the NPV is \$0.00114 million. [1]

(iv) ***Restructuring***

The company currently has equity shares with a market value of 300 million × \$1.5

$$= \$450 \text{ million}$$

The suggested capital structure would leave the company with \$250 million of equity capital and \$200 million debt (which is clearly perceived as risk-free in the market).

To calculate the new beta of the ordinary shares we can use:

$$\text{Geared beta} = \text{Ungeared beta} \times \left[1 + \frac{\text{debt}}{\text{equity}}(1-t) \right]$$

where t is the corporation tax rate (30%).

Thus the equity shares would have a beta of $1.2 \times (1 + (0.8 \times 0.7)) = 1.87$ [1]

The return required by equity shareholders would then be:

$$4\% + (1.87 \times 5\%) = 13.4\% \quad [1]$$

$$\text{Thus the WACC} = \frac{[200 \times 4\%(1 - 0.3)] + (250 \times 13.4\%)}{450} = 8.7\% \quad [1]$$

We have used the fact that debt is tax efficient to the company under the corporation tax system by treating the cost of debt to the company as $4\% \times (1 - 0.3)$.

This is below the IRR for the project. Therefore the project would have a positive NPV at the new WACC for the company. This makes the project more viable. [1]

(v) ***Sensitivity tests***

The company could perform any of the following sensitivity tests:

- The effect on the NPV if the anticipated selling price of each house is reduced by 10%. [1]
- The effect on the NPV if the anticipated raw material cost is increased by 10%. [1]
- The effects of a half-year delay in all cashflows caused by construction problems. [1]
[Maximum 2]

(vi) ***Other analyses****Opportunity cost*

- Investigate the available resources of the company at present and in the near future. What return will the company achieve with these resources if it does not undertake this project? [1]
- There may be a limited number of other possible projects, or the alternative might be to have cash invested in low yielding deposit accounts or Treasury bills. [1]
- Even if the project fails to meet the WACC criteria, it might be the best opportunity available at the time, and the company might want to consider lowering its appraisal criteria. [½]

Shareholder value

- Analyse what investors appreciate about equity investments in general and the shares of this company in particular. This might be a low PE, a high cashflow, a low beta, high gearing, etc. [1]
 - Calculate the current values of these factors, and then model the company including the new project, paying close attention to the effect on the factors that are most important to investors (and paying less attention to those factors that are deemed not important to investors). [1]
 - Adopt or reject the project on the basis of the extent to which it adds shareholder value. [½]
- [Maximum 4]

(vii) ***Stochastic model****Advantages*

- Gives a spread of results rather than a single deterministic result. [1]
 - Increases the company's understanding of the parameters that are central to the profitability of the project. [1]
 - Allows the investigation of “outliers” – situations which may cause a particular blip in the overall profitability. [1]
- [Maximum 1]

Disadvantages

- A great deal of effort is required. [1]
 - Is it justified given the quality of the data and estimates? If the input parameters are of poor quality, then so will be the output. [1]
 - How do you estimate the variability of the raw materials and labour costs, and how do you estimate the correlation between certain factors such as an increase in raw material costs and an increase in house prices, *etc*? The correlations may be impossible to estimate. [1]
- [Maximum 1]

Subject CT2: Assignment X1

2014 Examinations

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Subject CT2: Assignment X1

2014 Examinations

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MCQ	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Total	
20	5	8	4	5	5	13	20	80	= ____ %

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For Questions 1.1 to 1.10 indicate on your answer sheet which one of the answers A, B, C or D is correct.

Question X1.1

Which of the following statements about taxation is false?

- A Taxation is often based on cashflows.
- B The marginal rate of tax increases as income increases.
- C Taxation is usually assessed in arrears.
- D Companies pay corporation tax on their taxable profits.

[2]

Question X1.2

Which of the following is NOT true of a limited company?

- A Its liability in respect of claims against the company is limited to the share capital and reserves of the company.
- B It must have an issued share capital of at least £50,000.
- C Its tax calculation will be affected by changes in corporation tax rates.
- D Its board of directors are legally responsible for its financial affairs.

[2]

Question X1.3

The effective conversion price of a convertible bond is:

- A the value of the equity + excess income prior to conversion
- B market price of convertible bond – market price of a similar non-convertible bond
- C market price of convertible bond ÷ number of shares into which the bond converts
- D market price of convertible bond + excess dividend income after conversion

[2]

Question X1.4

Which of the following is NOT a reason why the gross redemption yield on corporate loan stock is usually greater than that on government bonds of equivalent term and coupon?

- A lower issues size of most corporate loan stock
- B accrued interest basis of taxing income on government bonds
- C lower marketability of the corporate loan stock
- D greater chance of default of the loan stock

[2]

Question X1.5

A floating-rate note is:

- A an overdraft.
- B a bond issued in the Euro market with a variable rate of interest.
- C a bank loan with a variable rate of interest.
- D an option to buy a currency future.

[2]

Question X1.6

Consider the following definition:

“The borrower can change the security of the loan from time to time (within limits imposed by the trust deed). Upon default the lender can appoint a receiver to take control of the assets. If necessary the assets can be sold off to pay the lender (in advance of unsecured creditors).”

This is a definition of a:

- A subordinated loan stock.
- B floating-rate note.
- C fixed-charge debenture.
- D floating-charge debenture.

[2]

Question X1.7

Which of the following is NOT a method of reducing principal-agent problems?

- A a profit-related employee bonus scheme
- B executive share options
- C an hourly rate of pay for workers and managers
- D written agreements between stakeholders

[2]

Question X1.8

Which of the following investors in the futures and options markets can never find that the contract is a liability at expiry?

- A the seller of a futures contract
- B the buyer of a put option
- C the writer of a call option
- D the buyer of a futures contract

[2]

Question X1.9

Which of the following is NOT the goal of the financial manager?

- A to maximise the share price
- B to invest in projects that display a positive net present value
- C to invest in projects if the rate of return is greater than the cost of borrowing
- D to maximise shareholder wealth

[2]

Question X1.10

Backshoot plc has decided to make a scrip issue. Its share capital stands at £100,000 (25p ordinary shares) and its reserves are £50,000. Its share price is £3. It makes a 1-for-4 scrip issue. What is the theoretical effect on the share price and what will be the share capital and reserves after the scrip issue?

- A £2.40; £125,000; £50,000
- B £2.25; £125,000; £25,000
- C £2.40; £100,000; £50,000
- D £2.40; £125,000; £25,000

[2]

Question X1.11

Explain, with examples, why the interests of a firm's shareholders might conflict with those of its other stakeholders. [5]

Question X1.12

Discuss the economic advantages and disadvantages of the limited company as a business entity. [8]

Question X1.13

Describe the principles of double taxation relief. [4]

Question X1.14

Country Dairy Ltd is a small business selling ice cream and other dairy products to local shops and restaurants. Recently, the business has experienced some cashflow problems as a result of a few customers paying their bills late, and the owners are now considering using factoring to improve the situation.

Explain the difference between recourse and non-recourse factoring and consider the relative merits of each for Country Dairy Ltd. [5]

Question X1.15

A company that has successfully tendered for a large overseas construction project is planning to use forwards and futures to hedge the risk that changes in currency exchange rates would increase costs and make the project unprofitable.

Explain how this risk can be hedged and the advantages and disadvantages of the hedging strategies. [5]

Question X1.16

The directors of Thatcher plc are considering a 1-for-4 rights issue at a 20% discount to the current share price. The book value of the company's ordinary 50p shares is £8m and the current market capitalisation is £60m.

- (i) Calculate the theoretical ex-rights share price. [3]
 - (ii) Explain why, in practice, the actual ex-rights share price is likely to differ from this theoretical price. [5]
 - (iii) Describe the factors that Thatcher's directors should take into account in deciding whether to have the rights issue underwritten. [5]
- [Total 13]

Question X1.17

You are the managing director of the manufacturing company XYZ limited. Currently the company's shares are not listed on any market.

- (i) Explain the reasons why XYZ may seek a full stock exchange listing. [5]
 - (ii) Describe any disadvantages of such a listing for the existing shareholders. [3]
 - (iii) XYZ wishes to obtain a full listing to broaden the pool of shareholders beyond the existing owners and to raise cash. Describe the various methods of issuing shares to achieve these aims and the advantages of each method. [12]
- [Total 20]

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2014 Examinations

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Under exam conditions (delete as applicable): yes / nearly / no

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Score and grade for this assignment (to be completed by marker):

MCQ	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Total
20	5	8	6	7	5	15	14	80 = ____%

Grade: A B C D E

Marker's initials: _____

Please grade your Assignment X1 marker by ticking the appropriate box.

- [] **Excellent** – the marker's comments were thorough and very helpful
- [] **Good** – the marker's comments were generally helpful
- [] **Acceptable** – please explain below how the marker could have been more helpful
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For Questions 2.1 to 2.10 indicate on your answer sheet which one of the answers A, B, C or D is correct.

Question X2.1

Which of the following would NOT explain why the amount shown in post-tax profits in the income statement could not be distributed to a company's ordinary shareholders?

- A Most of the company's sales revenues are from credit sales.
- B Past profits are too low.
- C The company has insufficient cash.
- D Preference dividends must be paid.

[2]

Question X2.2

In January 2012 Nafco Ltd bought some machinery for £70,000. The machinery will be depreciated using the reducing balance method over 10 years, assuming a scrap value of £5,000 at the end of the period. What was the value shown in the statement of financial position on 31 December 2012 in respect of this machinery?

- A £63,500
- B £63,000
- C £53,763
- D £16,237

[2]

Question X2.3

Which of the following might help explain why a large company's tax charge ratio is less than 30% (in an environment in which corporation tax is payable at the rate of 30%)?

- A receipt of unfranked investment income
- B certain business expenses in the company's accounts not being allowable for tax
- C capital allowances available on non-current assets are greater than the depreciation charged by the company
- D receipt of overseas income

[2]

Question X2.4

A company has an issued share capital of £1m in ordinary £1 shares and reserves of £2.5m. The ordinary shares are quoted on the London Stock Exchange and stand at a price of 500p in the market. The company has decided to capitalise £1m of the reserves by means of a 1-for-1 scrip issue and then to make a rights issue of 200,000 new ordinary £1 shares at £2 each in the proportion of one new share for five held *prior* to the scrip issue. In theory, what will be the price of the ordinary shares after both issues have been made, in the absence of market movements?

- A 225p
- B 227p
- C 230p
- D 245p

[2]

Question X2.5

Which of the following does NOT have to be part of a listed company's annual report and accounts?

- A cashflow statement
- B notes to the accounts
- C income statement
- D statement of financial position

[2]

Question X2.6

Information provided in a company's accounts is deemed to be "relevant" if it:

- A is material in the view of the company's directors.
- B is neutral and free from bias.
- C informs decisions taken by users of the financial statements.
- D is a historical fact.

[2]

Question X2.7

Which of the following changes in working capital will result in an improvement in a company's net cash inflow from operating activities?

- A increase in trade payables
- B increase in inventories
- C increase in trade receivables
- D decrease in other current liabilities

[2]

Question X2.8

Which of the following is NOT a current asset?

- A inventories
- B trade receivables
- C trade payables
- D cash

[2]

Question X2.9

Which of the following would NOT be included in a firm's equity?

- A retained earnings
- B dividends
- C share capital
- D the upward revaluation of a non-current asset

[2]

Question X2.10

How are cash and long-term loans treated in the trial balance?

- A Cash is a credit item and a long-term loan is a debit item.
- B Both cash and the long-term loan are credit items.
- C Cash is a debit item and a long-term loan is a credit item.
- D Both cash and long-term loans are debit items.

[2]

Question X2.11

Explain how the accounting concept of materiality may improve the usefulness of the financial statements. [5]

Question X2.12

Explain, with the aid of numerical examples, the purpose and methods of charging depreciation in a company's accounts. [8]

Question X2.13

Name four users of accounting information and give examples, with reasons, of the type of information in which they are interested. [6]

Question X2.14

- (i) Explain the main purpose of an auditors' report and the three aspects of the accounts about which the auditors must express an opinion [3]
 - (iii) Describe the four possible variations to the standard wording of the auditors' report. [4]
- [Total 7]

Question X2.15

Explain why financial statements must be supplemented and supported by notes to the accounts. [5]

Question X2.16

The following information has been extracted from the bookkeeping records of Z plc:

Trial balance as at 30 June 2013

	£000	£000
Administrative overheads	25	
Advertising	200	
Bank		6
Dividend paid (for year to 30 June 2012)	50	
Trade payables		54
Trade receivables	90	
Interest	120	
Land and buildings – cost	983	
Land and buildings – depreciation		45
Loan		600
Directors' remuneration	35	
Plant and machinery – cost	550	
Plant and machinery – depreciation		150
Retained earnings as at 1 July 2012		180
Purchases	450	
Revenue		1,200
Share capital		200
Share premium		300
Inventories as at 1 July 2012	18	
Wages – administrative staff	44	
Wages – distribution staff	30	
Wages – manufacturing	140	
	<hr/> <u>2,735</u>	<hr/> <u>2,735</u>

Notes

1. Inventories at 30 June 2013 were valued at £19,000.
2. Depreciation is to be charged on the following bases:
Land and buildings – 2% of cost
Plant and machinery – 25% of reducing balance
3. The corporation tax charge has been estimated at £22,000 for the year.

Prepare Z plc's income statement for the year ended 30 June 2013 and its statement of financial position as at that date. These should be in a form suitable for publication insofar as this is possible from the information provided. [15]

Question X2.17

- (i) Explain the purpose of a cashflow statement. [7]

Consider the following seemingly healthy company:

<i>Extracts from the income statement for year ending 31 July 2013</i>	(£000s)
Gross profit before depreciation	1,350
Depreciation	(200)
Other expenses	<u>(350)</u>
Net profit before tax and interest	800
Interest paid	<u>(500)</u>
Pre-tax profit	300
Tax	<u>(90)</u>
Earnings for the year	<u>210</u>

A total dividend of £50,000 was paid during the year to 31 July 2013.

<i>Extracts from the statements of financial position</i>	(£000s)	
	<i>31 July 12</i>	<i>31 July 13</i>
<i>Non-current assets</i>	9,250	11,500
<i>Current assets</i>		
Inventories	250	360
Trade receivables	51	240
Cash in bank	<u>13</u>	<u>54</u>
	<u>314</u>	<u>654</u>
<i>Total assets</i>	<u>9,564</u>	<u>12,154</u>
<i>Equity</i>		
Share capital	2,000	2,000
Retained earnings	<u>2,184</u>	<u>2,344</u>
<i>Total equity</i>	4,184	4,344
<i>Non-current liabilities</i>		
Long-term debt	5,000	7,600
<i>Current liabilities</i>		
Trade payables	350	120
Tax payable	<u>30</u>	<u>90</u>
	<u>380</u>	<u>210</u>
<i>Total liabilities</i>	5,380	7,810
<i>Total equity and liabilities</i>	<u>9,564</u>	<u>12,154</u>

*Cashflow statement for the year ending 31 July 2013**(£000s)***Cashflows from operating activities**

Cash generated from operations ¹	471
Interest paid	(500)
Tax paid ²	<u>(30)</u>
Net cash used in operating activities	(59)

Cashflows from investing activities

Purchase of non-current assets	<u>(2,450)</u>
Net cash used in investing activities	(2,450)

Cashflows from financing activities

Proceeds from borrowings ³	2,600
Dividends paid	<u>(50)</u>
Net cash generated from financing activities	2,550

Net increase in cash, cash equivalents and bank overdrafts	41
Cash, cash equivalents and bank overdrafts at beginning of the year	<u>13</u>
Cash, cash equivalents and bank overdrafts at end of the year	<u>54</u>

Notes

1. Net profit + depreciation + increase in trade payables – increase in trade receivables – increase in inventories

$$(800 + 200 + (120 - 350) - (240 - 51) - (360 - 250))$$
 2. Tax payable at start of year + tax in respect of 2013 – tax payable at the end of the year $(30 + 90 - 90)$
 3. Long-term debt has risen by £2.6 million.
- (ii) Comment on any problems you observe from an analysis of the company's cashflow statement. [7]
[Total 14]

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2014 Examinations

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Subject CT2: Assignment X3

2014 Examinations

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Score and grade for this assignment (to be completed by marker):

MCQ	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Total
20	5	5	5	5	5	5	10	20	20	100 = _____ %

Grade: A B C D E

Marker's initials: _____

Please grade your Assignment X2 marker by ticking the appropriate box.

- [] **Excellent** – the marker's comments were thorough and very helpful
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- [] Attached your Marking Voucher or ordered Series X Marking?
- [] Rated your Assignment X2 marker?

Feedback from marker

Notes on marker's section

The marker's main objective is to give you advice on how to improve your answers. The marker will also assess your script quantitatively and qualitatively. The percentage score gives you a quantitative assessment. The grade is a qualitative assessment of how your script might be classified in the exam. The grades are as follows:

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For Questions 3.1 to 3.10 indicate on your answer sheet which one of the answers A, B, C or D is correct.

Question X3.1

An entry for “goodwill” might appear in:

- A the unconsolidated statement of financial position of a subsidiary company.
- B the consolidated statement of financial position of a holding company with a subsidiary.
- C the unconsolidated statement of financial position of a holding company with a subsidiary.
- D the consolidated statement of financial position of a holding company with an associate interest.

[2]

Question X3.2

The Stock Exchange:

- A buys and sells shares.
- B publishes scales of maximum commission that member firms can charge.
- C provides a market for foreign exchange transactions.
- D operates a computerised dealing service.

[2]

Question X3.3

Last year Company X made profits before taxation of £85m. Throughout the year, the company had a mortgage of £50m on which £6m interest was paid, and an 8% unsecured loan stock with interest payments of £10m. The interest cover on the unsecured loan stock was:

- A 5.3
- B 6.3
- C 9.5
- D 10.1

[2]

Question X3.4

As a rule of thumb, what is the minimum acceptable asset cover and interest cover for an unsecured loan stock?

- A $2.5\times$ for asset cover, $4\times$ for interest cover
- B $4\times$ for asset cover, $2.5\times$ for interest cover
- C $4\times$ for both asset cover and interest cover
- D $2.5\times$ for both asset cover and interest cover

[2]

Question X3.5

The dividend yield for Arrow plc is currently 3.4%. A year ago it was 1.7%. Which of the following is consistent with this increase?

- A Earnings per share and dividend cover have remained constant. The share price has increased by 100% over the past year.
- B Earnings per share have fallen by 50% over the past year. Dividend cover and the share price have remained constant.
- C Earnings per share and the share price have remained constant. Dividend cover has fallen by 50% over the past year.
- D Earnings per share and the share price have increased by 100% over the past year. Dividend cover has remained the same.

[2]

Question X3.6

Techno Holdings has shares in three companies. It holds 25% of Wizz's shares and has the right to choose 1 of the 4 directors of the company. Its 55% holding in Wam enables it to control the board of directors. It holds 18% of Watt's shares and has 1 of the 3 seats on the board. Which are associate companies of Techno Holdings?

- A Wizz, Wam and Watt
- B Wizz and Wam only
- C Wizz and Watt only
- D Wizz only

[2]

Question X3.7

Unlike tangible assets, an intangible asset:

- A cannot suffer depreciation.
- B does not have a value.
- C can be created when one company takes over another company.
- D cannot be sold.

[2]

The next three questions are based on the following information from the accounts of Frendo plc for 2011 and 2012:

	2011	2012
Sales	£400,000	£500,000
Net profit before tax and interest	£40,000	£60,000
Trade receivables	£30,000	£50,000
Trade payables	£50,000	£75,000
Long-term loans	£50,000	£150,000
Share capital	£50,000	£60,000
Reserves	£25,000	£40,000

Question X3.8

The following can be said about the performance of Frendo plc:

- A The return on capital employed has risen because the profit margin has risen.
- B The return on capital employed has risen because the asset utilisation ratio has risen.
- C The return on capital employed has fallen because the fall in the profit margin has outweighed the rise in the asset utilisation ratio.
- D The return on capital employed has fallen because the fall in the asset utilisation ratio has outweighed the rise in the profit margin.

[2]

Question X3.9

The shareholders' equity ratio has:

- A risen from 40% to 60%.
- B fallen from 60% to 40%.
- C fallen from 40% to 24%.
- D fallen from 150% to 67%.

[2]

Question X3.10

Assuming that half of Frendo's sales are on credit, the average length of time taken by customers to settle their bills has increased from:

- A 23 days to 27 days.
- B 91 days to 109 days.
- C 27 days to 37 days.
- D 55 days to 73 days.

[2]

Question X3.11

Explain how a holding company would prepare a set of consolidated accounts.

[5]

Question X3.12

- (i) Explain why analysts would sometimes prefer to focus on EBITDA (earnings before interest, taxation, depreciation and amortisation) rather than EBIT (earnings before tax and interest). [2]
- (ii) Explain why analysts would sometimes prefer to focus on diluted EPS (earnings per share) rather than basic EPS. [3]

[Total 5]

Question X3.13

The following information is provided from the statements of financial position of Bigtop plc and Littletom Ltd. Figures in £m

	<i>Bigtop plc</i>	<i>Littletom Ltd</i>
ASSETS		
Non-current assets	50.0	10.0
Current assets	2.0	1.0
Total assets	52.0	11.0
EQUITY AND LIABILITIES		
Share capital (25p shares)	10.0	3.0
Reserves	<u>21.0</u>	<u>4.5</u>
<i>Equity</i>	<u>31.0</u>	<u>7.5</u>
Loan stock	20.0	3.0
Current liabilities	<u>1.0</u>	<u>0.5</u>
<i>Total liabilities</i>	<u>21.0</u>	<u>3.5</u>
Total equity and liabilities	52.0	11.0
<i>Market value of share</i>	<i>£1.60</i>	<i>£0.80</i>

Bigtop plc has agreed to buy 60% of Littletom Ltd for a package of 50p plus 3 shares in Bigtop plc for every 5 shares bought in Littletom Ltd.

Calculate the value of goodwill on this transaction.

[5]

Question X3.14

You have been asked to analyse two companies and have the following information:

	<i>Share price (p)</i>	<i>Earnings per share (p)</i>
Company X	100	5
Company Y	216	8

Explain what the price earnings ratios of these two companies might tell you about the market's opinions of them.

[5]

Question X3.15

Explain how units in a unit trust are priced, including a consideration of whether the fund is expanding or contracting. [5]

Question X3.16

Explain how the Bank of England provides liquidity in the money markets. [5]

Question X3.17

The preparation of insurance company financial statements is complicated by the special features of insurance business, including the underlying liabilities falling due outside the accounting period and being uncertain in size.

Describe the similarities and differences between insurance company financial statements and those of most other companies. [10]

Question X3.18

A friend of yours is considering buying ordinary shares in either Company A or Company B. Some information is provided below.

	Company A	Company B
Share price	180p	95p
Pre-tax profit	£420,000	£320,000
Net profit after tax	£360,000	£240,000
Dividends and interest:		
Preference shareholders	£60,000	£40,000
Ordinary shareholders	£200,000	£150,000
Unsecured loan stock	£75,000	£30,000
Share capital:		
Preference shares	£1,000,000	£500,000
Ordinary shares	£1,000,000	£1,500,000
Reserves	£500,000	£1,000,000
Loan capital	£1,500,000	£500,000

In addition you are given the information that Company A has 1 million £1 preference shares which have a coupon of 6%, 4 million 25p ordinary shares and 1.5 million unsecured loan stock with a coupon of 5%. Company B has 500,000 £1 preference shares with a coupon of 8%, 6 million 25p ordinary shares and 500,000 unsecured loan stock with a coupon of 6%.

- (i) On the basis of this information, calculate suitable investment ratios that might help to analyse the companies from an ordinary shareholder's point of view and state which company's ordinary shares you would advise your friend to invest in, and why. [12]
 - (ii) Explain, with examples, why such a comparison might yield tenuous results. [4]
 - (iii) Outline the further information you would like to see, explaining how it would help you to reach a decision. [4]
- [Total 20]

Question X3.19

The income statement for the year ending 31 December 2012 and the statement of financial position as at 31 December 2012 are shown below for XYZ plc, a UK manufacturing company.

Income statement for year ending 31 December 2012

	£000	£000
Sales		4,000
Cost of sales:		
Purchases	1,300	
less Increase in inventories	(100)	
Depreciation	<u>500</u>	
		<u>(1,700)</u>
Gross profit		2,300
Expenses:		
Rent and rates	500	
Salaries	<u>200</u>	
		<u>(700)</u>
Operating profit		1,600
Long-term loan interest		<u>(48)</u>
Pre-tax profit		1,552
Tax		<u>(512)</u>
Earnings for the year attributable to equity holders		<u>1,040</u>

During the year dividends totalling £300,000 were paid to ordinary shareholders.

One half of the sales recorded in the year was for cash and remainder was on credit terms. All purchases were on credit.

Statement of financial position as at 31 December 2012

	£000
ASSETS	
<i>Non-current assets</i>	3,000
<i>Current assets</i>	
Inventories	1,400
Trade receivables	600
Cash	<u>1,552</u>
	<u>3,552</u>
Total assets	<u>6,552</u>
EQUITY AND LIABILITIES	
<i>Equity</i>	
Ordinary shares of 10p	1,100
Reserves	<u>2,540</u>
Total equity	3,640
<i>Non-current liabilities</i>	
12% loan stock 2020	400
<i>Current liabilities</i>	
Taxation	712
Trade payables	<u>1,800</u>
	<u>2,512</u>
Total liabilities	2,912
Total equity and liabilities	6,552

- (i) Using appropriate ratios, comment on the liquidity, efficiency and profitability of XYZ. [16]
- (ii) The directors of XYZ have chosen optimistic accounting policies in the belief that this will increase the company's share price. Explain whether the share price is likely to increase as a result of this practice. [4]
[Total 20]

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2014 Examinations

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MCQ	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Total
20	4	16	5	8	3	6	8	10	20	100 = _____ %

Grade: A B C D E

Marker's initials: _____

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- [] **Acceptable** – please explain below how the marker could have been more helpful
- [] **Poor** – the marker's comments were generally unhelpful; please give details below

Please give any additional comments here (especially if you rate the marker less than good):

Note: Giving feedback on your marker helps us to improve the quality of marking.

Please follow the instructions on the previous page when submitting your script for marking.

***This page has been left blank in case you wish to submit your
script by fax.***

Please tick the following checklist so that your script can be marked quickly. Have you:

- [] Checked that you are using the latest version of the assignments, eg 2014 for the sessions leading to the 2014 exams?
- [] Written your full name and postal address in the appropriate box?
- [] Completed your ActEd Student Number in the appropriate box?
- [] Recorded your attempt conditions?
- [] Numbered all pages of your script (excluding this cover sheet)?
- [] Written the total number of pages (excluding the cover sheet) in the space above?
- [] Attached your Marking Voucher or ordered Series X Marking?
- [] Rated your Assignment X3 marker?

Feedback from marker

Notes on marker's section

The marker's main objective is to give you advice on how to improve your answers. The marker will also assess your script quantitatively and qualitatively. The percentage score gives you a quantitative assessment. The grade is a qualitative assessment of how your script might be classified in the exam. The grades are as follows:

A = Clear Pass B = Probable Pass C = Borderline D = Probable Fail E = Clear Fail

Please note that you can provide feedback on the marking of this assignment at:

www.ActEd.co.uk/marking

***This page has been left blank in case you wish to submit your
script by fax.***

For Questions 4.1 to 4.10 indicate on your answer sheet which one of the answers A, B, C or D is correct.

Question X4.1

A share has a beta of 1.5 relative to the diversified market portfolio. If the risk-free rate of interest over the previous year has been 5%, and the market index has risen 3%, by how much would you expect the share price to have risen?

- A 4.5%
- B 9.5%
- C 2%
- D 0.5%

[2]

Question X4.2

The structure of XYZ is such that the company has \$75 million of shareholders' capital and reserves and \$25 million market value of outstanding debt. These funds are invested in a diversified portfolio of assets, which are expected to earn a return no more or less than the market. The risk-free rate of return in the market is 6% and investors expect the market to give a return of 12%.

Assuming that the company can borrow at the risk-free rate and that there are no taxes, the return expected from the equity shares in XYZ is:

- A 10.5%.
- B 12%.
- C 14%.
- D 15.5%.

[2]

Question X4.3

According to Modigliani and Miller's first irrelevance proposition, which is the best way to increase the market value of a firm?

- A borrow as much debt as possible
- B only use equity finance
- C adjust gearing so as to minimise weighted average cost of capital
- D none of the above

[2]

Question X4.4

Rapido plc is trying to estimate its weighted average cost of capital (WACC). 60% of its long-term finance is in the form of equity finance and 40% is in the form of debt finance. Other information available includes:

gross cost of debt	7%
risk-free rate of return	3%
equity risk premium	8%
$\text{cov}(r, m)$	0.06
$\text{var}(m)$	0.04
corporation tax rate	30%

where $\text{cov}(r, m)$ is the covariance between Rapido's return and the market return and $\text{var}(m)$ is the variance of the market return.

Rapido's weighted average cost of capital is:

- A 8.94%
 - B 9.16%
 - C 10.96%
 - D 11.8%
- [2]

Question X4.5

Which of the following is most likely to mean that a company's financial gearing will be low?

- A intangible assets being a high proportion of total assets
 - B high tax rates
 - C high taxable profits
 - D expensive share issue costs
- [2]

Question X4.6

Which of the following statements is false?

- A If a project has a large amount of systematic risk, then the discount rate used to value the cashflows should be raised to reflect the risk.
- B A large, well-diversified portfolio of projects should have little or no specific risk.
- C No amount of diversification can remove the systematic risk involved in a project.
- D Specific risk arises because of the volatility of the market as a whole. [2]

Question X4.7

Which of the following would be examples of specific risk for a large domestic house building company?

- A inflation
- B interest rates
- C regional variations in house prices
- D recession [2]

Question X4.8

The following table gives the net present value of two projects at three different discount rates.

	<i>NPV @ 5%</i>	<i>NPV @ 10%</i>	<i>NPV @ 15%</i>
Project A	100	0	-50
Project B	80	60	40

Which of the following statements is true?

- A Project A is more profitable than Project B.
- B The internal rate of return is higher for Project A than Project B.
- C Project A will not earn a 15% return.
- D Project B is more sensitive to a change in the discount rate than Project A. [2]

Question X4.9

Which of the following is NOT a likely consequence of an increase in a company's gearing?

- A The company will benefit from the tax advantages of debt finance.
- B The company's credit rating will improve.
- C The return to shareholders of the company will increase.
- D The company's weighted average cost of capital will fall. [2]

Question X4.10

When analysing a project, the systematic risk should be allowed for by using:

- A RAMP (Risk Assessment and Management of Projects).
- B scenario testing.
- C an appropriate discount rate.
- D a risk matrix. [2]

Question X4.11

A company has experienced volatile earnings in the last five years. The underlying business is unpredictable and risky and involves a high proportion of overseas earnings. List the steps the management can take to reduce the volatility in reported earnings for equity shareholders. [4]

Question X4.12

Z plc is an established, successful media company. The Finance Director has raised concerns about the company's low level of gearing. Currently the company raises about a fifth of its long-term finance from debt finance and the director feels that if the company were to increase this proportion by issuing debt to finance a share buyback operation, the return to the shareholders would increase.

- (i) Describe the methods the company could use to conduct the buyback operation and the practical problems that might occur. [4]
 - (ii) Discuss the advantages and disadvantages to shareholders of such an operation. [8]
 - (iii) Discuss the possible effects on the share price of such an operation. [4]
- [Total 16]

Question X4.13

Explain Modigliani and Miller's two irrelevance propositions.

[5]

Question X4.14

You are the financial analyst for a company that has hit hard times. It is just breaking even and is likely to remain in this condition for the next two years until the restructuring package has time to take effect. The Chief Executive has asked you to advise on the dividend that should be paid by the company for the financial year just ended.

- (i) Describe the additional information you would require before beginning to answer the question. [5]
 - (ii) List three strategies you would consider and explain the circumstances under which you would recommend each. [3]
- [Total 8]

Question X4.15

The company you work for has a financial policy that is written as follows:

“For expenditures of less than £1 million, any project submission that demonstrates an IRR of more than 5% can be put forward for consideration. For projects of between £1 million and £10 million the submission document has to demonstrate an IRR in excess of 10%, and for larger expenditure an IRR of greater than 15% must be demonstrated.”

Explain the disadvantages of this approach.

[3]

Question X4.16

You have been asked to evaluate a project that involves the purchase of machinery to manufacture a new microchip. It is likely that the microchip will be out of date within 3 years, and the estimated cashflows are:

<i>Time in years</i>	0	1	2	3
<i>Cashflow in \$ millions</i>	(6)	1	4	3

Assume revenues are received at the end of each year.

- (i) Calculate and comment on the:
 - (a) annual capital charge using a 3-year amortisation period
 - (b) payback period
 - (c) nominal return over three years. [3]

 - (ii) When managing projects, some project managers use probability trees. Describe what a probability tree is and how it can be used to help in the management of a project. [3]
- [Total 6]

Question X4.17

You have been asked to make a risk analysis on a large new project being considered by your company. The project is much larger and riskier than any single project your company has ever been involved in. Indeed the initial investment required is about half the market capitalisation of the existing company. The chief executive is concerned about the risk that the project may lead the entire company into bankruptcy. The risk-free rate is 4% and the risk premium is 6%.

- (i) Describe briefly:
 - (a) the meaning of specific and systematic risk [2]
 - (b) the meaning of the beta of a project. [2]

 - (ii) Suppose the beta of the project is found to be 0.6.
 - (a) Calculate the required rate of return on the project. [2]
 - (b) Explain why such a very risky project is required to earn a relatively low rate of return. [2]
- [Total 8]

Question X4.18

Four Pillows is a company that builds and operates hotels. They have asked you to assist in the appraisal of a project that involves building a large hotel in Abingdon. As a first step you have decided to draw up a risk matrix for the project.

Describe in detail what is meant by a risk matrix and list its uses for project management in general. [10]

Question X4.19

A company has asked you to calculate its weighted average cost of capital (WACC) and has given you the following information:

Market capitalisation of loan capital	£200m
Market capitalisation of equity share capital	£800m
Average redemption yield on loan capital	10%
Dividend yield on equity shares	3%
Beta of equity shares	1.5
Risk-free rate of return	6%
Equity risk premium	8%
Rate of corporation tax	30%

- (i) Define the term market capitalisation and calculate the WACC. [4]
- (ii) Discuss the investigations you would carry out to estimate the systematic risk of a project. [4]

The company is considering undertaking a large project, which is estimated to give a 14% rate of return.

- (iii) Comment on the relationship between the WACC calculated in (i) and the expected return of the project given above and comment on the level of systematic risk of this particular project. [4]
 - (iv) A director has said that it is clear that the project would be worthwhile provided the company could borrow the money in the form of debt at 10%. Explain the link between gearing and the level of systematic risk and discuss whether the director is correct or not. [4]
 - (v) The director has refused to use the cost of capital as a rate for assessing projects because it changes each time new capital is raised. Discuss whether the director is correct or not and explain how you would approach the problem. [4]
- [Total 20]

End of paper

For the session leading to the April 2014 exams – CT Subjects

Marking vouchers

Subjects	Assignments	Mocks
CT1, CT8	26 March 2014	7 April 2014
CT2, CT3, CT4, CT5, CT6, CT7	2 April 2014	14 April 2014

Series X Assignments

Subjects	Assignment	Recommended submission date	Final deadline date
CT1, CT8	X1	13 November 2013	22 January 2014
CT2, CT3, CT4, CT5, CT6, CT7		20 November 2013	29 January 2014
CT1, CT8	X2	27 November 2013	12 February 2014
CT2, CT3, CT4, CT5, CT6, CT7		4 December 2013	19 February 2014
CT1, CT8	X3	29 January 2014	5 March 2014
CT2, CT3, CT4, CT5, CT6, CT7		5 February 2014	12 March 2014
CT1, CT8	X4	19 February 2014	19 March 2014
CT2, CT3, CT4, CT5, CT6, CT7		26 February 2014	26 March 2014

Mock Exams

Subjects	Recommended submission date	Final deadline date
CT1, CT8	26 March 2014	7 April 2014
CT2, CT3, CT4, CT5, CT6, CT7	2 April 2014	14 April 2014

We encourage you to work to the recommended submission dates where possible.

We strongly recommend that you submit your mock exam electronically, by email or fax, in order for us to return your marked script to you in plenty of time before your exam. If you submit your mock by post to arrive with us on the final deadline date, you are likely to receive your script back less than a week before your exam.

In general, the turnaround of all scripts is likely to be quicker if you submit it electronically and well before the final deadline date.

For the session leading to the September/October 2014 exams – CT Subjects**Marking vouchers**

Subjects	Assignments	Mocks
CT1, CT2, CT4, CT6, CT7	27 August 2014	8 September 2014
CT3, CT5, CT8	3 September 2014	15 September 2014

Series X Assignments

Subjects	Assignment	Recommended submission date	Final deadline date
CT1, CT2, CT4, CT6, CT7	X1	11 June 2014	2 July 2014
CT3, CT5, CT8		18 June 2014	9 July 2014
CT1, CT2, CT4, CT6, CT7	X2	2 July 2014	23 July 2014
CT3, CT5, CT8		9 July 2014	30 July 2014
CT1, CT2, CT4, CT6, CT7	X3	23 July 2014	6 August 2014
CT3, CT5, CT8		30 July 2014	13 August 2014
CT1, CT2, CT4, CT6, CT7	X4	6 August 2014	20 August 2014
CT3, CT5, CT8		13 August 2014	27 August 2014

Mock Exams

Subjects	Recommended submission date	Final deadline date
CT1, CT2, CT4, CT6, CT7	20 August 2014	8 September 2014
CT3, CT5, CT8	27 August 2014	15 September 2014

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