

ACCA

Advanced Financial Management

Practice & Revision Kit

BPP Learning Media is an **ACCA Approved Content Provider** for the ACCA qualification. This means we work closely with ACCA to ensure our products fully prepare you for your ACCA exams.

In this Practice & Revision Kit which has been reviewed by the **ACCA examining team**, we:

- Discuss the **best strategies** for revising and taking your ACCA exams
- Ensure you are well **prepared** for your exam
- Provide you with **lots of great guidance** on tackling questions
- Provide you with **four** mock exams

**For exams in September 2019, December 2019,
March 2020 and June 2020**

First edition 2007
Thirteenth edition February 2019

ISBN 9781 5097 2455 0
(previous ISBN 9781 5097 1671 5)

e-ISBN 9781 5097 2447 5

British Library Cataloguing-in-Publication Data

A catalogue record for this book
is available from the British Library

Published by

BPP Learning Media Ltd
BPP House, Aldine Place
142–144 Uxbridge Road
London W12 8AA

www bpp com/learningmedia

Printed in the United Kingdom

Your learning materials, published by BPP Learning Media Ltd, are
printed on paper obtained from traceable, sustainable sources.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of BPP Learning Media Ltd.

The contents of this book are intended as a guide and not professional advice. Although every effort has been made to ensure that the contents of this book are correct at the time of going to press, BPP Learning Media makes no warranty that the information in this book is accurate or complete and accepts no liability for any loss or damage suffered by any person acting or refraining from acting as a result of the material in this book.

We are grateful to the Association of Chartered Certified Accountants for permission to reproduce past examination questions. The suggested solutions in the Practice & Revision Kit have been prepared by BPP Learning Media Ltd, except where otherwise stated.

©
BPP Learning Media Ltd
2019

A note about copyright

Dear Customer

What does the little © mean and why does it matter?

Your market-leading BPP books, course materials and e-learning materials do not write and update themselves. People write them on their own behalf or as employees of an organisation that invests in this activity. Copyright law protects their livelihoods. It does so by creating rights over the use of the content.

Breach of copyright is a form of theft – as well as being a criminal offence in some jurisdictions, it is potentially a serious breach of professional ethics.

With current technology, things might seem a bit hazy but, basically, without the express permission of BPP Learning Media:

- Photocopying our materials is a breach of copyright
- Scanning, ripcasting or conversion of our digital materials into different file formats, uploading them to facebook or emailing them to your friends is a breach of copyright

You can, of course, sell your books, in the form in which you have bought them – once you have finished with them. (Is this fair to your fellow students? We update for a reason.) Please note the e-products are sold on a single user licence basis: we do not supply 'unlock' codes to people who have bought them secondhand.

And what about outside the UK? BPP Learning Media strives to make our materials available at prices students can afford by local printing arrangements, pricing policies and partnerships which are clearly listed on our website. A tiny minority ignore this and indulge in criminal activity by illegally photocopying our material or supporting organisations that do. If they act illegally and unethically in one area, can you really trust them?

Contents

	Page
Finding questions	
Question index	iv
Topic index	vii
The exam	
Helping you with your revision	xiii
Essential skill areas	xv
Questions and answers	
Questions	3
Answers	83
Mock exams	
Mock exam 1 (BPP exam)	
• Questions	295
• Plan of attack	303
• Answers	304
Mock exam 2 (Specimen exam)	
• Questions	321
• Plan of attack	329
• Answers	330
Mock exam 3 (ACCA March/June 2018 Sample questions)	
• Questions	347
• Plan of attack	357
• Answers	358
Mock exam 4 (ACCA December 2018 exam)	
• Questions	373
• Plan of attack	379
• Answers	380
Mathematical tables and formulae	397
Review form	

Finding questions

Question index

The headings in this checklist/index indicate the main topics of questions, but questions often cover several different topics.

Part A: Role of the senior financial adviser in the multinational organisation	Marks	Time allocation	Page number	
			Question	Answer
1 Preparation question: Mezza (6/11, amended)	25	49	3	83
2 Preparation question: Strom (12/12, amended)	25	49	4	86
3 Preparation question: Bournelorth (Mar/Jun 17)	25	49	4	88
4 Chawan (6/15)	25	49	6	91
5 High K (Sep/Dec 17)	25	49	7	94
6 Tillinton (Sep 18)	25	49	9	98
7 Limni Co (6/13)	25	49	10	102
8 Arthuro (Mar/Jun 18)	25	49	12	105
9 Lamri (12/10, amended)	25	49	13	108
10 Moonstar (Sep/Dec 15)	25	49	14	111

Part B: Advanced investment appraisal				
11 Preparation question: Cathlynn	15	29	15	114
12 Preparation question: Faoilean (6/14)	25	49	16	115
13 Fernhurst (Sep/Dec 16)	25	49	17	118
14 Tisa Co (6/12, amended)	25	49	18	121
15 Riviere (12/14)	25	49	19	123
16 Arbore (12/12, amended)	25	49	20	126
17 MMC (6/11, amended)	25	49	21	129
18 Marengo (12/10, amended)	25	49	22	131
19 Furlion Co (Mar/Jun 16)	25	49	23	134
20 Toltuck (Mar/Jun 17)	25	49	24	136
21 Coeden (12/12, amended)	25	49	25	139
22 GNT (2013 pilot exam)	25	49	26	142
23 Fubuki (12/10)	25	49	26	145

Part C: Acquisitions and mergers	Marks	Time allocation	Page number		
			Mins	Question	Answer
24 Preparation question: Saturn Systems (6/08, amended)	25	49	28	149	
25 Selorne (6/08, amended)	25	49	29	152	
26 Chithurst (Sep/Dec 16)	25	49	30	155	
27 Louieed (Mar/Jun 16)	25	49	31	158	
28 Makonis (12/13)	25	49	32	161	
29 Vogel (6/14)	25	49	33	164	

Part D: Corporate reconstruction and reorganisation				
30 Doric (2013 pilot exam)	25	49	35	167
31 Flufftort (Sep/Dec 15)	25	49	36	169
32 Ennea (6/12)	25	49	38	173
33 Nubo (12/13)	25	49	39	176
34 Bento (6/15)	25	49	41	179
35 Eview Cinemas (Sep/Dec 17)	25	49	42	182

Part E: Treasury and advanced risk management techniques				
36 Kenduri Co (6/13)	25	49	44	185
37 Massie (Sep/Dec 15)	25	49	45	187
38 Asteroid Systems (6/08, amended)	25	49	47	192
39 Casasophia (6/11, amended)	25	49	47	195
40 Buryecs (Mar/Jun 17)	25	49	49	199
41 Alecto (2013 pilot exam)	25	49	50	203
42 Awan (12/13)	25	49	51	206
43 Wardegul (Sep/Dec 17)	25	49	52	208
44 Keshi (12/14)	25	49	53	213
45 Daikon (6/15)	25	49	54	217
46 Sembilan (6/12, amended)	25	49	55	220
47 Pault (Sep/Dec 16)	25	49	56	222

Part F: 50 mark questions	Marks	Time allocation	Page number	
			Mins	Question
48 Conejo (Sep/Dec 17)	50	98	57	225
49 Chrysos (Mar/Jun 17)	50	98	59	231
50 Yilandwe (6/15)	50	98	62	237
51 Avem (12/14)	50	98	64	243
52 Chmura (12/13)	50	98	66	249
53 Washi (Sep 18)	50	98	67	255
54 Tramont (2013 pilot exam)	50	98	70	261
55 Cigno (Sep/Dec 15)	50	98	72	267
56 Lirio (Mar/Jun 16)	50	98	74	273
57 Morada (Sep/Dec 16)	50	98	76	279
58 Nente (6/12, amended)	50	98	78	285

Mock exam 1 (BPP mock)

Mock exam 2 (Specimen exam)

Mock exam 3 (ACCA Mar/Jun 2018 Sample questions)

Mock exam 4 (ACCA December 2018 exam)

Topic index

Listed below are the key AFM syllabus topics and the numbers of the questions in this Kit covering those topics. We have also included a reference to the relevant Chapter of the BPP AFM Workbook, the companion to the BPP AFM Practice and Revision Kit, in case you wish to revise the information on the topic you have covered.

If you need to concentrate your practice and revision on certain topics or if you want to attempt all available questions that refer to a particular subject, you will find this index useful.

Syllabus topic	Question numbers	Workbook chapter
A1: Role of senior financial advisor	1, 8, 21, ME2 Q1	1
A2: Financial strategy formulation	1, 2, 4, 5, 6, 7, 8, 10, 29, 48, 49, 50, 51, 54, 57, 58	2
A3: Ethical and governance issues	1, 24, 54, ME1 Q1, ME1 Q3, ME2 Q1	1
A4: Management of international trade and finance	2, 4, 36, 51, 52	16
A5: Strategic business and financial planning	3, 5	16
A6: Dividend policy and transfer pricing	4, 7, 9, 26, 56, ME3 Q3	16
B1: Discounted cash flow techniques	13, 14, 15, 16, 35, 51	3
B2: Option pricing theory	11, 12, 17, 18, 19, 52	4
B3: Impact of financing and APV	20, 23, 22, 33, 44, 46, 48, 54, ME1 Q1, ME2 Q2, ME3 Q2, ME4 Q3	6 and 7
B4: Valuation and free cash flows	9, 21, 27, 35, 56, ME1 Q1, ME3 Q1	8
B5: International investment and financing	49, 50, 52, 53	5
C1: Acquisitions and other growth strategies	24, 25, 27, 29, 49, 50, 53, 55, 56, ME2 Q3, ME3 Q1	9
C2: Valuation for acquisition and mergers	25, 26, 27, 28, 29, 51, 55, 56, 58, ME1 Q1, ME2 Q3, ME3 Q1, ME4 Q1	8
C3: Regulatory issues	55, 58, ME3 Q1	9
C4: Financing acquisitions and mergers	25, 27, 28	10
D1: Financial reconstruction	30, 31, 32, 34, 48, 57	14
D2: Business reorganisation	30, 33, 34, 35, 49, 55, 57, ME1 Q3, ME4 Q1	15
E1: Treasury function	12, 35, 38, 42, 44	11 and 12
E2: Foreign exchange hedging	36, 37, 38, 40, 41, 53, 56, ME1 Q2, ME2 Q1, ME3 Q3, ME4 Q2	12 and 13
E3: Interest rate hedging	35, 37, 41, 42, 44, 45, 46, 47	13

ME1 is Mock Exam 1, ME2 is Mock Exam 2, ME3 is Mock Exam 3 and ME4 is Mock Exam 4.

The exam

Computer-based exams

With effect from the March 2020 sitting, ACCA have commenced the launch of computer-based exams (CBEs) for this exam with the aim of rolling out into all markets internationally over a short period. Paper-based examinations (PBE) will be run in parallel while the CBEs are phased in. BPP materials have been designed to support you, whichever exam option you choose. For more information on these changes and when they will be implemented, please visit the ACCA website.

Approach to examining the syllabus

The Advanced Financial Management syllabus is assessed by a 3 hour 15 minute exam. The pass mark is **50%**. All questions in the exam are **compulsory**.

Examining team's general comments

If you are preparing to sit AFM you should pay particular attention to the following in order to maximise your chances of success.

1 Know your stuff

- Develop a sound knowledge of the entire AFM syllabus. Augment studying the manuals with wider reading of the financial press, finance textbooks, articles in *Student Accountant* and financial journals.
- You should expect and be prepared for questions from a range of syllabus areas and more than one area may be tested in a single question. Be prepared for questions that require you to consider a number of areas of the syllabus within one question.

2 Question practice

- Work through the past exam questions under exam conditions and to time. Doing past questions will help you build efficiency in answering questions and help you build knowledge of how to make your answer relevant to the scenario in the question.

3 Address the requirement and scenario

- Your answer must relate to the scenario in question. Context is very important for higher-level exams. General answers will gain fewer or even no marks.
- In your exams, good time management techniques and habits are essential in ensuring success. Make sure that you are able to answer all parts of each question and manage your time effectively so that you make a reasonable attempt at each part of each question. Good time management skills are essential.
- Often parts of a requirement may ask for more than one aspect. Make sure that you can answer, and do answer, everything each part of each requirement is asking for.
- Make sure you answer the requirements correctly. For example, if the question asks you to explain, it is not enough just to list. If the question asks you to assess, it is not enough just to explain.

4 Communicate concisely

- For the written parts of any question, remember it is generally a mark for each relevant point. Repeating a point does not get you any extra marks and it wastes time. Avoid repetition.

- Don't use incomplete sentences when making a point. Marks are awarded for complete points made in full sentences. However, you can use bullet points and numbered paragraphs, and headings when appropriate, to structure an answer to a question. But points made should be in complete sentences.

5 Think before you start and manage your time

- Pay attention to the number of marks available – this provides you with a clear indication of the amount of time you should spend on each question part.
- Use your exam time effectively. The questions may contain a substantial amount of information that you will need to sort out and apply properly and you should plan your answer before beginning to write it.

Marks available in respect of professional skills

The presentation of your answers is critical. It is very important to pay regard to neatness, organisation and structure of your answers. Professional exams are extremely time-pressured but giving your answers a structure will help you organise your thoughts and work more effectively. Make sure that your answers are legible because markers cannot award marks for something that they cannot read.

Format of the exam

100 marks, two sections, each section 50 marks		Marks
Section A	<p>One compulsory question, totalling 50 marks</p> <p>Longer questions will cover topics from across the syllabus but will tend to be based on one major area – for example a cross-border merger question (major topic) might bring in ethical issues (smaller topic).</p> <p>Four professional marks are available. The examining team has emphasised that in order to gain all the marks available, students must write in the specified format (such as a report or memo).</p> <p>Reports must have terms of reference, conclusion, appendices and appropriate headings.</p>	50
Section B	<p>Two compulsory 25-mark questions (from September 2018), totalling 50 marks</p> <p>From the September 2018 exam, all topics and syllabus sections will be examinable in either Section A or Section B of the exam, but every exam will have questions which have a focus on syllabus Sections B and E. There will no longer be any wholly narrative questions (although some still appear in this Revision Kit as preparation questions).</p>	50

Analysis of past exams

The table below provides details of when each element of the syllabus has been examined in the ten most recent sittings and the question number and section in which each element was examined. We have also included a reference to the relevant Chapter of the BPP AFM Workbook, the companion to the BPP AFM Practice and Revision Kit, in case you wish to revise the information on the topic covered.

Note that in exams before June 2018 there were three questions in Section B (of which two had to be answered) so that five questions in total are referenced.

Workbook chapter	ROLE OF SENIOR FINANCIAL ADVISER	Dec	Sep	Mar	Sep/	Mar	Sep/	Mar	Sep			
		2018	2018	/Jun 2018	Dec 2017	/Jun 2017	Dec 2016	/Jun 2016	Dec 2015	/Dec 2015	Jun 2015	Dec 2014
1	Financial strategy formulation			B	A		A, B	A, B				
2	Financial strategy evaluation		B		B					B	B	
16	Planning and trading issues for multinationals								B		B	
	ADVANCED INVESTMENT APPRAISAL											
3	Discounted cash flow techniques				B		B					
4	Application of option pricing theory to investment decisions								B			B
5	International investment		A			B		A			A	
6	Cost of capital and changing risk	B		B			A					
7	Financial and credit risk				A	B			B			

Workbook chapter	ACQUISITIONS AND MERGERS	Dec	Sep	Mar	Sep/	Mar	Sep/	Mar	Sep		
		2018	2018	/Jun 2018	Dec 2017	/Jun 2017	Dec 2016	/Jun 2016	/Dec 2015	Jun 2015	Dec 2014
8	Valuation techniques	A	B	A	B		B	B	A		A
9	Strategic and regulatory issues		B	A		A		B	A		A
10	Financing acquisitions	A	B			A		B			
	CORPORATE RECONSTRUCTION AND REORGANISATION										
14	Financial reconstruction				A				B	B	
15	Business reorganisation	A			B	A		B		B	
	TREASURY AND ADVANCED RISK MANAGEMENT TECHNIQUES										
11	Role of the treasury function		A		B		A				B
12	Managing foreign currency risk	B	A			B		A	B		
13	Managing interest rate risk				B		B		B	B	B

IMPORTANT! The table above gives a broad idea of how frequently major topics in the syllabus are examined. It should **not** be used to question spot and predict, for example, that Topic X will not be examined because it came up two sittings ago. The examining team's reports indicate that they are well aware that some students try to question spot. They avoid predictable patterns and may, for example, examine the same topic two sittings in a row, particularly if there has been a recent change in legislation.

Syllabus and Study Guide

The complete AFM syllabus and study guide can be found by visiting the exam resource finder on the ACCA website.

Helping you with your revision

BPP Learning Media – Approved Content Provider

As an ACCA **Approved Content Provider**, BPP Learning Media gives you the **opportunity** to use revision materials reviewed by the ACCA examining team. By incorporating the ACCA examining team's comments and suggestions regarding the depth and breadth of syllabus coverage, the BPP Learning Media Practice & Revision Kit provides excellent, **ACCA-approved** support for your revision.

These materials are reviewed by the ACCA examining team. The objective of the review is to ensure that the material properly covers the syllabus and study guide outcomes, used by the examining team in setting the exams, in the appropriate breadth and depth. The review does not ensure that every eventuality, combination or application of examinable topics is addressed by the ACCA Approved Content. Nor does the review comprise a detailed technical check of the content as the Approved Content Provider has its own quality assurance processes in place in this respect.

The structure of this Practice & Revision Kit section

This Practice & Revision Kit is divided into two sections. The questions in Section A are 25 mark questions which are mainly focused on specific syllabus areas. Section B contains a number of 50 mark questions which generally cover at least two different syllabus areas. There are also four mock exams which provide sufficient opportunity to refine your knowledge and skills as part of your final exam preparations.

Question practice

Question practice under timed conditions is absolutely vital. We strongly advise you to create a revision study plan which focuses on question practice. This is so that you can get used to the pressures of answering exam questions in limited time, develop proficiency in the Specific AFM skills and the Exam success skills. Ideally, you should aim to cover all questions in this Kit, and very importantly, all four mock exams.

Selecting questions

To help you plan your revision, we have provided a full **topic index** which maps the questions to topics in the syllabus (see page vii).

Making the most of question practice

At BPP Learning Media we realise that you need more than just questions and model answers to get the most from your question practice.

- Our **Top tips** included for certain questions provide essential advice on tackling questions, presenting answers and the key points that answers need to include.
- We show you how you can pick up **Easy marks** on some questions, as we know that picking up all readily available marks often can make the difference between passing and failing.
- We include **marking guides** to show you what the examining team rewards.

Attempting mock exams

This Kit has four mock exams, including the ACCA Specimen Exam, which provide practice at coping with the pressures of the exam day. We strongly recommend that you attempt them under exam conditions. All the mock exams reflect the question styles and syllabus coverage of the exam.

Topics to revise

Any part of the syllabus could be tested in the compulsory Section A question, therefore it is essential that you learn the **entire syllabus** to maximise your chances of passing. There are no short cuts – trying to spot topics is dangerous and will significantly reduce the likelihood of success.

As this is an advanced level exam, it **assumes knowledge** of the topics covered in *Financial Management (FM)*, including business valuation techniques, investment appraisal techniques, cost of capital and risk management. You should revise these topics if necessary as they impact on your understanding of the more advanced techniques.

From September 2018 every exam will contain a question which has a clear focus on syllabus Section B (advanced investment appraisal) and on Section E (treasury and advanced risk management) so these syllabus sections are especially important.

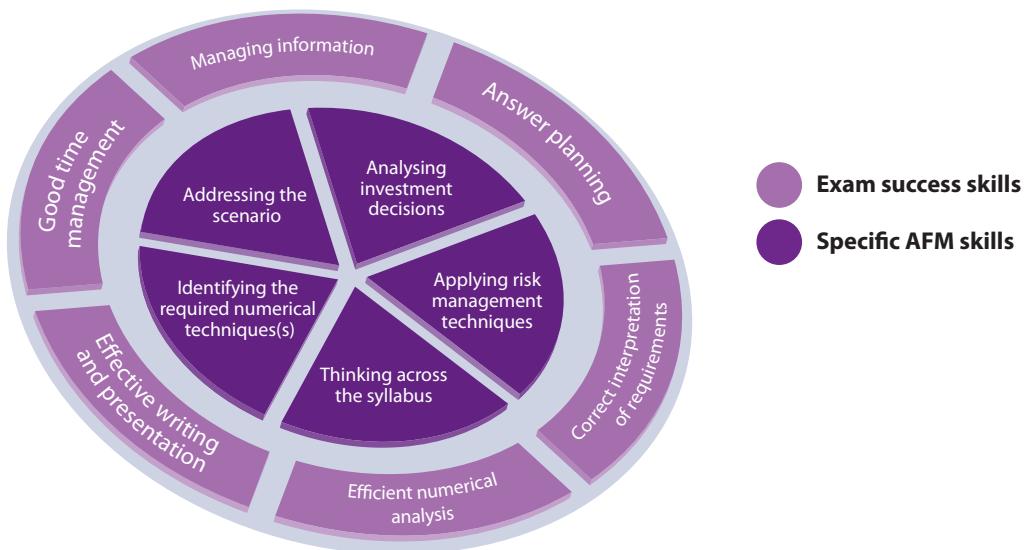
It's also useful to keep reading the business pages during your revision period and not just narrowly focus on the syllabus. Remember that the examining team has stressed that this exam is about how organisations respond to real-world issues, so the more you read, the more practical examples you will have of how organisations have tackled real-life situations.

Essential skills areas to be successful in Advanced Financial Management

We think there are two areas you should develop in order to achieve exam success in Advanced Financial Management:

- (1) Specific AFM skills
- (2) Exam success skills

These are shown in the diagram below.



Specific AFM skills

These are the skills specific to AFM that we think you need to develop in order to pass the exam.

In this Workbook, there are five **Skills Checkpoints** which define each skill and show how it is applied in answering a question. A brief summary of each skill is given below.

Skill 1: Addressing the scenario

All of the questions in your Advanced Financial Management (AFM) exam will be scenario-based.

It is vital to spend time reading and assimilating the scenario as part of your answer planning. Both with your numerical and (especially) discursive points it will be important for you **to address them to the requirements of the question and the problem as presented in the scenario**.

A common complaint from the ACCA examining team is that 'Less satisfactory answers tended to give more general responses rather than answers specific to the scenario'. This skill is relevant to all syllabus areas and is likely to be important in every question in your AFM exam.

BPP recommends a step-by-step technique to develop this skill:

- STEP 1** Allow about 20% of your allotted time for planning.
- STEP 2** Prepare an answer plan using key words from the question's requirements.
- STEP 3** Read the scenario; identify specific points from the scenario that are relevant to the question being asked.
- STEP 4** Write your answer using short paragraphs, relating each point to the scenario as far as is possible.

Skills Checkpoint 1 covers this technique in detail through application to an exam-standard question.

Skill 2: Analysing investment decisions

Analysing investments to select those which are most likely to benefit shareholders is probably the most important activity for a senior financial adviser.

Section B of the AFM syllabus is 'advanced investment appraisal' and directly focusses on the skill of 'analysing investment decisions'. The AFM exam **will always contain a question** that have a focus on this syllabus area, so this skill is extremely important.

BPP recommends a step-by-step technique to develop this skill:

- STEP 1** Spend time analysing the scenario and considering why numerical information has been provided and how long you will have to analyse it.
- STEP 2** Plan your answer carefully; check your analysis matches the question's requirements.
- STEP 3** Complete your calculations in a time-efficient manner – if necessary, make simplifying assumptions in order to complete the question in the time allowed.
- STEP 4** Write your answer using short paragraphs; don't forget to explain the meaning of your numbers.
- STEP 5** Write up your answer; do not try to correct errors identified at this late stage.

Skills Checkpoint 2 covers this technique in detail through application to an exam-standard question.

Skill 3: Identifying the required numerical analysis

Some exam questions **will not directly state which numerical techniques should be used** and you may have to use clues in the scenario of the question to select an appropriate technique.

This issue commonly arises in syllabus Section C, acquisitions and mergers. Often you will need to assess from the scenario what type of valuation is required and what techniques can be used given the details that are provided in the scenario.

In syllabus Section B, investment appraisal questions will also sometimes be formulated so that you will have to infer that specific techniques (such as real options or adjusted present value) are required ie the question may not always specifically tell you to use these techniques.

A step-by-step technique for developing this skill is outlined below.

- STEP 1** Don't panic if you do not immediately see which technique needs to be used – spend time considering the range of techniques that could potentially be applied in the scenario presented.
- STEP 2** Next, carefully analyse the scenario and consider why numerical information has been provided and which of the techniques that you have identified in Step 1 can be used given this information.
- STEP 3** Complete your numerical analysis.

Skills Checkpoint 3 covers this technique in detail through application to an exam-standard question.

Skill 4: Applying risk management techniques

Section E of the AFM syllabus covers treasury and advanced risk management techniques and directly focuses on the skill of 'applying risk management techniques'.

The AFM exam will **always contain a question that will have a clear focus on this syllabus area**, so this skill is extremely important.

Successful application of this skill will require a strong technical knowledge of this syllabus area, especially of setting up arrangements to manage risk using futures and options.

Additionally, you will need to be able to forecast the outcome of a technique quickly and efficiently under exam conditions.

Finally, as well as being able to apply the techniques numerically you need to be able to discuss the advantages and disadvantages of using them, the meaning of the numbers and their suitability given the scenario (as discussed in Skills Checkpoint 1).

A step-by-step technique for developing this skill is outlined below.

- STEP 1** Spend time analysing the scenario and requirements to ensure that you understand the nature of the risk being faced. Work out how many minutes you have to answer each part of the question.
- STEP 2** Plan your answer. Double check that you are applying the correct type of risk management analysis given the nature of the risk that is faced and the techniques mentioned in the scenario. Identify a time-efficient approach.
- STEP 3** Complete your numerical analysis. Don't overcomplicate it – aim for a set of clear relevant numbers. Be careful not to overrun on time with your calculations.
- STEP 4** Explain the meaning of your numbers – relating your points to the scenario wherever possible.

Skills Checkpoint 4 covers this technique in detail through application to an exam-standard question.

Skill 5: Thinking across the syllabus

A common cause for failure in the AFM exam is that students focus on mastering the key numerical parts of the syllabus (typically investment appraisal, valuation techniques and risk management) but leave gaps in their knowledge, in two senses:

- (1) Failing to carefully revise discussion areas within a given syllabus section
- (2) Neglecting some syllabus sections entirely; for example, syllabus Sections A and D are often neglected because they do not contain complex numerical techniques

The structure of the AFM exam exposes students that have knowledge gaps because:

- Exams are designed so that question-spotting does not work
- The 50-mark question is structured to test multiple syllabus areas
- The 25-mark questions, although often focusing on a specific syllabus section, normally contain three requirements which often means that a wide variety of topics within this syllabus area are tested
- And, of course, there are no optional questions

It is therefore crucial that you prepare yourself for the exam by revising across the whole syllabus, even if your knowledge is deeper in some areas than others there **must not be any 'gaps'**, and that you practice questions that force you to address a problem from a variety of perspectives. This skill will often involve thinking outside the confines of one specific chapter of the workbook and **thinking across the syllabus**.

A step-by-step technique for developing this skill is outlined below.

- STEP 1** Analyse the scenario and requirements. Consider the wording of the requirements carefully to understand the nature of the problem being faced.
- STEP 2** Next, plan your answer. Double-check that you are applying the correct knowledge and that you are not neglecting other syllabus areas that would help to support your analysis.
- STEP 3** Produce your answer, explaining the meaning of your points – and relating them to the scenario wherever possible.

Skills Checkpoint 5 covers this technique in detail through application to an exam-standard question.

Exam success skills

Passing the AFM exam requires more than applying syllabus knowledge and demonstrating the specific AFM skills; it also requires the development of excellent exam technique through question practice.

We consider the following six skills to be vital for exam success. The Skills Checkpoints show how each of these skills can be applied in the exam.

Exam success skill 1

Managing information

Questions in the exam will present you with a lot of information. The skill is how you handle this information to make the best use of your time. The key is determining how you will approach the exam and then actively reading the questions.

Advice on developing Managing information

Approach

The exam is 3 hours 15 minutes long. There is no designated 'reading' time at the start of the exam, however, one approach that can work well is to start the exam by spending 10–15 minutes carefully reading through all of the questions to familiarise yourself with the exam paper.

Once you feel familiar with the exam consider the order in which you will attempt the questions; always attempt them in your order of preference. For example, you may want to leave to last the question you consider to be the most difficult.

If you do take this approach, remember to adjust the time available for each question appropriately – see Exam success skill 6: Good time management.

If you find that this approach doesn't work for you, don't worry – you can develop your own technique.

Active reading

You must take an active approach to reading each question. Focus on the requirement first, underlining key verbs such as 'prepare', 'comment', 'explain', 'discuss', to ensure you answer the question properly. Then read the rest of the question, underlining and annotating important and relevant information, and making notes of any relevant technical information you think you will need.

Exam success skill 2

Correct interpretation of the requirements

The active verb used often dictates the approach that written answers should take (eg 'explain', 'discuss', 'evaluate'). It is important you identify and use the verb to define your approach. The **correct interpretation of the requirements** skill means correctly producing only what is being asked for by a requirement. Anything not required will not earn marks.

Advice on developing correct interpretation of the requirements

This skill can be developed by analysing question requirements and applying this process:

Step 1 **Read the requirement**

Firstly, read the requirement a couple of times slowly and carefully and highlight the active verbs. Use the active verbs to define what you plan to do. Make sure you identify any sub-requirements.

Step 2 **Read the rest of the question**

By reading the requirement first, you will have an idea of what you are looking out for as you read through the case overview and exhibits. This is a great time saver and means you don't end up having to read the whole question in full twice. You should do this in an active way – see Exam success skill 1: Managing Information.

Step 3 **Read the requirement again**

Read the requirement again to remind yourself of the exact wording before starting your written answer. This will capture any misinterpretation of the requirements or any missed requirements entirely. This should become a habit in your approach and, with repeated practice, you will find the focus, relevance and depth of your answer plan will improve.

Exam success skill 3

Answer planning: Priorities, structure and logic

This skill requires the planning of the key aspects of an answer which accurately and completely responds to the requirement.

Advice on developing Answer planning: Priorities, structure and logic

Everyone will have a preferred style for an answer plan. For example, it may be a mind map, bullet-pointed lists or simply annotating the question paper. Choose the approach that you feel most comfortable with, or, if you are not sure, try out different approaches for different questions until you have found your preferred style.

For a discussion question, annotating the question paper is likely to be insufficient. It would be better to draw up a separate answer plan in the format of your choosing (eg a mind map or bullet-pointed lists).

Exam success skill 4

Efficient numerical analysis

This skill aims to maximise the marks awarded by making clear to the marker the process of arriving at your answer. This is achieved by laying out an answer such that, even if you make a few errors, you can still score subsequent marks for follow-on calculations. It is vital that you do not lose marks purely because the marker cannot follow what you have done.

Advice on developing Efficient numerical analysis

This skill can be developed by applying the following process:

Step 1 Use a standard proforma working where relevant

If answers can be laid out in a standard proforma then always plan to do so. This will help the marker to understand your working and allocate the marks easily. It will also help you to work through the figures in a methodical and time-efficient way.

Step 2 Show your workings

Keep your workings as clear and simple as possible and ensure they are cross-referenced to the main part of your answer. Where it helps, provide brief narrative explanations to help the marker understand the steps in the calculation. This means that if a mistake is made you do not lose any subsequent marks for follow-on calculations.

Step 3 Keep moving!

It is important to remember that, in an exam situation, it is difficult to get every number 100% correct. The key is therefore ensuring you do not spend too long on any single calculation. If you are struggling with a solution then make a sensible assumption, state it and move on.

Exam success skill 5

Effective writing and presentation

Written answers should be presented so that the marker can clearly see the points you are making, presented in the format specified in the question. The skill is to provide efficient written answers with sufficient breadth of points that answer the question, in the right depth, in the time available.

Advice on developing Effective writing and presentation

Step 1 Use headings

Using the headings and sub-headings from your answer plan will give your answer structure, order and logic. This will ensure your answer links back to the requirement and is clearly signposted, making it easier for the marker to understand the different points you are making. Underlining your headings will also help the marker.

Step 2 Write your answer in short, but full, sentences

Use short, punchy sentences with the aim that every sentence should say something different and generate marks. Write in full sentences, ensuring your style is professional.

Step 3 Do your calculations first and explanation second

Questions often ask for an explanation with suitable calculations. The best approach is to prepare the calculation first but present it on the bottom half of the page of your answer, or on the next page. Then add the explanation before the calculation. Performing the calculation first should enable you to explain what you have done.

Exam success skill 6

Good time management

This skill means planning your time across all the requirements so that all tasks have been attempted at the end of the 3 hours 15 minutes available and actively checking on time during your exam. This is so that you can flex your approach and prioritise requirements which, in your judgement, will generate the maximum marks in the available time remaining.

Advice on developing Good time management

The exam is 3 hours 15 minutes long, which translates to 1.95 minutes per mark. Therefore a 10-mark requirement should be allocated a maximum of 20 minutes to complete your answer before you move on to the next task. At the beginning of a question, work out the amount of time you should be spending on each requirement and write the finishing time next to each requirement on your exam paper.

Keep an eye on the clock

Aim to attempt all requirements, but be ready to be ruthless and move on if your answer is not going as planned. The challenge for many is sticking to planned timings. Be aware this is difficult to achieve in the early stages of your studies and be ready to let this skill develop over time.

If you find yourself running short on time and know that a full answer is not possible in the time you have, consider recreating your plan in overview form and then add key terms and details as time allows. Remember, some marks may be available, for example, simply stating a conclusion which you don't have time to justify in full.

Question practice

Question practice is a core part of learning new topic areas. When you practise questions, you should focus on improving the Exam success skills – personal to your needs – by obtaining feedback or through a process of self-assessment.

Question Bank

ROLE OF THE SENIOR FINANCIAL ADVISER IN THE MULTINATIONAL ORGANISATION

Questions 1 to 10 cover the role and responsibility towards stakeholders, the subject of Part A of the BPP Workbook for AFM.

1 Preparation question: Mezza (6/11, amended)

49 mins

[Note that from September 2018 questions that are wholly narrative will not be set]

Mezza Co is a large food manufacturing and wholesale company. It imports fruit and vegetables from countries in South America, Africa and Asia, and packages them in steel cans and plastic tubs and as frozen foods, for sale to supermarkets around Europe. Its suppliers range from individual farmers to government-run co-operatives, and farms run by its own subsidiary companies. In the past, Mezza Co has been very successful in its activities, and has an excellent corporate image with its customers, suppliers and employees. Indeed Mezza Co prides itself on how it has supported local farming communities around the world and has consistently highlighted these activities in its annual reports.

However, in spite of buoyant stock markets over the last couple of years, Mezza Co's share price has remained static. Previously announcements to the stock market about growth potential led to an increase in the share price. It is thought that the current state is because there is little scope for future growth in its products. As a result the company's directors are considering diversifying into new areas. One possibility is to commercialise a product developed by a recently acquired subsidiary company. The subsidiary company is engaged in researching solutions to carbon emissions and global warming, and has developed a high carbon absorbing variety of plant that can be grown in warm, shallow sea water. The plant would then be harvested into carbon-neutral bio-fuel. This fuel, if widely used, is expected to lower carbon production levels.

Currently there is a lot of interest among the world's governments in finding solutions to climate change. Mezza Co's directors feel that this venture could enhance its reputation and result in a rise in its share price. They believe that the company's expertise would be ideally suited to commercialising the product. On a personal level, they feel that the venture's success would enhance their generous remuneration package which includes share options. It is hoped that the resulting increase in the share price would enable the options to be exercised in the future.

Mezza Co has identified the coast of Maienar, a small country in Asia, as an ideal location, as it has a large area of warm, shallow waters. Mezza Co has been operating in Maienar for many years and as a result, has a well-developed infrastructure to enable it to plant, monitor and harvest the crop, although a new facility would be needed to process the crop after harvesting. The new plant would employ local people. Mezza Co's directors have strong ties with senior government officials in Maienar and the country's politicians are keen to develop new industries, especially ones with a long-term future.

The area identified by Mezza Co is a rich fishing ground for local fishermen, who have been fishing there for many generations. However, the fishermen are poor and have little political influence. The general perception is that the fishermen contribute little to Maienar's economic development. The coastal area, although naturally beautiful, has not been well developed for tourism. It is thought that the high carbon absorbing plant, if grown on a commercial scale, may have a negative impact on fish stocks and other wildlife in the area. The resulting decline in fish stocks may make it impossible for the fishermen to continue with their traditional way of life.

Required

- (a) Discuss the key issues that the directors of Mezza Co should consider when making the decision about whether or not to commercialise the new product, and suggest how these issues may be mitigated or resolved. **(17 marks)**
- (b) Advise the board on what Mezza Co's integrated report should disclose about the impact of undertaking the project on Mezza Co's capitals. **(8 marks)**

(Total = 25 marks)

2 Preparation question: Strom (12/12, amended)

49 mins

[Note that from September 2018 questions that are wholly narrative will not be set]

Strom Co is a clothing retailer, with stores selling mid-price clothes and clothing accessories throughout Europe. It sells its own-brand items, which are produced by small manufacturers located in Africa, who work solely for Strom Co. The recent European sovereign debt crisis has affected a number of countries in the European Union (EU). Consequently, Strom Co has found trading conditions to be extremely difficult, putting pressure on profits and sales revenue.

The sovereign debt crisis in Europe resulted in countries finding it increasingly difficult and expensive to issue government bonds to raise funds. Two main reasons have been put forward to explain why the crisis took place: firstly, a number of countries continued to borrow excessive funds, because their expenditure exceeded taxation revenues; and secondly, a number of countries allocated significant sums of money to support their banks following the 'credit crunch' and the banking crisis.

In order to prevent countries defaulting on their debt obligations and being downgraded, the countries in the EU and the International Monetary Fund (IMF) established a fund to provide financial support to member states threatened by the risk of default, credit downgrades and excessive borrowing yields. Strict economic conditions known as austerity measures were imposed on these countries in exchange for receiving financial support.

The austerity measures have affected Strom Co negatively, and the years 20X1 and 20X2 have been particularly bad, with sales revenue declining by 15% and profits by 25% in 20X1, and remaining at 20X1 levels in 20X2. On investigation, Strom Co noted that clothing retailers selling clothes at low prices and at high prices were not affected as badly as Strom Co or other mid-price retailers. Indeed, the retailers selling low-priced clothes had increased their profits, and retailers selling luxury, expensive clothes had maintained their profits over the last two to three years.

In order to improve profitability, Strom Co's board of directors expects to cut costs where possible. A significant fixed cost relates to quality control, which includes monitoring the working conditions of employees of Strom Co's clothing manufacturers, as part of its ethical commitment.

Required

- (a) Explain the role and aims of the IMF and discuss possible reasons why the austerity measures imposed on EU countries might have affected Strom Co negatively. **(10 marks)**
- (b) Suggest, giving reasons, why the austerity measures might not have affected clothing retailers at the high and low price range, as much as the mid-price range retailers like Strom Co. **(4 marks)**
- (c) Discuss the risks to Strom Co of reducing the costs relating to quality control and how the detrimental impact of such reductions in costs could be decreased. **(6 marks)**
- (d) Discuss the competitive advantages that a global multinational clothing retailer would have over a clothing retailer based in one Eurozone country. **(5 marks)**

(Total = 25 marks)

3 Preparation question: Bournelorth (Mar/Jun 17)

49 mins

[Note that from September 2018 questions that are wholly narrative will not be set]

Bournelorth Co is an IT company which was established by three friends ten years ago. It was listed on a local stock exchange for smaller companies nine months ago.

Bournelorth Co originally provided support to businesses in the financial services sector. It has been able to expand into other sectors over time due to the excellent services it has provided and the high quality staff whom its founders recruited. The founders have been happy with the level of profits which the IT services have generated. Over time they have increasingly left the supervision of the IT services in the hands of experienced managers and focused on developing diagnostic applications

(apps). The founders have worked fairly independently of each other on development work. Each has a small team of staff and all three want their teams to work in an informal environment which they believe enhances creativity.

Two apps which Bournelorth Co developed were very successful and generated significant profits. The founders wanted the company to invest much more in developing diagnostic apps. Previously they had preferred to use internal funding, because they were worried that external finance providers would want a lot of information about how Bournelorth Co is performing. However, the amount of finance required meant that funding had to be obtained from external sources and they decided to seek a listing, as two of Bournelorth Co's principal competitors had recently been successfully listed.

25% of Bournelorth Co's equity shares were made available on the stock exchange for external investors, which was the minimum allowed by the rules of the exchange. The founders have continued to own the remaining 75% of Bournelorth Co's equity share capital. Although the listing was fully subscribed, the price which new investors paid was lower than the directors had originally hoped.

The board now consists of the three founders, who are the executive directors, and two independent non-executive directors, who were appointed when the company was listed. The non-executive directors have expressed concerns about the lack of frequency of formal board meetings and the limited time spent by the executive directors overseeing the company's activities, compared with the time they spend leading development work. The non-executive directors would also like Bournelorth Co's external auditors to carry out a thorough review of its risk management and control systems.

The funds obtained from the listing have helped Bournelorth Co expand its development activities. Bournelorth Co's competitors have recently launched some very successful diagnostic apps and its executive directors are now afraid that Bournelorth Co will fall behind its competitors unless there is further investment in development. However, they disagree about how this investment should be funded. One executive director believes that Bournelorth Co should consider selling off its IT support and consultancy services business. The second executive director favours a rights issue and the third executive director would prefer to seek debt finance. At present Bournelorth Co has low gearing and the director who is in favour of debt finance believes that there is too much uncertainty associated with obtaining further equity finance, as investors do not always act rationally.

Required

- (a) Discuss the factors which will determine whether the sources of finance suggested by the executive directors are used to finance further investment in diagnostic applications (apps). **(8 marks)**
- (b) (i) Identify the risks associated with investing in the development of apps and describe the controls which Bournelorth Co should have over its investment in development. **(6 marks)**
 - (ii) Discuss the issues which determine the information Bournelorth Co communicates to external finance providers. **(3 marks)**
- (c) (i) Explain the insights which behavioural finance provides about investor behaviour. **(3 marks)**
 - (ii) Assess how behavioural factors may affect the share price of Bournelorth Co. **(5 marks)**

(Total = 25 marks)

The treasury department of Chawan Co, a listed company, aims to maintain a portfolio of around \$360 million consisting of equity shares, corporate bonds and government bonds, which it can turn into cash quickly for investment projects. Chawan Co is considering disposing of 27 million shares, valued at \$2.15 each, which it has invested in Oden Co. The head of Chawan Co's treasury department is of the opinion that, should the decision be made to dispose of its equity stake in Oden Co, this should be sold through a dark pool network and not sold on the stock exchange where Oden Co's shares are listed. In the last few weeks, there have also been rumours that Oden Co may become subject to a takeover bid.

Oden Co operates in the travel and leisure (T&L) sector, and the poor weather conditions in recent years, coupled with a continuing recession, have meant that the T&L sector is underperforming. Over the past three years, sales revenue fell by an average of 8% per year in the T&L sector. However, there are signs that the economy is starting to recover, but this is by no means certain.

Given below are extracts from the recent financial statements and other financial information for Oden Co and the T&L sector.

ODEN CO

YEAR ENDING 31 MAY

	20X3	20X4	20X5
	\$m	\$m	\$m
Total non-current assets	972	990	980
Total current assets	128	142	126
<u>Total assets</u>	<u>1,100</u>	<u>1,132</u>	<u>1,106</u>
Equity			
Ordinary shares (\$0.50)	300	300	300
Reserves	305	329	311
<u>Total equity</u>	<u>605</u>	<u>629</u>	<u>611</u>
Non-current liabilities			
Bank loans	115	118	100
Bonds	250	250	260
<u>Total non-current liabilities</u>	<u>365</u>	<u>368</u>	<u>360</u>
Current liabilities			
Trade and other payables	42	45	37
Bank overdraft	88	90	98
<u>Total current liabilities</u>	<u>130</u>	<u>135</u>	<u>135</u>
<u>Total equity and liabilities</u>	<u>1,100</u>	<u>1,132</u>	<u>1,106</u>

ODEN CO

YEAR ENDING 31 MAY

	20X3	20X4	20X5
	\$m	\$m	\$m
Sales revenue	1,342	1,335	1,185
Operating profit	218	203	123
Finance costs	(23)	(27)	(35)
Profit before tax	195	176	88
Taxation	(35)	(32)	(16)
<u>Profit for the year</u>	<u>160</u>	<u>144</u>	<u>72</u>

OTHER FINANCIAL INFORMATION (BASED ON ANNUAL FIGURES TILL 31 MAY OF EACH YEAR)

	20X2	20X3	20X4	20X5
Oden Co average share price (\$)	2.10	2.50	2.40	2.20
Oden Co dividend per share (\$)	0.15	0.18	0.20	0.15
T&L sector average share price (\$)	3.80	4.40	4.30	4.82
T&L sector average earnings per share (\$)	0.32	0.36	0.33	0.35
T&L sector average dividend per share (\$)	0.25	0.29	0.29	0.31
Oden Co's equity beta	1.5	1.5	1.6	2.0
T&L sector average equity beta	1.5	1.4	1.5	1.6

The risk-free rate and the market return have remained fairly constant over the last 10 years at 4% and 10% respectively.

Required

(a) Explain what a dark pool network is and why Chawan Co may want to dispose of its equity stake in Oden Co through one, instead of through the stock exchange where Oden Co's shares are listed. **(5 marks)**

(b) Discuss whether or not Chawan Co should dispose of its equity stake in Oden Co. Provide relevant calculations to support the discussion.

Note. Up to 10 marks are available for the calculations.

(20 marks)

(Total = 25 marks)

5 High K (Sep/Dec 17)

49 mins

High K Co is one of the three largest supermarket chains in the country of Townia. Its two principal competitors, Dely Co and Lemminster Co, are of similar size to High K Co. In common with its competitors (but see below), High K Co operates three main types of store:

- Town centre stores – these sell food and drink and a range of small household items. High K Co's initial growth was based on its town centre stores, but it has been shutting them over the last decade, although the rate of closure has slowed in the last couple of years.
- Convenience stores – these are smaller and sell food and drink and very few other items. Between 20X3 and 20Y3, High K Co greatly expanded the number of convenience stores it operated. Their performance has varied, however, and since 20Y3, High K Co has not opened any new stores and closed a number of the worst-performing stores.
- Out-of-town stores – these sell food and drink and a full range of household items, including large electrical goods and furniture. The number of out-of-town stores which High K Co operated increased significantly until 20Y0, but has only increased slightly since.

The majority of town centre and out-of-town stores premises are owned by High K Co, but 85% of convenience stores premises are currently leased.

High K Co also sells most of its range of products online, either offering customers home delivery or 'click and collect' (where the customer orders the goods online and picks them up from a collection point in one of the stores).

High K Co's year end is 31 December. When its 20Y6 results were published in April 20Y7, High K Co's chief executive emphasised that the group was focusing on:

- Increasing total shareholder return by improvements in operating efficiency and enhancement of responsiveness to customer needs
- Ensuring competitive position by maintaining flexibility to respond to new strategic challenges
- Maintaining financial strength by using diverse sources of funding, including making use in future of revolving credit facilities

Since April 20Y7, Dely Co and Leminster Co have both announced that they will be making significant investments to boost online sales. Dely Co intends to fund its investments by closing all its town centre and convenience stores, although it also intends to open more out-of-town stores in popular locations.

The government of Townia was re-elected in May 20Y7. In the 18 months prior to the election, it eased fiscal policy and consumer spending significantly increased. However, it has tightened fiscal policy since the election to avoid the economy overheating. It has also announced an investigation into whether the country's large retail chains treat their suppliers unfairly.

Extracts from High K Co's 20Y6 financial statements and other information about it are given below:

HIGH K CO

STATEMENT OF PROFIT OR LOSS EXTRACTS

YEAR ENDING 31 DECEMBER (ALL AMOUNTS IN \$m)

	20Y4	20Y5	20Y6
Sales revenue	23,508	23,905	24,463
Gross profit	1,018	1,211	1,514
Operating profit	204	407	712
Finance costs	(125)	(115)	(100)
Profit after tax	52	220	468
Dividends	150	170	274

HIGH K CO STATEMENT OF FINANCIAL POSITION EXTRACTS

YEAR ENDING 31 DECEMBER (ALL AMOUNTS IN \$m)

Non-current assets	10,056	9,577	8,869
Cash and cash equivalents	24	709	1,215
Other current assets	497	618	747
Total non-current and current assets	<u>10,577</u>	<u>10,904</u>	<u>10,831</u>
<i>Equity</i>			
Ordinary shares (\$1)	800	800	800
Reserves	7,448	7,519	7,627
Total equity	<u>8,248</u>	<u>8,319</u>	<u>8,427</u>
Non-current liabilities	1,706	1,556	1,246
Current liabilities	<u>623</u>	<u>1,029</u>	<u>1,158</u>
<i>Other information</i>			
Market price per share (in \$, \$3.89 at end of 20Y3, \$3.17 currently)	3.54	3.34	3.23
Staff working in shops ('000)	78	75	72
<i>Segment information</i>			
<i>Revenue (\$m)</i>			
Town centre stores	5,265	5,189	5,192
Convenience stores	3,786	3,792	3,833
Out-of-town stores	<u>10,220</u>	<u>10,340</u>	<u>10,547</u>
Store revenue	19,271	19,321	19,572
Online sales	4,237	4,584	4,891
<i>Number of stores</i>			
Town centre stores	165	157	153
Convenience stores	700	670	640
Out-of-town stores	220	224	227

Required

(a) Evaluate High K Co's financial performance. You should indicate in your discussion areas where further information about High K Co would be helpful. Provide relevant calculations for ratios and trends to support your evaluation.

Note. Up to 10 marks are available for calculations. **(21 marks)**

(b) Discuss how High K Co may seek to finance an investment programme. **(4 marks)**

(Total = 25 marks)

6 Tillinton (Sep 18)

49 mins

Tillinton Co is a listed company which has traditionally manufactured children's clothing and toys with long lives. Five years ago, it began manufacturing electronic toys and has since made significant investment in development and production facilities. The first electronic toys which Tillinton Co introduced into the market were received very well, partly as it was seen to be ahead of its competitors in making the most of the technology available.

The country where Tillinton Co is listed has seen a significant general increase in share prices over the last three years, with companies in the electronic goods sector showing particularly rapid increases.

Statement by Tillinton Co's chief executive

Assume it is now September 20X3. Tillinton Co's annual report for the year ended 31 March 20X3 has just been published. Its chief executive commented when announcing the company's results:

'I am very pleased to report that revenue and gross profits have shown bigger increases than in 20X2, resulting in higher post-tax earnings and our company being able to maintain increases in dividends. The sustained increase in our share price clearly demonstrates how happy investors are with us. Our cutting-edge electronic toys continue to perform well and justify our sustained investment in them. Our results have also benefited from improvements in operational efficiencies for our older ranges and better working capital management. We are considering the development of further ranges of electronic toys for children, or developing other electronic products for adults. If necessary, we may consider scaling down or selling off our operations for some of our older products.'

Steph Slindon represents an institutional investor who holds shares in Tillinton Co. Steph is doubtful whether its share price will continue to increase, because she thinks that Tillinton Co's situation may not be as good as its chief executive suggests and because she believes that current share price levels generally may not be sustainable.

Financial information

Extracts from Tillinton Co's financial statements for the last three years and other information about it are given below.

Tillinton Co statement of profit or loss in years ending 31 March (all amounts in \$m)

	20X1	20X2	20X3
Sales revenue	1,385	1,636	1,914
Gross profit	381	451	528
Operating profit	205	252	300
Finance costs	(46)	(50)	(66)
Profit before tax	159	202	234
Taxation	(40)	(51)	(65)
Profit after tax	119	151	169
Dividends	(60)	(72)	(84)

**Tillinton Co statement of financial position in years ending 31 March
(all amounts in \$m)**

	20X1	20X2	20X3
Non-current assets	2,070	2,235	2,449
Cash and cash equivalents	10	15	15
Other current assets	150	130	125
Total non-current and current assets	<u>2,230</u>	<u>2,380</u>	<u>2,589</u>
Equity			
Ordinary shares (\$0.50)	400	400	400
Reserves	805	884	969
Total equity	1,205	1,284	1,369
Non-current liabilities	920	970	1,000
Current liabilities	105	126	220
Total equity and liabilities	<u>2,230</u>	<u>2,380</u>	<u>2,589</u>

Other information

Market price per \$0.50 share (\$2.50 at 31 March 20X0,

\$5.06 in Sept 20X3)	\$2.76	\$3.49	\$4.44
Earnings per share (\$)	0.15	0.19	0.21
Dividend per share (\$)	0.075	0.09	0.105

Analysis of revenue

Electronic toys	249	319	390
Non-electronic toys	302	350	404
Clothing	834	967	1,120
	<u>1,385</u>	<u>1,636</u>	<u>1,914</u>

Analysis of gross profit

Electronic toys	100	112	113
Non-electronic toys	72	88	105
Clothing	209	251	310
	<u>381</u>	<u>451</u>	<u>528</u>

Note. None of Tillinton Co's loan finance in 20X3 is repayable within one year.

Required

(a) Evaluate Tillinton Co's performance and business prospects in the light of the chief executive's comments and Steph Slindon's concerns. Provide relevant calculations for ratios and trends to support your evaluation.

Note. 10 marks are available for the calculations. **(20 marks)**

(b) Discuss how behavioural factors may have resulted in Tillinton Co's share price being higher than is warranted by a rational analysis of its position. **(5 marks)**

(Total = 25 marks)

7 Limni Co (6/13)

49 mins

Limni Co is a large company manufacturing hand-held electronic devices such as mobile phones and tablet computers. The company has been growing rapidly over the last few years, but it also has high research and development expenditure. It is involved in a number of projects worldwide, developing new and innovative products and systems in a rapidly changing industry. Due to the nature of the industry, this significant growth in earnings has never been stable, but has depended largely on the success of the new innovations and competitor actions. However, in the last two years it seems that the rapid period of growth is slowing, with fewer products coming to market compared to previous years.

Limni Co has never paid dividends and has financed projects through internally generated funds and with occasional rights issues of new share capital. It currently has insignificant levels of debt. The retained cash reserves have recently grown because of a drop in the level of investment in new projects.

The company has an active treasury division which invests spare funds in traded equities, bonds and other financial instruments; and releases the funds when required for new projects. The division also manages cash flow risk using money and derivative markets. The treasury division is currently considering investing in three companies with the following profit after tax (PAT) and dividend history:

Year	Company Theta		Company Omega		Company Kappa	
	PAT \$'000	Dividends \$'000	PAT \$'000	Dividends \$'000	PAT \$'000	Dividends \$'000
20X7	57,100	22,840	93,300	60,560	162,400	44,100
20X6	54,400	21,760	90,600	57,680	141,500	34,200
20X5	52,800	21,120	88,000	54,840	108,900	26,300
20X4	48,200	19,280	85,400	52,230	105,700	20,250
20X3	45,500	18,200	82,900	49,740	78,300	15,700

All three companies' share capital has remained largely unchanged since 20X3.

Recently, Limni Co's board of directors (BoD) came under pressure from the company's larger shareholders to start returning some of the funds, currently retained by the company, back to the shareholders. The BoD thinks that the shareholders have a strong case to ask for repayments. However, it is unsure whether to pay a special, one-off large dividend from its dividend capacity and retained funds, followed by small annual dividend payments, or to undertake a periodic share buyback scheme over the next few years.

Limni Co is due to prepare its statement of profit or loss shortly and estimates that the annual sales revenue will be \$600 million, on which its profit before tax is expected to be 23% of sales revenue. It charges depreciation of 25% on a straight-line basis on its non-current assets of \$220 million. It estimates that \$67 million investment in current and non-current assets was spent during the year. It is due to receive \$15 million in dividends from its subsidiary companies, on which annual tax of 20% on average has been paid. Limni Co itself pays annual tax at 26%, and the tax authorities where Limni Co is based charge tax on dividend remittances made by overseas subsidiary companies, but give full credit on tax already paid on those remittances. In order to fund the new policy of returning funds to shareholders, Limni Co's BoD wants to increase the current estimated dividend capacity by 10%, by asking the overseas subsidiary companies for higher repatriations.

Required

- (a) Discuss Limni Co's current dividend, financing and risk management policies, and suggest how the decision to return retained funds back to the shareholders will affect these policies. **(8 marks)**
- (b) Evaluate the dividend policies of each of the three companies that Limni Co is considering investing in, and discuss which company Limni Co might select. **(8 marks)**
- (c) Calculate, and briefly comment on, how much the dividends from overseas companies need to increase by, to increase Limni Co's dividend capacity by 10%. **(6 marks)**
- (d) Discuss the benefits to Limni Co's shareholders of receiving repayments through a share buyback scheme as opposed to the dividend scheme described above. **(3 marks)**

(Total = 25 marks)

Arthur Co is based in Hittyland and is listed on Hittyland's stock exchange. Arthur Co has one wholly-owned subsidiary, Bowerscots Co, based in the neighbouring country of Owlia. Hittyland and Owlia are in a currency union and the currency of both countries is the \$.

Arthur Co purchased 100% of Bowerscots Co's share capital three years ago. Arthur Co has the power under the acquisition to determine the level of dividend paid by Bowerscots Co. However, Arthur Co's board decided to let Bowerscots Co's management team have some discretion when making investment decisions. Arthur Co's board decided that it should receive dividends of 60% of Bowerscots Co's post-tax profits and has allowed Bowerscots Co to use its remaining retained earnings to fund investments chosen by its management. A bonus linked to Bowerscots Co's after-tax profits is a significant element of Bowerscots Co's managers' remuneration.

Bowerscots Co operates in a very competitive environment. Recently, a senior member of its management team has left to join a competitor.

Arthur Co's dividend policy

Until three months ago, Arthur Co had 90 million \$2 equity shares in issue and \$135 million 8% bonds. Three months ago it made a 1 for 3 rights issue. A number of shareholders did not take up their rights, but sold them on, so there have been changes in its shareholder base. Some shareholders expressed concern about dilution of their dividend income as a result of the rights issue. Therefore, Arthur Co's board felt it had to promise, for the foreseeable future, at least to maintain the dividend of \$0.74 per equity share, which it paid for the two years before the rights issue.

Arthur Co's board is nevertheless concerned about whether it will have sufficient funds available to fulfil its promise about the dividend. It has asked the finance director to forecast its dividend capacity based on assumptions about what will happen in a 'normal' year. The finance director has made the following assumptions in the forecast:

1. Sales revenue can be assumed to be 4% greater than the most recent year's of \$520 million.
2. The operating profit margin can be assumed to be 20%.
3. Operating profit can be assumed to be reported after charging depreciation of \$30 million and profit on disposal of non-current assets of \$5.9 million. The cost of the non-current assets sold can be assumed to be \$35 million and its accumulated depreciation to be \$24.6 million. Depreciation is allowable for tax and the profit on disposal is fully chargeable to tax.
4. The net book value of non-current assets at the year end in the most recent accounts was \$110 million. To maintain productive capacity, sufficient investment to increase this net book value figure 12 months later by 4% should be assumed, in line with the increase in sales. The calculation of investment required for the year should take into account the depreciation charged of \$30 million, and net book value of the non-current assets disposed of during the year.
5. A \$0.15 investment in working capital can be assumed for every \$1 increase in sales revenue.
6. Bowerscots Co's pre-tax profits can be assumed to be \$45 million.

Arthur Co's directors have decided that if there is a shortfall of dividend capacity, compared with the dividends required to maintain the current dividend level, the percentage of post-tax profits of Bowerscots Co paid as dividend should increase, if necessary up to 100%.

Taxation

Arthuro Co pays corporation tax at 30% and Bowerscots Co pays corporation tax at 20%. A withholding tax of 5% is deducted from any dividends remitted by Bowerscots Co. There is a bilateral tax treaty between Hittyland and Owlia. Corporation tax is payable by Arthuro Co on profits declared by Bowerscots Co, but Hittyland gives full credit for corporation tax already paid in Owlia. Hittyland gives no credit for withholding tax paid on dividends in Owlia.

Required

(a) (i) Estimate Arthuro Co's forecast dividend capacity for a 'normal' year; **(11 marks)**
(ii) Estimate the level of dividend required from Bowerscots Co to give Arthuro Co sufficient dividend capacity to maintain its dividend level of \$0.74 per equity share. **(3 marks)**

(b) Arthuro Co has decided to increase its level of dividend from Bowerscots Co if its dividend capacity is insufficient.

Required

(i) From Arthuro Co's viewpoint, discuss the financial benefits of, and problems with, this decision; **(5 marks)**
(ii) Discuss the agency problems, and how they might be resolved, with this decision. **(6 marks)**

(Total = 25 marks)

9 Lamri (12/10, amended)

49 mins

Lamri Co (Lamri), a listed company, is expecting sales revenue to grow to \$80 million next year, which is an increase of 20% from the current year. The operating profit margin for next year is forecast to be the same as this year at 30% of sales revenue. In addition to these profits, Lamri receives 75% of the after-tax profits from one of its wholly owned foreign subsidiaries, Magnolia Co (Magnolia), as dividends. However, its second wholly owned foreign subsidiary, Strymon Co (Strymon), does not pay dividends.

Lamri is due to pay dividends of \$7.5 million shortly and has maintained a steady 8% annual growth rate in dividends over the past few years. The company has grown rapidly in the last few years as a result of investment in key projects and this is likely to continue.

For the coming year it is expected that Lamri will require the following capital investment.

- An investment equivalent to the amount of depreciation to keep its non-current asset base at the present productive capacity. Lamri charges depreciation of 25% on a straight-line basis on its non-current assets of \$15 million. This charge has been included when calculating the operating profit amount.
- A 25% investment in additional non-current assets for every \$1 increase in sales revenue.
- \$4.5 million additional investment in non-current assets for a new project.

Lamri also requires a 15% investment in working capital for every \$1 increase in sales revenue.

Strymon produces specialist components solely for Magnolia to assemble into finished goods. Strymon will produce 300,000 specialist components at \$12 variable cost per unit and will incur fixed costs of \$2.1 million for the coming year. It will then transfer the components to Magnolia at full cost price, where they will be assembled at a cost of \$8 per unit and sold for \$50 per unit. Magnolia will incur additional fixed costs of \$1.5 million in the assembly process.

Tax-Ethic (TE) is a charitable organisation devoted to reducing tax avoidance schemes by companies operating in poor countries around the world. TE has petitioned Lamri's board of directors to reconsider Strymon's policy of transferring goods at full cost. TE suggests that the policy could be changed to cost plus 40% mark-up. If Lamri changes Strymon's policy, it is expected that Strymon would be asked to remit 75% of its after-tax profits as dividends to Lamri.

Other information

- 1 Lamri's outstanding non-current liabilities of \$35 million, on which it pays interest of 8% per year, and its 30 million \$1 issued equity capital will not change for the coming year.
- 2 Lamri's, Magnolia's and Strymon's profits are taxed at 28%, 22% and 42% respectively. A withholding tax of 10% is deducted from any dividends remitted from Strymon.
- 3 The tax authorities where Lamri is based charge tax on profits made by subsidiary companies but give full credit for tax already paid by overseas subsidiaries.
- 4 All costs and revenues are in \$ equivalent amounts and exchange rate fluctuations can be ignored.

Required

- (a) Calculate Lamri's dividend capacity for the coming year prior to implementing TE's proposal and after implementing the proposal. **(14 marks)**
- (b) Comment on the impact of implementing TE's proposal and suggest possible actions Lamri may take as a result. **(6 marks)**
- (c) Outline the mechanisms that the tax authorities could use to prevent transfer price manipulation by Lamri. **(5 marks)**

(Total = 25 marks)

10 Moonstar (Sep/Dec 15)

49 mins

Moonstar Co is a property development company which is planning to undertake a \$200 million commercial property development. Moonstar Co has had some difficulties over the last few years, with some developments not generating the expected returns and the company has at times struggled to pay its finance costs. As a result Moonstar Co's credit rating has been lowered, affecting the terms it can obtain for bank finance. Although Moonstar Co is listed on its local stock exchange, 75% of the share capital is held by members of the family who founded the company. The family members who are shareholders do not wish to subscribe for a rights issue and are unwilling to dilute their control over the company by authorising a new issue of equity shares. Moonstar Co's board is therefore considering other methods of financing the development, which the directors believe will generate higher returns than other recent investments, as the country where Moonstar Co is based appears to be emerging from recession.

Securitisation proposals

One of the non-executive directors of Moonstar Co has proposed that it should raise funds by means of a securitisation process, transferring the rights to the rental income from the commercial property development to a special purpose vehicle. Her proposals assume that the leases will generate an income of 11% per annum to Moonstar Co over a 10-year period. She proposes that Moonstar Co should use 90% of the value of the investment for a collateralised loan obligation which should be structured as follows:

- 60% of the collateral value to support a tranche of A-rated floating rate loan notes offering investors LIBOR plus 150 basis points
- 15% of the collateral value to support a tranche of B-rated fixed rate loan notes offering investors 12%
- 15% of the collateral value to support a tranche of C-rated fixed rate loan notes offering investors 13%
- 10% of the collateral value to support a tranche as subordinated certificates, with the return being the excess of receipts over payments from the securitisation process

The non-executive director believes that there will be sufficient demand for all tranches of the loan notes from investors. Investors will expect the income stream from the development to be low risk, as they will expect the property market to improve with the recession coming to an end and enough potential lessees to be attracted by the new development.

The non-executive director predicts that there would be annual costs of \$200,000 in administering the loan. She acknowledges that there would be interest rate risks associated with the proposal, and proposes a fixed for variable interest rate swap on the A-rated floating rate notes, exchanging LIBOR for 9.5%.

However, the Finance Director believes that the prediction of the income from the development that the non-executive director has made is over-optimistic. He believes that it is most likely that the total value of the rental income will be 5% lower than the non-executive director has forecast. He believes that there is some risk that the returns could be so low as to jeopardise the income for the C-rated fixed rate loan note holders.

Islamic finance

Moonstar Co's Chief Executive has wondered whether Sukuk finance would be a better way of funding the development than the securitisation.

Moonstar Co's Chairman has pointed out that a major bank in the country where Moonstar Co is located has begun to offer a range of Islamic financial products. The Chairman has suggested that a Mudaraba contract would be the most appropriate method of providing the funds required for the investment.

Required

- (a) Calculate the amounts in \$ which each of the tranches can expect to receive from the securitisation arrangement proposed by the non-executive director and discuss how the variability in rental income affects the returns from the securitisation. **(11 marks)**
- (b) Discuss the benefits and risks for Moonstar Co associated with the securitisation arrangement that the non-executive director has proposed. **(6 marks)**
- (c) (i) Discuss the suitability of Sukuk finance to fund the investment, including an assessment of its appeal to potential investors. **(4 marks)**
- (ii) Discuss whether a Mudaraba contract would be an appropriate method of financing the investment and discuss why the bank may have concerns about providing finance by this method. **(4 marks)**

(Total = 25 marks)

ADVANCED INVESTMENT APPRAISAL

Questions 11 to 23 cover advanced investment appraisal, the subject of Part B of the BPP Workbook for AFM.

11 Preparation question: Cathlynn

29 mins

- (a) The current share price of Cathlynn plc is £3.50. Using the Black-Scholes model, estimate the value of a European call option on the shares of the company that has an exercise price of £3.30 and 3 months to run before it expires. The risk-free rate of interest is 8% and the variance of the rate of return on the share has been 12%.

Note. The Black-Scholes formula shows call price for a European option P_c where

$$P_c = P_s N(d_1) - X e^{-rT} N(d_2)$$

Where $N(d)$ = cumulative distribution function

$$d_1 = \frac{\ln(P_s / X) + rT}{\sigma\sqrt{T}} + 0.5\sigma\sqrt{T}$$

$$d_2 = d_1 - \sigma\sqrt{T}$$

P_s = share price

e = the exponential constant 2.7183

X = exercise price of option

r = annual (continuously compounded) risk-free rate of return

T = time of expiry of option in years

σ = share price volatility, the standard deviation of the rate of return on shares

$N(d_x)$ = delta, the probability that a deviation of less than d_x will occur in a normal distribution with a mean of zero and a standard deviation of one

\ln = natural log

Normal distribution tables are in the appendix to this Kit.

(10 marks)

(b) Discuss the main limitations of the Black-Scholes model.

(5 marks)

(Total = 15 marks)

12 Preparation question: Faoilean (6/14)

49 mins

[Note that from September 2018 questions that are wholly narrative will not be set]

The Chief Executive Officer (CEO) of Faoilean Co has just returned from a discussion at a leading university on the 'application of options to investment decisions and corporate value'. She wants to understand how some of the ideas which were discussed can be applied to decisions made at Faoilean Co. She is still a little unclear about some of the discussion on options and their application, and wants further clarification on the following:

- (i) Faoilean Co is involved in the exploration and extraction of oil and gas. Recently there have been indications that there could be significant deposits of oil and gas just off the shores of the Republic of Ireland. The Government of the Republic of Ireland has invited companies to submit bids for the rights to commence the initial exploration of the area to assess the likelihood and amount of oil and gas deposits, with further extraction rights to follow. Faoilean Co is considering putting in a bid for the rights. The speaker leading the discussion suggested that using options as an investment assessment tool would be particularly useful to Faoilean Co in this respect.
- (ii) The speaker further suggested that options were useful in determining the value of equity and default risk, and suggested that this was why companies facing severe financial distress could still have a positive equity value.
- (iii) Towards the end of the discussion, the speaker suggested that changes in the values of options can be measured in terms of a number of risk factors known as the 'greeks', such as the 'vega'. The CEO is unclear why option values are affected by so many different risk factors.

Required

- (a) With regard to (i) above, discuss how Faoilean Co may use the idea of options to help with the investment decision in bidding for the exploration rights, and explain the assumptions made when using the idea of options in making investment decisions. **(11 marks)**
- (b) With regard to (ii) above, discuss how options could be useful in determining the value of equity and default risk, and why companies facing severe financial distress still have positive equity values. **(9 marks)**
- (c) With regard to (iii) above, explain why changes in option values are determined by numerous different risk factors and what 'vega' determines. **(5 marks)**

(Total = 25 marks)

13 Fernhurst (Sep/Dec 16)

49 mins

Fernhurst Co is a manufacturer of mobile communications technology. It is about to launch a new communications device, the Milland, which its directors believe is both more technologically advanced and easier to use than devices currently offered by its rivals.

Investment in the Milland

The Milland will require a major investment in facilities. Fernhurst Co's directors believe that this can take place very quickly and production be started almost immediately.

Fernhurst Co expects to sell 132,500 units of the Milland in its first year. Sales volume is expected to increase by 20% in Year 2 and 30% in Year 3, and then be the same in Year 4 as Year 3, as the product reaches the end of its useful life. The initial selling price in Year 1 is expected to be \$100 per unit, before increasing with the rate of inflation annually.

The variable cost of each unit is expected to be \$43.68 in Year 1, rising by the rate of inflation in subsequent years annually. Fixed costs are expected to be \$900,000 in Year 1, rising by the rate of inflation in subsequent years annually.

The initial investment in non-current assets is expected to be \$16,000,000. Fernhurst Co will also need to make an immediate investment of \$1,025,000 in working capital. The working capital will be increased annually at the start of each of Years 2 to 4 by the inflation rate and is fully recoverable at the end of the project's life. Fernhurst Co will also incur one-off marketing expenditure of \$1,500,000 post-inflation after the launch of the Milland. The marketing expenditure can be assumed to be made at the end of Year 1 and be a tax-allowable expense.

Fernhurst Co pays company tax on profits at an annual rate of 25%. Tax is payable in the year that the tax liability arises. Tax-allowable depreciation is available at 20% on the investment in non-current assets on a reducing balance basis. A balancing adjustment will be available in Year 4. The realisable value of the investment at the end of Year 4 is expected to be zero.

The expected annual rate of inflation in the country in which Fernhurst Co is located is 4% in Year 1 and 5% in Years 2 to 4.

The applicable cost of capital for this investment appraisal is 11%.

Other calculations

Fernhurst Co's finance director has indicated that besides needing a net present value calculation based on this data for the next board meeting, he also needs to know the figure for the project's duration, to indicate to the board how returns from the project will be spread over time.

Failure of launch of the Milland

The finance director would also like some simple analysis based on the possibility that the marketing expenditure is not effective and the launch fails, as he feels that the product's price may be too high. He has suggested that there is a 15% chance that the Milland will have negative net cash flows for

Year 1 of \$1,000,000 or more. He would like to know by what percentage the selling price could be reduced or increased to result in the investment having a zero net present value, assuming demand remained the same.

Assessment of new products

Fernhurst Co's last board meeting discussed another possible new product, the Racton, and the finance director presented a range of financial data relating to this product, including the results of net present value and payback evaluations. One of the non-executive directors, who is not a qualified accountant, stated that they found it difficult to see the significance of the different items of financial data. Their understanding was that Fernhurst Co merely had to ensure that the investment had a positive net present value and shareholders were bound to be satisfied with it, as it would maximise their wealth in the long term. The Finance Director commented that, in reality, some shareholders looked at the performance of the investments which Fernhurst Co made over the short term, whereas some were more concerned with the longer term. The financial data he presented to board meetings included both short- and long-term measures.

Required

- (a) Evaluate the financial acceptability of the investment in the Milland and calculate and comment on the investment's duration. **(15 marks)**
- (b) Calculate the percentage change in the selling price required for the investment to have a zero net present value, and discuss the significance of your results. **(5 marks)**
- (c) Discuss the non-executive director's understanding of net present value and explain the importance of other measures in providing data about an investment's short- and long-term performance. **(5 marks)**

(Total = 25 marks)

14 Tisa Co (6/12, amended)

49 mins

Tisa Co is considering an opportunity to produce an innovative component which, when fitted into motor vehicle engines, will enable them to utilise fuel more efficiently. The component can be manufactured using either process Omega or process Zeta. Although this is an entirely new line of business for Tisa Co, it is of the opinion that developing either process over a period of four years and then selling the production rights at the end of four years to another company may prove lucrative.

The annual after-tax cash flows for each process are as follows:

Process Omega

Year	0	1	2	3	4
After-tax cash flows (\$'000)	(3,800)	1,220	1,153	1,386	3,829

Process Zeta

Year	0	1	2	3	4
After-tax cash flows (\$'000)	(3,800)	643	546	1,055	5,990

Tisa Co has 10 million 50c shares trading at 180c each. Its loans have a current value of \$3.6 million and an average after-tax cost of debt of 4.50%. Tisa Co's capital structure is unlikely to change significantly following the investment in either process.

Elfu Co manufactures electronic parts for cars including the production of a component similar to the one being considered by Tisa Co. Elfu Co's equity beta is 1.40, and it is estimated that the equivalent equity beta for its other activities, excluding the component production, is 1.25. Elfu Co has 400 million 25c shares in issue trading at 120c each. Its debt finance consists of variable rate loans redeemable in seven years. The loans paying interest at base rate plus 120 basis points have a current value of \$96 million. It can be assumed that 80% of Elfu Co's debt finance and 75% of Elfu

Co's equity finance can be attributed to other activities excluding the component production. Both companies pay annual corporation tax at a rate of 25%. The current base rate is 3.5% and the market risk premium is estimated at 5.8%.

Required

- (a) Provide a reasoned estimate of the cost of capital that Tisa Co should use to calculate the net present value of the two processes. Include all relevant calculations. **(8 marks)**
- (b) Calculate the internal rate of return (IRR) and the modified internal rate of return (MIRR) for Process Omega. Given that the IRR and MIRR of Process Zeta are 26.6% and 23.3% respectively, recommend which process, if any, Tisa Co should proceed with and explain your recommendation. **(8 marks)**
- (c) Elfu Co has estimated an annual standard deviation of \$800,000 on one of its other projects, based on a normal distribution of returns. The average annual return on this project is \$2,200,000.

Required

- (i) Estimate the project's value at risk (VaR) at a 99% confidence level for 1 year and over the project's life of 5 years. Explain what is meant by the answers obtained. **(4 marks)**
- (ii) Apart from the use of VaR, briefly explain methods that Elfu Co can use to deal with risk and uncertainty in investment appraisal and their drawbacks. **(5 marks)**

(Total = 25 marks)

15 Riviere (12/14)

49 mins

Riviere Co is a small company based in the European Union (EU). It produces high quality frozen food which it exports to a small number of supermarket chains located within the EU as well. The EU is a free trade area for trade between its member countries.

Riviere Co finds it difficult to obtain bank finance and relies on a long-term strategy of using internally generated funds for new investment projects. This constraint means that it cannot accept every profitable project and often has to choose between them.

Riviere Co is currently considering investment in one of two mutually exclusive food production projects: Privi and Drugi. Privi will produce and sell a new range of frozen desserts exclusively within the EU. Drugi will produce and sell a new range of frozen desserts and savoury foods to supermarket chains based in countries outside the EU. Each project will last for five years and the following financial information refers to both projects.

PROJECT DRUGI ANNUAL AFTER-TAX CASH FLOWS EXPECTED AT THE END OF EACH YEAR

Year	Current	1	2	3	4	5
Cash flows (€'000)	(11,840)	1,230	1,680	4,350	10,240	2,200

	Privi	Drugi
Net present value	€2,054,000	€2,293,000
Internal rate of return	17.6%	Not provided
Modified internal rate of return	13.4%	Not provided
<i>Value at risk (over the project's life)</i>		
95% confidence level	€1,103,500	Not provided
90% confidence level	€860,000	Not provided

Both projects' net present value has been calculated based on Riviere Co's nominal cost of capital of 10%. It can be assumed that both projects' cash flow returns are normally distributed and the annual standard deviation of project Drugi's present value of after-tax cash flows is estimated to be

€400,000. It can also be assumed that all sales are made in € (Euro) and therefore the company is not exposed to any foreign exchange exposure.

Notwithstanding how profitable project Drugi may appear to be, Riviere Co's board of directors is concerned about the possible legal risks if it invests in the project because they have never dealt with companies outside the EU before.

Required

- (a) Discuss the aims of a free trade area, such as the EU, and the possible benefits to Riviere Co of operating within the EU. **(5 marks)**
- (b) Calculate the figures which have not been provided for project Drugi and recommend which project should be accepted. Provide a justification for the recommendation and explain what the value at risk measures. **(13 marks)**
- (c) Discuss the possible legal risks of investing in project Drugi which Riviere Co may be concerned about and how these may be mitigated. **(7 marks)**

(Total = 25 marks)

16 Arbore (12/12, amended)

49 mins

Arbore Co is a large listed company with many autonomous departments operating as investment centres. It sets investment limits for each department based on a three-year cycle. Projects selected by departments would have to fall within the investment limits set for each of the three years. All departments would be required to maintain a capital investment monitoring system, and report on their findings annually to Arbore Co's board of directors.

The Durvo department is considering the following five investment projects with three years of initial investment expenditure, followed by several years of positive cash inflows. The department's initial investment expenditure limits are \$9,000,000, \$6,000,000 and \$5,000,000 for years one, two and three respectively. None of the projects can be deferred and all projects can be scaled down but not scaled up.

Investment required at start of year

Project	Year one (Immediately)	Year two	Year three	Project net present value
PDur01	\$4,000,000	\$1,100,000	\$2,400,000	\$464,000
PDur02	\$800,000	\$2,800,000	\$3,200,000	\$244,000
PDur03	\$3,200,000	\$3,562,000	\$0	\$352,000
PDur04	\$3,900,000	\$0	\$200,000	\$320,000
PDur05	\$2,500,000	\$1,200,000	\$1,400,000	Not provided

PDur05 project's annual operating cash flows commence at the end of year four and last for a period of 15 years. The project generates annual sales of 300,000 units at a selling price of \$14 per unit and incurs total annual relevant costs of \$3,230,000. Although the costs and units sold of the project can be predicted with a fair degree of certainty, there is considerable uncertainty about the unit selling price. The department uses a required rate of return of 11% for its projects, and inflation can be ignored.

The Durvo department's Managing Director is of the opinion that all projects which return a positive net present value (NPV) should be accepted and does not understand the reason(s) why Arbore Co imposes capital rationing on its departments. Furthermore, she is not sure why maintaining a capital investment monitoring system would be beneficial to the company.

Required

(a) (i) Calculate the NPV of project PDur05. Calculate and comment on what percentage fall in the selling price would need to occur before the NPV falls to zero. **(6 marks)**

(ii) Explain the strengths and weaknesses of NPV as a basis for making investment decisions in a capital rationing situation. **(5 marks)**

(b) Formulate an appropriate capital rationing model, based on the above investment limits, that maximises the NPV for department Durvo. Finding a solution for the model is not required. **(3 marks)**

(c) Assume the following output is produced when the capital rationing model in part (b) above is solved:

Category 1: Total Final Value

\$1,184,409

Category 2: Adjustable Final Values

Project PDur01: 0.958

Project PDur02: 0.407

Project PDur03: 0.732

Project PDur04: 0.000

Project PDur05: 1.000

Category 3:

Constraints Utilised	Slack
Year one: \$9,000,000	Year one: \$0
Year two: \$6,000,000	Year two: \$0
Year three: \$5,000,000	Year three: \$0

Required

Explain the figures produced in each of the three output categories. **(5 marks)**

(d) Provide a brief response to the Managing Director's opinions by:

(i) Explaining why Arbore Co may want to impose capital rationing on its departments **(2 marks)**

(ii) Explaining the features of a capital investment monitoring system and discussing the benefits of maintaining such a system **(4 marks)**

(Total = 25 marks)

17 MMC (6/11, amended)

49 mins

MesmerMagic Co (MMC) is considering whether to undertake the development of a new computer game based on an adventure film due to be released in 22 months. It is expected that the game will be available to buy two months after the film's release, by which time it will be possible to judge the popularity of the film with a high degree of certainty. However, at present, there is considerable uncertainty about whether the film, and therefore the game, is likely to be successful. Although MMC would pay for the exclusive rights to develop and sell the game now, the directors are of the opinion that they should delay the decision to produce and market the game until the film has been released and the game is available for sale.

MMC has forecast the following end of year cash flows for the four-year sales period of the game.

Year	1	2	3	4
Cash flows (\$ million)	25	18	10	5

MMC will spend \$7 million at the start of each of the next 2 years to develop the game and the gaming platform, and to pay for the exclusive rights to develop and sell the game. Following this, the company will require \$35 million for production, distribution and marketing costs at the start of the 4-year sales period of the game.

It can be assumed that all the costs and revenues include inflation. The relevant cost of capital for this project is 11% and the risk-free rate is 3.5%. MMC has estimated the likely volatility of the cash flows at a standard deviation of 30%.

Required

(a) Estimate the financial impact of the directors' decision to delay the production and marketing of the game. The Black-Scholes option pricing model may be used, where appropriate. All relevant calculations should be shown. **(12 marks)**

(b) Briefly discuss the implications of the answer obtained in part (a) above. **(7 marks)**

(c) Discuss how a decrease in the value of each of the determinants of the option price in the Black-Scholes option pricing model for European options is likely to change the price of a call option. **(6 marks)**

(Total = 25 marks)

18 Marengo (12/10, amended)

49 mins

The treasury division of Marengo Co, a large quoted company, holds equity investments in various companies around the world. One of the investments is in Arion Co, in which Marengo holds 200,000 shares, which is around 2% of the total number of Arion Co's shares traded on the stock market. Over the past year, due to the general strength in the equity markets following optimistic predictions of the performance of world economies, Marengo's investments have performed well. However, there is some concern that the share price of Arion Co may fall in the coming two months due to uncertainty in its markets. It is expected that any fall in share prices will be reversed following this period of uncertainty.

The treasury division managers in Marengo, Wenyu, Lola and Sam, have met with the Chief Executive Officer (CEO), Edward, to discuss what to do with the investment in Arion Co and they each made a different suggestion as follows:

- 1 Wenyu was of the opinion that Marengo's shareholders would benefit most if no action were taken. He argued that the courses of action proposed by Lola and Sam, below, would result in extra costs and possibly increase the risk to Marengo Co.
- 2 Lola proposed that Arion Co's shares should be sold in order to eliminate the risk of a fall in the share price.
- 3 Sam suggested that the investment should be hedged using an appropriate derivative product.
- 4 Edward does not understand why Marengo Co holds equity investments at all. He believes all shares should be sold.

Although no exchange-traded derivative products exist on Arion Co's shares, a bank has offered over-the-counter (OTC) option contracts at an exercise price of 350 cents per share in a contract size of 1,000 shares each, for the appropriate time period. Arion Co's current share price is 340 cents per share, although the volatility of the share prices could be as high as 40%.

It can be assumed that Arion Co will not pay any dividends in the coming few months and that the appropriate inter-bank lending rate will be 4% over that period.

Required

(a) Estimate the number of OTC put option contracts that Marengo Co will need to hedge against any adverse movement in Arion Co's share price. Provide a brief explanation of your answer.

Note. You may assume that the delta of a put option is equivalent to $N(-d_1)$. **(7 marks)**

(b) Discuss possible reasons for the suggestions made by each of the three managers and the CEO. **(18 marks)**

(Total = 25 marks)

19 Furlion Co (Mar/Jun 16)

49 mins

Furlion Co manufactures heavy agricultural equipment and machinery which can be used in difficult farming conditions. Furlion Co's Chief Executive has been investigating a significant opportunity in the country of Naswa, where Furlion Co has not previously sold any products. The Government of Naswa has been undertaking a major land reclamation programme and Furlion Co's equipment is particularly suitable for use on the reclaimed land. Because of the costs and other problems involved in transporting its products, Furlion Co's Chief Executive proposes that Furlion Co should establish a plant for manufacturing machinery in Naswa. He knows that the Naswan Government is keen to encourage the development of sustainable businesses within the country.

Initial calculations suggest that the proposed investment in Naswa would have a negative net present value of \$1.01 million. However, Furlion Co's Chief Executive believes that there may be opportunities for greater cash flows in future if the Naswan Government expands its land reclamation programme. The Government at present is struggling to fund expansion of the programme out of its own resources and is looking for other funding. If the Naswan government obtains this funding, the Chief Executive has forecast that the increased demand for Furlion Co's products would justify \$15 million additional expenditure at the site of the factory in 3 years' time. The expected net present value for this expansion is currently estimated to be \$0.

It can be assumed that all costs and revenues include inflation. The relevant cost of capital is 12% and the risk-free rate is 4%. The Chief Executive has estimated the likely volatility of cash flows at a standard deviation of 30%.

One of Furlion Co's non-executive directors has read about possible changes in interest rates and wonders how these might affect the investment appraisal.

Required

(a) Assess, showing all relevant calculations, whether Furlion Co should proceed with the significant opportunity. Discuss the assumptions made and other factors which will affect the decision of whether to establish a plant in Naswa. The Black-Scholes pricing model may be used, where appropriate. **(16 marks)**

(b) Explain what is meant by an option's rho and discuss the impact of changes in interest rates on the appraisal of the investment. **(5 marks)**

(c) Discuss the possibility of the Naswan Government obtaining funding for further land reclamation from the World Bank, referring specifically to the International Development Association. **(4 marks)**

(Total = 25 marks)

20 Toltuck (Mar/Jun 17)

49 mins

Toltuck Co is a listed company in the building industry which specialises in the construction of large commercial and residential developments. Toltuck Co had been profitable for many years, but has just incurred major losses on the last two developments which it has completed in its home country of Arumland. These developments were an out-of-town retail centre and a major residential development. Toltuck Co's directors have blamed the poor results primarily on the recent recession in Arumland, although demand for the residential development also appears to have been adversely affected by it being located in an area which has suffered serious flooding over the last two years.

As a result of returns from these two major developments being much lower than expected, Toltuck Co has had to finance current work-in-progress by a significantly greater amount of debt finance, giving it higher gearing than most other construction companies operating in Arumland. Toltuck Co's directors have recently been alarmed by a major credit agency's decision to downgrade Toltuck Co's credit rating from AA to BBB. The directors are very concerned about the impact this will have on the valuation of Toltuck Co's bonds and the future cost of debt.

The following information can be used to assess the consequences of the change in Toltuck Co's credit rating.

Toltuck Co has issued an 8% bond, which has a face or nominal value of \$100 and a premium of 2% on redemption in three years' time. The coupon on the bond is payable on an annual basis.

The government of Arumland has three bonds in issue. They all have a face or nominal value of \$100 and are all redeemable at par. Taxation can be ignored on government bonds. They are of the same risk class and the coupon on each is payable on an annual basis. Details of the bonds are as follows:

Bond	Redeemable	Coupon	Current market value
1	1 year	9%	\$ 104
2	2 years	7%	102
3	3 years	6%	98

Credit spreads, published by the credit agency, are as follows (shown in basis points):

Rating	1 year	2 years	3 years
AA	18	31	45
BBB	54	69	86

Toltuck Co's shareholder base can be divided broadly into two groups. The majority of shareholders are comfortable with investing in a company where dividends in some years will be high, but there will be low or no dividends in other years because of the cash demands facing the business. However, a minority of shareholders would like Toltuck Co to achieve at least a minimum dividend each year and are concerned about the company undertaking investments which they regard as very speculative. Shareholders from both groups have expressed some concerns to the board about the impact of the fall in credit rating on their investment.

Required

- Calculate the valuation and yield to maturity of Toltuck Co's \$100 bond under its old and new credit ratings. **(10 marks)**
- Discuss the factors which may have affected the credit rating of Toltuck Co published by the credit agency. **(8 marks)**
- Discuss the impact of the fall in Toltuck Co's credit rating on its ability to raise financial capital and on its shareholders' return. **(7 marks)**

(Total = 25 marks)

21 Coeden (12/12, amended)

49 mins

Coeden Co is a listed company operating in the hospitality and leisure industry. Coeden Co's board of directors met recently to discuss a new strategy for the business. The proposal put forward was to sell all the hotel properties that Coeden Co owns and rent them back on a long-term rental agreement. Coeden Co would then focus solely on the provision of hotel services at these properties under its popular brand name. The proposal stated that the funds raised from the sale of the hotel properties would be used to pay off 70% of the outstanding non-current liabilities and the remaining funds would be retained for future investments.

The board of directors is of the opinion that reducing the level of debt in Coeden Co will reduce the company's risk and therefore its cost of capital. If the proposal is undertaken and Coeden Co focuses exclusively on the provision of hotel services, it can be assumed that the current market value of equity will remain unchanged after implementing the proposal.

Coeden Co financial information

EXTRACT FROM THE MOST RECENT STATEMENT OF FINANCIAL POSITION

	\$'000
Non-current assets (revalued recently)	42,560
Current assets	<u>26,840</u>
Total assets	69,400
Share capital (25c per share par value)	3,250
Reserves	21,780
Non-current liabilities (5.2% redeemable bonds)	42,000
Current liabilities	<u>2,370</u>
Total capital and liabilities	69,400

Coeden Co's latest free cash flow to equity of \$2,600,000 was estimated after taking into account taxation, interest and reinvestment in assets to continue with the current level of business. It can be assumed that the annual reinvestment in assets required to continue with the current level of business is equivalent to the annual amount of depreciation. Over the past few years, Coeden Co has consistently used 40% of its free cash flow to equity on new investments while distributing the remaining 60%. The market value of equity calculated on the basis of the free cash flow to equity model provides a reasonable estimate of the current market value of Coeden Co.

The bonds are redeemable at par in three years and pay the coupon on an annual basis. Although the bonds are not traded, it is estimated that Coeden Co's current debt credit rating is BBB but would improve to A+ if the non-current liabilities are reduced by 70%.

Other information

Coeden Co's current equity beta is 1.1 and it can be assumed that debt beta is 0. The risk-free rate is estimated to be 4% and the market risk premium is estimated to be 6%.

There is no beta available for companies offering just hotel services, since most companies own their own buildings. The average asset beta for property companies has been estimated at 0.4. It has been estimated that the hotel services business accounts for approximately 60% of the current value of Coeden Co and the property company business accounts for the remaining 40%.

Coeden Co's corporation tax rate is 20%. The three-year borrowing credit spread on A+ rated bonds is 60 basis points and 90 basis points on BBB rated bonds, over the risk-free rate of interest.

Required

(a) Calculate, and comment on, Coeden Co's cost of equity and weighted average cost of capital before and after implementing the proposal. Briefly explain any assumptions made. **(20 marks)**

(b) Discuss the validity of the assumption that the market value of equity will remain unchanged after the implementation of the proposal. **(5 marks)**

(Total = 25 marks)

22 GNT (2013 pilot exam)

49 mins

GNT Co is considering an investment in one of two corporate bonds. Both bonds have a par value of \$1,000 and pay coupon interest on an annual basis. The market price of the first bond is \$1,079.68. Its coupon rate is 6% and it is due to be redeemed at par in 5 years. The second bond is about to be issued with a coupon rate of 4% and will also be redeemable at par in 5 years. Both bonds are expected to have the same gross redemption yields (yields to maturity). The yield to maturity of a company's bond is determined by its credit rating.

GNT Co considers duration of the bond to be a key factor when making decisions on which bond to invest.

Required

(a) Estimate the Macaulay duration of the two bonds GNT Co is considering for investment. **(9 marks)**

(b) Discuss how useful duration is as a measure of the sensitivity of a bond price to changes in interest rates. **(8 marks)**

(c) Among the criteria used by credit agencies for establishing a company's credit rating are the following: industry risk, earnings protection, financial flexibility and evaluation of the company's management.

Briefly explain each criterion and suggest factors that could be used to assess it. **(8 marks)**

(Total = 25 marks)

23 Fubuki (12/10)

49 mins

Fubuki Co, an unlisted company based in Megaera, has been manufacturing electrical parts used in mobility vehicles for people with disabilities and the elderly for many years. These parts are exported to various manufacturers worldwide but at present there are no local manufacturers of mobility vehicles in Megaera. Retailers in Megaera normally import mobility vehicles and sell them at an average price of \$4,000 each. Fubuki Co wants to manufacture mobility vehicles locally and believes that it can sell vehicles of equivalent quality locally at a discount of 37.5% to the current average retail price.

Although this is a completely new venture for Fubuki Co, it will be in addition to the company's core business. Fubuki Co's directors expect to develop the project for a period of 4 years and then sell it for \$16 million to a private equity firm. Megaera's Government has been positive about the venture and has offered Fubuki Co a subsidised loan of up to 80% of the investment funds required, at a rate of 200 basis points below Fubuki Co's borrowing rate. Currently Fubuki Co can borrow at 300 basis points above the 5-year government debt yield rate.

A feasibility study commissioned by the directors, at a cost of \$250,000, has produced the following information.

- 1 Initial cost of acquiring suitable premises will be \$11 million, and plant and machinery used in the manufacture will cost \$3 million. Acquiring the premises and installing the machinery is a quick process and manufacturing can commence almost immediately.
- 2 It is expected that in the first year 1,300 units will be manufactured and sold. Unit sales will grow by 40% in each of the next 2 years before falling to an annual growth rate of 5% for the final year. After the first year the selling price per unit is expected to increase by 3% per year.
- 3 In the first year, it is estimated that the total direct material, labour and variable overhead costs will be \$1,200 per unit produced. After the first year, the direct costs are expected to increase by an annual inflation rate of 8%.
- 4 Annual fixed overhead costs would be \$2.5 million of which 60% are centrally allocated overheads. The fixed overhead costs will increase by 5% per year after the first year.
- 5 Fubuki Co will need to make working capital available of 15% of the anticipated sales revenue for the year, at the beginning of each year. The working capital is expected to be released at the end of the fourth year when the project is sold.

Fubuki Co's tax rate is 25% per year on taxable profits. Tax is payable in the same year as when the profits are earned. Tax-allowable depreciation is available on the plant and machinery on a straight-line basis. It is anticipated that the value attributable to the plant and machinery after 4 years is \$400,000 of the price at which the project is sold. No tax-allowable depreciation is available on the premises.

Fubuki Co uses 8% as its discount rate for new projects but feels that this rate may not be appropriate for this new type of investment. It intends to raise the full amount of funds through debt finance and take advantage of the Government's offer of a subsidised loan. Issue costs are 4% of the gross finance required. It can be assumed that the debt capacity available to the company is equivalent to the actual amount of debt finance raised for the project.

Although no other companies produce mobility vehicles in Megaera, Haizum Co, a listed company, produces electrical-powered vehicles using similar technology to that required for the mobility vehicles. Haizum Co's cost of equity is estimated to be 14% and it pays tax at 28%. Haizum Co has 15 million shares in issue trading at \$2.53 each and \$40 million bonds trading at \$94.88 per \$100. The 5-year government debt yield is currently estimated at 4.5% and the market risk premium at 4%.

Required

- (a) Evaluate, on financial grounds, whether Fubuki Co should proceed with the project. **(17 marks)**
- (b) Discuss the appropriateness of the evaluation method used and explain any assumptions made in part (a) above. **(8 marks)**

(Total = 25 marks)

ACQUISITIONS AND MERGERS

Questions 24 to 29 cover acquisitions and mergers, the subject of Part C of the BPP Workbook for AFM.

24 Preparation question: Saturn Systems (6/08, amended) 49 mins

[Note that from September 2018 questions that are wholly narrative will not be set]

Mr Moon is the Chief Executive Officer of Saturn Systems, a very large listed company in the telecommunications business. The company is in a very strong financial position, having developed rapidly in recent years through a strategy based upon growth by acquisition. Currently, earnings and earnings growth are at all-time highs, although the company's cash reserves are at a low level following a number of strategic investments in the last financial year. The previous evening Mr Moon gave a speech at a business dinner and during questions made some remarks that Pluto Ltd was an attractive company with 'great assets' and that he would be a 'fool' if he did not consider the possibility 'like everyone else' of acquiring the company. Pluto is a long established supplier to Saturn Systems and if acquired would add substantially to the market capitalisation of the business.

Mr Moon's comments were widely reported in the following morning's financial newspapers and, by 10am, the share price of Pluto had risen 15% in out-of-hours and early trading. The first that you, Saturn's chief financial officer, heard about the issue was when you received an urgent call from Mr Moon's office. You have just completed a background investigation of Pluto, along with three other potential targets instigated at Saturn's last board meeting in May. Following that investigation, you have now commenced a review of the steps required to raise the necessary debt finance for a bid and the procedure you would need to follow in setting up a due diligence investigation of each company.

On arriving at Mr Moon's office you are surprised to see the Chairman of the board in attendance. Mr Moon has just put down the telephone and is clearly very agitated. They tell you about the remarks made by Mr Moon the previous evening and that the call just taken was from the Office of the Regulator for Public Companies. The regulator had wanted to know if a bid was to be made and what announcement the company intended to make. They had been very neutral in their response pending your advice but had promised to get back to the regulator within the hour. They knew that if they were forced to admit that a bid was imminent and then withdrew that they would not be able to bid again for another six months. Looking at you they ask as one: 'what do we do now?' After a short discussion you returned to your office and began to draft a memorandum with a recommendation about how to proceed.

Required

- (a) Discuss the advantages and disadvantages of growth by acquisition as compared with growth by internal (or organic) investment. **(5 marks)**
- (b) Assess the regulatory, financial and ethical issues in this case. **(15 marks)**
- (c) Propose a course of action that the company should now pursue, including a draft of any announcement that should be made, given that the board of Saturn Systems wishes to hold open the option of making a bid in the near future. **(5 marks)**
(Total = 25 marks)

25 Selorne (6/08, amended)

49 mins

Selorne Co

Selorne Co is one of the biggest removal companies in Pauland, offering home and business removals. It has a number of long-term contracts with large businesses, although it has not won any new major contracts in the last two years. Selorne Co is listed on Pauland's stock market for smaller companies. Selorne Co is financed by a mixture of equity and short and long-term debt, but its gearing level is below the average for its sector.

Selorne Co has four executive directors, who each own 20% of the company's share capital, with the other 20% owned by external shareholders. Selorne Co has paid a constant dividend since it has been listed and its share price has risen slightly over the last three years.

Selorne Co is based in a number of the large cities and towns in Pauland and owns the majority of the sites where it is located. Many of its employees have worked for the company for a long time. Drivers of the lorries used by Selorne Co are required to have a special, heavy vehicles licence. Salary levels at Selorne Co are relatively high compared with other companies in the sector.

Chawon Co

Selorne Co is currently considering making a bid for Chawon Co, an unlisted company specialising in distribution and delivery services. Chawon Co is owned 100% by its founder, Chris Chawon. Chawon Co has built up a portfolio of small contracts over time. It has made unsuccessful bids for two larger contracts over the last 12 months, the bids being rejected primarily because Chawon Co was not felt to be big enough to be able to guarantee the level of service required.

Chawon Co is based in many of the same cities and towns where Selorne Co is located, although Chawon's premises are all rented. The drivers of Chawon's vehicles do not require a heavy vehicles licence. Chawon Co has a few long-serving employees who are mostly centre managers. Most of its drivers and staff, however, stay at Chawon Co for only a short time. Salary levels are low, although Chawon Co pays high levels of overtime and high bonuses if target profit levels are achieved. Chawon Co is highly geared, leading to recent media speculation about its financial viability.

Terms of bid for Chawon Co

In initial discussions about the acquisition, Chris Chawon indicated that he would prefer the consideration to be a share-for-share exchange, the terms being one Chawon Co share for five Selorne Co shares.

Chawon Co has 2 million \$1 shares in issue, and Selorne Co has 50 million \$0.50 shares in issue. Each Selorne Co share is currently trading at \$6.50, which is a multiple of 8 of its free cash flow to equity. The multiple of 8 can be assumed to remain unchanged if the acquisition takes place. Chawon Co's free cash flow to equity is currently estimated at \$7 million, with an expected annual growth rate of 3%, and it is expected to generate a return on equity of 15%. Chris Chawon expects that the total free cash flows to equity of the combined company will increase by \$5 million due to synergy benefits. He believes that Selorne Co will be able to win more contracts because it is larger and because it will be diversifying the services which it offers. He also believes that significant operational synergies can be achieved, pointing out the time Selorne Co drivers spend idle during the winter months when removal activity is traditionally lower. Chris Chawon believes that he can achieve the synergies if he is given management responsibility for the operational reorganisation, including dealing with the staff employment and retention issues. Chris Chawon thinks that synergies could also be achieved in central administration and in premises costs.

The chief executive and the finance director of Selorne Co are in favour of bidding for Chawon Co. However, one of the other executive directors is opposed to the bid. He is sceptical about the level of synergies which can be achieved and does not want Chris Chawon to be brought into the management of Selorne Co. He suggests that if the bid is to go ahead, it should be a cash offer rather than a share exchange. Selorne Co's chief executive has responded that Chris Chawon is likely to ask for a higher equivalent price if the purchase is for cash.

Financing the bid for Chawon Co

Selorne Co's finance director has pointed out that Selorne Co will need additional funding if Chawon Co is purchased for cash. He has suggested that there may be a number of possible sources of finance:

- A rights issue
- A fixed rate, long-term, bank loan
- A three-year, unsecured, mezzanine loan facility
- Convertible debt, with conversion rights being exercisable in five years' time

Required

(a) (i) Estimate the equity value of the combined company and the expected additional value arising from the combination of Selorne Co and Chawon Co. **(6 marks)**

(ii) Estimate the share of the gain from the combination created for Chris Chawon and the share of the gain created for Selorne Co's shareholders and comment on your results. **(6 marks)**

(b) Evaluate how reliable the estimates of the synergies for the combined company are likely to be and discuss the factors which may prevent the forecast synergies from being achieved. **(7 marks)**

(c) Discuss the factors which Selorne Co's board will consider when determining which source or sources of finance are chosen to finance a possible cash bid for the share capital of Chawon Co. **(6 marks)**

(Total = 25 marks)

26 Chithurst (Sep/Dec 16)

49 mins

Chithurst Co gained a stock exchange listing five years ago. At the time of the listing, members of the family who founded the company owned 75% of the shares, but now they only hold just over 50%. The number of shares in issue has remained unchanged since Chithurst Co was listed. Chithurst Co's directors have continued the policy of paying a constant dividend per share each year which the company had before it was listed. However, investors who are not family members have become increasingly critical of this policy, saying that there is no clear rationale for it. They would prefer to see steady dividend growth, reflecting the increase in profitability of Chithurst Co since its listing.

The Finance Director of Chithurst Co has provided its board with details of Chithurst Co's dividends and investment expenditure, compared with two other similar-sized companies in the same sector, Earham Co and Iping Co. Each company has a 31 December year end.

	Chithurst Co			Earham Co			Iping Co		
	Profit for year after interest and tax		New investment expenditure	Profit for year after interest and tax		New investment expenditure	Profit for year after interest and tax		New investment expenditure
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
20X2	77	33	18	95	38	30	75	35	37
20X3	80	33	29	(10)	15	15	88	17	64
20X4	94	33	23	110	44	42	118	39	75
20X5	97	33	21	120	48	29	132	42	84

Other financial information relating to the three companies is as follows:

	Chithurst Co	Eartham Co	Iping Co
Cost of equity	11%	14%	12%
Market capitalisation \$m	608	1,042	1,164
Increase in share price in last 12 months	1%	5%	10%

Chithurst Co's Finance Director has estimated the costs of equity for all three companies.

None of the three companies has taken out significant new debt finance since 20X1.

Required

(a) Discuss the benefits and drawbacks of the dividend policies which the three companies appear to have adopted. Provide relevant calculations to support your discussion.

Note. Up to 5 marks are available for the calculations. **(15 marks)**

(b) Discuss how the market capitalisation of the three companies compares with your valuations calculated using the dividend valuation model. Use the data provided to calculate valuations based on growth rates for the most recent year and for the last three years.

Note. Up to 5 marks are available for the calculations. **(10 marks)**

(Total = 25 marks)

27 Louieed (Mar/Jun 16)

49 mins

Louieed Co, a listed company, is a major supplier of educational material, selling its products in many countries. It supplies schools and colleges and also produces learning material for business and professional exams. Louieed Co has exclusive contracts to produce material for some examining bodies. Louieed Co has a well-defined management structure with formal processes for making major decisions.

Although Louieed Co produces online learning material, most of its profits are still derived from sales of traditional textbooks. Louieed Co's growth in profits over the last few years has been slow and its directors are currently reviewing its long-term strategy. One area in which they feel that Louieed Co must become much more involved is the production of online testing materials for exams and to validate course and textbook learning.

Bid for Tidded Co

Louieed Co has recently made a bid for Tidded Co, a smaller listed company. Tidded Co also supplies a range of educational material, but has been one of the leaders in the development of online testing and has shown strong profit growth over recent years. All of Tidded Co's initial five founders remain on its board and still hold 45% of its issued share capital between them. From the start, Tidded Co's directors have been used to making quick decisions in their areas of responsibility. Although listing has imposed some formalities, Tidded Co has remained focused on acting quickly to gain competitive advantage, with the five founders continuing to give strong leadership.

Louieed Co's initial bid of five shares in Louieed Co for three shares in Tidded Co was rejected by Tidded Co's board. There has been further discussion between the two boards since the initial offer was rejected and Louieed Co's board is now considering a proposal to offer Tidded Co's shareholders two shares in Louieed Co for one share in Tidded Co or a cash alternative of \$22.75 per Tidded Co share. It is expected that Tidded Co's shareholders will choose one of the following options:

- 1 To accept the 2 shares for 1 share offer for all the Tidded Co shares;
- 2 To accept the cash offer for all the Tidded Co shares; or
- 3 60% of the shareholders will take up the 2 shares for 1 share offer and the remaining 40% will take the cash offer.

In the case of the third option being accepted, it is thought that 3 of the company's founders, holding 20% of the share capital in total, will take the cash offer and not join the combined company. The remaining two founders will probably continue to be involved in the business and be members of the combined company's board.

Louieed Co's Finance Director has estimated that the merger will produce annual post-tax synergies of \$20 million. He expects Louieed Co's current price/earnings (P/E) ratio to remain unchanged after the acquisition.

Extracts from the two companies' most recent accounts are shown below:

	<i>Louieed</i>	<i>Tidded</i>
	\$m	\$m
Profit before finance cost and tax	446	182
Finance costs	<u>(74)</u>	<u>(24)</u>
Profit before tax	372	158
Tax	<u>(76)</u>	<u>(30)</u>
Profit after tax	<u>296</u>	<u>128</u>
Issued \$1 nominal shares	340 million	90 million
P/E ratios, based on most recent accounts	14	15.9
Long-term liabilities (market value) (\$m)	540	193
Cash and cash equivalents (\$m)	220	64

The tax rate applicable to both companies is 20%.

Assume that Louieed Co can obtain further debt funding at a pre-tax cost of 7.5% and that the return on cash surpluses is 5% pre-tax.

Assume also that any debt funding needed to complete the acquisition will be reduced instantly by the balances of cash and cash equivalents held by Louieed Co and Tidded Co.

Required

- (a) Discuss the advantages and disadvantages of the acquisition of Tidded Co from the viewpoint of Louieed Co. **(6 marks)**
- (b) Calculate the P/E ratios of Tidded Co implied by the terms of Louieed Co's initial and proposed offers, for all three of the above options. **(5 marks)**
- (c) Calculate, and comment on, the funding required for the acquisition of Tidded Co and the impact on Louieed Co's earnings per share and gearing, for each of the three options given above.

Note. Up to 10 marks are available for the calculations. **(14 marks)**

(Total = 25 marks)

28 Makonis (12/13)

49 mins

Makonis Co, a listed company producing motor cars, wants to acquire Nuvola Co, an engineering company involved in producing innovative devices for cars. Makonis Co is keen to incorporate some of Nuvola Co's innovative devices into its cars and thereby boost sales revenue.

The following financial information is provided for the two companies:

	<i>Makonis Co</i>	<i>Nuvola Co</i>
Current share price	\$5.80	\$2.40
Number of issued shares	210 million	200 million
Equity beta	1.2	1.2
Asset beta	0.9	1.2

It is thought that combining the two companies will result in several benefits. Free cash flows to firm of the combined company will be \$216 million in current value terms, but these will increase by an annual growth rate of 5% for the next 4 years, before reverting to an annual growth rate of 2.25% in perpetuity. In addition to this, combining the companies will result in cash synergy benefits of \$20 million per year, for the next 4 years. These synergy benefits are not subject to any inflationary increase and no synergy benefits will occur after the fourth year. The debt to equity ratio of the combined company will be 40:60 in market value terms and it is expected that the combined company's cost of debt will be 4.55%.

The corporation tax rate is 20%, the current risk-free rate of return is 2% and the market risk premium is 7%. It can be assumed that the combined company's asset beta is the weighted average of Makonis Co's and Nuvola Co's asset betas, weighted by their current market values.

Makonis Co has offered to acquire Nuvola Co through a mixed offer of one of its shares for two Nuvola Co shares plus a cash payment, such that a 30% premium is paid for the acquisition. Nuvola Co's equity holders feel that a 50% premium would be more acceptable. Makonis Co has sufficient cash reserves if the premium is 30%, but not if it is 50%.

Required

- (a) Estimate the additional equity value created by combining Nuvola Co and Makonis Co, based on the free cash flows to firm method. Comment on the results obtained and briefly discuss the assumptions made. **(13 marks)**
- (b) Estimate the impact on Makonis Co's equity holders if the premium paid is increased to 50% from 30%. **(5 marks)**
- (c) Estimate the additional funds required if a premium of 50% is paid instead of 30% and discuss how this premium could be financed. **(7 marks)**

(Total = 25 marks)

29 Vogel (6/14)

49 mins

Vogel Co, a listed engineering company, manufactures large-scale plant and machinery for industrial companies. Until ten years ago, Vogel Co pursued a strategy of organic growth. Since then, it has followed an aggressive policy of acquiring smaller engineering companies, which it feels have developed new technologies and methods, which could be used in its manufacturing processes. However, it is estimated that only between 30% and 40% of the acquisitions made in the last 10 years have successfully increased the company's shareholder value.

Vogel Co is currently considering acquiring Tori Co, an unlisted company, which has three departments. Department A manufactures machinery for industrial companies, Department B produces electrical goods for the retail market, and the smaller Department C operates in the construction industry. Upon acquisition, Department A will become part of Vogel Co, as it contains the new technologies which Vogel Co is seeking, but Departments B and C will be unbundled, with the assets attached to Department C sold and Department B being spun off into a new company called Ndege Co.

Given below are extracts of financial information for the two companies for the year ended 30 April 2014.

	<i>Vogel Co</i> \$m	<i>Tori Co</i> \$m
Sales revenue	790.2	124.6
Profit before depreciation, interest and tax (PBDIT)	244.4	37.4
Interest	13.8	4.3
Depreciation	72.4	10.1
Pre-tax profit	158.2	23.0
Non-current assets	723.9	98.2
Current assets	142.6	46.5
7% unsecured bond	–	40.0
Other non-current and current liabilities	212.4	20.2
Share capital (50c/share)	190.0	20.0
Reserves	464.1	64.5

Share of current and non-current assets and profit of Tori Co's three departments:

	<i>Department A</i>	<i>Department B</i>	<i>Department C</i>
Share of current and non-current assets	40%	40%	20%
Share of PBDIT and pre-tax profit	50%	40%	10%

Other information

- 1 It is estimated that for Department C, the realisable value of its non-current assets is 100% of their book value, but its current assets' realisable value is only 90% of their book value. The costs related to closing Department C are estimated to be \$3 million.
- 2 The funds raised from the disposal of Department C will be used to pay off Tori Co's other non-current and current liabilities.
- 3 The 7% unsecured bond will be taken over by Ndege Co. It can be assumed that the current market value of the bond is equal to its book value.
- 4 At present, around 10% of Department B's PBDIT come from sales made to Department C.
- 5 Ndege Co's cost of capital is estimated to be 10%. It is estimated that in the first year of operation Ndege Co's free cash flows to firm will grow by 20%, and then by 5.2% annually thereafter.
- 6 The tax rate applicable to all the companies is 20%, and Ndege Co can claim 10% tax-allowable depreciation on its non-current assets. It can be assumed that the amount of tax-allowable depreciation is the same as the investment needed to maintain Ndege Co's operations.
- 7 Vogel Co's current share price is \$3 per share and it is estimated that Tori Co's price/earnings (P/E) ratio is 25% higher than Vogel Co's P/E ratio. After the acquisition, when Department A becomes part of Vogel Co, it is estimated that Vogel Co's P/E ratio will increase by 15%.
- 8 It is estimated that the combined company's annual after-tax earnings will increase by \$7 million due to the synergy benefits resulting from combining Vogel Co and Department A.

Required

- (a) Discuss the possible reasons why Vogel Co may have switched its strategy of organic growth to one of growing by acquiring companies. **(4 marks)**
- (b) Discuss the possible actions Vogel Co could take to reduce the risk that the acquisition of Tori Co fails to increase shareholder value. **(7 marks)**

(c) Estimate, showing all relevant calculations, the maximum premium Vogel Co could pay to acquire Tori Co, explaining the approach taken and any assumptions made. **(14 marks)**
(Total = 25 marks)

CORPORATE RECONSTRUCTION AND REORGANISATION

Questions 30 to 35 cover corporate reconstruction and reorganisation, the subject of Part D of the BPP Workbook for AFM.

30 Doric (2013 pilot exam)

49 mins

Doric Co has two manufacturing divisions: parts and fridges. Although the parts division is profitable, the fridges division is not, and as a result its share price has declined to 50c per share from a high of \$2.83 per share around 3 years ago. Assume it is now 1 January 20X3.

The board of directors is considering two proposals:

- (i) To cease trading and close down the company entirely.
- (ii) To close the fridge division and continue the parts division through a leveraged management buyout. The new company will continue with manufacturing parts only, but will make an additional investment of \$50 million in order to grow the parts division after-tax cash flows by 3.5% in perpetuity. The proceeds from the sale of the fridges division will be used to pay the outstanding liabilities. The finance raised from the management buyout will pay for any remaining liabilities, the funds required for the additional investment, and to purchase the current equity shares at a premium of 20%. The fridges division is twice the size of the parts division in terms of its assets attributable to it.

Extracts from the most recent financial statements:

FINANCIAL POSITION AS AT 31 DECEMBER 20X2		\$m
<i>Assets</i>		
Non-current assets		110
Current assets		220
Share capital (\$0.40 per share par value)		40
Reserves		10
Liabilities (Non-current and current)		280

STATEMENT OF PROFIT OR LOSS FOR THE YEAR ENDED 31 DECEMBER 20X2

		\$m
Sales revenue: Parts division		170
Fridge division		340
Costs prior to depreciation, interest payments and tax:	Parts division	(120)
	Fridge division	(370)
Depreciation, tax and interest		<u>(34)</u>
Loss		<u>(14)</u>

If the entire company's assets are sold, the estimated realisable values of assets are as follows:

	\$m
Non-current assets	100
Current assets	110

The following additional information has been provided:

Redundancy and other costs will be approximately \$54 million if the whole company is closed, and pro rata for individual divisions that are closed. These costs have priority for payment before any other liabilities in case of closure. The taxation effects relating to this may be ignored.

Corporation tax on profits is 20% and it can be assumed that tax is payable in the year incurred. Annual depreciation on non-current assets is 10% and this is the amount of investment needed to maintain the current level of activity. The new company's cost of capital is expected to be 11%.

Required

- (a) Briefly discuss the possible benefits of Doric Co's parts division being divested through a management buyout. **(4 marks)**
- (b) Provide an estimate of the return the liability holders and the shareholders would receive in the event that Doric Co is closed and all its assets sold. **(3 marks)**
- (c) Estimate the amount of additional finance needed and the value of the new company, if only the assets of the fridges division are sold and the parts division is divested through a management buyout. Briefly discuss whether or not the management buyout would be beneficial. **(10 marks)**
- (d) Doric Co's directors are of the opinion that they could receive a better price if the fridges division is sold as a going concern instead of its assets sold separately. They have been told that they need to consider two aspects when selling a company or part of a company: (i) seeking potential buyers and negotiating the sale price; and (ii) due diligence.

Discuss the issues that should be taken into consideration with each aspect. **(8 marks)**

(Total = 25 marks)

31 Flufftort (Sep/Dec 15)

49 mins

Five years ago the Patel family invested in a new business, Flufftort Co, which manufactures furniture. Some family members became directors of Flufftort Co, others have not been actively involved in management. A venture capital firm, Gupte VC, also made a 20% investment in Flufftort Co. A representative of Gupte VC was appointed to Flufftort Co's board. Flufftort Co also took out a long-term 8.5% bank loan.

Sales have generally been disappointing. As a result, members of the Patel family have been reluctant to invest further in Flufftort Co. Over the last year Gupte VC has taken a tougher attitude towards Flufftort Co. Gupte VC pressurised Flufftort Co to pay a dividend of \$2 million for the year ended 30 June 20X5. Gupte VC has also said that if Flufftort Co's financial results do not improve, Gupte VC may exercise its right to compel Flufftort Co to buy back its shares at par on 30 June 20X6.

However, Flufftort Co's most recent product, the Easicushion chair, has been a much bigger success than expected. In order to produce enough Easicushion chairs to affect its results substantially, Flufftort Co will need to make significant expenditure on manufacturing facilities and additional working capital.

EXTRACTS FROM STATEMENT OF PROFIT OR LOSS FOR YEAR ENDED 30 JUNE 20X5 AND FORECAST STATEMENT OF PROFIT OR LOSS FOR YEAR ENDED 30 JUNE 20X6

	20X5	20X6 forecast
	\$m	\$m
Operating profit	8.0	6.0
Finance cost	<u>(3.0)</u>	<u>(3.0)</u>
Profit before tax	5.0	3.0
Tax on profits (20%)	<u>(1.0)</u>	<u>(0.6)</u>
Profit for the period	4.0	2.4
Dividends	<u>(2.0)</u>	<u>—</u>
Retained earnings	<u>2.0</u>	<u>2.4</u>

Note. The forecast statement of profit or loss for the year ended 30 June 20X6 is not affected by the proposed investment. This can be assumed only to affect results after 30 June 20X6. The figure shown for retained earnings in the 20X6 forecast can be assumed to be the net increase in cash for the year ended 30 June 20X6.

SUMMARISED STATEMENT OF FINANCIAL POSITION AS AT 30 JUNE 20X5

	\$m
<i>Assets</i>	
Non-current assets	69.0
Current assets excluding cash	18.0
Cash	7.6
Total assets	<u>94.6</u>
<i>Equity and liabilities</i>	
Share capital (\$1 shares)	50.0
Retained earnings	2.6
Total equity	<u>52.6</u>
 <i>Long-term liabilities</i>	
8.5% bank loan	30.0
9% loan note	5.0
 Total long-term liabilities	35.0
 <i>Current liabilities</i>	 7.0
 Total liabilities	 <u>42.0</u>
 Total equity and liabilities	 <u>94.6</u>

Notes

- 55% of shares are owned by the members of the Patel family who are directors, 25% by other members of the Patel family and 20% by Gupte VC.
- The bank loan is secured on the non-current assets of Flufftort and is due for repayment on 31 December 20X9. The loan is subject to a covenant that the ratio of equity to non-current liabilities should be greater than 1.3 on a book value basis. Flufftort has also been granted an overdraft facility of up to \$5 million by its bank.
- The loan note is held by Rajiv Patel, a member of the Patel family who is not a director. The loan note is unsecured, is subordinated to the bank loan and has no fixed date for repayment.
- If no finance is available for investment in manufacturing facilities, non-current assets, current assets excluding cash, the bank loan, loan note and current liabilities can be assumed to be the same at 30 June 20X6 as at 30 June 20X5.

However, the Chief Executive and Finance Director of Flufftort Co intend to propose that the company should be refinanced to fund the expanded production of the Easicushion chair. They have not yet consulted anyone else about their proposals.

Details of the proposed refinancing are as follows:

- The members of the Patel family who are directors would subscribe to an additional 15 million \$1 shares at par.
- Gupte VC would subscribe to an additional 20 million \$1 shares at par.
- The 8.5% bank loan would be renegotiated with the bank and the borrowing increased to \$65 million, to be repaid on 30 June 20Y2. The expected finance cost of the loan would be 10% per annum.
- Rajiv Patel's loan note would be replaced by 5 million \$1 shares.

- 5 The refinancing would mean non-current assets would increase to \$125 million, current assets other than cash would increase to \$42 million and current liabilities would increase to \$12 million.
- 6 Operating profits would be expected to increase to \$20 million in the first full year after the facilities are constructed (year ended 30 June 20X7) and \$25 million in the second year (year ended 30 June 20X8). No dividends would be paid for these two years, as cash surpluses would be used for further investment as required. Tax on company profits can be assumed to remain at 20%.

Required

- (a) (i) Prepare a projected statement of financial position as at 30 June 20X6, on the assumption that Gupte VC exercises its rights and Gupte VC's shares are repurchased and cancelled by Flufftort Co. **(4 marks)**
- (ii) Prepare a projected statement of financial position as at 30 June 20X6 on the assumption that the proposed refinancing and investment take place. **(4 marks)**
- (iii) Prepare projected statements of profit or loss for the years ended 30 June 20X7 and 30 June 20X8 on the basis that the profit forecasts are correct. **(4 marks)**
- (b) Evaluate whether the suggested refinancing scheme is likely to be agreed by all finance providers. State clearly any assumptions which you make. **(13 marks)**

(Total = 25 marks)

32 Ennea (6/12)

49 mins

Three proposals were put forward for further consideration after a meeting of the executive directors of Ennea Co to discuss the future investment and financing strategy of the business. Ennea Co is a listed company operating in the haulage and shipping industry.

Proposal 1

To increase the company's level of debt by borrowing a further \$20 million and use the funds raised to buy back share capital.

Proposal 2

To increase the company's level of debt by borrowing a further \$20 million and use these funds to invest in additional non-current assets in the haulage strategic business unit.

Proposal 3

To sell excess non-current haulage assets with a net book value of \$25 million for \$27 million and focus on offering more services to the shipping strategic business unit. This business unit will require no additional investment in non-current assets. All the funds raised from the sale of the non-current assets will be used to reduce the company's debt.

Ennea Co financial information

EXTRACTS FROM THE FORECAST FINANCIAL POSITION FOR THE COMING YEAR

	\$m
Non-current assets	282
Current assets	66
Total assets	<u>348</u>
Equity and liabilities	
Share capital (40c per share)	48
Retained earnings	123
Total equity	<u>171</u>
Non-current liabilities	140
Current liabilities	37
Total liabilities	<u>177</u>
Total liabilities and equity	<u>348</u>

Ennea Co's forecast after-tax profit for the coming year is expected to be \$26 million and its current share price is \$3.20 per share. The non-current liabilities consist solely of a 6% medium-term loan redeemable within 7 years. The terms of the loan contract stipulate that an increase in borrowing will result in an increase in the coupon payable of 25 basis points on the total amount borrowed, while a reduction in borrowing will lower the coupon payable by 15 basis points on the total amount borrowed.

Ennea Co's effective tax rate is 20%. The company's estimated after-tax rate of return on investment is expected to be 15% on any new investment. It is expected that any reduction in investment would suffer the same rate of return.

Required

(a) Estimate and discuss the impact of each of the three proposals on the forecast statement of financial position, the earnings and earnings per share, and gearing of Ennea Co. **(20 marks)**

(b) An alternative suggestion to Proposal 3 was made where the non-current assets could be leased to other companies instead of being sold. The lease receipts would then be converted into an asset through securitisation. The proceeds from the sale of the securitised lease receipts asset would be used to reduce the outstanding loan borrowings.

Required

Explain what the securitisation process would involve and what would be the key barriers to Ennea Co undertaking the process. **(5 marks)**

(Total = 25 marks)

33 Nubo (12/13)

49 mins

Nubo Co has divisions operating in two diverse sectors: production of aircraft parts and supermarkets. Whereas the aircraft parts production division has been growing rapidly, the supermarkets division's growth has been slower. The company is considering selling the supermarkets division and focusing solely on the aircraft parts production division.

Extracts from Nubo Co's most recent financial statements are as follows:

Year ended 30 November	20X3
	\$m
Profit after tax	166
Non-current assets	550
Current assets	122
Non-current liabilities	387
Current liabilities	95

About 70% of Nubo Co's non-current assets and current assets are attributable to the supermarkets division and the remainder to the aircraft parts production division. Each of the two divisions generates roughly half of the total profit after tax. The market value of the two divisions is thought to be equivalent to the price/earnings (P/E) ratios of the two divisions' industries. The supermarket industry's P/E ratio is 7 and the aircraft parts production industry's P/E ratio is 12.

Nubo Co can either sell the supermarkets division as a going concern or sell the assets of the supermarkets division separately. If the assets are sold separately, Nubo Co believes that it can sell the non-current assets for 115% of the book value and the current assets for 80% of the book value. The funds raised from the sale of the supermarkets division will be used to pay for all the company's current and non-current liabilities.

Following the sale of the supermarkets division and paying off the liabilities, Nubo Co will raise additional finance for new projects in the form of debt. It will be able to borrow up to a maximum of 100% of the total asset value of the new downsized company.

One of the new projects which Nubo Co is considering is a joint venture with Pilvi Co to produce an innovative type of machinery which will be used in the production of light aircraft and private jets. Both companies will provide the expertise and funding required for the project equally. Representatives from both companies will make up the senior management team and decisions will be made jointly. Legal contracts will be drawn up once profit-sharing and other areas have been discussed by the companies and agreed on.

Pilvi Co has approached Ulap Bank for the finance it requires for the venture, based on Islamic finance principles. Ulap Bank has agreed to consider the request from Pilvi Co but, because the financing requirement will be for a long period of time and because of uncertainties surrounding the project, Ulap Bank wants to provide the finance based on the principles of a Musharaka contract, with Ulap Bank requiring representation on the venture's senior management team. Normally Ulap Bank provides funds based on the principles of a Mudaraba contract, which the bank provides for short-term, low-risk projects, where the responsibility for running a project rests solely with the borrower.

Required

(a) Advise Nubo Co whether it should sell the supermarkets division as a going concern or sell the assets separately and estimate the additional cash and debt funds which could be available to the new, downsized company. Show all relevant calculations. **(7 marks)**

(b) An alternative to selling the supermarkets division would be to demerge both the divisions. In this case, all of Nubo Co's liabilities would be taken over by the demerged supermarkets division. Also, either of the demerged companies can borrow up to 100% of their respective total asset values.

Required

Discuss whether a demerger of the supermarkets division may be more appropriate than a sale. **(6 marks)**

(c) Discuss why Ulap Bank may want to consider providing the finance based on a Musharaka contract instead of a Mudaraba contract, and the key concerns Nubo Co may have from the arrangement between Pilvi Co and Ulap Bank. **(12 marks)**

(Total = 25 marks)

34 Bento (6/15)**49 min**

In order to raise funds for future projects, the management of Bento Co, a large manufacturing company, is considering disposing of one of its subsidiary companies, Okazu Co, which is involved in manufacturing rubber tubing. It is considering undertaking the disposal through a management buyout (MBO) or a management buy-in (MBI). Bento Co wants \$60 million from the sale of Okazu Co.

Given below are extracts from the most recent financial statements for Okazu Co:

YEAR ENDING 30 APRIL

	20X5 \$'000
Total non-current assets	40,800
Total current assets	<u>12,300</u>
Total assets	<u>53,100</u>
Equity	24,600
Non-current liabilities	16,600
Current liabilities	
Trade and other payables	7,900
Bank overdraft	<u>4,000</u>
Total current liabilities	<u>11,900</u>
 Total equity and liabilities	 <u>53,100</u>

YEAR ENDING 30 APRIL

	20X5 \$'000
Sales revenue	54,900
Operating profit	<u>12,200</u>
Finance costs	<u>1,600</u>
Profit before tax	<u>10,600</u>
Taxation	<u>2,120</u>
Profit for the year	<u>8,480</u>

Notes relating to the financial statements above:

- 1 Current assets, non-current assets and the trade and other payables will be transferred to the new company when Okazu Co is sold. The bank overdraft will be repaid by Bento Co prior to the sale of Okazu Co.
- 2 With the exception of the bank overdraft, Bento Co has provided all the financing to Okazu Co. No liabilities, except the trade and other payables specified above, will be transferred to the new company when Okazu Co is sold.
- 3 It is estimated that the market value of the non-current assets is 30% higher than the book value and the market value of the current assets is equivalent to the book value.
- 4 The group finance costs and taxation are allocated by Bento Co to all its subsidiaries in pre-agreed proportions.

Okazu Co's senior management team has approached Dofu Co, a venture capital company, about the proposed MBO. Dofu Co has agreed to provide leveraged finance for a 50% equity stake in the new company on the following basis:

- \$30 million loan in the form of an 8% bond on which interest is payable annually, based on the loan amount outstanding at the start of each year. The bond will be repaid on the basis of fixed equal annual payments (constituting of interest and principal) over the next four years.

- \$20 million loan in the form of a 6% convertible bond on which interest is payable annually. Conversion may be undertaken on the basis of 50 equity shares for every \$100 from the beginning of Year 5 onwards.
- 5,000,000 \$1 equity shares for \$5,000,000.

Okazu Co's senior management will contribute \$5,000,000 for 5,000,000 \$1 equity shares and own the remaining 50% of the equity stake.

As a condition for providing the finance, Dofu Co will impose a restrictive covenant that the new company's gearing ratio will be no higher than 75% at the end of its first year of operations, and then fall to no higher than 60%, 50% and 40% at the end of Year 2 to Year 4 respectively. The gearing ratio is determined by the book value of debt divided by the combined book values of debt and equity.

After the MBO, it is expected that earnings before interest and tax will increase by 11% per year and annual dividends of 25% on the available earnings will be paid for the next 4 years. It is expected that the annual growth rate of dividends will reduce by 60% from Year 5 onwards following the MBO. The new company will pay tax at a rate of 20% per year. The new company's cost of equity has been estimated at 12%.

Required

- (a) Distinguish between an MBO and an MBI. Discuss the relative benefits and drawbacks to Okazu Co if it is disposed through an MBO instead of an MBI. **(5 marks)**
- (b) Estimate, showing all relevant calculations, whether the restrictive covenant imposed by Dofu Co is likely to be met. **(12 marks)**
- (c) Discuss, with supporting calculations, whether or not an MBO would be beneficial for Dofu Co and Okazu Co's senior management team. **(8 marks)**

(Total = 25 marks)

35 Eview Cinemas (Sep/Dec 17)

49 mins

Eview Cinemas Co is a long-established chain of cinemas in the country of Taria. 20 years ago Eview Cinemas Co's board decided to convert some of its cinemas into sports gyms, known as the EV clubs. The number of EV clubs has expanded since then. Eview Cinemas Co's board brought in outside managers to run the EV clubs, but over the years there have been disagreements between the clubs' managers and the board. The managers have felt that the board has wrongly prioritised investment in, and refurbishment of, the cinemas at the expense of the EV clubs.

Five years ago, Eview Cinemas Co undertook a major refurbishment of its cinemas, financing this work with various types of debt, including loan notes at a high coupon rate of 10%. Shortly after the work was undertaken, Taria entered into a recession which adversely affected profitability. The finance cost burden was high and Eview Cinemas Co was not able to pay a dividend for two years.

The recession is now over and Eview Cinemas Co has emerged in a good financial position, as two of its competitors went into insolvency during the recession. Eview Cinemas Co's board wishes to expand its chain of cinemas and open new, multiscreen cinemas in locations which are available because businesses were closed down during the recession.

In two years' time Taria is due to host a major sports festival. This has encouraged interest in sport and exercise in the country. As a result, some gym chains are looking to expand and have contacted Eview Cinemas Co's board to ask if it would be interested in selling the EV clubs. Most of the directors regard the cinemas as the main business and so are receptive to selling the EV clubs.

The finance director has recommended that the sales price of the EV clubs be based on predicted free cash flows as follows:

1. The predicted free cash flow figures in \$millions for EV clubs are as follows:

Year	1	2	3	4
	390	419	455	490

2. After Year 4, free cash flows should be assumed to increase at 5.2% per annum.
3. The discount rate to be used should be the current weighted average cost of capital, which is 12%.
4. The finance director believes that the result of the free cash flow valuation will represent a fair value of the EV clubs' business, but Eview Cinemas Co is looking to obtain a 25% premium on the fair value as the expected sales price.

Other information supplied by the finance director is as follows:

1. The predicted after-tax profits of the EV clubs are \$454 million in Year 1. This can be assumed to be 40% of total after-tax profits of EV Cinemas Co.
2. The expected proceeds which Eview Cinemas Co receives from selling the EV clubs will be used firstly to pay off the 10% loan notes. Part of the remaining amount from the sales proceeds will then be used to enhance liquidity by being held as part of current assets, so that the current ratio increases to 1.5. The rest of the remaining amount will be invested in property, plant and equipment. The current net book value of the non-current assets of the EV clubs to be sold can be assumed to be \$3,790 million. The profit on the sale of the EV clubs should be taken directly to reserves.
3. Eview Cinemas Co's asset beta for the cinemas can be assumed to be 0.952.
4. Eview Cinemas Co currently has 1,000 million \$1 shares in issue. These are currently trading at \$15.75 per share. The finance director expects the share price to rise by 10% once the sale has been completed, as he thinks that the stock market will perceive it to be a good deal.
5. Tradeable debt is currently quoted at \$96 per \$100 for the 10% loan notes and \$93 per \$100 for the other loan notes. The value of the other loan notes is not expected to change once the sale has been completed. The overall pre-tax cost of debt is currently 9% and can be assumed to fall to 8% when the 10% loan notes are redeemed.
6. The current tax rate on profits is 20%.
7. Additional investment in current assets is expected to earn a 7% pre-tax return and additional investment in property, plant and equipment is expected to earn a 12% pre-tax return.
8. The current risk-free rate is 4% and the return on the market portfolio is 10%.

Eview Cinemas Co's current summarised statement of financial position is shown below. The CEO wants to know the impact the sale of the EV clubs would have immediately on the statement of financial position, the impact on the Year 1 forecast earnings per share and on the weighted average cost of capital.

	\$m
Assets	
Non-current assets	15,621
Current assets	2,347
Total assets	17,968
Equity and liabilities	
Called-up share capital	1,000
Retained earnings	7,917
Total equity	8,917

	\$m
Non-current liabilities	
10% loan notes	3,200
Other loan notes	2,700
Bank loans	985
Total non-current liabilities	<u>6,885</u>
Current liabilities	<u>2,166</u>
Total equity and liabilities	<u>17,968</u>

Required

(a) Calculate the expected sales price of the EV clubs and demonstrate its impact [ie the impact of the sale] on Eview Cinemas Co's statement of financial position, forecast earnings per share and weighted average cost of capital. **(17 marks)**

(b) Evaluate the decision to sell the EV clubs. **(8 marks)**

(Total = 25 marks)

TREASURY AND ADVANCED RISK MANAGEMENT TECHNIQUES

Questions 36 to 47 cover treasury and advanced risk management techniques, the subject of Part E of the BPP Workbook for AFM.

36 Kenduri (6/13)

49 mins

Kenduri Co is a large multinational company based in the UK with a number of subsidiary companies around the world. Currently, foreign exchange exposure as a result of transactions between Kenduri Co and its subsidiary companies is managed by each company individually. Kenduri Co is considering whether or not to manage the foreign exchange exposure using multilateral netting from the UK, with the sterling pound (£) as the base currency. If multilateral netting is undertaken, spot mid-rates would be used.

The following cash flows are due in three months between Kenduri Co and three of its subsidiary companies. The subsidiary companies are Lakama Co, based in the US (currency US\$), Jaia Co, based in Canada (currency CAD), and Gochiso Co, based in Japan (currency JPY).

Owed by	Owed to	Amount
Kenduri Co	Lakama Co	US\$4.5 million
Kenduri Co	Jaia Co	CAD 1.1 million
Gochiso Co	Jaia Co	CAD 3.2 million
Gochiso Co	Lakama Co	US\$1.4 million
Jaia Co	Lakama Co	US\$1.5 million
Jaia Co	Kenduri Co	CAD 3.4 million
Lakama Co	Gochiso Co	JPY 320 million
Lakama Co	Kenduri Co	US\$2.1 million

Exchange rates available to Kenduri Co

	US\$/£1	CAD/£1	JPY/£1
Spot	1.5938–1.5962	1.5690–1.5710	131.91–133.59
3-month forward	1.5996–1.6037	1.5652–1.5678	129.15–131.05

Currency options available to Kenduri Co

Contract size £62,500, Exercise price quotation: US\$/£1, Premium: cents per £1

	Call options		Put options	
	3-month expiry	6-month expiry	3-month expiry	6-month expiry
Exercise price				
1.60	1.55	2.25	2.08	2.23
1.62	0.98	1.58	3.42	3.73

It can be assumed that option contracts expire at the end of the relevant month.

Annual interest rates available to Kenduri Co and subsidiaries

	Borrowing rate	Investing rate
UK	4.0%	2.8%
US	4.8%	3.1%
Canada	3.4%	2.1%
Japan	2.2%	0.5%

Required

- (a) Advise Kenduri Co on, and recommend, an appropriate hedging strategy for the US\$ cash flows it is due to receive or pay in three months, from Lakama Co. Show all relevant calculations to support the advice given. **(12 marks)**
- (b) Calculate, using a tabular format (transactions matrix), the impact of undertaking multilateral netting by Kenduri Co and its three subsidiary companies for the cash flows due in three months. Briefly discuss why some governments allow companies to undertake multilateral netting, while others do not. **(10 marks)**
- (c) When examining different currency options and their risk factors, it was noticed that a long call option had a high gamma value. Explain the possible characteristics of a long call option with a high gamma value. **(3 marks)**

(Total = 25 marks)

37 Massie (Sep/Dec 15)

49 mins

The Armstrong Group is a multinational group of companies. Today is 1 September. The treasury manager at Massie Co, one of Armstrong Group's subsidiaries based in Europe, has just received notification from the group's head office that it intends to introduce a system of netting to settle balances owed within the group every six months. Previously inter-group indebtedness was settled between the two companies concerned.

The predicted balances owing to, and owed by, the group companies at the end of February are as follows:

Owed by	Owed to	Local currency
		million (m)
Armstrong (US)	Horan (South Africa)	US\$12.17
Horan (South Africa)	Massie (Europe)	SA R42.65
Giffen (Denmark)	Armstrong (US)	D Kr21.29
Massie (Europe)	Armstrong (US)	US\$19.78
Armstrong (US)	Massie (Europe)	€1.57
Horan (South Africa)	Giffen (Denmark)	D Kr16.35
Giffen (Denmark)	Massie (Europe)	€1.55

The predicted exchange rates, used in the calculations of the balances to be settled, are as follows:

	D Kr	US\$	SA R	€
1 D Kr =	1.0000	0.1823	1.9554	0.1341
1 US\$ =	5.4855	1.0000	10.7296	0.7358
1 SA R =	0.5114	0.0932	1.0000	0.0686
1 € =	7.4571	1.3591	14.5773	1.0000

Settlement will be made in dollars, the currency of Armstrong Group, the parent company. Settlement will be made in the order that the company owing the largest net amount in dollars will first settle with the company owed the smallest net amount in dollars.

Note. D Kr is Danish Krone, SA R is South African Rand, US\$ is United States dollar and € is euro.

Required

(a) (i) Calculate the inter-group transfers which are forecast to occur for the next period. **(8 marks)**

(ii) Discuss the problems which may arise with the new arrangement. **(3 marks)**

The most significant transaction which Massie Co is due to undertake with a company outside the Armstrong Group in the next six months is that it is due to receive €25 million from Bardsley Co on 30 November. Massie Co's treasury manager intends to invest this money for the six months until 31 May, when it will be used to fund some major capital expenditure. However, the treasury manager is concerned about changes in interest rates. Predictions in the media range from a 0.5% rise in interest rates to a 0.5% fall.

Because of the uncertainty, the treasury manager has decided to protect Massie Co by using derivatives. The treasury manager wishes to take advantage of favourable interest rate movements. Therefore she is considering options on interest rate futures or interest rate collars as possible methods of hedging, but not interest rate futures. Massie Co can invest at LIBOR minus 40 basis points and LIBOR is currently 3.6%.

The treasury manager has obtained the following information on euro futures and options. She is ignoring margin requirements.

Three-month euro futures, €1,000,000 contract, tick size 0.01% and tick value €25.

September	95.94
December	95.76
March	95.44

Options on 3-month euro futures, €1,000,000 contract, tick size 0.01% and tick value €25. Option premiums are in annual %.

September	Calls		Strike	Puts		
	December	March		September	December	March
0.113	0.182	0.245	96.50	0.002	0.123	0.198
0.017	0.032	0.141	97.00	0.139	0.347	0.481

It can be assumed that settlement for the contracts is at the end of the month. It can also be assumed that basis diminishes to zero at contract maturity at a constant rate and that time intervals can be counted in months.

Required

(b) Based on the choice of options on futures or collars which Massie Co is considering and assuming the company does not face any basis risk, recommend a hedging strategy for the €25 million receipt. Support your recommendations with appropriate comments and relevant calculations. **(14 marks)**

(Total = 25 marks)

38 Asteroid Systems (6/08, amended)

49 mins

Asteroid Systems is a German-based company with a subsidiary in Switzerland. The company's treasury manager expects the Swiss business will remit the equivalent of €1.5 million in 2 months. Her expectations of the future remittance are based upon the current SFr/Euro forward rate.

The current spot and forward rates for Swiss francs against the euro are extracted from the *Financial Times* and are shown in the table below.

	Closing mid-point	Change on day	Bid/offer spread	Days mid	One month	Three month
				High	Rate	Rate
				Low	Annual	Annual
Switzerland (SFr/€)	1.6242	0.0107	239–244	1.6261	1.6147	1.6223
				1.6261	1.4	1.6176
						1.6

In the euro money market the company can make fixed interest deposits at LIBOR and can borrow at LIBOR plus 20 basis points for terms of greater than one month but up to six months. The company can borrow at fixed rates in the Swiss money market. LIBOR rates, as quoted in the *Financial Times*, are as follows.

	EUR	CHF
Spot	3.56688	2.06000
1 week	3.57300	2.06000
2 week	3.58438	2.07000
1 month	3.60900	2.08000
2 month	3.72538	2.17000
3 month	3.78238	2.20000

The company's treasury manager is keen to eliminate transaction risk. However, because of the margin requirements and their impact upon the firm's cash flow, she would prefer not to use exchange-traded derivatives. Swiss franc borrowing or lending rates would need to be negotiated with the bank.

The CEO of Asteroid Systems has heard that a local competitor has made substantial gains from using its treasury department to speculate on foreign exchange markets and is interested in adding speculation to the role of the treasury department.

Required

- (a) Estimate the lowest acceptable Swiss borrowing or lending rate for a money market hedge maturing in two months. **(10 marks)**
- (b) Discuss the relative advantages and disadvantages of the use of a money market hedge compared with using exchange-traded derivatives for hedging a foreign exchange exposure. **(6 marks)**
- (c) Discuss the extent to which currency hedging can reduce a firm's cost of capital. **(4 marks)**
- (d) Discuss the points to consider when deciding whether the treasury department of Asteroid Systems should operate as a profit centre or a cost centre. **(5 marks)**

(Total = 25 marks)

39 Casasophia (6/11, amended)

49 mins

Casasophia Co, based in a European country that uses the euro (€), constructs and maintains advanced energy efficient commercial properties around the world. It has just completed a major project in the US and is due to receive the final payment of US\$20 million in 4 months.

Casasophia Co is planning to commence a major construction and maintenance project in Mazabia, a small African country, in six months' time. This government-owned project is expected to last for three years during which time Casasophia Co will complete the construction of state of the art energy efficient properties and provide training to a local Mazabian company in maintaining the properties.

The carbon-neutral status of the building project has attracted some grant funding from the European Union and these funds will be provided to the Mazabian Government in Mazabian Shillings (MShs).

Casasophia Co intends to finance the project using the US\$20 million it is due to receive and borrow the rest through a € loan. It is intended that the US\$ receipts will be converted into € and invested in short-dated treasury bills until they are required. These funds plus the loan will be converted into MShs on the date required, at the spot rate at that time.

Mazabia's Government requires Casasophia Co to deposit the MShs2.64 billion it needs for the project, with Mazabia's central bank, at the commencement of the project. In return, Casasophia Co will receive a fixed sum of MShs1.5 billion after tax, at the end of each year for a period of 3 years. Neither of these amounts is subject to inflationary increases. The relevant risk-adjusted discount rate for the project is assumed to be 12%.

Financial information

Exchange rates available to Casasophia

	Per €1	Per €1
Spot	US\$1.3585–US\$1.3618	MShs116–MShs128
4-month forward	US\$1.3588–US\$1.3623	Not available

Currency futures (Contract size €125,000, Quotation: US\$ per €1)

2-month expiry	1.3633
5-month expiry	1.3698

Currency options (Contract size €125,000, Exercise price quotation: US\$ per €1, cents per euro)

Exercise price	Calls		Puts	
	2-month expiry	5-month expiry	2-month expiry	5-month expiry
1.36	2.35	2.80	2.47	2.98
1.38	1.88	2.23	4.23	4.64
Casasophia Co local government base rate		2.20%		
Mazabia government base rate		10.80%		
Yield on short-dated euro treasury bills (assume 360-day year)		1.80%		

Mazabia's current annual inflation rate is 9.7% and is expected to remain at this level for the next 6 months. However, after that, there is considerable uncertainty about the future and the annual level of inflation could be anywhere between 5% and 15% for the next few years. The country where Casasophia Co is based is expected to have a stable level of inflation at 1.2% per year for the foreseeable future. A local bank in Mazabia has offered Casasophia Co the opportunity to swap the annual income of MShs1.5 billion receivable in each of the next 3 years for euros, at the estimated annual MShs/€ forward rates based on the current government base rates.

Required

(a) Advise Casasophia Co on, and recommend, an appropriate hedging strategy for the US\$ income it is due to receive in four months. Include all relevant calculations. **(15 marks)**

(b) Given that Casasophia Co agrees to the local bank's offer of the swap, calculate the net present value of the project, in six months' time, in €. Discuss whether the swap would be beneficial to Casasophia Co. **(10 marks)**

(Total = 25 marks)

40 Buryecs (Mar/Jun 17)**49 mins**

Buryecs Co is an international transport operator based in the Eurozone which has been invited to take over a rail operating franchise in Wirtonia, where the local currency is the dollar (\$). Previously this franchise was run by a local operator in Wirtonia but its performance was unsatisfactory and the government in Wirtonia withdrew the franchise.

Buryecs Co will pay \$5,000 million for the rail franchise immediately. The government has stated that Buryecs Co should make an annual income from the franchise of \$600 million in each of the next three years. At the end of the three years the government in Wirtonia has offered to buy the franchise back for \$7,500 million if no other operator can be found to take over the franchise.

Today's spot exchange rate between the Euro and Wirtonia \$ is €0.1430 = \$1. The predicted inflation rates are as follows:

Year	1	2	3
Eurozone	6%	4%	3%
Wirtonia	3%	8%	11%

Buryecs Co's finance director (FD) has contacted its bankers with a view to arranging a currency swap, since he believes that this will be the best way to manage financial risks associated with the franchise. The swap would be for the initial fee paid for the franchise, with a swap of principal immediately and in three years' time, both these swaps being at today's spot rate. Buryecs Co's bank would charge an annual fee of 0.5% in € for arranging the swap. Buryecs Co would take 60% of any benefit of the swap before deducting bank fees, but would then have to pay 60% of the bank fees.

Relevant borrowing rates are:

	Buryecs Co	Counterparty
Eurozone	4.0%	5.8%
Wirtonia	Wirtonia bank rate + 0.6%	Wirtonia bank rate + 0.4%

In order to provide Buryecs Co's board with an alternative hedging method to consider, the FD has obtained the following information about over-the-counter options in Wirtonia \$ from the company's bank.

The exercise price quotation is in Wirtonia \$ per €1, premium is % of amount hedged, translated at today's spot rate.

Exercise price	Call options	Put options
7.75	2.8%	1.6%
7.25	1.8%	2.7%

Assume a discount rate of 14%.

Required

- Discuss the advantages and drawbacks of using the currency swap to manage financial risks associated with the franchise in Wirtonia. **(6 marks)**
- Calculate the annual percentage interest saving which Buryecs Co could make from using a currency swap, compared with borrowing directly in Wirtonia, demonstrating how the currency swap will work. **(4 marks)**
 - Evaluate, using net present value, the financial acceptability of Buryecs Co operating the rail franchise under the terms suggested by the government of Wirtonia and calculate the gain or loss in € from using the swap arrangement. **(8 marks)**
- Calculate the results of hedging the receipt of \$7,500 million using the currency options and discuss whether currency options would be a better method of hedging this receipt than a currency swap. **(7 marks)**

(Total = 25 marks)

41 Alecto (2013 pilot exam)

49 mins

Alecto Co, a large listed company based in Europe, is expecting to borrow €22,000,000 in 4 months' time on 1 May 20X2. It expects to make a full repayment of the borrowed amount nine months from now. Currently there is some uncertainty in the markets, with higher than normal rates of inflation, but an expectation that the inflation level may soon come down. This has led some economists to predict a rise in interest rates and others suggesting an unchanged outlook or maybe even a small fall in interest rates over the next six months.

Although Alecto Co is of the opinion that it is equally likely that interest rates could increase or fall by 0.5% in 4 months, it wishes to protect itself from interest rate fluctuations by using derivatives. The company can borrow at LIBOR plus 80 basis points and LIBOR is currently 3.3%. The company is considering using interest rate futures, options on interest rate futures or interest rate collars as possible hedging choices.

The following information and quotes from an appropriate exchange are provided on euro futures and options. Margin requirements may be ignored.

Three-month euro futures, €1,000,000 contract, tick size 0.01% and tick value €25.

March	96.27
June	96.16
September	95.90

Options on three-month euro futures, €1,000,000 contract, tick size 0.01% and tick value €25. Option premiums are in annual %.

March	Calls			Puts		
	June	September	Strike	March	June	September
0.279	0.391	0.446	96.00	0.006	0.163	0.276
0.012	0.090	0.263	96.50	0.196	0.581	0.754

It can be assumed that settlement for both the futures and options contracts is at the end of the month. It can also be assumed that basis diminishes to zero at contract maturity at a constant rate and that time intervals can be counted in months.

Required

- Briefly discuss the main advantage and disadvantage of hedging interest rate risk using an interest rate collar instead of options. **(4 marks)**
- Based on the three hedging choices Alecto Co is considering and assuming that the company does not face any basis risk, recommend a hedging strategy for the €22,000,000 loan. Support your recommendation with appropriate comments and relevant calculations in €. **(17 marks)**
- Explain what is meant by basis risk and how it would affect the recommendation made in part (b) above. **(4 marks)**

(Total = 25 marks)

42 Awan (12/13)**49 mins**

Awan Co is expecting to receive \$48,000,000 on 1 February 2014, which will be invested until it is required for a large project on 1 June 2014. Due to uncertainty in the markets, the company is of the opinion that it is likely that interest rates will fluctuate significantly over the coming months, although it is difficult to predict whether they will increase or decrease.

Awan Co's treasury team want to hedge the company against adverse movements in interest rates using one of the following derivative products:

Forward rate agreements (FRAs);

Interest rate futures; or

Options on interest rate futures.

Awan Co can invest funds at the relevant inter-bank rate less 20 basis points. The current inter-bank rate is 4.09%. However, Awan Co is of the opinion that interest rates could increase or decrease by as much as 0.9% over the coming months.

The following information and quotes are provided from an appropriate exchange on \$ futures and options. Margin requirements can be ignored.

Three-month \$ futures, \$2,000,000 contract size

Prices are quoted in basis points at 100 – annual % yield

December 2013: 94.80

March 2014: 94.76

June 2014: 94.69

Options on three-month \$ futures, \$2,000,000 contract size, option premiums are in annual %

December	Calls			Puts		
	March	June	Strike	December	March	June
0.342	0.432	0.523	94.50	0.090	0.119	0.271
0.097	0.121	0.289	95.00	0.312	0.417	0.520

Voblaka Bank has offered the following FRA rates to Awan Co:

1-7: 4.37%

3-4: 4.78%

3-7: 4.82%

4-7: 4.87%

It can be assumed that settlement for the futures and options contracts is at the end of the month and that basis diminishes to zero at contract maturity at a constant rate, based on monthly time intervals. Assume that it is 1 November 2013 now and that there is no basis risk.

Required

(a) Based on the three hedging choices Awan Co is considering, recommend a hedging strategy for the \$48,000,000 investment, if interest rates increase or decrease by 0.9%. Support your answer with appropriate calculations and discussion. **(19 marks)**

(b) A member of Awan Co's treasury team has suggested that if option contracts are purchased to hedge against the interest rate movements, then the number of contracts purchased should be determined by a hedge ratio based on the delta value of the option.

Required

Discuss how the delta value of an option could be used in determining the number of contracts purchased. **(6 marks)**

(Total = 25 marks)

Wardegul Co, a company based in the Eurozone, has expanded very rapidly over recent years by a combination of acquiring subsidiaries in foreign countries and setting up its own operations abroad. Wardegul Co's board has found it increasingly difficult to monitor its activities and Wardegul Co's support functions, including its treasury function, have struggled to cope with a greatly increased workload. Wardegul Co's board has decided to restructure the company on a regional basis, with regional boards and appropriate support functions. Managers in some of the larger countries in which Wardegul Co operates are unhappy with reorganisation on a regional basis, and believe that operations in their countries should be given a large amount of autonomy and be supported by internal functions organised on a national basis.

Assume it is now 1 October 20W7. The central treasury function has just received information about a future transaction by a newly-acquired subsidiary in Euria, where the local currency is the dinar (D). The subsidiary expects to receive D27,000,000 on 31 January 20X8. It wants this money to be invested locally in Euria, most probably for five months until 30 June 20X8.

Wardegul Co's treasury team is aware that economic conditions in Euria are currently uncertain. The central bank base rate in Euria is currently 4.2% and the treasury team believes that it can invest funds in Euria at the central bank base rate less 30 basis points. However, treasury staff have seen predictions that the central bank base rate could increase by up to 1.1% or fall by up to 0.6% between now and 31 January 20X8.

Wardegul Co's treasury staff normally hedge interest rate exposure by using whichever of the following products is most appropriate:

- Forward rate agreements (FRAs)
- Interest rate futures
- Options on interest rate futures

Treasury function guidelines emphasise the importance of mitigating the impact of adverse movements in interest rates. However, they also allow staff to take into consideration upside risks associated with interest rate exposure when deciding which instrument to use.

A local bank in Euria, with which Wardegul Co has not dealt before, has offered the following FRA rates:

4-9: 5.02%

5-10: 5.10%

The treasury team has also obtained the following information about exchange traded Dinar futures and options:

Three-month D futures, D500,000 contract size

Prices are quoted in basis points at 100 – annual % yield:

December 20W7: 94.84

March 20X8: 94.78

June 20X8: 94.66

Options on three-month D futures, D500,000 contract size, option premiums are in annual %

December	Calls			Strike price	Put		
	March	June	December		March	June	
0.417	0.545	0.678	94.25	0.071	0.094	0.155	
0.078	0.098	0.160	95.25	0.393	0.529	0.664	

It can be assumed that futures and options contracts are settled at the end of each month. Basis can be assumed to diminish to zero at contract maturity at a constant rate, based on monthly time intervals. It can also be assumed that there is no basis risk and there are no margin requirements.

Required

(a) Recommend a hedging strategy for the D27,000,000 investment, based on the hedging choices which treasury staff are considering, if interest rates increase by 1.1% or decrease by 0.6%. Support your answer with appropriate calculations and discussion. **(18 marks)**

(b) Discuss the advantages of operating treasury activities through regional treasury functions compared with:

- Each country having a separate treasury function.
- Operating activities through a single global treasury function. **(7 marks)**

(Total = 25 marks)

44 Keshi (12/14)**49 mins**

Keshi Co is a large multinational company with a number of international subsidiary companies. A centralised treasury department manages Keshi Co and its subsidiaries' borrowing requirements, cash surplus investment and financial risk management. Financial risk is normally managed using conventional derivative products such as forwards, futures, options and swaps.

Assume it is 1 December 20X4 today and Keshi Co is expecting to borrow \$18,000,000 on 1 February 20X5 for a period of 7 months. It can either borrow the funds at a variable rate of LIBOR plus 40 basis points or a fixed rate of 5.5%. LIBOR is currently 3.8% but Keshi Co feels that this could increase or decrease by 0.5% over the coming months due to increasing uncertainty in the markets.

The treasury department is considering whether or not to hedge the \$18,000,000, using either exchange-traded March options or over-the-counter swaps offered by Rozu Bank.

The following information and quotes for \$ March options are provided from an appropriate exchange. The options are based on 3-month \$ futures and \$1,000,000 contract size and option premiums are in annual %.

March calls	Strike price	March puts
0.882	95.50	0.662
0.648	96.00	0.902

Option prices are quoted in basis points at 100 minus the annual percentage yield and settlement of the options contracts is at the end of March 20X5. The current basis on the March futures price is 44 points and it is expected to be 33 points on 1 January 20X5, 22 points on 1 February 20X5 and 11 points on 1 March 20X5.

Rozu Bank has offered Keshi Co a swap on a counterparty variable rate of LIBOR plus 30 basis points or a fixed rate of 4.6%, where Keshi Co receives 70% of any benefits accruing from undertaking the swap, prior to any bank charges. Rozu Bank will charge Keshi Co 10 basis points for the swap.

Keshi Co's Chief Executive Officer believes that a centralised treasury department is necessary in order to increase shareholder value, but Keshi Co's new Chief Financial Officer (CFO) thinks that having decentralised treasury departments operating across the subsidiary companies could be more beneficial. The CFO thinks that this is particularly relevant to the situation which Suisen Co, a company owned by Keshi Co, is facing.

Suisen Co operates in a country where most companies conduct business activities based on Islamic finance principles. It produces confectionery products including chocolates. It wants to use Salam contracts instead of commodity futures contracts to hedge its exposure to price fluctuations of cocoa. Salam contracts involve a commodity which is sold based on currently agreed prices, quantity and quality. Full payment is received by the seller immediately, for an agreed delivery to be made in the future.

Required

(a) Based on the two hedging choices Keshi Co is considering, recommend a hedging strategy for the \$18,000,000 borrowing. Support your answer with appropriate calculations and discussion. **(15 marks)**

(b) Discuss how a centralised treasury department may increase value for Keshi Co and the possible reasons for decentralising the treasury department. **(6 marks)**

(c) Discuss the key differences between a Salam contract, under Islamic finance principles, and futures contracts. **(4 marks)**

(Total = 25 marks)

45 Daikon (6/15)

49 mins

For a number of years Daikon Co has been using forward rate agreements to manage its exposure to interest rate fluctuations. Recently its Chief Executive Officer (CEO) attended a talk on using exchange-traded derivative products to manage risks. She wants to find out by how much the extra cost of the borrowing detailed below can be reduced, when using interest rate futures, options on interest rate futures, and a collar on the options, to manage the interest rate risk. She asks that detailed calculations for each of the three derivative products be provided and a reasoned recommendation be made.

Daikon Co is expecting to borrow \$34,000,000 in 5 months' time. It expects to make a full repayment of the borrowed amount in 11 months' time. Assume it is 1 June 20X5 today. Daikon Co can borrow funds at LIBOR plus 70 basis points. LIBOR is currently 3.6%, but Daikon Co expects that interest rates may increase by as much as 80 basis points in 5 months' time.

The following information and quotes from an appropriate exchange are provided on LIBOR-based \$ futures and options.

Three-month \$ December futures are currently quoted at 95.84. The contract size is \$1,000,000, the tick size is 0.01% and the tick value is \$25.

Options on 3-month \$ futures, \$1,000,000 contract, tick size 0.01% and tick value \$25. Option premiums are in annual %

December calls	Strike price	December puts
0.541	95.50	0.304
0.223	96.00	0.508

Initial assumptions

It can be assumed that settlement for both the futures and options contracts is at the end of the month; that basis diminishes to zero at a constant rate until the contract matures and time intervals can be counted in months; that margin requirements may be ignored; and that if the options are in-the-money, they will be exercised at the end of the hedge instead of being sold.

Further issues

In the talk, the CEO was informed of the following issues:

(i) Futures contracts will be marked to market daily. The CEO wondered what the impact of this would be if 50 futures contracts were bought at 95.84 on 1 June and 30 futures contracts were sold at 95.61 on 3 June, based on the \$ December futures contract given above. The closing settlement prices are given below for four days:

Date	Settlement price
1 June	95.84
2 June	95.76
3 June	95.66
4 June	95.74

- (ii) Daikon Co will need to deposit funds into a margin account with a broker for each contract they have opened, and this margin will need to be adjusted when the contracts are marked to market daily.
- (iii) It is unlikely that option contracts will be exercised at the end of the hedge period unless they have reached expiry. Instead, they are more likely to be sold and the positions closed.

Required

- (a) Based on the three hedging choices available to Daikon Co and the initial assumptions given above, draft a response to the Chief Executive Officer's (CEO's) request made in the first paragraph of the question. **(15 marks)**
- (b) Discuss the impact on Daikon Co of each of the three further issues given above. As part of the discussion, include the calculations of the daily impact of the mark to market closing prices on the transactions specified by the CEO. **(10 marks)**

(Total = 25 marks)

46 Sembilan (6/12, amended)

49 mins

Sembilan Co, a listed company, recently issued debt finance to acquire assets in order to increase its activity levels. This debt finance is in the form of a floating rate bond, with a face value of \$320 million, redeemable in 4 years. The bond interest, payable annually, is based on the spot yield curve plus 60 basis points. The next annual payment is due at the end of year one.

Sembilan Co is concerned that the expected rise in interest rates over the coming few years would make it increasingly difficult to pay the interest due. It is therefore proposing to either swap the floating rate interest payment to a fixed rate payment, or to raise new equity capital and use that to pay off the floating rate bond. The new equity capital would either be issued as rights to the existing shareholders or as shares to new shareholders.

Ratus Bank has offered Sembilan Co an interest rate swap, whereby Sembilan Co would pay Ratus Bank interest based on an equivalent fixed annual rate of 3.76 1/4% in exchange for receiving a variable amount based on the current yield curve rate. Payments and receipts will be made at the end of each year, for the next four years. Ratus Bank will charge an annual fee of 20 basis points if the swap is agreed and will also guarantee the swap. The current annual spot yield curve rates are as follows:

Year	1	2	3	4
Rate	2.5%	3.1%	3.5%	3.8%

The current annual forward rates for years two, three and four are as follows:

Year	2	3	4
Rate	3.7%	4.3%	4.7%

Required

- (a) Based on the above information, calculate the amounts Sembilan Co expects to pay or receive every year on the swap (excluding the fee of 20 basis points). Explain why the fixed annual rate of interest of 3.76 1/4% is less than the 4-year yield curve rate of 3.8%. **(6 marks)**
- (b) (i) Demonstrate that Sembilan Co's interest payment liability does not change, after it has undertaken the swap, whether the interest rates increase or decrease. **(5 marks)**
(ii) Discuss the advantages and disadvantages of the swap for Sembilan Co. **(5 marks)**
- (c) Discuss the factors that Sembilan Co should consider when deciding whether it should raise equity capital to pay off the floating rate debt. **(9 marks)**

(Total = 25 marks)

Pault Co is currently undertaking a major programme of product development. Pault Co has made a significant investment in plant and machinery for this programme. Over the next couple of years, Pault Co has also budgeted for significant development and launch costs for a number of new products, although its Finance Director believes there is some uncertainty with these budgeted figures, as they will depend upon competitor activity amongst other matters.

Pault Co issued floating rate loan notes, with a face value of \$400 million, to fund the investment in plant and machinery. The loan notes are redeemable in ten years' time. The interest on the loan notes is payable annually and is based on the spot yield curve, plus 50 basis points.

Pault Co's Finance Director has recently completed a review of the company's overall financing strategy. His review has highlighted expectations that interest rates will increase over the next few years, although the predictions of financial experts in the media differ significantly.

The Finance Director is concerned about the exposure Pault Co has to increases in interest rates through the loan notes. He has therefore discussed with Millbridge Bank the possibility of taking out a four-year interest rate swap. The proposed terms are that Pault Co would pay Millbridge Bank interest based on an equivalent fixed annual rate of 4.847%. In return, Pault Co would receive from Millbridge Bank a variable amount based on the forward rates calculated from the annual spot yield curve rate at the time of payment minus 20 basis points. Payments and receipts would be made annually, with the first one in a year's time. Millbridge Bank would charge an annual fee of 25 basis points if Pault Co enters the swap.

The current annual spot yield curve rates are as follows:

Year	1	2	3	4
Rate	3.70%	4.25%	4.70%	5.10%

A number of concerns were raised at the recent board meeting when the swap arrangement was discussed.

- Pault Co's chairman wondered what the value of the swap arrangement to Pault Co was, and whether the value would change over time.
- One of Pault Co's non-executive directors objected to the arrangement, saying that in his opinion the interest rate which Pault Co would pay and the bank charges were too high. Pault Co ought to stick with its floating rate commitment. Investors would be critical if, at the end of four years, Pault Co had paid higher costs under the swap than it would have done had it left the loan unhedged.

Required

(a) (i) Using the current annual spot yield curve rates as the basis for estimating forward rates, calculate the amounts Pault Co expects to pay or receive each year under the swap (excluding the fee of 25 basis points). **(6 marks)**

(ii) Calculate Pault Co's interest payment liability for Year 1 if the yield curve rate is 4.5% or 2.9%, and comment on your results. **(6 marks)**

(b) Advise the chairman on the current value of the swap to Pault Co and the factors which would change the value of the swap. **(4 marks)**

(c) Discuss the disadvantages and advantages to Pault Co of not undertaking a swap and being liable to pay interest at floating rates. **(9 marks)**

(Total = 25 marks)

50 MARK QUESTIONS

Questions 48 to 57 are a bank of mixed 50 mark questions which cover a range of syllabus areas.

48 Conejo (Sep/Dec 17)

98 mins

Conejo Co is a listed company based in Ardilla and uses the \$ as its currency. The company was formed around 20 years ago and was initially involved in cybernetics, robotics and artificial intelligence within the information technology industry. At that time due to the risky ventures Conejo Co undertook, its cash flows and profits were very varied and unstable. Around ten years ago, it started an information systems consultancy business and a business developing cyber security systems. Both these businesses have been successful and have been growing consistently. This in turn has resulted in a stable growth in revenues, profits and cash flows. The company continues its research and product development in artificial intelligence and robotics, but this business unit has shrunk proportionally to the other two units.

Just under eight years ago, Conejo Co was successfully listed on Ardilla's national stock exchange, offering 60% of its share capital to external equity holders, whilst the original founding members retained the remaining 40% of the equity capital. The company remains financed largely by equity capital and reserves, with only a small amount of debt capital. Due to this, and its steadily growing sales revenue, profits and cash flows, it has attracted a credit rating of A from the credit rating agencies.

At a recent board of directors (BoD) meeting, the company's chief financial officer (CFO) argued that it was time for Conejo Co to change its capital structure by undertaking a financial reconstruction, and be financed by higher levels of debt. As part of her explanation, the CFO said that Conejo Co is now better able to bear the increased risk resulting from higher levels of debt finance; would be better protected from predatory acquisition bids if it was financed by higher levels of debt; and could take advantage of the tax benefits offered by increased debt finance. She also suggested that the expected credit migration from a credit rating of A to a credit rating of BBB, if the financial reconstruction detailed below took place, would not weaken Conejo Co financially.

Financial reconstruction

The BoD decided to consider the financial reconstruction plan further before making a final decision. The financial reconstruction plan would involve raising \$1,320 million (\$1.32 billion) new debt finance consisting of bonds issued at their face value of \$100. The bonds would be redeemed in five years' time at their face value of \$100 each. The funds raised from the issue of the new bonds would be used to implement one of the following two proposals:

- (a) Proposal 1: Either buy back equity shares at their current share price, which would be cancelled after they have been repurchased; or
- (b) Proposal 2: Invest in additional assets in new business ventures.

Conejo Co, Financial information

EXTRACT FROM THE FORECAST FINANCIAL POSITION FOR NEXT YEAR

	\$m
Non-current assets	1,735
Current assets	530
Total assets	2,265

Equity and liabilities

Share capital (\$1 per share par value)	400
Reserves	1,700
Total equity	2,100
Non-current liabilities	120
Current liabilities	45
Total liabilities	165
Total liabilities and capital	2,265

Conejo Co's forecast after-tax profit for next year is \$350 million and its current share price is \$11 per share.

The non-current liabilities consist solely of 5.2% coupon bonds with a face value of \$100 each, which are redeemable at their face value in three years' time. These bonds are currently trading at \$107.80 per \$100. The bond's covenant stipulates that should Conejo Co's borrowing increase, the coupon payable on these bonds will increase by 37 basis points.

Conejo Co pays tax at a rate of 15% per year and its after-tax return on the new investment is estimated at 12%.

Other financial information

Current government bond yield curve

Year	1	2	3	4	5
	1.5%	1.7%	1.9%	2.2%	2.5%

Yield spreads (in basis points)

	1 year	2 years	3 years	4 years	5 years
A	40	49	59	68	75
BBB	70	81	94	105	112
BB	148	167	185	202	218

The finance director wants to determine the percentage change in the value of Conejo Co's current bonds, if the credit rating changes from A to BBB. Furthermore, she wants to determine the coupon rate at which the new bonds would need to be issued, based on the current yield curve and appropriate yield spreads given above.

Conejo Co's chief executive officer (CEO) suggested that if Conejo Co paid back the capital and interest of the new bond in fixed annual repayments of capital and interest through the five-year life of the bond, then the risk associated with the extra debt finance would be largely mitigated. In this case, it was possible that credit migration, by credit rating companies, from A rating to BBB rating may not happen. He suggested that comparing the duration of the new bond based on the interest payable annually and the face value in five years' time with the duration of the new bond where the borrowing is paid in fixed annual repayments of interest and capital could be used to demonstrate this risk mitigation.

Required

(a) Discuss the possible reasons for the finance director's suggestions that Conejo Co could benefit from higher levels of debt with respect to risk, from protection against acquisition bids, and from tax benefits. **(7 marks)**

(b) Prepare a report for the board of directors of Conejo Co which:

- Estimates, and briefly comments on, the change in value of the current bond and the coupon rate required for the new bond, as requested by the CFO **(6 marks)**
- Estimates the Macaulay duration of the new bond based on the interest payable annually and face value repayment, and the Macaulay duration based on the fixed annual repayment of the interest and capital, as suggested by the CEO **(6 marks)**
- Estimates the impact of the two proposals on how the funds may be used on next year's forecast earnings, forecast financial position, forecast earnings per share and on forecast gearing **(11 marks)**
- Using the estimates from (b)(i), (b)(ii) and (b)(iii), discusses the impact of the proposed financial reconstruction and the proposals on the use of funds on:
 - Conejo Co;
 - Possible reaction(s) of credit rating companies and on the expected credit migration, including the suggestion made by the CEO;
 - Conejo Co's equity holders; and
 - Conejo Co's current and new debt holders.**(16 marks)**

Professional marks will be awarded in part (b) for the format, structure and presentation of the report.

(4 marks)

(Total = 50 marks)

49 Chrysos (Mar/Jun 17)

98 mins

The eight-member board of executive directors (BoD) of Chrysos Co, a large private, unlisted company, is considering the company's long-term business and financial future. The BoD is considering whether or not to undertake a restructuring programme. This will be followed a few years later by undertaking a reverse takeover to obtain a listing on the stock exchange in order to raise new finance. However, a few members of the BoD have raised doubts about the restructuring programme and the reverse takeover, not least the impact upon the company's stakeholders. Some directors are of the opinion that an initial public offering (IPO) would be a better option when obtaining a listing compared to a reverse takeover.

Chrysos Co was formed about 15 years ago by a team of five senior equity holders who are part of the BoD and own 40% of the equity share capital in total; 30 other equity holders own a further 40% of the equity share capital but are not part of the BoD; and a consortium of venture capital organisations (VCOs) own the remaining 20% of the equity share capital and have three representatives on the BoD. The VCOs have also lent Chrysos Co substantial debt finance in the form of unsecured bonds due to be redeemed in ten years' time. In addition to the BoD, Chrysos Co also has a non-executive supervisory board consisting of members of Chrysos Co's key stakeholder groups. Details of the supervisory board are given below.

Chrysos Co has two business units: a mining and shipping business unit, and a machinery parts manufacturing business unit. The mining and shipping business unit accounts for around 80% of Chrysos Co's business in terms of sales revenue, non-current and current assets, and payables. However, it is estimated that this business unit accounts for around 75% of the company's operating

costs. The smaller machinery parts manufacturing business unit accounts for the remaining 20% of sales revenue, non-current and current assets, and payables; and around 25% of the company's operating costs.

The following figures have been extracted from Chrysos Co's most recent financial statements:

Profit before depreciation, interest and tax for the year to 28 February 20X7

	\$m
Sales revenue	16,800
Operating costs	<u>(10,080)</u>
Profit before depreciation, interest and tax	<u>6,720</u>

Financial position as at 28 February 20X7

	\$m
Non-current assets	
Land and buildings	7,500
Equipment	5,400
Current assets	
Inventory	1,800
Receivables	<u>900</u>
Total assets	<u>15,600</u>
Equity	
Share capital (\$1 par value per share)	1,800
Reserves	5,400
Non-current liabilities	
4.50% unsecured bonds 20Y6 (from the VCOs)	4,800
Other debt	1,050
Current liabilities	
Payables	750
Bank overdraft	<u>1,800</u>
Total equity and liabilities	<u>15,600</u>

Corporate restructuring programme

The purpose of the restructuring programme is to simplify the company's gearing structure and to obtain extra funding to expand the mining and shipping business in the future. At present, Chrysos Co is having difficulty obtaining additional funding without having to pay high interest rates.

Machinery parts manufacturing business unit

The smaller machinery parts manufacturing business unit will be unbundled either by having its assets sold to a local supplier for \$3,102 million after its share of payables have been paid; or

The smaller machinery parts manufacturing business unit will be unbundled through a management buy-out by four managers. In this case, it is estimated that its after-tax net cash flows will increase by 8% in the first year only and then stay fixed at this level for the foreseeable future. The cost of capital related to the smaller business unit is estimated to be 10%. The management buy-out team will pay Chrysos Co 70% of the estimated market value of the smaller machinery parts manufacturing business unit.

Mining and shipping business unit

Following the unbundling of the smaller machinery parts manufacturing business unit, Chrysos Co will focus solely on the mining and shipping business unit, prior to undertaking the reverse takeover some years into the future.

As part of the restructuring programme, the existing unsecured bonds lent by the VCOs will be cancelled and replaced by an additional 600 million \$1 shares for the VCOs. The VCOs will pay \$400 million for these shares. The bank overdraft will be converted into a 15-year loan on which

Chrysos Co will pay a fixed annual interest of 4.50%. The other debt under non-current liabilities will be repaid. In addition to this, Chrysos Co will invest \$1,200 million into equipment for its mining and shipping business unit and this will result in its profits and cash flows growing by 4% per year in perpetuity.

Additional financial information

Chrysos Co aims to maintain a long-term capital structure of 20% debt and 80% equity in market value terms. Chrysos Co's finance director has assessed that the 4.50% annual interest it will pay on its bank loan is a reasonable estimate of its long-term cost of debt, based on the long-term capital structure above.

Although Chrysos Co does not know what its cost of capital is for the mining and shipping business unit, its finance director has determined that the current ungeared cost of equity of Sidero Co, a large quoted mining and shipping company, is 12.46%. Chrysos Co's finance director wants to use Sidero Co's ungeared cost of equity to calculate its cost of capital for the mining and shipping business unit.

The annual corporation tax rate on profits applicable to all companies is 18% and it can be assumed that tax is payable in the year incurred. All the non-current assets are eligible for tax allowable depreciation of 12% annually on the book values. The annual reinvestment needed to keep operations at their current levels is equivalent to the tax allowable depreciation.

Details of the supervisory board

The non-executive supervisory board provides an extra layer of governance over the BoD. It consists of representatives from the company's internal stakeholder groups including the finance providers, employees and the company's management. It ensures that the actions taken by the BoD are for the benefit of all the stakeholder groups and to the company as a whole. Any issues raised in board meetings are resolved through negotiation until an agreed position is reached.

Required

- (a) Explain what a reverse takeover involves and discuss the relative advantages and disadvantages to a company, such as Chrysos Co, of obtaining a listing through a reverse takeover as opposed to an initial public offering (IPO). **(9 marks)**
- (b) Prepare a report for the board of directors of Chrysos Co which includes:
 - (i) An extract of the financial position and an estimate of Chrysos Co's value to the equity holders, after undertaking the restructuring programme. **(18 marks)**
 - (ii) An explanation of the approach taken and assumptions made in estimating Chrysos Co's value to the equity holders, after undertaking the restructuring programme. **(5 marks)**
 - (iii) A discussion of the impact of the restructuring programme on Chrysos Co and on the venture capital organisations. **(10 marks)**
 Professional marks will be awarded in part (b) for the format, structure and presentation of the report. **(4 marks)**
- (c) Discuss why the attention Chrysos Co pays to its stakeholders represented on the supervisory board may change once it has obtained a listing. **(4 marks)**

(Total = 50 marks)

Yilandwe, whose currency is the Yilandwe Rand (YR), has faced extremely difficult economic challenges in the past 25 years because of some questionable economic policies and political decisions made by its previous governments. Although Yilandwe's population is generally poor, its people are nevertheless well educated and ambitious. Just over three years ago, a new government took office and since then it has imposed a number of strict monetary and fiscal controls, including an annual corporation tax rate of 40%, in an attempt to bring Yilandwe out of its difficulties. As a result, the annual rate of inflation has fallen rapidly from a high of 65% to its current level of 33%. These strict monetary and fiscal controls have made Yilandwe's Government popular in the larger cities and towns, but less popular in the rural areas which seem to have suffered disproportionately from the strict monetary and fiscal controls.

It is expected that Yilandwe's annual inflation rate will continue to fall in the coming few years as follows:

Year	Inflation rate
1	22.0%
2	14.7%
3 onwards	9.8%

Yilandwe's Government has decided to continue the progress made so far, by encouraging foreign direct investment into the country. Recently, government representatives held trade shows internationally and offered businesses a number of concessions, including:

- 1 Zero corporation tax payable in the first two years of operation; and
- 2 An opportunity to carry forward tax losses and write them off against future profits made after the first two years.

The government representatives also promised international companies investing in Yilandwe prime locations in towns and cities with good transport links.

Imoni Co

Imoni Co, a large listed company based in the US with the US dollar (\$) as its currency, manufactures high tech diagnostic components for machinery, which it exports worldwide. After attending one of the trade shows, Imoni Co is considering setting up an assembly plant in Yilandwe where parts would be sent and assembled into a specific type of component, which is currently being assembled in the US. Once assembled, the component will be exported directly to companies based in the European Union (EU). These exports will be invoiced in euro (€).

Assembly plant in Yilandwe: financial and other data projections

It is initially assumed that the project will last for four years. The four-year project will require investments of YR21,000 million for land and buildings, YR18,000 million for machinery and YR9,600 million for working capital to be made immediately. The working capital will need to be increased annually at the start of each of the next three years by Yilandwe's inflation rate and it is assumed that this will be released at the end of the project's life.

It can be assumed that the assembly plant can be built very quickly and production started almost immediately. This is because the basic facilities and infrastructure are already in place as the plant will be built on the premises and grounds of a school. The school is ideally located, near the main highway and railway lines. As a result, the school will close and the children currently studying there will be relocated to other schools in the city. The government has kindly agreed to provide free buses to take the children to these schools for a period of six months to give parents time to arrange appropriate transport in the future for their children.

The current selling price of each component is €700 and this price is likely to increase by the average EU rate of inflation from Year 1 onwards.

The number of components expected to be sold every year are as follows:

Year	1	2	3	4
Sales component units ('000)	150	480	730	360

The parts needed to assemble into the components in Yilandwe will be sent from the US by Imoni Co at a cost of \$200 per component unit, from which Imoni Co would currently earn a pre-tax contribution of \$40 for each component unit. However, Imoni Co feels that it can negotiate with Yilandwe's Government and increase the transfer price to \$280 per component unit. The variable costs related to assembling the components in Yilandwe are currently YR15,960 per component unit. The current annual fixed costs of the assembly plant are YR4,600 million. All these costs, wherever incurred, are expected to increase by that country's annual inflation every year from Year 1 onwards.

Imoni Co pays corporation tax on profits at an annual rate of 20% in the US. The tax in both the US and Yilandwe is payable in the year that the tax liability arises. A bilateral tax treaty exists between Yilandwe and the US. Tax-allowable depreciation is available at 25% per year on the machinery on a straight-line basis.

Imoni Co will expect annual royalties from the assembly plant to be made every year. The normal annual royalty fee is currently \$20 million, but Imoni Co feels that it can negotiate this with Yilandwe's Government and increase the royalty fee by 80%. Once agreed, this fee will not be subject to any inflationary increase in the project's four-year period.

If Imoni Co does decide to invest in an assembly plant in Yilandwe, its exports from the US to the EU will fall and it will incur redundancy costs. As a result, Imoni Co's after-tax cash flows will reduce by the following amounts:

Year	1	2	3	4
Redundancy and lost contribution	20,000	55,697	57,368	59,089

Imoni Co normally uses its cost of capital of 9% to assess new projects. However, the Finance Director suggests that Imoni Co should use a project-specific discount rate of 12% instead.

Other financial information

Current spot rates

Euro per dollar	€0.714/\$1
YR per euro	YR142/€1
YR per dollar	YR101.4/\$1

Forecast future rates based on expected inflation rate differentials

Year	1	2	3	4
YR/\$1	120.1	133.7	142.5	151.9

Year	1	2	3	4
YR/€1	165.0	180.2	190.2	200.8

Expected inflation rates

EU expected inflation rate: Next two years	5%
EU expected inflation rate: Year 3 onwards	4%
US expected inflation rate: Year 1 onwards	3%

Required

(a) Discuss the possible benefits and drawbacks to Imoni Co of setting up its own assembly plant in Yilandwe, compared to licensing a company based in Yilandwe to undertake the assembly on its behalf. **(5 marks)**

(b) Prepare a report which:

(i) Evaluates the financial acceptability of the investment in the assembly plant in Yilandwe **(21 marks)**

(ii) Discusses the assumptions made in producing the estimates, and the other risks and issues which Imoni Co should consider before making the final decision **(17 marks)**

(iii) Provides a reasoned recommendation on whether or not Imoni Co should invest in the assembly plant in Yilandwe **(3 marks)**

Professional marks will be awarded in part (b) for the format, structure and presentation of the report. **(4 marks)**

(Total = 50 marks)

51 Avem (12/14)

98 mins

Nahara Co and Fugae Co

Nahara Co is a private holding company owned by the Government of a wealthy oil-rich country to invest its sovereign funds. Nahara Co has followed a strategy of risk diversification for a number of years by acquiring companies from around the world in many different sectors.

One of Nahara Co's acquisition strategies is to identify and purchase undervalued companies in the airline industry in Europe. A recent acquisition was Fugae Co, a company based in a country which is part of the European Union (EU). Fugae Co repairs and maintains aircraft engines.

A few weeks ago, Nahara Co stated its intention to pursue the acquisition of an airline company based in the same country as Fugae Co. The EU, concerned about this, asked Nahara Co to sell Fugae Co before pursuing any further acquisitions in the airline industry.

Avem Co's acquisition interest in Fugae Co

Avem Co, a UK-based company specialising in producing and servicing business jets, has approached Nahara Co with a proposal to acquire Fugae Co for \$1,200 million. Nahara Co expects to receive a premium of at least 30% on the estimated equity value of Fugae Co, if it is sold.

Given below are extracts from the most recent statements of financial position of both Avem Co and Fugae Co.

	Avem Co	Fugae Co
	\$m	\$m
Share capital (50c/share)	800	100
Reserves	3,550	160
Non-current liabilities	2,200	380
Current liabilities	130	30
Total capital and liabilities	<u>6,680</u>	<u>670</u>

Each Avem Co share is currently trading at \$7.50, which is a multiple of 7.2 of its free cash flow to equity. Avem Co expects that the total free cash flows to equity of the combined company will increase by \$40 million due to synergy benefits. After adding the synergy benefits of \$40 million, Avem Co then expects the multiple of the total free cash flow of the combined company to increase to 7.5.

Fugae Co's free cash flow to equity is currently estimated at \$76.5 million and it is expected to generate a return on equity of 11%. Over the past few years, Fugae Co has returned 77.3% of its annual free cash flow to equity back to Nahara Co, while retaining the balance for new investments.

Fugae Co's non-current liabilities consist entirely of \$100 nominal value bonds which are redeemable in 4 years at the nominal value, on which the company pays a coupon of 5.4%. The debt is rated at B+ and the credit spread on B+ rated debt is 80 basis points above the risk-free rate of return.

Proposed luxury transport investment project by Fugae Co

In recent years, the country in which Fugae Co is based has been expanding its tourism industry and hopes that this industry will grow significantly in the near future. At present tourists normally travel using public transport and taxis, but there is a growing market for luxury travel. If the tourist industry does expand, then the demand for luxury travel is expected to grow rapidly. Fugae Co is considering entering this market through a four-year project. The project will cease after four years because of increasing competition.

The initial cost of the project is expected to be \$42,000,000 and it is expected to generate the following after-tax cash flows over its 4-year life:

Year	1	2	3	4
Cash flows (\$'000)	3,277.6	16,134.3	36,504.7	35,683.6

The above figures are based on the tourism industry expanding as expected. However, it is estimated that there is a 25% probability that the tourism industry will not grow as expected in the first year. If this happens, then the present value of the project's cash flows will be 50% of the original estimates over its 4-year life.

It is also estimated that if the tourism industry grows as expected in the first year, there is still a 20% probability that the expected growth will slow down in the second and subsequent years, and the present value of the project's cash flows would then be 40% of the original estimates in each of these years.

Lumi Co, a leisure travel company, has offered \$50 million to buy the project from Fugae Co at the start of the second year. Fugae Co is considering whether having this choice would add to the value of the project.

If Fugae Co is bought by Avem Co after the project has begun, it is thought that the project will not result in any additional synergy benefits and will not generate any additional value for the combined company, above any value the project has already generated for Fugae Co.

Although there is no beta for companies offering luxury forms of travel in the tourist industry, Reka Co, a listed company, offers passenger transportation services on coaches, trains and luxury vehicles. About 15% of its business is in the luxury transport market and Reka Co's equity beta is 1.6. It is estimated that the asset beta of the non-luxury transport industry is 0.80. Reka Co's shares are currently trading at \$4.50 per share and its debt is currently trading at \$105 per \$100. It has 80 million shares in issue and the book value of its debt is \$340 million. The debt beta is estimated to be zero.

General information

The corporation tax rate applicable to all companies is 20%. The risk-free rate is estimated to be 4% and the market risk premium is estimated to be 6%.

Required

- (a) Discuss whether or not Nahara Co's acquisition strategies, of pursuing risk diversification and of purchasing undervalued companies, can be valid. **(7 marks)**
- (b) Discuss why the European Union (EU) may be concerned about Nahara Co's stated intention and how selling Fugae Co could reduce this concern. **(4 marks)**
- (c) Prepare a report for the board of directors of Avem Co, which:
 - (i) Estimates the additional value created for Avem Co, if it acquires Fugae Co without considering the luxury transport project; **(10 marks)**

- (ii) Estimates the additional value of the luxury transport project to Fugae Co, both with and without the offer from Lumi Co; and **(18 marks)**
- (iii) Evaluates the benefit attributable to Avem Co and Fugae Co from combining the two companies with and without the project, and concludes whether or not the acquisition is beneficial. The evaluation should include any assumptions made. **(7 marks)**

Professional marks will be awarded in part (c) for the format, structure and presentation of the report. **(4 marks)**

(Total = 50 marks)

52 Chmura (12/13)

98 mins

Since becoming independent just over 20 years ago, the country of Mehgam has adopted protectionist measures which have made it difficult for multinational companies to trade there. However, recently, after discussions with the World Trade Organization (WTO), it seems likely that Mehgam will reduce its protectionist measures significantly.

Encouraged by these discussions, Chmura Co, a company producing packaged foods, is considering a project to set up a manufacturing base in Mehgam to sell its goods there and in other regional countries nearby. An initial investigation costing \$500,000 established that Mehgam had appropriate manufacturing facilities, adequate transport links and a reasonably skilled but cheap workforce. The investigation concluded that, if the protectionist measures were reduced, then the demand potential for Chmura Co's products looked promising. It is also felt that an early entry into Mehgam would give Chmura Co an advantage over its competitors for a period of five years, after which the current project will cease, due to the development of new advanced manufacturing processes.

Mehgam's currency, the Peso (MP), is currently trading at MP72 per \$1. Setting up the manufacturing base in Mehgam will require an initial investment of MP2,500 million immediately, to cover the cost of land and buildings (MP1,250 million) and machinery (MP1,250 million). Tax-allowable depreciation is available on the machinery at an annual rate of 10% on cost on a straight-line basis. A balancing adjustment will be required at the end of year five, when it is expected that the machinery will be sold for MP500 million (after inflation). The market value of the land and buildings in 5 years' time is estimated to be 80% of the current value. These amounts are inclusive of any tax impact.

Chmura Co will require MP200 million for working capital immediately. It is not expected that any further injections of working capital will be required for the five years. When the project ceases at the end of the fifth year, the working capital will be released back to Chmura Co.

Production of the packaged foods will take place in batches of product mixes. These batches will then be sold to supermarket chains, wholesalers and distributors in Mehgam and its neighbouring countries, which will repackage them to their individual requirements. All sales will be in MP. The estimated average number of batches produced and sold each year is given below:

Year	1	2	3	4	5
Batches produced and sold	10,000	15,000	30,000	26,000	15,000

The current selling price for each batch is estimated to be MP115,200. The costs related to producing and selling each batch are currently estimated to be MP46,500. In addition to these costs, a number of products will need a special packaging material which Chmura Co will send to Mehgam. Currently the cost of the special packaging material is \$200 per batch. Training and development costs, related to the production of the batches, are estimated to be 80% of the production and selling costs (excluding the cost of the special packaging) in the first year, before falling to 20% of these costs (excluding the cost of the special packaging) in the second year, and then nil for the remaining years. It is expected that the costs relating to the production and sale of each batch will increase annually by 10% but the selling price and the special packaging costs will only increase by 5% every year.

The current annual corporation tax rate in Mehgam is 25% and Chmura Co pays annual corporation tax at a rate of 20% in the country where it is based. Both countries' taxes are payable in the year that the tax liability arises. A bi-lateral tax treaty exists between the two countries which permits offset of overseas tax against any tax liabilities Chmura Co incurs on overseas earnings.

The risk-adjusted cost of capital applicable to the project on \$-based cash flows is 12%, which is considerably higher than the return on short-dated \$ treasury bills of 4%. The current rate of inflation in Mehgam is 8%, and in the country where Chmura Co is based it is 2%. It can be assumed that these inflation rates will not change for the foreseeable future. All net cash flows from the project will be remitted back to Chmura Co at the end of each year.

Chmura Co's Finance Director is of the opinion that there are many uncertainties surrounding the project and has assessed that the cash flows can vary by a standard deviation of as much as 35% because of these uncertainties.

Recently Bulud Co offered Chmura Co the option to sell the entire project to Bulud Co for \$28 million at the start of year three. Chmura Co will make the decision of whether or not to sell the project at the end of year two.

Required

- (a) Discuss the role of the World Trade Organization (WTO) and the possible benefits and drawbacks to Mehgam of reducing protectionist measures. **(9 marks)**
- (b) Prepare an evaluative report for the board of directors of Chmura Co which addresses the following parts and recommends an appropriate course of action:
 - (i) An estimate of the value of the project before considering Bulud Co's offer. Show all relevant calculations. **(14 marks)**
 - (ii) An estimate of the value of the project taking into account Bulud Co's offer. Show all relevant calculations. **(9 marks)**
 - (iii) A discussion of the assumptions made in parts (i) and (ii) above and the additional business risks which Chmura Co should consider before it makes the final decision whether or not to undertake the project. **(14 marks)**

Professional marks will be awarded in part (b) for the format, structure and presentation of the report. **(4 marks)**

(Total = 50 marks)

53 Washi (Sep 18)

98 mins

Washi Co is a large, unlisted company based in Japan and its local currency is the Japanese Yen (JPY). It manufactures industrial equipment and parts. Initially Washi Co's customers consisted of other Japanese companies, but over the last 12 years it has expanded into overseas markets and also sources its materials from around the world. The company's board of directors (BoD) believes that the strategy of overseas investments, through subsidiary companies, branches and joint ventures, has directly led to the company's substantial increase in value in the past few years.

Washi Co's BoD is considering investing in a project based in Airone, whose currency is the Airone Rand (ARD). It believes that the project will be an important addition to the company's portfolio of investments, because Washi Co does not currently have a significant presence in the part of the world where Airone is located. It is intended that the project will commence in one year's time. Details of the project are given below.

Washi Co intends to finance the project through proceeds from an agreed sale of a small European subsidiary, with any remaining funding requirement being met by additional debt finance issued in Japanese Yen. The company is due to receive the proceeds from the sale of a European subsidiary company in six months' time and it will then invest these funds in short-dated Japanese treasury bills

for a further six months before they are needed for the project. Washi Co has a centralised treasury department, which hedges expected future cash flows against currency fluctuations.

Funding and financial information

The agreed proceeds from the sale of the European subsidiary company receivable in six months' time are Euro (EUR) 80 million. The BoD is concerned about a negative fluctuation in EUR/JPY rate between now and in six months when the EUR 80 million will be received. Therefore, it has asked Washi Co's treasury department to hedge the expected receipt using one of currency forwards, currency futures or exchange traded currency options. Washi Co's treasury department has obtained the following information:

	JPY per EUR 1	ARD per EUR 1
Spot	129.2–132.4	92.7–95.6
Six-month forward rate	125.3–128.6	

Currency futures (contract size EUR 125,000, quotation JPY per EUR 1)

Four-month expiry	126.9
Seven-month expiry	125.2

Currency options (contract size EUR 125,000, exercise price quotation: JPY per EUR 1, premium quotation: JPY per EUR 1)

At an exercise price of JPY 126.0 per EUR 1

	Four-month expiry	Seven-month expiry
Calls	2.3	2.6
Puts	3.4	3.8

Annualised yield on short-dated Japanese treasury bills	1.20%
---------------------------------------------------------	-------

Airone's annual inflation rate is 9% currently, but has fluctuated markedly in the last five years. The Japanese annual inflation rate is 1.5% and has been stable for many years.

Pato Bank has offered Washi Co the possibility of using over-the-counter options to hedge the EUR receipt instead of exchange traded currency options.

Airone project information

A member of Washi Co's finance team has produced the following estimates of the Airone project which is expected to last for four years. The estimates are based on the notes given below but not on the further information. The estimates have been checked and verified independently for their numerical accuracy.

All figures are in ARD millions

<i>Project year</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Sales revenue		13,000	30,800	32,300	4,500
Costs		(10,200)	(24,200)	(24,500)	(3,200)
Tax allowable depreciation		(1,000)	(1,000)	(1,000)	(1,000)
Pre-tax profits		1,800	5,600	6,800	300
Tax at 15%		(270)	(840)	(1,020)	(45)
Tax allowable depreciation		1,000	1,000	1,000	1,000
Working capital	(400)				400
Investment in buildings	(5,750)				
Investment in machinery	(4,000)				
Cash flows in ARD	(10,150)	2,530	5,760	6,780	1,655

Notes (incorporated into the estimates above):

1. The estimates are based on using the end of the first year, when the project commences, as the start of the project (year 0). The numbers are given in ARD million (m).
2. The total investment required for the project is ARD 10,150m and separated into buildings, machinery and working capital in the table above. The machinery is eligible for tax allowable depreciation on a straight-line basis and the working capital is redeemable at the end of the project.
3. The impact of inflation has been incorporated into the sales revenue and cost figures, at Airone's current annual inflation figures.
4. Corporation tax has been included based on Airone's annual rate of 15%. The tax is payable in the year that the tax liability arises.

Further information (not incorporated into the estimates above):

1. Undertaking the Airone project will result in lost sales for Washi Co. These sales would have generated a pre-tax contribution of JPY 110m in the first year of the project, rising by the Japanese rate of inflation in the following years 2 to 4 of the project.
2. The Airone project costs include components which are made in Japan by Washi Co and would be imported to the Airone project. The pre-inflation revenues generated from the sale of the components are estimated to be as follows:

In JPY millions

Project year	1	2	3	4
Components revenue	1,200	2,400	2,500	300

These revenues are expected to increase by the Japanese inflation rate in years 2 to 4 of the project. The contribution which Washi Co expects to earn on these components is 25% of revenue.

3. The Japanese annual corporation tax rate is 30% and tax is payable in the year that the tax liability arises. A bilateral tax treaty exists between Japan and Airone, which permits offset of overseas tax against any Japanese tax liability on overseas earnings.
4. Washi Co's finance department has estimated a cost of capital of 12% to be used as a discount rate for the project.

Required

- (a) Discuss how investing in overseas projects may enable Washi Co to gain competitive advantage over its competitors, who only invest in domestic projects. **(5 marks)**
- (b) Discuss the advantages and drawbacks of exchange traded option contracts compared with over-the-counter options. **(5 marks)**
- (c) Prepare a report for the board of directors of Washi Co which:
 - (i) Estimates the expected amount of JPY receivable under each hedge choice and the additional debt finance needed to fund the Airone project for the preferred hedge choice; **(12 marks)**
 - (ii) Estimates the net present value of the Airone project in Japanese Yen, based on the end of year one being the start of the project (year 0); **(9 marks)**
 - (iii) Evaluates the preferred hedge choice made, the debt finance needed and whether the Airone project should be undertaken, considering both financial and non-financial factors. **(8 marks)**

Professional marks will be awarded in part (c) for the format, structure and presentation of the report. **(4 marks)**

(d) Washi Co's chief operations officer (COO) has suggested that it would be more beneficial for the company to let its major subsidiary companies have their own individual treasury departments, instead of having one centralised treasury department for the whole company.

Required

Discuss the validity of the COO's suggestion.

(7 marks)

(Total = 50 marks)

54 Tramont (2013 pilot exam)

98 mins

Tramont Co is a listed company based in the US and manufactures electronic devices. One of its devices, the X-IT, is produced exclusively for the US market. Tramont Co is considering ceasing the production of the X-IT gradually over a period of four years because it needs the manufacturing facilities used to make the X-IT for other products.

The Government of Gamala, a country based in South-East Asia, is keen to develop its manufacturing industry and has offered Tramont Co first rights to produce the X-IT in Gamala and sell it to the US market for a period of four years. At the end of the four-year period, the full production rights will be sold to a government-backed company for Gamalan Rupiahs (GR) 450 million after tax (this amount is not subject to inflationary increases). Tramont Co has to decide whether to continue production of the X-IT in the US for the next four years or to move the production to Gamala immediately.

Currently each X-IT unit sold makes a unit contribution of \$20. This unit contribution is not expected to be subject to any inflationary increase in the next four years. Next year's production and sales estimated at 40,000 units will fall by 20% each year for the following 3 years. It is anticipated that after four years the production of the X-IT will stop. It is expected that the financial impact of the gradual closure over the four years will be cost neutral (the revenue from sale of assets will equal the closure costs). If production is stopped immediately, the excess assets would be sold for \$2.3 million and the costs of closure, including redundancy costs of excess labour, would be \$1.7 million.

The following information relates to the production of the X-IT moving to Gamala. The Gamalan project will require an initial investment of GR 230 million, to pay for the cost of land and buildings (GR 150 million) and machinery (GR 80 million). The cost of machinery is tax allowable and will be depreciated on a straight-line basis over the next four years, at the end of which it will have a negligible value.

Tramont Co will also need GR 40 million for working capital immediately. It is expected that the working capital requirement will increase in line with the annual inflation rate in Gamala. When the project is sold, the working capital will not form part of the sale price and will be released back to Tramont Co.

Production and sales of the device are expected to be 12,000 units in the first year, rising to 22,000 units, 47,000 units and 60,000 units in the next 3 years respectively.

The following revenues and costs apply to the first year of operation:

- Each unit will be sold for \$70.
- The variable cost per unit comprising of locally sourced materials and labour will be GR 1,350.
- In addition to the variable cost above, each unit will require a component bought from Tramont Co for \$7, on which Tramont Co makes \$4 contribution per unit.
- Total fixed costs for the first year will be GR 30 million.

The costs are expected to increase by their countries' respective rates of inflation, but the selling price will remain fixed at \$70 per unit for the 4-year period.

The annual corporation tax rate in Gamala is 20% and Tramont Co currently pays corporation tax at a rate of 30% per year. Both countries' corporation taxes are payable in the year that the tax liability arises. A bi-lateral tax treaty exists between the US and Gamala, which permits offset of overseas tax against any US tax liability on overseas earnings. The US and Gamalan tax authorities allow losses to be carried forward and written off against future profits for taxation purposes.

Tramont Co has decided to finance the project by borrowing the funds required in Gamala. The commercial borrowing rate is 13% but the Gamalan Government has offered Tramont Co a 6% subsidised loan for the entire amount of the initial funds required. The Gamalan Government has agreed that it will not ask for the loan to be repaid as long as Tramont Co fulfils its contract to undertake the project for the four years. Tramont Co can borrow dollar funds at an interest rate of 5%.

Tramont Co's financing consists of 25 million shares currently trading at \$2.40 each and \$40 million 7% bonds trading at \$1,428 per \$1,000. Tramont Co's quoted beta is 1.17. The current risk-free rate of return is estimated at 3% and the market risk premium is 6%. Due to the nature of the project, it is estimated that the beta applicable to the project if it is all-equity financed will be 0.4 more than the current all-equity financed beta of Tramont Co. If the Gamalan project is undertaken, the cost of capital applicable to the cash flows in the US is expected to be 7%.

The spot exchange rate between the dollar and the GR is GR 55 per \$1. The annual inflation rates are currently 3% in the US and 9% in Gamala. It can be assumed that these inflation rates will not change for the foreseeable future. All net cash flows arising from the project will be remitted back to Tramont Co at the end of each year.

There are two main political parties in Gamala: the Gamala Liberal (GL) Party and the Gamala Republican (GR) Party. Gamala is currently governed by the GL Party but general elections are due to be held soon. If the GR Party wins the election, it promises to increase taxes of international companies operating in Gamala and review any commercial benefits given to these businesses by the previous government.

Required

(a) Prepare a report for the board of directors (BoD) of Tramont Co that:

- (i) Evaluates whether or not Tramont Co should undertake the project to produce the X-IT in Gamala and cease its production in the US immediately. In the evaluation, include all relevant calculations in the form of a financial assessment and explain any assumptions made.

It is suggested that the financial assessment should be based on present value of the operating cash flows from the Gamalan project, discounted by an appropriate all-equity rate, and adjusted by the present value of all other relevant cash flows. **(27 marks)**

- (ii) Discusses the potential change in government and other business factors that Tramont Co should consider before making a final decision. **(8 marks)**

Professional marks will be awarded in part (a) for the format, structure and presentation of the answer. **(4 marks)**

(b) Although not mandatory for external reporting purposes, one of the members of the BoD suggested that adopting a triple bottom line approach when monitoring the X-IT investment after its implementation would provide a better assessment of how successful it has been. Discuss how adopting aspects of triple bottom line reporting may provide a better assessment of the success of X-IT. **(6 marks)**

(c) Another member of the BoD felt that, despite Tramont Co having a wide range of shareholders holding well-diversified portfolios of investments, moving the production of the X-IT to Gamala would result in further risk diversification benefits.

Discuss whether moving the production of the X-IT to Gamala may result in further risk diversification for the shareholders already holding well-diversified portfolios. **(5 marks)**

(Total = 50 marks)

55 Cigno (Sep/Dec 15)

98 mins

Cigno Co is a large pharmaceutical company, involved in the research and development (R&D) of medicines and other healthcare products. Over the past few years, Cigno Co has been finding it increasingly difficult to develop new medical products. In response to this, it has followed a strategy of acquiring smaller pharmaceutical companies which already have successful products in the market and/or have products in development which look very promising for the future. It has mainly done this without having to resort to major cost cutting and has therefore avoided large-scale redundancies. This has meant that not only has Cigno Co performed reasonably well in the stock market, but it has also maintained a high level of corporate reputation.

Anatra Co is involved in two business areas: the first area involves the R&D of medical products, and the second area involves the manufacture of medical and dental equipment. Until recently, Anatra Co's financial performance was falling, but about three years ago a new Chief Executive Officer (CEO) was appointed and she started to turn the company around. Recently, the company has developed and marketed a range of new medical products, and is in the process of developing a range of cancer-fighting medicines. This has resulted in a good performance in the stock market, but many analysts believe that its shares are still trading below their true value. Anatra Co's CEO is of the opinion that the turnaround in the company's fortunes makes it particularly vulnerable to a takeover threat, and she is thinking of defence strategies that the company could undertake to prevent such a threat. In particular, she was thinking of disposing of some of the company's assets and focusing on its core business.

Cigno Co is of the opinion that Anatra Co is being held back from achieving its true potential by its equipment manufacturing business and that by separating the two business areas, corporate value can be increased. As a result, it is considering the possibility of acquiring Anatra Co, unbundling the manufacturing business, and then absorbing Anatra Co's R&D of medical products business. Cigno Co estimates that it would need to pay a premium of 35% to Anatra Co's shareholders to buy the company.

Financial information: Anatra Co

Given below are extracts from Anatra Co's latest statement of profit or loss and statement of financial position for the year ended 30 November 20X5.

	20X5
	\$m
Sales revenue	21,400
Profit before interest and tax (PBIT)	3,210
Interest	720
Pre-tax profit	2,490
Non-current liabilities	9,000
Share capital (50c/share)	3,500
Reserves	4,520

Anatra Co's share of revenue and profits between the two business areas are as follows:

	Medical products R&D	Equipment manufacturing
Share of revenue and profit	70%	30%

Post-acquisition benefits from acquiring Anatra Co

Cigno Co estimates that following the acquisition and unbundling of the manufacturing business, Anatra Co's future sales revenue and profitability of the medical R&D business will be boosted. The annual sales growth rate is expected to be 5% and the profit margin before interest and tax is

expected to be 17.25% of sales revenue, for the next 4 years. It can be assumed that the current tax-allowable depreciation will remain equivalent to the amount of investment needed to maintain the current level of operations, but that the company will require an additional investment in assets of 40c for every \$1 increase in sales revenue.

After the 4 years, the annual growth rate of the company's free cash flows is expected to be 3% for the foreseeable future.

Anatra Co's unbundled equipment manufacturing business is expected to be divested through a sell-off, although other options such as a management buy-in were also considered. The value of the sell-off will be based on the medical and dental equipment manufacturing industry. Cigno Co has estimated that Anatra Co's manufacturing business should be valued at a factor of 1.2 times higher than the industry's average price/earnings ratio. Currently the industry's average earnings per share is 30c and the average share price is \$2.40.

Possible additional post-acquisition benefits

Cigno Co estimates that it could achieve further cash flow benefits following the acquisition of Anatra Co, if it undertakes a limited business reorganisation. There is some duplication of the R&D work conducted by Cigno Co and Anatra Co, and the costs related to this duplication could be saved if Cigno Co closes some of its own operations. However, it would mean that many redundancies would have to be made, including employees who have worked in Cigno Co for many years. Anatra Co's employees are considered to be better qualified and more able in these areas of duplication, and would therefore not be made redundant.

Cigno Co could also move its headquarters to the country where Anatra Co is based and thereby potentially save a significant amount of tax, other than corporation tax. However, this would mean a loss of revenue for the Government where Cigno Co is based.

The company is concerned about how the Government and the people of the country where it is based might react to these issues. It has had a long and beneficial relationship with the country and its people.

Cigno Co has estimated that it would save \$1,600 million after-tax free cash flows to the firm at the end of the first year as a result of these post-acquisition benefits. These cash flows would increase by 4% every year for the next 3 years.

Estimating the combined company's weighted average cost of capital

Cigno Co is of the opinion that as a result of acquiring Anatra Co, the cost of capital will be based on the equity beta and the cost of debt of the combined company. The asset beta of the combined company is the individual companies' asset betas weighted in proportion of the individual companies' market value of equity. Cigno Co has a market debt to equity ratio of 40:60 and an equity beta of 1.10.

It can be assumed that the proportion of market value of debt to market value of equity will be maintained after the two companies combine.

Currently, Cigno Co's total firm value (market values of debt and equity combined) is \$60,000 million and Anatra Co's asset beta is 0.68.

Additional information

- The estimate of the risk-free rate of return is 4.3% and of the market risk premium is 7%.
- The corporation tax rate applicable to all companies is 22%.
- Anatra Co's current share price is \$3 per share, and it can be assumed that the book value and the market value of its debt are equivalent.
- The pre-tax cost of debt of the combined company is expected to be 6.0%.

Important note

Cigno Co's board of directors (BoD) does not require any discussion or computations of currency movements or exposure in this report. All calculations are to be presented in \$ million. Currency movements and their management will be considered in a separate report. The BoD also does not expect any discussion or computations relating to the financing of acquisition in this report, other than the information provided above on the estimation of the cost of capital.

Required

(a) Distinguish between a divestment through a sell-off and a management buy-in as forms of unbundling. **(4 marks)**

(b) Prepare a report for the BoD of Cigno Co which:

(i) Estimates the value attributable to Cigno Co's shareholders from the acquisition of Anatra Co before taking into account the cash benefits of potential tax savings and redundancies, and then after taking these into account **(18 marks)**

(ii) Assesses the value created from (b)(i) above, including a discussion of the estimations made and methods used **(8 marks)**

(iii) Advises the BoD on the key factors it should consider in relation to the redundancies and potential tax savings **(4 marks)**

Professional marks will be awarded in part (b) for the format, structure and presentation of the report. **(4 marks)**

(c) Discuss whether the defence strategy suggested by Anatra Co's CEO of disposing assets is feasible. **(6 marks)**

(d) Takeover regulation, where Anatra Co is based, offers the following conditions aimed at protecting shareholders: the mandatory-bid condition through sell-out rights, the principle of equal treatment, and squeeze-out rights.

Required

Explain the main purpose of each of the three conditions. **(6 marks)**

(Total = 50 marks)

56 Lirio (Mar/Jun 16)

98 mins

Lirio Co is an engineering company which is involved in projects around the world. It has been growing steadily for several years and has maintained a stable dividend growth policy for a number of years now. The board of directors (BoD) is considering bidding for a large project which requires a substantial investment of \$40 million. It can be assumed that the date today is 1 March 20X6.

The BoD is proposing that Lirio Co should not raise the finance for the project through additional debt or equity. Instead, it proposes that the required finance is obtained from a combination of funds received from the sale of its equity investment in a European company and from cash flows generated from its normal business activity in the coming two years. As a result, Lirio Co's current capital structure of 80 million \$1 equity shares and \$70 million 5% bonds is not expected to change in the foreseeable future.

The BoD has asked the company's treasury department to prepare a discussion paper on the implications of this proposal. The following information on Lirio Co has been provided to assist in the preparation of the discussion paper.

Expected income and cash flow commitments prior to undertaking the large project for the year to the end of February 20X7

Lirio Co's sales revenue is forecast to grow by 8% next year from its current level of \$300 million, and the operating profit margin on this is expected to be 15%. It is expected that Lirio Co will have the following capital investment requirements for the coming year, before the impact of the large project is considered:

- 1 A \$0.10 investment in working capital for every \$1 increase in sales revenue;
- 2 An investment equivalent to the amount of depreciation to keep its non-current asset base at the present productive capacity. The current depreciation charge already included in the operating profit margin is 25% of the non-current assets of \$50 million;
- 3 A \$0.20 investment in additional non-current assets for every \$1 increase in sales revenue; and
- 4 \$8 million additional investment in other small projects.

In addition to the above sales revenue and profits, Lirio Co has one overseas subsidiary – Pontac Co, from which it receives dividends of 80% on profits. Pontac Co produces a specialist tool which it sells locally for \$60 each. It is expected that it will produce and sell 400,000 units of this specialist tool next year. Each tool will incur variable costs of \$36 per unit and total annual fixed costs of \$4 million to produce and sell.

Lirio Co pays corporation tax at 25% and Pontac Co pays corporation tax at 20%. In addition to this, a withholding tax of 8% is deducted from any dividends remitted from Pontac Co. A bi-lateral tax treaty exists between the countries where Lirio Co is based and where Pontac Co is based. Therefore corporation tax is payable on profits made by subsidiary companies, but full credit is given for corporation tax already paid.

It can be assumed that receipts from Pontac Co are in \$ equivalent amounts and exchange rate fluctuations on these can be ignored.

Sale of equity investment in the European country

It is expected that Lirio Co will receive euro (€) 20 million in 3 months' time from the sale of its investment. The € has continued to remain weak, while the \$ has continued to remain strong through 20X5 and the start of 20X6. The financial press has also reported that there may be a permanent shift in the €/\$ exchange rate, with firms facing economic exposure. Lirio Co has decided to hedge the € receipt using one of currency forward contracts, currency futures contracts or currency options contracts.

The following exchange contracts and rates are available to Lirio Co.

	Per €1
Spot rates	\$1.1585–\$1.1618
Three-month forward rates	\$1.1559–\$1.1601

Currency futures (contract size \$125,000, quotation: € per \$1)

March futures	€0.8638
June futures	€0.8656

Currency options (contract size \$125,000, exercise price quotation € per \$1, premium € per \$1)

Exercise price	Calls		Puts	
	March	June	March	June
0.8600	0.0255	0.0290	0.0267	0.0319

It can be assumed that futures and options contracts expire at the end of their respective months.

Dividend history, expected dividends and cost of capital, Lirio Co

Year to end of February	20X3	20X4	20X5	20X6
Number of \$1 equity shares in issue ('000)	60,000	60,000	80,000	80,000
Total dividends paid (\$'000)	12,832	13,602	19,224	20,377

It is expected that dividends will grow at the historic rate, if the large project is not undertaken.

Expected dividends and dividend growth rates if the large project is undertaken:

Year to end of February 20X7	Remaining cash flows after the investment in the \$40 million project will be paid as dividends.
Year to end of February 20X8	The dividends paid will be the same amount as the previous year.
Year to end of February 20X9	Dividends paid will be \$0.31 per share.
In future years from February 20X9	Dividends will grow at an annual rate of 7%.

Lirio Co's cost of equity capital is estimated to be 12%.

Required

- (a) With reference to purchasing power parity, explain how exchange rate fluctuations may lead to economic exposure. **(6 marks)**
- (b) Prepare a discussion paper, including all relevant calculations, for the BoD of Lirio Co which:
 - (i) Estimates Lirio Co's dividend capacity as at 28 February 20X7, prior to investing in the large project **(9 marks)**
 - (ii) Advises Lirio Co on, and recommends, an appropriate hedging strategy for the euro (€) receipt it is due to receive in three months' time from the sale of the equity investment **(14 marks)**
 - (iii) Using the information on dividends provided in the question, and from (b)(i) and (b)(ii) above, assesses whether or not the project would add value to Lirio Co **(8 marks)**
 - (iv) Discusses the issues of proposed methods of financing the project which need to be considered further **(9 marks)**

Professional marks will be awarded in part (b) for the format, structure and presentation of the discussion paper. **(4 marks)**

(Total = 50 marks)

57 Morada (Sep/Dec 16)

98 mins

Morada Co is involved in offering bespoke travel services and maintenance services. In addition to owning a few hotels, it has built strong relationships with companies in the hospitality industry all over the world. It has a good reputation of offering unique, high quality holiday packages at reasonable costs for its clients. The strong relationships have also enabled it to offer repair and maintenance services to a number of hotel chains and cruise ship companies.

Following a long discussion at a meeting of the board of directors (BoD) about the future strategic direction which Morada Co should follow, three directors continued to discuss one particular issue over dinner. In the meeting, the BoD had expressed concern that Morada Co was exposed to excessive risk and therefore its cost of capital was too high. The BoD feared that several good projects had been rejected over the previous two years, because they did not meet Morada Co's high cost of capital threshold. Each director put forward a proposal, which they then discussed in turn. At the conclusion of the dinner, the directors decided to ask for a written report on the proposals put forward by the first director and the second director, before taking all three proposals to the BoD for further discussion.

First director's proposal

The first director is of the opinion that Morada Co should reduce its debt in order to mitigate its risk and therefore reduce its cost of capital. He proposes that the company should sell its repair and maintenance services business unit and focus just on offering bespoke travel services and hotel accommodation. In the sale, the book value of non-current assets will reduce by 30% and the book value of current liabilities will reduce by 10%. It is thought that the non-current assets can be sold for an after-tax profit of 15%.

The first director suggests that the funds arising from the sale of the repair and maintenance services business unit and cash resources should be used to pay off 80% of the long-term debt. It is estimated that as a result of this, Morada Co's credit rating will improve from Baa2 to A2.

Second director's proposal

The second director is of the opinion that risk diversification is the best way to reduce Morada Co's risk and therefore reduce its cost of capital. He proposes that the company raise additional funds using debt finance and then create a new strategic business unit. This business unit will focus on construction of new commercial properties.

The second director suggests that \$70 million should be borrowed and used to invest in purchasing non-current assets for the construction business unit. The new debt will be issued in the form of 4-year redeemable bonds paying an annual coupon of 6.2%. It is estimated that if this amount of debt is raised, then Morada Co's credit rating will worsen to Ca3 from Baa2. Current liabilities are estimated to increase to \$28 million.

Third director's proposal

The third director is of the opinion that Morada Co does not need to undertake the proposals suggested by the first director and the second director just to reduce the company's risk profile. She feels that the above proposals require a fundamental change in corporate strategy and should be considered in terms of more than just tools to manage risk. Instead, she proposes that a risk management system should be set up to appraise Morada Co's current risk profile, considering each type of business risk and financial risk within the company, and taking appropriate action to manage the risk where it is deemed necessary.

MORADA CO EXTRACTS FROM THE FORECAST FINANCIAL POSITION FOR THE COMING YEAR

	\$'000
Non-current assets	280,000
Current assets	8,000
Total assets	328,000

Equity and liabilities

Share capital (40c/share)	50,000
Retained earnings	137,000
Total equity	187,000

Non-current liabilities (6.2% redeemable bonds)	120,000
Current liabilities	21,000
Total liabilities	141,000
Total liabilities and equity capital	328,000

Other financial information

Morada Co's forecast after-tax earnings for the coming year are expected to be \$28 million. It is estimated that the company will make a 9% return after tax on any new investment in non-current assets, and will suffer a 9% decrease in after-tax earnings on any reduction in investment in non-current assets.

Morada Co's current share price is \$2.88 per share. According to the company's finance division, it is very difficult to predict how the share price will react to either the proposal made by the first director or the proposal made by the second director. Therefore it has been assumed that the share price will not change following either proposal.

The finance division has further assumed that the proportion of the book value of non-current assets invested in each business unit gives a fair representation of the size of each business unit within Morada Co.

Morada Co's equity beta is estimated at 1.2, while the asset beta of the repairs and maintenance services business unit is estimated to be 0.65. The relevant equity beta for the new, larger company including the construction unit relevant to the second director's proposals has been estimated as 1.21.

The bonds are redeemable in four years' time at face value. For the purposes of estimating the cost of capital, it can be assumed that debt beta is zero. However, the 4-year credit spread over the risk-free rate of return is 60 basis points for A2 rated bonds, 90 basis points for Baa2 rated bonds and 240 basis points for Ca3 rated bonds.

A tax rate of 20% is applicable to all companies. The current risk-free rate of return is estimated to be 3.8% and the market risk premium is estimated to be 7%.

Required

(a) Explain how business risk and financial risk are related; and how risk mitigation and risk diversification can form part of a company's risk management strategy. **(6 marks)**

(b) Prepare a report for the board of directors of Morada Co which:

- (i) Estimates Morada Co's cost of equity and cost of capital, based on market value of equity and debt, before any changes and then after implementing the proposals put forward by the first and by the second directors; **(17 marks)**
- (ii) Estimates the impact of the first and second directors' proposals on Morada Co's forecast after-tax earnings and forecast financial position for the coming year; and **(7 marks)**
- (iii) Discusses the impact on Morada Co of the changes proposed by the first and second directors and recommends whether or not either proposal should be accepted. The discussion should include an explanation of any assumptions made in the estimates in (b)(i) and (b)(ii) above. **(9 marks)**

Professional marks will be awarded in part (b) for the format, structure and presentation of the report. **(4 marks)**

(c) Discuss the possible reasons for the third director's proposal that a risk management system should consider each risk, before taking appropriate action. **(7 marks)**

(Total = 50 marks)

58 Nente (6/12, amended)

98 mins

Nente Co, an unlisted company, designs and develops tools and parts for specialist machinery. The company was formed 4 years ago by 3 friends, who own 20% of the equity capital in total, and a consortium of 5 business angel organisations, which own the remaining 80%, in roughly equal proportions. Nente Co also has a large amount of debt finance in the form of variable rate loans. Initially the amount of annual interest payable on these loans was low and allowed Nente Co to invest internally generated funds to expand its business. Recently, though, due to a rapid increase in interest rates, there has been limited scope for future expansion and no new product development.

The board of directors, consisting of the three friends and a representative from each business angel organisation, met recently to discuss how to secure the company's future prospects. Two proposals were put forward, as follows:

Proposal 1

To accept a takeover offer from Mije Co, a listed company, which develops and manufactures specialist machinery tools and parts. The takeover offer is for \$2.95 cash per share or a share-for-share exchange where two Mije Co shares would be offered for three Nente Co shares. Mije Co would need to get the final approval from its shareholders if either offer is accepted.

Proposal 2

To pursue an opportunity to develop a small prototype product that just breaks even financially, but gives the company exclusive rights to produce a follow-on product within two years.

The meeting concluded without agreement on which proposal to pursue.

After the meeting, Mije Co was consulted about the exclusive rights. Mije Co's directors indicated that they had not considered the rights in their computations and were willing to continue with the takeover offer on the same terms without them.

Currently, Mije Co has 10 million shares in issue and these are trading for \$4.80 each. Mije Co's price/earnings (P/E) ratio is 15. It has sufficient cash to pay for Nente Co's equity and a substantial proportion of its debt, and believes that this will enable Nente Co to operate on a P/E level of 15 as well. In addition to this, Mije Co believes that it can find cost-based synergies of \$150,000 after tax per year for the foreseeable future. Mije Co's current profit after tax is \$3,200,000.

The following financial information relates to Nente Co and to the development of the new product.

Nente Co financial information

EXTRACT FROM THE MOST RECENT STATEMENT OF PROFIT OR LOSS

	\$'000
Sales revenue	8,780
Profit before interest and tax	1,230
Interest	(455)
Tax	(155)
Profit after tax	620
Dividends	Nil

EXTRACT FROM THE MOST RECENT STATEMENT OF FINANCIAL POSITION

	\$'000
Net non-current assets	10,060
Current assets	690
Total assets	<u>10,750</u>

Share capital (40c per share par value)	960
Reserves	1,400
Non-current liabilities: Variable rate loans	6,500
Current liabilities	1,890
Total liabilities and capital	<u>10,750</u>

In arriving at the profit after tax amount, Nente Co deducted tax-allowable depreciation and other non-cash expenses totalling \$1,206,000. It requires an annual cash investment of \$1,010,000 in non-current assets and working capital to continue its operations.

Nente Co's profits before interest and tax in its first year of operation were \$970,000 and have been growing steadily in each of the following three years, to their current level. Nente Co's cash flows grew at the same rate as well, but it is likely that this growth rate will reduce to 25% of the original rate for the foreseeable future.

Nente Co currently pays interest of 7% per year on its loans, which is 380 basis points over the government base rate, and corporation tax of 20% on profits after interest. It is estimated that an overall cost of capital of 11% is reasonable compensation for the risk undertaken on an investment of this nature.

New product development (Proposal 2)

Developing the new follow-on product will require an investment of \$2,500,000 initially. The total expected cash flows and present values of the product over its 5-year life, with a volatility of 42% standard deviation, are as follows:

Year(s)	Now	1	2	3 to 7 (total)
Cash flows (\$'000)	–	–	(2,500)	3,950
Present values (\$'000)	–	–	(2,029)	2,434

Required

(a) Prepare a report for the board of directors of Nente Co that:

- (i) Estimates the current value of a Nente Co share, using the free cash flow to firm methodology **(7 marks)**
- (ii) Estimates the percentage gain in value to a Nente Co share and a Mije Co share under each payment offer **(8 marks)**
- (iii) Estimates the percentage gain in the value of the follow-on product to a Nente Co share, based on its cash flows and on the assumption that the production can be delayed following acquisition of the exclusive rights of production. **(8 marks)**
- (iv) Discusses the likely reaction of Nente Co and Mije Co shareholders to the takeover offer, including the assumptions made in the estimates above and how the follow-on product's value can be utilised by Nente Co. **(8 marks)**

Professional marks will be awarded for the presentation, structure and clarity of the answer. **(4 marks)**

- (b) Evaluate the current performance of Nente Co and comment on what this will mean for the proposed takeover bid. **(8 marks)**
- (c) Since the approach to Nente Co, Mije Co has itself been the subject of a takeover bid from Tianhe Co, a listed company which specialises in supplying machinery to the manufacturing sector and has a market capitalisation of \$245 million.

Required

Evaluate the general post-bid defences and comment on their suitability for Mije Co to try to prevent the takeover from Tianhe Co. **(7 marks)**

(Total = 50 marks)

Answers

1 Preparation question: Mezza

Workbook references. Ethical and environmental issues are covered in Chapter 1. Takeover regulation is in Chapter 9.

Top tips. Read the entire requirement before starting your answer – as you will note from the examining team's comments below, a number of students failed to address how issues could be mitigated. Part (b) specifically refers to the integrated reporting, so you need to know the relevant capitals to include in your answer.

Easy marks. There are numerous easy marks to be gained from the environmental and ethical issues surrounding the project, as such issues are extremely topical.

Examining team's comments. This question was well answered with many students gaining a high proportion of the marks for their answers. Answers that gained fewer marks did not give many points or lacked adequate discussion. Some answers considered the issues but not how these could be mitigated.

Marking scheme

	Marks
(a) Overarching corporate aim	1–2
Discussion of the project adding value and issues relating to return and risk	3–4
Possible suggestions for mitigating the negative issues to above discussion	3–4
Discussion of the ethical and environmental issues	3–4
Possible suggestions for mitigating the ethical and environmental issues	3–4
Other relevant key issues and suggestions for mitigation	<u>2–3</u>
	Max 17
(b) 1–2 marks per capital discussed	Max <u>8</u> <u>25</u>

(a) Overarching corporate aim

The main aim of the directors is to maximise shareholder value and any decisions should be taken with this objective in mind. However, the company has other stakeholders and directors should be sensitive to potential negative implications from implementing the project.

Key issue (1) – will the project add value?

The first issue to consider is whether the project will add value to the company.

Positive factors

At first glance it would appear that the project would be adding value, as it is meeting an identifiable market need (tackling climate change). There are likely to be positive effects on the company's reputation and ultimately its share price as Mezza Co is demonstrating a desire and ability to tackle climate change. If Mezza Co champions the work being done by its subsidiary, there are likely to be future opportunities for the subsidiary to work on similar projects.

Other factors to consider

Before progressing with the project, further investigation into its likely value is required. Whilst there is no doubt that such a project should be well received, there are risks that must be considered, not just from the project itself but also from the behaviour of the directors. Share options form part of the directors' remuneration package and they may be tempted to take greater risks as a result, in order to try to boost the share price. This may be against the wishes of shareholders and other stakeholders who may have a more risk-averse attitude.

The project appears to use new technology and ideas which, by their very nature, will be risky. There will therefore be uncertainty surrounding the income stream from the project – the extent of the risk should be assessed prior to progressing with the project. Are the current revenue and cost estimates realistic? What is the likelihood of competitors entering the market and the potential effects on revenue and market share? A full investigation, using such means as sensitivity analysis and duration, is required to answer such questions.

When assessing the extent of the value added by the project, it is important that risk is factored into the process. By doing so, directors will be in a better position (if necessary) to show stakeholders that they are not taking unacceptable risks in proceeding with the project. Other factors that must be investigated include the length of time it will take to get the product to market, any additional infrastructure required and potential expertise needed.

Key issue (2) – plant location

Positive factors

Mezza Co has identified an 'ideal' location for the plant, namely Maienar in Asia. This is due to Mezza already having a significant presence in Maienar and thus a well-developed infrastructure exists. There are also strong ties with senior government officials in this country and the Government is keen to develop new industries. All of these factors are very positive for the potential development of the project. The ties to senior government officials are likely to be particularly useful when trying to deal with legal and administrative issues, thus reducing the time between development and production actually starting.

Other factors to consider

Despite the positive factors mentioned above, there are ethical and environmental issues to consider prior to making a final decision regarding plant location. The likely effect on the fishermen's livelihood could produce adverse publicity, as could potential damaging effects on the environment and wildlife. Environmental impact tends to generate considerable debate and Mezza will want to avoid any negative effects on its reputation (particularly as the project is supposed to be 'environmentally friendly').

The fact that Mezza has close ties with senior political figures and the Government in general may create negative feeling if it is felt that Mezza could influence the Government into making decisions that are not in the best interests of the locality and the country as a whole. This is a relationship that will have to be managed very carefully.

Risk mitigation

Given that Mezza has an excellent corporate image, it is unlikely that it will want to ignore the plight of the fishermen. It could try to work with the fishermen and involve them in the process, pointing out the benefits of the project to the environment as a whole (without ignoring the effects on their livelihood). It could offer the fishermen priority on new jobs that are created and emphasise the additional wealth that the project is likely to create.

Mezza could also consider alternative locations for the plant, although this is likely to be expensive, given the need for certain infrastructure already present in Maienar. Alternatively the company could try to find an alternative process for growing and harvesting the plant that would not have adverse effects on wildlife and fish stocks. Again, this is an expensive option and any such costs would have to be set against expected revenues to determine value added.

As mentioned, Mezza will have to manage its relationship with Maienar's Government very carefully as it does not want to appear to be influencing government decisions. Mezza needs to make it very clear that it is following proper legal and administrative procedures – and is working with the Government to protect and improve the country, rather than exploit it for its own gains.

Conclusion

It is important that Mezza considers all of the likely benefits and costs related to the project, not just to itself but also to the country and its inhabitants. While gaining prompt approval from the Government will allow the project to proceed and become profitable more quickly, it is important that Mezza focuses on the effects of the project and alternative ways to proceed, in order to avoid an overall negative impact on its reputation.

(b) **Integrated reporting**

Integrated reporting looks at the ability of an organisation to create value and considers important relationships, both internally and externally. It involves considering the impact of the proposed project and six capitals as follows.

Financial

The integrated report should explain how commercialising the product should generate revenues over time, be an important element in diversification and make a significant contribution to the growth of Mezza. The report should also disclose the financial strategy implications if additional funding was required and what finance cost commitments Mezza will assume.

Manufactured

The report would identify the new facility as an important addition to Mezza's productive capacity. It would also show how the infrastructure that Mezza already has in Maienar will be used to assist in growing and processing the new plant.

Intellectual

The report should show how Mezza intends to protect the plant and hence its future income by some sort of protection, such as the patent. It should also highlight how development of the plant fulfils the aims of the subsidiary, to develop products that have beneficial impacts on other capitals.

Human

Mezza should show how the employment opportunities provided by the new facility link to how Mezza has been using local labour in Maienar. It should highlight the ways in which the new facility allows local labour to develop their skills. However, the report also needs to show whether Mezza is doing anything to help the fishermen deal with their loss of livelihood, since the adverse impact on the fishermen would appear to go against Mezza's strategy of supporting local farming communities.

Social and relationship

The development of the plant and the new facility should be reported in the context of Mezza's strategy of being a good corporate citizen in Maienar. It should explain how the new plant will assist economic development there and in turn how this will enhance the value derived to Mezza from operating in that country.

Natural

The report needs to set the adverse impact on the area and the fishing stock in the context of the longer-term environmental benefits that development of the plant brings. It also needs to show the commitments that Mezza is making to mitigate environmental damage.

2 Preparation question: Strom

Workbook references. This area is covered in Chapter 16.

Top tips. In part (a) you need to assume that the marks are evenly split between the two parts of the requirement when writing your answer.

For part (b) ensure that you address each issue separately rather than giving one overall answer.

In part (d) make sure your answers are not generic advantages of multinationals as many of these relate to producers rather than retailers.

Easy marks. In part (c) there are some fairly easy marks available for discussion of obvious risks from reducing the spend on quality control. Remember to tailor your answer to be relevant for Strom Co.

Marking scheme

		Marks
(a)	Explanation of the role and aims of the IMF Reasons for austerity measures affecting Strom Co negatively	5–6 4–5 _____ Max 10
(b)	Suggestion(s) for not affecting low-price retailers Suggestion(s) for not affecting high-price retailers	2 2 _____ 4
(c)	Discussion of the risks Reduction of the detrimental impact	3–4 2–3 _____ Max 6
(d)	One mark per valid point	Max 5 _____ 25

(a) The role of the IMF is to oversee the global financial system, in particular to stabilise exchange rates, helping countries to achieve a **balance of payments** and influencing economic policies to help in the **development of countries**. The IMF can provide financial support to member countries in the form of a loan which is typically repayable in three to five years. The funds for the loan are raised through the deposits of member countries. The pre-conditions that the IMF places on its loans to debtor countries vary according to the individual situation of each country, but the general position is as follows.

- (i) The IMF wants countries which borrow from the IMF to get into a position to start **repaying the loans fairly quickly**. To do this, the countries must take effective action to improve their balance of payments position.
- (ii) To make this improvement, the IMF generally believes that a country should take action to **reduce the demand for goods and services** in the economy (eg by increasing taxes and cutting government spending). This will reduce imports and help to put a brake on any price rises. The country's industries should then also be able to divert more resources into export markets and hence exports should improve in the longer term.
- (iii) With 'deflationary' measures along these lines, standards of living will fall (at least in the short term) and unemployment may rise. The IMF regards these short-term hardships to be necessary if a country is to succeed in sorting out its balance of payments and international debt problems.

The IMF has been criticised for the conditions imposed on countries, including specific criticism for the suggestion that its policies cause austerity measures which impact more on those with **lower or mid-range incomes**. This in turn hinders long-term growth and development.

Strom Co trades across Europe, where economic activity has been **severely affected in recent years** due to the banking crisis and then due to austerity measures applied by many European governments. For retailers there are two problems posed by this. Firstly, with limited growth and higher taxes, individuals will have **less disposable income**. Secondly, increased unemployment will also limit disposable income. These two problems mean customers may reduce their expenditure on clothing in order to meet other needs.

Companies may need to increase their marketing spend and possibly offer greater discounts or other incentives in order to **remain competitive** or maintain market share. These increased costs will **reduce profit margins**. It can be seen that profit margins have reduced for Strom Co from 20X1 levels. This may be caused by increased spend on marketing or by a failure to reduce the cost base proportionally, but further analysis would be required to determine the cause.

It appears that Strom Co is trying to reduce its costs to address the issue of **declining profitability**. In circumstances where sales revenues are declining and they cannot be stabilised or improved, cost structures may need to be changed in order for Strom Co to make **reasonable profits**.

(b) Low-price clothing retailers may benefit at the expense of mid-price retailers due to a **switch** from mid-price clothes to low-price clothes by consumers. The austerity measures may result in people having less money to spend or being less willing to spend due to future uncertainty. As stated above it is thought that austerity measures affect the mid-income and low-income earners more negatively. Together with the above this may change their buying preferences to low-priced clothes. This would be the case especially where **brand loyalty is limited** and the low-price clothes are perceived as either similar quality or better **value for money**.

With high-priced clothes, there may be **greater brand loyalty**, meaning customers are less likely to switch to mid-priced clothing. Customers who purchase high-priced clothing may prefer to make **savings elsewhere** to switching to cheaper clothing. Many people who purchase high-priced clothing may be high-income earners who are relatively less affected by austerity measures as argued above.

(c) The most obvious risk arising from reducing the allocation of resources to quality control is that quality control inspections will be reduced. This **increases the risk of defective goods** being sold. There is a chance that the cost of processing returned goods could outweigh the savings in quality control. A reduction in the monitoring of working conditions of employees may allow **questionable employment practices** to emerge, which could compromise Strom Co's ethical standards.

A further significant risk is the impact on the reputation of Strom Co and its products. Lower quality and defective clothes could cause serious **damage to the reputation** of Strom Co and result in reduced future sales revenue. This damage to reputation would be very **difficult to reverse**. A fall in ethical standards could also badly damage reputation. Customers may switch their custom to alternative suppliers, investors may sell their shares and the public may organise campaigns against Strom Co. Such reputation damage will be **long term** and maybe even permanent.

Strom Co may be able to make savings in quality control without causing the adverse effects discussed above. Savings could be made by reviewing the processes and eliminating any **unnecessary or duplicated procedures**. It should also evaluate whether alternative processes, which are less resource intensive, can be used that will not compromise quality control or the monitoring of working conditions. This review should be performed by experts. **All critical processes must be retained**, regardless of the level of resources required.

The risk of the review containing errors should be evaluated and discussed by senior management to ensure that Strom Co is comfortable with the likely risk level.

(d) A global multinational retailer has the advantage of a presence in different countries which are **not all experiencing the same economic conditions**. For example, a mid-price clothing retailer may still have strong sales in a country which has not been as strongly affected by the sovereign debt crisis as the Eurozone.

Managerial expertise may be fostered in the environment of the larger multinational enterprise, and can be developed from previous knowledge of foreign markets.

Economies of scale can be gained in marketing, finance, research and development, transport and purchasing by virtue of firms being large and having increased bargaining power.

Multinationals enjoy considerable cost advantages in relation to finance. They have the advantage of access to the **full range of financial instruments** such as eurocurrency and eurobonds, which reduces their borrowing costs.

Multinationals' financial strength is also achieved through their ability to **reduce risk by diversifying their operations** and their sources of borrowing.

3 Preparation question: Bournelorth

Marking scheme

		Marks
(a)	Shareholder wealth maximisation and need for further investment	1–2
	Sell-off of IT services business	1–2
	Rights issue	2–3
	Debt finance	<u>2–3</u>
		Max <u>8</u>
(b)	(i) Risks associated with investment in development	up to 4
	Controls over development	up to 4
		Max <u>6</u>
	(ii) 1 mark per point	<u>3</u>
(c)	(i) Explanation that behavioural finance departs from rational decision-making	<u>3</u>
	(ii) Impacts of behavioural factors on share price – up to 2 marks per well-explained point	Max <u>5</u>
		<u>25</u>

(a) According to traditional finance theory, Bournelorth Co's directors will wish to strive for long-term shareholder wealth maximisation. The directors may not have been fully committed to long-term wealth maximisation, as they seemed to have focused on the development aspects which interested them most and left the original business mostly to others. However, now they are likely to come under pressure from the new external shareholders to maximise shareholder wealth and pay an acceptable level of dividend. To achieve this, it seems that Bournelorth Co will have to commit further large sums to investment in development of diagnostic applications (apps) in order to keep up with competitors.

Selling off the IT services business

At present the IT services business seems to be a reliable generator of significant profits. Selling it off would very likely produce a significant cash boost now, when needed. However, it would remove the safety net of reasonably certain income and mean that Bournelorth Co followed a much riskier business model. The IT services business also offers a possible gateway to reach customers who may be interested in the apps which Bournelorth Co develops.

Rights issue

If the executive directors wish to maintain their current percentage holdings, they would have to subscribe to 75% of the shares issued under the rights issue. Even though the shares would be issued at a discount, the directors might well not have the personal wealth available to subscribe fully. Previously they had to seek a listing to obtain enough funds for expansion, even though they were reluctant to bring in external investors, and this suggests their personal financial resources are limited.

However, the directors may need to take up the rights issue in order to ensure its success. If they do not, it may send out a message to external investors that the directors are unwilling to make a further commitment themselves because of the risks involved. There are also other factors which indicate that the rights issue may not be successful. The directors did not achieve the initial market price which they originally hoped for when Bournelorth Co was listed and shareholders may question the need for a rights issue soon after listing.

If the executive directors do not take up all of their rights, and the rights issue is still successful, this may have consequences for the operation of the business. The external shareholders would own a greater percentage of Bournelorth Co's equity share capital and may be in a position to reinforce the wishes of non-executive directors for improved governance and control systems and change of behaviour by the executive directors. Possibly they may also demand additional executive and non-executive directors, which would change the balance of power on the board.

The level of dividend demanded by shareholders may be less predictable than the interest on debt. One of the directors is also concerned whether the stock market is efficient or whether the share price may be subject to behavioural factors (discussed in (c) below).

Debt finance

Debt providers will demand Bournelorth Co commits to paying interest and ultimately repaying debt. This may worry the directors because of the significant uncertainties surrounding returns from new apps. Significant debt may have restrictive covenants built in, particularly if Bournelorth Co cannot provide much security. The directors may be faced with restrictions on dividends, for example, which may upset external shareholders.

Uncertainties surrounding funding may also influence directors' decisions. Loan finance may be difficult to obtain, but the amount and repayments would be fixed and could be budgeted, whereas the success of a rights issue is uncertain.

(b) (i) The main risks connected with development work are that time and resources are wasted on projects which do not generate sales or are not in line with corporate strategy. Directors may choose apps which interest them rather than apps which are best for the business. There is also the risk that projects do not deliver benefits, take too long or are too costly. Bournelorth Co's directors' heavy involvement in development activities may have made it easier to monitor them. However, the dangers with this are that the directors focus too much on their own individual projects, do not consider their projects objectively and do not step back to consider the overall picture.

The board must decide on a clear strategy for investment in development and needs to approve major initiatives before they are undertaken. There must be proper planning and budgeting of all initiatives and a structured approach to development. The board must regularly review projects, comparing planned and actual expenditure and resource usage. The board must be prepared to halt projects which are unlikely to deliver benefits. One director should be given responsibility for monitoring overall development activity without being directly involved in any of the work. Post-completion reviews should be carried out when development projects have been completed.

(ii) Communication with shareholders and other important stakeholders, such as potential customers, may be problematic. Bournelorth Co faces the general corporate governance requirement of transparency and has to comply with the specific disclosure requirements of its local stock market.

However, governance best practice also acknowledges that companies need to be allowed to preserve commercial confidentiality if appropriate, and clearly it will be relevant for Bournelorth Co. However, the less that it discloses, the less information finance providers will have on which to base their decisions.

Another issue with disclosure is that product failures may be more visible now that Bournelorth Co has obtained a listing and may have to include a business review in its accounts.

(c) (i) Sewell defines behavioural finance as the influence of psychology on the behaviour of financial practitioners and the subsequent effect on markets. Behavioural finance suggests that individual decision-making is complex and will deviate from rational decision-making. Under rational decision-making, individual preferences will be clear and remain stable. Individuals will make choices with the aim of maximising utility, and adopt a rational approach for assessing outcomes.

Under behavioural finance, individuals may be more optimistic or conservative than appears to be warranted by rational analysis. They will try to simplify complex decisions and may make different decisions based on the same facts at different times.

(ii) Bournelorth Co's share price may be significantly influenced by the impact of behavioural factors, as it is a newly listed company operating in a sector where returns have traditionally been variable and unpredictable. The impact of behavioural factors may be complex, and they may exert both upward and downward pressures on Bournelorth Co's share price. Investors may, for example, compensate for not knowing much about Bournelorth Co by anchoring, which means using information which is irrelevant, but which they do have, to judge investment in Bournelorth Co.

The possibility of very high returns may add to the appeal of Bournelorth Co's shares. Some investors may want the opportunity of obtaining high returns even if it is not very likely that they will. The IT sector has also been subject to herd behaviour, notably in the dotcom boom. The herd effect is when a large number of investors have taken the same decision, for example to invest in a particular sector, and this influences others to conform and take the same decision.

However, even if Bournelorth Co produces high returns for some time, the fact that it is in a volatile sector may lead to investors selling shares before it appears to be warranted on the evidence, on the grounds that by the laws of chance Bournelorth Co will make a loss eventually (known as the gambler's fallacy).

Under behavioural finance, the possible volatility of Bournelorth Co's results may lead to downward pressure on its share price for various reasons. First some investors have regret aversion, a general bias against making a loss anyway. This, it is claimed, means that the level of returns on equity is rather higher than the returns on debt than is warranted by a rational view of the risk of equity.

Similarly under prospect theory, investors are more likely to choose a net outcome which consists entirely of small gains, rather than an identical net outcome which consists of a combination of larger gains and some losses. At present also, Bournelorth Co does not have much of a history of results for the market to analyse. Even when it has been listed for some time, however, another aspect of behavioural finance is investors placing excessive weight on the most recent results.

If the market reacts very well or badly to news about Bournelorth Co, the large rise or fall in the share price which results may also not be sustainable, but may revert back over time.

4 Chawan

Workbook references. Chapter 2.

Top tips. This question required analysis of a company's past performance to help to decide whether or not to dispose of shares in the company. This is a tricky question to interpret; if rushed it can easily be misinterpreted as a valuations question (this was a common error in the exam). Once you have interpreted what is required this question is fairly straightforward in terms of the technical skills required.

Examining team's comments. Good answers for this part, which provided calculations in a tabular format and then discussed the results in a holistic manner, gained the majority of the marks. However, many responses tended to be unstructured, with few calculations to back up what was being said. Some responses also tended to be largely descriptive and piecemeal, where a ratio or trend was calculated and commented on, but the larger picture and discussion were missed. A surprising number of responses made errors in calculating the ratios and/or only gave ratios for one or two years. At this level, such an approach will not gain many marks. It is also difficult to discuss the key findings in any meaningful manner without examining a trend, but this cannot be done from examining one or two years' data.

Marking scheme

		Marks
(a)	Explanation of a dark pool network	3–4
	Explanation of why Chawan Co may want to use one	<u>1–2</u>
		Max 5
(b)	Profitability ratios	1–2
	Investor ratios	3–4
	Other ratios	1–2
	Trends and other calculations	<u>3–4</u>
		Max 10

Note. Maximum 7 marks if only ratio calculations provided

Discussion of company performance over time	2–3
Discussion of company performance against competitors	2–3
Discussion of actual returns against expected returns	1–2
Discussion of need to maintain portfolio and alternative investments	1–2
Discussion of future trends and expectations	1–2
Discussion of takeover rumour and action as a result	1–2
Other relevant discussion/commentary	<u>1–2</u>
	Max 10
	<u>25</u>

(a) A dark pool network allows shares to be traded anonymously, away from public scrutiny. No information on the trade order is revealed prior to it taking place. The price and size of the order are only revealed once the trade has taken place. Two main reasons are given for dark pool networks: first they prevent the risk of other traders moving the share price up or down; and second they often result in reduced costs because trades normally take place at the mid-price between the bid and offer; and because broker-dealers try to use their own private pools, thereby saving exchange fees.

Chawan Co's holding in Oden Co is 27 million shares out of a total of 600 million shares, or 4.5%. If Chawan Co sold such a large holding all at once, the price of Oden Co shares may fall temporarily and significantly, and Chawan Co may not receive the value based on the current price. By utilising a dark pool network, Chawan Co may be able to keep the price of the share largely intact, and possibly save transaction costs.

Although the criticism against dark pool systems is that they prevent market efficiency by not revealing bid-offer prices before the trade, proponents argue that in fact market efficiency is maintained because a large sale of shares will not move the price down artificially and temporarily.

(b) **Ratio calculations**

Focus on investor and profitability ratios

Oden Co	20X2	20X3	20X4	20X5
Operating profit/sales revenue		16.2%	15.2%	10.4%
Operating profit/capital employed		22.5%	20.4%	12.7%
Earnings per share		\$0.27	\$0.24	\$0.12
Price to earnings ratio		9.3	10.0	18.3
Gearing ratio (debt/(debt + equity))		37.6%	36.9%	37.1%
Interest cover (operating profit/finance costs)		9.5	7.5	3.5
Dividend yield	7.1%	7.2%	8.3%	6.8%
Travel and leisure (T&L) sector				
Price to earnings ratio	11.9	12.2	13.0	13.8
Dividend yield	6.6%	6.6%	6.7%	6.4%

Other calculations

Oden Co sales revenue annual growth rate average between 20X3 and 20X5 =

$$\left(\frac{1,185}{1,342} \right)^{1/2} - 1 = -6.0\%$$

Between 20X4 and 20X5 = $(1,185 - 1,335)/1,335 = -11.2\%$.

Oden Co average financing cost

$$\begin{aligned} 20X3: 23/(365 + 88) &= 5.1\% \\ 20X4: 27/(368 + 90) &= 5.9\% \\ 20X5: 35/(360 + 98) &= 7.6\% \end{aligned}$$

Share price changes	20X2–20X3	20X3–20X4	20X4–20X5
Oden Co	19.0%	-4.0%	-8.3%
T&L sector	15.8%	-2.3%	12.1%

Oden Co

Return to shareholders (RTS)	20X3	20X4	20X5
Dividend yield	7.2%	8.3%	6.8%
Share price gain	19.0%	-4.0%	-8.3%
Total	26.2%	4.3%	-1.5%
Average: 9.7%			
Required return (based on capital asset pricing model (CAPM))	13.0%	13.6%	16.0%
Average: 14.2%			
T&L sector (RTS)	20X3	20X4	20X5
Dividend yield	6.6%	6.7%	6.4%
Share price gain	15.8%	-2.3%	12.1%
Total shareholder return	22.4%	4.4%	18.5%
Average: 15.1%			
Required return (based on CAPM)	12.4%	13.0%	13.6%
Average: 13.0%			

Tutorial note. Dividend yield, when calculated as part of total shareholder return, is normally calculated as current dividend \div **closing** share price of the **previous** year. This is not the case in the calculations shown here because the closing share price is not given (the share price given is the average share price for the year) but a calculation based on the previous year share price would be acceptable in the exam.

Discussion

The following discussion compares the performance of Oden Co over time to the T&L sector and against expectations, in terms of it being a sound investment. It also considers the wider aspects which Chawan Co should take account of and the further information which the company should consider before coming to a final decision.

In terms of Oden Co's performance between 20X3 and 20X5, it is clear from the calculations above that the company is experiencing considerable financial difficulties. Profit margins have fallen and so has the earnings per share (EPS). While the amount of gearing appears fairly stable, the interest cover has deteriorated. The reason for this is that borrowing costs have increased from an average of 5.1% to an average of 7.6% over the 3 years. The share price has decreased over the three years as well and in the last year so has the dividend yield. This would indicate that the company is unable to maintain adequate returns for its investors (please also see below).

Although Oden Co has tried to maintain a dividend yield which is higher than the sector average, its price/earnings (P/E) ratio has been lower than the sector average between 20X3 and 20X4. It does increase significantly in 20X5, but this is because of the large fall in the EPS, rather than an increase in the share price. This could be an indication that there is less confidence in the future prospects of Oden Co, compared to the rest of the T&L sector. This is further corroborated by the higher dividend yield which may indicate that the company has fewer value-creating projects planned in the future. Finally, whereas the T&L sector's average share price seems to have recovered strongly in 20X5, following a small fall in 20X4, Oden Co's share price has not followed suit and the decline has gathered pace in 20X5. It would seem that Oden Co is a poor performer within its sector.

This view is further strengthened by comparing the actual returns to the required returns based on the capital asset pricing model (CAPM). Both the company and the T&L sector produced returns exceeding the required return in 20X3 and Oden Co experienced a similar decline to the sector in 20X4. However, in 20X5, the T&L sector appears to have recovered but

Oden Co's performance has worsened. This has resulted in Oden Co's actual average returns being significantly below the required returns between 20X2 and 20X5.

Taking the above into account, the initial recommendation is for Chawan Co to dispose of its investment in Oden Co. However, there are three important caveats which should be considered before the final decision is made.

The first caveat is that Chawan Co should look at the balance of its portfolio of investments. A sale of \$58 million worth of equity shares within a portfolio total of \$360 million may cause the portfolio to become unbalanced and for unsystematic risk to be introduced into the portfolio. Presumably, the purpose of maintaining a balanced portfolio is to virtually eliminate unsystematic risk by ensuring that it is well diversified. Chawan Co may want to reinvest the proceeds from the sale of Oden Co (if it decides to proceed with the disposal) in other equity shares within the same sector to ensure that the portfolio remains balanced and diversified.

The second caveat is that Chawan Co may want to look into the rumours of a takeover bid of Oden Co and assess how realistic it is that this will happen. If there is a realistic chance that such a bid may happen soon, Chawan Co may want to hold onto its investment in Oden Co for the present time. This is because takeover bids are made at a premium and the return to Chawan Co may increase if Oden Co is sold during the takeover.

The third caveat is that Chawan Co may want to consider Oden Co's future prospects. The calculations above are based on past performance between 20X2 and 20X5 and indicate an increasingly poor performance. However, the economy is beginning to recover, albeit slowly and erratically. Chawan Co may want to consider how well placed Oden Co is to take advantage of the improving conditions compared to other companies in the same industrial sector.

If Chawan Co decides that none of the caveats materially affect Oden Co's poor performance and position, then it should dispose of its investment in Oden Co.

5 High K

Workbook references. Analysis of financial strategy is covered in Chapter 2 of the Workbook.

Easy Marks. The ratio analysis required here should have been a source of easy marks.

Examining team's comments. The performance of candidates who attempted this question was good. Sometimes candidates merely stated that a ratio/trend was increasing or decreasing, without attempting to address why this may be happening.

Marking scheme

	Marks
(a) Ratios	
Profitability	1–2
Liquidity	1
Solvency	1–2
Investor	3–4
Other ratios and trends	<u>2–3</u>
	Max 10

	Marks
Discussion	
Profitability	2–3
Liquidity	1–2
Gearing	1–2
Investor	2–3
Stores and online sales	3–4
Conclusion	1–2
	Max 11
(b) 1 mark per relevant point	Max 4 25

(a) **Profitability**

Revenues from the different types of store and online sales have all increased this year, despite a drop in store numbers. The increase in revenue this year may be largely due, however, to the government-induced pre-election boom in consumer expenditure, which appears unlikely to be sustained. Because the split of profits is not given, it is impossible to tell what has been the biggest contributor to increased profit. Profit as well as revenue details for different types of store would be helpful, also profit details for major product lines.

Improvements in return on capital employed derive from increases in profit margins and asset turnover.

The improvements in gross margins may be due to increased pressure being put on suppliers, in which case they may not be sustainable because of government pressure. The increased sales per store employee figures certainly reflects a fall in staff numbers, improving operating profit, although it could also be due to staff being better utilised or increased sales of higher value items in larger stores. If staff numbers continue to be cut, however, this could result in poorer service to customers, leading ultimately to decreased sales, so again it is questionable how much further High K Co can go.

The asset turnover shows an improvement which partly reflects the increase in sales. There have been only limited movements in the portfolio of the larger stores last year. The fall in non-current assets suggests an older, more depreciated, asset base. If there is no significant investment, this will mean a continued fall in capital employed and improved asset turnover. However, in order to maintain their appeal to customers, older stores will need to be refurbished and there is no information about refurbishment plans. Information about recent impairments in asset values would also be helpful, as these may indicate future trading problems and issues with realising values of assets sold.

Liquidity

The current ratio has improved, although the higher cash balances have been partly reflected by higher current liabilities. The increase in current liabilities may be due to a deliberate policy of taking more credit from suppliers, which the government may take measures to prevent. Being forced to pay suppliers sooner will reduce cash available for short-term opportunities.

Gearing

The gearing level in 20Y6 is below the 20Y4 level, but it would have fallen further had a fall in debt not been partly matched by a fall in High K Co's share price. It seems surprising that High K Co's debt levels fell during 20Y6 at a time of lower interest rates. Possibly lenders were (rightly) sceptical about whether the cut in central bank lending rate would be sustained and limited their fixed rate lending. Interest cover improved in 20Y6 and will improve further if High K Co makes use of revolving credit facilities. However, when High K Co's loans come up for renewal, terms available may not be as favourable as those High K Co has currently.

Investors

The increase in after-tax profits in 20Y5 and 20Y6 has not been matched by an increase in share price, which has continued to fall. The price/earnings ratio has been falling from an admittedly artificially high level, and the current level seems low despite earnings and dividends being higher. The stock market does not appear convinced by High K Co's current strategy. Return to shareholders in 20Y6 has continued to rise, but this has been caused by a significant % increase in dividend and hence increase in dividend yield. The continued fall in share price after the year end suggests that investors are sceptical about whether this increase can be maintained.

Revenue analysis

Town centre stores

High K Co has continued to close town centre stores, but closures have slowed recently and revenue increased in 20Y6. This suggests High K Co may have selected wisely in choosing which stores to keep open, although Dely Co believes there is no future for this type of store. Arguably though, town centre stores appeal to some customers who cannot easily get to out-of-town stores. Town centre stores may also be convenient collection points for customers using online click and collect facilities.

Convenience stores

High K Co has invested heavily in these since 20X3. The figures in 20Y4 suggest it may have over-extended itself or possibly suffered from competitive pressures and saturation of the market. The 20Y6 results show an improvement despite closures of what may have been the worst-performing stores. The figures suggest Dely Co's decision to close its convenience stores may be premature, possibly offering High K Co the opportunity to take over some of its outlets. Maintaining its convenience store presence would also seem to be in line with High K Co's commitment to be responsive to customer needs. Profitability figures would be particularly helpful here, to assess the impact of rental commitments under leases.

Out-of-town stores

Although the revenue per store for out-of-town stores has shown limited improvement in 20Y6, this is less than might have been expected. The recent consumer boom would have been expected to benefit the out-of-town stores particularly, because expenditure on the larger items which they sell is more likely to be discretionary expenditure by consumers which will vary with the business cycle. Where Dely Co sites its new out-of-town stores will also be a major issue for High K Co, as it may find some of its best-performing stores face more competition. High K Co again may need to consider significant refurbishment expenditure to improve the look of these stores and customer experience in them.

Online sales

Online sales have shown steady growth over the last few years, but it is difficult to say how impressive High K Co's performance is. Comparisons with competitors would be particularly important here, looking at how results have changed over the years compared with the level of investment made. It is also impossible to tell from the figures how much increases in online sales have been at the expense of store sales.

Conclusion

If High K Co's share price is to improve, investors need it to make some sort of definite decision about strategy the way its competitors have since its last year end. What the chief executive has been saying about flexibility and keeping a varied portfolio has not convinced investors. If High K Co is to maintain its competitive position, it may well have no choice but to make a significant further investment in online operations. Possibly as well it could review where its competitor is closing convenience stores, as it may be able to open, with limited investment, new stores in locations with potential.

However, it also must decide what to do about the large out-of-town stores, as their performance is already stagnating and they are about to face enhanced competition. High K Co will also need to determine its dividend policy, with maybe a level of dividend which is considered the minimum acceptable to shareholders allowed for in planning cash outflows.

Appendix

	20Y4	20Y5	20Y6
<i>Profitability</i>			
Gross profit %	4.33	5.07	6.19
Operating profit %	0.87	1.70	2.91
Asset turnover (sales revenue/(total assets – current liabilities))	2.36	2.42	2.53
Return on capital employed % (operating profit % × asset turnover)	2.05	4.11	7.36
<i>Liquidity</i>			
Current ratio	0.84	1.29	1.69
<i>Solvency</i>			
Gearing (non-current liabilities/non-current liabilities + share capital)			
(Market values of share capital) %	37.6	36.8	32.5
Interest cover	1.63	3.54	7.12
<i>Investors</i>			
Dividend cover	0.35	1.29	1.71
Price/earnings ratio	54.46	12.15	5.52
<i>Return to shareholders</i>			
Dividend yield %	5.30	6.36	10.60
Share price gain/(loss) %	(9.00)	(5.65)	(3.29)
Total	(3.70)	0.71	7.31
<i>Revenue/store (\$m)</i>			
Town centre	31.91	33.05	33.93
Convenience	5.41	5.66	5.99
Out-of-town	46.45	46.16	46.46
Store revenue per store staff member ('000)	247	258	272

(Note. Credit will be given for alternative relevant calculations and discussion. Candidates are not expected to complete all of the calculations or evaluation above to obtain the available marks.)

(b) High K Co has not raised any equity finance over the last five years. Its falling share price means that a new share issue may not be successful. It may not only need debt finance to be renewed, but additional funding to be obtained.

High K Co intends to make more use of revolving credit facilities, which it need not draw on fully, rather than loans, which will mean that its finance costs are lower than on ordinary debt. However, these facilities are likely to be at floating rates, so if the government increases the central bank rate significantly, they could come at significant cost if High K Co decides to utilise them fully.

Finance costs on new debt, whatever form it takes, may therefore be significant and lower interest cover. High K Co may have to investigate selling some of the stores it owns either outright or on a sale or leaseback basis.

6 Tillinton

Workbook references. Analysis of financial strategy is covered in Chapter 2 of the Workbook.

Easy Marks. The ratio analysis required here should have been a source of easy marks. Part (b) is also relatively straightforward in terms of applying knowledge of behavioural finance theory.

Examining team's comments. Every candidate should have aimed for the 10 marks available on the calculations as they are relatively easily earned. As only a mark is typically awarded for a ratio calculation, candidates who calculated well in excess of 10 ratios have done extra work without gaining more calculation marks. Equally, some answers produced only a few ratios or did not examine the full trend. Doing so, meant they obtained fewer marks than were available here. Some answers simply showed a percentage or figure without any workings at all. This meant that it is often difficult for markers to see how the ratio was arrived at. Therefore, own figure rule (OFR marks) cannot be awarded when the same mistake is applied to calculating another related ratio. It is also disappointing to see answers which used the wrong formulae to calculate basic ratios particularly, the return on capital employed, asset turnover, current ratio, gearing and price/earnings. Or mixed up dividend yield with payout ratio. These ratios and their interpretation are considered as assumed knowledge from the applied skills level.

Answers which interpreted and discussed the ratios calculated with reference to the question scenario and provided insight scored high marks. However, all too often, answers earned very few or no marks for the evaluation aspect as they merely described the increases and/or decreases in ratios and trends over the three-year period without further analysis.

In part (b) candidates were asked to discuss how behavioural factors may have affected the company's higher than expected share price. There were some excellent answers suggesting that these candidates may have read the AFM technical article published on this topic area.

Marking scheme

		Marks
(a)	Ratios	
	Profitability	2-3
	Liquidity	1
	Solvency	1-2
	Investor	3-4
	Other ratios and trends	<u>2-3</u>
		Max 10
	Discussion	
	Profitability	3-4
	Liquidity	2-3
	Solvency	2-3
	Investor	2-3
	Conclusion	<u>2-3</u>
		Max 10
(b)	Up to 2 marks per relevant point	Max <u>5</u> <u>25</u>

(a) **Profitability**

Tillinton Co's chief executive is correct in saying that the absolute increase in revenue and gross profits on all products was greater in 20X3 than 20X2, but the % increase in revenue was smaller on all products, and the % increase in gross profit on toys was also lower. The % increase on the electronic toys shows the biggest fall, possibly indicating greater competition.

The improvements in operations mentioned by the chief executive seem to have maintained gross and operating profit margins and resulted in the absolute overall increases in gross and operating profits. However, this aspect of performance is almost all attributable to Tillinton Co's older products. The gross profit on electronic toys has hardly increased and the gross profit margin has fallen over the last two years. Although the margin remains higher than on the other products, even the 20X3 margin may not be sustainable. If competitors are starting to catch up with Tillinton Co, then the profit margin on the current range of electronic toys may continue to fall in future years, as prices fall to maintain market share.

Despite the emphasis on developing the products, the revenue generated by electronic toys is still below the revenue generated by non-electronic toys.

Asset turnover and return on capital employed have risen significantly over the last two years. However, part of the reason for the 20X3 increases was the significant increase in current liabilities. The further amount of investment which the chief executive appears to be contemplating suggests that asset turnover and return on capital employed may fall in future years, particularly if profit margins on electronic toys cannot be sustained.

Liquidity

The figures for other current assets seem to support the chief executive's contention that working capital is being managed better, as other current assets are falling as revenue and gross profits are rising.

However, the fall of the current ratio from 1.52 to 0.64 is significant, and the biggest reason for the fall in 20X3 was the large increase in current liabilities. Cash balances have remained at a low level, despite higher revenues and profit. Possibly there is now a bank overdraft, which could have contributed to the significant increase in finance costs between 20X2 and 20X3. It would seem that cash reserves have been exhausted by the combination of investment in non-current assets and the payments to finance providers (both interest and dividends), and Tillinton Co is more dependent on short-term liability finance. Slowdown in any product area, particularly electronic toys, may result in significant liquidity problems.

Solvency

Gearing has fallen over the last two years, but this is due to share price increases which may not be sustainable. If book values rather than market values are used to calculate gearing, the fall in gearing is much smaller. More information is needed about an additional \$30 million in long-term loans. Although costs on these may be higher than on its current loans, this would not account for all the increase in finance costs. As discussed above, Tillinton Co may be making use of overdraft finance. The fact that current liabilities have increased much more than non-current liabilities could be an indication that Tillinton Co is having problems raising all the longer term loan finance which it requires.

The figures suggest that Tillinton Co's board needs to review future financing carefully if the company wants to make further investment in electronic products. At some stage, the board will have to consider raising further finance, either through an issue of shares or through selling off parts of its operations.

Investor ratios

Both earnings and dividends per share have risen since 20X1, which could help explain the significant increase in share price. Dividend cover has remained around 2.0 despite an increase in earnings. Although dividends have increased, dividend yield has fallen since

20X1. The increase in total shareholder return is due solely to the increases in share price, which have also resulted in the price-earnings ratio increasing in 20X3. The current rate of share price increase does not appear to be warranted by the most recent results and may be partly due to generous dividend levels, which may not be sustainable if more cash is required for investment.

Conclusion

Despite the chief executive's optimistic message in the annual report, the benefits from the electronic toys development may be short-lived. There appears to be a mismatch between investment, dividend and financing policies. As discussed, margins on current products may fall further and there is no guarantee that margins on new electronic toys or other products will be higher if competition generally is increasing.

Further significant investment in electronic toys or other goods may be difficult to finance. Increased reliance on short-term finance is clearly not sustainable, but obtaining more debt may be problematic, particularly if gearing levels rise as share prices fall. Tillinton Co seems reluctant to take advantage of high share price levels to issue equity capital. This, plus the increase in dividends, may indicate Tillinton Co's board is unwilling to risk upsetting shareholders, despite the large increases in share price. The chief executive may be right in saying that funds may have to be obtained by selling off one of the other parts of the business, but revenue and profits from the older products may be more sustainable. An increased concentration on electronic products may be a high-risk strategy. Possibly, if investors become less positive towards the electronic goods sector, they may realise this, resulting in an increase in cost of capital and a fall in share price.

Note. Credit will be given for relevant, alternative approaches to the calculations and discussion.

Appendix

	20X1	20X2	20X3
Profitability			
% increase in revenue		18.1	17.0
Gross profit %	27.5	27.6	27.6
% increase in gross profit		18.4	17.1
Operating profit %	14.8	15.4	15.7
% increase in operating profit		22.9	19.0
Asset turnover (revenue/(total assets – current liabilities))	0.65	0.73	0.81
Return on capital employed % (operating profit % × asset turnover)	9.6	11.2	12.7
Liquidity			
Current ratio	1.52	1.15	0.64
Solvency			
Gearing % (non-current liabilities/(non-current liabilities + market value of share capital))	29.4	25.8	22.0
Gearing % (non-current liabilities/(non-current liabilities + book value of share capital + reserves))	43.3	43.0	42.2
Interest cover	4.5	5.0	4.5

Investors

Earnings per share (\$)	0.15	0.19	0.21
Dividend per share (\$)	0.075	0.09	0.105
Dividend cover	1.98	2.10	2.01
Market price per \$0.50 share	2.76	3.49	4.44
Price/earnings ratio	18.4	18.4	21.1
Dividend yield % (dividend per share/share price)	2.72	2.58	2.36
Share price gain/(loss) %	10.40	26.45	27.22
Total shareholder return %	13.12	29.03	29.58

Types of product**Electronic toys**

% increase in revenue	28.1	22.3
Gross profit %	40.2	35.1
% increase in gross profit	12.0	1.0

Other toys

% increase in revenue	15.9	15.4
Gross profit %	23.8	25.1
% increase in gross profit	22.2	19.3

Clothing

% increase in revenue	15.9	15.8
Gross profit %	25.1	27.7
% Increase in gross profit	20.1	23.5

(Note. Credit will be given for alternative, relevant, calculations and discussion. Candidates will not be expected to complete all the calculations above to obtain 10 marks.)

(b) Tillinton Co's shares may be overvalued because share prices generally are too high. The situation may be a stock market bubble. Share prices have been rising consistently recently and this could be encouraging investors to buy more shares, further increasing share prices.

The bubble could be more localised. Tillinton Co seems to be positioning itself as much in terms of producing technologically-advanced electronic products as manufacturing toys. The electronic goods sector may be more likely than other sectors to attract investors on the basis of future profit potential, with investors possibly following a herd instinct, investing because others have been investing in the expectation of future gains.

Possibly, investors are more persuaded by the chairman's confident language and future promises than they are by the concerns the figures suggest. They may also be paying excessive attention to the most recent set of results, rather than seeing them in the context of whether they can be sustained in the future.

If investors are attempting to make a valuation, they could prefer using a model which confirms what they believe the shares are worth (confirmation bias), rather than one which gives a more reliable indication of value. As discussed above, shareholders may be basing their estimates of value on the recent increases in dividend, even though it may be doubtful whether this is sustainable.

7 Limni Co

Workbook references. Financial strategy is covered in Chapter 1.

Top tips. For part (a) it is necessary to consider why Limni Co has these policies in place rather than just describing the existing policy.

In part (b) you do not need to calculate dividend growth or payout ratios for every year to be able to pick up the marks; you can just consider overall growth and look at the earliest and most recent years to make sensible comments. It does not really matter which investment choice is recommended as long as you can support your choice with a valid argument.

Part (c) requires you to know how to calculate dividend capacity. Ensure that you learn the adjustments required to profit after tax if you did not already know these.

Easy marks. There are some easy marks to be gained in part (b) from the evaluation of dividend policies and the discussion of which company to invest in. Part (d) should also offer some fairly easy marks as long as the answer relates to the shareholders' point of view, not the company's.

Examining team's comments. Weaker responses to part (a) tended to be descriptive, often repeating the narrative of the question, rather than being discursive. Also many candidates failed to pick up the point that the nature of the growth of the industrial sector affects the risk management, financing and dividend policies of the company.

In part (b) a sizeable number of candidates were confused between stable dividends (Theta) and stable dividend policies (Omega and Kappa), and thereby demonstrating a lack of sufficient knowledge and understanding.

Some reasonable attempts were made at calculating the current dividend capacity of the company in part (c), but few candidates then proceeded to calculate the increased dividend capacity or provide reasoned comments. Therefore not all the requirements were addressed.

For part (d) the main areas of weakness were that some candidates thought that only one of these methods would provide instant cash to the shareholders or that the requirement was not to compare the two methods with each other, but to discuss the importance of returning cash to shareholders.

Marking scheme

		Marks
(a)	Evaluation of dividend policy	1–2
	Evaluation of financing policy	3–4
	Evaluation of risk management policy	1–2
	Effect of dividends and share buybacks on the policies	<u>2–3</u>
		Max 8
(b)	2 marks per evaluation of each of the three companies	6
	Discussion of which company to invest in	<u>2</u>
		8
(c)	Calculation of initial dividend capacity	3
	Calculation of new repatriation amount	2
	Comment	<u>1–2</u>
		Max 6
(d)	1 mark per relevant point	<u>3</u>
		Max 25

(a) Dividend policy

Many high-growth companies, such as Limni Co, retain cash instead of paying dividends and use the cash to help fund the growth. Many such companies declare an intention not to pay dividends and as such the shareholders expect their wealth to increase through **capital gains** rather than dividend payments.

Financing

Capital structure theory suggests that to take advantage of the tax shield on interest payments, companies should have a capital structure which is a mixture of debt and equity. **Pecking order theory** suggests that companies typically use internally generated funds before seeking to raise external funds (initially debt, then equity). The two main factors in deterring companies from seeking external finance are **favouring one investor group at the expense of another** and the agency effect of providing additional information to the market.

Limni Co is following the pecking order theory to the extent that it is using internally generated funds first. However, it is then deviating from pecking order theory in looking to raise equity finance rather than debt even though it currently has insignificant levels of debt and is therefore not making full use of the tax shield. This may be explained by the fact that Limni Co operates in a **high-risk, rapidly changing industry**, where business risk is high. It may not want to take on **high levels of financial risk** by using significant levels of debt finance. Other issues such as potentially restrictive debt covenant may also be a factor in the financing decision.

Risk management

Managing the volatility of cash flows enables a company to plan its investment strategy more accurately. Limni Co needs to ensure that it will have **sufficient internally generated cash available when it is needed** for planned investments. More importantly, since Limni Co faces high levels of business risk, as discussed above, the company should look to manage the risks that are beyond the individual control of the company's managers.

Effect on policies by returning funds to shareholders

Returning funds to shareholders will affect each of these policies. The shareholder clientele could change, which may lead to share price fluctuations. However, since the change is being requested by shareholders, there is a good chance that this may not happen. The financing policy is likely to change since there will be less internally generated funds available, so Limni Co may consider taking on additional debt finance and therefore will have to look at the balance of business and financial risk. This could in turn change the risk management policy as interest rate risk will also have to be managed as well.

(b) Theta

Company Theta has a **fixed dividend payout ratio of 40%**. As a result the increase in dividends in recent years depends on the increase in profit after tax in these years rather than increasing at a steady rate, which is often preferred by shareholders. If profit after tax was to fall, Theta may reduce its dividend, which could send the wrong signals to shareholders and cause significant fluctuations in the share price. To avoid this, Theta may keep a stable dividend in years of reduced profits.

Omega

Company Omega has a policy of **increasing dividends at approximately 5% per year**, but earnings are only increasing at a rate of approximately 3% per year. This means the **dividend payout ratio is increasing**; it was 60% in 20X3 and is 65% in 20X7. Although this cannot continue in the long term, it suggests that there are less investment opportunities currently and Omega is reducing its retention ratio. This investment would be attractive to an investor looking for a high level of dividend income.

Kappa

Company Kappa has increased its payout ratio from 20% in 20X3 to 27% in 20X7. This is a fairly low payout ratio, but it is growing. **Earnings are growing rapidly** overall, but not at a constant annual rate (35% growth in 20X4, but only 3% in 20X5). Overall dividend growth is at a rate of 29% per year, and the annual dividend growth rate has been fairly constant. This policy seems consistent with a **growing company**, which is now **starting to pay more significant dividends** and return more funds to shareholders. This investment would be attractive to investors seeking a lower level of dividend income and higher levels of capital growth.

Due to uncertainty about whether Theta could decrease its future dividend payments, Limni Co is likely to prefer to invest in either Omega or Kappa. The choice between these two depends on whether Limni Co would **prefer higher dividends or higher capital growth**. Issues such as taxation position or length of time that the funds would be invested for may influence this choice too.

(c) Current dividend capacity

		\$'000
Profit before tax	(23% × \$600m)	138,000
Tax	(26% × \$138m)	<u>(35,880)</u>
Profit after tax		102,120
Add back depreciation	(25% × 220m)	55,000
Less investment in assets		(67,000)
Overseas remittances		15,000
Additional tax	(6% × 15m)	<u>(900)</u>
Dividend capacity		<u>104,220</u>

Increase in dividend capacity = $104.22m \times 0.1 = \$10.422m$

Gross up to allow for extra 6% tax = $\$10.422m / 0.94 = \$11,087,234$

Percentage increase in remittances needed = $(11,087,234 / 15,000,000) \times 100\% = 73.9\%$

Dividend repatriations would need to increase by approximately \$11.1 million or 73.9% in order to increase dividend capacity by 10%. Limni Co needs to consider both whether this is **possible** for the subsidiaries and the **motivational and operational impact** of doing so on the subsidiaries.

(d) The main benefit of a share buyback scheme to a shareholder is that they can choose whether or not to sell their shares back to the company. This means they **can control the amount of cash they receive and in turn manage their own tax liability**. With dividend payments, especially with large special dividends, there may be a large tax liability as a result. Further benefits include the fact that, as share capital is reduced, the **earnings per share figure is likely to increase and share price may increase** too. Additionally share buybacks are often viewed positively by the markets and share price may increase.

8 Arthuro

Workbook references. Dividend capacity is covered in Chapter 1.

Top tips. The bulk of the marks relate to calculations in this question therefore it is important to show clear your workings. Add brief narrative where appropriate to explain your approach to the marker.

Easy marks. There are several easy marks to be gained in part (a) – for example, calculating operating profit, interest and tax. Part (b) is a straightforward discussion of benefits and problems.

Examining team's comments.

In part (a) candidates were asked to calculate the dividend capacity of a company (based on free cash to equity method), and how much the subsidiary company would need to provide given an increase in the number of shares due to a rights issue. Only a minority of responses provided the correct answer for the initial dividend capacity. Common errors included not deducting interest before calculating the tax liability, errors in adding profit from sale of assets, cash received from sale of assets, investment in new assets and the remittances from the subsidiary company. Many responses were poorly presented and lacked evidence of a coherent approach. Because of this, very few candidates were able to calculate how much additional profits the subsidiary company would need to provide, in part (a)(ii).

Part (b) Many candidates failed to recognise that companies face agency issues beyond just between shareholders and company's directors. Agency issues can also occur, for example, between debt holders and the company, or in this case, between the directorate of a subsidiary company and the directorate of the parent company.

Marking scheme

		Marks
(a)	(i) Calculation of operating profit, interest and domestic tax	3
	Depreciation	1
	Profit on disposal of no-current assets and cash from disposal	2
	Investment in new non-current assets	2
	Investment in working capital	1
	Calculation of dividend remittance from Bowerscots	1
	Calculation of additional tax payable on Bowerscots profits	<u>1</u>
		11
	(ii) Dividend capacity required	1
	Increase in dividend remittance	1
	Revised dividend required (% or absolute amount)	<u>1</u>
		3
(b)	(i) Benefits of new policy	2-3
	Problems of new policy	<u>2-3</u>
		Max 5
	(ii) Agency problems	3-4
	Solutions to problems	<u>3-4</u>
		Max 6
		<u>25</u>

(a) (i) Forecast dividend capacity is as follows:

	\$000
Operating profit ($20\% \times 1.04 \times \520 million)	108,160
Less: Interest ($8\% \times \$135$ million)	(10,800)
Less: Taxation ($30\% \times (\$108.16 \text{ million} - \$10.8 \text{ million})$)	(29,208)
Add: Depreciation	30,000
Less: Profit on disposal of NCA	(5,900)
Add: Cash received on disposal of NCA (W1)	16,300
Less: Investment in new NCA (W2)	(44,800)
Less: Investment in working capital ($15\% \times 0.04 \times \520 million)	(3,120)
Add: Dividend remittance from Bowerscots Co (W3)	20,520
Less: Additional tax on Bowerscots Co's profits ($10\% \times \$45$ million)	(4,500)
Forecast dividend capacity	<u>76,652</u>

Workings

1 *Disposal of non-current assets*

	\$000
Profit on disposal	5,900
Cost	35,000
Less: Depreciation	(24,600)
Cash received on disposal	<u>16,300</u>

2 *Investment in non-current assets*

	\$000
Net book value at end of most recent year (start of 'normal' year)	110,000
Less: Depreciation in 'normal' year	(30,000)
Less: Net book value of assets disposed ($\$35$ million – $\$24.6$ million)	<u>(10,400)</u>
Net book value before investment in non-current assets	69,600
Required level of non-current assets ($\$110$ million $\times 1.04$)	<u>114,400</u>
Investment in non-current assets	<u>44,800</u>

3 *Dividend remittance from Bowerscots*

	\$000
Profit before tax	45,000
Less: Tax at 20%	(9,000)
Profit after tax	<u>36,000</u>
Remitted to Arthuro Co ($36,000 \times 60\% \times 0.95$)	<u>20,520</u>

(ii) Dividend capacity required = $(90 \times 4/3)$ million $\times \$0.74$ = $\$88.8$ million

Increase in dividend remittances required = $\$88.8$ million – $\$76.652$ million = $\$12.148$ million

Total dividend remittance required = $(\$20.52 \text{ million} + \$12.148 \text{ million})/0.95$ = $\$34.387$ million

Distribution % required = $(\$34.387 \text{ million}/\$36 \text{ million}) \times 100\%$ = 95.5%

(b) (i) **Benefits of policy**

The change of policy appears to be viable. Arthuro Co would have had some slack if it had not undertaken the rights issue. The new policy takes up this slack and effectively tops up the amount required with an increase in dividends.

The new policy appears to ensure that Arthuro Co will have sufficient funds to pay the required level of dividends and fulfil its own investment requirements. It will mean that Bowerscots Co has less retained funds available for investment, but Arthuro Co's investment opportunities may be more profitable.

Problems with policy

Arthuro Co is now close to taking all of Bowerscots Co's post-tax earnings as dividends. Only a limited fall in Bowerscots Co's earnings would be needed for its dividends not to be enough to sustain Arthuro Co's dividend level. A fall could easily happen given the highly competitive environment in which Bowerscots Co operates. If Arthuro Co wanted to increase its dividends over time, it could not do so by receiving extra dividends from Bowerscots Co.

As mentioned, an increase in dividend will leave Bowerscots Co's management with less retained earnings to invest. The amount of investment they can undertake with the reduced funds available may be insufficient to sustain earnings levels and hence dividends for Arthuro Co.

The tax regime between the two countries means that the group will suffer more tax. The amount of additional tax payable by Arthuro Co on Bowerscots Co's profits will remain unchanged, but the increase in dividends will mean an increase in withholding tax, for which Arthuro Co will receive no credit. Given the lower tax rate in Owlia, for tax purposes higher retained earnings for Bowerscots Co would be preferable, possibly with funds loaned to Arthuro Co rather than paid as dividends.

(ii) Agency problems

An agency situation arises between Arthuro Co's board (the principal) and Bowerscots Co's management (the agent). The proposals are likely to involve agency costs.

The policy limits the discretion of Bowerscots Co's management by restricting the amounts of retained funds available. However, this seems an inefficient way of exercising closer control, with agency costs including the increased liability for withholding tax. If Arthuro Co's board has concerns about Bowerscots Co's management, it would be better to make changes in the management team.

Even if Arthuro Co's board has confidence in Bowerscots Co's management team, it may nevertheless wish to oversee Bowerscots Co more closely, given the dependence of its dividend capacity on the amount received from the subsidiary. Again, increased supervision will involve increased agency costs in terms of time spent by Arthuro Co's management.

Bowerscots Co's management may feel that the new policy threatens their remuneration, as the limited funds available for investment will adversely affect the company's ability to maintain its profit levels. The managers may seek to join competitors, disrupting Bowerscots Co's management, jeopardising its ability to achieve its profit forecasts.

Resolving agency problems

Ways of motivating Bowerscots Co's management include making their remuneration less dependent on Bowerscots Co's results, for example, allowing them share options in Arthuro Co. If more of their remuneration depends on the group's results, Bowerscots Co's management may be happier with the suggested arrangement if they feel it will benefit the group. However, this motivational effect will be limited if Bowerscots Co's management feels that the group results are not influenced much by what they do.

Alternatively, a greater proportion of Bowerscots Co's management's remuneration could be by methods which are not dependent on its results, for example, increased salary or better benefits. However, by weakening the link between results and remuneration, it lessens their incentive to strive to produce the results needed to maintain the required level of dividend.

The decision-making on investments at group level may also have to change. Bowerscots Co will, under the new policy, have insufficient funds for major investments. Its management team should have the opportunity to make a case for retaining a greater percentage of funds, as they may have better investment opportunities than those available to the parent.

9 Lamri

Workbook references. Dividend capacity is covered in Chapter 1.

Top tips. The bulk of the marks relate to calculations in this question therefore it is important to show all your workings. However, there is a lot to do for 14 marks so try to identify shortcuts where you can – for example, the cash from domestic activities both prior to and subsequent to the implementation of the proposal is the same so there is no need to calculate this twice.

Don't be afraid to state what you might think is the obvious. There are marks available for identifying the irrelevance of adjusting for depreciation so make sure you mention your reasons for not including this calculation.

In part (b) it is important to recognise that the implementation of the proposal would result in a shortfall in dividend capacity (don't forget to uplift existing dividend by 8%). By recognising this issue, you can then make suggestions as to how the problem can be overcome.

Easy marks. There are several easy marks to be gained in part (a) – for example, calculating operating profit, interest and tax. Part (c) is a straightforward discussion of mechanisms to prevent transfer price manipulation.

Examining team's comments. This question required a logical and systematic approach as a lot was being asked (particularly in part (a)). Good attempts at part (a) achieved high marks but sometimes the answers were not appropriately structured which resulted in mixed-up answers. Few appropriate answers were received for part (b) and mostly reflected the disorganised approach to part (a).

Marking scheme

	Marks
(a) Calculation of operating profit, interest and domestic tax	3
Calculation of investments in working capital and non-current assets (including correct treatment of depreciation)	3
Calculation of dividend remittance before new policy implementation	2
Calculation of additional tax payable on Magnolia profits before new policy implementation	1
Calculation of dividend remittance after new policy implementation	3
Calculation of additional tax payable on Magnolia profits after new policy implementation	1
Dividend capacity	<u>1</u>
	14
(b) Concluding comments and explanation of reason	2
Possible actions (1 mark per suggestion)	<u>4</u>
	6
(c) 1 mark per valid point	<u>5</u>
	<u>25</u>

(a) **Dividend capacity***Prior to implementing TE's proposal*

	\$m
Operating profit (30% of \$80m)	24.00
Less interest (8% of \$35m)	(2.80)
Profit before tax	21.20
Less tax (28%)	<u>(5.94)</u>
Profit after tax	15.26
Less investment in working capital [15% of (20/120 × \$80m)]	(2.00)
Less investment in non-current assets [25% of (20/120 × \$80m)]	(3.33)
Less investment in new project	<u>(4.50)</u>
Cash flow from domestic activities	5.43
Overseas subsidiaries dividend remittances (W1)	3.16
Less tax paid on Magnolia's profits [(28 – 22)% of \$5.40m]	<u>(0.32)</u>
Dividend capacity	<u>8.27</u>

Tutorial note. There is no need to add back depreciation to obtain cash flow as the investment that amounts to the total depreciation charged will cancel out this calculation. The effect is therefore neutral.

After implementing TE's proposal

	\$m
Cash flows from domestic activities (see above)	5.43
Overseas subsidiaries dividend remittances (W2)	2.71
Additional tax on Magnolia's profits (6% of \$3.12m)	<u>(0.19)</u>
Dividend capacity	<u>7.95</u>

*Workings*1 *Overseas subsidiaries dividend remittances prior to TE's proposal*

	<i>Magnolia</i>	<i>Strymon</i>
	\$m	\$m
Sales revenue	15.00	5.70
Less variable costs	(2.40)	(3.60)
Less transferred costs	(5.70)	Nil
Less fixed costs	<u>(1.50)</u>	<u>(2.10)</u>
Operating profit	5.40	Nil
Less tax	(1.19)	Nil
Profit after tax	4.21	Nil
Remitted to Lamri	<u>(3.16)</u>	Nil
Retained in company	<u>1.05</u>	Nil

2 *Overseas subsidiaries dividend remittances after implementing TE's proposal*

	<i>Magnolia</i>	<i>Strymon</i>
	\$m	\$m
Sales revenue	15.00	7.98
Less variable costs	(2.40)	(3.60)
Less transferred costs	(7.98)	Nil
Less fixed costs	<u>(1.50)</u>	<u>(2.10)</u>
Operating profit	3.12	2.28

	<i>Magnolia</i>	<i>Strymon</i>
Less tax	<u>(0.69)</u>	<u>(0.96)</u>
Profit after tax	2.43	1.32
Remitted to Lamri	(1.82)	(0.89)
Withholding tax		<u>(0.1)</u>
Retained in company	<u>0.61</u>	<u>0.33</u>

(b) **Comments on impact of TE's proposal**

If the proposal is implemented, Lamri's dividend capacity will fall from \$8.27m to \$7.95m. Whilst the dividend capacity prior to implementation of the proposal exceeds the dividend to be paid ($\$7.5m \times 1.08 = \$8.1m$), the proposal would lead to a shortfall in dividend capacity. The shortfall arises due to the high tax rate paid on Strymon's profits that Lamri cannot obtain credit for. Not only does Lamri lose the withholding tax on the remittances (10%), it is also paying an additional 14% in corporation tax (42 – 28).

There are several ways in which the problem of this relatively small shortfall could be overcome. Lamri might consider reducing the growth rate of its dividends to a level that would be covered by the dividend capacity of \$7.95m. However, this might send adverse signals to the market given that a steady 8% growth has been maintained over the last few years.

Another alternative would be to borrow the shortfall. This may not be a popular option if Lamri wishes to avoid increasing its borrowings, particularly to fund dividend payments. Given that it would have to borrow to fund current shortfalls, there is a possibility that this problem would continue in the future, leading to even greater borrowings or the potential of having to reduce dividend growth.

Lamri might wish to consider postponing the project to a later date but the potential impact on company business would have to be evaluated. We are told in the scenario that a number of projects are in the pipeline for the future. Therefore postponing a current investment may not be feasible without impacting on future investments.

The final possibility would be to ask for a higher remittance from Strymon or Magnolia. The main problem with this would be the potential negative impact on morale of the subsidiaries' managers if they are required to pay over greater proportions of their profits (which may affect any profit-related benefits they may have).

(c) Transfer price manipulation is said to occur where Lamri uses transfer prices to avoid payment of taxes and tariffs, or other controls that the Government of the host country has put in place.

The most common solution that tax authorities have adopted to reduce the probability of transfer price manipulation is to develop particular transfer pricing regulations as part of the corporate income tax code. These regulations are generally based on the concept of the arm's length standard, which states that all intra-firm activities of Lamri should be priced as if they took place between unrelated parties acting at arm's length in a competitive market.

The arm's length standard is defined as the prices which would have been agreed upon between unrelated parties engaged in the same or similar transactions under the same or similar conditions in the open market. In the absence of the existence of data to allow a reasonable estimate of the arm's length standard then the alternative methods used to establish the arm's length transfer price include:

(i) **Comparable uncontrolled price**

This method looks for a comparable product to the transaction in question being traded by Lamri in a comparable transaction with an unrelated party or the same or similar product being traded between two unrelated parties.

(ii) **Resale price method**

This method focuses on one side of the transaction, either the manufacturer or distributor, to estimate the transfer price using a functional approach.

(iii) **Cost plus method**

This method starts with the costs of production, measured using recognised accounting principles and then adds an appropriate mark-up over costs. The appropriate mark-up is estimated from those earned by similar manufacturers.

(iv) **Profit split method**

This method allocates the profit earned on a transaction between related parties.

10 Moonstar

Workbook references. Securitisation is covered in Chapter 16, Islamic finance in Chapter 7, and interest rate swaps in Chapter 14.

Top tips. It is important to review the articles on the ACCA website in the lead up to the exam; these often signal that a topic is likely to be tested. An article on securitisation appeared on the ACCA website shortly before this exam sitting.

Easy marks. There are a few easy marks to be picked up in part (c) but only if you have a good working knowledge of this area.

Marking scheme

		Marks
(a)	Calculation of receivable	1
	Loan note amounts attributable to the A, B and C tranches	1
	Impact of swap	2
	Calculation of interest payable on interest for tranches A-, B- and C-rated tranches	3
	Estimation of return to subordinated certificates	1
	Comments and calculation relating to sensitivity	3
		11
(b)	Benefits of securitisation	3–4
	Risks associated with securitisation	2–3
		Max 6
(c)	(i) Explanation/discussion of suitability of Sukuk finance	2–3
	Discussion of investors' views	1–2
		Max 4
	(ii) Explanation/discussion of suitability of Mudaraba contract	2–3
	Discussion of bank's views	1–2
		Max 4
		<u><u>25</u></u>

(a) An annual cash flow account compares the estimated cash flows receivable from the property against the liabilities within the securitisation process. The swap introduces leverage into the arrangement.

<i>Cash flow receivable</i>	<i>\$m</i>	<i>Cash flow payable</i>	<i>\$m</i>
\$200 million \times 11%	22.00	A-rated loan notes	
Less service charge	(0.20)	Pay \$108 million (W1) \times 11% (W2)	11.88
		B-rated loan notes	
		Pay \$27 million (W1) \times 12%	3.24
		C-rated loan notes	
		Pay \$27 million (W1) \times 13%	3.51
	<u>21.80</u>		<u>18.63</u>
		Balance to the subordinated certificates	3.17

Workings

1	<i>Loan notes</i>	<i>\$m</i>
	A	$\$200m \times 0.9 \times 0.6$
	B	$\$200m \times 0.9 \times 0.15$
	C	$\$200m \times 0.9 \times 0.15$
2	<i>Swap</i>	
	Pay fixed rate under swap	<u>9.5%</u>
	Pay floating rate	<u>LIBOR + 1.5%</u>
	Receive floating rate under swap	<u>(LIBOR)</u>
	Net payment	<u>11%</u>

The holders of the certificates are expected to receive \$3.17 million on \$18 million, giving them a return of 17.6%. If the cash flows are 5% lower than the non-executive director has predicted, annual revenue received will fall to \$20.90 million, reducing the balance available for the subordinated certificates to \$2.07 million, giving a return of 11.5% on the subordinated certificates, which is below the returns offered on the B- and C-rated loan notes. The point at which the holders of the certificates will receive nothing and below which the holders of the C-rated loan notes will not receive their full income will be an annual income of \$18.83 million (a return of 9.4%), which is 14.4% less than the income that the non-executive director has forecast.

(b) **Benefits**

The finance costs of the securitisation may be lower than the finance costs of ordinary loan capital. The cash flows from the commercial property development may be regarded as lower risk than Moonstar Co's other revenue streams. This will impact upon the rates that Moonstar Co is able to offer borrowers.

The securitisation matches the assets of the future cash flows to the liabilities to loan note holders. The non-executive director is assuming a steady stream of lease income over the next ten years, with the development probably being close to being fully occupied over that period.

The securitisation means that Moonstar Co is no longer concerned with the risk that the level of earnings from the properties will be insufficient to pay the finance costs. Risks have effectively been transferred to the loan note holders.

Risks

Not all of the tranches may appeal to investors. The risk-return relationship on the subordinated certificates does not look very appealing, with the return quite likely to be below what is received on the C-rated loan notes. Even the C-rated loan note holders may question the relationship between the risk and return if there is continued uncertainty in the property sector.

If Moonstar Co seeks funding from other sources for other developments, transferring out a lower risk income stream means that the residual risks associated with the rest of Moonstar Co's portfolio will be higher. This may affect the availability and terms of other borrowing.

It appears that the size of the securitisation should be large enough for the costs to be bearable. However, Moonstar Co may face unforeseen costs, possibly unexpected management or legal expenses.

(c) (i) Sukuk finance could be appropriate for the securitisation of the leasing portfolio. An asset-backed Sukuk would be the same kind of arrangement as the securitisation, where assets are transferred to a special purpose vehicle and the returns and repayments are directly financed by the income from the assets. The Sukuk holders would bear the risks and returns of the relationship.

The other type of Sukuk would be more like a sale and leaseback of the development. Here the Sukuk holders would be guaranteed a rental, so it would seem less appropriate for Moonstar Co if there is significant uncertainty about the returns from the development.

The main issue with the asset-backed Sukuk finance is whether it would be as appealing as certainly the A-tranche of the securitisation arrangement which the non-executive director has proposed. The safer income that the securitisation offers A-tranche investors may be more appealing to investors than a marginally better return from the Sukuk. There will also be costs involved in establishing and gaining approval for the Sukuk, although these costs may be less than for the securitisation arrangement described above.

(ii) A Mudaraba contract would involve the bank providing capital for Moonstar Co to invest in the development. Moonstar Co would manage the investment which the capital funded. Profits from the investment would be shared with the bank, but losses would be solely borne by the bank. A Mudaraba contract is essentially an equity partnership, so Moonstar Co might not face the threat to its credit rating which it would if it obtained ordinary loan finance for the development. A Mudaraba contract would also represent a diversification of sources of finance. It would not require the commitment to pay interest that loan finance would involve.

Moonstar Co would maintain control over the running of the project. A Mudaraba contract would offer a method of obtaining equity funding without the dilution of control which an issue of shares to external shareholders would bring. This is likely to make it appealing to Moonstar Co's directors, given their desire to maintain a dominant influence over the business.

The bank would be concerned about the uncertainties regarding the rental income from the development. Although the lack of involvement by the bank might appeal to Moonstar Co's directors, the bank might not find it so attractive. The bank might be concerned about information asymmetry – that Moonstar Co's management might be reluctant to supply the bank with the information it needs to judge how well its investment is performing.

11 Preparation question: Cathlynn

Workbook references. Chapter 4.

Top tips. If you can work your way through the formula and are able to use the normal distribution table, this question is actually not that bad. In (i), we need the standard deviation, σ , so therefore we need to take the square root of the variance which we are given in the question. We have used interpolation to find the values in (ii).

(a) (i) Find (d_1) and (d_2) .

Note. Standard deviation = square root of the variance so $s = \sqrt{0.12} = 0.346$

$$d_1 = \frac{\ln(P_A / P_E) + (r + 0.5s^2)t}{s\sqrt{t}}$$

$$d_1 = \frac{\ln(3.5 / 3.3) + (0.08 + 0.5 \times 0.346^2)0.25}{0.346\sqrt{0.25}}$$

$$d_1 = \frac{0.059 + (0.14)0.25}{0.173}$$

$$d_1 = \frac{0.094}{0.173} = 0.54$$

$$d_2 = d_1 - s\sqrt{T}$$

$$d_2 = 0.54 - (\sqrt{0.12}\sqrt{0.25})$$

$$= 0.54 - 0.17 = 0.37$$

(ii) Find $N(d_1)$ and $N(d_2)$ using normal distribution tables.

$$N(0.54) = 0.5 + 0.2054 = 0.7054$$

$$N(0.37) = 0.5 + 0.1443 = 0.6443$$

(iii) Using the Black-Scholes formula:

$$C_0 = (3.50 \times 0.7054) - (3.30e^{-0.08 \times 0.25}) \times 0.6443 \\ = 2.47 - 2.08 = 0.39$$

(b) The main limitations of the Black-Scholes model are:

- (i) The model is **only designed** for the valuation of **European call options**.
- (ii) The basic model is based on the assumption that **shares pay no dividends**.
- (iii) The model assumes that there will be **no transaction costs**.
- (iv) The model assumes knowledge of the **risk-free rate of interest**, and also assumes the risk-free rate will be constant throughout the option's life.
- (v) Likewise the model also assumes accurate knowledge of the **standard deviation of returns**, which is also assumed to be constant throughout the option's life.

12 Preparation question: Faoilean

Workbook references. The Black-Scholes model and its use in the valuation of real options are covered in Chapter 4.

Top tips. Note that in part (a) you need to do more than state the types of real option – you need to **apply** each type to the scenario to spell out how they can help with the investment decision.

Easy marks. If you can identify general limitations of the Black-Scholes option pricing (BSOP) model in part (a) and the general factors that cause option values to change you can score up to seven marks.

Examining team's comments. From the answers it was evident that this question was selected by candidates either because the candidates knew the topic area well and were able to gain good marks, or because they felt that by writing a lot on the area, they would be able to gain sufficient marks to achieve a pass. Unfortunately marks were only awarded for answers which were relevant and where the answer was directed to the question asked in each part.

Part (a) – on the whole, this part was not answered very well. Whereas in past examinations candidates were asked, and could do, numerical calculations of real options, candidates this time around found discussing the concept of real options and its application particularly difficult.

Part (b) – it seems that candidates' knowledge of this area was very poor.

Part (c) – most answers listed the greeks but few explained why option values were determined by the greeks. The part on what vega determines was addressed better, but again this was in a minority of answers and not the majority.

Marking scheme

		Marks
(a)	Discussion of the idea of using options in making the project investment decision	7–8
	Explanation of the assumptions	<u>3–4</u>
		Max 11
(b)	Discussion of using options to value equity	4–5
	Discussion of using options to assess default risk	2–3
	Discussion of financial distress and time value of an option	<u>2–3</u>
		Max 9
(c)	Explanation of why option values are determined by different risk factors	2–3
	Explanation of what determines 'vega'	<u>2–3</u>
		Max 5
		<u><u>25</u></u>

(a) Conventional investment appraisal techniques such as net present value analysis often do not capture the full strategic benefits of a project in terms of either features of a project that allow risk to be managed or features that allow further follow-on gains to be made.

For example a situation may exist where a project is easy to abandon, or uses assets that are easy to switch to another use if the project fails. This **abandonment/redeployment option** adds value to a project because it limits the project's downside risk.

With this project Faoilean Co could negotiate a get-out clause which gives it the right to **sell the project back** to the Government at a later date at a pre-agreed price. Alternatively, it could build facilities in such a way that it can **redeploy** them to other activities, or scale the production up or down more easily and at less cost. These options give the company the opportunity to step out of a project at a future date, if uncertainties today become negative outcomes in the future.

Another type of real option is the **option to delay**. A project can be structured to allow a company to react to improved information about the prospects of the project eg by staggering the capital expenditure over a period of time instead of investing in one block at the start of the project.

In the situation which Faoilean Co is considering, the initial **exploration rights** may give it the **option to delay** the decision of whether to undertake the **extraction** of oil and gas to a later date. In that time, using previous knowledge and experience, it can estimate the quantity of oil and gas which is present more accurately. It can also use its knowledge to assess the variability of the likely quantity. Faoilean Co may be able to negotiate a longer timescale with the Government of Ireland for undertaking the initial exploration, before it needs to make a final decision on whether and how much to extract.

Finally, some projects may create an **option to expand into other areas** using the benefit of the experience gained during the project. For example, Faoilean Co can explore whether or not applying for the rights to undertake this exploration project could give it priority in terms of future projects, perhaps due to the new knowledge or technologies it builds during the current project. These opportunities would allow it to gain competitive advantage over rivals which, in turn, could provide it with greater opportunities in the future, but which are uncertain at present.

Faoilean Co can use the Black-Scholes option valuation formulae to assess the value of any real options associated with the project. This value can be added to the conventional net present value computation to give a more accurate assessment of the project's value.

The option price formula used with investment decisions is based on the BSOP model. The BSOP model makes a number of assumptions as follows:

- (i) The option is assumed to be exercised at a specific point in time (ie a European option); this may not be true in reality eg an option to redeploy may be exercised at any time.
- (ii) The BSOP model uses the risk-free rate of interest. It is assumed that this is known and remains constant, which may not be the case where the time it takes for the option to expire is long;
- (iii) The most significant drawback of the BSOP model is the **estimation of the standard deviation** of the price of the asset. The BSOP model assumes that volatility can be assessed and stays constant throughout the life of the project; again with long-term projects these assumptions may not be valid.
- (iv) The BSOP model assumes that the underlying asset can be traded freely. This is probably not accurate where the underlying asset is an investment project.

These assumptions mean that the value based around the BSOP model is indicative and not definitive.

(**Note.** Credit will be given for alternative relevant comments.)

(b) The value of a firm can be thought of in these terms:

- (i) If the firm fails to generate enough value to repay its loans, then its value = 0; shareholders have the **option** to let the company die at this point.

(ii) However, if the firm does generate enough value then the extra value belongs to the shareholders and in this case shareholders can pay off the debt (this is the **exercise price**) and continue in their **ownership** of the company.

Therefore, the BSOP model can be applied because shareholders have a **call option** on the business. The protection of limited liability creates the same effect as a call option because there is an upside if the firm is successful, but shareholders lose nothing other than their initial investment if it fails. So the value of a company can be calculated as the amount that you would pay as a **premium for this call option**.

If, at expiry of the debt, the value of the company is greater than the face value of debt, then the option is in-the-money, otherwise if the value of the firm is less than the face value of debt, then the option is out-of-the-money and equity is worthless.

Prior to expiry of the debt, the call option (value to holders of equity) will also have a time value attached to it.

The BSOP model can be used to assess the value of the option to the equity holders, the value of equity, which can consist of both time value and intrinsic value if the option is in-the-money, or just time value if the option is out-of-money.

Within the BSOP model, $N(d_1)$, the delta value, shows how the value of equity changes when the value of the company's assets changes. $N(d_2)$ depicts the probability that the call option will be in-the-money (ie have intrinsic value for the equity holders).

Debt can be regarded as the debt holders writing a put option on the company's assets, where the premium is the receipt of interest when it falls due and the capital redemption. If $N(d_2)$ depicts the probability that the call option is in-the-money, then $1 - N(d_2)$ depicts the probability of default.

Therefore the BSOP model and options are useful in determining the value of equity and default risk.

Option pricing can be used to explain why companies facing severe financial distress can still have positive equity values. A company facing severe financial distress would presumably be one where the equity holders' call option is well out-of-money and therefore has no intrinsic value. However, as long as the debt on the option is not at expiry, then that call option will still have a time value attached to it. Therefore, the positive equity value reflects the time value of the option, even where the option is out-of-money, and this will diminish as the debt comes closer to expiry. The time value indicates that even though the option is currently out-of-money, there is a possibility that due to the volatility of asset values, by the time the debt reaches maturity, the company will no longer face financial distress and will be able to meet its debt obligations.

(Note. Credit will be given for alternative relevant comments.)

(c) According to the BSOP model, the value of an option is dependent on five variables: the value of the underlying asset, the exercise price, the risk-free rate of interest, the implied volatility of the underlying asset, and the time to expiry of the option. These five variables are input into the BSOP formula, in order to compute the value of a call or a put option. The different risk factors determine the impact on the option value of the changes in the five variables, and collectively these are known as the 'Greeks'.

In the case of a call option the option will be more valuable if:

- The exercise price is lower; or
- The value of the underlying asset, the risk-free rate of interest, the volatility, or the time period is higher.

The 'vega' determines the sensitivity of an option's value to a change in the implied volatility of the underlying asset. Implied volatility is what the market is implying the volatility of the underlying asset will be in the future. The value of an option will rise as volatility increases because it will increase the potential extent to which an option may be in-the-money which will benefit the option holder – but if an option is out-of-the-money it will simply not be exercised and therefore if the extent to which an option is out-of-the-money rises then it has no impact on the option holder. Therefore as the 'vega' increases, so will the value of the option.

(**Note.** Credit will be given for alternative relevant comments.)

13 Fernhurst

Workbook references. Investment appraisal methods are covered in Chapter 3.

Top tips. In part (a) time management will be important, there are a lot of calculations to do (tax, inflation, working capital, duration) and it will be important to move on if a particular calculation is proving to be time consuming.

Easy marks. Parts (b) and (c) are opportunities to score strongly. Part (b) asked for a calculation (and discussion) of the sensitivity of the project to a reduction in the selling price. Good exam technique could have been employed here to deal with the only area of complexity (the 15% chance of negative cash flows in Year 1) as a brief discussion point in your answer. Part (c) required a discussion of the meaning and significance of NPV and whether short-term measures were also important. This allowed candidates to identify the important of risk and uncertainty in investment appraisal.

Marking scheme

	Marks
(a) Sales revenue	2
Variable costs	2
Fixed costs	1
Tax-allowable depreciation	2
Tax payable	1
Working capital	2
NPV of project	1
Comment on NPV	1
Duration calculation	2
Comment on duration	1
	<u>15</u>
(b) Reduction in selling price	3
Discussion	2-3
	<u>5</u>
(c) Significance of net present value	1-2
Shareholders' attitude to the longer and shorter term	2-3
Time frame measures	1-2
	<u>5</u>
	<u>25</u>

(a)

	0 \$'000	1 \$'000	2 \$'000	3 \$'000	4 \$'000
Sales revenue (W1)	13,250	16,695	22,789	23,928	
Variable costs (W2)	(5,788)	(7,292)	(9,954)	(10,452)	
Contribution	7,462	9,403	12,835	13,476	
Marketing expenditure	(1,500)				
Fixed costs	(900)	(945)	(992)	(1,042)	
Tax-allowable depreciation (W3)	(3,200)	(2,560)	(2,048)	(8,192)	
Taxable profits/(losses)	1,862	5,898	9,795	4,242	
Taxation (25%)	(466)	(1,475)	(2,449)	(1,061)	
Add back tax-allowable depreciation	3,200	2,560	2,048	8,192	
Cash flows after tax	4,596	6,983	9,394	11,373	
Initial investment	(16,000)				
Working capital	(1,025)	(41)	(53)	(56)	1,175
Cash flows	(17,025)	4,555	6,930	9,338	12,548
Discount factor	1.000	0.901	0.812	0.731	0.659
Present values	(17,025)	4,104	5,627	6,826	8,269
Net present value	7,801				

The net present value (NPV) is positive, which indicates the project should be undertaken.

Workings

1 Sales revenue

Year	\$'000
1	132,500 × 100
2	132,500 × 100 × 1.05 × 1.2
3	132,500 × 100 × 1.052 × 1.2 × 1.3
4	132,500 × 100 × 1.053 × 1.2 × 1.3

2 Variable costs

Year	\$m
1	132,500 × 43.68
2	132,500 × 43.68 × 1.05 × 1.2
3	132,500 × 43.68 × 1.052 × 1.2 × 1.3
4	132,500 × 43.68 × 1.053 × 1.2 × 1.3

3 Tax-allowable depreciation

Year	\$'000
	16,000
1	Tax-allowable depreciation
	(3,200)
2	Tax-allowable depreciation
	(2,560)
3	Tax-allowable depreciation
	(2,048)
4	Balancing allowance
	(8,192)
	0

Duration

Present value of inflows = NPV of project + outlay in time 0 = 7,801 + 17,025 = **24,826**

Year	1	2	3	4
Present value (PV) \$'000	4,104	5,627	6,826	8,269
PV x year	4,104	11,254	20,478	33,076

Duration = $(4,104 + 11,254 + 20,478 + 33,076) / 24,286 = 2.78 \text{ years}$

The **project duration** is a measure of the **average time over which this project delivers its value**, ie it is the equivalent of a project that delivers 100% of its (present value) cash inflows in 2.78 years' time.

Alternative calculation:

Year	1	2	3	4
Present value (PV) \$'000	4,104	5,627	6,826	8,269
Percentage of total PV	16.5%	22.7%	27.5%	33.3%

Duration = $(1 \times 0.165) + (2 \times 0.227) + (3 \times 0.275) + (4 \times 0.333) = 2.78 \text{ years}$

(b) Reduction in selling price

Discounted revenue cash flows = $(13,250 \times 0.75 \times 0.901) + (16,695 \times 0.75 \times 0.812) + (22,789 \times 0.75 \times 0.731) + (23,928 \times 0.75 \times 0.659) = \$43,441,000$

Reduction in selling price = $7,801 / 43,441 = 18.0\%$

Fernhurst Co would appear to have some scope to reduce the price in order to guarantee the success of the product launch. It would be useful to know whether the Finance Director's views on the success of the product would change if the product was launched at a lower price. There may be scope to launch at a price which is more than 18.0% lower than the planned launch price, and increase the sales price subsequently by more than the rate of inflation if the launch is a success.

If the directors are unwilling to reduce the price, then their decision will depend on whether they are willing to consider other ways of mitigating a failed launch or take a chance that the product will make a loss and be abandoned. They will take into account both the probability (15%) of the loss and the magnitude (at least \$1,000,000 but possibly higher).

Presumably the Finance Director's assessment of the probability of a loss is based more on doubts about the demand level rather than the level of costs, as costs should be controllable. Possibly Fernhurst Co's directors may consider a smaller-scale launch to test the market, but then Fernhurst Co would still be left with expensive facilities if the product were abandoned. The decision may therefore depend on what alternative uses could be made of the new facilities.

(c) The non-executive director has highlighted the importance of long-term maximisation of shareholders' wealth. The NPV is the most important indicator of whether an investment is likely to do that. However, the assessment of investments using NPV has to be modified if the company is undertaking a number of different investments and capital is rationed. It is not necessarily the case that the investments with the highest NPV will be chosen, as account has to be taken of the amount of capital invested as well.

However, investors are not necessarily concerned solely with the long term. They are also concerned about short-term indicators, such as the annual dividend which the company can sustain. They may be concerned if the company's investment portfolio is weighted towards projects which will produce good long-term returns, but limited returns in the near future.

Risk will also influence shareholders' views. They may prefer investments where a higher proportion of returns are made in the shorter term, if they feel that longer-term returns are much more uncertain. The NPV calculation itself discounts longer-term cash flows more than shorter-term cash flows.

The payback method shows how long an investment will take to generate enough returns to pay back its investment. It favours investments which pay back quickly, although it fails to take into account longer-term cash flows after the payback period. Duration is a better measure of the distribution of cash flows, although it may be less easy for shareholders to understand.

14 Tisa Co

Workbook references. Investment appraisal is covered in Chapter 3.

Top tips. For part (a) you need to calculate the weighted average cost of capital (WACC). This can be done by estimating the project's asset beta, then using Tisa Co's capital structure to estimate the equity beta, then calculate the WACC.

Part (c)(i) requires an understanding of how to calculate VaR, but you could still get marks from the explanations of what the figures mean even if you have not calculated them correctly.

For part (b) do not neglect the requirement to explain the recommendation you have made.

Easy marks. Part (c)(ii) offers some straightforward discussion marks, some of which will be brought forward knowledge from FM.

Examining team's comments. In part (a) most candidates made a reasonably good attempt at determining the cost of capital, although few candidates were able to calculate the asset beta of other activities and therefore the component asset beta. A small number of candidates used an average of equity and debt weightings and, where this was done correctly, appropriate credit was given. Many responses did not give reasons for the approach taken and thereby did not achieve some relatively easy marks.

Few responses calculated the annual and five-year VaR figures in part (c), and very few provided explanations of the values obtained.

Marking scheme

		Marks
(a)	Reasoning behind cost of capital calculation	2
	Calculation of component asset beta	3
	Calculation of component equity beta, and K_e and WACC	<u>3</u>
		8
(b)	Calculation of IRR for Process Omega	3
	Calculation of MIRR for Process Omega	1
	Resolution and advice	<u>4</u>
		8
(c)	(i) Annual and five-year VaR	2
	Explanation	<u>2</u>
		4
	(ii) 1 mark per relevant discussion point	Max <u>5</u>
		<u>25</u>

(a) Use the information for Elf Co to estimate the component project's asset beta. Then use Tisa Co's capital structure to estimate the project's equity beta and WACC. It is assumed that the beta of debt is zero.

Elf Co $MV_e = \$1.20 \times 400\text{m shares} = \480m

Elf Co $MV_d = \$96\text{m}$

Elf Co portfolio asset beta = $1.40 \times \$480\text{m}/(\$480\text{m} + \$96\text{m} \times (1 - 0.25)) = 1.217$

Elf Co asset beta of other activities = $1.25 \times \$360\text{m}/(\$360\text{m} + \$76.8\text{m} \times (1 - 0.25)) = 1.078$

$1.217 = \text{component asset beta} \times 0.25 + 1.078 \times 0.75$

Component asset beta = $(1.217 - (1.078 \times 0.75))/0.25 = 1.634$

Component equity beta based on Tisa Co capital structure

$1.634 \times [(\$18\text{m} + \$3.6\text{m} \times 0.75)/\$18\text{m}] = 1.879$

Using CAPM

$K_e = 3.5\% + 1.879 \times 5.8\% = 14.40\%$

WACC = $(14.40\% \times \$18\text{m} + 4.5\% \times \$3.6\text{m})/(\$18\text{m} + \$3.6\text{m}) = 12.75\%$, say 13%.

(b) **Process Omega**

Year	Cash flow	Discount factor		Discount factor	
		13%	PV	20%	PV
	\$'000		\$'000		\$'000
0	(3,800)	1.000	(3,800)	1.000	(3,800)
1	1,220	0.885	1,080	0.833	1,016
2	1,153	0.783	903	0.694	800
3	1,386	0.693	960	0.578	801
4	3,829	0.613	2,347	0.482	1,846
			1,490		663

IRR is approximately $13\% + (1,490/(1,490 - 663)) \times (20\% - 13\%) = 25.6\%$

Tutorial note. You are unlikely to have used these exact discount rates, in which case you may reach a different conclusion to the one below. As long as your conclusion is based on your calculations you will gain credit, whichever discount rates have been used.

MIRR

$$\text{MIRR} = \left[\frac{PV_r}{PV_i} \right]^{1/n} \times (1+r_e) - 1$$

PV_i = PV of investment phase = 3,800

PV_r = PV of return phase = $3,800 + \text{NPV of } 1,490 = 5,290$

$$\text{MIRR} = \left[\frac{5,290}{3,800} \right]^{1/4} \times (1+0.13) - 1 = 0.227 \text{ or } \underline{\underline{22.7\%}}$$

IRR assumes that positive cash flows are **reinvested and earn a return at the same rate as the project's IRR**. The MIRR assumes that positive cash flows are reinvested at the cost of capital. The assumption is more **reasonable** and the result produced is consistent with the net present value. Process Zeta should be adopted as a result, although the difference between the two projects is not significant.

(c) (i) A 99% confidence level requires the VaR to be within 2.33 standard deviations from the mean, based on a single tail measure.

$$\text{Annual VaR} = 2.33 \times \$800,000 = \$1,864,000$$

$$\text{Five-year VaR} = \$1,864,000 \times 5^{0.5} = \$4,168,031$$

This means that Elfu Co can be 99% confident that the cash flows will not fall by more than \$1,864,000 in any one year or \$4,168,031 in total over the 5-year period. This means that it can be 99% sure that the returns will be at least $(\$2,200,000 - \$1,864,000) = \$336,000$ each year. The company can also be 99% sure that the total 5-year returns will be at least $(\$11,000,000 - \$4,168,031) = \$6,831,969$. There is only a 1% chance that the returns will be less than \$336,000 each year or \$6,831,969 in total.

(ii) Risk is most commonly dealt with by using **expected value** analysis, which involves assigning probabilities to all possible outcomes. The major drawback is that the assignment of probabilities is highly subjective. This method is also not suitable for a one-off project, as it may give an expected value that is not possible. It also does not indicate the maximum loss or the probability of making a loss, factors which will impact managers' decision making when they consider project risks.

Uncertainty can be dealt with using a variety of methods. One of these is **sensitivity analysis**. This involves altering the variables in the investment appraisal and seeing how this affects the outcome. The main drawbacks are that variables are looked at in isolation, but in reality they may be **interdependent** and that it does not assess the likelihood of the changes in the variables occurring.

Payback and **discounted payback** can be used to determine how long it will take to recover the initial cost of the investment. The major drawback is that any cash flows after payback has occurred are ignored.

15 Riviere

Workbook references. Project appraisal is covered in Chapter 3. Free trade areas are covered in Chapter 16.

Top tips. Make sure that you answer parts (a) and (c) in full – there are two aspects to both of these questions.

Easy marks. There are some easy marks to be gained in parts (a) and (c) for some straightforward discussion points; ensure where possible that these relate to the scenario.

Marking scheme

		Marks
(a)	Discussion of the EU as a free trade area	2–3
	Discussion of the possible benefits to Riviere Co	2–3
		Max 5
(b)	Calculation of IRR	2
	Calculation of MIRR	2
	Standard deviation calculations	1
	Value at risk calculations	2
	Discussion of merits of NPV and MIRR	2–3
	Explanation of VaR	2–3
	Recommendation	1–2
		Max 13

		Marks
(c)	Discussion of possible legal risks	3–4
	Discussion of how to deal with these	<u>3–4</u>
		Max <u>7</u> <u>25</u>

(a) **A free trade area** like the EU aims to remove barriers to trade and allow **freedom of movement** of production resources such as capital and labour within the EU. The EU also has a **common legal structure** across all member countries and tries to **limit any discriminatory practice** against companies operating in these countries.

The EU also erects **common external trade barriers** to trade against countries which are not member states.

Riviere Co may benefit from operating within the EU in a number of ways.

It may be protected from non-EU competition because companies outside the EU may find it **difficult to enter the EU** markets due to barriers to trade.

A common legal structure should ensure that the standards of food quality and packaging apply equally across all the member countries. This will **reduce compliance costs** for Riviere, which may be an important issue for a small company with limited financial resources.

Having access to capital and labour within the EU may make it easier for the company to set up branches inside the EU, if it wants to. The company may also be able to access any grants which are available to companies based within the EU.

(b) **Project Drugi internal rate of return (IRR)**

Net present value (NPV): €2,293,000 approximately using a cost of capital of 10%

Time	0	1	2	3	4	5
Cash flows (€'000)	(11,840)	1,230	1,680	4,350	10,240	2,200
Try 20%	1.0	0.833	0.694	0.579	0.482	0.402
Present value	(11,840)	1,025	1,166	2,519	4,936	884

$$NPV = €(1,310,000)$$

$$IRR = 10\% + 2,293/(2,293 + 1,310) \times 10\% \text{ approximately} = \underline{\underline{16.4\%}}$$

Modified internal rate of return (MIRR)

Total present values (PVs) of inflows from time 1 to 5 at 10% discount rate = outlay + NPV of project = €11,840,000 + €2,293,000 = €14,133,000

$$\text{MIRR (using formula provided)} = \left[\frac{PV_r}{PV_i} \right]^{1/n} \times (1+r_e) - 1$$

$$\text{MIRR} = \left[\frac{14,133}{11,840} \right]^{1/5} \times (1+0.1) - 1 = \underline{\underline{14\%}}$$

Value at risk (VaR)

A 95% confidence level requires the annual present value VaR to be within approximately 1.645 standard deviations from the mean.

A 90% confidence level requires annual present value VaR to be within approximately 1.282 standard deviations from the mean.

(Note. An approximation of standard deviations to two decimal places is acceptable.)

95%, 5-year present value VaR = $\$400,000 \times 1.645 \times \text{square root of } 5$ (since it is a 5-year project) = approx. **€1,471,000**

90%, 5-year present value VaR = $\$400,000 \times 1.28$ (approx.) $\times \text{square root of } 5$ (since it is a 5-year project) = approx. **€1,145,000**

	Privi	Drugi
NPV (10%)	€2,054,000	€2,293,000
IRR	17.6%	16.4%
MIRR	13.4%	14.0%
VaR (over the project's life)		
95% confidence level	€1,103,500	€1,471,000
90% confidence level	€860,000	€1,145,000

The IRR for project Privi is higher. However, where projects are mutually exclusive, the **IRR can give an incorrect answer**. One reason for this is that the IRR assumes that returns are reinvested at the internal rate of return, whereas NPV and the MIRR assume that they are reinvested at the cost of capital (discount rate) which in this case is 10%. The cost of capital is a more realistic assumption as this is the minimum return required by investors in a company.

The NPV and the MIRR both indicate that project Drugi would create more value for Riviere Co.

Therefore, based purely on cash flows, **project Drugi should be accepted due to the higher NPV and MIRR, as they give the theoretically correct answer of the value created.**

The VaR provides an indication of the potential riskiness of a project. For example, if Riviere Co invests in project Drugi then it can be 95% confident that the PV will not fall by more than €1,471,000 over its life. Hence the project will still produce a positive NPV. However, there is a 5% chance that the loss could be greater than €1,471,000. With project Privi, the potential loss in value is smaller and therefore it is less risky.

When risk is also taken into account, the choice between the projects is not clear cut and depends on Riviere Co's attitude to risk and return. Project Drugi gives the higher potential NPV but is riskier, whereas project Privi is less risky but gives a smaller NPV. This is before taking into account additional uncertainties such as trading in an area in which Riviere Co is not familiar.

It is therefore recommended that Riviere Co should only proceed with project Drugi if it is willing to accept the higher risk and uncertainty.

(c) There are a number of possible **legal risks** which Riviere Co may face:

- The countries where the product is sold may have **different legal regulations** on food preparation, quality and packaging.
- The legal regulations may be more lax in countries outside the EU but Riviere Co needs to be aware that **complying only with the minimum standards may impact its image negatively overall**, even if they are acceptable in the countries concerned.
- There may be **trade barriers** eg **import quotas** in the countries concerned which may make it difficult for Riviere Co to compete.
- The legal system in some countries **may not recognise the trademarks** or production patents which the company holds on its packaging and production processes. This may enable competitors to copy the food and the packaging.
- Different countries may have different regulations regarding **product liability** from poorly prepared and/or stored food which cause harm to consumers.

Possible mitigation strategies:

- (i) Riviere Co needs to undertake sufficient **research** into the countries' **current laws** and regulations to ensure that it complies with the standards required. It may even want to ensure that it exceeds the required standards to ensure that it maintains its reputation.
- (ii) Riviere Co needs to ensure that it also keeps abreast of **potential changes** in the law. It may also want to ensure that it complies with best practice, even if it is not the law yet. Often current best practices become enshrined in future legislation.
- (iii) Strict **contracts** need to be set up between Riviere Co and any agents it uses to transport and sell the food. These could be followed up by **regular checks** to ensure that the standards required are maintained.

(Note. Credit will be given for alternative, relevant discussion for parts (a) and (c).)

16 Arbore

Workbook references. Chapter 3 covers net present value and capital rationing.

Top tips. In part (a)(i) ensure you tackle both parts of the requirement. For part (ii) it is important to consider the factors which are different in a capital rationing scenario.

For part (d) ensure that you take the mark allocation for each sub-part into account when determining the length of your answer.

Easy marks. If you have studied multi-period capital rationing, full marks should be obtained on parts (b) and (c).

Marking scheme

			Marks
(a)	(i)	Calculation of project PDur05 net present value	2
		Calculation of percentage fall of selling price	3
		Comment	<u>1</u>
	(ii)	1 mark per relevant point	6 Max 5
(b)		Formulation of objective function	1
		Formulation of constraints	<u>2</u>
			3
(c)		Category 1	1
		Category 2	2
		Category 3	<u>2</u>
(d)	(i)	Explanation	5 2
	(ii)	Explanation of the features of a CIMS	1-2
		Benefits of maintaining a CIMS (1 mark per benefit)	<u>2-3</u>
			Max <u>4</u> <u>25</u>

(a) (i) **PDur05 NPV**

Annual sales revenue = $\$14 \times 300,000 = \4.2m

Annual costs = $\$3.23\text{m}$

Annual cash flows = $\$0.97\text{m}$

This cash flow will be a 15-year annuity, starting from Year 4.

$$\begin{aligned}\text{NPV} &= (2.5\text{m}) + (1.2\text{m} \times 0.901) + (1.4\text{m} \times 0.812) + (0.97\text{m} \times 7.191 \times 0.731) \\ &= (2.5\text{m}) + (1.081\text{m}) + (1.137\text{m}) + 5.099\text{m} \\ &= \$0.381\text{m}\end{aligned}$$

Sensitivity

To get an NPV of zero, the total present value (PV) of the project's annual cash flows needs to equal the sum of the PV of the investment amounts.

$$2.5\text{m} + 1.081\text{m} + 1.137\text{m} = \$4.718\text{m}$$

This would mean annual cash flows would need to fall to:

$$4.718\text{m}/(7.191 \times 0.731) = \$0.897\text{m}$$

Sales revenue would need to fall to:

$$0.897\text{m} + 3.23\text{m} = \$4.127\text{m}$$

Sales price would need to fall to:

$$4.127\text{m}/300,000 = \$13.76$$

or a percentage decrease of:

$$(14 - 13.76)/14 \times 100 = 1.7\%$$

Conclusion

The NPV of the project is very sensitive to changes in the selling price of the product. Just a small decrease in the selling price could make the NPV zero or negative, meaning the project would not be worthwhile.

(ii) The **NPV method** gives an absolute figure which shows the increase in shareholders' funds as a result of the investment in a particular project. If capital is unlimited then this is the measure that should determine the projects to be invested in. If capital is limited then it is also necessary to consider the amount of limited capital required by the project.

Capital rationing decisions are often **more complicated** than identifying the ranking by NPV. Some of the complications of capital rationing problems are as follows:

- (1) If capital is restricted in one period then it is highly likely to also be restricted in the next and **subsequent periods** as well. A multi-period model will therefore be required.
- (2) Projects are unlikely to possess the same characteristics. For example, some projects may contain real options with follow-on opportunities. Other projects may have greater **strategic significance**, which outweigh other financial considerations.
- (3) Some projects may be '**one-off opportunities**' which can only be undertaken in a particular period. Other projects may be able to be delayed and then commence in the following period.

(b) A multi-period capital rationing model would use linear programming as follows:

Let: X1 = investment in project PDur01; X2 = investment in project PDur02; X3 = investment in project PDur03; X4 = investment in project PDur04; and X5 = investment in project PDur05

Then the objective is to maximise:

$$464X1 + 244X2 + 352X3 + 320X4 + 383X5$$

Given the following constraints:

$$\text{Constraint Year 1: } 4,000X1 + 800X2 + 3,200X3 + 3,900X4 + 2,500X5 \leq 9,000$$

$$\text{Constraint Year 2: } 1,100X1 + 2,800X2 + 3,562X3 + 0X4 + 1,200X5 \leq 6,000$$

$$\text{Constraint Year 3: } 2,400X1 + 3,200X2 + 0X3 + 200X4 + 1,400X5 \leq 5,000$$

And where $X1, X2, X3, X4, X5 \geq 0$

(c) **Category 1**

This figure is the maximum NPV that can be earned with the given constraints on capital expenditure. This is why this figure is less than the total NPV of all five of the projects.

Category 2

These are the proportions of each project that should be undertaken to achieve the maximum NPV given in category 1. In this situation all of PDur05, 95.8% of PDur01, 73.2% of PDur03 and 40.7% of PDur02 should be undertaken. There should be no investment at all in project PDur04.

Category 3

These figures show the use of the constraints in each period and also any slack or investment funds unused in each period. As can be seen here, the constraints are fully utilised and there is no slack in any of the periods.

(d) (i) Generally speaking, a project with a positive NPV should be undertaken by a company and it **increases shareholder wealth** by generating returns in excess of the required rate. In this case, Arbore Co appears to be imposing **internal limits** on the amount of capital available for investment for each department. This may be due to budgetary limits on the amount the company wants to borrow. This is known as **soft capital rationing**.

(ii) A capital investment monitoring system (CIMS) is used to monitor the ongoing progress of a capital investment project once the decision to proceed has been taken. The CIMS will set a plan of how the project is to proceed and also a budget for the project. It will set project milestones and when they need to be achieved by. It will also consider the potential **external and internal risks** to the project. Contingency plans will be drawn up to deal with these identified risks if it is considered necessary. The CIMS will then ensure that the project progresses in line with the plan and the budget.

The benefits of a CIMS to Arbore include the fact that it attempts to ensure that the project **meets its budgeted revenue and expenditure**. It also helps to ensure that the project is completed on time and that the identified risk factors are still valid. Part of the role of the CIMS will be to identify a **critical path** of linked activities which will be vital to delivering the project on time. The participating departments should also take a **proactive** approach towards managing the risks of the project and may be able to reduce costs as a result. In addition, CIMS could be used as a means of communication between the project managers and the monitoring team.

17 MMC

Workbook references. Real options and the Black-Scholes model are covered in Chapter 4.

Top tips. The key to part (a) is determining the values for the variables in the Black-Scholes equation. P_a is the current 'price' of the project (in this case the present value of its cash flows without the option to delay) and P_e is the 'exercise price'. P_e in this scenario is how much you will pay in production, distribution and marketing costs once the project actually starts (that is, the costs that can be delayed if the option to delay is exercised).

Don't forget to show all workings as it is very easy to make a mistake in putting numbers into your calculator. You will be awarded marks for workings even if you don't get the correct answer.

If you are unsure what some of the variables should be (eg P_a and P_e), make an assumption and use the figures you have assumed to be correct. Remember to state your assumptions in your answer so that the marker will see what you are doing.

Easy marks. The calculations in part (a) are not difficult as you are already given the formulae therefore you should be able to pick up some marks here. Part (c) is straightforward discussion if you understand the determinants within the Black-Scholes model.

Examining team's comments. Most students were able to determine the value of the option in part (a) but few students were able to identify the P_a and P_e values. In part (b) a significant number of students did not identify and discuss real options but merely talked about financial options in a general sense. However, some students did recognise that the value of the real option obtained in part (a) is not an actual value.

Marking scheme

		Marks
(a)	Value of project without considering option to delay decision and conclusion	2
	Current price variable (P_a) for Black-Scholes formula	1
	Additional cost (P_e) for Black-Scholes formula	1
	Other variables for Black-Scholes formula	1
	Calculation of $N(d_1)$	3
	Calculation of $N(d_2)$	1
	Value of option to delay decision	1
	Revised value of project and conclusion	<u>2</u>
		12
(b)	1 to 2 marks per well-explained point	Max 7
(c)	1 to 2 marks per well-explained point	Max <u>6</u> <u>25</u>

(a) **Financial impact of option to delay**

First of all we calculate the present value (PV) of the project without the option to delay.

Year	0	1	2	3	4	5	6
	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Cash flows	(7.0)	(7.0)	(35.0)	25.0	18.0	10.0	5.0
Discount factor (11%)	1.000	0.901	0.812	0.731	0.659	0.593	0.535
DCF	(7.0)	(6.31)	(28.42)	18.28	11.86	5.93	2.68

NPV = \$(2.98)m

Without the option to delay the project would be rejected.

Option to delay – use the Black-Scholes model to value this option

$$c = P_a N(d_1) - P_e N(d_2) e^{-rt}$$

$$\text{Where } d_1 = \frac{\ln(P_a / P_e) + (r + 0.5s^2)t}{s\sqrt{t}}$$

$$d_2 = d_1 - s\sqrt{t}$$

$$\begin{aligned} P_a &= \text{current value of the project (that is the PV of its cash inflows)} \\ &= \$18.28m + \$11.86m + \$5.93m + \$2.68m \\ &= \$38.75m \end{aligned}$$

$$\begin{aligned} P_e &= \text{'exercise price' of the project (that is, the cost of production etc that can be delayed)} \\ &= \$35m \end{aligned}$$

$$t = \text{exercise date (that is, when the exercise price is paid)} = 2 \text{ years}$$

$$r = \text{risk-free rate} = 3.5\%$$

$$s = \text{standard deviation} = 0.3$$

$$d_1 = [\ln(38.75/35) + (0.035 + 0.5 \times 0.3^2) \times 2] / [0.3 \times \sqrt{2}] = 0.62$$

$$d_2 = 0.62 - (0.3 \times \sqrt{2}) = 0.20$$

Using the normal distribution tables:

$$N(d_1) = 0.5 + 0.2324 = 0.7324$$

$$N(d_2) = 0.5 + 0.0793 = 0.5793$$

$$\text{Value of option to delay} = (38.75 \times 0.7324) - (35 \times 0.5793 \times e^{(-0.035 \times 2)}) = \$9.127m$$

$$\text{Total value of project} = \$9.127m - \$2.98m = \$6.147m$$

The project would therefore be accepted with the option to delay included.

(b) **Implications of the results**

The option to delay the project gives management time to consider and monitor the potential investment before committing to its execution. This extra time will allow management to assess the popularity of similar launches and also to monitor competition. The success of the film will be heavily reliant on the marketing campaign launched by the film's promoters prior to its release – management will be able to monitor the extent of this campaign before committing to an expensive (and potentially unsuccessful) project.

However, the calculations of the value of the option to delay are subject to several limiting assumptions, primarily the volatility of the cash flows. The value of the option to delay (\$9.127m) is not an exact figure but rather an **indication** of how much management would value the opportunity to delay. The result shows that management should not dismiss the project immediately, despite the current negative NPV.

There may be other options embedded within the project. The technology used to develop the game may be used for other projects in the future (option to **redeploy**). Alternatively the project could lead to follow-on projects if the film is successful enough to generate sequels.

(c) The value of the option depends on the following variables.

(i) **The price of the security**

A decrease in the price of the security will mean that a call option becomes **less valuable**. Exercising the option will mean purchasing a security that has a lower value.

(ii) **The exercise price of the option**

A decrease in the exercise price will mean that a call option becomes **more valuable**; the profit that can be made from exercising the option will have increased.

(iii) **Risk-free rate of return**

A decrease in the risk-free rate will mean that a call option becomes **less valuable**. The purchase of an option rather than the underlying security will mean that the option holder has spare cash available which can be invested at the risk-free rate of return. A decrease in that rate will mean that it becomes less worthwhile to have spare cash available, and hence to have an option rather than having to buy the underlying security.

(iv) **Time to expiry of the option**

A decrease in the time of expiry will mean that a call option becomes **less valuable**, as the time premium element of the option price has been decreased.

(v) **Volatility of the security price**

A decrease in volatility will mean that a call option becomes **less valuable**. A decrease in volatility will decrease the chance that the security price will be above the exercise price when the option expires.

18 Marengo

Workbook references. Option pricing is covered in Chapter 4.

Top tips. There are several ways in which part (b) can be approached and the examining team stated that he would award marks for alternative relevant approaches. What is important is that you assess the advantages and disadvantages of each suggestion to provide a balanced discussion.

Easy marks. Part (a) offers some easy marks for calculating the delta of options and the number of options required.

Examining team's comments. Part (a) was either done well with candidates calculating the delta and then applying it correctly, or done poorly where candidates went on to calculate the value of a call and put option (which were not required). Very few candidates explained the numerical answer. Candidates need to be aware that some question parts may have more than a single requirement and all the requirements need to be addressed correctly in order to achieve full marks. Some reasonable points were made in part (b) but in many cases these lacked depth or substance.

Marking scheme

	Marks
(a) Identifying the need to calculate $N(d_1)$ for hedge ratio	2
Calculation of d_1	2
Calculation of $N(-d_1)$	2
Calculation of number of put options required	1

		Marks
		7
(b)	Discussing the theoretical argument for not hedging	3–4
	Discussing the limitations/risks/costs of selling the shares	3–4
	Discussing the risks/costs of using OTC options to hedge	2–3
	Discussing whether to hold shares at all	2–3
	Discussing the potential benefits of hedging and application to scenario	2–3
	Relevant concluding remarks	<u>1–2</u>
		Max <u>18</u> <u>25</u>

(a) The number of put options to be purchased depends on the hedge ratio, which in turn is determined by the option's delta. We can estimate delta using $N(-d_1)$.

$$d_1 = \frac{\ln(P_a / P_e) + (r + 0.5s^2)t}{s\sqrt{t}}$$

$$d_1 = [\ln(340/350) + (0.04 + 0.5 \times 0.4^2) \times 2/12] / (0.4 \times \sqrt{2/12})$$

$$d_1 = (-0.0290 + 0.02) / 0.163$$

$$d_1 = -0.06$$

$$-d_1 = 0.06$$

$$N(-d_1) = 0.5 + 0.0239 = 0.5239$$

Number of put options needed = 200,000 shares / (0.5239 × 1,000 shares) = 382 contracts

(b) Possible reasons for the suggestions made by each of the three managers

(i) No hedging at all

This argument is based on the theory that corporate risk should not be hedged. This theory states that, where a company holds a well-diversified portfolio and securities are priced correctly, unsystematic risk will be at least reduced to a minimal level or eliminated completely. There is, therefore, no apparent gain to shareholders of any further hedging or management of corporate risk (that is, unsystematic risk cannot be reduced further). Should hedging take place in a perfect market it is likely that shareholders will actually lose out, as the benefits derived from hedging will be outweighed by the costs of doing so.

In an imperfect market, however, shareholders are more likely to benefit from hedging. By reducing the volatility of the firm's earnings, cash flows are likely to increase, which will increase shareholders' wealth. Such a situation is likely to arise:

- (1) If stable earnings increase the certainty of being able to pay for future investments which would encourage a more stable investment policy
- (2) If tax rates are increasing
- (3) If a high volatility of earnings could lead to financial distress for the company

None of the above reasons for hedging appears to exist for Marengo Co and the case for hedging seems to be weak. Marengo is a large company with numerous investments, therefore it is unlikely that reducing the volatility of one such investment will have a significant effect on its cash flows.

(ii) *Sell Arion Co's shares in order to eliminate risk of a fall in share price*

This is based on the assumption that Marengo will be protected from a fall in Arion's share price if it gets rid of the shares in Arion. However, there are a few issues with this proposal.

It is assumed that Marengo holds shares in Arion as an investment and generates a return greater than the risk-free rate. If Marengo sells these shares, an alternative investment offering similar returns should have to be found for the surplus funds, to prevent a reduction in Marengo's shareholder value. If such investments are not available, the shares should not be sold.

Another issue is the potential effect on Arion's share price if Marengo does 'dump' a large number of shares on the market. Managers have to ask whether they are likely to be able to sell such a large proportion of Arion's shares, although there is the chance that investors want to take the opportunity of purchasing shares at a lower price now, in the expectation that the price will increase again following the projected period of uncertainty.

(iii) *Hedge the investment using an appropriate derivative product*

If this proposal was undertaken, Marengo would be required to purchase 382 OTC put options from the bank (see calculations above). This could prove to be expensive, as Marengo will have to pay a premium on each option for the flexibility of having the right, but not the obligation, to exercise the options. Should the option not be exercised, Marengo will have suffered the cost of the premiums for no reason. However, if the options are exercised, Marengo will have protected itself against downside movements in the share price.

Hedging using options involves several risks. Delta is not stable, which means that the number of options that should have been taken out may change (thus Marengo may not be fully protected). Option values also change, the closer they come to the exercise date (measured by theta) and the underlying asset's volatility changes (measured by vega).

Despite the risks associated with derivative products, a stable hedging policy can be used to reduce agency conflicts between shareholders and managers. A single hedging transaction is unlikely to have much impact, but it is important to maintain a consistent approach to hedging against investment risks. This protects not only shareholders' wealth but also managers, who may not be as well diversified as the shareholders.

(iv) *Do not hold any equity investments at all*

Edward may be correct that Marengo Co should not hold equity investments. This is not a core area of business for Marengo Co and it may be best not to focus on it and therefore sell all the shares. However, it is the job of the treasury department to manage excess funds and liquidity and it may be that the equity holdings deliver a valuable dividend stream which contributes to a healthy cash flow for the business. The treasury department will be able to show if their investment choices outperform the market return.

There is no easy way to justify or discourage hedging. Each case should be examined on its individual merits, but it is important for a company to have a risk management strategy on which such decisions can be based.

19 Furlion Co

Workbook references. The Black-Scholes model and its use in the valuation of real options are covered in Chapter 4, the World Bank is covered in Chapter 16 and rho is covered in Chapter 14.

Top tips. A number of articles on the Black-Scholes model were published on the ACCA website in the lead up to these exams, so make sure you are checking the ACCA website for recently published articles.

If you have studied – and are comfortable with – the valuation of real options using the Black-Scholes model, part (a) of this question should be relatively straightforward. The main issues you have to deal with are recognising that you are dealing with real options rather than traded options and appreciating that the option to delay is a call option.

Part (a) is a straightforward application of the Black-Scholes model. Make sure you make clear to the marker the value you are attaching to each of the components of the formulae being used. Remember to deal with the discussion areas of the question too – an easy thing to forget in the midst of large calculations!

Part (b), for five marks, required a discussion of the impact of changes in the interest rate on the value of a call option. The impact of changes in any of 'the greeks' is a commonly examined area.

Part (c) should be fairly brief. A couple of points about the role and limitations of the World Bank (and the International Development Association) are all that is needed.

Easy marks. Discussion of the limitations of Black-Scholes and other factors to be taken into account in part (a).

Marking scheme

		Marks
(a)	Current price variable (P_a) in BSOP formula	1
	Other variables in BSOP formula	1
	Calculation of d_1 and d_2	3
	Determination of $N(d_1)$ and $N(d_2)$	2
	Value of the option to expand decision	1
	Revised value of projects and comments	Max 3
	Assumptions	Max 3
	Other factors	Max <u>3</u>
		Max <u>16</u>
(b)	Explanation of rho	2
	Impact of interest rate movements	3
		5
(c)	Role of World Bank	1
	Usefulness of World Bank as a source of finance	1-2
	Role of IDA	1
	Usefulness of IDA as a source of finance	1-2
		Max <u>4</u>
		<u>25</u>

(a) **Value of option to expand**

Variables

Volatility = 30%

Current price (value of project including option exercise price) = $\$15m \times 0.712 = \$10.68m$

Exercise price (capital expenditure) = \$15m

Exercise date = 3 years

Risk-free rate = 4%

$$d_1 = [\ln(10.68/15) + (0.04 + 0.5 \times 0.3^2) \times 3] / (0.3 \times \sqrt{3}) = -0.1630$$

$$d_2 = -0.1630 - 0.3 \times \sqrt{3} = -0.6826$$

$$N(d_1) = 0.5 - 0.0636 = 0.4364 \text{ (using 0.16 for } d_1\text{)}$$

$$N(d_2) = 0.5 - 0.2517 = 0.2483 \text{ (using 0.68 for } d_2\text{)}$$

$$\text{Value of call option} = P_a \times N(d_1) - P_e \times N(d_2) \times e^{-rt}$$

$$= (10.68 \times 0.4364) - (15 \times 0.2483 \times e^{-0.04 \times 3})$$

$$= 4.66 - 3.30$$

$$= \$1.36m$$

$$\text{Overall value} = \$1.36m - \$1.01m = \$0.35m$$

The investment has a positive net present value, so should be accepted on those grounds. Furlion Co should also consider the value of an abandonment option if results turn out to be worse than expected or a delay option if it wants to see how the reclamation programme is going to continue.

Assumptions made and other factors

Using real options for decision making has limitations. Real options are built around uncertainties surrounding future cash flows, but real option theory is only useful if management can respond effectively to these uncertainties as they evolve. The Black-Scholes model for valuing real options has a number of assumptions which may not be true in practice. It assumes that there is a market for the underlying asset and the volatility of returns on the underlying asset follows a normal distribution. The model also assumes perfect markets, a constant risk-free interest rate and constant volatility.

Furlion Co will also consider expectations about the future of the land reclamation programme. Has the programme been as quick and as effective as the Naswan Government originally expected? Furlion Co will also want to consider how the programme will be affected by the amount of funding the Government obtains and any conditions attached to that funding.

Furlion Co may also wish to consider whether its investment of this type will be looked on favourably by the Naswan Government and whether tax or other concessions will be available. These may come with conditions, given the Government's commitment to a sustainable economy, such as the way production facilities operate or the treatment of employees.

Given that this is a market which may expand in the future, Furlion Co should also consider the reaction of competitors. This may be a market where establishing a significant presence quickly may provide a significant barrier if competitors try to enter the market later.

As the investment is for the manufacture of specialist equipment, it is possible that there is insufficient skilled labour in the local labour pool in Naswa. As well as training local labour, supervision is likely to be required, at least initially, from staff based in other countries. This may involve cultural issues such as different working practices.

(b) The sensitivity of the valuation of options to interest rate changes can be measured by the option's rho. The option's rho is the amount of change in the option's value for a 1% change in the risk-free interest rate. The rho is positive for calls and so will be positive if the risk-free interest rate does increase.

However, interest rates tend to move quite slowly and the interest rate is often not a significant influence on the option's value, particularly for short-term options. However, many real options are longer term and will have higher rhos than short-term options. A change in interest rates will be more significant the longer the time until expiry of an option.

In addition, there are possible indirect economic effects of interest rate changes, such as on the return demanded by finance providers and hence on the cost of capital.

(c) The World Bank provides loans, often direct to governments, on a commercial basis, for capital projects. Loans are generally for a long-term period, which may suit the Naswa Government. However, the terms of the loan may be onerous; not just the finance costs but the other conditions imposed on the scope of the projects.

Given the circumstances of the investment, Naswa may be able to obtain assistance from the International Development Association, which is part of the World Bank. This provides loans on more generous terms to the poorest countries. However, it is designed for countries with very high credit risk which would struggle to obtain funding by other means, and Naswa may not be eligible.

20 Toltuck

Workbook references. Credit spreads and credit ratings are covered in Chapter 7.

Top tips. The calculations in part (a) were covered in an article published in 2015, this underlines the importance of reading the recent articles published on the ACCA website as part of your preparations for AFM.

Easy marks. The discussion parts of the question offered a source of easy marks but marks were capped at 3 in part (b) if no reference was made to the scenario. Always try to refer your points to the scenario wherever possible.

Marking scheme

		Marks
(a)	Government yield curve	2
	Toltuck Co spot-curve old and new	2
	Bond valuation – old and new	3
	Yield to maturity – old and new	3
		10
(b)	Financial factors	4
	Other factors	4
	Limit marks for (b) to 3 marks in total if answer does not mention Toltuck Co's position and performance	8
(c)	1–2 marks per impact discussed	Max 7 25

(a) The government yield curve can be estimated from the data available:

$$\text{Bond 1: } \$104 = \$109/(1 + r_1)$$

$$r_1 = (\$109/\$104) - 1 = 4.81\%$$

$$\text{Bond 2: } \$102 = \$7/1.0481 + \$107/(1 + r_2)^2$$

$$r_2 = [107/(102 - 6.68)]^{1/2} - 1 = 5.95\%$$

$$\text{Bond 3: } \$98 = \$6/1.0481 + \$6/1.0595^2 + \$106/(1 + r_3)^3$$

$$r_3 = [106/(98 - 5.72 - 5.35)]^{1/3} - 1 = 6.83\%$$

Year	Govt yield curve %	Spread old rating %	Toltuck Co spot old rating %	Spread new rating %	Toltuck Co spot new rating %
1	4.81	0.18	4.99	0.54	5.35
2	5.95	0.31	6.26	0.69	6.64
3	6.83	0.45	7.28	0.86	7.69

Valuation of bond under old credit rating

Year	Payment	Discount factor	Discounted cash flow
		\$	\$
1	8	1/1.0499	7.62
2	8	1/1.0626 ²	7.09
3	110	1/1.0728 ³	89.09
Bond valuation			<u>103.80</u>

Valuation of bond under new credit rating

Year	Payment	Discount factor	Discounted cash flow
		\$	\$
1	8	1/1.0535	7.59
2	8	1/1.0664 ²	7.03
3	110	1/1.0769 ³	88.08
Bond valuation			<u>102.70</u>

Yield to maturity under old credit rating

Year	Payment	Discount factor	Discounted cash flow	Discount factor	Discounted cash flow
		\$ 8%	\$	7%	\$
0	(103.80)	1.000	(103.80)	1.000	(103.80)
1–3	8.00	2.577	20.62	2.624	20.99
3	102.00	0.794	80.99	0.816	83.23
			<u>(2.19)</u>		<u>0.42</u>

Using IRR approach, yield to maturity = $7 + ((0.42/(2.19 + 0.42)) \times (8 - 7)) = 7.16\%$

Yield to maturity under new credit rating

Year	Payment	Discount factor	Discounted cash flow	Discount factor	Discounted cash flow
		\$ 8%	\$	7%	\$
0	(102.70)	1.000	(102.70)	1.000	(102.70)
1–3	8.00	2.577	20.62	2.624	20.99
3	102.00	0.794	80.99	0.816	83.23
			<u>(1.09)</u>		<u>1.52</u>

Using IRR approach, yield to maturity = $7 + ((1.52/(1.09 + 1.52)) \times (8 - 7)) = 7.58\%$

Market value of \$100 bond has fallen by \$1.10 and the yield to maturity has risen by 0.42%.

(b) The credit agency will have taken the following criteria into consideration when assessing Toltuck Co's credit rating:

Country

Toltuck Co's debt would not normally be rated higher than the credit ratings of its country of origin, Arumland. Therefore the credit rating of Arumland should normally be at least AA. The rating will also have depended on Toltuck Co's standing relative to other companies in Arumland. The credit agency may have reckoned that Toltuck Co's recent poor results have weakened its position.

Industry

The credit agency will have taken account of the impact of the recession on property construction companies generally in Arumland. Toltuck Co's position within the industry compared with competitors will also have been assessed. If similar recent developments by competitors have been more successful, this is likely to have had an adverse impact on Toltuck Co's rating.

Management

The credit agency will have made an overall assessment of management and succession planning at Toltuck Co. It will have looked at business and financing strategies and planning and controls. It will also have assessed how successful the management has been in terms of delivering financial results. The credit agency may have believed the poor returns on recent developments show shortcomings in management decision-making processes and it may have rated the current management team poorly.

Financial

The credit agency will have analysed financial results, using measures such as return on capital employed. The agency will also have assessed possible sources of future earnings growth. It may have been sceptical about prospects, certainly for the short term, given Toltuck Co's recent problems.

The credit agency will also have assessed the financial position of Toltuck Co, looking at its gearing and working capital management, and considering whether Toltuck Co has enough cash to finance its needs. The agency will also have looked at Toltuck Co's relationship with its bankers and its debt covenants, to assess how flexible its sources of finances are if it comes under stress. It may well have been worried about Toltuck Co's gearing being higher than the industry average and concerned about the high levels of cash it needs to finance operations. It will also have assessed returns on developments-in-progress compared with commitments to repay loans. Greater doubt about Toltuck Co's ability to meet its commitments is likely to have been a significant factor in the fall in its rating.

The agency will also have needed reassurance about the quality of the financial information it was using, so it will have looked at the audit report and accounting policies.

(c) Toltuck Co may not have increased problems raising debt finance if debtholders do not react in the same way as the credit rating agency. They may attach different weightings to the criteria which they use. They may also come to different judgements about the quality of management and financial stability. Debtholders may believe that the recent problems Toltuck Co has had generating returns may be due more to external factors which its management could not have controlled.

However, it is probable that the fall in Toltuck Co's credit rating will result in it having more difficulty raising debt finance. Banks may be less willing to provide loans and investors less willing to subscribe for bonds. Even if debt finance is available, it may come with covenants restricting further debt or gearing levels. This will mean that if Toltuck Co requires substantial additional finance, it is more likely to have to make a rights issue or issue new equity on the stock market. Shareholders may be faced with the choice of subscribing large amounts for

new capital or having their influence diluted. This may particularly worry the more cautious shareholders.

Even if Toltuck Co can obtain the debt it needs, the predicted increase in yield to maturity may be matched by debtholders demanding a higher coupon rate on debt. This will increase finance costs, and decrease profits and earnings per share, with a possible impact on share price. It will also mean that fewer funds are available for paying dividends. Toltuck Co has been faced with difficult decisions on balancing investment expenditure versus paying dividends and these difficulties may well increase.

Additional debt may have other restrictive covenants. They may restrict Toltuck Co's buying and selling of assets, or its investment strategy. Restrictions on Toltuck Co's decisions about the developments it undertakes may impact adversely on shareholder returns.

Loan finance or bonds will also come with repayment covenants. These may require Toltuck Co to build up a fund over time which will be enough to redeem the debt at the end of its life. Given uncertainties over cash flows, this commitment to retain cash may make it more difficult to undertake major developments or pay an acceptable level of dividend.

The fall in Toltuck Co's credit rating may result in its cost of equity rising as well as its cost of debt. In turn, Toltuck Co's weighted average cost of capital will rise. This will affect its investment choices and hence its ability to generate wealth for shareholders. It may result in Toltuck Co prioritising developments offering better short-term returns. This may suit the more cautious shareholders, but the current majority may worry that Toltuck Co will have to turn down opportunities which offer the possibility of high returns.

21 Coeden

Workbook references. Cost of capital is covered in Chapter 6.

Top tips. In part (a) there are a series of related calculations to get to the answer for the post-implementation weighted average cost of capital (WACC). It may not be immediately obvious how to get to the final answer. If you cannot see how to get to the next stage, state a simplifying assumption and move on.

The pre-implementation WACC is relatively straightforward to calculate and does represent half of the marks for this requirement.

Easy marks. The requirement for part (b) gives you a clue that the assumption is highly questionable.

Marking scheme

	Marks
(a) <i>Prior to implementation of the proposal</i>	
Cost of equity	1
Cost of debt	1
Market value of debt	2
Market value of equity	3
WACC	1
<i>After implementing the proposal</i>	
Coeden Co's current asset beta	1
Asset beta of hotel services business only	2
Equity beta of hotel services business only	2
Cost of equity	1
WACC	1

	Marks
Assumptions (1–2 marks per explained assumption)	2–3
Discussion	2–3
	<u>Max 20</u>
(b) Discussion (1–2 marks per point)	Max <u>5</u>
	<u><u>25</u></u>

(a) Before implementing proposal

$$\text{Cost of equity} = 4\% + (1.1 \times 6\%) = 10.6\%$$

$$\text{Cost of debt} = 4\% + 0.90 = 4.9\%$$

Market value of debt (MV_d)

$$(\$5.20 \times 1/1.049) + (\$5.20 \times 1/1.049^2) + (\$105.20 \times 1/1.049^3) = \$100.82$$

$$\text{Total value} = \$42 \text{ million} \times 100.82/100 = \$42,344,400$$

Market value of equity (MV_e)

As stated in the question the free cash flow to equity model provides a reasonable estimate of the market value of the company.

Assumption

The growth rate can be estimated using the rb model. It is assumed that the retained free cash flows to equity will be invested to generate a return at least equal to the shareholders' required rate of return.

$$r = 10.6\% \text{ and } b = 0.4$$

$$g = rb = 10.6\% \times 0.4 = 4.24\%$$

$$MV_e = \frac{FCF \times g}{k_e - g} = 2.6m \times 1.0424/(0.106 - 0.0424) = \$42,614,000 \text{ (rounded)}$$

The proportion of MV_e to MV_d is close to 50:50, which will be used here to simplify the calculations.

$$\text{WACC} = 10.6\% \times 0.5 + 4.9\% \times 0.5 \times 0.8 = 7.3\%$$

After implementing the proposal

The estimate of the asset beta for Coeden Co is:

$$\beta_a = 1.1 \times 0.5/(0.5 + 0.5 \times 0.8) = 0.61$$

Asset beta for hotel services

It has been assumed that Coeden Co's asset beta is a weighted average of the average property company beta and the hotel services beta.

Therefore:

$$0.61 = (\text{Asset beta (hotel services)} \times 0.6) + (0.4 \times 0.4)$$

$$0.45 = \text{Asset beta (hotel services)} \times 0.6$$

$$\text{Asset beta (hotel services)} = 0.75$$

Equity beta for Coeden Co, hotel services only

MV_e is unchanged as stated in the question.

$$MV_e = \$42,614,000$$

$$k_d = 4 + 0.6 = 4.6\%$$

$$MV_d = (\$5.20 \times 1/1.046) + (\$5.20 \times 1/1.046^2) + (\$105.20 \times 1/1.046^3) = \$101.65$$

$$\text{Total value} = \$12.6 \text{ million} \times 101.65/100 = \$12,808,000 \text{ (rounded)}$$

Equity beta calculation

$$0.75 = \beta_e \times (42,614/(42,614 + 12,808 \times 0.8))$$

$$0.75 = \beta_e \times 0.806$$

$$\beta_e = 0.93$$

Hotel services cost of equity and WACC

$$k_e = 4\% + 0.93 \times 6\% = 9.6\%$$

$$\text{WACC} = 9.6\% \times (42,614/(42,614 + 12,808)) + 4.6\% \times 0.8 \times (12,808/(42,614 + 12,808)) = 8.2\%$$

Comment

	<i>Before proposal</i>	<i>After proposal</i>
Cost of equity	10.6%	9.6%
WACC	7.3%	8.2%

The proposal will increase the asset beta of Coeden Co because the hotel services industry has a **higher business risk** than a business that also owns hotels. However, the equity beta and the cost of equity are both lower because of the **reduction in the level of debt**. This is because the reduction in debt means that the financial risk of Coeden Co is lower. However, the WACC increases because this lower debt level means there is less cheap debt in the financing mix. As a result the board of directors' assertion that the lower level of debt will reduce WACC is incorrect.

(b) The assumption that the market value of equity will not change is unlikely to hold in reality. The change in the growth rate of free cash flows and sales revenue and the changes in the business and financial risks of the new business are all likely to have an effect.

In estimating the asset beta of Coeden Co for offering hotel services only there has been no consideration of the **change in business risk** as a result of renting rather than owning the hotels. A revised asset beta should be estimated to reflect the change in business risk.

The market value of equity has been used to estimate the post-implementation equity beta and cost of equity of the business. However, the market value of equity is dependent on the cost of equity, which is itself dependent on the equity beta. Therefore both the cost of equity and the market value of equity will **change** as a result of the implementation of this proposal.

22 GNT

Workbook references. Duration and credit ratings are both covered in Chapter 7.

Top tips. To calculate the duration, you will first need to calculate the gross redemption yield using an internal rate of return (IRR) style calculation, which can then be used as the discount rate to determine the present value (PV). Don't forget to then multiply the PV by the period number for the duration calculation.

In part (b) it is important to remember the limitations of duration; this is shown best by the inclusion of the diagram, as in the answer here.

Easy marks. There are some easy marks to be gained in parts (b) and (c) as the comments can almost be taken straight from the Workbook.

Marking scheme

		Marks
(a)	Calculation of the gross redemption yield	2
	PV of cash flows and the duration of bond 1	3
	PV of cash flows and the duration of bond 2	<u>4</u>
		9
(b)	Duration as a single measure of sensitivity of interest rates	3-4
	Explanation of convexity	2-3
	Explanation of the change in the shape of the yield curve and other limitations	<u>2-3</u>
		Max 8
(c)	For each of the criteria – 2 marks for explanation and suggestion of factors	<u>8</u>
		<u>25</u>

(a) To calculate the duration of both bonds, the PV of the cash flows and the selling price of the bonds need to be calculated first. To obtain the PVs of the cash flows they need to be discounted by the gross redemption yield. This requires an IRR style calculation.

The market price of the first bond, which is \$1,079.68, can be used to find the gross redemption yield that is common to both bonds.

Period	Cash flow	Amount	Discount		PV	Discount	PV
			factor 5%	\$			
1-4	Interest	60	3.546		212.76	3.630	217.80
5	Interest plus redemption	1,060	0.784		<u>831.04</u>	0.822	<u>871.32</u>
					<u>1,043.80</u>		<u>1,089.12</u>

Gross redemption yield = $4\% + [(1,089.12 - 1,079.68)/(1,089.12 - 1,043.80)] = 4.21\%$
say 4.2%

Bond 1

Period	Cash flow	Amount	Discount factor at 4.2%	PV
		\$		
1	Interest	60	0.9597	57.58
2	Interest	60	0.9210	55.26
3	Interest	60	0.8839	53.03
4	Interest	60	0.8483	50.89
5	Interest plus redemption	1,060	0.8141	862.95
				<u>1,079.71</u>

Note. This should be the market price; difference is due to rounding.

Period	PV	Duration multiplier	
1	57.58	1	57.58
2	55.26	2	110.52
3	53.03	3	159.09
4	50.89	4	203.56
5	<u>862.95</u>	5	<u>4,314.75</u>
	<u>1,079.71</u>		<u>4,845.50</u>

$$\text{Duration} = 4,845.50/1,079.71 = 4.49 \text{ years}$$

Bond 2

Period	Cash flow	Amount	Discount factor at 4.2%	PV
		\$		
1	Interest	40	0.9597	38.39
2	Interest	40	0.9210	36.84
3	Interest	40	0.8839	35.36
4	Interest	40	0.8483	33.93
5	Interest plus redemption	1,040	0.8141	846.66
				<u>991.18</u>

This is the market price of Bond 2.

Period	PV	Duration multiplier	
1	38.39	1	38.39
2	36.84	2	73.68
3	35.36	3	106.08
4	33.93	4	135.72
5	<u>846.66</u>	5	<u>4,233.30</u>
	<u>991.18</u>		<u>4,587.17</u>

$$\text{Duration} = 4,587.17/991.18 = 4.63 \text{ years}$$

(b) The sensitivity of a particular bond to a change in interest rates will depend on its **redemption date**. Bonds that have a later maturity date are **more price sensitive** to interest rate changes.

Duration measures the average time that a bond takes to 'pay back' its market price. The average time taken to recover the cash flow from an investment is not only affected by the maturity date of the investment but also by the coupon rate (which determines the interest payments). We want to be able to **compare bonds** quickly – this is where duration is useful.

Duration can be used to assess a bond's change in value following an interest rate change by using the following formula:

$$\Delta P = -D/(1 + Y) \times \Delta Y \times P$$

Where:

ΔP = change in bond price

P = current market price of the bond

ΔY = change in yield

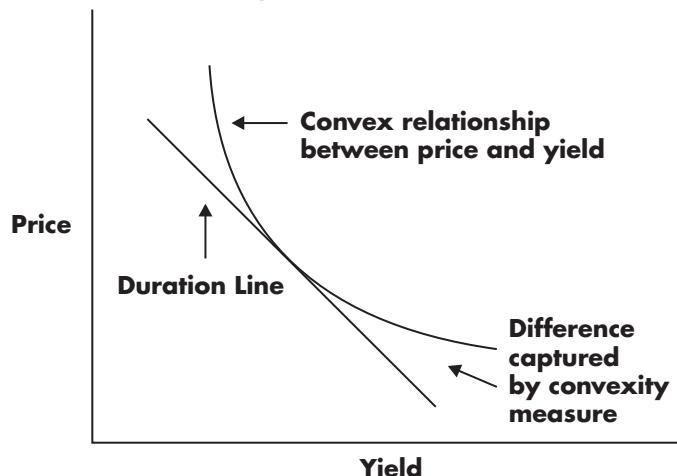
Y = gross redemption yield

D = duration

The main limitation of duration is that it **assumes a linear relationship** between interest rates and price. That is, it assumes that for a certain percentage change in interest rates, there will be an equal percentage change in price.

However, as interest rates change the bond price is unlikely to change in a linear fashion. Rather, it will have some kind of convex relationship with interest rates (see below).

Relationship Between Bond Price and Yield



From the diagram above, the more convex the relationship the more inaccurate duration is for measuring interest rate sensitivity. Therefore **duration should be treated with caution** in predictions of interest rate/price relationships, for any interest rate changes that are not small.

Duration can only be applied to measure the **approximate change** in bond price due to changes in interest rates if the interest rate change does not lead to a change in the shape of the yield curve. This is because it is an average measure based on the GRY (yield to maturity).

(c) **Industry risk**

Industry risk is a measure of the resilience of the company's industry to changes in the wider economy. The following factors could be used to assess this:

- The strength of the industry measured by the impact of economic forces
- Cyclical nature of the industry and the scale of the peaks and troughs
- Demand factors within the industry

Earnings protection

Earnings protection is a measure of how well the company can maintain or protect its current level of earnings in changing circumstances. The following factors could be used to assess this:

- Sources of earnings growth
- Customer base
- Return on capital, pre-tax and net profit margins

Financial flexibility

Financial flexibility is a measure of the ability of the company to raise the finance it needs to pursue its investment goals. The following factors could be used to assess this:

- Relationships with banks
- Any existing debt covenants
- Evaluation of financing needs
- Plans and alternatives under stress

Evaluation of company management

Evaluation of company management is a measure of how well management is managing and planning the future of the company. The following factors could be used to assess this:

- The company's planning, controls, financing policies and strategies
- Overall quality of management and succession
- Merger and acquisition performance
- Record of achievement in financial and non-financial results

23 Fubuki

Workbook references. Net present value (NPV) is covered in Chapter 3 and adjusted present value (APV) in Chapter 6.

Top tips. It is not immediately obvious that APV calculations are required – at this level of examination you are expected to recognise the potential impact of the method of financing. You will still gain marks for calculating the base case NPV but will fail to gain any of the marks available for the APV aspect of part (a).

Be careful which discount rate you use to calculate NPV – you should be making use of the information given on the company in a similar line of business to the new venture. When calculating the tax shield and subsidy effects for APV, make sure you state which rate you use as there are two rates that are feasible.

Part (b) demonstrates the importance of assumptions as you are required to explain any assumptions that you have made. Don't just state the assumptions you think require more explanation – make sure you list all the assumptions made, regardless of how obvious you think they might be.

Easy marks. There are easy marks to be gained in part (a) when calculating base case NPV.

Examining team's comments. The computational element of (a) was done well, but common errors occurred when calculating the working capital requirement (where many answers got the timing wrong) and when calculating the tax shield and value of the subsidy for the APV. Many candidates derived the cost of equity using geared and ungeared betas, whereas using the Modigliani and Miller formula would have been less time consuming.

Answers that gained high marks in part (b) gave a detailed discussion of the method used and explanation of the assumptions made. Weaker answers tried to answer this part in brief note form and these did not gain many marks. Many answers did not discuss the link between APV and MM.

		Marks
(a)	Sales revenue, direct costs and additional fixed costs	4
	Incremental working capital	1
	Taxation	2
	Estimation of k_e (ungeared)	2
	Net cash flows, present value and base case NPV	2
	Issue costs	1
	Calculation of tax shield impact	2
	Calculation of subsidy impact	1
	APV and conclusion	2
		17
(b)	Discussion of using APV	2–3
	Assumption about Haizum as proxy and MM proposition 2	3–4
	Other assumptions	2–3
		Max $\frac{8}{25}$

(a) Net present value

	0	1	2	3	4
	\$m	\$m	\$m	\$m	\$m
Sales (W1)		3.250	4.687	6.757	7.308
Direct costs (W2)		(1.560)	(2.359)	(3.567)	(4.045)
Specific fixed costs (W2)		<u>(1.000)</u>	<u>(1.050)</u>	<u>(1.102)</u>	<u>(1.157)</u>
Taxable cash flows		0.690	1.278	2.088	2.106
Tax (25%)		(0.173)	(0.320)	(0.522)	(0.527)
Capital allowances (W3)		0.163	0.163	0.163	0.163
Capital expenditure	(14.0)				
Sale of project					16.000
Working capital (W4)	<u>(0.488)</u>	<u>(0.215)</u>	<u>(0.311)</u>	<u>(0.082)</u>	<u>1.096</u>
Net cash flows	(14.488)	0.465	0.810	1.647	18.838
Discount factor (W5)	1.000	0.909	0.826	0.751	0.683
DCF	(14.488)	0.423	0.669	1.237	12.866

Base case NPV = \$0.707m (positive but marginal)

Workings
1 Sales

	1	2	3	4
Sales units	1,300	1,820	2,548	2,675
Selling price (3% increase p.a.)	\$2,500	\$2,575	\$2,652	\$2,732
Sales revenue	\$3.250m	\$4.687m	\$6.757m	\$7.308m

2 Costs

Tutorial note. Remember that only specific fixed costs should be included in the NPV calculation – allocated fixed costs are not relevant.

	1	2	3	4
Sales units	1,300	1,820	2,548	2,675
Direct costs/unit (8% increase p.a.)	\$1,200	\$1,296	\$1,400	\$1,512
Total direct costs	\$1.560m	\$2.359m	\$3.567m	\$4.045m
Specific fixed costs (5% increase p.a.)	\$1m	\$1.05m	\$1.102m	\$1.157m

3 Capital allowances

Capital allowances (tax-allowable depreciation) are available on plant and machinery at a rate of 25% (straight-line basis).

Annual capital allowance will be 25% of \$3 – 0.4m = \$0.65m

Tax benefit = \$0.65m × 25% = \$0.163m p.a.

Tutorial note. You could also have assumed that capital allowances were \$0.75m in the first 3 years and \$0.35m in the final year. You would gain full credit for this.

4 Working capital

Tutorial note. It is only the **extra** working capital required each year that should be included in the NPV calculation. Don't be tempted to include the full 15% of each year's sales revenue as the annual working capital requirement. You should only include the difference between this year's working capital requirement and that required for next year.

Working capital requirement

	1	2	3	4
Total sales revenue	\$3.250m	\$4.687m	\$6.757m	\$7.308m
Total working capital required for the year (15% of sales revenue)	\$0.488m	\$0.703m	\$1.014m	\$1.096m
Incremental working capital	\$0.488m	\$0.215m	\$0.311m	\$0.082m
Year in which accounted for	0	1	2	3

5 Discount factor

We assume that the ungeared cost of equity will be used to discount the project as this represents the business risk associated with this new venture.

$$k_e^i = k_e^i + (1-T)(k_e^i - k_d^i) \frac{V_d}{V_e}$$

$$V_d = \$40m \times 0.9488 = \$37.952m \quad (\text{where } 0.9488 \text{ represents the fraction of the par value at which the debt is trading})$$

$$V_e = 15 \text{m shares} \times \$2.53 = \$37.95m$$

We are not told the ratio of V_d to V_e therefore we will assume that it is 1.

$$14 = k_e^i + 0.72 \times (k_e^i - 4.5) \times 1$$

$$14 = 1.72 \quad k_e^i - 3.24$$

$$k_e^i = 10.02\% \text{ (say 10\%)}$$

Tutorial note. You could also have estimated the discount rate by calculating the asset beta and then using that to calculate the cost of equity.

Financing side effects

Issue costs (4%) are on the gross (ie total) finance required which is the time 0 project cash flow of \$14.488m divided by 96% (1 minus 4% issue costs) = \$15.092m.

The subsidy benefit of 2% is available on 80% of the project finance (\$14.488m) and needs to be multiplied by 1 minus the tax rate to capture the after tax effect.

	\$m
Issue costs (4% × \$15.092m)	(0.604)
Tax shield on debt (W6)	0.764
Subsidy benefit (\$14.488m × 80% × 0.02 × 75% × 3.588)	<u>0.624</u>
Net benefits of financing side effects	0.784
Add base case NPV	<u>0.707</u>
Adjusted NPV	<u>1.491</u>

When the side effects of financing are taken into consideration the project looks more attractive. The NPV is less marginal and the project is likely to be accepted.

Tutorial note. You might have included the issue costs in the funds borrowed. This would still give you the full credit of marks.

6 Tax shield

Fubuki Co can borrow at 300 basis points above the 5-year government debt yield rate of 4.5% – that is, 7.5%.

The Government has offered Fubuki a subsidised loan of up to 80% of the funds required (\$14.488m) at a rate of 200 basis points below Fubuki's borrowing rate of 7.5% (that is, 5.5%).

Annual tax relief

	\$m
Subsidised loan (\$14.488m × 80% × 5.5% × 25%)	0.159
Remainder of loan (\$14.488m × 20% × 7.5% × 25%)	<u>0.054</u>
Total	0.213
Discounted at 4.5% debt yield rate for 4 years – annuity factor of	3.588
Present value of tax shield	<u>0.764</u>

Tutorial note. Instead of using 4.5% to discount the tax relief, you could have used 7.5% as this is Fubuki's normal borrowing rate and reflects its normal risk.

(b) Appropriateness of the evaluation method

APV can be used when the impact of debt financing is considerable. As can be seen from the calculations above, the side effects of debt financing are significant and are shown separately rather than being integrated into the cost of capital. Base case NPV is marginal but when the financing side effects are taken into consideration the project becomes much more acceptable (NPV is increased by more than 100% even after issue costs have been deducted).

Assumptions

Some of the assumptions made in (a) above are quite general.

- (i) Cash flows occur at the end of the year (unless otherwise specified).
- (ii) The feasibility study is treated as a sunk cost.
- (iii) We have assumed that the five-year debt yield is equivalent to the risk-free rate.
- (iv) Annual reinvestment needed on plant and machinery is equal to the tax-allowable depreciation.

However, other assumptions were made that warrant further discussion.

- (i) Initial working capital represents part of the funds borrowed but subsequent increments will be financed by the project itself. The company may not have the necessary funds at the start of the project to finance the working capital. Therefore it is reasonable to include the required amount in the initial borrowings. However, the company should assess whether it is reasonable to expect the project to fund the incremental requirements, as these represent quite large amounts.
- (ii) Haizum Co's ungeared cost of equity is used as it is assumed to represent the business risk attributable to the new venture and is calculated on the assumption that Modigliani and Miller's Proposition 2 holds.
- (iii) This assumes that the ungeared cost of equity does not include financial distress costs which may or may not be reasonable. It is difficult to determine an accurate ungeared cost of equity in practice and the figure used is based on a company in a similar, but not identical, line of business to the new venture. However it is likely that such approximations of the cost of capital are acceptable given that the discount rate tends to be the least sensitive factor in investment appraisal.

24 Preparation question: Saturn Systems

Workbook references. Ethics are covered in Chapter 1. Regulations relating to takeovers are covered in Chapter 9.

Top tips. This is a relatively straightforward question if you can identify the issues involved.

Requirement (b) is divided neatly into three types of issues so deal with each type under a separate heading to make it easy for the marker to identify your points.

The solution given relates to the UK City Code but you can refer to your own country's codes instead and still gain the available marks.

Make sure you relate your answer to the specific scenario and do not just write everything you know about takeover and acquisition regulations.

Easy marks. Part (a) is a fairly straightforward discussion. Also it should have been easy to identify that the financial risk of Saturn could change if more debt was introduced into the capital structure to fund the acquisition of Pluto.

Examining team's comments. Under most jurisdictions, what was said could be taken as notice of intention to bid, whereas the company had neither estimated the value nor undertaken a due diligence study of the potential target. The many good answers to this question recognised the significance of the CEO's remarks and the weak position of the company in terms of both its state of preparation for an announcement and the regulatory implications of the remarks. A small minority of candidates did not recognise that there was a problem with the CEO's comments and spent considerable space discussing ways in which the bid might be defended.

Overall many candidates performed well on this question, providing well-written and well-argued answers. More attention to the wider implications, and particularly those relating to the ethical issues concerning the transparency and availability of price-sensitive information, would have earned more marks.

		Marks
(a)	Per explained point	1-2
		Max 5
(b)	Identification of the problems created by Mr Moon's remarks	3
	Significance of the price reaction	3
	The firm's current position and identification of the holding option on the PR	4
	Ethical problems of insider information, fairness to stakeholders, avoidance of dissembling	5
		<u>15</u>
(c)	Issue of immediate press release	2
	Draft of statement reserving the company's position under the six-month rule	3
		<u>5</u>
		<u><u>25</u></u>

(a) Advantages of growth by acquisition

Acquiring an **existing company** is a speedier method of entering a new business than setting up a project using internal resources, because an acquired business will already have **customers** and, hopefully, **goodwill**. An acquisition may also effectively **eliminate a competitor** and may **allow higher profitability**. Other advantages may come from the **combination of complementary resources** of the acquiring and acquired companies.

Also, because Pluto is a **major supplier** of Saturn, the acquisition will help to secure Saturn's supply chain and could help reduce costs, which can be important in a competitive industry such as telecommunications. The acquisition could also mean that competitors are forced to seek alternative and perhaps lower quality suppliers.

Problems of growth by acquisition

Frequently, a **significant premium** must be **paid** in order to **encourage existing shareholders** to sell, or to outbid, a rival. This may make it difficult to show a **respectable return** on the cost of the acquisition.

The acquired company may **not produce the exact product or service** that the acquirer needs, or may need **significant investment** before it conforms to quality requirements.

Management problems are also quite common, particularly when the acquiring and acquired companies have different organisational cultures. **Disputes** may cause the loss of key staff members, resulting in reduced quality or even in the establishment of competing businesses.

(b) There are several **regulatory, financial and ethical issues** that must be considered if Saturn Systems wants to make a bid for Pluto Ltd.

Regulatory issues

As a large listed company we have an obligation to ensure that any remarks made in the public domain will not mislead investors. The **City Code** in the UK requires the maintenance of **absolute secrecy** prior to an announcement being made. This requirement falls on the person or persons who hold **confidential information** (particularly information that might affect share price) and every effort should be made to prevent **accidental disclosure** of such information.

The City Code specifically states that a **false market must not be created** in the shares of the 'target' company. The remarks made last night no doubt contributed to the 15% rise in Pluto's share price. In accordance with the City Code, Saturn Systems will be expected to make a **statement of intention** in the light of the effect of the remarks at the dinner.

If it is stated that Saturn Systems are not interested in making a bid, it will not be able to make another bid **for six months**, unless Pluto's board **recommends** a bid that might be made by Saturn Systems. Another way in which this restriction could be waived is if another offer is made by a **third party**.

Financial issues

Saturn Systems are in a strong **financial position** at the moment which may be one of the reasons the market interpreted the remarks as being significant. The 15% increase in Pluto's share price indicates that the market now sees Pluto as being a **target for takeover** and that Saturn may be interested in buying the company.

One problem is that Saturn Systems is only in the early stages of investigating Pluto and has not yet conducted a **due diligence** study. It does not know what the company is worth as a valuation has not yet taken place. As the remarks apparently contributed to a 15% increase in share price, Saturn Systems will now have to pay more for Pluto if it decides to make a bid. This could affect the financial position as it may be unable to raise the extra finance required to cover the additional cost.

As well as the issues above, there is the likelihood of the extra debt affecting the **financial risk profile**. The acquisition of Pluto could also affect the **business risk exposure**. As a result, Saturn Systems cannot value Pluto without revaluing the existing business. If Pluto's value exceeds the increase in Saturn's value if the acquisition took place, it should not proceed with the purchase.

Ethical issues

There is now a dilemma of how to proceed. Saturn Systems has made no secret of the fact that it wants to growth by acquisition rather than organically therefore it would not be ethical to deny any interest in Pluto. It was one of four potential targets discussed at the last board meeting and investigations have been conducted into the company as well as reviewing the steps necessary to raise the finance for acquisition. In order to maintain its commitment to transparency of information, it is recommended that Saturn Systems clarifies its intentions.

(c) Proposed course of action

Saturn Systems should release a statement to **clarify the position** regarding Pluto. It should confirm that it is looking into the possibility of an acquisition of Pluto but make it clear that the board has decided not to make a bid at this time. However, it should be made clear that Saturn Systems **reserves the right** to make a bid or take any action that would otherwise be prohibited under the **six-month rule** should Pluto's board agree to an acquisition or if any other company announced its intention to make an offer. This means Saturn Systems still has the chance to complete its investigations and develop a bid proposal before entering into negotiations with Pluto's board.

25 Selorne

Workbook references. Acquisitions are covered in Chapters 8-10 of the workbook.

Examining team's comments. In part (a) (i), common mistakes in the weaker attempts included getting the number of shares wrong for Selorne Co, mixing up free cash flow to equity with equity value and adding the two together, and miscalculating the additional value created.

Part (a) (ii) the majority of candidates answered this question part quite poorly probably because there were no standard valuation models to apply.

Part (b) candidates who described the various types of synergies available and how they could be achieved, received limited or no marks as they did not answer the question asked. Answers which scored high marks made good use of the scenario in the question and provided suggestions to explain why the synergy estimates might not be reliable.

In part (c), candidates received no marks when they compared the choice between a cash payment and a share-for-share exchange for the bid, as it is irrelevant to the question requirement. Secondly, it is disappointing to read in some answers which described that a rights issue would dilute the existing shareholders' control. Dilution of control would only happen if the said shareholders do not subscribe to their rights shares.

Marking scheme

		Marks
(a)	(i) Valuation of Selorne Co	1
	Valuation of Chawon Co	2
	Valuation of Salorne Co's FCFE	1
	Valuation of combined company	1
	Additional value created	<u>1</u>
		6
	(ii) Value per share combined company	1
	Value of Chawon's shareholding in combined company	1
	Share of gain created for Chawon	1
	Share of gain for Selorne's shareholders	1
	Comments	<u>2</u>
		6
(b)	Up to 2 marks per relevant point discussed, discussion must relate to Selorne to obtain 2 marks for a point	
	Reliability of estimates	
	Problems with achieving synergies	3-4
	Nature of private equity finance and its advantages and disadvantages	<u>3-4</u>
		Max <u>7</u>
		Max <u>6</u>
		<u>25</u>
(c)	Up to 2 marks per relevant factor discussed	

(a) (i) Selorne Co current equity value = $50\text{m shares} \times \$6.50 = \$325\text{m}$
 Chawon Co current equity value = $\$7 \text{ million} \times 1.03 / (0.15 - 0.03) = \60.1m
 Selorne Co free cash flow to equity = $\$325\text{m} / 8 = \40.6m
 Combined company valuation = $(\$40.6\text{m} + \$7\text{m} + \$5\text{m}) \times 8 = \420.8m
 Additional value created = $\$420.8\text{m} - \$325\text{m} - \$60.1\text{m} = \35.7m

(ii) Chris Chawon will hold $2\text{m} \times 5 = 10\text{m}$ shares in combined company
 Value per share in combined company = $\$420.8\text{m} / (50\text{m} + 10\text{m}) = \7.01
 Value of Chris Chawon's shareholding = $10\text{m} \times \$7.01 = \70.1m
 Gain created for Chris Chawon = $\$70.1\text{m} - \$60.1\text{m} = \$10\text{m}$
 Gain created for Selorne Co shareholders = $\$35.7\text{m} - \$10\text{m} = \$25.7\text{m}$
 Chris Chawon will have a 16.7% ($10\text{m} / (50\text{m} + 10\text{m})$) shareholding in the combined company but 28.0% ($\$10\text{m} / \35.7m) of the gain on the combination will be attributable to him. Shareholders who are doubtful about the merger may question whether this is excessive, as possibly Chawon Co's desire to sell is being prompted by the company struggling to remain solvent.

(b) **Reliability of synergy estimates**

The reliability of the estimates may vary depending on the synergies involved. The synergies relating to size and services offered will depend on the ability to gain large contracts and neither company has had recent success in doing this. However, the contracts recently bid for by Chawon Co might have been won if the larger combined company had bid. The synergies relating to operations and working practices may be difficult to obtain if it is difficult to change the employment conditions of Selorne Co drivers. Claims that improved driver utilisation may reduce spare capacity may be true, but there is likely to be less spare capacity anyway if more contracts are won.

Other synergies may be easier to obtain. Duplication of premises in some locations should be eliminated easily, providing Chawon Co does not have onerous rental contracts and there is space on Selorne Co's sites. Combining central administrative functions should reduce some staffing costs, although these are likely to be smaller synergies than the potential operational synergies.

Problems with achieving synergies

A significant problem may be lack of unity at the top of the company. Selorne Co's directors are not all keen on the acquisition and this may spill over into being unable to agree on a clear post-acquisition plan. If lack of unity at board level becomes apparent to staff, it may be difficult to achieve unity at employee level.

Chris Chawon's role in the combined company may also make synergies difficult to achieve. He will have a significant shareholding and a place on the board, so it will be difficult for him not to be involved. Possibly he has the abilities and desire to achieve changes in operational practices which other board members lack. However, if Chris is given the leading role he requires, there may be a change in management style which may upset long-serving Selorne Co staff. Some may leave, jeopardising the continuity which seems to have been an important part of Selorne Co's success.

Another reason for possible problems with staff is the differing remuneration arrangements. Selorne Co's staff may have stayed with the company because both their job prospects and their remuneration have been safe. Attempts to change their employment conditions may lead to resistance and employee departures. Ex-Chawon Co employees who have been with the company for a while may expect salaries to be increased to be more in line with Selorne Co's employees, particularly if bonus arrangements become less generous.

The success of the acquisition may also depend on how well the staff of the two businesses integrate. Integration may be difficult to achieve. Many of Chawon Co's staff will not have the necessary licence to drive the Selorne Co lorries and may not wish to go through the process of obtaining this licence. Selorne Co drivers may be reluctant to drive the smaller vehicles. Staff sticking to what they have been used to driving is likely to prolong a 'them and us' culture.

(c) **Availability**

Although the finance director has identified possible sources of finance, there is no guarantee that they will necessarily be available. The success of a rights issue may well depend on the willingness and ability of the director-shareholders to subscribe. It may be difficult to find others willing to take up the directors' rights if they do not subscribe, as the directors' unwillingness may be seen as indicating a lack of confidence in the business. A rights issue may also take longer to arrange than other methods, which may be significant if Selorne Co needs the finance quickly to complete the acquisition.

Obtaining a bank loan or mezzanine finance may be difficult if Selorne Co takes on Chawon Co's debt and is viewed as too highly geared as a result. The success of a convertible debt issue may depend on the terms, also how possible subscribers view the future prospects of Selorne Co and the marketability of the shares.

Cost

Cost will be another significant factor. The cost of equity will normally be viewed as higher anyway than the cost of debt. Issue costs of equity are likely to be higher than those of debt. As Selorne Co's share price is stable, its current external shareholders appear content with the dividends paid, so there does not appear to be pressure to increase them. In any case, the board is not required to pay dividends every year.

Fixed interest cost on the bank loan may become a burden if interest rates fall, but the cost can be forecast with certainty. Because the mezzanine finance is unsecured, it is likely to have a higher interest cost than the bank loan. The rights of conversion to shares attaching to the convertible debt will mean a lower rate can be set for this, but the cost will depend on how appealing the possibility of conversion is. Again, the finance cost of debt will depend on the finance providers' attitude towards the increased debt burden resulting from the acquisition of Chawon Co.

Director preferences

The choice will also be determined by Selorne Co's board's attitude to gearing as well as how the possible finance providers view the company's gearing level. The board may feel that Selorne Co has reached, or exceeded, the gearing level which it would regard as desirable by taking on Chawon Co's debt. If this is the case, the board would have to use equity finance. The board may also be influenced by how gearing is likely to change over time. Over the next few years gearing may fall as Selorne Co makes profits and (hopefully) its share price increases. Chawon Co's debt may be repaid and not replaced. The convertible debt and mezzanine finance will also not be long-term sources of debt finance.

Control of Selorne Co

Selorne Co's board decision may also be determined by the implications of the different sources of finance for control of the company. The directors' control of the company will not be diminished if a rights issue is used and they take up their rights. An issue of shares arising from the convertible debt would change the balance of shareholdings, so the directors would have to decide how significant this would be. Mezzanine finance may also offer conversion rights, but possibly these could only be exercised if Selorne Co defaulted, which the board may view as unlikely.

Using a bank loan will have no impact on share capital, but the bank may impose restrictions which the directors are unwilling to bear, particularly if high gearing is an issue. These conditions could include restrictions on the sale of assets, limitations of dividends, or requiring accounting figures, for example, liquidity or solvency ratios, not to go beyond certain levels.

Mix of finance

Ultimately the board may also consider the possibility of a mix of finance. The offer could be backed by a core of equity finance from a rights issue, but if Selorne Co has to pay a higher price than expected, the difference could be made up by mezzanine finance.

Note. Credit will be given for alternative, relevant answers.

26 Chithurst

Workbook references. Valuing a firm using the dividend valuation model is covered in Chapter 8. Dividend policy is covered in Chapters 1 and 16.

Top tips. In part (a), the key is to spend time analysing the actual policies being followed, not in righting generalised answers on the relevance or irrelevance of dividend policies in general. A similar question was set in June 2013.

Easy marks. Part (b), should have been easier because of the clear instructions as to the nature of the analysis that was required, however in the exam many students did not read the question properly and did not provide valuations based on 2 growth assumptions as specified by the question.

Marking scheme

		Marks
(a)	Benefits of dividend policy – 1–2 marks for each company	Max 5
	Drawbacks of dividend policy – 2–3 marks for each company	Max 7
	Calculations – Dividend payout ratios – 1 mark per company	3
	Other calculations	<u>2</u>
		Max <u>15</u>
(b)	Comments on valuation of each company, max 4 marks per company (max 5 marks for valuation calculation(s))	Max <u>10</u> <u>25</u>

(a) Dividend payout ratio

	<i>Chithurst Co</i>	<i>Eartham Co</i>	<i>Iping Co</i>
	%	%	%
20X2	42.9	40.0	46.7
20X3	41.3	(150.0)	19.3
20X4	35.1	40.0	33.1
20X5	34.0	40.0	31.8

Residual profit (after-tax profit for the year – dividend – new investment)

	<i>Chithurst Co</i>	<i>Eartham Co</i>	<i>Iping Co</i>
	\$m	\$m	\$m
20X2	26	27	3
20X3	18	(40)	7
20X4	38	24	4
20X5	43	43	6

Chithurst Co's policy

Benefits

Chithurst Co's policy provides shareholders with a stable, predictable income each year. As profits have grown consistently, dividend cover has increased, which suggests that, for now, dividend levels are sustainable. These are positive signals to the stock market.

Drawbacks

Chithurst Co's dividend policy is unpopular with some of its shareholders. They have indicated a preference for dividend levels to bear a greater relation to profit levels. Although they are still in a minority and cannot force the directors to pay more dividends, they are now possibly a significant minority. Ultimately, Chithurst Co's share price could fall significantly if enough shareholders sell their shares because they dislike the dividend policy.

The dividend policy may also have been established to meet the financial needs of the shareholders when Chithurst Co was unquoted. However, it is now difficult to see how it fits into Chithurst Co's overall financial strategy. The greater proportion of funds retained does not appear to be linked to the levels of investment Chithurst Co is undertaking. Chithurst Co's shareholders may be concerned that best use is not being made of the funds available. If there are profitable investments which Chithurst Co could be making but is not doing so, then Chithurst Co may find it more difficult in future to sustain the levels of profit growth. Alternatively, if profitable investments do not exist, some shareholders may prefer to have funds returned in the form of a special dividend or share repurchase.

Eartham Co

Benefits

For three out of four years, Eartham Co has been paying out dividends at a stable payout ratio. This may be attractive to some investors, who have expectations that the company's profits will keep increasing in the longer term and wish to share directly in increases in profitability.

The year when Eartham Co's dividend payout ratio differed from the others was 20X3, when Eartham Co made a loss. A dividend of \$15m was paid in 20X3, which may be a guaranteed minimum. This limits the downside risk of the dividend payout policy to shareholders, as they know they will receive this minimum amount in such a year.

Drawbacks

Although shareholders are guaranteed a minimum dividend each year, dividends have been variable. Eartham Co's shareholders may prefer dividends to increase at a steady rate which is sustainable over time, even if this rate is lower than the rate of increase in some years under the current policy.

If Eartham Co had another poor year of trading like 20X3, shareholders' expectations that they will be paid a minimum dividend may mean that cash has to be earmarked to pay the minimum dividend, rather than for other, maybe better, uses in the business.

Having a 'normal' dividend policy results in expectations about what the level of dividend will be. Over time Eartham Co's managers may be reluctant to change to a lower payout ratio because they fear that this will give shareholders an adverse signal. Even if its directors maintain a constant ratio normally, shareholders may question whether the proportion of funds being retained is appropriate or whether a higher proportion could be paid out as dividends.

Eartham Co appears to be linking investment and dividend policy by its normal policy of allocating a constant proportion of funds for dividends and therefore a constant proportion of funds to invest. However, the actual level of new investments does not seem to bear much relation to the proportion of funds put aside for investment. When deciding on investments, the directors would also take into account the need to take advantage of opportunities as they arise and the overall amount of surplus funds built up over the years, together with the other sources of external finance available.

Iping Co

Benefits

Iping Co seems to have adopted a residual dividend policy, which links investment and dividend decisions. The strategy appears to be to make investments if they offer sufficient return to increase long-term company value and only pay dividends if there are no more profitable investments. They are assuming that internal funds are cheaper than external funds, or maybe Iping Co cannot raise the funds required from external sources.

The policy is likely to appeal to shareholders who are more concerned with capital growth than short-term income.

Drawbacks

Dividend payments are totally unpredictable, as they depend on the investment choices. Shareholders cannot rely on having any dividend income in a particular year.

Many shareholders may be prepared to sacrifice dividends for a while in order for funds to be available for investment for growth. However, at some point they may consider that Iping Co is well established enough to be able to maintain a consistent dividend policy as well as invest sufficiently for future growth.

(b) **Use of dividend valuation model**

Chithurst Co

$$\text{Valuation} = 33/0.11 = \$300\text{m}$$

Chithurst Co's market capitalisation of \$608m is considerably in excess of the valuation suggested by the dividend valuation model. This may suggest that investors have some positive expectations about the company and the lower cost of equity compared with the other two companies suggests it is regarded as a more stable investment. Investors could also be valuing the company using earnings growth rather than dividend growth. However, the lower market capitalisation compared with the other two companies and the smaller increase in share price suggest that investors have higher expectations of long-term growth from Eartham Co and Iping Co.

Eartham Co

$$\text{One-year growth rate} = (48/44) - 1 = 9.1\%$$

$$\text{Valuation using one-year growth rate} = 48 (1 + 0.091)/(0.14 - 0.091) = \$1,068.7\text{m}$$

$$\text{Three-year growth rate} = \sqrt[3]{48/38} - 1 = 8.1\%$$

$$\text{Valuation using three-year growth rate} = 48 (1 + 0.081)/(0.14 - 0.081) = \$879\text{m}$$

Eartham Co's market capitalisation is closer to the valuation suggested by the dividend growth model using the one-year growth rate between 20X4 and 20X5 rather than the three-year growth rate between 20X2 and 20X5. This, together with the recent increase in share price, suggests that Eartham Co's shareholders have an optimistic view of its ability to sustain the profit growth and hence the dividend growth of the last two years, although its higher cost of equity than the other companies suggests that they are more wary about the risks of investing in Eartham Co. It indicates confidence in the directors' strategy, including the investments they have made.

Iping Co

$$\text{One-year growth rate} = (42/39) - 1 = 7.7\%$$

$$\text{Valuation using one-year growth rate} = 42 (1 + 0.077)/(0.12 - 0.077) = \$1,052.0\text{m}$$

$$\text{Three-year growth rate} = \sqrt[3]{42/35} - 1 = 6.3\%$$

$$\text{Valuation using three-year growth rate} = 42 (1 + 0.063)/(0.12 - 0.063) = \$783.3\text{m}$$

The market capitalisation of Iping Co is higher than is suggested by the dividend valuation model, but the dividend valuation model may not provide a realistic valuation because dividends payable are dependent on investment opportunities.

The larger increase in share price compared with the other two companies suggests that Iping Co's investors expect its investments to produce high long-term returns and hence are presumably satisfied with its dividend policy.

27 Louieed

Workbook references. Chapter 8 covers valuation of acquisitions, Chapter 9 covers strategic issues and, acquisitions, and Chapter 10 covers financing issues.

Top tips. In part (a) ensure you use the clues in the scenario to discuss the pros and cons of the acquisition.

Part (b) is only worth five marks, so it is important not to spend too much time here. The implied P/E ratio of the pure cash and pure paper offers is fairly straightforward.

In part (c), for 14 marks, it is very important to answer the whole question. For example, answers that only answered the first aspect of the question (on finance required) would only have scored two marks.

Easy marks. Candidates who focused on the simpler bids (pure cash and pure paper) would have been able to access most of the marks in parts (b) and (c).

Marking scheme

	Marks
(a) Reasons for acquisition	3
Reasons against acquisition	3
	<u>6</u>
(b) Calculations: 1 mark for EPS, 1 mark each for P/E ratio for original offer, and for each of the three options for the proposed offer	5
(c) Funding of bid: 1 mark for cash option, 1 mark for mixed option	2
Earnings per share: 1 mark for share-for-share option, 2 marks for cash option, 2 marks for mixed option	5
Gearing: 1 mark for each option	3
Comments	<u>4-5</u>
	<u>Max 14</u>
	<u>25</u>

(a) **Advantages of the acquisition**

Louieed Co and Tidded Co appear to be a good strategic fit for a number of reasons. Louieed Co appears to have limited potential for further growth. Acquiring Tidded Co, a company with better recent growth, should hopefully give Louieed Co the impetus to grow more quickly.

Acquiring a company which has a specialism in the area of online testing will give Louieed Co capabilities quicker than developing this function in-house. If Louieed Co does not move quickly, it risks losing contracts to its competitors.

Acquiring Tidded Co will give Louieed Co access to the abilities of some of the directors who have led Tidded Co to becoming a successful company. They will provide continuity and hopefully will help integrate Tidded Co's operations successfully into Louieed Co. They may be

able to lead the upgrading of Tidded Co's existing products or the development of new products which ensures that Louieed Co retains a competitive advantage.

It appears that Tidded Co's directors now want to either realise their investment or be part of a larger company, possibly because it will have more resources to back further product development. If Louieed Co does not pursue this opportunity, one of Louieed Co's competitors may purchase Tidded Co and acquire a competitive advantage itself.

There may also be other synergistic benefits, including savings in staff costs and other savings, when the two companies merge.

Disadvantages of the acquisition

It is not known what the costs of developing in-house capabilities will be. Although the process may be slower, the costs may be less and the process less disruptive to Louieed Co than suddenly adding on Tidded Co's operations.

It is not possible to tell which of Tidded Co's directors are primarily responsible for its success. Loss of the three directors may well represent a significant loss of its capability. This will be enhanced if the three directors join a competitor of Louieed Co or set up in competition themselves.

There is no guarantee that the directors who remain will fit into Louieed Co's culture. They are used to working in a less formal environment and may resent having Louieed Co's way of operating imposed upon them. This could result in departures after the acquisition, jeopardising the value which Tidded Co has brought.

Possibly Tidded Co's leadership in the online testing market may not last. If competitors do introduce major advances, this could mean that Tidded Co's current growth is not sustainable.

(b) P/E ratio calculations

Value of Louieed Co's share = $\$296m \times 14/340m = \12.19

Value of Tidded Co share per original bid = $\$12.19 \times (5/3) = \20.32

Tidded Co earnings per share = $\$128m/90 = \1.42

Tidded Co P/E ratio implied by original bid = $\$20.32/\$1.42 = 14.3$

Tidded Co P/E ratio implied by all Tidded Co's shareholders taking up the share offer = $\$12.19 \times 2/\$1.42 = 17.2$

Tidded Co P/E ratio implied by mixed cash and share offer = $(\$22.75 \times 0.4 + \$12.19 \times 2 \times 0.6)/\$1.42 = 16.7$

Tidded Co P/E ratio implied by all Tidded Co's shareholders taking up the cash offer = $\$22.75/\$1.42 = 16.0$

(c) Funding of bid

No extra finance will be required if all Tidded Co's shareholders take up the share offer.

All Tidded Co's shareholders take up cash offer

Cash required = $90m \times \$22.75 = \$2,048m$

Extra debt finance required = $\$2,048m - \$220m - \$64m = \$1,764m$

60% share-for-share offer, 40% cash offer

Cash required = $40\% \times 90m \times \$22.75 = \$819m$

Extra debt finance required = $\$819m - \$220m - \$64m = \$535m$

Impact of bid on earnings per share (EPS)

Louieed Co's EPS prior to acquisition = $\$296m/340 = \0.87

All Tidded Co's shareholders take up share offer

Number of shares after acquisition = $340m + (90m \times 2) = 520m$

EPS after acquisition = $(\$296m + \$128m + \$20m)/520m = \0.85

All Tidded Co's shareholders take up cash offer

Number of shares after acquisition = $340m$

EPS after acquisition = $(\$296m + \$128m + \$20m - \$11.36m - \$105.84m)/340m = \0.96

$\$105.84m$ is the post-tax finance cost on the additional loan finding required of $\$1,764m$. Therefore $\$1,764m \times 7.5\% \times 80\% = \$105.84m$.

$\$11.36m$ is the post-tax opportunity cost of lost interest on the cash and cash equivalents surpluses of the two companies of $\$220m + \$64m = \$284m$. Therefore $\$284m \times 5\% \times 80\% = \$11.36m$.

60% share-for-share offer, 40% cash offer

Number of shares after acquisition $340m + (90m \times 2 \times 0.6) = 448m$

EPS after acquisition = $(\$296m + \$128m + \$20m - \$11.36m - \$32.1m)/448m = \0.89

$\$32.1m$ is the post-tax finance cost on the additional loan funding required of $\$535m$. Therefore $\$535m \times 7.5\% \times 80\% = \$32.1m$.

Impact of bid on gearing (using market values)

Louieed Co's gearing (debt/(debt + equity)) prior to bid = $540/(540 + (340 \times 12.19)) = 11.5\%$

All Tidded Co's shareholders take up share offer

Debt/(Debt + equity) after bid = $(540 + 193)/(540 + 193 + (520 \times \$0.85 \times 14)) = 10.6\%$

All Tidded Co's shareholders take up cash offer

Debt/(Debt + equity) after anticipated bid = $(540 + 193 + 1,764)/(540 + 193 + 1,764 + (340 \times \$0.96 \times 14)) = 35.3\%$

60% share-for-share offer, 40% cash offer

Debt/(Debt + equity) after bid = $(540 + 193 + 535)/(540 + 193 + 535 + (448 \times \$0.89 \times 14)) = 18.5\%$

Comments

The calculations suggest that if Tidded Co's shares are acquired on a share-for-share exchange on the terms required by its shareholders, Louieed Co's shareholders will suffer a fall in EPS attributable to them from $\$0.87$ to $\$0.85$. This is because Tidded Co is being bought on a higher P/E ratio than Louieed Co and the synergies arising from the acquisition are insufficient to compensate for this.

Use of loan finance to back a cash offer will attract tax relief on interest. The cost of debt will be lower than the cost of equity.

Issuing extra shares will lead to a dilution of the power of Louieed Co's existing shareholders. If all of Tidded Co's shareholders take up the share-for-share offer, they will hold around one-third of the shares of the combined company ($180m/520m$) and this may be unacceptable to Louieed Co's shareholders.

The benefits which Tidded Co's shareholders will gain will be fixed if they take up a cash offer and do not acquire shares in the combined company. If there are significant gains after the acquisition, these will mostly accrue to Louieed Co's existing shareholders if a significant proportion of Tidded Co's shareholders have taken a cash offer.

If the forecast for take-up of the offer is correct, even by combining the cash flows of the two companies, the new company will have insufficient funds to be able to pay all the shareholders who are expected to take up the cash offer. Further finance will be required.

The alternative to loan finance is financing the bid by issuing shares. Depending on the method used, this may also result in dilution of existing shareholders' ownership and also there is no guarantee that the issue will be successful.

There is also no guarantee that the forecast of 40% of the shareholders taking up the cash offer is correct. If all five of the major shareholders decide to realise their investment rather than just two, this will increase the cash required by \$512 million ($25\% \times \$22.75 \times 90m$), for example.

Gearing will increase if loan finance is needed to finance the cash offer. If the mixed share and cash offer is taken up in the proportions stated, the gearing level of the combined company will increase from 11.5% to 18.5%. Current shareholders may not be particularly concerned about this. However, if all or most of the share capital is bought for cash, the gearing level of the combined company will be significantly greater, at a maximum of 35.3%, than Louieed Co's current gearing. This may be unacceptable to current shareholders and could mean an increase in the cost of equity, because of the increased risk, and also possibly an increase in the cost of debt, assuming in any case that debt finance at the maximum level required will be available. To guard against this risk, Louieed Co's board may want to limit the cash offer to a certain percentage of share value.

28 Makonis

Workbook references. Acquisitions are covered in Chapters 8 and 10.

Top tips. For part (a) make sure that you both state **and** discuss your assumptions; often candidates only stated their assumptions but did not discuss them.

Examining team's comments. In part (a) common errors included not converting the asset beta into the equity beta; deducting tax from the free cash flows; growing cash flows from the wrong year; and not recognising that the debt value has to be deducted from the value of the company to find the value attributable to equity holders.

Part (b) was not done well by many candidates. Few candidates could estimate the reduction in value to the equity holders of the acquiring company when the premium paid was increased. A sizeable number of candidates who chose this question left part (b) unanswered.

Part (c) was answered reasonably well by many candidates but again weaker answers tended to state, rather than discuss, the possible financing methods. A number of candidates suggested using Islamic finance to finance the acquisition but, unless a specific asset or asset group can be identified to match with this form of finance, it is difficult to see how this can be an appropriate source of finance. The finance source(s) should be appropriate to what it is needed for. Therefore, again, contextualisation to the scenario is important.

	Marks
(a) Market values of Makonis Co and Nuvola Co	1
Combined company asset beta	1
Combined company equity beta	1
Combined company: cost of capital	1
Combined company value: Years 1 to 4	3
Combined company value: Years 5 to perpetuity	1
Combined company value: value to equity holders and additional value	2
Comment and discussion of assumptions	<u>3-4</u>
	Max 13
(b) Impact on Makonis Co's equity holders if the premium paid to Nuvola Co's equity holders is 30%	2
Impact on Makonis Co's equity holders if the premium paid to Nuvola Co's equity holders is 50%	2
Impact	<u>1</u>
	5
(c) Impact on the cash payable under each of 30% and 50% premiums	3
Discussion of how Makonis Co would pay the high premium	<u>4-5</u>
	Max <u>7</u> <u>25</u>

(a) **Combined company, cost of capital**

Asset beta

$$(1.2 \times 480 + 0.9 \times 1,218)/(480 + 1,218) = 0.985$$

Equity beta

$$0.985 \times (60 + 40 \times 0.8)/60 = 1.51$$

Cost of equity

$$2\% + 1.51 \times 7\% = 12.57\%$$

Cost of capital

$$12.57\% \times 0.6 + 4.55\% \times 0.8 \times 0.4 = 9.00\%$$

Combined company equity value

Year

	1 \$m	2 \$m	3 \$m	4 \$m
Free cash flows before synergy (growing at 5%)	226.80	238.14	250.05	262.55
Synergies	20.00	20.00	20.00	20.00
Free cash flows	<u>246.80</u>	<u>258.14</u>	<u>270.05</u>	<u>282.55</u>
PV of free cash flows at 9%	226.42	217.27	208.53	200.17

(**Note.** The present value (PV) figures are slightly different if discount table factors are used, instead of formulae. Full credit will be given if discount tables are used to calculate PV figures.)

Total PV of cash flows (Years 1 to 4) = \$852.39 million

Total PV of cash flows (Years 5 to perpetuity) = $262.55 \times 1.0225 / (0.09 - 0.0225) \times (1.09 \text{ to the power of } - 4)$ = \$2,817.51 million

Total value to firm = \$3,669.90 million

Value attributable to equity holders = \$3,669.90 million $\times 0.6$ = \$2,201.94 million

Additional value created from the combined company = \$2,201.94 million - (\$1,218 million + \$480 million) = \$2,201.94 million - \$1,698.00 million = \$503.94 million (or 29.7%)

Although the equity beta and therefore the risk of the combined company is more than Makonis Co on its own, probably due to Nuvola Co's higher business risk (reflected by the higher asset beta), overall the benefits from growth in excess of the risk-free rate and additional synergies have led to an increase in the value of the combined company of just under 30% when compared to the individual companies' values.

However, a number of assumptions have been made in obtaining the valuation, for example:

- The assumption of growth of cash flows in perpetuity and whether this is realistic or not
- Whether the calculation of the combined company's asset beta when based on the weighted average of market values is based on good evidence or not
- It has been assumed that the figures such as growth rates, tax rates, free cash flows, risk-free rate of return and risk premium are accurate and do not change in the future

In all these circumstances, it may be appropriate to undertake sensitivity analysis to determine how changes in the variables would impact on the value of the combined company, and whether the large increase in value is justified.

(b) If 30% premium is paid to Nuvola Co's equity holders, they will receive = $30\% \times \$480 \text{ million} = \144 million of the additional value created.

Makonis Co's equity holders will receive about \$359.94 million or \$1.71 per share of the additional value created, which is 29.5% of the current share price.

If 50% premium is paid to Nuvola Co's equity holders, they will receive = $50\% \times \$480 \text{ million} = \240 million of the additional value created.

Makonis Co's equity holders will receive about \$263.94 million or \$1.26 per share of the additional value created, which is 21.7% of the current share price.

Hence, Makonis Co's equity holders will receive almost 8% less return if a premium of 50% were paid.

(c) One Makonis Co share for two Nuvola Co shares implies a premium of \$0.50 ($[\$5.80 - \$4.80]/2$) per Nuvola Co share.

If a 30% premium is offered to Nuvola Co's equity holders, then they will expect \$144 million premium or \$0.72 per share, and therefore the cash paid will be \$0.22 for each Nuvola Co share or \$44 million in total.

If a 50% premium is offered to Nuvola Co's equity holders, then they will expect \$240 million premium or \$1.20 per share, and therefore the cash paid will be \$0.70 per Nuvola Co share or \$140 million in total.

The amount of cash required will increase substantially, by about \$96 million, if Makonis Co agrees to the demands made by Nuvola Co's equity holders and pays the 50% premium. Makonis Co needs to determine how it is going to acquire the additional funds and the implications from this. For example, it could borrow the money required for the additional funds, but taking on more debt may affect the cost of capital and therefore the value of the company. It could raise the funds by issuing more equity shares, but this may not be viewed in a positive light by the current equity holders.

Makonis Co may decide to offer a higher proportion of its shares in the share-for-share exchange instead of paying cash for the additional premium. However, this will affect its

equity holders and dilute their equity holding further. Even the current proposal to issue 100 million new shares will mean that Nuvola Co's equity holders will own just under one-third of the combined company and Makonis Co's shareholders would own just over two-thirds of the combined company.

Makonis Co should also consider what Nuvola Co's equity holders would prefer. They may prefer less cash and more equity due to their personal tax circumstances but, in most cases, cash is preferred by the target firm's equity holders.

29 Vogel

Workbook references. Acquisitions are covered in Chapters 8 and 10.

Top tips. Part (a) of this question is straightforward and this tempted a lot of candidates to choose this question. However, part (a) is only worth four marks. Be careful to read all parts of a question before choosing it; parts (b) and (c) of this question were not easy!

Easy marks. You should be able to pick up some relatively straightforward marks in part (a) by outlining the motives for an acquisition strategy.

Examining team's comments. This was a popular question with the first part of the question answered well by the majority of the candidates, but parts (b) and (c) were answered less well. It seems that many candidates chose this question because they liked the first part of the question, without considering the subsequent parts.

In part (c) there was little coherent presentation and structure to the answer, with many numbers and calculations presented in a haphazard manner. This approach did not gain many marks as it was not clear where the answer was heading and gave little confidence that the candidate knew what they were doing.

Marking scheme

	Marks
(a) 1–2 marks per point	Max <u>4</u>
(b) 2–3 marks per point	Max <u>7</u>
(c) Cash gained from sales of Department C assets	1
Calculation of free cash flows for Ndege Co	2
Calculation of present values of Ndege Co cash flows and value	2
Vogel Co P/E ratios before and after acquisition	2
Tori Co P/E ratio and value	1
Value created from combining Department A with Vogel Co	1
Maximum premium payable	1
Approach taken	1–2
Assumptions made	2–3
	Max <u>14</u>
	<u><u>25</u></u>

(a) Vogel Co may have switched from a strategy of organic growth to one of growth by acquisition, if it was of the opinion that such a change would result in increasing the value for the shareholders.

Acquiring a company to gain access to new products, markets, technologies and expertise will almost certainly be quicker and may be less costly than developing these internally. Horizontal acquisitions may help Vogel Co eliminate key competitors and thereby reduce rivalry and possible overcapacity in its industry; they may also have enabled Vogel Co to take advantage of economies of scale and to compete against large rivals. Vertical acquisitions may help Vogel Co to secure the supply chain and maximise returns from its value chain.

Organic growth may take a long time, can be expensive and may result in little competitive advantage being established due to the time taken. Also organic growth, especially into a new area, would need managers to gain knowledge and expertise of an area or function, which they are not currently familiar with. Furthermore, in a saturated market, there may be little opportunity for organic growth.

(Note. Credit will be given for alternative relevant comments.)

(b) Vogel Co can take the following actions to reduce the risk that the acquisition of Tori Co fails to increase shareholder value.

Since Vogel Co has a poor track record of adding value from its acquisitions it needs to review recent acquisitions to understand why they have not added value ie it should do a post-audit of these acquisitions.

Vogel Co should also ensure that the valuation is based on reasonable input figures and that proper due diligence of the perceived benefits is undertaken prior to the offer being made. Often it is difficult to get an accurate picture of the target when looking at it from the outside. Vogel Co needs to ensure that it has sufficient data and information to enable a thorough and sufficient analysis to be undertaken.

The sources of synergy need to be properly assessed to ensure that they are achievable and to identify what actions Vogel Co needs to undertake to ensure their achievement. Targets should be set for all areas of synergy and responsibility for achieving these targets should be clearly allocated to members of Vogel's senior management team.

The board of directors of Vogel Co needs to ensure that there are good reasons to undertake the acquisition, and that the acquisition should result in an increase in value for the shareholders. The non-executive directors should play a crucial role in ensuring that acquisitions are made to enhance the value for the shareholders. Procedures need to be established to ensure that the acquisition is not overpaid. Vogel Co should determine the maximum premium it is willing to pay and not go beyond that figure. Research indicates that often too much is paid to acquire a company and the resultant synergy benefits are not sufficient to cover the premium paid. Often this is the result of the management of the acquiring company wanting to complete the deal at any cost, because not completing the deal may be perceived as damaging to both their own, and their company's, reputation. Vogel Co needs to ensure that it has proper procedures in place to integrate the staff and systems of the target company effectively, and also to recognise that such integration takes time. Vogel Co may decide instead to give the target company a large degree of autonomy and thus make integration less necessary; however, this may result in a reduction in synergy benefits.

Vogel Co should also have strategies in place to retain key staff in the companies that it is acquiring – these people need to be identified at an early stage and given assurances over their role and responsibilities post-acquisition. Vogel Co should also be mindful that its own and the acquired company's staff and management need to integrate and ensure a good working relationship between them.

(Note. Credit will be given for alternative relevant comments.)

(c) **Approach taken**

The maximum premium payable is equal to the maximum additional benefit created from the acquisition of Tori Co, with no increase in value for the shareholders of Vogel Co. It should be noted that the shareholders of Vogel Co would probably not approve of the acquisition if they do not gain from it, but certainly they would not approve a bid in excess of this.

The additional benefit can be estimated as the sum of the cash gained (or lost) from selling the assets of Department C, spinning off Department B and integrating Department A, less the sum of the values of Vogel Co and Tori Co as separate companies.

Estimation of cash gained from selling the assets of Department C:

Non-current assets = $(20\% \times \$98.2m)$	= \$19.64m
Current assets = $(20\% \times \$46.5m \times 0.9)$	= \$8.37m
Liabilities and closure costs = $(\$20.2 + \$3m)$	= \$23.2m
Total \$19.64m + \$8.37m - \$23.2m	= <u>\$4.81m</u>

Value created from spinning off Department B into Ndege Co

Free cash flow of Ndege Co	\$m
Current share of PBDIT $(0.4 \times \$37.4m)$	14.96
Less PBIT attributable to Department C $(10\% \times 14.96)$	(1.50)
Less tax-allowable depreciation $(0.4 \times 98.2 \times 0.10)$	<u>(3.93)</u>
Profits before tax	9.53
Tax (20%)	<u>(1.91)</u>
Free cash flows	<u>7.62</u>

Value of Ndege Co =

Present value of \$7.62m free cash flow growing at 20% in the first year and discounted at 10%:

$$\$7.62m \times 1.2 \times 0.909 = \$8.31m$$

Add present value of cash flows from Year 2 onwards:

$$(\$9.14m \times 1.052) / (0.1 - 0.052) \times 0.909 = \$182.11m$$

Less bond taken over by Ndege = \$40m

Value to shareholders of Ndege Co = $8.31 + 182.11 - 40 = \b{ \$150.42m}$

Current values

Vogel Co's current value = $\$3 \times 380m = \b{ \$1,140m}$

Vogel Co, profit after tax = $\$158.2m \times 0.8 = \b{ \$126.56m}$

Vogel Co, P/E ratio before acquisition = $\$1,140.0m / \$126.56m = 9.01$ say 9

Vogel Co, P/E ratio after acquisition = $9 \times 1.15 = 10.35$

Tori Co, P/E ratio before acquisition = $9 \times 1.25 = 11.25$

Tori Co post-tax profit = $\$23m \times 0.8 = \$18.4m$

Tori Co's current value = $11.25 \times \$18.4m = \b{ \$207.0m}$

Value created from combined company

Post-acquisition 50% of Tori's earnings will remain after the disposal of Department C and the spin-off of Department B. So earnings will become:

$$\$126.56m + (0.5 \times \$18.4m) + \$7m \text{ synergy} = \$142.76m$$

So the combined company should be worth the P/E of $10.35 \times \$142.76m = \$1,477.57m$.

Maximum premium =	\$m
Value of combined firm	1,477.57
Value of Ndege	150.42
Value for disposal of C	4.81
Less current value (\$1,140m + \$207.0m)	<u>1,347</u>
	285.80

Assumptions

Based on the calculations given above, it is estimated that the value created will be \$285.80m.

However, Vogel Co needs to assess whether the numbers it has used in the calculations and the assumptions it has made are reasonable. For example, Ndege Co's future cash flows seem to be growing without any additional investment in assets and Vogel Co needs to establish whether or not this is reasonable. It also needs to establish how the increase in its P/E ratio was determined after acquisition. Perhaps sensitivity analysis would be useful to show the impact on value changes, if these figures are changed. Given its poor record in generating value previously, Vogel Co needs to pay particular attention to these figures.

30 Doric

Workbook references. Management buyouts (MBOs) are covered in Chapter 15.

Top tips. In part (c) don't forget to apportion the assets to each division in the two-thirds to one-third ratio. Also do not forget to conclude whether the MBO is likely to be beneficial or not.

In part (d) don't forget to address both aspects. There are a number of issues for both points so you should be able to produce a reasonable answer here.

Easy marks. There are some easy marks to be gained in part (a) as the comments are very generic and can almost be taken straight from Chapter 15 of the Workbook.

Marking scheme

	Marks
(a) 1 mark per benefit discussed	Max 4
(b) Calculation of funds used to pay proportion of liabilities	2
Comment	1
	<u>3</u>
(c) Calculation of funds required from MBO	4
Calculation of value of the business	4
Discussion	<u>2-3</u>
	Max 10
(d) Seeking buyers	4-5
Due diligence	<u>3-4</u>
	Max <u>8</u>
	<u>25</u>

(a) There are a number of possible benefits from disposing of a division through an MBO. These include: It may be the **fastest way of raising funds** compared to other divestment methods. It is likely that there would be **less resistance from the managers** and employees which would make a smoother process. It may also offer a **better price** to the selling company as the current management has knowledge of the division and is able to make it successful. Costs associated with an MBO may be less than other methods.

(b) If the company is closed, the net proceeds will be:

	\$m
Sale of all assets	210
Less redundancy and other costs	(54)
Net proceeds from sale of all assets	<u>156</u>
Total liabilities are \$280m.	

Therefore liability holders will receive \$0.56 per \$1 owing to them (\$156m/\$280m). Shareholders will not receive anything.

(c) If the fridges division is sold:

	\$m
Sale of fridge division ($2/3 \times 210$)	140
Redundancy and other costs ($2/3 \times 54$)	(36)
Net proceeds from sale of all assets	<u>104</u>
Amount of current and non-current liabilities	280

Amount of MBO funds needed to pay current and non-current liabilities	176
($280 - 104$)	176
Amount of MBO funds needed to pay shareholders	60
Investment needed for new venture	50
Total funds required	<u>286</u>

Value of new company following buyout	\$m
Sales revenue	170.0
Costs	(120.0)
Profits before depreciation	50.0
Depreciation ($((1/3 \times 100m) + 50m) \times 10\% *$	<u>(8.3)</u>
Profits before tax	41.7
Tax at 20%	(8.3)
Cash flows before interest payments *	<u>33.4</u>

* It has been assumed that depreciation is available on the revalued non-current assets plus the new investment. It is also assumed that no further investment in non-current assets or working capital is needed.

$$\text{Estimated value based on cash flows in perpetuity} = \$33.4m \times \frac{1.035}{(0.11 - 0.035)} = \$461m$$

This is about 61% over and above the funds invested in the new venture and therefore the MBO is likely to be beneficial. However, this assessment is based on estimates. Small changes in variables, particularly the growth rate, will have a large impact on the value. The assumption of growth in perpetuity may not be accurate either. Sensitivity analysis should be performed before a final decision is made.

(d) The search for a potential buyer will either involve an **open tender** or the use of an **intermediary**. It may be that a single bidder is sought or maybe Doric Co will look to have an auction of the business among interested parties. Potential purchasers may be found

amongst industry competitors as well as Doric Co's suppliers and distributors. A good deal of discretion will be needed to protect the value of the business for sale from adverse competitive action. If this did not happen a dominant competitor in the industry could start a price war which would reduce prices and also the value of the division prior to them making a bid.

Once a potential purchaser is found, it will want to conduct its own **due diligence** to ensure that **everything is as expected** / as it has been told. Access should be given to the potential purchaser for this, including up to date accounts and any legal documentation relating to the assets to be transferred. Doric Co should also perform some due diligence, on the ability of the potential purchaser to complete the transaction. It is necessary to establish how it will be able to finance the purchase and the timescale involved in obtaining this finance. Doric Co's lawyers will also need to assess any possible contractual issues relating to the sale, the transfer of employment rights, the transfer of intellectual property and any rights and responsibilities that will remain with Doric Co.

A sale price is likely to be **negotiated** and should be negotiated in a way that will maximise the return to Doric. **Professionals** should be used to conduct the negotiations and they must be fully informed of the situation around the sale, including any conditions and legal requirements. The consideration for the sale, the title deeds of the assets and terms for the transfer of staff and any accrued employment benefits (such as pension rights) will be **subject to agreement**.

31 Flufftort

Workbook references. Financial reconstruction is covered in Chapter 14.

Easy marks. You should be able to pick up some relatively easy marks in part (b). This required an evaluation of the acceptability of the financing scheme to all parties. There were up to two marks per well-explained point. This should have picked up the breach of a loan covenant in part (a)(i) as well as issues relating to control and risk.

Examining team's comments. In part (a), it is worth reminding candidates that occasionally, as in this part of the question, there are marks available for relatively straightforward calculations without needing to apply complex techniques.

Marking scheme

		Marks
(a)	(i) SOFP if shares purchased and cancelled	
	Cash and other assets	2
	Equity	1
	Liabilities	1
		<hr/> 4
	(ii) SOFP if full refinancing takes place	
	Cash and other assets	2
	Equity	1
	Liabilities	1
		<hr/> 4
	(iii) 20X7 forecast	2
	20X8 forecast	2
		<hr/> 4
(b)	Up to 2 marks for each well-discussed point	Max <u>13</u> <u>25</u>

(a) (i) **Statement of financial position (SOFP) if Gupte VC shares are purchased by Flufftort Co and cancelled**

	\$m
<i>Assets</i>	
Non-current assets	69
Current assets excluding cash	18
Cash	—
Total assets	<u>87</u>
<i>Equity and liabilities</i>	
Share capital	40
Retained earnings	5
Total equity	<u>45</u>
Long-term liabilities	
Bank loan	30
Loan note	5
Total long-term liabilities	35
Current liabilities	7
Total liabilities	42
Total equity and liabilities	<u>87</u>

(ii) **SOFP if full refinancing takes place**

	\$m
<i>Assets</i>	
Non-current assets	125
Current assets excluding cash	42
Cash (balancing figure)	5
Total assets	<u>172</u>
<i>Equity and liabilities</i>	
Share capital	90
Retained earnings	5
Total equity	<u>95</u>
Long-term liabilities	
Bank loan	65
Loan note	—
Total long-term liabilities	65
Current liabilities	12
Total liabilities	77
Total equity and liabilities	<u>172</u>

(iii) **Projected SOPL**

	20X7	20X8
	\$m	\$m
Operating profit	20.0	25.0
Finance cost	(6.5)	(6.5)
Profit before tax	13.5	18.5
Taxation 20%	(2.7)	(3.7)
Profit after tax	10.8	14.8
Dividends	—	—
Retained earnings	10.8	14.8

(b) **Current situation**

Initial product developments have not generated the revenues required to sustain growth. The new Easicushion chair appears to offer Flufftort Co much better prospects of commercial success. At present, however, Flufftort Co does not have the resources to make the investment required.

Purchase of Gupte VC's shares

In the worst case scenario, Gupte VC will demand repayment of its investment in a year's time. The calculations in (a) show the financial position in a year's time, assuming that there is no net investment in non-current assets or working capital, the purchase of shares is financed solely out of cash reserves and the shares are cancelled. Repayment by this method would mean that the limits set out in the covenant would be breached ($45/35 = 1.29$) and the bank could demand immediate repayment of the loan.

The directors can avoid this by buying some of Gupte VC's shares themselves, but this represents money which is not being put into the business. In addition, the amount of shares which the directors would have to purchase would be greater if results, and therefore reserves, were worse than expected.

Financing the investment

The calculations in (a) show that the cash flows associated with the refinancing would be enough to finance the initial investment. The ratio of equity to non-current liabilities after the refinancing would be 1.46 (95/65), in line with the current limits in the bank's covenant. However, financing for the subsequent investment required would have to come from surplus cash flows.

Shareholdings

The disposition of shareholdings will change as follows:

	Current shareholdings		Shareholdings after refinancing	
	Million	%	Million	%
Directors	27.5	55.0	42.5	47.2
Other family members	12.5	25.0	12.5	13.9
Gupte VC	10.0	20.0	30.0	33.3
Loan note holder	—	—	5.0	5.6
	<u>50.0</u>	<u>100.0</u>	<u>90.0</u>	<u>100.0</u>

Gupte VC's percentage shareholding will rise from 20% to 33.3%, enough possibly to give it extra rights over the company. The directors' percentage shareholding will fall from 55% to 47.2%, which means that collectively they no longer have control of the company. The percentage of shares held by family members who are not directors falls from 25% to around 19.5%, taking into account the conversion of the loan note. This will mean, however, that the directors can still maintain control if they can obtain the support of some of the rest of the family.

Position of finance providers

The refinancing has been agreed by the Chief Executive and Finance Director. At present, it is not clear what the views of the other directors are, or whether the \$15 million contributed by directors will be raised from them in proportion to their current shareholdings. Some of the directors may not be able to, or wish to, make a significant additional investment in the company. On the other hand, if they do not, their shareholdings, and perhaps their influence within the company, will diminish. This may be a greater concern than the board collectively losing control over the company, since it may be unlikely that the other shareholders will combine to outvote the board.

The other family shareholders have not been actively involved in Flufftort Co's management out of choice, so a reduction in their percentage shareholdings may not be an issue for them. They may have welcomed the recent dividend payment as generating a return on their investment. However, as they appear to have invested for the longer term, the new investment appears to offer much better prospects in the form of a capital gain on listing or buyout than an uncertain flow of dividends. The new investment appears only to have an upside for them in the sense that they are not being asked to contribute any extra funding towards it.

Rajiv Patel is unlikely to be happy with the proposed scheme. He is exchanging a guaranteed flow of income for an uncertain flow of future dividends sometime after 20X8. On the other hand, his investment may be jeopardised by the realisation of the worst case scenario, since his debt is subordinated to the bank's debt.

The most important issue from Gupte VC's viewpoint is whether the extra investment required is likely to yield a better outcome than return of its initial investment in a year's time. The plan that no dividends would be paid until after 20X8 is a disadvantage. On the other hand, the additional investment seems to offer the only prospect of realising a substantial gain by Flufftort Co being either listed or sold. The arrangement will mean that Gupte VC may be able to exercise greater influence over Flufftort Co, which may provide it with a greater sense of reassurance about how Flufftort Co is being run. The fact that Gupte VC has a director on Flufftort Co's board should also give it a clear idea of how successful the investment is likely to be.

The bank will be concerned about the possibility of Flufftort Co breaching the covenant limits and may be concerned whether Flufftort Co is ultimately able to repay the full amount without jeopardising its existence. The bank will be concerned if Flufftort Co tries to replace loan finance with overdraft finance. The refinancing provides reassurance to the bank about gearing levels and a higher rate of interest. The bank will also be pleased that the level of interest cover under the refinancing is higher and increasing (from 2.0 in 20X6 to 3.1 in 20X7 and 3.8 in 20X8). However, it will be concerned about how Flufftort Co finances the additional investment required if cash flows from the new investment are lower than expected. In those circumstances Flufftort Co may seek to draw on its overdraft facility.

Conclusion

The key players in the refinancing are Gupte VC, the bank and the directors other than the Chief Executive and the Finance Director. If they can be persuaded, then the scheme has a good chance of being successful. However, Rajiv Patel could well raise objections. He may be pacified if he retains the loan note. This would marginally breach the current covenant limit ($90/70 = 1.29$), although the bank may be willing to overlook the breach as it is forecast to be temporary. Alternatively, the refinancing would mean that Flufftort Co just had enough spare cash initially to redeem the loan note, although it would be more dependent on cash surpluses after the refinancing to fund the additional investment required.

32 Ennea

Workbook references. Chapter 1 for the role and responsibilities of management; Chapter 7 for sources of finance; Chapter 16 for securitisation.

Top tips. In part (a) it is important to include the discussion as well as the forecast statements of financial position and ratios. Don't state just what has happened, but also what this means for Ennea Co to get more marks.

Remember to relate the answer in part (b) to the scenario and the relatively small amount of finance makes a securitisation less likely to be appropriate.

Easy marks. There are some easy marks to be gained in part (a) in the forecasts under each of the three different proposals.

Examining team's comments. Part (a) revolved around the impact of changes in financing of a company and how the impact of changing financial structure affected the financial position, earnings per share and the gearing of the company.

The answers to this part tended to be varied. Candidates, who presented the changed financial position and calculated the changes in earnings for each proposal, which were then incorporated into the calculations of EPS and gearing, gained the majority of marks. However, overall this part of the question was not done well.

Many responses tended to discuss or try to explain the changes and therefore gained fewer marks. Many responses did not consider the impact on interest of increased or reduced debt financing, and therefore did not incorporate the impact into the profit after tax and the financial position. In a notable minority of responses, candidates did not calculate the earnings per share (EPS) and gearing correctly. Such responses gained few marks.

Part (b) tested what securitisation was and the key barriers to Ennea Co undertaking the process. This part was done poorly by most candidates. Few responses gave an adequate explanation of the securitisation process, often confusing it with what leasing was and/or assuming securitisation meant providing asset security or collateral for a loan. Very few responses considered the barriers to Ennea Co in any detail.

Marking scheme

	Marks
(a) Financial position calculations: proposal 1	3
Financial position calculations: proposal 2	2
Financial position calculations: proposal 3	3
Adjustments to forecast earnings	
Interest payable on additional borrowing and higher coupon	2
Interest saved on lower borrowing and lower coupon	1
Return on additional investment	1
Return lost on less investment and profit on sale of non-current assets	1
Gearing and EPS calculations	2
Discussion of the results of the proposals	2-3
Discussion of the implications (eg risk, market reaction)	2-3
	Max 20

		Marks
(b)	Explanation of the process	2-3
	Key barriers in undertaking the process	<u>2-3</u>
		Max <u>5</u> <u>25</u>

(a) Forecast financial position

	<i>Current</i> \$'000	<i>Proposal 1</i> \$'000	<i>Proposal 2</i> \$'000	<i>Proposal 3</i> \$'000
Non-current assets	282,000	282,000	302,000	257,000
Current assets	66,000	64,720	67,720	63,682
Total assets	<u>348,000</u>	<u>346,720</u>	<u>369,720</u>	<u>320,682</u>
Current liabilities	37,000	37,000	37,000	37,000
Non-current liabilities	140,000	160,000	160,000	113,000
Total liabilities	<u>177,000</u>	<u>197,000</u>	<u>197,000</u>	<u>150,000</u>
Share capital (40c per share)	48,000	45,500	48,000	48,000
Retained earnings	123,000	104,220	124,720	122,682
Total equity	<u>171,000</u>	<u>149,720</u>	<u>172,720</u>	<u>170,682</u>
Total equity and capital	<u>348,000</u>	<u>346,720</u>	<u>369,720</u>	<u>320,682</u>
	<i>Current</i> \$'000	<i>Proposal 1</i> \$'000	<i>Proposal 2</i> \$'000	<i>Proposal 3</i> \$'000
Initial profit after tax	26,000	26,000	26,000	26,000
Interest payable on additional borrowing (\$20m \times 6% \times (1 - 0.2))		(960)	(960)	
Additional interest payable (\$160m \times 0.25% \times (1 - 0.2))		(320)	(320)	
Interest saved on reduced borrowing (\$27m \times 6% \times (1 - 0.2))				1,296
Interest saved on lower coupon (\$113m \times 0.15% \times (1 - 0.2))				136
Return on additional investment (\$20m \times 15%)			3,000	
Return lost on reduced investment (\$25m \times 15%)				(3,750)
Profit on sale of non-current assets				2,000
Total assets	<u>26,000</u>	<u>24,720</u>	<u>27,720</u>	<u>25,682</u>
Gearing (non-current liabilities/non-current liabilities + equity)	45.0%	51.7%	48.1%	39.8%
Number of shares ('000)	120,000 (\$48m/\$0.4 per share)	113,750 (\$20m/\$3.2 = 6.25m shares bought back)	120,000	120,000
Adjusted EPS	21.67c	21.73c	23.10c	21.40c

Note. Other calculations of gearing would be acceptable.

Tutorial note. These explanations are not required for the answer, but are presented here to aid understanding.

Explanations of figures above

Proposal 1

Non-current liabilities are increased by \$20 million from the additional debt and capital is reduced by the same amount. Given that the share price is \$3.20, the \$20 million will buy back $\$20m / \$3.20 = 6.25m$ shares. These shares have a nominal value of $6.25m \times \$0.4 = \2.5 million. The split between share capital and retained earnings will therefore be \$2.5 million to share capital and the balance of \$17.5 million to retained earnings (actually to the share premium account, but this is included in retained earnings for simplicity).

The additional interest payable of \$1.28 million is taken off retained earnings due to the reduction in profit after tax and also deducted from cash as it is assumed to be paid in cash. It would be acceptable to include as a current liability if it was assumed to be unpaid.

Proposal 2

Non-current liabilities and non-current assets are increased by \$20 million from the additional debt and purchase of assets. Additional interest is payable as for Proposal 1 and the new investment will generate an additional return of 15% which is \$3 million in income. The net impact is income of \$1.72 million, which is added to retained earnings and to current assets as it represents either cash or a receivable.

Proposal 3

Non-current assets are reduced by the net value at disposal (\$25 million) and the proceeds of \$27 million are used to reduce non-current liabilities. The profit of \$2 million is added to retained earnings.

The reduction of investment in non-current assets means there will be a lower return on investment of 15% of the \$25 million. However, interest will be saved on the non-current liabilities which will be paid off. The net impact is a loss of \$2.318 million which is subtracted from retained earnings and deducted from current assets as a cash expense. Again it would be acceptable to include as a current liability if it was assumed to be unpaid.

Discussion

Proposal 1 would lead to a small increase in EPS, due to the reduction in the number of shares since earnings fall by about 5% because of the higher interest payments from the additional debt. However, gearing significantly increases by approximately 6%.

Under Proposal 3 EPS will fall, although total earnings will be higher than under Proposal 1. Total earnings fall because the interest saved and the profit on disposal are less than the loss of the return on the non-current asset investment. Gearing would also reduce significantly, by 5%.

Proposal 2 significantly increases EPS, which the other proposals do not. This is due to the return on the additional non-current asset investment. However, gearing will also increase by just over 3%, although this is less than under Proposal 1.

Proposal 1 is the least attractive. The choice between Proposals 2 and 3 will depend on whether the board of Ennea Co would prefer a higher EPS figure or a lower level of financial gearing. This may depend on industry averages for both of these figures, how the stock market would react to the proposals and the implications of the proposals on changes to the risk profile of the company and whether this would change the overall cost of capital. It should also be noted that the above forecasts and estimates and actual results may well differ from those stated.

(b) Asset securitisation for Ennea Co would involve converting the future lease income, from the non-current asset leases, into assets and **selling these assets as bonds** now. The future income is then used to pay the coupons on the bonds. In effect Ennea Co forgoes the interest payments on the leases in favour of the bond sale proceeds.

The lease income would be aggregated and pooled and new bonds would be created based on these. The pooled assets are divided into **tranches** and the tranches are **credit rated**. The higher rated tranches would carry less risk and also have a lower return than tranches with a lower rating. If default occurs, the income of the lower tranches gets reduced first and any subsequent default is applied to the lowest tranche with any income left. This process means an asset with a low level of liquidity can be transformed into a security with high liquidity.

There are a number of barriers to undertaking a securitisation process. It is **very expensive** due to management costs, legal fees and ongoing administration and compliance costs. Ennea Co is looking at selling a relatively small amount of non-current assets and therefore the costs would be a significant proportion of the potential income. This high cost means that securitisation is **not feasible for a small asset pool**.

It is usual to not offer the full value of the asset in the form of securities, but to leave say 10% of the asset value as a buffer against default and converting the other 90% into securities. The method of credit enhancement would give the tranches a **higher credit rating** and therefore **improve their marketability**. However, if Ennea Co was to use this method it would not be able to take advantage of the full value of the assets.

33 Nubo

Workbook references. Demergers are covered in Chapter 15 and Islamic finance is covered in Chapter 7.

Easy marks. Part (c) offers easy marks if you answer both parts of the question.

Examining team's comments. Part (a) – many candidates made a reasonable attempt at calculating the financial impact of each of the two options but few candidates were then able to calculate the impact on the debt capacity and the additional funds available to the downsized company.

Part (b) – few candidates were able to give responses beyond a general discussion of demergers and many candidates did not relate their answers to the scenario. Very few candidates discussed the impact on the debt capacity for the downsized company if it undertook a demerger instead of a sale as its divestment option.

Part (c) – the discussion between using Musharaka and Mudaraba contracts was generally done well and it was pleasing to see that candidates had paid due attention to this area.

Marking scheme

		Marks
(a)	Sale of supermarkets division's assets	1
	Sale of supermarkets division as going concern	1
	Advice	2
	Extra cash after liabilities are paid	1
	Maximum debt which can be borrowed	1
	Additional funds available to Nubo Co	1
		<u>7</u>
(b)	1–2 marks per relevant point	Max <u>6</u>
(c)	Discussion of why Ulap Bank might prefer a Musharaka contract	6–7
	Discussion of key concerns over the joint venture relationship	5–6
		Max <u>12</u> <u>25</u>

(a) Current and non-current liabilities = \$387m + \$95m = \$482m

Sale of assets of supermarkets division

Proportion of assets to supermarkets division

Non-current assets = $70\% \times \$550m = \$385m$; Current assets = $70\% \times \$122m = \$85.4m$

Sale of assets = $\$385m \times 1.15 + \$85.4m \times 0.80 = \$511.07m$

Sale of supermarkets division as a going concern

Profit after tax attributable to the supermarkets division: $\$166m/2 = \$83m$

Estimate of value of supermarkets division based on the P/E ratio of supermarket industry:
 $\$83 \times 7 = \$581m$

Although both options generate sufficient funds to pay for the liabilities, the sale of the supermarkets division as a going concern would generate higher cash flows and the spare cash of \$99m [$\$581m - \$482m$] can be used by Nubo Co for future investments. This is based on the assumption that the value based on the industries' P/E ratios is accurate.

Proportion of assets remaining within Nubo Co

$30\% \times (\$550m + \$122m) = \$201.6m$

Add extra cash generated from the sale of \$99m

Maximum debt capacity = \$300.6m

Total additional funds available to Nubo Co for new investments = $\$300.6m + \$99m = \$399.6m$

(b) A demerger would involve splitting Nubo Co into two separate companies which would then operate independently of each other. The equity holders in Nubo Co would continue to have an equity stake in both companies.

Normally demergers are undertaken to ensure that each company's equity values are fair. For example, the value of the aircraft parts production division based on the P/E ratio gives a value of \$996m ($12 \times \$83m$) and the value of the supermarkets division as \$581m. If the

current company's value is less than the combined values of \$1,577m, then a demerger may be beneficial. However, the management and shareholders of the new supermarkets company may not be keen to take over all the debt.

Nubo Co's equity holders may view the demerger more favourably than the sale of the supermarkets division. At present their equity investment is diversified between the aircraft parts production and supermarkets. If the supermarkets division is sold, then the level of their diversification may be affected. With the demerger, since the equity holders will retain an equity stake in both companies, the benefit of diversification is retained.

However, the extra \$99m cash generated from the sale will be lost in the case of a demerger. Furthermore, if the new aircraft parts production company can only borrow 100% of its asset value, then its borrowing capacity and additional funds available to it for new investments will be limited to \$201.6m instead of \$399.6m.

(c) With a Mudaraba contract, the profits which Pilvi Co makes from the joint venture would be shared according to a pre-agreed arrangement when the contract is constructed between Pilvi Co and Ulap Bank. Losses, however, would be borne solely by Ulap Bank as the provider of the finance, although provisions can be made where losses can be written off against future profits. Ulap Bank would not be involved in the executive decision-making process. In effect, Ulap Bank's role in the relationship would be similar to an equity holder holding a small number of shares in a large organisation.

With a Musharaka contract, the profits which Pilvi Co makes from the joint venture would still be shared according to a pre-agreed arrangement similar to a Mudaraba contract, but losses would also be shared according to the capital or other assets and services contributed by both parties involved in the arrangement. Therefore a value could be put to the contribution-in-kind made by Pilvi Co and any losses would be shared by Ulap Bank and Pilvi Co accordingly. Within a Musharaka contract, Ulap Bank can also take the role of an active partner and participate in the executive decision-making process. In effect, the role adopted by Ulap Bank would be similar to that of a venture capitalist.

With the Mudaraba contract, Pilvi Co would essentially be an agent to Ulap Bank, and many of the agency issues facing corporations would apply to the arrangement, where Pilvi Co can maximise its own benefit at the expense of Ulap Bank. Pilvi Co may also have a propensity to undertake excessive risk because it is essentially holding a long call option with an unlimited upside and a limited downside.

Ulap Bank may prefer the Musharaka contract in this case, because it may be of the opinion that it needs to be involved with the project and monitor performance closely due to the inherent risk and uncertainty of the venture, and also to ensure that the revenues, expenditure and time schedules are maintained within initially agreed parameters. In this way, it may be able to monitor and control agency related issues more effectively and control Pilvi Co's risky actions and decisions. Being closely involved with the venture would change both Pilvi Co's and Ulap Bank's roles and make them more like stakeholders rather than principals and agents, with a more equitable distribution of power between the two parties.

Nubo Co's concerns would mainly revolve around whether it can work with Ulap Bank and the extra time and cost which would need to be incurred before the joint venture can start. If Pilvi Co had not approached Ulap Bank for funding, the relationship between Nubo Co and Pilvi Co would be less complex within the joint venture. Although difficulties may arise about percentage ownership and profit sharing, these may be resolved through negotiation and having tight specific contracts. The day to day running, management and decision-making process could be resolved through negotiation and consensus. Therefore having a third party involved in all aspects of the joint venture complicates matters.

Nubo Co may feel that it was not properly consulted about the arrangements between Pilvi Co and Ulap Bank, and Pilvi Co would need to discuss the involvement of Ulap Bank with Nubo

Co and get its agreement prior to formalising any arrangements. This is to ensure a high level of trust continues to exist between the parties, otherwise the venture may fail.

Nubo Co may want clear agreements on ownership and profit-sharing. It would want to ensure that the contract clearly distinguishes it as not being part of the Musharaka arrangement which exists between Pilvi Co and Ulap Bank. Hence negotiation and construction of the contracts may need more time and may become more expensive.

Nubo Co may have felt that it could work with Pilvi Co on a day to day basis and could resolve tough decisions in a reasonable manner. It may not feel the same about Ulap Bank initially. Clear parameters would need to be set up on how executive decision making will be conducted by the three parties. Therefore, the integration process of bringing a third partner into the joint venture needs to be handled with care and may take time and cost more money. The above issues would indicate that the relationship between the three parties is closer to that of stakeholders, with different levels of power and influence, at different times, as opposed to a principal–agent relationship. This would create an environment which would need ongoing negotiation and a need for consensus, which may make the joint venture hard work. Additionally, it would possibly be more difficult and time consuming to accomplish the aims of the joint venture.

(Note. Credit will be given for alternative relevant comments and suggestions for parts (b) and (c) of the question.)

34 Bento

Workbook references. MBOs are covered in Chapter 15.

Easy marks. Part (a) offers easy marks if you address the question accurately.

Examining team's comments. In part (b) few candidates could apply the annuity factor to calculate the annual amount payable. Instead they opted to do it on a straight-line basis but this ignored the time value of money. However, a good number of responses then structured the profit or loss statement appropriately to take account of interest, tax and dividends, to get to the retained earnings figures. Nonetheless, some responses did not do this and therefore kept the book value of equity unchanged, casting doubt about whether or not they understand the relationship between the profit or loss statement and the statement of financial position.

In part (c), candidates were asked to assess whether or not the MBO was beneficial. Although not specified in the requirements, the appropriate way to assess benefit was to compare the value of the investment, the MBO in this case, with the cost of that investment, the price to be paid for the MBO. This part of the question was not done well.

Marking scheme

		Marks
(a)	Distinguish between an MBI and an MBO	2
	Discuss the relative benefits and drawbacks	4
		Max 5
(b)	Annual annuity on 8% bond	1
	Split between interest and capital repayment	2
	Operating profit for the first 4 years	1
	Finance costs	2
	Tax and dividend payable for the first 4 years (1 mark each)	2
	Book values of debt and equity in Years 1 to 4	2
	Gearing and concluding comment	2
		Max 12

	Marks
(c) Valuation methods (1 for net assets, 3 for dividend valuation)	4
Discussion (1 to 2 marks per point)	4
	Max <u>8</u> <u>25</u>

(a) An MBO involves the purchase of a business by the management team running that business. Hence, an MBO of Okazu Co would involve the takeover of that company from Bento Co by Okazu Co's current management team. However, an MBI involves purchasing a business by a management team brought in from outside the business.

The benefits of an MBO relative to an MBI to Okazu Co are that the existing management is likely to have detailed knowledge of the business and its operations. Therefore they will not need to learn about the business and its operations in a way which a new external management team may need to. It is also possible that an MBO will cause less disruption and resistance from the employees when compared to an MBI. If Bento Co wants to continue doing business with the new company after it has been disposed of, it may find it easier to work with the management team which it is more familiar with. The internal management team may be more focused and have better knowledge of where costs can be reduced and sales revenue increased, in order to increase the overall value of the company.

The drawbacks of an MBO relative to an MBI to Okazu Co may be that the existing management may lack new ideas to rejuvenate the business. A new management team, through their skills and experience acquired elsewhere, may bring fresh ideas into the business. It may be that the external management team already has the requisite level of finance in place to move quickly and more decisively, whereas the existing management team may not have the financial arrangements in place yet. It is also possible that the management of Bento Co and Okazu Co have had disagreements in the past and the two teams may not be able to work together in the future if they need to. It may be that an MBI is the only way forward for Okazu Co to succeed in the future.

(b) Annuity (8%, 4 years) = 3.312

Annuity payable per year on loan = $\$30,000,000 / 3.312 = \$9,057,971$

Interest payable on convertible loan, per year = $\$20,000,000 \times 6\% = \$1,200,000$

Annual interest on 8% bond

Year end	1 \$'000	2 \$'000	3 \$'000	4 \$'000
Opening loan balance	30,000	23,342	16,151	8,385
Interest at 8%	2,400	1,867	1,292	671
Annuity	<u>(9,058)</u>	<u>(9,058)</u>	<u>(9,058)</u>	<u>(9,058)</u>
Closing loan balance	<u>23,342</u>	<u>16,151</u>	<u>8,385</u>	<u>(2)*</u>

*The loan outstanding in Year 4 should be zero. The small negative figure is due to rounding.

Estimate of profit and retained earnings after MBO

Year end	1	2	3	4
	\$'000	\$'000	\$'000	\$'000
Operating profit	13,542	15,032	16,686	18,521
Finance costs	(3,600)	(3,067)	(2,492)	(1,871)
Profit before tax	9,942	11,965	14,194	16,650
Taxation	(1,988)	(2,393)	(2,839)	(3,330)
Profit for the year	7,954	9,572	11,355	13,320
Dividends	(1,989)	(2,393)	(2,839)	(3,330)
Retained earnings	<u>5,965</u>	<u>7,179</u>	<u>8,516</u>	<u>9,990</u>

Estimate of gearing

Year end	1	2	3	4
	\$'000	\$'000	\$'000	\$'000
Book value of equity	15,965 *	23,144	31,660	41,650
Book value of debt	43,342	36,151	28,385	20,000
Gearing	73%	61%	47%	32%
Covenant	75%	60%	50%	40%
Covenant breached?	No	Yes	No	No

* The book value of equity consists of the sum of the 5,000,000 equity shares which Dofu Co and Okazu Co's senior management will each invest in the new company (total 10,000,000), issued at their nominal value of \$1 each, and the retained earnings from Year 1. In subsequent years the book value of equity is increased by the retained earnings from that year.

The gearing covenant is forecast to be breached in the second year only, and by a marginal amount. It is forecast to be met in all the other years. It is unlikely that Dofu Co will be too concerned about the covenant breach.

(c) Net asset valuation

Based on the net asset valuation method, the value of the new company to its investors (debt holders plus equity holders) is approximately:

$1.3 \times \$40,800,000$ (market value of non-current assets) + $\$12,300,000$ (current assets) - $\$7,900,000$ approx. (trade and other payables) = $\$57,440,000$.

The new company will have \$50m of non-current liabilities so the value to equity investors will be $\$57,440,000 - \$50,000,000 = \$7,440,000$.

Dividend valuation model

Year	Dividend \$'000	DF (12%)	PV \$'000
1	1,989	0.893	1,776
2	2,393	0.797	1,907
3	2,839	0.712	2,021
4	3,330	0.636	2,118
Total			7,822

Annual dividend growth rate, Years 1 to 4 = $(3,330/1,989)1/3 - 1 = 18.7\%$

Annual dividend growth rate after Year 4 = 7.5% [40% \times 18.7%]

Value of dividends after Year 4 = $(\$3,330,000 \times 1.075)/(0.12 - 0.075) \times 0.636 = \$50,594,000$ approximately

Based on the dividend valuation model, the value of the equity in the new company is approximately: $\$7,822,000 + \$50,594,000 = \$58,416,000$

The \$60m asked for by Bento Co is payable as \$50m of debt finance and \$10m of equity; \$10m is higher than the current value of the new company's net assets (\$7.44m) but \$10m is considerably lower than the value of the company based on the present value of future dividends based on the dividend valuation model (\$58.4m).

It can be argued that the future growth potential of the company is better represented by the dividend valuation model, rather than the current value of the assets, so the price of \$60m does not seem excessive.

However, the dividend valuation model can produce a large variation in results if the model's variables are changed by even a small amount. Therefore, the basis for estimating the variables should be examined carefully to judge their reasonableness, and sensitivity analysis applied to the model to demonstrate the impact of the changes in the variables. The value of the future potential of the new company should also be estimated using alternative valuation methods including free cash flows and price/earnings methods.

It is therefore recommended that the MBO should be accepted.

(Note. Credit will be given for alternative, relevant discussion for parts (a) and (c).)

35 Eview Cinemas

Workbook references. Valuations are covered in Chapter 8, and reorganisations in Chapter 15.

Easy marks. Part (a) offers easy marks for determining the sales proceeds. In part (b) there were marks available that did not relate to the calculations in part (a) but instead were based on non-financial strategic factors relating to the scenario.

Examining team's comments. In part (a) the majority of candidates omitted to add back the interest saved from paying off the loan when calculating the adjusted earnings per share. A large number of candidates erroneously either included the loan already repaid or ignored the bank loans in determining the company's weighted average cost of capital. Quite a few candidates made a basic error in using market return instead of market premium when calculating a company's cost of equity.

Part (b) required an evaluation of the decision to sell off the unbundled part of the company. Most discussions were too narrowly focused on the results from the calculations produced in part (a).

Marking scheme

	Marks
(a) PV of free cash flows Years 1–4	1
PV of free cash flows Years 5 onwards	2
Desired sales proceeds	1
Impact on statement of financial position	4
Impact on eps	5
Impact on WACC	
Equity beta – cinemas	2
Revised cost of equity – cinemas	1
Revised WACC	<u>1</u>

		Marks
(b)	Arguments against sale	4–5
	Arguments for sale	<u>4–5</u>
		Max <u>8</u>
		25

(a) Proceeds from sales of EV clubs

Year (all figures \$m)	1	2	3	4
Free cash flows	390	419	455	490
Discount factor 12%	0.893	0.797	0.712	0.636
Present value	348	334	324	312
Present value	1,318			

Present value in Year 5 onwards = $\$490m \times 1.052/(0.12 - 0.052) \times 0.636 = \$4,821m$

Total present value = $\$1,318m + \$4,821m = \$6,139m$

Desired sales proceeds (25% premium) = $\$6,139m \times 1.25 = \$7,674m$

Impact on statement of financial position (\$m)

Profit on sale = $\$7,674m - \$3,790m = \$3,884m$

Current assets increase = current liabilities $\$2,166m \times$ current ratio of 1.5 = $\$3,249m$ = increase of $\$902m$ compared to current level of $\$2,347m$

Increase in non-current assets = increase in non-current assets = proceeds from sale of $\$7,674m$ less $\$902m$ increase in working capital, less $\$3,200m$ loan note repayment = $\$3,572m$ increase. This is then reduced by the sale of EV clubs with non-current asset value given as $\$3,790m$. So the net change is a fall of $\$3,790m - \$3,572m = \$218m$.

	<i>Original</i>	<i>Adjustments</i>	<i>Final</i>
	\$m	\$m	\$m
Assets			
Non-current assets	15,621	(218)	15,403
Current assets	<u>2,347</u>	902	<u>3,249</u>
Total assets	<u>17,968</u>		<u>18,652</u>
Equity and liabilities			
Called-up share capital	1,000		1,000
Retained earnings	<u>7,917</u>	3,884	<u>11,801</u>
Total equity	<u>8,917</u>		<u>12,801</u>
Non-current liabilities			
10% loan notes	3,200	(3,200)	–
Other loan notes	<u>2,700</u>		<u>2,700</u>
Bank loans	<u>985</u>		<u>985</u>
Total non-current liabilities	<u>6,885</u>		<u>3,685</u>
Current liabilities			
	<u>2,166</u>		<u>2,166</u>
Total equity and liabilities	<u>17,968</u>		<u>18,652</u>

Impact on eps (\$m)

	Current forecast	Revised forecast
Predicted post tax profits (\$454m \times 10/4)	1,135	1,135
Less: profits from EV clubs		(454)
Add: interest saved, net of tax (\$3,200m \times 10% \times (1 - 0.2))	256	
Add: return on additional non-current assets (\$3,572m \times 12% \times (1 - 0.2))		343
Add: return on additional current assets (\$902m \times 7% \times (1 - 0.2))	51	
Adjusted profits	1,135	1,331
Number of shares	1,000m	1,000m
Adjusted eps	\$1.135	\$1.331

Impact on WACC

Equity beta

$$V_e = \$15,750m \times 1.1 = \$17,325m$$

$$V_d = (\$2,700 \times 0.93) + \$985m = \$3,496m$$

$$\beta_e = 0.952 ((17,325 + 3,496 (1 - 0.2)) / 17,325 = 1.106$$

Revised cost of equity

$$k_e = 4 + (10 - 4)1.106 = 10.64\%$$

Revised WACC

$$WACC = 10.64 (17,325 / (17,325 + 3,496)) + 8 (1 - 0.2) (3,496 / (17,325 + 3,496)) = 9.93\%$$

(b) Shareholders would appear to have grounds for questioning the sale of the EV clubs. It would mean that Eview Cinemas Co was no longer diversified into two sectors. Although shareholders can achieve diversification themselves in theory, in practice transaction costs and other issues may mean they do not want to adjust their portfolio.

The increase in gym membership brought about by the forthcoming sports festival could justify the predicted increases in free cash flows made in the forecasts. Although increased earnings per share are forecast once the EV clubs are sold, these are dependent on Eview Cinemas Co achieving the sales price which it desires for the EV clubs and the predicted returns being achieved on the remaining assets.

The proposed expansion of multiscreen cinemas may be a worthwhile opportunity, but the level of demand for big cinema complexes may be doubtful and there may also be practical problems like negotiating change of use. In Year 1 the EV clubs would be forecast to make a post-tax return on assets of $(454 / 3,790) = 12.0\%$ compared with $9.6\% (12\% \times 0.8)$ on the additional investment in the cinemas.

Investors may also wonder about the motives of Eview Cinemas Co's board. Selling the EV clubs offers the board a convenient way of resolving the conflict with the management team of the EV clubs and investors may feel that the board is trying to take an easy path by focusing on what they are comfortable with managing.

There may be arguments in favour of the sale, however. The lower WACC will be brought about by a fall in the cost of equity as well as the fall in the cost of debt. A reduction in the complexity of the business may result in a reduction in central management costs.

Eview Cinemas Co may also be selling at a time when the EV clubs chain is at its most attractive as a business, in the period before the sports festival. The premium directors are hoping to obtain (on top of a valuation based on free cash flow figures which may be optimistic) suggest that they may be trying to realise maximum value while they can.

36 Kenduri

Workbook references. Hedging foreign currency transactions is covered in Chapter 12. Gamma is covered in Chapter 11.

Top tips. In part (b) make sure you don't confuse payments and receipts in your matrix. Also it was important to read the scenario carefully to see that the spot mid-rate should be used, rather than any other rate.

For part (c) don't waste time if you don't know what a gamma value is.

Easy marks. There are some easy marks to be gained in part (a) for money market hedging and forward market calculations as these should be brought forward knowledge from FM.

Examining team's comments. For part (a), in many cases the advice was limited to a recommendation but without proper justification, and therefore few marks were gained.

Answers to part (c) were poor and few candidates were aware of what gamma is and what a high gamma meant in relation to a long call option. There also appeared to be some confusion about what a long call meant. A long call is buying the right to buy an underlying asset at a predetermined price, whereas a short call is selling the right to buy an underlying asset at a predetermined price (and similarly for put options).

Marking scheme

	Marks
(a) Calculation of net US\$ amount	1
Calculation of forward market US\$ amount	1
Calculation of US\$ money market amount	2
Calculation of one put option amount (1.60 or 1.62)	3
Calculation of the second put option amount or if the preferred exercise price is explained	2
Advice and recommendation	<u>3–4</u>
	Max 12
(b) Construction of the transactions matrix	1
Calculation of the £ equivalent amounts of US\$, CAD and JPY	4
Calculation of the net receipt/payment	2
Explanation of government reaction to hedging	<u>3</u>
	10
(c) 1 mark per valid point	Max <u>3</u>
	<u>25</u>

(a) Only transactions between Kenduri Co and Lakama Co are relevant, which are:
 Payment of \$4.5 million
 Receipt of \$2.1 million
 Net payment = \$2.4 million

The hedging options are: using the forward market, money market hedging and currency options.

Forward market

As selling £ for \$, receive at lower rate.

$$2,400,000/1.5996 = £1,500,375$$

Money market hedge

Invest US\$ now: $2,400,000/(1 + 0.031/4) = \$2,381,543$

Converted at spot: $2,381,543/1.5938 = £1,494,255$

Borrow in £ now: $1,494,255 \times (1 + 0.04/4) = £1,509,198$

The forward market is cheaper and therefore is preferred.

Options

Kenduri would buy sterling put options to protect against a depreciating £.

Exercise price \$1.60/£1

£ payment = $2,400,000/1.6 = £1,500,000$

$1,500,000/62,500 = 24$ contracts

24 3-month put options purchased

Premium = $24 \times 0.0208 \times 62,500 = \$31,200$

Premium in £ = $31,200/1.5938 = £19,576$

Total payments = $1,500,000 + 19,576 = £1,519,576$

Exercise price \$1.62/£1

£ payment = $2,400,000/1.62 = £1,481,481$

$1,481,481/62,500 = 23.7$ contracts

23 3-month put options purchased

£ payment = $23 \times 62,500 = £1,437,500$

Premium = $23 \times 0.0342 \times 62,500 = \$49,163$

Premium in £ = $49,163/1.5938 = £30,846$

Unhedged amount = $2,400,000 - (1,437,500 \times 1.62) = \$71,250$

Hedging using forward market = $71,250/1.5996 = £44,542$

Total payments = $1,437,500 + 30,846 + 44,542 = £1,512,888$

Both options hedges are worse than using the forward or money markets as a result of the premiums payable for the options. However, options have an advantage over forwards and money markets because the prices are not fixed and the buyer can let the option lapse if exchange rates move favourably. Therefore the options have a limited downside, but an unlimited upside. Only with options can Kenduri Co take advantage of the \$ weakening against the £.

Conclusion

The forward market is preferred to the money market hedge. The choice between options and forwards will depend on whether management wants to risk the higher cost for the potential upside if exchange rates move in Kenduri Co's favour.

(b) Spot mid-rates are as follows:

US\$1.5950/£1

CAD 1.5700/£1

JPY 132.75/£1

Paying subsidiary

Receiving subsidiary	UK £'000	US £'000	Canada £'000	Japan £'000	Total receipts (add across) £'000	Total payments (add down) £'000	Net receipt / (payment) £'000
UK	–	1,316.6	2,165.6	–	3,482.2	3,521.9	(39.7)
US	2,821.3	–	940.4	877.7	4,639.4	3,727.1	912.3
Canada	700.6	–	–	2,038.2	2,738.8	3,106.0	(367.2)
Japan	–	2,410.5	–	–	2,410.5	2,915.9	(505.4)

Kenduri Co will make a payment of £39,700 to Lakama Co.

Jaia Co will make a payment of £367,200 to Lakama Co.

Gochiso Co will make a payment of £505,400 to Lakama Co.

Multilateral netting will minimise the number of transactions taking place through the banks of each country. This limits the amount paid in fees to these banks. Governments which do not allow multilateral netting are therefore looking to **maximise the transactions and fees** that the local banks will receive. Other countries may choose to allow multilateral netting in the belief that this makes them more attractive to multinational companies and the lost banking fees are **more than compensated for** by the extra business brought to the country.

(c) Gamma measures the **rate of change of the delta** of an option. Deltas can be near zero for a long call option which is deep out-of-the-money, where the price of the option will be insensitive to changes in the price of the underlying asset. Deltas can also be near 1 for a long call option which is deep in-the-money, where the price of the option and the value of the underlying asset move mostly in line with each other. When a long call option is at-the-money, the delta is 0.5 but also changes rapidly. Therefore, the **highest gamma values are when a call option is at-the-money**. Gamma values are also higher when the option is closer to expiry. In this case, it appears that the option is trading near at-the-money and that it has a relatively short period before expiry.

37 Massie

Workbook references. Chapters 11 and 12.

Top tips. Don't rush into hedging questions without reading the scenario carefully. A number of candidates assumed that because Europe was mentioned, the netting would be in euros which was not in fact the case.

Examining team's comments. Very few candidates demonstrated the knowledge to calculate the effective cost of the collar hedge.

Marking scheme

			Marks
(a)	(i)	Dollar amounts owed and owing	2
		Totals owed and owing	3
		Net amounts owed	1
		Payments and receipts	<u>2</u>
			<u>8</u>
	(ii)	1–2 marks per problem discussed	Max 3
(b)		Recommendation to purchase calls	1
		Number and month of contracts	1
		Calculation of basis	1
		Options contracts calculations (only one option contract needs to be used, with a justification for choosing this exercise price, lose 1 mark if no justification)	4
		Collars approach and calculations	5
		Comments and conclusion	<u>2–3</u>
			Max 14
			<u>25</u>

(a)	(i)	Owed by	Owed to	Local currency (m)	\$m
		Armstrong (US)	Horan (South Africa)	US\$12.17	12.17
		Horan (South Africa)	Massie (Europe)	SA R42.65	3.97
		Giffen (Denmark)	Armstrong (US)	D Kr21.29	3.88
		Massie (Europe)	Armstrong (US)	US\$19.78	19.78
		Armstrong (US)	Massie (Europe)	€1.57	2.13
		Horan (South Africa)	Giffen (Denmark)	D Kr16.35	2.98
		Giffen (Denmark)	Massie (Europe)	€1.55	2.11

Owed to	Giffen (De)	Armtg (US)	Owed by	Total
	\$m	\$m	\$m	\$m
Giffen (De)			2.98	2.98
Armtg (US)	3.88		19.78	23.66
Horan (SA)		12.17		12.17
Massie (Eu)	2.11	2.13	3.97	8.21
Owed by	(5.99)	14.30	(6.95)	(19.78)
Owed to	2.98	23.66	12.17	8.21
Net	(3.01)	9.36	5.22	(11.57)

Under the terms of the arrangement, Massie, as the company with the largest debt, will pay Horan \$5.22m, as the company with the smallest amount owed. Then Massie will pay Armstrong \$6.35m and Giffen will pay Armstrong \$3.01m.

(ii) The Armstrong Group may have problems if any of the governments of the countries where the subsidiaries are located object to multilateral netting. However, this may be unlikely here.

The new system may not be popular with the management of the subsidiaries because of the length of time before settlement (up to six months). Not only might this cause cash flow issues for the subsidiaries, but also the length of time may mean that some of the

subsidiaries face significant foreign exchange risks. The system may possibly have to allow for immediate settlement in certain circumstances, for example, if transactions are above a certain size or if a subsidiary will have significant cash problems if amounts are not settled immediately.

(b) Need to hedge against a fall in interest rate, therefore buy call options. Require 50 contracts $(25,000,000/1,000,000) \times 6/3$.

As Massie is looking to invest on 30 November, December contracts are needed.

Basis

Futures price – current price (1 September) = basis

$$95.76 - (100 - 3.6) = -0.64$$

$$\text{Unexpired basis} = \frac{1}{4} \times 0.64 = -0.16$$

Option

Amount received will be $(\text{LIBOR} - 0.4\%) \times 25,000,000 \times 6/12$

If interest rates increase by 0.5% to 4.1%

$$\text{Expected futures price} = (100 - 4.1) - 0.16 = 95.74$$

Exercise price	97.00	96.50
Futures price	95.74	95.74
Exercise option?	No	No
Gain in basis points	–	–

	€	€
Interest received		
$(€25m \times 6/12 \times (4.1 - 0.4)\%)$	462,500	462,500
Gain on options	–	–
Premium		
$(3.2 \times €25 \times 50)$	(4,000)	
$(18.2 \times €25 \times 50)$		<u>(22,750)</u>
Net receipt	<u>458,500</u>	<u>439,750</u>
Effective interest rates	3.67%	3.52%

Alternative solution:

Exercise rate (100 – price)	3%	3.5%
Futures rate (100 – price)	4.26%	4.26%
Exercise option?	No	No
Gain in %	–	–
	%	%
Interest received		
$(4.1 - 0.4)\%$	3.7	3.70
Gain on options	–	–
Premium		
	(0.032)	(0.182)
Effective interest rates	3.668%	3.518%
Net receipt $(€25m \times \text{effective interest rate} \times 6/12)$	<u>458,500</u>	<u>439,750</u>

If interest rates fall by 0.5% to 3.1%

Expected futures price = $(100 - 3.1) - 0.16 = 96.74$

Exercise price	97.00	96.50
Futures price	96.74	96.74
Exercise option?	No	Yes
Gain in basis points	–	24
	€	€
Interest received		
$(€25m \times 6/12 \times (3.1 - 0.4)\%)$	337,500	337,500
Gain on options		
$(0 \text{ and } 24 \times €25 \times 50)$	–	30,000
Premium		
$(3.2 \times €25 \times 50)$	(4,000)	
$(18.2 \times €25 \times 50)$	_____	<u>(22,750)</u>
Net receipt	<u>333,500</u>	<u>344,750</u>
Effective interest rates	2.67%	2.76%
<i>Alternative solution:</i>		
Exercise rate (100 – price)	3%	3.5%
Futures rate (100 – price)	3.26%	3.26%
Exercise option?	No	Yes
Gain in %	–	0.24%
	%	%
Interest received		
$(3.1 - 0.4)\%$	2.7	2.70
Gain on options	–	0.24
Premium		
	(0.032)	(0.182)
Effective interest rates	2.668%	2.758%
Net receipt ($€25m \times \text{effective interest rate} \times 6/12$)	<u>333,500</u>	<u>344,750</u>

Using a collar

Buy December call at 97.00 for 0.032 and sell December put at 96.50 for 0.123. Net premium received = 0.091.

If interest rates increase to 4.1%

	Buy call	Sell put
Exercise price	97.00	96.50
Futures price	95.74	95.74
Exercise option?	No	Yes
Gain in basis points	–	
	€	
Interest received	462,500	
Loss on exercise		
$(76 \times €25 \times 50)$	(95,000)	
Premium		
$(9.1 \times €25 \times 50)$	11,375	
Net receipt	<u>378,875</u>	
Effective interest rates		3.03%

Alternative solution:

Futures rate	4.26%
Exercise call option at 3%?	No
Exercise put option at 3.5%?	Yes
Loss on option (futures rate 4.26 – 3.5% put rate)	(0.76)%
	%
Interest received	
(4.1 – 0.4)%	3.7
Loss on options	(0.76)
Premium (cost of call – revenue from put)	0.091
Effective interest rates	3.031%
Net receipt (€25m × effective interest rate × 6/12)	378,875

If interest rates fall to 3.1%

	<i>Buy call</i>	<i>Sell put</i>
Exercise price	97.00	96.50
Futures price	96.74	96.74
Exercise option?	No	No
Gain in basis points	–	
	€	
Interest received	337,500	
Loss on exercise	–	
Premium (9.1 × €25 × 50)	11,375	
Net receipt	<u>348,875</u>	
Effective interest rates	2.79%	

Alternative solution:

Futures price	3.26%
Exercise call option at 3%?	No
Exercise put option at 3.5%?	No
	%
Interest received	
(3.1 – 0.4)%	2.7
Premium (cost of call – revenue from put)	0.091
Effective interest rates	2.791%
Net receipt (€25m × effective interest rate × 6/12)	348,875

Summary

	97.00	96.50	<i>Collar</i>
Interest rates rise to 4.1%	3.67%	3.52%	3.03%
Interest rates fall to 3.1%	2.67%	2.76%	2.79%

The collar gives a significantly worse result than either of the options if interest rates rise, because Massie cannot take full advantage of the increase. It is marginally the better choice if interest rates fall.

The recommendation would be to choose the option with the 97.00 exercise price, which has a cheaper premium, unless interest rates are virtually certain to fall.

38 Asteroid Systems

Workbook references. Foreign currency hedging is covered in Chapter 12.

Top tips. At first glance this appears to be a straightforward foreign currency hedging question but there is a twist involved. The money is being remitted to Asteroid Systems rather than the company making a commitment to pay – therefore a reverse money market hedge will be needed.

In part (a) you will have to calculate the two-month rate using an average of the one-month and three-month rates. When using the interest rate parity formula for calculating the acceptable interest rate, remember that you are dealing with a reverse money market hedge – that is, the foreign currency is borrowed in the overseas market, converted at spot rate and then deposited in the domestic market. You are also trying to find the overseas country's interest rate (i_o) rather than the forward rate (f_o).

Remember that you are trying to calculate a two-month rate, therefore you will have to adjust the interest rate parity formula accordingly.

Easy marks. The effects of hedging on cost of capital should offer a fairly easy four marks and the discussion on the treasury department operating as a profit or cost centre should be fairly straightforward.

Examining team's comments. This was not a popular question and only a minority of candidates who attempted it were able to identify the money market requirements and the procedure for setting up a hedge of this type. Whilst straightforward, the calculations focused attention on identifying the minimum Swiss borrowing rate that would make the hedge worthwhile.

The discursive parts of the question asked candidates to discuss the relative merits of money market hedging compared with hedging through the use of exchange-traded derivatives. Good answers focused on the range of hedging instruments available and commonly used in this type of business scenario (currency futures and forex options). Part (c) of the question asked candidates to consider whether hedging of this type would impact on the company's cost of capital. Good answers recognised that this depended on the significance of currency risk in the assessment of a firm's exposure to market risk (in the case of equity) and overall risk (in the case of debt). Many candidates ignored this part of the question.

Common errors in this question were:

- (a) Incorrect estimation of the appropriate forward rate
- (b) Being unable to use the money market hedge in a situation where there is a remittance as opposed to a commitment in the foreign currency concerned
- (c) Not recognising the role of the interest rate parity relationship in determining the minimum acceptable rate for borrowing
- (d) Not appreciating the significance of the correlation between the domestic and the counter currency in determining the potential gains from hedging

Marking scheme

	Marks
(a) Calculation of forward rates	4
Calculation of minimum rate at LIBOR + 7 through reverse money market hedge	5
Conclusion	1
	<u>1</u>
	Max 10
(b) Advantages and disadvantages of OTC versus ET derivatives	2
Basis risk	1
Under/over hedging	1
Counterparty risk	1
Flexibility	1
Margin	1
	<u>1</u>
	6
(c) Impact upon the cost of equity capital	2
Impact upon cost of debt capital	2
	<u>2</u>
	4
(d) One mark per well-explained point	Max <u>5</u>
	<u>25</u>

(a) Money market hedge**Calculate two-month forward rate**

Two-month forward rate is the average of one-month and three-month rates

$$= (1.6223 + 1.6176)/2 = 1.6199 \text{ SFr}/\text{€}$$

Exposure to transaction risk could be eliminated by entering into a forward contract to purchase Swiss francs at a rate of SFr/€1.6199 – that is, you would purchase SFr1.6199 × 1.5 million = SFr2.4299 million.

Use interest rate parity formula to calculate lowest acceptable Swiss borrowing or lending rate.

Interest rate parity:

$$f_o = s_o \frac{(1+i_c)}{(1+i_b)}$$

Where f_o is the forward rate (calculated above as 1.6199)

s_o is the spot rate (1.6244)

i_c is the interest rate in the country overseas (in this case, Switzerland)

i_b is the interest rate in the base country (Germany)

As we are looking for a two-month interest rate, we have to multiply i_c by $(2/12)$ in all cases.

$$1.6199 = 1.6244 \times \frac{1+i_c \times 2/12}{(1+0.03725 \times 2/12)}$$

$$(1+i_c \times 2/12) = \frac{1.6199 \times (1+0.03725 \times 2/12)}{1.6244}$$

$$(1+i_c \times 2/12) = 1.0034$$

$$(i_c \times 2/12) = 0.0034$$

$$i_c = 0.0204 \text{ or } 2.04\%$$

If Asteroid Systems can borrow at less than 2.04% in the Swiss market, the money market hedge will be preferable to selling Swiss francs in the forward market.

(b) **Relative advantages and disadvantages of a money market hedge versus exchange-traded derivatives**

Money market hedge

A money market hedge is the **manufacture of a forward rate** using the spot exchange rate and interest rates of the home and overseas countries. It requires **preferential access** to the short-term money markets and can be a **substitute** for forward contracts.

The **main problems** with a money market hedge are that it is **difficult to reverse** and it can be **relatively expensive**. It is not always possible to construct a money market hedge depending on the currencies with which you are dealing, as you may not be able to get access to the short-term money market in the overseas country.

Exchange-traded derivatives

Exchange-traded derivatives such as futures and options can be set up quickly and closed out easily.

Futures, for example, are normally closed out before maturity with the profit/loss being used to offset the gain or loss in the underlying. These derivatives tend to have **relatively low costs** for small deals and they are **marked to market**; they offer relatively low risk. **Options** offer flexibility in that the holder is **not obliged** to exercise the option on maturity if the market position is such that it would be more profitable not to do so.

However, exchange-traded derivatives are only available for **certain currencies** and offer **few maturity dates**. They are also only available in **fixed amounts** which may mean an **inexact hedge**. In the case of futures, there can also be **cash flow problems** as marking-to-market requires any daily shortfalls to be paid immediately. With exchange-traded options, there will be a premium to be paid which could prove to be expensive for the privilege of flexibility.

Conclusion

For **small, infrequent hedges** the forward market may be more suitable for hedging risk. However, you must take the **costs** of setting up loans and deposits into consideration before making a decision.

(c) **Currency hedging and cost of capital**

Cost of equity

As hedging reduces a firm's exposure to foreign currency risk, there should be a **favourable impact** on the company's **beta value** and hence its cost of equity. The extent of the impact will depend on **the size and importance** of the potential foreign currency exposure and the **correlation of the currency with the market**. If the currency and the company

have the same correlations with the market then the removal of currency risk would have **little or no effect** on the company's cost of capital, as the company's exposure to market risk would not change. The reverse would be true for different correlations with the market and the company's cost of equity would be affected by changes in levels of foreign currency risk.

Cost of debt

The reduction in foreign currency risk may have a **favourable impact** on the company's exposure to **default risk**. The risk of defaulting on debt payments is closely related to the volatility of the company's cash flows – the greater the volatility, the greater will be the default risk. Reduction in foreign currency risk will have a **smoothing effect** on the company's cash flows which will therefore **reduce** the risk of defaulting on debt. This should have a downward impact on the cost of debt and hence the overall cost of capital.

(d) Competence of staff

Local managers may not have sufficient expertise in the area of treasury management to carry out speculative treasury operations competently. Mistakes in this specialised field may be costly. This would make a treasury department more likely to operate as a cost centre.

Controls

Adequate controls must be in place to prevent costly errors and overexposure to risks such as foreign exchange risks in a profit centre.

Information

A treasury department which acts as a profit centre would be competing with other traders employed by major financial institutions who may have better knowledge of the market. In order to compete effectively, the team needs to have detailed and up to date market information.

Attitudes to risk

The more aggressive approach to risk taking may be difficult to reconcile with the attitude to risk that the directors have. The recognition of treasury operations as profit making activities may not fit well with the main business operations of the company.

Internal charges

If the department is to be a true profit centre, then market prices should be charged for its services to other departments. It may be difficult to put realistic prices on some services, such as arrangement of finance or general financial advice.

Performance evaluation

Even with a profit centre approach, it may be difficult to measure the success of a treasury team for the reason that successful treasury activities sometimes involve **avoiding** the incurring of costs, for example when a currency devalues.

39 Casasophia

Workbook references. Net present value (NPV) is covered in Chapter 3 and currency hedging in Chapter 12.

Top tips. In part (a) you are looking for the strategy that maximises receipts for the company. If you are faced with a fraction of a contract when dealing with options, round down and hedge the remainder using a forward contract. Note that the futures contracts will be closed out before expiry therefore you will have to estimate the futures rate (either of the two ways given is acceptable).

Be careful in part (b) as the project is due to start in six months' time rather than the more usual one year's time. This means that you will have to calculate forward rates for six months' time and then go up in increments of one year.

Easy marks. This is quite a challenging question but you should be able to pick up some marks in performing the forward contract and futures contract calculations and adding comments.

Examining team's comments. This question was not done well. In part (a) many students presented adequate calculations of the cash flows using different derivative products but failed to advise adequately (for example although options are generally more expensive they do provide more flexibility). In some cases students had difficulty in calculating an estimate for the basis remaining and occasionally students tried to use money market hedges despite the necessary information not being available in the question.

Few attempts were made to calculate future spot rates based on purchasing power parity for part (b) and some answers just discounted the project in the local currency rather than in euro.

Marking scheme

	Marks
(a) Forward contract calculation	1
Forward contract comment	1
Futures contracts calculations	3
Futures contracts comments	2
Option contracts calculations	4
Option contracts comments	2-3
Conclusion	<u>1</u>
	Max 15
(b) Estimates of forward rates	3
Estimates of present values and net present value in euros	3
Discussion	<u>4-5</u>
	Max <u>10</u> <u>25</u>

(a) Hedging strategy

Forward contract

The company will be receiving US\$ therefore we use US\$1.3623 as the rate.

Receipt in € = US\$20m/1.3623 = €14,681,054

The hedge fixes the rate at €1 = US\$1.3623. This rate is legally binding.

Futures contract

A two-month contract is too short for the required hedge period therefore we must use a five-month contract. The contract will be closed out in four months' time.

Number of contracts = €14,624,159/€125,000 = 117 contracts

You can estimate the futures rate using the five-month price, the spot rate and the four-month forward rate:

We could estimate the number of contracts needed as:

\$'000	€'000	Contract size	No contracts
20,000	1.3698	14,601	125

117

Outcome

The outcome will depend on the spot and future prices, the futures price can be estimated as follows:

	Now	4 months	
5-month future	1.3698	1.3714	balance
Spot rate	1.3618	1.3698	assumed
Basis	$0.0080 \times 1/5 =$	0.0016	
	5 months	1 month remaining	

Assuming that the spot rate in four months is the same as the futures rate, the outcome will be:

	\$'000	€'000	
Actual	\$20,000		
Assumed spot in 4 months		1.3698	(alternative assumptions are possible)
In euros ('000)		<u>€14,601</u>	

Future

Opening	1.3698	to buy
Closing	<u>1.3714</u>	to sell
Ticks	(0.0016)	
Profit ('000)		€17
($117 \times 125,000 \times 0.0016 / \text{spot } 1.3698$)		€14,618
Effective rate (20,000/14,618)		1.3682

Alternative shortcut approach

Opening future rate – closing basis = $1.3698 - 0.0016 = \text{effective rate } 1.3682$

Comments

The futures rate is worse than the forward rate. Futures contracts are marked to market on a daily basis and require margin payments as a result. As with forward contracts, futures contracts fix the rates and are legally binding.

Options

With options the holder has the right but not the obligation to exercise the option (that is, the option will be exercised if it is beneficial to the holder). However, there is a premium to be paid for this flexibility, making options more expensive than futures and forward contracts.

To protect itself against a weakening US\$, Casasophia will purchase euro call options.

Exercise price = \$1.36

Receipts = $\$20m / 1.36 = €14,705,882$

Number of contracts = $€14,705,882 / €125,000 = 117.6$ contracts (117 contracts)

With 117 contracts, receipts = $€125,000 \times 117 = €14,625,000$

Premium payable = $\$0.0280 \times 117 \times 125,000 = \$409,500$ (or $\$409,500 / 1.3585 = €301,435$)

Amount not hedged = $\text{US\$}20m - (117 \times €125,000 \times 1.36) = \text{US\$}110,000$

This amount can be hedged using a 4-month forward contract as follows:

US\$110,000/1.3623 = €80,746

Total receipts = €14,625,000 – €301,435 + €80,746 = €14,404,311

Exercise price = \$1.38

Receipts = \$20m/1.38 = €14,492,754

Number of contracts = €14,492,754/€125,000 = 115.9 contracts (purchase 115 contracts)

With 115 contracts, receipts = €125,000 × 115 = €14,375,000

Premium payable = \$0.0223 × 115 × 125,000 = US\$320,563 (or \$320,563/1.3585 = €235,968)

Amount not hedged = US\$20m – (115 × €125,000 × 1.38) = US\$162,500

This amount can be hedged using a 4-month forward contract as follows:

US\$162,500/1.3623 = €119,284

Total receipts = €14,375,000 – €235,968 + €119,284 = €14,258,316

The receipts from either of the options are considerably lower than those from either the futures contract or the forward contract. This is primarily due to the premiums payable to secure the flexibility that options offer. The US\$ would have to move significantly against the € to allow Casasophia to cover the cost of the premiums.

Conclusion

Based on the calculations above, it is recommended that Casasophia uses forward contracts to hedge against the US\$ depreciating against the € in order to maximise receipts. The company should be aware that once the contract is agreed, the price is fixed and is legally binding. In addition, there is no formal exchange for forward contracts, thus giving rise to default risk.

(b) Project NPV

Expected forward rates (using interest rate parity)

$$F_0 = S_0 \times \frac{(1+i_c)}{(1+i_b)}$$

Year	Forward rate (€1 = MShs)
Half year	$128 \times (1.108/1.022) = 138.77$
	$128 + [(138.77 - 128)/2] = 133.38$
1.5 years	$133.38 \times (1.108/1.022) = 144.60$
2.5 years	$144.60 \times (1.108/1.022) = 156.77$
3.5 years	$156.77 \times (1.108/1.022) = 169.96$

NPV calculation (note that Year 1 actually means 1.5 years from now as project starts in 6 months' time)

Year	1	2	3
Income (MShs, million)	1,500	1,500	1,500
Forward rate	144.60	156.77	169.96
Income (€m)	10.37	9.57	8.82
Discount factor (12%)	0.893	0.797	0.712
DCF	9.26	7.63	6.28

Total present value = €23.17m

Expected spot rate (MShs) in 12 months' time (using purchasing power parity):

$$S_1 = S_0 \times \frac{(1+h_c)}{(1+h_b)}$$

$$S_1 = 116 \times (1 + 0.097)/(1 + 0.012) = 125.74$$

$$\text{In 6 months' time expected spot rate} = 116 + (125.74 - 116)/2 = 120.9$$

$$\text{Total investment required in } \text{€} = \text{MShs}2.64 \text{ billion}/120.9 = \text{€}21.84\text{m}$$

NPV = €1.33m

Will the swap be beneficial for Casasophia?

Forward rates based on interest rate parity show that MShs is depreciating against the € as interest rates are much higher in Mazabia (10.8%) than in the European country (2.2%). However, even with a depreciating MShs the project is still worthwhile (positive NPV).

When forward rates are estimated using purchasing power parity, it is assumed that forward rates will change according to differences between the two countries' inflation rates. If Mazabia's inflation rate is greater than the European country's rate, the MShs will depreciate against the €.

We are told that Mazabia's inflation rate could vary between 5% and 15% over the next few years therefore a swap would appear to be advantageous (as it would fix the future exchange rates). Without the swap there will be uncertainty over the NPV of the project.

Default risk should also be taken into consideration and Casasophia may ask the Government of Mazabia to act as a guarantor in order to reduce the risk.

The grant funding will be provided directly to the Mazabian Government in MShs. It may be worthwhile for Casasophia to explore the possibility of receiving the grant directly in € as this would reduce currency exposure.

40 Buryecs

Workbook references. Foreign currency hedging is covered in Chapter 12.

Top tips. Part (a), 6 marks, this asked for an analysis of the pros and cons of currency swaps. There was clearly the opportunity for some 'text-book' points to be made here but the marking guide caps the marks at 3 if no reference is made to the scenario (eg the swap did not cover the full amount of the currency inflows).

Part (b)(i), 4 marks, this required a brief analysis of the benefits from the swap and explanation of how it would work. There was quite a lot of work to do here for 4 marks, but no issues that have not been seen before in similar interest rate swap questions.

Part (b)(ii), 8 marks, this required an NPV analysis of the project. This required a careful projection of future exchange rates using PPP theory and recognising that exchange rates were being quoted to 1 unit of the foreign currency.

Part (c), 7 marks, this was an assessment of the outcome of using two OTC option contracts. It would have been sensible to assess these against the swap but 5 of the marks were available for simple showing the outcome of the option contracts. Care had to be taken here to understand the currency the option contracts were in and whether calls or puts were needed.

A similar question was set in June 2011.

Examining team comments. In part (c) a large number of candidates showed a lack of understanding when they chose call instead of put options. Many attempted to treat the currency options as if they were exchange traded when they were not. Finally, few candidates discussed whether the currency option is a preferred hedging method to a currency swap, hence many missed out on the marks allocated to this part of the question.

Marking scheme

		Marks
(a)	Advantages	2-3
	Disadvantages	3-4
	Limit marks for (a) to 3 marks in total if answer does not mention Buryecs Co's situation	<u>Max 6</u>
(b)	(i) Recognition that swap gives advantage	1
	Swap mechanism	2
	Net benefit after bank charges	<u>1</u>
		<u>4</u>
	(ii) Exchange rates	2
	Correct translation of amounts swapped	1
	Correct translation of other amounts	1
	Net present value	1
	Gain in € from the swap of the initial fee amount	1
	Comments	<u>2-3</u>
		<u>8</u>
(c)	Put option	1
	\$7.25 option calculations	2
	\$7.75 option calculations	2
	Comments	<u>2-3</u>
		<u>7</u>
		<u>25</u>

(a) The currency swap will involve Buryecs Co taking out a loan in € and making an arrangement with a counterparty in Wirtonia, which takes out a loan in \$. Buryecs Co will pay the interest on the counterparty's loan and vice versa.

Advantages

Payment of interest in \$ can be used to match the income Buryecs Co will receive from the rail franchise, reducing foreign exchange risk.

Buryecs Co will be able to obtain the swap for the amount it requires and may be able to reverse the swap by exchanging with the other counterparty. Other methods of hedging risk may be less certain. The cost of a swap may also be cheaper than other methods of hedging, such as options.

The swap can be used to change Buryecs Co's debt profile if it is weighted towards fixed-rate debt and its directors want a greater proportion of floating rate debt, to diversify risk and take advantage of probable lower future interest rates.

Drawbacks

The counterparty may default. This would leave Buryecs Co liable to pay interest on the loan in its currency. The risk of default can be reduced by obtaining a bank guarantee for the counterparty.

The swap may not be a worthwhile means of hedging currency risk if the exchange rate is unpredictable. If it is assumed that exchange rates are largely determined by inflation rates, the predicted inflation rate in Wirtonia is not stable, making it more difficult to predict future exchange rates confidently. If the movement in the exchange rate is not as expected, it may turn out to have been better for Buryecs Co not to have hedged.

Buryecs Co is swapping a fixed rate commitment in the Eurozone for a floating rate in Wirtonia. Inflation is increasing in Wirtonia and there is a risk that interest rates will increase as a result, increasing Buryecs Co's finance costs.

The swap does not hedge the whole amount of the receipt in Year 3. Another method will have to be used to hedge the additional receipt from the government in Year 3 and the receipts in the intervening years.

If the government decides to impose exchange controls in Wirtonia, Buryecs Co may not be able to realise the receipt at the end of Year 3, but will still have to fulfil the swap contract.

(b) (i)

			Interest rate benefit
	Buryecs Co	Counterparty	
Eurozone	4.0%	5.8%	1.8%
Wirtonia	Bank rate + 0.6%	Bank rate + 0.4%	0.2%
Gain on swap (60:40)	1.2%	0.8%	2.0%
Bank fee (60:40)	(0.3%)	(0.2%)	(0.5%)
Gain on swap after bank fee	<u>0.9%</u>	<u>0.6%</u>	<u>1.5%</u>

The swap arrangement will work as follows:

	Buryecs Co	Counterparty
Buryecs Co borrows at	4.0%	
Counterparty borrows at		Bank rate + 0.4%
Swap		
Counterparty receives		(Bank rate)
Buryecs Co pays	Bank rate	
Counterparty pays		4.6%
Buryecs Co receives	(4.6%)	
Advantage	120 basis points	80 basis points
Net result	Bank rate - 0.6%	5.0%

After paying the 30 point basis fee, Buryecs Co will effectively pay interest at the bank rate - 0.3% and benefit by 90 basis points or 0.9%. The counterparty will effectively pay interest at 5.2% and benefit by 60 basis points or 0.6%.

(ii) Using the purchasing power parity formula to calculate exchange rates:

$$S_t = S_0 \times (1 + h_c) / (1 + h_b)$$

Year	1	2	3
	$0.1430 \times 1.06 / 1.03$ = 0.1472	$0.1472 \times 1.04 / 1.08$ = 0.1417	$0.1417 \times 1.03 / 1.11$ = 0.1315

At Year 3, \$5,000 million will be exchanged at the original spot rate as per the agreement and the remaining inflows will be exchanged at the Year 3 rate.

Year	0	1	2	3
	\$m	\$m	\$m	\$m
Initial fee	(5,000)			
Payment at end of franchise				7,500
Annual income		600	600	600
Year 0 Exchange rate	0.1430			
Years 1–3 Exchange rates		0.1472	0.1417	0.1315
	€m	€m	€m	€m
Swap translated at 0.1430	(715)			715
Amount not covered by swap				
(7,500 – 5,000) translated at				
0.1315				329
Annual income		88	85	79
Cash flows in home country	(715)	88	85	1,123
Discount factor 14%	1.000	0.877	0.769	0.675
Present value	(715)	77	65	758

The net present value of the project is €185 million, indicating that it should go ahead. However, the value is dependent on the exchange rate, which is worsening for the foreign income. If there are also uncertainties about the variability of returns during the three years, the directors may consider the project to be in excess of their risk appetite and decline the opportunity.

As a result of the exchange rates on the initial fee being fixed at the year 0 spot rate, Buryecs Co has gained $\$5,000m \times (0.1430 - 0.1315) \times 0.675 = €39m$.

(c) Receipt using swap arrangement = €715m + €329m = €1,044m

Receipt if transaction unhedged = \$7,500m $\times 0.1315 = €986m$

Predicted exchange rate at year 3 is €0.1315 = \$1 or \$7.6046 = €1

Options

Buy \$ put options as receiving \$.

\$7.75 exercise price

Do not exercise

Net receipt = €986m – (1.6% \times \$7,500m $\times 0.1430$) = €969m

\$7.25 exercise price

Exercise

Receipt from government = \$7,500m/7.25 = €1,034m

Net receipt = €1,034m – (2.7% \times \$7,500m $\times 0.1430$) = €1,005m

The \$7.25 option gives a better result than not hedging, given the current expectations of the exchange rate. However, it gives a worse result than the swap even before the premium is deducted, because of the exchange rate being fixed on the swap back of the original amount paid. These calculations do not take into account possible variability of the finance costs associated with the swap, caused by swapping into floating rate borrowing.

41 Alecto

Workbook references. Interest rate hedging is covered in Chapter 13.

Top tips. Remember that interest rate hedging involves finding the best interest rate whilst protecting yourself against interest rate movements. You are told that interest rates can move by 0.5% in either direction, therefore you really have six calculations to do in part (b) – three techniques with two interest rate movements. Use the tabular approach demonstrated in the Study Text as far as possible.

When tackling hedging questions on interest rates establish immediately whether the company is borrowing or lending. This will help when trying to decide whether it should be buying or selling contracts.

Make sure that you set-up the contracts correctly as your marks will be capped to a low level if you get this wrong.

You do not have to tackle the hedging techniques in the order given in the question – just make sure you label your workings to make it clear which technique you are dealing with. Remember that the net cost of a future when the interest rate rises or falls should be the same (subject to rounding).

As the company is borrowing money and is using a collar, it should buy a put (the right to sell a future) and sell a call. The put will be at the higher interest rate (and the lower strike price) and the call will be at the lower interest rate (the higher strike price).

Whilst the calculations in part (b) may seem quite long, remember that you can use a number of the figures you calculated early on in your later calculations (such as expected futures price) – don't rework these calculations as you will just be wasting valuable time.

Easy marks. You should be able to pick up some relatively straightforward marks in part (c) – you should know what basis risk is.

Marking scheme

		Marks
(a)	Discussion of the main advantage	2
	Discussion of the main disadvantage	2
		4
(b)	Recommendation to go short if futures are used and purchase puts if options are used	1
	Calculation of number of contracts and remaining basis	2
	Futures contracts calculations	4
	Options contracts calculations	4
	Collar approach and calculations	4
	Supporting comments and conclusion	2-3
		Max 17
(c)	Explanation of basis risk	2-3
	Effect of basis risk on recommendation made	2-3
		Max 4

(a) An interest rate collar involves the purchase of a **put option** and the **simultaneous selling of a call option** at different exercise prices. The main advantage is that it is **cheaper** than just purchasing the put option. This is because the premium received from selling the call option reduces the higher premium payable for the put option.

The main disadvantage is that the **benefit** from any upside movement in interest rates is **capped** by the sale of the call option. With just the put option, the full upside benefit would be realised.

(b) **Futures**

As Alecto is looking to protect against a rise in interest rates it needs to sell futures. As the borrowing is required on 1 May, June contracts are needed.

No of contracts needed = $\frac{\text{€22,000,000}}{\text{€1,000,000}} \times \frac{5}{3} \text{ months} = 36.67$

Need 37 contracts

Basis

Current price (1 Jan) – futures price = basis

$100 - 3.3 - 96.16 = 0.54$

Unexpired basis = $2/6 \times 0.54 = 0.18$

	<i>Interest rates increase to 3.8%</i>	<i>Interest rates decrease to 2.8%</i>
Cost of borrowing	$(3.8\% + 0.8\%) \times \frac{5}{12} \times \text{€22m}$	$(2.8\% + 0.8\%) \times \frac{5}{12} \times \text{€22m}$
Expected futures price	$100 - 3.8 - 0.18$	$100 - 2.8 - 0.18$
Gain/loss on futures market	$(9,616 - 9,602) \times \frac{€25}{37}$	$(9,616 - 9,702) \times \frac{€25}{37}$
Net cost	€408,717	€409,550
Effective interest rate	$408,717/22\text{m} \times \frac{12}{5}$	$409,550/22\text{m} \times \frac{12}{5}$

The difference in interest rates comes from the rounding of the contracts.

Using options on futures

As Alecto is looking to protect against a rise in interest rates it needs to buy June put options. As before 37 contracts are needed.

<i>Interest rates</i>	<i>Increase to 3.8%</i>	<i>Decrease to 2.8%</i>
Put option exercise price	4%	3.5%
June futures price	3.98%	3.98%
Exercise option?	No	Yes
Gain	–	0.48%
	%	%
Actual interest cost	(4.60)	(4.60)
Value of option gain	–	0.48
Premium	(0.16)	(0.58)
Net cost of loan	<u>(4.76)</u>	<u>(4.70)</u>
	%	%
	(3.60)	(3.60)
	–	–
	(0.16)	(0.58)
	<u>(3.76)</u>	<u>(4.18)</u>

In each case the cost in euros can be calculated as interest rate $\times \frac{5}{12} \times$ size of loan eg $0.0476 \times \frac{5}{12} \times 22\text{m} = 436,333$ euros.

Using a collar

Buy June put at 96.00 for 0.163 and sell June call at 96.50 for 0.090. Net premium payable = 0.073. As before 37 contracts are required.

If interest rates increase to 3.8%

	<i>Buy put</i>	<i>Sell call</i>
Exercise price	4%	3.5%
June futures price	3.98%	3.98%
Exercise option?	No	No
	%	
Actual interest cost	(4.60)	
Value of option gain	–	
Premium	(0.07)	
Net cost of loan	<u>(4.67)</u>	

If interest rates decrease to 2.8%

	<i>Buy put</i>	<i>Sell call</i>
Exercise price	4%	3.5%
June futures price	2.98%	2.98%
Exercise option?	No	Yes
	%	
Actual interest cost	(3.60)	
Value of option loss	(0.52)	
Premium	(0.07)	
Net cost of loan	<u>(4.19)</u>	

The cost in euros can be calculated as interest rate \times 5/12 \times size of loan ie $0.0419 \times 5/12 \times 22m = 384,083$ euros.

If the interest rate futures market is used, the interest cost will be fixed at 4.47%, but if options on futures or an interest rate collar is used the cost will change. If interest rates were to fall then the options hedge gives the more favourable rates. However, if interest rates rise, then the futures hedge gives the lowest interest cost and the options hedge has the highest cost. If Alecto wants to fix its interest rate irrespective of the circumstances, then the futures hedge should be selected.

This recommendation does not include margin payments or other transaction costs, which should be considered in full before a final decision is made.

(c) **Basis risk** arises from the fact the price of a futures contract may not move as expected in relation to the value of the instrument being hedged. Basis changes do occur and thus represent potential profits/losses to investors. Basis risk is the **difference between the spot and futures prices** and so there is no basis risk where a futures contract is held until maturity. In this case, however, the June contracts are closed two months before expiry and there is no guarantee that the price of the futures contract will be the same as the predicted price calculated by basis at that date. It is assumed that the unexpired basis above is 0.18 but it could be either more or less.

This creates a problem in that the futures contract, which in theory gives a fixed interest cost, may vary and therefore the amount of interest is not fixed or predictable. Typically, this risk is much smaller than the risk of **remaining unhedged** and therefore the impact of this risk is smaller and **preferable** to not hedging at all.

Workbook references. Interest rate hedging is covered in Chapter 13.

Examining team's comments. Part (a) looked at hedging an investment that was going to be made in a few months' time using interest rate FRAs, futures and options. Responses to this part of the question were mixed. Some responses made more fundamental errors like going short in futures, purchasing put options or choosing the incorrect contract month (June instead of March), and therefore limiting the number of marks that were awarded.

Few responses were able to calculate the basis correctly.

A number of responses chose the incorrect FRA rate.

The discussion of the outcomes tended to be general, as opposed to specifically relating to the scenario, and therefore the recommendation tended to be general as well. At this level it is important for candidates to recognise that contextualised discussion and conclusion will result in higher marks.

The presentation quality of the responses tended to be mixed. Some candidates' answers were presented well, while others were presented in a haphazard way without any coherent flow. This made it very difficult for markers to award marks.

Responses to part (b) of the question were generally weak.

Marking scheme

	Marks
(a) Calculation of impact of FRA for interest rate increase and decrease	4
Decision to go long on futures	1
Selection of March futures and options	1
Unexpired basis calculation	1
Impact of interest rates increase/decrease with futures	4
Decision to buy call options	1
Impact of interest rates increase/decrease with options	5
Discussion	<u>2–3</u>
	Max <u>19</u>
(b) 1–2 marks per well-explained point	Max <u>6</u>
	<u>25</u>

(a) Using FRAs

FRA rate 4.82% (3–7), since the investment will take place in 3 months' time for a period of 4 months.

If interest rates increase by 0.9% to 4.99%

Investment return = $4.79\% \times 4/12 \times \$48,000,000 =$	\$766,400
Payment to Voblaka Bank = $(4.99\% - 4.82\%) \times \$48,000,000 \times 4/12 =$	\$[27,200]
Net receipt =	\$739,200
Effective annual interest rate = $739,200/48,000,000 \times 12/4 =$	4.62%

If interest rates decrease by 0.9% to 3.19%

Investment return = $2.99\% \times 4/12 \times \$48,000,000 =$	\$478,400
Receipt from Voblaka Bank = $(4.82\% - 3.19\%) \times \$48,000,000 \times 4/12 =$	\$260,800
Net receipt =	\$739,200
Effective annual interest rate (as above)	4.62%

Using futures

Need to hedge against a fall in interest rates, therefore go long in the futures market. Awan Co needs March contracts as the investment will be made on 1 February.

No. of contracts needed = $\$48,000,000/\$2,000,000 \times 4 \text{ months}/3 \text{ months} = 32 \text{ contracts.}$

Basis

Current price (on 1/11) – futures price = total basis

$(100 - 4.09) - 94.76 = 1.15$

Unexpired basis = $2/5 \times 1.15 = 0.46$

If interest rates increase by 0.9% to 4.99%

Investment return (from above) =	\$766,400
Expected futures price = $100 - 4.99 - 0.46 =$	94.55
Loss on the futures market = $(0.9455 - 0.9476) \times \$2,000,000 \times 3/12 \times 32 =$	\$(33,600)
Net return =	\$732,800
Effective annual interest rate = $\$732,800/\$48,000,000 \times 12/4 =$	4.58%

If interest rates decrease by 0.9% to 3.19%

Investment return (from above) =	\$478,400
Expected futures price = $100 - 3.19 - 0.46 = 96.35$	
Gain on the futures market = $(0.9635 - 0.9476) \times \$2,000,000 \times 3/12 \times 32 =$	\$254,400
Net return =	\$732,800
Effective annual interest rate (as above) =	4.58%

Using options on futures

Need to hedge against a fall in interest rates, therefore buy call options. As before, Awan Co needs 32 March call option contracts ($\$48,000,000/\$2,000,000 \times 4 \text{ months}/3 \text{ months}$).

If interest rates increase by 0.9% to 4.99%

Exercise price	94.50	95.00
Futures price	94.55	94.55
Exercise?	Yes	No
Gain in basis points	5	0
Underlying investment return (from above)	\$766,400	\$766,400
Gain on options ($0.0005 \times 2,000,000 \times 3/12 \times 32, 0$)	\$8,000	\$0
Premium		
$0.00432 \times \$2,000,000 \times 3/12 \times 32$	\$69,120	
$0.00121 \times \$2,000,000 \times 3/12 \times 32$		\$(19,360)
Net return	\$705,280	\$747,040
Effective interest rate	4.41%	4.67%

If interest rates decrease by 0.9% to 3.19%

Exercise price	94.50	95.00
Futures price	96.35	96.35
Exercise?	Yes	Yes
Gain in basis points	185	135
Underlying investment return (from above)	\$478,400	\$478,400
Gain on options		
($0.0185 \times 2,000,000 \times 3/12 \times 32$)	\$296,000	
($0.0135 \times 2,000,000 \times 3/12 \times 32$)		\$216,000
Premium		
As above	\$(-69,120)	
As above		\$(-19,360)
Net return	\$705,280	\$675,040
Effective interest rate	4.41%	4.22%

Discussion

The FRA offer from Voblaka Bank gives a slightly higher return compared to the futures market; however, Awan Co faces a credit risk with over-the-counter products like the FRA, where Voblaka Bank may default on any money owing to Awan Co if interest rates should fall. The March call option at the exercise price of 94.50 seems to fix the rate of return at 4.41%, which is lower than the return on the futures market and should therefore be rejected. The March call option at the exercise price of 95.00 gives a higher return compared to the FRA and the futures if interest rates increase, but does not perform as well if the interest rates fall. If Awan Co takes the view that it is more important to be protected against a likely fall in interest rates, then that option should also be rejected. The choice between the FRA and the futures depends on Awan Co's attitude to risk and return; the FRA gives a small, higher return, but carries a credit risk. If the view is that the credit risk is small and it is unlikely that Voblaka Bank will default on its obligation, then the FRA should be chosen as the hedge instrument.

(b) The delta value measures the extent to which the value of a derivative instrument, such as an option, changes as the value of its underlying asset changes. For example, a delta of 0.8 would mean that a company would need to purchase 1.25 option contracts ($1/0.8$) to hedge against a rise in price of an underlying asset of that contract size, known as the hedge ratio. This is because the delta indicates that when the underlying asset increases in value by \$1, the value of the equivalent option contract will increase by only \$0.80.

The option delta is equal to $N(d_1)$ from the Black-Scholes option pricing formula. This means that the delta is constantly changing when the volatility or time to expiry change. Therefore even when the delta and hedge ratio are used to determine the number of option contracts needed, this number needs to be updated periodically to reflect the new delta.

43 Wardegul

Workbook references. Interest rate risk and hedging are covered in Chapter 13.

Top tips. If you are familiar with interest rate hedging using derivatives, this should be a relatively straightforward question. Use the BPP proforma for setting up futures and options to ensure you do not forget any of the steps.

In part (b) read the question and its requirements carefully; in this question, many candidates misread the question and answered it in terms of national or global functions, some without even mentioning regional functions, which was asked for in the question. These answers indicated the question had not been properly understood, and candidates mistakenly reproduced their textbook knowledge of centralised (global) versus decentralised (country) treasury functions instead of applying their knowledge to the question asked.

Easy marks. Part (a) is a commonly examined area, offering an opportunity to show your knowledge of this area.

Examining team's comments. Part a) Some candidates omitted to identify which hedging instruments they had chosen for example, a buy vs sell futures or a put vs call options, making it difficult for markers to award marks. A number of candidates omitted to discuss their results and/or make a recommendation meaning that they could not be awarded these marks.

Marking scheme

		Marks
(a)	Impact of FRA for rate increase and decrease	2
	Go long on futures	1
	Selection of March futures and options	1
	Number of contracts	1
	Basis calculation	1
	Impact of interest rate increase/decrease with futures	3
	Buy call options	1
	Premium calculations	1
	Exercise options?	1
	Impact of interest rate increase/decrease with options	3
	Discussion	<u>3–4</u>
		Max 18
(b)	Regional functions compared with national functions	4–5
	Regional functions compared with global function	<u>3–4</u>
		Max <u>7</u> <u>25</u>

(a) Forward rate agreement

FRA 5.02% (4–9) since the investment will take place in four months' time for a period of five months.

If interest rates increase by 1.1% to 5.3%

	D
Investment return $5.0\% \times 5/12 \times D27,000,000$	562,500
Payment to bank $(5.3\% - 5.02\%) \times 5/12 \times D27,000,000$	<u>(31,500)</u>
Net receipt	<u>531,000</u>
Effective annual interest rate $531,000/27,000,000 \times 12/5$	4.72%

If interest rates fall by 0.6% to 3.6%

	D
Investment return $3.3\% \times 5/12 \times D27,000,000$	371,250
Receipt from bank $(5.02\% - 3.6\%) \times 5/12 \times D27,000,000$	<u>159,750</u>
Net receipt	<u>531,000</u>
Effective annual interest rate as above	4.72%

Futures

Go long in the futures market, as the hedge is against a fall in interest rates. Use March contracts, as investment will be made on 31 January.

Number of contracts = D27,000,000/D500,000 × 5 months/3 months = 90 contracts

Basis

Current price (1 October) – futures price = basis

$$(100 - 4.20) - 94.78 = 1.02$$

Unexpired basis on 31 January = 2/6 × 1.02 = 0.34

If interest rates increase by 1.1% to 5.3%

	D
Investment return as above	562,500
Expected futures price: 100 – 5.3 – 0.34 = 94.36	
Loss on the futures market: (0.9436 – 0.9478) × D500,000 × 3/12 × 90	(47,250)
Net return	<u>515,250</u>
Effective annual interest rate 515,250/27,000,000 × 12/5	4.58%

If interest rates fall by 0.6% to 3.6%

	D
Investment return as above	371,250
Expected futures price: 100 – 3.6 – 0.34 = 96.06	
Profit on the futures market: (0.9606 – 0.9478) × D500,000 × 3/12 × 90	144,000
Net receipt	<u>515,250</u>
Effective annual interest rate as above	4.58%

Options on futures

Buy call options as need to hedge against a fall in interest rates. As above, 90 contracts required.

If interest rates increase by 1.1% to 5.3%

	94.25	95.25
Exercise price	94.25	95.25
Futures price as above	94.36	94.36
Exercise?	Yes	No
Gain in basis points	11	0
	D	D
Investment return (as above)	562,500	562,500
Gain from options (0.0011 × 500,000 × 3/12 × 90)	12,375	0
Premium		
0.00545 × D500,000 × 3/12 × 90	(61,313)	
0.00098 × D500,000 × 3/12 × 90		(11,025)
Net return	<u>513,562</u>	<u>551,475</u>
Effective interest rate		
513,562/27,000,000 × 12/5	4.56%	
551,475/27,000,000 × 12/5		4.90%

If interest rates fall by 0.6% to 3.6%

Exercise price	94.25	95.25
Futures price as above	96.06	96.06
Exercise?	Yes	Yes
Gain in basis points	181	81
Investment return (as above)	371,250	371,250
Gain from options		
Gain from options: $0.0181 \times D500,000 \times 3/12 \times 90$	203,625	
Gain from options: $0.0081 \times D500,000 \times 3/12 \times 90$		91,125
Premium as above	<u>(61,313)</u>	<u>(11,025)</u>
Net return	<u>513,562</u>	<u>451,350</u>
Effective interest rate		
$513,562/27,000,000 \times 12/5$	4.56%	
$451,350/27,000,000 \times 12/5$		4.01%

Alternative presentation of calculations:

Forward rate agreement:

FRA 5.02% (4–9) since the investment will take place in 4 months' time and last for 5 months.

Possible scenarios:	Rates rise by 1.1%	Rates fall by 0.6%
Base rate (now = 4.2%)	5.3%	3.6%
Return on investment (Base – 0.3%)	5.0%	3.3%
Impact of FRA (5.02% vs Base)	(0.28%)	1.42%
Net outcome as %	4.72%	4.72%
In Ds (% $\times D27,000,000 \times 5/12$)	531,000	531,000

Futures agreement:

March contracts to buy at 94.78 or 5.22% ($100 - 94.78$) are needed to cover the start of the investment (31 January). The number of contracts required will be $D27m / D0.5m$ contract size \times 5 months (investment term) divided by 3 months (contract term) = 90.

Opening basis on 1 Oct: future – base = 5.22% – 4.20% = 1.02% with 6 months to expiry of March future.

Estimated closing basis on 31 January = $1.02\% \times 2/6 = 0.34\%$ with 2 months to expiry of March future.

So if rates rise to a base rate of 5.3% the estimated futures price is $5.3\% + 0.34\% = 5.64\%$.

If rates fall to a base rate of 3.6% the estimated futures price is $3.6\% + 0.34\% = 3.94\%$.

Possible scenarios:	Rates rise by 1.1%	Rates fall by 0.6%
Base rate (now = 4.2%)	5.3%	3.6%
Return on investment (Base – 0.3%)	5.0%	3.3%
Impact of Future:		
Opening rate 1 Oct (to receive)	5.22%	5.22%
Closing rate 31 January (to pay)	<u>5.64%</u>	<u>3.94%</u>
Net outcome on future	<u>(0.42%)</u>	<u>1.28%</u>
Overall net outcome (actual + future)	4.58%	4.58%
In Ds (% $\times D27,000,000 \times 5/12$)	515,250	515,250

Options agreement:

March call options at 5.75% (94.25) or 4.75% (95.25) can be chosen. There is an argument for either, this solution illustrates the outcome if 4.75% is chosen, which is the rate closest to the current base rate and provides compensation if interest rates fall at a lower premium compared to the 5.75% rate. Again 90 contracts will be needed, and contracts are closed out against the futures price on 31 January.

Possible scenarios:	Rates rise by 1.1%	Rates fall by 0.6%
Base rate (now = 4.2%)	5.3%	3.6%
Return on investment (Base – 0.3%)	5.0%	3.3%

Impact of Future:

Call option rate 1 Oct	4.75%	4.75%
Closing rate 31 January (to pay)	<u>5.64%</u>	<u>3.94%</u>
Net outcome on future	Do not exercise	0.81%
Premium	(0.098)%	(0.098)%
Outcome (actual + option– premium)	4.902%	4.012%
In Ds (% × D27,000,000 × 5/12)	551,475	451,350

Discussion

The forward rate agreement gives the highest guaranteed return. If Wardegul Co wishes to have a certain cash flow and is primarily concerned with protecting itself against a fall in interest rates, it will most likely choose the forward rate agreement. The 95.25 option gives a better rate if interest rates rise, but a significantly lower rate if interest rates fall, so if Wardegul Co is at all risk averse, it will choose the forward rate agreement.

This assumes that the bank which Wardegul Co deals with is reliable and there is no risk of default. If Wardegul Co believes that the current economic uncertainty may result in a risk that the bank will default, the choice will be between the futures and the options, as these are guaranteed by the exchange. Again the 95.25 option may be ruled out because it gives a much worse result if interest rates fall to 3.6%. The futures give a marginally better result than the 94.25 option in both scenarios but the difference is small. If Wardegul Co feels there is a possibility that interest rates will be higher than 5.41%, the point at which the 94.25 option would not be exercised, it may choose this option rather than the future.

(b) Regional functions compared with national functions

Organising treasury activities on a regional basis would be consistent with what is happening in the group overall. Other functions will be organised regionally. A regional treasury function may be able to achieve synergies with them and also benefit from information flows being organised based on the regional structure.

If, as part of a reorganisation, some treasury activities were to be devolved outside to a bank or other third party, it would be simpler to arrange for a single provider on a regional basis than arrange for separate providers in each country.

A regional function will avoid duplication of responsibilities over all the countries within a region. A regional function will have more work to do, with maybe a greater range of activities, whereas staff based nationally may be more likely to be under-employed. There may be enough complex work on a regional basis to justify employing specialists in particular treasury areas which will enhance the performance of the function. It may be easier to recruit these specialists if recruitment is done regionally rather than in each country.

Regional centres can carry out some activities on a regional basis which will simplify how funds are managed and mean less cost than managing funds on a national basis. These include pooling cash, borrowing and investing in bulk, and netting of foreign currency income and expenditure.

Regional centres could in theory be located anywhere in the region, rather than having one treasury function based in each country. This means that they could be located in the most important financial centres in each region or in countries which offered significant tax advantages.

From the point of view of Warde gul Co's directors and senior managers, it will be easier to enforce common standards and risk management policies on a few regional functions than on many national functions with differing cultures in individual countries.

Regional functions compared with global function

Warde gul Co is being reorganised on a regional basis because of the demands of its global expansion. As discussed above, reorganising treasury functions regionally will be consistent with the way other functions are organised. Reorganising the treasury function regionally will be one way of dealing with the problem of having a single, overstretched, global function.

A regional function could employ experts with knowledge of the regulations, practices and culture of the major countries within the region. It may be more difficult for a global function to recruit staff with local expertise.

There may be practical issues why individual countries prefer to deal with regional functions rather than a global function, for example, a regional function will be based in the same, or similar, time zone as the countries in its region.

A regional function may have better ideas of local finance and investment opportunities. There may, for example, be better alternatives for investment of the surplus funds than the centralised function has been able to identify.

44 Keshi

Workbook references. Treasury management is covered in Chapter 11 and interest rate hedging is covered in Chapter 13.

Top tips. Do not be put off this question if you are unsure of part (b) but are comfortable with interest rate hedging questions. Remember to lay out your calculations in an easy to follow way. You can also work in percentage terms, which is easier than working in monetary amounts.

For part (c) don't spend too long on this if you aren't sure what a Salam contract is.

Easy marks. You should be able to pick up some relatively straightforward marks in part (a) for the option calculations. Ensure your recommendation is based on your calculations.

Marking scheme

	Marks
(a) Buy put options and number of contracts	1
Future prices if interest rates rise or fall	1
Option contract calculations for any exercise price	3
Second set of option calculations if provided	1
Swap and resulting advantage	2
Swap impact	2
Effective borrowing rate	2
Discussion and recommendation	<u>3-4</u>
	Max 15

		Marks
(b)	Discussion of merits of centralising Discussion of merits of decentralising	3–4 2–3 Max 6
(c)	1–2 marks per well-explained point	Max <u>4</u> <u>25</u>

(a) Options

Keshi needs to hedge against a rise in interest rates, therefore it needs to buy **put options**.

Keshi Co needs 42 March put option contracts ($\$18,000,000/\$1,000,000 \times 7 \text{ months}/3 \text{ months}$).

Basis

Current March futures price – spot price = total basis = 44 basis points as at 1 December

Unexpired basis as at 1 February = 22 **or 0.22% (given in the question)**

If 95.50 options (ie 4.5%) are used:

	<i>Rates fall</i> – 0.5% %	<i>Rates rise</i> + 0.5% %
LIBOR rate (currently 3.8%)	3.3	4.3
Borrowing rate for Keshi	3.7	4.7
Closing future LIBOR + basis of 0.22%	3.52	4.52
Exercise option at 4.5%?	No	Yes
	<i>Rates fall</i> – 0.5% (0.662)	<i>Rates rise</i> + 0.5% (0.662)
Premium	(0.662)	0.02
Option gain/(loss)		
Net effective annual interest rate	4.362%	5.342
	$(3.7 + 0.662)$	$(4.7 + 0.662 - 0.02)$

Alternative solution:

Expected futures price on 1 February if interest rates increase by 0.5% =

$$100 - (3.8 + 0.5) - 0.22 = 95.48$$

Expected futures price on 1 February if interest rates decrease by 0.5% =

$$100 - (3.8 - 0.5) - 0.22 = 96.48$$

If interest rates increase by 0.5% to 4.3%

Exercise price 95.50

Futures price 95.48

Exercise? Yes

Gain in basis points 2

Underlying cost of borrowing

$$4.7\% \times 7/12 \times \$18,000,000 = \$493,500$$

Gain on options

$$0.0002 \times \$1,000,000 \times 3/12 \times 42 = \$2,100$$

Premium

$$0.00662 \times \$1,000,000 \times 3/12 \times 42 = \$69,510$$

Net cost \$560,910

Effective interest rate **5.342%** ($560,910 / 18,000,000 \times 12/7$)

If interest rates decrease by 0.5% to 3.3%

Exercise price 95.50

Futures price 96.48

Exercise? No

Underlying cost of borrowing

$$3.7\% \times 7/12 \times \$18,000,000 = \$388,500$$

Premium \$69,510

Net cost \$458,010

Effective interest rate **4.362%** ($458,010 / 18,000,000 \times 12/7$)

Using swaps

Keshi will want to swap into fixed rate finance in order to hedge the risk of interest rates rising.

With this type of swap the outcome will be as follows:

Keshi Co

No swap: (5.5%)

Swap:

Loan (LIBOR + 0.4%)

Fixed rate paid (4.6%)

Floating rate received LIBOR + 0.3%

Net cost pre-fee (4.7%)

Total gain (5.5 vs 4.7) 0.8%

Gain to Keshi (70% of 0.8) 0.56%

Outcome pre-fees (5.5 – 0.56) 4.94%

Outcome post-fees (4.94 + 0.1) **5.04%**

Discussion and recommendation

Under each choice the interest rate cost to Keshi Co will be as follows:

	<i>Doing nothing</i>	<i>95.50 option</i>	<i>Swap</i>
If rates increase by 0.5%	4.7% floating;	5.342%	5.04%
	5.5% fixed		
If rates decrease by 0.5%	3.7% floating;	4.362%	5.04%
	5.5% fixed		

Borrowing at the floating rate and undertaking a **swap** effectively fixes the rate of interest at 5.04% for the loan, which is **significantly lower than the market fixed rate of 5.5%**.

On the other hand, **doing nothing** and borrowing at the floating rate minimises the interest rate at 4.7%, against the next best choice which is the swap at 5.04% if interest rates increase by 0.5%. And, should interest rates decrease by 0.5%, then doing nothing and borrowing at a floating rate of 3.7% minimises cost, compared to the next best choice which is the 95.50 option.

On the face of it, **doing nothing and borrowing at a floating rate seems to be the better choice** if interest rates increase or decrease by a small amount, but if interest rates increase substantially then this choice will no longer result in the lowest cost.

The swap minimises the variability of the borrowing rates, while doing nothing and borrowing at a floating rate maximises the variability. If Keshi Co wants to eliminate the risk of interest rate fluctuations completely, then it should borrow at the floating rate and swap it into a fixed rate.

(b) A **centralised** treasury department should be able to evaluate the financing requirements of Keshi Co's group as a whole and it may be able to **negotiate better rates when borrowing in bulk**. The department could operate as an internal bank and undertake **matching** of funds. Therefore it could transfer funds from subsidiaries which have spare cash resources to ones which need them, and thus **avoid going into the costly external market to raise funds**.

The department may be able to undertake **multilateral internal netting** and thereby reduce costs related to hedging activity. **Experts** and resources within one location could **reduce duplication costs**.

The concentration of experts and resources within one central department may result in a **more effective decision-making** environment and higher quality risk monitoring and control. Further, having access to the Keshi Co group's entire cash funds may give the company access to larger and more diverse investment markets.

Decentralising Keshi Co's treasury function to its subsidiary companies may be beneficial in several ways. Each subsidiary company may be better placed to take **local regulations and customs** into consideration. An example is the case of Suisen Co's need to use Salam contracts instead of conventional derivative products which the centralised treasury department may use as a matter of course.

Giving subsidiary companies more **autonomy** over how they undertake their own fund management may result in increased **motivation** and effort from the subsidiary's senior management and thereby increase future income. Subsidiary companies which have access to their own funds may be able to respond to opportunities **quicker** and establish competitive advantage more effectively.

(c) Islamic principles stipulate the need to avoid uncertainty and speculation. In the case of Salam contracts, payment for the commodity is made at the start of the contract. The buyer and seller of the commodity know the price, the quality and the quantity of the commodity and the date of future delivery with certainty. Therefore, **uncertainty and speculation** are avoided.

On the other hand, futures contracts are marked to market daily and this could lead to uncertainty in the amounts received and paid every day. Furthermore, **standardised futures contracts have fixed expiry dates and predetermined contract sizes**.

This may mean that the underlying position is not hedged or covered completely, leading to limited speculative positions even where the futures contracts are used entirely for hedging purposes.

Finally, only a few commodity futures contracts are offered to cover a range of different quality grades for a commodity, and therefore price movement of the futures market may not be completely in line with the price movement in the underlying asset.

(Note. Credit will be given for alternative, relevant discussion for parts (b) and (c).)

45 Daikon

Workbook references. Interest rate hedging is covered in Chapter 13.

Easy marks. You should be able to pick up some relatively straightforward marks in part (a) for the option calculations. Ensure your recommendation is based on your calculations.

Examining team's comments. Part (b) was done unsatisfactorily by most candidates. Very few candidates got the calculations of the marked to market correct. What was required was to identify the change in ticks or basis points and multiply the three numbers together.

Marking scheme

	Marks
(a) Additional interest cost	1
Contract types	1
Number of contracts and remaining basis	2
Futures calculations	1
Options calculations	4
Collar	4
Comments and conclusion	<u>3</u>
	Max 15
(b) Marked to market calculations	3
Impact of daily marked to market	3
Impact of margin requirements	3
Impact of selling options instead of exercising	<u>3</u>
	Max <u>10</u> <u>25</u>

(a) Borrowing period is 6 months (11 months – 5 months).

Current borrowing cost = $\$34,000,000 \times 6 \text{ months} / 12 \text{ months} \times 4.3\% = \$731,000$

Borrowing cost if interest rates increase by 80 basis points (0.8%) = $\$34,000,000 \times 6 / 12 \times 5.1\% = \$867,000$

Additional cost = $\$136,000 [\$34,000,000 \times 6 / 12 \times 0.8\%]$

Using futures to hedge

Need to hedge against a rise in interest rates, therefore go short (contracts to sell) in the futures market.

Borrowing period is 6 months

No. of contracts needed = $\$34,000,000 / \$1,000,000 \times 6 \text{ months} / 3 \text{ months} = 68 \text{ contracts.}$

Basis

Current price (on 1 June 20X5) – futures price = total basis

$(100 - 3.6) - 95.84 = 0.56$

Unexpired basis (at beginning of November) = $2 / 7 \times 0.56 = 0.16$

Assume that interest rates increase by 0.8% (80 basis points) to 4.4%

Expected futures price = $100 - 4.4 - 0.16 = 95.44$ (or $100 - 95.44 = 4.56\%$)

Gain on the futures market = $(95.84 - 95.44) \times \$25 \times 68 = \$68,000$ (or 4.56% closing future – 4.16% opening future = 0.4%)

Net additional cost = $(\$136,000 - \$68,000) / \$68,000$ (or $0.8\% - 0.4\%$ gain on future = 0.4%)

Using options on futures to hedge

Need to hedge against a rise in interest rates, therefore buy put options. As before, 68 put option contracts are needed ($\$34,000,000 / \$1,000,000 \times 6 \text{ months} / 3 \text{ months}$).

Assume that interest rates increase by 0.8% (80 basis points) to 4.4%

Exercise price	95.50	96.00
Futures price	95.44	95.44
Exercise?	Yes	Yes
Gain in basis points	6	56
Gain on options		
$6 \times \$25 \times 68$	\$10,200	
$56 \times \$25 \times 68$		\$95,200
Premium		
$30.4 \times \$25 \times 68$	\$51,680	
$50.8 \times \$25 \times 68$		\$86,360
Option benefit/(cost)	$\$41,480$	$\$8,840$
Net additional cost		
$(\$136,000 + \$41,480)$	\$177,480	
$(\$136,000 - \$8,840)$		\$127,160

Alternative solution (shown in %)

	%	%
Borrow	-5.1	-5.1
Opening	4.5	4.0
Closing	<u>4.56</u>	<u>4.56</u>
	0.06	0.56
Premium	<u>-0.304</u>	<u>-0.508</u>
NET	-5.344	-5.048
Extra vs 4.3%	-1.044	-0.748
	$(0.01044 \times \$34m \times 6/12)$	$(0.00748 \times \$34m \times 6/12)$
In \$s	-177,480	-127,160

Using a collar on options to hedge

Buy put options at 95.50 for 0.304 and sell call at 96.00 for 0.223

Net premium payable = 0.081

Assume that interest rates increase by 0.8% (80 basis points) to 4.4%

	Buy put	Sell call
Exercise price	95.50	96.00
Futures price	95.44	95.44
Exercise?*	Yes	No

(*The put option is exercised since, by exercising the option, the option holder has the right to sell the instrument at 95.50 instead of the market price of 95.44 and gain 6 basis points per contract. The call option is not exercised since, by not exercising the option, the option holder can buy the instrument at a lower market price of 95.44 instead of the higher option exercise price of 96.00.)

Gain on options	
$6 \times \$25 \times 68$	\$10,200
Premium payable	
$8.1 \times \$25 \times 68$	\$13,770
Net cost of the collar	\$3,570
Net additional cost	
$(\$136,000 + \$3,570)$	\$139,570

Alternative solution for collar (in %)

	%	
Borrow	-5.1	
Put	0.06	gain (as before)
Call not exercised		
Premium	-0.081	(0.304% – 0.223%)
	<u>-5.121</u>	
	<u>-0.821%</u>	extra vs 4.3%

in \$s this is a cost of $-\$139,570$
 $(0.00821 \times \$34m \times 6/12)$

Based on the assumption that interest rates increase by 80 basis points in the next 5 months, the futures hedge would lower the additional cost by the greatest amount and is significantly better than either the options hedge or the collar hedge. In addition to this, futures fix the amount which Daikon Co is likely to pay, assuming that there is no basis risk. The benefits accruing from the options are lower, with the 95.50 option and the collar option actually increasing the overall cost. In each case, this is due to the high premium costs. However, if interest rates do not increase and actually reduce, then the options (and to some extent the collar) provide more flexibility because they do not have to be exercised when interest rates move in the company's favour. But the movement will need to be significant before the cost of the premium is covered.

On that basis, on balance, it is recommended that hedging using futures is the best choice as they will probably provide the most benefit to Daikon Co.

However, it is recommended that the points made in part (b) are also considered before a final conclusion is made.

(b) **Mark to market: Daily settlements**

2 June: 8 basis points $(95.76 - 95.84) \times \$25 \times 50 \text{ contracts} = \$10,000 \text{ loss}$

3 June: 10 basis points $(95.66 - 95.76) \times \$25 \times 50 \text{ contracts} + 5 \text{ basis points } (95.61 - 95.66) \times \$25 \times 30 \text{ contracts} = \$16,250 \text{ loss}$

[Alternatively: 15 basis points $(95.61 - 95.76) \times \$25 \times 30 \text{ contracts} + 10 \text{ basis points } (95.66 - 95.76) \times \$25 \times 20 \text{ contracts} = \$16,250 \text{ loss}]$

4 June: 8 basis points $(95.74 - 95.66) \times \$25 \times 20 \text{ contracts} = \$4,000 \text{ profit}$

Both mark to market and margins are used by markets to reduce (eliminate) the risk of non-payment by purchasers of the derivative products if prices move against them.

Mark to market closes all the open deals at the end of each day at that day's settlement price, and opens them again at the start of the following day. The notional profit or loss on the deals is then calculated and the margin account is adjusted accordingly on a daily basis. The impact on Daikon Co is that if losses are made, then the company may have to deposit extra funds with its broker if the margin account falls below the maintenance margin level. This may affect the company's ability to plan adequately and ensure it has enough funds for other activities. On the other hand, extra cash accruing from the notional profits can be withdrawn from the broker account if needed.

Each time a market-traded derivative product is opened, the purchaser needs to deposit a margin (initial margin) with the broker, which consists of funds to be kept with the broker while the position is open. As stated above, this amount may change daily and would affect Daikon Co's ability to plan for its cash requirements, but also open positions require that funds are tied up to support these positions and cannot be used for other purposes by the company.

The value of an option prior to expiry consists of time value, and may also consist of intrinsic value if the option is in-the-money. If an option is exercised prior to expiry, Daikon Co will only receive the intrinsic value attached to the option but not the time value. If the option is sold instead, whether it is in-the-money or out-of-the-money, Daikon Co will receive a higher value for it due to the time value. Unless options have other features, like dividends, attached to them, which are not reflected in the option value, they would not normally be exercised prior to expiry.

46 Sembilan

Workbook references. Chapter 13 for interest rate hedging, Chapter 14 for debt-equity swaps.

Top tips. For part (a) you need to use the forward rates rather than the current yield curve rates for Years 2 to 4. Don't forget the second part of the requirement!

For part (b)(ii) it is important to note that the bank has guaranteed the swap.

Part (c) requires you to think about the implications of raising equity to pay off debt, including the willingness of the shareholders to participate.

Easy marks. Part (b)(i) is fairly straightforward, it just requires you to choose a higher and lower rate to use for the illustration.

Examining team's comments. Part (a) required the candidates to calculate the variable amounts received and the fixed amounts paid by Sembilan Co to Ratus Bank based on forward rates. A number of candidates incorrectly included the 60 basis points, which is part of the original loan contract but would not be part of the swap; and some answers used the spot rates instead of the forward rates. It is surprising that the responses contained basic errors when there was a recent article in the *Student Accountant* on how a swap contract can be valued based on forward rates and a fixed rate. Few candidates could explain why the fixed rate was lower than the four-year spot rate.

In part (b) many responses gave explanations, rather than a demonstration, that the payment liability did not change. Many of the explanations lacked adequate detail. The requirement 'Demonstrate' means that the candidates should show, by examples or otherwise, that the payment does not change whether interest rates increase or decrease. Few managed to do this with any clarity.

Marking scheme

		Marks
(a)	Gross amount receivable by Sembilan Co	1
	Gross amounts payable by Sembilan Co	1
	Net amounts receivable or payable every year	2
	Explanation of why fixed rate is less than the four-year yield curve rate	2
		<u>6</u>
(b)	(i) Demonstration of impact of interest rate changes	4
	Explanation and conclusion	1
		<u>5</u>
	(ii) 1 mark per relevant discussion point	Max 5
(c)	1–2 marks per relevant discussion point	Max <u>9</u> <u>25</u>

(a) Gross amounts of interest receivable from Ratus Bank based on Year 1 spot rate and Years 2–4 forward rates.

$$\text{Year 1} = 0.025 \times \$320\text{m} = \$8\text{m}$$

$$\text{Year 2} = 0.037 \times \$320\text{m} = \$11.84\text{m}$$

$$\text{Year 3} = 0.043 \times \$320\text{m} = \$13.76\text{m}$$

$$\text{Year 4} = 0.047 \times \$320\text{m} = \$15.04\text{m}$$

Fixed gross amount of interest payable to Ratus Bank in each of the Years 1–4

$$3.7625\% \times \$320\text{m} = \$12.04\text{m}$$

Therefore the expected receipts/(payments) are:

$$\text{Year 1} = \$8.00\text{m} - \$12.04\text{m} = (\$4.04\text{m})$$

$$\text{Year 2} = \$11.84\text{m} - \$12.04\text{m} = (\$0.20\text{m})$$

$$\text{Year 3} = \$13.76\text{m} - \$12.04\text{m} = \$1.72\text{m}$$

$$\text{Year 4} = \$15.04\text{m} - \$12.04\text{m} = \$3.00\text{m}$$

The equivalent fixed rate of 3.7625% is less than the 3.8% 4-year yield curve rate because the 3.8% represents a zero-coupon bond with one payment in the fourth year. The relevant bond here pays coupons at different time periods when the yield curve rates are lower, hence the fixed rate is lower.

(b) (i)

	% impact	Yield interest 3%	Yield interest 5%
	%	\$m	\$m
Borrow at yield + 60 basis points	(Yield + 0.6)	(11.52)	(17.92)
Receive yield	Yield	9.60	16.00
Pay fixed	(3.7625)	(12.04)	(12.04)
Fee 20 basis points	(0.2)	(0.64)	(0.64)
	4.5625	(14.60)	(14.60)

The receipt and payment based on the yield curve remove the fluctuating element, leaving the 60 basis points borrowing charge, the 20 basis points fee and the fixed payment rate: $0.6\% + 3.7625\% + 0.2\% = 4.5625\%$.

(ii) Sembilan Co is using the swap to manage its **interest rate risk** and is protecting against a rise in interest rates. This has been done without changing the initial debt of \$320 million, which is already in issue.

The interest rate payments are fixed, which means that it is much easier for Sembilan Co to **forecast its future cash flows** and also helps to budget accurately.

The cost to Sembilan Co is relatively small, especially when compared to **potential losses** if interest rates are to rise. Other derivatives, such as options, are typically more expensive.

The swap will be relatively **straightforward**, with the bank undertaking all the relevant administration and organisation. Other derivatives would be more time consuming to arrange.

The main disadvantage is that Sembilan Co will be unable to take advantage of a **favourable movement** in interest rates.

There is no **counterparty risk** involved as the bank is guaranteeing the swap and will make good any default.

(c) Issuing equity and using the proceeds to reduce the amount of debt will **change the capital structure** of Sembilan Co and there are a number of implications of this which need to be considered.

As the proportion of debt compared to equity increases, **financial distress also increases** and associated costs along with it. Companies with high levels of financial distress may find

that suppliers demand more onerous credit terms, and that they may have to give longer credit terms to attract customers and pay higher wages to attract employees. Also providers of equity may **demand a higher level of return** because financial risk has increased. In addition, there may be restrictive covenants that make it more difficult to raise funds (either debt or equity). On the other hand, there will be greater levels of tax relief from the higher interest payments. However, this is only available while the company is making taxable profits or **tax exhaustion** will set in. Sembilan Co is assumed to have judged the relative benefits of high and low levels of financial gearing in making its original decision on debt and equity levels.

The proposed equity issue will change the existing balance and therefore the value of Sembilan Co may not be maximised. However, a **lower debt level** would result in a **higher credit rating** for the company as well as reduce the scale of restrictive covenants. Increasing the level of equity would also increase the debt capacity of the company, which would help to raise finance for future projects more easily. Reduced financial distress may make it easier to deal with stakeholders such as suppliers and customers.

Changing the financial structure of a company can be expensive. There are likely to be costs for the early redemption of debt which can be found in the contractual clauses of the debt to be repaid. **A new issue of equity may also be expensive**, especially if shares are offered to new shareholders as there will be marketing costs and underwriting costs as well. Although a rights issue may be less expensive, the costs may still be significant.

If a rights issue is undertaken, Sembilan Co will need to decide on whether the current shareholders will be able to take up the rights and the level of discount to the current market price that should be offered to ensure a full take-up of rights. The impact of the rights issue on the current price should be considered as well. Studies have shown that **typically markets view rights issues positively** and the share price does not reduce to the theoretical ex-rights price. However, this is because the funds are usually spent on profitable projects and the reaction may not be so positive if the funds are to be used to repay debt.

The move will need to be justified to the market and so Sembilan Co will need to provide information to existing and any new shareholders which shows that one group will not be favoured at the expense of another. Sufficient information is required to **prevent issues with information asymmetry**, but if too much information is produced it may reduce the competitive position of Sembilan Co.

47 Pault

Workbook references. Chapter 13 for interest rate hedging, Chapter 14 for debt-equity swaps.

Top tips. It is important to read articles produced by the examining team, this question was covered by an article that was published in the lead up to the September exam. It is important not to panic with this type of question, for example part (a)(ii) required the evaluation of a swap after 1 year; this did not require anything from (a)(i) and should have been accessible even to candidates that had struggled with (a)(i).

Easy marks. Part (b), 4 marks – required advice on the factors influencing the value of a swap. Part (c), 9 marks – required a discussion of the advantages and disadvantages of simply continuing with floating rate finance compared to using a swap. This was well answered and was the easiest, and most important part of the question.

Marking scheme

		Marks
(a) (i)	Gross amount payable by Pault Co	1
	Calculation of forward rates	3
	Basis point reduction	1
	Net amounts receivable or payable each year	<u>1</u>
		<u>6</u>
(ii)	Yield interest calculations	5
	Comment on interest payment liability	<u>1</u>
		<u>6</u>
(b)	Up to 2 marks per point	Max <u>4</u>
(c)	Advantages (up to 2 marks per relevant point)	Max <u>5</u>
	Disadvantages (up to 2 marks per relevant point)	Max <u>5</u>
		<u>9</u>
		<u>25</u>

(a) (i) Gross amount of annual interest paid by Pault Co to Millbridge Bank = $4.847\% \times \$400m = \$19.39m$.
 Gross amounts of annual interest receivable by Pault Co from Millbridge Bank, based on Year 1 spot rates and Years 2–4 forward rates:

Year

- 1 $0.0350 \times \$400m = \$14m$
- 2 $0.0460 \times \$400m = \$18.4m$
- 3 $0.0541 \times \$400m = \$21.64m$
- 4 $0.0611 \times \$400m = \$24.44m$

Workings

Year 2 forward rate: $(1.0425^2 / 1.037) - 1 = 4.80\%$

Year 3 forward rate: $(1.0470^3 / 1.0425^2) - 1 = 5.61\%$

Year 4 forward rate: $(1.0510^4 / 1.0470^3) - 1 = 6.31\%$

Rates are reduced by 20 basis points in calculation.

At the start of the swap, Pault will expect to pay or receive the following net amounts at each of the next four years:

Year

- 1 $\$14m - \$19.39m = \$(-5.39m)$ payment
- 2 $\$18.4m - \$19.39m = \$(-0.99m)$ payment
- 3 $\$21.64m - \$19.39m = \$2.25m$ receipt
- 4 $\$24.44m - \$19.39m = \$5.05m$ receipt

(ii) Interest payment liability

		<i>Impact</i>	<i>Yield interest</i>	<i>Yield interest</i>
		%	\$m	\$m
Borrow at yield interest + 50 bp	(Yield + 0.5)	(13.60)	(20.00)	(20.00)
Receive yield – 20 bp	Yield – 0.2	10.80	17.20	17.20
Pay fixed 4.847%	(4.847)	(19.39)	(19.39)	(19.39)
Bank fee – 25 bp	(0.25)	(1.00)	(1.00)	(1.00)
	<u>(5.797)</u>	<u>(23.19)</u>	<u>(23.19)</u>	<u>(23.19)</u>

The interest payment liability will be \$23.19m, whatever the yield interest, as the receipt and payment are based on the yield curve net of interest rate fluctuations.

(b) At the start of the contract, the value of the swap will be zero. The terms offered by Millbridge Bank equate the discounted value of the fixed rate payments by Pault Co with the variable rate payments by Millbridge Bank.

However, the value of the swap will not remain at zero. If interest rates increase more than expected, Pault Co will benefit from having to pay a fixed rate and the value of the swap will increase. The value of the swap will also change as the swap approaches maturity, with fewer receipts and payments left.

(c) Disadvantages of swap arrangement

The swap represents a long-term commitment at a time when interest rates appear uncertain. It may be that interest rate rises are lower than expected. In this case, Pault Co will be committed to a higher interest rate and its finance costs may be higher than if it had not taken out the finance arrangements. Pault Co may not be able to take action to relieve this commitment if it becomes clear that the swap was unnecessary.

On the basis of the expected forward rates, Pault Co will not start benefiting from the swap until Year 3. Particularly during Year 1, the extra commitment to interest payments may be an important burden at a time when Pault Co will have significant development and launch costs.

Pault Co will be liable for an arrangement fee. However, other methods of hedging which could be used will have a cost built into them as well.

Advantages of swap arrangement

The swap means that the annual interest payment liability will be fixed at \$23.19m over the next 4 years. This is a certain figure which can be used in budgeting. Having a fixed figure may help planning, particularly as a number of other costs associated with the investment are uncertain.

The directors will be concerned not just about the probability that floating rates will result in a higher commitment than under the swap, but also about how high this commitment could be. The directors may feel that rates may possibly rise to a level which would give Pault Co problems in meeting its commitments and regard that as unacceptable.

Any criticism after the end of the loan period will be based on hindsight. What appeared to be the cheapest choice at that stage may not have been what appeared most likely to be the cheapest choice when the loan was taken out. In addition, criticism of the directors for not choosing the cheapest option fails to consider risk. The cheapest option may be the most risky. The directors may reasonably take the view that the saving in cost is not worth the risks incurred.

The swap is for a shorter period than the loan and thus allows Pault Co to reconsider the position in four years' time. It may choose to take out another swap then on different terms, or let the arrangement lapse and pay floating rate interest on the loan, depending on the expectations at that time of future interest rates.

48 Conejo

Workbook references. Financial reconstructions are covered in Chapter 15.

Easy marks. Part (a) should be a source of easy marks for discussing financial (and business risk).

Examining team's comments. In terms of professional marks, a significant number of candidates did not provide a reasonable structure in their answer, nor put the answer to part b) in a report format. These marks are relatively easy to obtain and a well-structured response would provide candidates with a useful framework within which to provide a response. Such an approach will result in a much higher chance of success in the examination.

Marking scheme

		Marks
(a)	Being able to bear higher levels of financial risk	Up to 3
	Better protection from predatory takeover bids	Up to 3
	Taxation benefit of higher levels of debt finance	Up to 2 Max 7
(b)	(i) Appendix 1	
	Conejo Co's yield curve based on BBB rating	1
	Bond value based on BBB rating and spot yield rates	1
	Comment on reason for virtually no change in value	1
	Calculation of the coupon rate of the new bond	2
	Comment on coupon rate	1 6
	(ii) Appendix 2	
	Duration based on annual coupon and balloon payment of \$100 in Year 5	2
	Amount of fixed annual repayments of capital and interest	2
	Duration based on annual equivalent payments	2 6
	(iii) Appendix 3	
	Financial position, Proposal 1	3
	Financial position, Proposal 2	3
	Interest payable on additional new debt finance	1
	Interest payable on higher coupon for current debt finance	1
	Return on additional investment	1
	Gearing calculations	1
	Earnings per share calculations	1 11
	(iv) Discussion in report	
	Impact on Conejo Co	Up to 6
	Credit migration, credit rating agencies and CEO's opinion	Up to 6
	Impact on Conejo Co's equity holders	Up to 4
	Impact on Conejo Co's debt holders: current and new	Up to 3 Max 16
	Professional marks for part (b)	
	Report format	1
	Structure and presentation of the report	3 4 50

(a) Increasing the debt finance of a company relative to equity finance increases its financial risk, and therefore the company will need to be able to bear the consequences of this increased risk. However, companies face both financial risk, which increases as the debt levels in the capital structure increase, and business risk, which is present in a company due to the nature of its business.

In the case of Conejo Co, it could be argued that as its profits and cash flows have stabilised, the company's business risk has reduced, in contrast to early in its life, when its business risk would have been much higher due to unstable profits and cash flows. Therefore, whereas previously Conejo Co was not able to bear high levels of financial risk, it is able to do so now without having a detrimental impact on the overall risk profile of the company. It could therefore change its capital structure and have higher levels of debt finance relative to equity finance.

The predatory acquisition of one company by another could be undertaken for a number of reasons. One possible reason may be to gain access to cash resources, where a company which needs cash resources may want to take over another company which has significant cash resources or cash generative capability. Another reason may be to increase the debt capacity of the acquirer by using the assets of the target company. Where the relative level of debt finance is increased in the capital structure of a company through a financial reconstruction, like in the case of Conejo Co, these reasons for acquiring a company may be diminished. This is because the increased levels of debt would probably be secured against the assets of the company and therefore the acquirer cannot use them to raise additional debt finance, and cash resources would be needed to fund the higher interest payments.

Many tax jurisdictions worldwide allow debt interest to be deducted from profits before the amount of tax payable is calculated on the profits. Increasing the amount of debt finance will increase the amount of interest paid, reducing the taxable profits and therefore the tax paid. Modigliani and Miller referred to this as the benefit of the tax shield in their research into capital structure, where their amended capital proposition demonstrated the reduction in the cost of capital and increase in the value of the firm, as the proportion of debt in the capital structure increases.

(b) **Report to the board of directors (BoD), Conejo Co**

Introduction

This report discusses whether the proposed financial reconstruction scheme which increases the amount of debt finance in Conejo Co would be beneficial or not to the company and the main parties affected by the change in the funding, namely the equity holders, the debt holders and the credit rating companies. Financial estimates provided in the appendices are used to support the discussion.

Impact on Conejo Co

Benefits to Conejo Co include the areas discussed in part (a) above and as suggested by the CFO. The estimate in Appendix 3 assumes that the interest payable on the new bonds and the extra interest payable on the existing bonds are net of the 15% tax. Therefore, the tax shield reduces the extra amount of interest paid. Further, it is likely that because of the large amount of debt finance which will be raised, the company's assets would have been used as collateral. This will help protect the company against hostile takeover bids. Additionally, proposal 2 (Appendix 3) appears to be better than proposal 1, with a lower gearing figure and a higher earnings per share figure. However, this is dependent on the extra investment being able to generate an after-tax return of 12% immediately. The feasibility of this should be assessed further.

Conejo Co may also feel that this is the right time to raise debt finance as interest rates are lower and therefore it does not have to offer large coupons, compared to previous years.

Appendix 1 estimates that the new bond will need to offer a coupon of 3.57%, whereas the existing bond is paying a coupon of 5.57%.

The benefits above need to be compared with potential negative aspects of raising such a substantial amount of debt finance. Conejo Co needs to ensure that it will be able to finance the interest payable on the bonds and it should ensure it is able to repay the capital amount borrowed (or be able to re-finance the loan) in the future. The extra interest payable (Appendix 3) will probably not pose a significant issue given that the profit after tax is substantially more than the interest payment. However, the repayment of the capital amount will need careful thought because it is significant.

The substantial increase in gearing, especially with respect to proposal 1 (Appendix 3), may worry some stakeholders because of the extra financial risk. However, based on market values, the level of gearing may not appear so high. The expected credit migration from A to BBB seems to indicate some increase in risk, but it is probably not substantial.

The BoD should also be aware of, and take account of, the fact that going to the capital markets to raise finance will require Conejo Co to disclose information, which may be considered strategically important and could impact negatively on areas where Conejo Co has a competitive advantage.

Reaction of credit rating companies

Credit ratings assigned to companies and to borrowings made by companies by credit rating companies depend on the probability of default and recovery rate. A credit migration from A to BBB means that Conejo Co has become riskier in that it is more likely to default and bondholders will find it more difficult to recover their entire loan if default does happen. Nevertheless, the relatively lower increase in yield spreads from A to BBB, compared to BBB to BB, indicates that BBB can still be considered a relatively safe investment.

Duration indicates the time it takes to recover half the repayments of interest and capital of a bond, in present value terms. Duration measures the sensitivity of bond prices to changes in interest rates. A bond with a higher duration would see a greater fluctuation in its value when interest rates change, compared to a bond with a lower duration. Appendix 2 shows that a bond which pays interest (coupon) and capital in equal annual instalments will have a lower duration. This is because a greater proportion of income is received earlier and income due to be received earlier is less risky. Therefore, when interest rates change, this bond's value will change by less than the bond with the higher duration. The CEO is correct that the bond with equal annual payments of interest and capital is less sensitive to interest rate changes, but it is not likely that this will be a significant factor for a credit rating company when assigning a credit rating.

A credit rating company will consider a number of criteria when assigning a credit rating, as these would give a more appropriate assessment of the probability of default and the recovery rate. These criteria include, for example, the industry within which the company operates, the company's position within that industry, the company's ability to generate profits in proportion to the capital invested, the amount of gearing, the quality of management and the amount of financial flexibility the company possesses. A credit rating company will be much less concerned about the manner in which a bond's value fluctuates when interest rates change.

Impact on equity holders

The purpose of the financial reconstruction would be of interest to the equity holders. If, for example, Conejo Co selects proposal 1 (Appendix 3), it may give equity holders an opportunity to liquidate some of their invested capital. At present, the original members of the company hold 40% of the equity capital and proposal 1 provides them with the opportunity to realise a substantial capital without unnecessary fluctuations in the share price. Selling large quantities of equity shares in the stock exchange may move the price of the shares down and cause unnecessary fluctuations in the share price.

If, on the other hand, proposal 2 (Appendix 3) is selected, any additional profits after the payment of interest will benefit the equity holders directly. In effect, debt capital is being used for the benefit of the equity holders.

It may be true that equity holders may be concerned about the increased risk which higher gearing will bring, and because of this, they may need higher returns to compensate for the higher risk. However, in terms of market values, the increased gearing may be of less concern to equity holders. Conejo Co should consider the capital structure of its competitors to assess what should be an appropriate level of gearing.

Equity holders will probably be more concerned about the additional restrictive covenants which will result from the extra debt finance, and the extent to which these covenants will restrict the financial flexibility of Conejo Co when undertaking future business opportunities.

Equity holders may also be concerned that because Conejo Co has to pay extra interest to debt holders, its ability to pay increasing amounts of dividends in the future could be affected. However, Appendix 3 shows that the proportion of interest relative to after-tax profits is not too high and any concern from the equity holders is probably unfounded.

Impact on debt holders

Although the current debt holders may be concerned about the extra gearing which the new bonds would introduce to Conejo Co, Appendix 1 shows that the higher coupon payments which the current debt holders will receive would negate any fall in the value of their bonds due to the credit migration to BBB rating from an A rating. Given that currently Conejo Co is subject to low financial risk, and probably lower business risk, it is unlikely that the current and new debt holders would be overly concerned about the extra gearing. The earnings figures in Appendix 3 also show that the after-tax profit figures provide a substantial interest cover and therefore additional annual interest payment should not cause the debt holders undue concern either.

The current and new debt holders would be more concerned about Conejo Co's ability to pay back the large capital sum in five years' time. However, a convincing explanation of how this can be achieved or a plan to roll over the debt should allay these concerns.

The current and new debt holders may be concerned that Conejo Co is not tempted to take unnecessary risks with the additional investment finance, but sensible use of restrictive covenants and the requirement to make extra disclosures to the markets when raising the debt finance should help mitigate these concerns.

Conclusion

Overall, it seems that the proposed financial reconstruction will be beneficial, as it will provide opportunities for Conejo Co to make additional investments and/or an opportunity to reduce equity capital, and thereby increasing the earnings per share. The increased gearing may not look large when considered in terms of market values. It may also be advantageous to undertake the reconstruction scheme in a period when interest rates are low and the credit migration is not disadvantageous. However, Conejo Co needs to be mindful of how it intends to repay the capital amount in five years' time, the information it will disclose to the capital markets and the impact of any negative restrictive covenants.

Report compiled by:**Date****Appendices:****Appendix 1: Change in the value of the current bond from credit migration and coupon rate required from the new bond (Question (b) (i))****Spot yield rates (yield curve) based on BBB rating**

1 year	2.20%
2 year	2.51%
3 year	2.84%
4 year	3.25%
5 year	3.62%

Bond value based on BBB rating

$$\$5.57 \times 1.0220^{-1} + \$5.57 \times 1.0251^{-2} + \$105.57 \times 1.0284^{-3} = \$107.81$$

Current bond value = \$107.80

Although the credit rating of Conejo Co declines from A to BBB, resulting in higher spot yield rates, the value of the bond does not change very much at all. This is because the increase in the coupons and the resultant increase in value almost exactly matches the fall in value from the higher spot yield rates.

Coupon rate required from the new bond

Take R as the coupon rate, such that:

$$(\$R \times 1.0220^{-1}) + (\$R \times 1.0251^{-2}) + (\$R \times 1.0284^{-3}) + (\$R \times 1.0325^{-4}) + (\$R \times 1.0362^{-5}) + (\$100 \times 1.0362^{-5}) = \$100$$

$$4.5665R + 83.71 = 100$$

$$R = \$3.57$$

Coupon rate for the new bond is 3.57%.

If the coupon payments on the bond are at a rate of 3.57% on the face value, it ensures that the present values of the coupons and the redemption of the bond at face value exactly equals the bond's current face value, based on Conejo Co's yield curve.

Appendix 2: Macaulay durations (Question (b) (ii))**Macaulay duration based on annual coupon of \$3.57 and redemption value of \$100 in Year 5:**

$$[(\$3.57 \times 1.0220^{-1} \times 1 \text{ year}) + (\$3.57 \times 1.0251^{-2} \times 2 \text{ years}) + (\$3.57 \times 1.0284^{-3} \times 3 \text{ years}) + (\$3.57 \times 1.0325^{-4} \times 4 \text{ years}) + (\$103.57 \times 1.0362^{-5} \times 5 \text{ years})] / \$100$$

$$= [3.49 + 6.79 + 9.85 + 12.57 + 433.50] / 100 = 4.7 \text{ years}$$

Macaulay duration based on fixed annual repayments of interest and capital:

Annuity factor: (3.57%, 5 years) = $(1 - 1.0357^{-5}) / 0.0357 = 4.51$ approximately

Annual payments of capital and interest required to pay back new bond issue = $\$100 / 4.51 = \22.17 per \$100 bond approximately

$$[(\$22.17 \times 1.0220^{-1} \times 1 \text{ year}) + (\$22.17 \times 1.0251^{-2} \times 2 \text{ years}) + (\$22.17 \times 1.0284^{-3} \times 3 \text{ years}) + (\$22.17 \times 1.0325^{-4} \times 4 \text{ years}) + (\$22.17 \times 1.0362^{-5} \times 5 \text{ years})] / \$100$$

$$= [21.69 + 42.20 + 61.15 + 78.03 + 92.79] / 100 = 3.0 \text{ years}$$

Alternative presentation of duration calculations:

(Discount factors are based on the interest rates shown in previous presentation)

Based on annual rate of 3.57% and redemption in Year 5:

Time	1	2	3	4	5	Total
\$	3.57	3.57	3.57	3.57	103.57	
df	0.978	0.952	0.919	0.880	0.837	
PV	3.5	3.4	3.3	3.1	86.7	100.0
% PV	0.04	0.03	0.03	0.03	0.87	1.0
% x year	0.04	0.06	0.09	0.12	4.35	4.7

Based on fixed annual repayments of interest and capital:

	22.17	22.17	22.17	22.17	22.17	Total
df	0.978	0.952	0.919	0.880	0.837	
PV	21.7	21.1	20.4	19.5	18.6	101.3
% PV	0.22	0.21	0.20	0.20	0.19	1.0
% x year	0.22	0.42	0.60	0.80	0.95	3.0

Appendix 3: Forecast earnings, financial position, earnings per share and gearing (Question (b) (iii)) Adjustments to forecast earnings

Amounts in \$ millions	Current	Proposal 1	Proposal 2
Forecast after-tax profit	350.00	350.00	350.00
Interest payable on additional borrowing (based on a coupon rate of 3.57%)			
3.57% × \$1,320m × (1 – 0.15)		(40.06)	(40.06)
Additional interest payable due to higher coupon 0.37% × \$120m × (1 – 0.15)		(0.38)	(0.38)
Return on additional investment (after tax)			
12% × \$1,320m	<u>350.00</u>	<u>309.56</u>	<u>158.40</u>
Adjusted profit after tax			
	<u>350.00</u>	<u>309.56</u>	<u>467.96</u>

Forecast financial position

Amounts in \$ millions	Current	Proposal 1	Proposal 2
Non-current assets	1,735.00	1,735.00	3,055.00
Current assets	530.00	489.56	647.96
Total assets	2,265.00	2,224.56	3,702.96
Equity and liabilities			
Share capital (\$1 per share par value)	400.00	280.00	400.00
Reserves	1,700.00	459.56	1,817.96
Total equity	2,100.00	739.56	2,217.96
Non-current liabilities	120.00	1,440.00	1,440.00
Current liabilities	45.00	45.00	45.00
Total liabilities	165.00	1,485.00	1,485.00
Total liabilities and capital	2,265.00	2,224.56	3,702.96
	Current	Proposal 1	Proposal 2
Gearing % (non-current liabilities/equity)	5.7%	194.7%	64.9%
Earnings per share (in cents)			
(Adjusted profit after tax/no. of shares)	87.5c	110.6c	117.0c

Notes

If gearing is calculated based on non-current liabilities/(non-current liabilities + equity) and/or using market value of equity, instead of as above, then this is acceptable as well.

Proposal 1

Additional interest payable is deducted from current assets, assuming it is paid in cash and this is part of current assets. Reserves are also reduced by this amount. (Other assumptions are possible)

Shares repurchased as follows: $\$1 \times 120\text{m shares deducted from share capital and } \$10 \times 120\text{m shares deducted from reserves. } \$1,320\text{m, consisting of } \$11 \times 120\text{m shares, added to non-current liabilities.}$

Proposal 2

Treatment of additional interest payable is as per proposal 1.

Additional debt finance raised, \$1,320 million, is added to non-current liabilities and to non-current assets, assuming that all this amount is invested in non-current assets to generate extra income.

It is assumed that this additional investment generates returns at 12%, which is added to current assets and to profits (and therefore to reserves).

(Explanations given in notes are not required for full marks, but are included to explain how the figures given in Appendix 3 are derived.)

(Note. Credit will be given for alternative relevant presentation of financial positions and discussion)

49 Chrysos

Workbook references. Reverse takeovers are covered in Chapter 9; business reorganisations are covered in Chapter 15.

Top tips. This question required careful reading because it was complicated to understand what was going on and, as you would expect, some of the numerical parts to the question were challenging. It is important to target the easier areas and not to worry about getting every aspect of the calculations correct (this is unlikely to be achievable under exam conditions). Part (b)(i), for 18 marks, was the hardest part of question 1. It was important here to keep your nerve and to score the easier marks; these were available for evaluating whether to sell or unbundle a division (6 marks), calculating the cost of capital for the remaining business (2 marks) and using it to attempt a cash flow valuation (5 marks). It was important not to panic, and to adopt a logical approach, for example:

- First decide whether the company sells a division to a supplier or to an MBO team.
- Next estimate the revised SOFP using a balancing figure for reserves to all it to balance, don't worry too much if it doesn't because this does not affect your ability to value the company.
- Now re-gear the given cost of equity to reflect company's given gearing.
- Now attempt a cash flow valuation and if your cash flow valuation is before interest return to the previous step and calculate a WACC using the given cost of debt.

Easy marks. It is important to target the easier discussion areas and not to worry about getting every aspect of the calculations correct (this is unlikely to be achievable under exam conditions). The discussion parts of this question – parts (a), (b)(iii) and (c) were worth about half of the marks and therefore need (almost) as much effort as the numerical areas.

		Marks
(a)	Explanation of what a reverse takeover involves Advantages (up to 2 marks per well explained advantage) Disadvantages (up to 2 marks per well explained disadvantage)	2 Max 4 Max 4 Max 9
(b)	(i) Extract of financial position after restructuring programme Appendix 1 Manufacturing business unit unbundled through an MBO Estimate of cash flows Estimate of amount payable to ChrysosCo Selection of higher value unbundling option	3 2 1
	Appendix 2 Chrysos Co, cost of equity Chrysos Co, cost of capital	1 1
	Appendix 3 Estimate of cash flows Estimate of equity value	3 2
(ii)	Explanation of approach taken Explanation of assumptions made (up to 2 marks per assumption)	1-2 3-4
		Max 5
(iii)	Appendix 4 Value from increased ownership Additional value Discussion of restructuring programme on the VCOs Discussion of restructuring programme on Chrysos Co	1 1 3-4 4-5
		Max 10
Professional marks for part (b)		
	Report format Structure and presentation of the report	1 3
		4
(c)	1-2 marks per relevant point	Max 4 50

(a) A reverse takeover enables a private, unlisted company, like Chrysos Co, to gain a listing on the stock exchange without needing to go through the process of an initial public offering (IPO). The private company merges with a listed 'shell' company. The private company initially purchases equity shares in the listed company and takes control of its board of directors. The listed company then issues new equity shares and these are exchanged for equity shares in the unlisted company, thereby the original private company's equity shares gain a listing on the stock exchange. Often the name of the listed company is also changed to that of the original unlisted company.

Advantages relative to an IPO

- (1) An IPO can take a long time, typically between one and two years, because it involves preparing a prospectus and creating an interest among potential investors. The equity shares need to be valued and the issue process needs to be administered. Since with the reverse takeover shares in the private company are exchanged for shares in the listed company and no new capital is being raised, the process can be completed much quicker.
- (2) An IPO is an expensive process and can cost between 3% and 5% of the capital being raised due to involvement of various parties, such as investment banks, law firms, etc, and the need to make the IPO attractive through issuing a prospectus and marketing the issue. A reverse takeover does not require such costs to be incurred and therefore is considerably cheaper.
- (3) In periods of economic downturn, recessions and periods of uncertainty, an IPO may not be successful. A lot of senior managerial time and effort will be spent, as well as expenditure, with nothing to show for it. On the other hand, a reverse takeover would not face this problem as it does not need external investors and it is not raising external finance, but is being used to gain from the potential benefits of going public by getting a listing.

Disadvantages relative to an IPO

- (1) The 'shell' listed company being used in the reverse takeover may have hidden liabilities and may be facing potential litigation, which may not be obvious at the outset. Proper and full due diligence is necessary before the process is started. A company undertaking an IPO would not face such difficulties.
- (2) The original shareholders of the listed company may want to sell their shares immediately after the reverse takeover process has taken place and this may affect the share price negatively. A lock-up period during which shares cannot be sold may be necessary to prevent this. [Note. An IPO may need a lock-up period as well, but this is not usually the case.]
- (3) The senior management of an unlisted company may not have the expertise and/or understanding of the rules and regulations which a listed company needs to comply with. The IPO process normally takes longer and is more involved, when compared to a reverse takeover. It also involves a greater involvement from external experts. These factors will provide the senior management involved in an IPO, with opportunities to develop the necessary expertise and knowledge of listing rules and regulations, which the reverse takeover process may not provide.
- (4) One of the main reasons for gaining a listing is to gain access to new investor capital. However, a smaller, private company which has become public through a reverse takeover may not obtain a sufficient analyst coverage and investor following, and it may have difficulty in raising new finance in future. A well-advertised IPO will probably not face these issues and find raising new funding to be easier.

(b) Report to the board of directors (BoD), Chrysos Co

This report provides extracts from the financial position and an estimate of the value of Chrysos Co after it has undertaken a restructuring programme. It also contains an explanation of the process used in estimating the value and of the assumptions made. Finally, the report discusses the impact of the restructuring programme on the company and on venture capital organisations.

It is recommended that the manufacturing business unit is unbundled through a management buy-out, rather than the assets being sold separately, and it is estimated that Chrysos Co will receive \$3,289 million from the unbundling of the manufacturing business unit (Appendix 1). This amount is recorded as a cash receipt in the extract of the financial position given below.

Extract of Chrysos Co's financial position following the restructuring programme

	\$m
Non-current assets	
Land and buildings ($80\% \times \$7,500\text{m}$)	6,000
Equipment ($(80\% \times \$5,400\text{m}) + \$1,200\text{m}$)	5,520
Current assets	
Inventory ($80\% \times \$1,800\text{m}$)	1,440
Receivables ($80\% \times \$900\text{m}$)	720
Cash ($\$3,289\text{m} + \$400\text{m} - \$1,200\text{m} - \$1,050\text{m}$)	<u>1,439</u>
Total assets	<u>15,119</u>
Equity	
Share capital ($\$1,800 + \600m)	2,400
Reserves **	10,319
Non-current liabilities	
Bank loan	1,800
Current liabilities	
Payables ($80\% \times \$750\text{m}$)	<u>600</u>
Total equity and liabilities	<u>15,119</u>

** Balancing figure

Estimate of Chrysos Co's equity value following the restructuring programme

It is estimated that Chrysos Co's equity value after the restructuring programme has taken place will be just over \$46 billion (Appendix 3).

Process undertaken in determining Chrysos Co's equity value

The corporate value is based on a growth rate of 4% on cash flows in perpetuity, which are discounted at Chrysos Co's cost of capital (Appendix 2). The cash flows are estimated by calculating the profit before depreciation and tax of the unbundled firm consisting of just the mining and shipping business unit and then deducting the depreciation and taxation amounts from this.

The bank loan debt is then deducted from the corporate value to estimate the value of the firm which is attributable to the equity holders (Appendix 3).

Assumptions made in determining Chrysos Co's equity value

It is assumed that Sidero Co's ungeared cost of equity is equivalent to Chrysos Co's ungeared cost of equity, given that they are both in the same industry and therefore face the same business risk. Modigliani and Miller's proposition 2 is used to estimate Chrysos Co's restructured cost of equity and cost of capital.

It is assumed that deducting depreciation and tax from the profit before depreciation, interest and tax provides a reasonably accurate estimate of the free cash flows (Appendix 3). Other adjustments such as changes in working capital are reckoned to be immaterial and therefore not considered. Depreciation is not added back because it is assumed to be the same as the capital needed for reinvestment purposes.

It is assumed that the cash flows will grow in perpetuity. The assumption of growth in perpetuity may be over-optimistic and may give a higher than accurate estimate of Chrysos Co's equity value.

(**Note.** Credit will be given for alternative and relevant assumptions.)

Impact of the restructuring programme on Chrysos Co and on the venture capital organisations (VCOs)

By acquiring an extra 600 million equity shares, the proportion of the VCOs' equity share capital will increase to 40% $((600m + 20\% \times 1,800)/(1,800 + 600))$ from 20%. Therefore, the share of the equity value the VCOs will hold in Chrysos Co will increase by \$9,229m, which is 77.5% more than the total of the value of bonds cancelled and extra payment made (Appendix 4). As long as the VCOs are satisfied that the equity value of Chrysos Co after the restructuring programme has been undertaken is accurate, the value of their investment has increased substantially. The VCOs may want undertake a feasibility study on the annual growth rate in cash flows of 4% and the assumption of growth in perpetuity. However, the extent of additional value created seems to indicate that the impact for the VCOs is positive.

By cancelling the VCOs' unsecured bonds and repaying the other debt in non-current liabilities, an opportunity has been created for Chrysos Co to raise extra debt finance for future projects. Based on a long-term capital structure ratio of 80% equity and 20% debt, and a corporate value of \$47,944 million (Appendix 3), this equates to just under \$9,600 million of possible debt finance which could be accessed. Since the bank loan has a current value of \$1,800 million, Chrysos Co could raise just under an extra \$7,800 million debt funding and it would also have \$1,439 million in net cash available from the sale of the machinery parts manufacturing business unit.

Chrysos Co's current value has not been given and therefore it is not possible to determine the financial impact of the equity value after the restructuring has taken place on the company as a whole. Nevertheless, given that the company has access to an extra \$7,800 million debt funding to expand its investment into new value-creating projects, it is likely that the restructuring programme will be beneficial. However, it is recommended that the company tries to determine its current equity value and compares this with the proposed new value. A concern may be that both the 5 senior equity holders' group and the 30 other equity holders group's proportion of equity shares will reduce to 30% from 40% each, as a result of the VCOs acquiring an additional 600 million shares. Both these shareholder groups need to be satisfied about the potential negative impact of these situations against the potential additional benefits accruing from the restructuring programme, before the company proceeds with the programme.

Conclusion

The restructuring programme creates an opportunity for Chrysos Co to have access to extra funding and additional cash for investment in projects in the future. The VCOs are likely to benefit financially from the restructuring programme as long as they are satisfied about the assumptions made when assessing the value created. However, Chrysos Co will need to ensure that all equity holder groups are satisfied with the change in their respective equity holdings.

Report compiled by:

Date:

(Note. Credit will be given for alternative and relevant points)

Appendices

Appendix 1: Unbundling the manufacturing business unit

Option 1: Sale of assets

Net proceeds to Chrysos Co from net sale of assets of the manufacturing business unit are \$3,102 million.

Option 2: Management buy-out

	\$m
Sales revenue ($20\% \times \$16,800\text{m}$)	3,360
Operating costs ($25\% \times 10,080\text{m}$)	<u>(2,520)</u>
Profit before depreciation, interest and tax	840
Depreciation ($12\% \times 20\% \times (\$7,500\text{m} + \$5,400\text{m})$)	<u>(310)</u>
	530
Tax ($18\% \times \$530\text{m}$)	<u>(95)</u>
Cash flows	<u>435</u>

Estimated value = $(\$435\text{m} \times 1.08)/0.10 = \$4,698\text{m}$

Amount payable to Chrysos Co = $70\% \times \$4,698\text{m} = \$3,289\text{m}$

The option to unbundle through a management buy-out (option 2) is marginally better for Chrysos Co and it will opt for this.

Appendix 2: Calculation of cost of equity and cost of capital

Chrysos Co, estimate of cost of equity (Ke) and cost of capital (CoC)

$$Ke = 12.46\% + [0.82 \times (12.46\% - 4.5\%) \times (0.2/0.8)]$$

$$Ke = 14.09\%$$

$$CoC = 0.8 \times 14.09\% + 0.2 \times 4.5\% \times 0.82 = 12.01, \text{ say } 12\%$$

Appendix 3: Estimate of value

	\$m
Sales revenue ($80\% \times \$16,800\text{m}$)	13,440
Costs prior to depreciation, interest and tax ($75\% \times 10,080\text{m}$)	<u>(7,560)</u>
Profit before depreciation and tax	5,880
Depreciation ($12\% \times (\$6,000\text{m} + \$5,520\text{m})$)	<u>(1,382)</u>
	4,498
Tax ($18\% \times \$4,498\text{m}$)	<u>(810)</u>
Cash flows	<u>3,688</u>

Cost of capital to be used in estimating Chrysos Co's value is 12% (Appendix 2)

Estimated corporate value = $(\$3,688\text{m} \times 1.04)/(0.12 - 0.04) = \$47,944\text{m}$

Estimated equity value = $\$47,944\text{m} - \$1,800\text{m} = \$46,144\text{m}$

(**Note.** It is also acceptable to calculate cash flows after interest payment and use the cost of equity to estimate the equity value based on cash flows to equity instead of cash flows to firm.)

Appendix 4: Value created for VCOs

Value attributable to the VCOs = $40\% \times \$46,144\text{m} = \$18,458\text{m}$

Value from increased equity ownership (this has doubled from 20% to 40%)

$$50\% \times \$18,458\text{m} = \$9,229\text{m}$$

Value of unsecured bonds foregone by the VCOs = $\$4,800\text{m}$

Additional capital invested by the VCOs = $\$400\text{m}$

Total of additional capital invested and value of bonds forgone = $\$5,200\text{m}$

$$\text{Additional value} = (\$9,229\text{m} - \$5,200\text{m})/\$5,200\text{m} = 77.5\% \text{ (or } \$4,029\text{m)}$$

(c) As a private company, Chrysos Co is able to ensure that the needs of its primary stakeholder groups – finance providers, managers and employees – are taken into account through the supervisory board. The supervisory board has representatives from each of these groups and each group member has a voice on the board. Each stakeholder group should be able to present its position to the board through its representatives, and decisions will be made after agreement from all group representatives. In this way, no single stakeholder group holds primacy over any other group.

Once Chrysos Co is listed and raises new capital, it is likely that it will have a large and diverse range of equity shareholders, who will likely be holding equity shares in many other companies. Therefore there is likely to be pressure on Chrysos Co to engage in value creating activity aimed at keeping its share price buoyant and thereby satisfying the equity shareholders. It is, therefore, likely that the equity shareholders' needs will hold primacy over the other stakeholder groups and quite possibly the power of the supervisory board will diminish as a result of this.

50 Yilandwe

Workbook references. Overseas investment appraisal is covered in Chapter 5 of the Workbook.

Examining team's comments. Many candidates found the calculations required in this question difficult and appeared to spend a significant amount of time on them. This created pressure on them to complete the rest of the requirements of the question in less time and also the structure of the report was often unsatisfactory. This meant that candidates failed to gain many of the easier marks available for discussing the assumptions and the majority of the professional marks. Many candidates' scripts which had marks of between 40% and 49% could have passed if these marks had been gained.

In part (a), generally this part of the question was done well with many candidates getting between three and five marks out of five. Where marks were lower, the candidates did not compare between the two options but merely talked about the benefits and drawbacks of setting up a plant in another country. Sometimes candidates made too many points on this part and spent too long on it. Good time management within questions, as well as between questions, is essential.

In part (b), unsatisfactory answers tried to convert all cash flows into dollars from the outset, instead of keeping them in Yilandwe currency. This was not a good approach, as it made the subsequent inflationary impact very difficult to calculate and often the answers were incorrect. Therefore, such answers received few marks.

Easy marks. There are numerous easy marks to be picked up in part (a) and (b)(ii) of this question.

Marking scheme

		Marks
(a)	Benefits	2-3
	Drawbacks	<u>2-3</u>
		Max 5
(b)	(i) Sales revenue	3
	Parts costs	3
	Variable costs	2
	Fixed costs	1
	Royalty fee	1
	Tax payable in Yilandwe	3
	Working capital	2
	Remittable cash flows (\$)	1
	Contribution from parts (\$)	2
	Tax on parts' contribution and royalty	1
	Impact of lost contribution and redundancy	1
	NPV of project	<u>1</u>

		Marks
(ii)	Up to 2 marks per assumption discussed 2–3 marks per issue/risk discussed	Max 9 Max 11
(iii)	Reasoned recommendation	Max 17 3
	Professional marks	
	Report format	1
	Layout, presentation and structure	<u>3</u>
		<u>4</u>
		<u><u>50</u></u>

(a) Benefits of own investment as opposed to licensing

Imoni Co may be able to benefit from setting up its own plant as opposed to licensing in a number of ways.

First, Yilandwe wants to attract foreign investment and is willing to offer a number of financial concessions to foreign investors which may not be available to local companies.

The company may also be able to control the quality of the components more easily, and offer better and targeted training facilities, if it has direct control of the labour resources.

The company may also be able to maintain the confidentiality of its products, whereas assigning the assembly rights to another company may allow that company to imitate the products more easily.

Investing internationally may provide opportunities for risk diversification, especially if Imoni Co's shareholders are not well diversified internationally themselves.

Finally, direct investment may provide Imoni Co with new opportunities in the future, such as follow-on options.

Drawbacks of own investment as opposed to licensing

Direct investment in a new plant will probably require higher, upfront costs from Imoni Co compared to licensing the assembly rights to a local manufacturer. It may be able to utilise these saved costs on other projects.

Imoni Co will most likely be exposed to higher risks involved with international investment, such as political risks, cultural risks and legal risks. With licensing these risks may be reduced somewhat.

The licensee, because it would be a local company, may understand the operational systems of doing business in Yilandwe better. It will therefore be able to get off the ground quicker. Imoni Co, on the other hand, will need to become familiar with the local systems and culture, which may take time and make it less efficient initially.

Similarly, investing directly in Yilandwe may mean that it costs Imoni Co more to train the staff and possibly require a steeper learning curve from them. However, the scenario does say that the country has a motivated and well-educated labour force and this may mitigate this issue somewhat.

(Note. Credit will be given for alternative, relevant suggestions.)

(b) **Report on the proposed assembly plant in Yilandwe**

This report considers whether or not it would be beneficial for Imoni Co to set up a parts assembly plant in Yilandwe. It takes account of the financial projections, presented in detail in Appendices 1 and 2, discusses the assumptions made in arriving at the projections and discusses other non-financial issues which should be considered. The report concludes by giving a reasoned recommendation on the acceptability of the project.

Assumptions made in producing the financial projections

It is assumed that all the estimates such as sales revenue, costs, royalties, initial investment costs, working capital, and costs of capital and inflation figures are accurate. There is considerable uncertainty surrounding the accuracy of these and a small change in them could change the forecasts of the project quite considerably. A number of projections using sensitivity and scenario analysis may aid in the decision-making process.

It is assumed that no additional tax is payable in the US for the profits made during the first two years of the project's life when the company will not pay tax in Yilandwe either. This is especially relevant to Year 2 of the project.

No details are provided on whether or not the project ends after four years. This is an assumption which is made, but the project may last beyond four years and therefore may yield a positive net present value. Additionally, even if the project ceases after four years, no details are given about the sale of the land, buildings and machinery. The residual value of these non-current assets could have a considerable bearing on the outcome of the project. It is assumed that the increase in the transfer price of the parts sent from the US directly increases the contribution which Imoni Co earns from the transfer. This is probably not an unreasonable assumption. However, it is also assumed that the negotiations with Yilandwe's Government will be successful with respect to increasing the transfer price and the royalty fee. Imoni Co needs to assess whether or not this assumption is realistic.

The basis for using a cost of capital of 12% is not clear and an explanation is not provided about whether or not this is an accurate or reasonable figure. The underpinning basis for how it is determined may need further investigation.

Although the scenario states that the project can start almost immediately, in reality this may not be possible and Imoni Co may need to factor in possible delays.

It is assumed that future exchange rates will reflect the differential in inflation rates between the respective countries. However, it is unlikely that the exchange rates will move fully in line with the inflation rate differentials.

Other risks and issues

Investing in Yilandwe may result in significant political risks. The scenario states that the current political party is not very popular in rural areas and that the population remains generally poor. Imoni Co needs to assess how likely it is that the Government may change during the time it is operating in Yilandwe and the impact of the change. For example, a new government may renege on the current government's offers and/or bring in new restrictions. Imoni Co will need to decide what to do if this happens.

Imoni Co needs to assess the likelihood that it will be allowed to increase the transfer price of the parts and the royalty fee. Whilst it may be of the opinion that currently Yilandwe may be open to such suggestions, this may depend on the interest the Government may get from other companies to invest in Yilandwe. It may consider that agreeing to such demands from Imoni Co may make it obligated to other companies as well.

The financial projections are prepared on the basis that positive cash flows from Yilandwe can be remitted back to the US. Imoni Co needs to establish that this is indeed the case and that it is likely to continue in the future.

Imoni Co needs to be careful about its ethical stance and its values, and the impact on its reputation, given that a school is being closed in order to provide it with the production facilities needed. Whilst the Government is funding some of the transport costs for the children, the disruption this will cause to the children and the fact that after six months the transport costs become the parents' responsibility may have a large, negative impact on the company's image and may be contrary to the ethical values which the company holds. The possibility of alternative venues should be explored.

Imoni Co needs to take account of cultural risks associated with setting up a business in Yilandwe. The way of doing business in Yilandwe may be very different and the employees may need substantial training to adapt to Imoni Co's way of doing business. On the other hand, the fact that the population is well educated, motivated and keen may make this process easier to achieve.

Imoni Co also needs to consider fiscal and regulatory risks. The company will need to assess the likelihood of changes in tax rates, laws and regulations, and set up strategies to mitigate eventualities which can be predicted. In addition to these, Imoni Co should consider and mitigate, as far as possible, operational risks such as the quality of the components and maintenance of transport links.

Imoni Co should assess and value alternative real options which it may have. For example, it could consider whether licensing the production of the components to a local company may be more financially viable; it could consider alternative countries to Yilandwe, which may offer more benefits; it could consider whether the project can be abandoned if circumstances change against the company; and entry into Yilandwe may provide Imoni Co with other business opportunities.

Recommendation

The result from the financial projections is that the project should be accepted because it results in a positive net present value. It is recommended that the financial projections should be considered in conjunction with the assumptions, the issues and risks, and the implications of these, before a final decision is made.

There is considerable scope for further investigation and analysis. It is recommended that sensitivity and scenario analysis be undertaken to take into consideration continuing the project beyond four years and so on. The value of any alternative real options should also be considered and incorporated into the decision.

Consideration must also be given to the issues, risks and factors beyond financial considerations, such as the impact on the ethical stance of the company and the impact on its image, if the school affected is closed to accommodate it.

Report compiled by:**Date:****Appendices****Appendix 1**

Year	0 YRm	1 YRm	2 YRm	3 YRm	4 YRm
Sales revenue (W2)		18,191	66,775	111,493	60,360
Parts costs (W2)		(5,188)	(19,060)	(31,832)	(17,225)
Variable costs (W2)		(2,921)	(10,720)	(17,901)	(9,693)
Fixed costs		(5,612)	(6,437)	(7,068)	(7,760)
Royalty fee (W3)		(4,324)	(4,813)	(5,130)	(5,468)
Tax-allowable depreciation		(4,500)	(4,500)	(4,500)	(4,500)
Taxable profits/(loss)		(4,354)	21,245	45,062	15,714
Tax loss carried forward				(4,354)	
				40,708	
Taxation (40%)		0	0	(16,283)	(6,286)
Add back loss carried fwd				4,354	
Add back depreciation		4,500	4,500	4,500	4,500
Cash flows after tax		146	25,745	33,279	13,928
Working capital	(9,600)	(2,112)	(1,722)	(1,316)	14,750
Land, buildings and machinery	(39,000)				
Cash flows (YRm)	(48,600)	(1,966)	24,023	31,963	28,678
Year	0 YRm	1 YRm	2 YRm	3 YRm	4 YRm
Exchange rate	101.4	120.1	133.7	142.5	151.9
Remittable flows	(479,290)	(16,370)	179,678	224,302	188,795
Contribution (parts sales)					
(\$120 + inflation per unit, W4)		18,540	61,108	95,723	48,622
Royalty (W3)		36,000	36,000	36,000	36,000
Tax on contribution and royalty (20%)		(10,908)	(19,422)	(26,345)	(16,924)
Cash flows	(479,290)	27,262	257,364	329,680	256,493
Discount factors (12%)	1	0.893	0.797	0.712	0.636
Present values	(479,290)	24,345	205,119	234,732	163,130

Net present value of the project before considering the impact of the lost contribution and redundancy is approximately \$148.0 million.

Lost contribution and redundancy cost

The lost contribution and redundancy costs are small compared to the net present value and would therefore have a minimal impact of reducing the net present value by \$0.1 million approximately.

(Note. Full credit will be given if the assumption is made that the amounts are in \$'000 instead of \$.)

Appendix 2

Workings

1 Unit prices and costs including inflation

Year	1	2	3	4
Selling price (€)	735	772	803	835
Parts (\$)	288	297	306	315
Variable costs (YR)	19,471	22,333	24,522	26,925

2 Sales revenue and costs

Year	1	2	3	4
	YRm	YRm	YRm	YRm
Sales revenue	$150 \times 735 \times$ 165 $= 18,191$	$480 \times 772 \times$ 180.2 $= 66,775$	$730 \times 803 \times$ 190.2 $= 111,493$	$360 \times 835 \times$ 200.8 $= 60,360$
Parts costs	$150 \times 288 \times$ 120.1 $= 5,188$	$480 \times 297 \times$ 133.7 $= 19,060$	$730 \times 306 \times$ 142.5 $= 31,832$	$360 \times 315 \times$ 151.9 $= 17,225$
Variable costs	$150 \times 19,471$ $= 2,921$	$480 \times 22,333$ $= 10,720$	$730 \times 24,522$ $= 17,901$	$360 \times 26,925$ $= 9,693$

3 Royalty fee

$$\$20 \text{ million} \times 1.8 = \$36 \text{ million}$$

This is then converted into YR at the YR/\$ rate for each year: 120.1, 133.7, 142.5 and 151.9 for Years 1 to 4 respectively.

4 Contribution from parts

Year	1	2	3	4
Revenue per unit in \$	280×1.03 $= \$288.4$	288.4×1.03 $= \$297.052$	297.052×1.03 $= \$305.964$	305.964×1.03 $= \$315.143$
Parts costs	200 (current price) – 40 (contribution at current price) = \$160 So $\$160 \times 1.03$ $= \$164.8$	$\$164.8 \times 1.03 =$ $\$169.744$	169.744×1.03 $= \$174.836$	174.836×1.03 $= \$180.081$
Contribution per unit	$288.4 - 164.8 =$ $\$123.6$	$297.052 -$ $169.744 =$ $\$127.308$	$305.964 -$ $174.836 =$ $\$131.128$	$315.143 -$ $180.081 =$ $\$135.062$
Contribution in \$m	$123.6 \times 150\text{m}$ (volume) $= \$18,540\text{m}$	$127.308 \times$ 480m $= \$61,108\text{m}$	$131.128 \times$ 730m $= \$95,723\text{m}$	$135.062 \times$ 360m $= \$48,622\text{m}$

(**Note.** Credit will be given for alternative, relevant approaches to the calculations, and to the discussion of the assumptions, risks and issues.)

51 Avem

Workbook references. Acquisition strategies and valuation issues are covered in Chapters 9 and 10 of the Workbook.

Top tips. For part (a) make sure that you answer **both** aspects to the question (risk diversification **and** identifying undervalued companies).

For part (b) you can score some easy marks by referring to general concerns of competition authorities.

To tackle part (c)(i) you need to realise that what is required is an assessment of the value of the combined entity compared to the value of the two companies as independent entities. If you are working on these lines then you are likely to score a pass mark even if your answer is not perfect.

Part (c)(ii) requires an attempt to assess the present value of the project and also whether to accept an offer at the end of Year 1 to abandon the project. There are many possible approaches here, but the ingredients to success are to have a reasonable attempt at a project-specific cost of capital and to use expected values in a sensible way.

Part (c)(iii) should be attempted even if the numerical analysis in (c)(i) and (c)(ii) has not been completed and gives an opportunity to score some easy marks.

Easy marks. There are numerous easy marks to be picked up in part (a), (b) and (c)(iii) of this question.

Marking scheme

		Marks
(a)	Risk diversification	2–3
	Purchasing undervalued companies	<u>4–5</u>
		Max 7
(b)	1–2 marks per point	1 Max 4
(c)	(i) Avem current value	1
	Avem free cash flow to equity	1
	Fugae estimated growth rate	2
	Fugae estimate of current value	2
	Combined company – value created	2
	Gain to Nahara	1
	Gain to Avem	<u>1</u>
		10
	(ii) Reka asset beta	2
	Project asset beta	1
	Fugae market value of debt	2
	Project equity beta and cost of equity	2
	Project risk-adjusted cost of capital	1
	Annual PVs of project	1
	PVs of different outcomes	2
	Expected NPV before Limni offer	3
	PV of Limni offer	1
	Expected NPV of project with Limni offer	<u>3</u>

18

		Marks
(iii)	Benefits with and without the project	2–3
	Assumptions	3–4
	Conclusion	<u>1–2</u>
		Max 7
Professional marks		
	Report format	1
	Layout, presentation and structure	<u>3</u>
		<u>4</u>
		<u>50</u>

(a) Like individuals holding well-diversified portfolios, a company could reduce its exposure to unsystematic risk by creating a number of subsidiaries in **different sectors**.

This may lead to a **reduction in the volatility of cash flows**, which may lead to a better credit rating and a **lower cost of capital**.

The argument against this states that since **individual shareholders can do this themselves both quickly and cheaply**, there is little reason for companies to do this. Indeed, research suggests that markets do not reward this risk diversification because diversified portfolios are **often managed inefficiently** because head office struggles to cope with the different issues facing each subsidiary. As a result decision making may be **ineffective and slow**.

For Nahara Co, undertaking mergers and acquisitions (M&As) may have beneficial outcomes **if the sovereign fund has its entire investment in the holding company and is not well-diversified itself**. In such a situation unsystematic risk reduction can be beneficial. The case study does not state whether or not this is the case and therefore a definitive conclusion cannot be reached.

If Nahara Co is able to identify undervalued companies and after purchasing the company can increase the value for the holding company overall, by increasing the value of the undervalued companies, then such activity would benefit their shareholders. However, for this strategy to work, Nahara Co must:

- (i) Possess a superior capability or knowledge in identifying bargain buys ahead of its competitor companies. To achieve this, it must have access to better information, which it can tap into quicker and/or have superior analytical tools. This implies that the stock market is **less than semi-strong form efficient**; if the stock market is accurately valuing companies using all available public information then share prices are unlikely to be undervalued.
- (ii) Ensure that it has quick access to the necessary funds to pursue an undervalued acquisition. Even if Nahara Co possesses superior knowledge, it is unlikely that this will last for a long time before its competitors find out; therefore it needs to have the funds ready, **to move quickly**. Given that it has access to sovereign funds from a wealthy source, access to funds is probably not a problem.
- (iii) Ensure it has competences in turning around underperforming companies – this will require a measure of understanding of the sector that the acquired company is operating in. It is likely that Nahara can develop expertise in a wide range of sectors, but not in all sectors. So there will be **limits to the validity of a diversification strategy**.

(b) In a similar manner to the Competition and Markets Authority in the UK, the EU will assess significant M&A impact in terms of whether they will lead to **a substantial lessening** of competition within a country's market.

It will, for example, use tests such as worldwide revenue and European revenue of the group after the M&A.

It may **block the M&A** if it feels that the M&A will give the company monopolistic powers or enable it to carve out a dominant position in the market so as to negatively affect consumer choice and prices.

Sometimes the EU may ask for the company to **sell some of its assets** to reduce its dominant position rather than not allow an M&A to proceed. It would appear that this may be the case behind the EU's concern and the reason for its suggested action.

(c) **Report**

To: Board of Directors, Avem Co
 From: AN Consultant
 Subject: Proposed acquisition of Fugae Co
 Date: XX/XX/XX

Introduction

This report considers whether Avem Co should acquire Fugae Co. In order to assess the additional value created from bringing the two companies together the value of the two companies is determined separately and then as a combined entity. The report concludes by considering whether or not the acquisition will be beneficial to Avem Co and to Nahara Co.

(i) **Additional value created for Avem without considering the luxury transport project**

Appendix 1 shows that the additional value created from combining the two companies is approximately \$451.5m. \$276.8m of this will go to Nahara Co, which represents a premium of about 30% which is the minimum acceptable to Nahara Co. The balance of the additional value will go to Avem Co which is about \$174.7m. This represents an increase in value of 1.46% [$\$174.7m/\$12,000m$].

(ii) **Additional value created for Avem including the luxury transport project**

Appendix 2 shows that accepting **the project would increase Fugae Co's value** as the expected net present value is positive.

After taking into account Lumi Co's offer, the expected net present value is higher. Therefore, it would be **beneficial for Fugae Co to take on the project and accept Lumi Co's offer, if the tourism industry does not grow as expected**, as this will increase Fugae Co's value.

(iii) **Assumptions**

It is assumed that all the figures relating to synergy benefits, betas, growth rates, multipliers, risk-adjusted cost of capital and the probabilities are accurate. There is considerable **uncertainty** surrounding the accuracy of these. A **sensitivity analysis** is probably needed to assess the impact of these uncertainties.

It is assumed that the br model provides a reasonably good estimate of the growth rate, and that perpetuity is not an unreasonable assumption when assessing the value of Fugae Co.

It is assumed that the **capital structure would not change substantially when the new project is taken on**. Since the project is significantly smaller than the value of Fugae Co itself, this is not an unreasonable assumption.

There may be more outcomes in practice than the ones given and financial impact of the outcomes may not be known with such certainty. The **Black-Scholes option pricing model** may provide an alternative and more accurate way of assessing the value of the project.

It is assumed that Fugae Co can rely on Lumi Co paying the \$50m at the beginning of Year 2 with certainty. Fugae Co may want to assess the reliability of Lumi Co's offer and whether formal contracts should be drawn up between the two companies.

Concluding comments

Although Nahara Co would gain more than Avem Co from the acquisition both in percentage terms and in monetary terms, **both companies benefit from the acquisition**. As long as all the parties are satisfied that the value is reasonable despite the assumptions highlighted above, it would appear that the acquisition should proceed.

Appendices

Appendix 1: Additional value created from combining Avem Co and Fugae Co

Avem Co, current value = \$7.5/share \times 1,600m shares = \$12,000m

To estimate Fugae's current value we need to estimate the growth rate. This is calculated on the basis of the bre model.

$$b = 1 - 0.773 = 0.267$$

$$r_e = 0.11$$

$$\text{Fugae Co, estimate of growth rate} = 0.227 \times 0.11 = 0.025 = 2.5\%$$

$$\text{Fugae Co, current value estimate} = \$76.5m \times 1.025 / (0.11 - 0.025) = \$922.5m$$

So the value of the two companies before the combination is approximately \$12,000m + \$922.5m = \$12,922.5m.

The **combined company** is expected to have a value that is 7.5 times its free cash flow. Avem Co's free cash flow to equity = \$12,000m/7.2 = \$1,666.7m

Fugae's free cash flow is \$76.5 million and is expected to increase by the expected synergy of \$40 million.

So we can estimate the additional value created by the combined company as:

Value as a combined company – value of Avem and Fugae as independent companies

$$([\$1,666.7m + \$76.5m + \$40m] \times 7.5) - (\$12,922.5m) = \mathbf{\$451.5m}$$

Nahara will expect a 30% return so the gain to Nahara for selling Fugae Co, $30\% \times \$922.5m = \mathbf{\$276.8m}$

Therefore Avem Co will gain \$174.7m of the additional value created, $\$451.5m - \$276.8m = \mathbf{\$174.7m}$

Appendix 2: Value of project to Fugae Co

Appendix 2.1 Project cost of capital

Estimate of risk-adjusted cost of capital to be used to discount the project's cash flows

The project value is calculated based on its cash flows which are discounted at the project's risk-adjusted cost of capital, to reflect the business risk of the project.

To determine the beta of the project we first need to calculate Reka Co's asset beta

$$\text{Reka Co equity value} = \$4.50 \times 80m \text{ shares} = \$360m$$

Reka Co debt value = $1.05 \times \$340m = \$357m$

Asset beta = $1.6 \times \$360m / (\$360m + \$357m \times 0.8) = 0.89$

Now we can calculate the project's asset beta

$0.89 = \text{project's asset beta} \times 0.15 + 0.80 \times 0.85$

Project's asset beta = 1.4

Before we can calculate the cost of equity for this project we will need to adjust it for Fugae Co's debt levels.

Fugae has \$380m of debt in terms of its book value. To calculate the market value of this debt we need to take into account the return required by debt holders. This can be estimated as

Cost of debt = Risk-free rate of return plus the credit spread

= 4% + 0.80% = 4.80%

So the current market value of a \$100 bond =

$\$5.4 \times 1.048^{-1} + \$5.4 \times 1.048^{-2} + \$5.4 \times 1.048^{-3} + \$105.4 \times 1.048^{-4} =$
\$102.14 per \$100 book value.

So the total market value of debt = $1.0214 \times \$380m = \$388.1m$.

The market value of Fugae's equity has been previously estimated as \$922.5m.

So now we can take the asset beta of 1.4 and estimate the project's risk-adjusted equity beta using

$$\beta_a = \left(\frac{V_e}{(V_e + V_d(1-t))} \right) \beta_e + \left(\frac{V_d(1-t)}{(V_e + V_d(1-t))} \right) \beta_d$$

so

$$1.4 = (\$922.5m / (\$922.5m + \$388.1m \times 0.8)) \beta_e$$

$$1.4 \times (\$922.5m + \$388.1m \times 0.8) / \$922.5m = \beta_e = 1.87$$

So the project's risk-adjusted cost of equity is:

$$(r_i) = R_f + \beta_e (E(R_m - R_f))$$

$$4\% + 1.87 \times 6\% = \mathbf{15.2\%}$$

And finally the project's risk-adjusted cost of capital

$$\text{WACC} = \left(\frac{V_e}{(V_e + V_d)} \right) K_e + \left(\frac{V_d}{(V_e + V_d)} \right) K_d (1 - t)$$

$$(922.5 / (922.5 + 388.1)) 15.2\% + (388.1m / (922.5m + 388.1m)) 4.8\% \times 0.8
= 11.84\%, \text{ say } 12\%$$

Appendix 2.2 Estimate of expected value of the project without the offer from Lumi Co

If the first year is as expected

(\$'000)

Year	1	2	3	4
Cash flows	3,277.6	16,134.3	36,504.7	35,683.6
Discount factor 12%	0.893	0.797	0.712	0.636
Present values	2,926.9	12,859.0	25,991.3	22,694.8
Probabilities	1.0	0.8	0.8	0.8
Expected value	2,926.9	10,287.8	20,793.0	18,155.8
Present values (40% time 2 – 4)		12,859.0 × 0.4 = 5,143.6	25,991.3 × 0.4 = 10,396.5	22,694.8 × 0.4 = 9,077.9
Probabilities		0.2	0.2	0.2
Expected value		1,029.3	2,079.3	1,815.6
Total expected value	2,926.9	11,317.1	22,872.3	19,971.4

Total expected value from time 1–4 if the first year is as expected is therefore $2,926.9 + 11,317.1 + 22,872.3 + 19,971.4 = \$57,087.7$ (000).

There is a 75% chance of this occurrence.

If the first year is NOT as expected

(\$'000)

Year	1	2	3	4
Present values (50% fall from original projections)	$2,926.9 \times 0.5 = 1,463.5$	$12,859.0 \times 0.5 = 6,429.5$	$25,991.3 \times 0.5 = 12,995.7$	$22,694.8 \times 0.5 = 11,347.4$

Total expected value from time 1–4 if the first year is **not** as expected is therefore $1,463.5 + 6,429.5 + 12,995.7 + 11,347.4 = \$32,236.1$ (000).

There is a 25% chance of this occurrence.

The **overall present value (PV) of the project inflows** is $(75\% \times 57,087.7) + (25\% \times 32,236.1) = \$50,874.8$ (000).

So the **project net present value (NPV)** is $50,874.8 - 42,000 = \$8,874.8$ (000).

Estimate of expected value of the project with the offer from Lumi Co

PV of \$50m = $\$50,000,000 \times 0.893 = \$44,650,000$

If the tourism industry does not grow as expected in the first year, then it is more beneficial for Fugae Co to exercise the offer made by Lumi Co, given that Lumi Co's offer of \$44.65m (PV of \$50m) is greater than the PV of the Years 2 to 4 cash flows for that outcome. This figure is then incorporated into the expected NPV calculations.

So, if the first year is **not** as expected the PV of the inflows becomes $1,463.5 + 44,650 = \$46,113.5$ (000).

There is a 25% chance of this occurrence.

The **overall PV of the project inflows** now becomes $(75\% \times 57,087.7) + (25\% \times 46,113.5) = \$54,344.2$ (000).

So the **project NPV** is $54,344.2 - 42,000 = \$12,344.2$ (000).

(Note. Credit will be given for alternative, relevant approaches to the calculations, comments and suggestions/recommendations.)

52 Chmura

Workbook references. Overseas investment issues are covered in Chapters 5 and 16.

Top tips. Focus on achieving a good attempt in the time available – where you get stuck on a part of the net present value (NPV) part of the question you have to be ruthless with your time management and move on.

Examining team's comments. On the whole, this question was done well by many candidates and many scripts earned over half the marks. However, a sizeable number of candidates spent far too long on this question to the detriment of the rest of the exam. Good time management, an ability to work under pressure and making a reasonable attempt at all the requirements of all the questions are the key ingredients for success. Therefore, doing one question well, even if it is the longer question, but not doing the others well, is unlikely to yield a good mark.

In part (a), most candidates performed well and some very good answers were given, especially for the discussion of benefits and drawbacks relating to the reduction in protectionist measures. The discussion of the role of the WTO was done less well, with some answers suggesting that it raised financial capital and provided financial help to countries and to companies, which is not correct.

In part (b)(i), a large number of candidates achieved a good mark. It was pleasing to see candidates using the purchasing power parity to predict future exchange rates and applying inflation rates and taxation to the project correctly.

However, common errors included starting to apply inflation from the incorrect year, not taking account of the balancing allowance adjustment, incorrectly adding an additional 5% tax when the amounts were converted into dollars and making numerical errors in their calculations.

Part (b)(ii) asked candidates to recognise that the second company was effectively offering a real put option when offering to buy the project in two years. Candidates were required to apply the Black-Scholes option pricing model to assess the value of the put option and the change in the value of the project as a result. This part was done well by the majority of the candidates, but only a few candidates got the correct present value of the underlying asset. Some candidates failed to recognise that this was a put option or that it was a real option at all.

Part (b)(iii) asked candidates to discuss the additional business risks and the assumptions made in calculating the amounts in (b)(i) and (b)(ii). The majority of candidates were able to state some of the assumptions made but there was very little meaningful discussion of these. The responses to additional business risks were patchy.

Marking scheme

		Marks
(a)	Role of the World Trade Organization	4–5
	Benefits of reducing protectionist measures	2–3
	Drawbacks of reducing protectionist measures	2–3
		<u>Max</u> <u>9</u>
(b)	(i) Future exchange rates predicted on inflation rate differential	1
	Sales revenue	1
	Production and selling costs	1
	Special packaging costs	2
	Training and development costs	1
	Correct treatment of tax and tax-allowable depreciation	2
	Years 1 to 5 cash flows in \$ and present values of cash flows	2

	Marks
Ignoring initial investigation cost and additional taxation in Chmura Co host country	1
Correct treatment of land, buildings, machinery and working capital	2
Net present value of the project	1
	<u>14</u>
(ii) Inputting correct values for the variables	2
Calculation of d1 and d2	2
Establishing N(d1) and N(d2)	2
Call value	1
Put value	1
Value of the project	1
	<u>9</u>
(iii) Estimated value and initial recommendation	2-3
Up to 2 marks per assumption discussed	5-6
Up to 2 marks per additional business risk discussed	5-6
Overarching recommendation(s)	1-2
	<u>Max 14</u>
Professional marks	1
Report format	3
Structure and presentation of the report	4
	<u>50</u>

(a) The WTO was set up to continue to implement the General Agreement on Tariffs and Trade (GATT), and its main aims are to reduce the barriers to international trade. It does this by seeking to prevent protectionist measures such as tariffs, quotas and other import restrictions. It also acts as a forum for negotiation and offering settlement processes to resolve disputes between countries.

The WTO encourages free trade by applying the most favoured nation principle between its members, where a reduction in tariffs offered to one country by another should be offered to all members.

Whereas the WTO has had notable success, some protectionist measures between groups of countries are nevertheless allowed and some protectionist measures, especially non-tariff based ones, have been harder to identify and control.

Mehgam could benefit from reducing protectionist measures because its actions would make other nations reduce their protectionist measures against it. Normally countries retaliate against each other when they impose protectionist measures. A reduction in these may allow Mehgam to benefit from increased trade and economic growth. Such a policy may also allow Mehgam to specialise and gain competitive advantage in certain products and services, and compete more effectively globally. Its actions may also gain political capital and more influence worldwide.

Possible drawbacks of reducing protectionist policies mainly revolve around the need to protect certain industries. It may be that these industries are developing and in time would be competitive on a global scale. However, inaction to protect them now would damage their development irreparably. Protection could also be given to old, declining industries which, if

not protected, would fail too quickly due to international competition, and would create large-scale unemployment making such inaction politically unacceptable. Certain protectionist policies are designed to prevent 'dumping' of goods at a very cheap price, which hurts local producers.

Note. Credit will be given for alternative relevant discussion.

(b) Report to the BoD, Chmura Co

This report recommends whether or not Chmura Co should invest in a food packaging project in Mehgam, following Mehgam reducing its protectionist measures. It initially considers the value of the project without taking into account the offer made by Bulud Co to purchase the project after two years. Following this, Bulud Co's offer is considered. The report concludes by recommending a course of action for the BoD to consider further.

Estimated value of the Mehgam project and initial recommendation

The initial net present value of the project is negative at approximately \$(451,000) (see Appendix 1). This would suggest that Chmura Co should not undertake the project.

Bulud Co's offer is considered to be a real option for Mehgam Co. Since it is an offer to sell the project as an abandonment option, a put option value is calculated based on the Finance Director's assessment of the standard deviation and using the Black-Scholes option pricing (BSOP) model. The value of the put option is added to the initial net present value of the project without the option, to give the value of the project. Although Chmura Co will not actually obtain any immediate cash flow from Bulud Co's offer, the real option computation indicates that the project is worth pursuing because the volatility may result in increases in future cash flows.

After taking account of Bulud Co's offer and the Finance Director's assessment, the net present value of the project is positive at approximately \$2,942,000 (see Appendix 2). This would suggest that Chmura Co should undertake the project.

Assumptions

It is assumed that all the figures relating to variables such as revenues, costs, taxation, initial investments and their recovery, inflation figures and cost of capital are accurate. There is considerable uncertainty surrounding the accuracy of these, and in addition to the assessments of value conducted in Appendices 1 and 2, sensitivity analysis and scenario analysis are probably needed to assess the impact of these uncertainties.

It is assumed that future exchange rates will reflect the differential in inflation rates between the two countries. It is, however, unlikely that exchange rates will move fully in line with the inflation rate differentials.

It is assumed that the value of the land and buildings at the end of the project is a relevant cost, as it is equivalent to an opportunity benefit, even if the land and buildings are retained by Chmura Co.

It is assumed that Chmura Co will be given and will utilise the full benefit of the bi-lateral tax treaty and therefore will not pay any additional tax in the country where it is based.

It is assumed that the short-dated \$ treasury bills are equivalent to the risk-free rate of return required for the BSOP model. And it is assumed that the Finance Director's assessment of the 35% standard deviation of cash flows is accurate.

It is assumed that Bulud Co will fulfil its offer to buy the project in two years' time and there is no uncertainty surrounding this. Chmura Co may want to consider making the offer more binding through a legal contract.

The BSOP model makes several assumptions such as perfect markets, constant interest rates and lognormal distribution of asset prices. It also assumes that volatility can be assessed and stays constant throughout the life of the project, and that the underlying asset can be traded.

Neither of these assumptions would necessarily apply to real options. Therefore the BoD needs to treat the value obtained as indicative rather than definitive.

Additional business risks

Before taking the final decision on whether or not to proceed with the project, Chmura Co needs to take into consideration additional risks, including business risks, and where possible mitigate these as much as possible. The main business risks are as follows:

Investing in Mehgam may result in political risks. For example, the current Government may be unstable and if there is a change of government, the new Government may impose restrictions, such as limiting the amount of remittances which can be made to the parent company. Chmura Co needs to assess the likelihood of such restrictions being imposed in the future and consider alternative ways of limiting the negative impact of such restrictions.

Chmura Co will want to gain assurance that the countries to which it will sell the packaged food batches remain economically stable and that the physical infrastructure such as railways, roads and shipping channels are maintained in good repair. Chmura Co will want to ensure that it will be able to export the special packaging material into Mehgam. Finally, it will need to assess the likelihood of substantial protectionist measures being lifted and not re-imposed in the future.

As much as possible, Chmura Co will want to ensure that fiscal risks such as imposition of new taxes and limits on expenses allowable for taxation purposes do not change. Currently, the taxes paid in Mehgam are higher than in Chmura Co's host country and, even though the bi-lateral tax treaty exists between the countries, Chmura Co will be keen to ensure that the tax rate does not change disadvantageously.

Chmura Co will also want to protect itself, as much as possible, against adverse changes in regulations. It will want to form the best business structure, such as a subsidiary company, joint venture or branch, to undertake the project. Also, it will want to familiarise itself on regulations such as employee health and safety law, employment law and any legal restrictions around land ownership.

Risks related to the differences in cultures between the host country, Mehgam, and the countries to which the batches will be exported would be a major concern to Chmura Co. For example, the product mix in the batches which are suitable for the home market may not be suitable for Mehgam or where the batches are exported. It may contain foods which would not be saleable in different countries and therefore standard batches may not be acceptable to the customers. Chmura Co will also need to consider the cultural differences and needs of employees and suppliers.

The risk of the loss of reputation through operational errors would need to be assessed and mitigated. For example, in setting up sound internal controls, segregation of duties is necessary. However, personal relationships between employees in Mehgam may mean that what would be acceptable in another country may not be satisfactory in Mehgam. Other areas Chmura Co will need to focus on are the quality control procedures to ensure that the quality of the food batches is similar to the quality in the host country.

Recommendation

With Bulud Co's offer, it is recommended that the BoD proceed with the project, as long as the BoD is satisfied that the offer is reliable, the sensitivity analysis/scenario analysis indicates that any negative impact of uncertainty is acceptable and the business risks have been considered and mitigated as much as possible.

If Bulud Co's offer is not considered, then the project gives a marginal negative net present value, although the results of the sensitivity analysis need to be considered. It is recommended that, if only these results are taken into consideration, the BoD should not proceed with the project. However, this decision is marginal and there may be other valid reasons for progressing with the project such as possibilities of follow-on projects in Mehgam.

Report compiled by:**Date:****Appendices****Appendix 1: Estimated value of the Mehgam project excluding the Bulud Co offer****(Cash flows in MPm)**

Year	1	2	3	4	5
Sales revenue (W2)	1,209.6	1,905.1	4,000.8	3,640.7	2,205.4
Production and selling costs (W3)	(511.5)	(844.0)	(1,856.7)	(1,770.1)	(1,123.3)
Special packaging costs (W4)	(160.1)	(267.0)	(593.7)	(572.0)	(366.9)
Training and development costs	(409.2)	(168.8)	0	0	0
Tax-allowable depreciation	(125)	(125)	(125)	(125)	(125)
Balancing allowance					(125)
Taxable profits/(loss)	3.8	500.3	1,425.4	1,173.6	465.2
Taxation (25%)	(1.0)	(125.1)	(356.4)	(293.4)	(116.3)
Add back depreciation	125	125	125	125	250
Cash flows (MPm)	127.8	500.2	1,194.0	1,005.2	598.9

(All amounts in \$'000)

Year	1	2	3	4	5
Exchange rate (W1)	76.24	80.72	85.47	90.50	95.82
Cash flows (\$'000)	1,676.3	6,196.7	13,969.8	11,107.2	6,250.3
Discount factor for 12%	0.893	0.797	0.712	0.636	0.567
Present values (\$'000)	1,496.9	4,938.8	9,946.5	7,064.2	3,543.9

Present value (PV) of cash flows approx. = \$26,990,000

PV of value of land, buildings and machinery in Year 5 = (80% × MP1,250m + MP500m)/95.82 × 0.567 approx. = \$8,876,000

PV of working capital = MP200m/95.82 × 0.567 approx. = \$1,183,000

Cost of initial investment in \$ = (MP2,500m + MP200m)/72 = \$37,500,000

NPV of project = \$26,990,000 + \$8,876,000 + \$1,183,000 – \$37,500,000 = \$(451,000)

Workings**1 Exchange rates**

Year	1	2	3	4	5
MP/\$	72 ×	76.24 ×	80.72 ×	85.47 ×	90.50 ×
1	1.08/1.02 =	1.08/1.02 =	1.08/1.02 =	1.08/1.02 =	1.08/1.02 =
	76.24	80.72	85.47	90.50	95.82

2 Sales revenue (MPm)

Year	1	2	3	4	5
	10,000 ×	15,000 ×	30,000 ×	26,000 ×	15,000 ×
	115,200 ×	115,200 ×	115,200 ×	115,200 ×	115,200 ×
	1.05 =	1.05 ² =	1.05 ³ =	1.05 ⁴ =	1.05 ⁵ =
	1,209.6	1,905.1	4,000.8	3,640.7	2,205.4

3 Production and selling (MPm)

Year	1	2	3	4	5
	10,000 ×	15,000 ×	30,000 ×	26,000 ×	15,000 ×
	46,500 × 1.1	46,500 × 1.1 ²	46,500 × 1.1 ³	46,500 × 1.1 ⁴	46,500 × 1.1 ⁵
	= 511.5	= 844.0	= 1,856.7	= 1,770.1	= 1,123.3

4 Special packaging (MPm)

Year	1	2	3	4	5
	10,000 × 200	15,000 × 200	30,000 × 200	26,000 × 200	15,000 × 200
	× 76.24 ×	× 80.72 ×	× 85.47 ×	× 90.50 ×	× 95.82 ×
	1.05 = 160.1	1.05 ² = 267.0	1.05 ³ = 593.7	1.05 ⁴ = 572.0	1.05 ⁵ = 366.9

Appendix 2: Estimated value of the Mehgam project including the Bulud Co offer

Present value of underlying asset (Pa) = \$30,613,600 (approximately)

(This is the sum of the PVs of the cash flows forgone in Years 3, 4 and 5)

Price offered by Bulud Co (Pe) = \$28,000,000

Risk-free rate of interest (r) = 4% (assume government treasury bills are a valid approximation of the risk-free rate of return)

Volatility of underlying asset (s) = 35%

Time to expiry of option (t) = 2 years

$$d_1 = [\ln(30,613.6/28,000) + (0.04 + 0.5 \times 0.35^2) \times 2] / [0.35 \times 2^{1/2}] = 0.59$$

$$d_2 = 0.59 - 0.35 \times 2^{1/2} = 0.10$$

$$N(d_1) = 0.5 + 0.2224 = 0.7224$$

$$N(d_2) = 0.5 + 0.0398 = 0.5398$$

Call value = \$30,613,600 × 0.7224 - \$28,000,000 × 0.5398 × e^{-0.04 × 2} = approx. \$8,160,000

Put value = \$8,160,000 - \$30,613,600 + \$28,000,000 × e^{-0.04 × 2} = approx. \$3,393,000

Net present value of the project with put option = \$3,393,000 - \$451,000 = approx. \$2,942,000

(Note. Credit will be given for relevant discussion and recommendation.)

53 Washi

Workbook references. International investment appraisal is covered in Chapter 5, and currency hedging is covered in Chapter 13.

Examining team's comments. Part (b) required a discussion of the comparative advantages and disadvantages between exchange traded and over-the-counter option (OTC) contracts. While some candidates did well for this part, others received no marks when they mixed up exchange traded with over-the-counter options or compared options with futures/forwards. A number of candidates made the same point for example, tailor-made hedge for OTC options as an advantage, and not tailor-made hedge for exchange traded options as a disadvantage, therefore not gaining any extra marks for double the effort.

Part (c) On futures hedging, many candidates omitted to identify whether futures contracts were to be sold or bought at the start of the hedge. Quite a few candidates incorrectly hedged using call options instead of put options. A large majority of candidates made no attempt to calculate the proceeds from the six-month investment of the JPY receivable which would reduce the additional debt finance needed, thus receiving no marks for this part. The main difficulty that many candidates encountered was calculating the ARD/JPY spot cross rates from the given JPY/EUR and ARD/EUR spot exchange rates and then forecasting ARD/JPY exchange rates using purchasing power parity. These spot cross rates and forecast exchange rates are then used to convert the initial investment amount in ARD currency to JPY currency to determine the debt finance required as well as for the investment appraisal in part c) ii).

Common mistakes in the answers include not showing workings for the exchange rates produced, therefore no 'own figure rule' (OFR) marks could be awarded if the exchange rates were wrong; not labelling the currencies making it difficult for markers to identify the exchange rate referred to in the calculation; cross rates incorrectly calculated and purchasing power parity wrongly applied in forecasting the ARD/JPY exchange rates.

Part (d) required candidates to discuss the validity of decentralising the one treasury department for the whole group into individual treasury departments for the major subsidiary companies. Most candidates demonstrated a good understanding in contrasting the benefits of both centralised and individual treasury departments and scored high marks. Answers which focussed only on the benefits of decentralisation or centralisation of the treasury function scored limited marks.

Marking scheme

		Marks
(a)	1–2 marks per valid point	Max <u>5</u>
(b)	Advantages	2–3
	Disadvantages	<u>2–3</u>
		Max <u>5</u>
(c) (i)	(Appendix 1)	
	Amount to be received based on forward rate	1
	Decision to go short on futures	1
	Estimate of futures rate in six months based on basis	1
	Amount to be received based on futures market	1
	Decision to purchase put options	1
	Premium payable	1
	Amount to be received based on options market	1
	Decision: select appropriate hedge instrument	1

		Marks
	JPY receivable following further six months of investment	1
	Estimate of current cross rate(s)	1
	Estimate of ARD/JPY rate in one year's time	1
	Debt borrowing required	1
		<u>12</u>
(ii)	(Appendix 2)	
	Estimate of future ARD/JPY rates	1
	Lost contribution	1
	Tax saving on lost contribution	1
	Contribution from sales of components	2
	Tax on contribution from components sales	1
	Additional tax payable in Japan	2
	Present values and net present value	1
		<u>9</u>
(iii)	(Report on project and funding evaluation)	
	Evaluation of hedge choice and debt finance required	3-4
	Evaluation of Airone project	3-4
	Conclusion	1-2
		Max <u>8</u>
	Professional marks for part (c)	
	Report format	1
	Structure and presentation of the report	3
		<u>4</u>
(d)	Benefits of a centralised treasury department	3-4
	Benefits of decentralised treasury departments	2-3
	Over-arching commentary	1
	(Note. Max 6 marks if no over-arching commentary)	
		Max <u>7</u>
		<u>50</u>

(a) Washi Co may want to invest in overseas projects for a number of reasons which result in competitive advantage for it, for example:

Investing overseas may give Washi Co access to new markets and/or enable it to develop a market for its products in locations where none existed before. Being involved in marketing and selling products in overseas markets may also help it gain an understanding of the needs of customers, which it may not have had if it merely exported its products.

Investing overseas may give Washi Co easier and cheaper access to raw materials it needs. It would therefore make good strategic sense for it to undertake the overseas investment.

Investing in projects internationally may give Washi Co access to cheaper labour resources and/or access to expertise which may not be readily available in Japan. This could therefore lead to reduction in costs and give Washi Co an edge against its competitors.

Closer proximity to markets, raw materials and labour resources may enable Washi Co to reduce its costs. For example, transportation and other costs related to logistics may be reduced if products are manufactured close to the markets where they are sold.

Risk, such as economic risk resulting from long-term currency fluctuations, may be reduced where costs and revenues are matched and therefore naturally hedged.

Washi Co may increase its reputation because it is based in the country within which it trades leading to a competitive edge against its rivals.

International investments might reduce both the unsystematic and systematic risks for Washi Co if its shareholders only hold well diversified portfolios in domestic markets, but not internationally.

(Note. Credit will be given for alternative valid areas of discussion)

(b) Advantages

Exchange traded options are readily available on the financial markets, their price and contract details are transparent, and there is no need to negotiate these. Greater transparency and tight regulations can make exchange traded options less risky. For these reasons, exchange traded options' transaction costs can be lower.

The option buyer can sell (close) the options before expiry. American style options can be exercised any time before expiry and most traded options are American style options, whereas over-the-counter options tend to be European style options.

Disadvantages

The maturity date and contract sizes for exchange traded options are fixed, whereas over-the-counter options can be tailored to the needs of parties buying and selling the options.

Exchange traded options tend to be of shorter terms, so if longer term options are needed, then they would probably need to be over-the-counter.

A wider range of products (for example, a greater choice of currencies) is normally available in over-the-counter options markets.

(c) Report to the board of directors (BoD), Washi Co

Introduction

This report evaluates whether or not Washi Co should invest in the Airone project and the amount of debt finance required of JPY 3,408.6 million (appendix 1) to fund the project. The evaluation considers both the financial and the non-financial factors.

Evaluation of the preferred hedge choice and debt finance required

The income from the sale of the European subsidiary is maximised when futures contracts are used. Therefore, these are chosen as Washi Co will borrow the least amount of debt finance as a result. However, compared to the forward contract, futures are marked-to-market daily and require a margin to be placed with the broker. This could affect Washi Co's liquidity position. The assumption has been made that basis reduces proportionally as the futures contracts approach expiry, but there is no guarantee that this will be the case. Therefore, basis risk still exists with futures contracts. Although forward contracts give a smaller return, there is no basis risk and margin requirements. However, they do contain a higher risk of default as they are not market traded. Options give the lowest return but would give Washi Co the flexibility of not exercising the option should the Euro strengthen against the Yen.

Although the EUR 80 million receipt from the sale of the subsidiary has been agreed, there may be a risk that the sale may fall through and/or the funds or some proportion of the funds are not received. Washi Co may need to assess and factor in this risk, however small it may be.

The amount of interest on deposit is based on the current short-dated Japanese treasury bills and the estimate of the borrowing requirement is computed from the predicted exchange rate between ARD and JPY in a year's time, based on the purchasing power parity. Both these estimates could be inaccurate if changes occur over the coming months. Although insufficient information is provided for a financial assessment, Washi Co should explore the possibility of

converting the EUR into ARD immediately on receipt and keeping it in an ARD bank account until needed, instead of first converting EUR into JPY and then into ARD.

Using debt finance to make up any shortfall in the funding requirement may be appropriate for Washi Co given that it is an unlisted company and therefore access to other sources of funding may be limited. Nevertheless, Washi Co should assess how the extra borrowing would affect any restrictive covenants placed on it and the impact on its cost of capital. Since the amount seems to be small in the context of the project as a whole, this may not be a major problem.

Washi Co should also explore whether or not investing in the Airone project restricts its ability to fund other projects or affects its ability to continue normal business activity, especially if Washi Co is facing the possibility of hard capital rationing.

Evaluation of the Airone project

The net present value of the Airone project is estimated to be JPY (457) million (appendix 2). Given the negative net present value, the initial recommendation would be to reject the project. However, given that the result is marginal, Washi Co should consider the following factors before rejecting the project.

At present, Washi Co does not have a significant presence in the part of the world where Airone is located. Taking on the project may make good strategic sense and provide a platform for Washi Co to establish its presence in that part of the world.

Furthermore, once Washi Co has established itself in Airone, it may be able to develop further opportunities and new projects. The value of these follow-on options has not been incorporated into the financial assessment. Washi Co should explore the possibility of such opportunities and their possible value.

The financial assessment ends abruptly at the end of the four years. No indication is given on what would happen to the project thereafter. It may be sold as a going concern or, if closed, its land and assets may be sold. The cash flows from these possible courses of action need to be incorporated into the assessment, and these could make the project worthwhile.

A number of assumptions and estimates would have been made in the financial assessment. For example, the rate of inflation used for future figures is the current rate and the tax rate used is the current rate, these may well change in the coming years. Therefore, it is best to undertake sensitivity analysis and produce a number of financial assessments before making any firm commitment to proceed with the project or deciding to reject it.

Conclusion and recommendation

The income from the sale of the European subsidiary is maximised when futures contracts are used, but Washi Co should weigh this against the benefits and drawbacks of all hedging instruments before making a final decision.

Although the project is currently giving a negative net present value, rejecting it at the outset is premature. A number of factors, discussed above, need to be considered and assessed before a final decision is made. Sensitivity analysis would be very helpful in this respect.

Finally, Washi Co should consider alternative uses for the funding which will be dedicated to the project. These alternative uses for the finance need to be considered before any decision is made, especially if Washi Co is facing the possibility of hard capital rationing.

Report compiled by:

Date

APPENDICES:

Appendix 1 (Part (c) (i)): Japanese Yen receivable from sale of European subsidiary under each hedging choice and the additional debt finance needed to fund the Airone project

Forward rate

Since it is a EUR receipt, the lock-in rate of JPY125.3 per EUR will be used.

Expected receipt from sale: EUR 80m \times 125.3 = JPY 10,024m

Futures contracts

The futures contracts need to show a gain when the Euro depreciates against the Yen, therefore a short position is needed, using the seven-month contracts. It is assumed that basis will depreciate proportionally to the time expired.

Predicted futures rate

$$125.2 + 1/3 \times (126.9 - 125.2) = 125.8$$

$$[\text{Or: } 125.2 + 1/7 \times (129.2 - 125.2) = 125.8]$$

Number of contracts sold = EUR 80,000,000/EUR 125,000 = 640 contracts

Expected receipt from sale: EUR 125,000 \times 640 \times 125.8 = JPY 10,064m

Options contracts

640 seven-month put options contracts will be purchased to protect against a depreciation of Euro.

If options are exercised:

$$\text{EUR } 125,000 \times 640 \times 126 = \text{JPY } 10,080\text{m}$$

$$\text{Premium payable} = \text{JPY } 3.8 \times 125,000 \times 640 = \text{JPY } 304\text{m}$$

$$\text{Net income} = \text{JPY } 10,080\text{m} - \text{JPY } 304\text{m} = \text{JPY } 9,776\text{m}$$

Conclusion

Futures contracts give the highest receipt and will, therefore, be used to hedge the expected Euro receipt.

Receipt invested

Invested for further six months till needed for the Airone project.

$$\text{JPY } 10,064\text{m} \times (1 + (0.012/2)) = \text{JPY } 10,124.4\text{m}$$

Spot cross rates: 0.70 – 0.74 ARD per JPY 1

$$[92.7/132.4 = 0.70 \text{ and } 95.6/129.2 = 0.74]$$

Expected ARD/JPY conversion spot rate in 12 months = 0.70 \times 1.09/1.015 = 0.75

Additional debt finance needed to fund Airone project

Investment amount required = ARD 10,150m/0.75 = JPY 13,533m

Debt finance required = JPY 13,533m – JPY 10,124.4m = JPY 3,408.6m

Appendix 2 (Part (c) (ii): Airone project net present value

Project year	0	1	2	3	4
Cash flows in ARD (millions)	(10,150)	2,530	5,760	6,780	1,655
Future exchange rate ARD/JPY (W1)	0.75	0.81	0.87	0.93	1.00
In JPY million					
Project year	0	1	2	3	4
Cash flows	(13,533)	3,123	6,621	7,290	1,655
Lost contribution		(110)	(112)	(113)	(115)

Tax saving on lost contribution (30%)	33	34	34	35
Contribution: components (W2)	300	609	644	79
Tax on components cont. (30%)	(90)	(183)	(193)	(24)
Additional tax payable (15%) (W3)	<u> </u>	<u>(333)</u>	<u>(966)</u>	<u>(1,097)</u>
Net cash flows	<u>(13,533)</u>	<u>2,923</u>	<u>6,003</u>	<u>6,565</u>
Present value (discounted at 12%)	(13,533)	2,610	4,784	4,674
				1,008

Expected net present value is JPY (457)m

Workings

1 *Predicted future exchange rate (ARD/JPY)*

Project year	0	1	2	3	4
	0.70 ×	0.75 ×	0.81 ×	0.87 ×	0.93 ×
	1.09/1.015	1.09/1.015	1.09/1.015	1.09/1.015	1.09/1.015

Exchange rate					
ARD/JPY	0.75	0.81	0.87	0.93	1.00

2 *Components contribution*

Project year	1	2	3	4
In JPY millions				
Components revenue (post inflation)	1,200	2,436	2,576	314
Contribution (25%)	300	609	644	79

3 *Additional tax payable*

Project year	1	2	3	4
Pre-tax profits (ARD m)	1,800	5,600	6,800	300
Additional tax payable at 15% (JPY m)	1,800/0.81 × 0.15 = 333	5,600/0.87 × 0.15 = 966	6,800/0.93 × 0.15 = 1,097	300/1.0 × 0.15 = 45

(d) It is difficult to conclude definitively whether a centralised treasury department is beneficial or not in all circumstances and for all companies. It depends on each company itself and the circumstances it faces. Washi Co should take this into account before making a final decision.

Benefits of a centralised treasury department

Having a centralised treasury management function avoids the need to have many bank accounts and may therefore reduce transaction costs and high bank charges.

Large cash deposits may give Washi Co access to a larger, diverse range of investment opportunities and it may be able to earn interest on a short-term basis, to which smaller cash deposits do not have access. On the other hand, if bulk borrowings are required, it may be possible for Washi Co to negotiate lower interest rates, which it would not be able to do on smaller borrowings.

A centralised treasury function can offer the opportunity for Washi Co to match income and expenditure and reduce the need for excessive risk management, and thereby reduce costs related to this.

A centralised treasury management department could hire experts, which smaller, diverse treasury management departments may not have access to.

A centralised treasury function may be better able to access what is beneficial for Washi Co as a whole, whereas local treasury functions may lead to dysfunctional behaviour.

Benefits of separate (decentralised) treasury departments

It could be argued that decentralised treasury departments are better able to match and judge the funding required with the need for asset purchases for investment purposes on a local level. Therefore, they may be able to respond quicker when opportunities arise and so could be more effective and efficient.

Individual departments within a subsidiary may have better relationships with the treasury departments of that subsidiary and are therefore able to present their case without lengthy bureaucratic delays.

Ultimately, the benefits may be implicit rather than explicit. Having decentralised treasury departments may make the subsidiary companies' senior management and directors more empowered and have greater autonomy. This in turn may increase their levels of motivation, as they are more in control of their own future, resulting in better decisions being made.

54 Tramont

Workbook references. Net present value (NPV) is covered in Chapter 3, adjusted present value (APV) in Chapter 6 and international aspects (including purchasing power parity) in Chapter 5.

Top tips. It is very easy to feel daunted when you see the number of marks available for part (a)(i). However, you are given guidance in the question regarding how to approach the financial assessment and you should follow this carefully. If you stop and think for a minute you will realise that you are dealing with a detailed NPV calculation and the requirement to adjust by the present value of all other relevant cash flows suggests an APV calculation will also be required. Once you have that clear in your mind the question should be more approachable.

There is a lot of information in the question but if you remember (and use) the NPV tabular approach the calculations should be more manageable. As Tramont is a US company you should expect to have to convert your results into dollars.

You are given inflation rates as part of the exchange rate information which suggests the use of purchasing power parity to forecast future rates. You are given the formula in the exam so this should give you some easy marks.

Also make sure you use the correct inflation rate in your NPV and APV calculations – don't get the two countries' rates mixed up!

There are several interest rates given in the question – make sure you use the correct one at the correct time! For example, for the tax shield on borrowings in Gamala you are told that a 6% subsidised loan is available, therefore 6% is the rate you should use.

We have shown additional US tax, contributions and opportunity costs as part of one calculation – given that you have to discount all these figures at the same rate, this is the quickest way of doing so. You will gain full credit if you discounted all the figures separately but remember this is a time-pressured exam.

Easy marks. There are numerous easy marks to be picked up in part (i).

		Marks
(a) (i)	Estimated future rates based on purchasing power parity	1
	Sales revenue, variable costs, component cost and fixed costs (in GR)	4
	Taxable profits and taxation	2
	Investment, terminal value and working capital	2
	Cash flows in GR	1
	Cash flows in \$	1
	Discount rate of all-equity financed project	2
	Base case PVs and NPV	2
	PVs of additional contribution, additional tax and opportunity cost	4
	PV of tax shield and subsidy benefits	4
	Closure costs and benefits	1
	Initial comments and conclusion	1–2
	Assumptions and sensitivity analysis	<u>2–3</u>
		Max 27
(ii)	Implications of change of government	2–3
	Other business factors (1–2 marks per factor)	<u>5–6</u>
		Max 8
Professional marks		
	Report format	1
	Layout, presentation and structure	<u>3</u>
		4
(b)	1 mark per relevant point	6
(c)	General commentary regarding benefits of risk diversification	2–3
	Relating specifically to Tramont Co and the Gamalan investment	<u>2–3</u>
		Max 5
		<u>50</u>

(a) To: The Board of Directors of Tramont Co
 From: Accountant
 Date: XX/X/XX
 Subject: Evaluation of proposal to relocate production of X-IT to Gamala

The report considers the proposal to relocate production of X-IT from the US to Gamala. The report includes an initial evaluation and then considers the key assumptions made in the evaluation, the potential effects of a change in the Government of Gamala following the upcoming elections and also other business factors that should be taken into account before a decision is made.

The initial evaluation is a base case NPV calculation that assesses the impact of production in Gamala. This is then adjusted to show the impact of cash flows in the US, including the impact of ceasing production, the impact of the subsidy and the tax shield benefits arising from the loan.

Based on the calculations, which can be found in the appendix, the move will generate a positive APV of just over \$2.3 million. Based on these calculations it is recommended that production of X-IT should move to Gamala.

Assumptions

The **borrowing rate of 5%** has been used to calculate the present value of the tax shield benefits. The risk-free rate of 3% could have been used instead, but it was felt more prudent to use the 5% rate. An APV calculation would normally use the debt capacity for the tax shield benefit calculation rather than the amount of debt finance used, but as this is not known it has been **assumed that the increase in debt capacity is equal to the debt finance used**.

There are a number of variables included in the calculations. It is assumed that these will change as stated over the four-year period. Exchange rates have been forecast using purchasing power parity, which it is assumed will hold for the four-year period. In reality these variables may not alter as has been assumed and therefore **it is recommended that sensitivity analysis is used** to calculate the effect of changes in these key variables on the overall conclusion.

Government change

A change of government in Gamala may have a significant impact on the project as a result of changes threatened by the opposition party. The **proposed tax increase may be significant** as this would reduce the total tax shield and subsidy benefits as well as creating higher cash outflows in Years 3 and 4 of the project. An even more significant change may arise, however, from the review of 'commercial benefits'. Approximately 45% (1,033/2,317) of the APV comes from the tax shield and subsidy benefits. If these arrangements were to change then Tramont could lose a significant amount of value from the project.

The new Government may also review whether remittances are allowed every year as has been assumed in these calculations. This issue may be fairly minor as the majority of the value comes from the final year of operation anyway.

Other business factors

Tramont needs to also consider whether being based in Gamala will lead to any **follow-on projects**. The real options that are present within any such projects should be factored into the assessment of whether to relocate.

Tramont also needs to ensure that this project **fits within its overall strategy**. Even if the decision to cease production in the US is made there may be other, better alternatives than the Gamalan option. These other options should also be assessed.

Tramont also needs to consider whether its **systems can be adapted to the culture in Gamala**. If Tramont has experience in international ventures then its directors may be surer of this. Tramont will need to develop strategies to combat any cultural differences. There may be further training costs as part of these strategies which have not been factored into this assessment.

Another factor to consider is whether the project can be delayed as this will reduce the opportunity cost of lost contribution, which is greater in Years 1 and 2. Therefore **a delay could increase the overall value** of the project.

There are possible redundancies from the closure of production of X-IT in the US. Since production will probably cease in the US anyway the strategy should be clearly communicated to employees and other stakeholders in order to ensure its reputation is not damaged. As a result it may be even more important to consider alternatives to this plan.

Conclusion

The initial evaluation suggests that moving production of X-IT to Gamala would be beneficial. Before making a final decision, the board should conduct a detailed sensitivity analysis, analysis of the effects of a change in government and the financial effects of the other factors identified above.

Appendix

NPV of Gamalan project

Year	0	1	2	3	4
	GR'000	GR'000	GR'000	GR'000	GR'000
Sales revenue (W2)		48,888	94,849	214,442	289,716
Variable costs – local (W3)		(16,200)	(32,373)	(75,385)	(104,897)
Imported components (W4)		(4,889)	(9,769)	(22,750)	(31,658)
Fixed costs (inflating at 9%)		<u>(30,000)</u>	<u>(32,700)</u>	<u>(35,643)</u>	<u>(38,851)</u>
Profit before tax		<u>(2,201)</u>	<u>20,007</u>	<u>80,664</u>	<u>114,310</u>
Tax (W5)		0	0	(7,694)	(18,862)
Investment	(230,000)				450,000
Working capital	<u>(40,000)</u>	<u>(3,600)</u>	<u>(3,924)</u>	<u>(4,277)</u>	<u>51,801</u>
Total GR cash flows	<u>(270,000)</u>	<u>(5,801)</u>	<u>16,083</u>	<u>68,693</u>	<u>597,249</u>
Exchange rate GR/\$ (W1)	55.00	58.20	61.59	65.18	68.98
Year	0	1	2	3	4
	\$'000	\$'000	\$'000	\$'000	\$'000
Total \$ cash flows	(4,909)	(100)	261	1,054	8,658
\$ discount factor (W6)	1.000	0.909	0.826	0.751	0.683
Present value	(4,909)	(91)	216	792	5,913
NPV = \$1,921,000					

APV	\$'000
Base case NPV	1,921
Additional US tax, opportunity cost and additional component contribution (W7)	(1,237)
Closure revenues and costs (\$2.3m – \$1.7m)	600
Tax shield and subsidy benefits (W8)	1,033
APV	<u>2,317</u>

Workings

1 Exchange rates

GR/\$

Now	55.00
Year 1	$55.00 \times (1.09/1.03) = 58.20$
Year 2	$58.20 \times (1.09/1.03) = 61.59$
Year 3	$61.59 \times (1.09/1.03) = 65.18$
Year 4	$65.18 \times (1.09/1.03) = 68.98$

2 Sales revenue

Revenue = price × units × exchange rate

Year	1	2	3	4
	GR'000	GR'000	GR'000	GR'000
Sales revenue	$70 \times 12,000 \times 58.20 = 48,888$	$70 \times 22,000 \times 61.59 = 94,849$	$70 \times 47,000 \times 65.18 = 214,442$	$70 \times 60,000 \times 68.98 = 289,716$

3 *Variable costs – local*Unit cost \times units \times inflation after Year 1

Year	1	2	3	4
	GR'000	GR'000	GR'000	GR'000
Cost	$1,350 \times$ 12,000 $= 16,200$	$1,350 \times 22,000 \times$ 1.09 $= 32,373$	$1,350 \times 47,000 \times$ 1.09 ² $= 75,385$	$1,350 \times 60,000 \times$ 1.09 ³ $= 104,897$

4 *Imported components*Price \times units \times inflation after Year 1 \times exchange rate

Year	1	2	3	4
	GR'000	GR'000	GR'000	GR'000
Cost	$7 \times 12,000 \times$ 58.20 = $4,889$	$7 \times 22,000 \times$ 1.03 \times $61.59 = 9,769$	$7 \times 47,000 \times$ 1.03 ² \times $65.18 = 22,750$	$7 \times 60,000 \times$ 1.03 ³ \times $68.98 = 31,658$

5 *Taxation*

Year	1	2	3	4
	GR'000	GR'000	GR'000	GR'000
Profit/(loss) before tax	(2,201)	20,007	80,664	114,310
Tax-allowable depreciation	(20,000)	(20,000)	(20,000)	(20,000)
Revised profit/(loss)	(22,201)	7	60,664	94,310
Offset against previous losses	0	(7)	(22,194)	0
Losses carried forward	(22,201)	(22,194)	0	0
Tax base	0	0	38,470	94,310
Taxation @ 20%	0	0	(7,694)	(18,862)

6 *Discount rate*

Tramont Co equity beta = 1.17

 $MV_e = \$2.40 \times 25\text{m shares} = \60m $MV_d = \$40\text{m} \times \$1,428/\$1,000 = \57.12m

Tramont Co asset beta (assume debt is risk free)

 $1.17 \times 60\text{m}/(60\text{m} + (57.12 \times 0.7)) = 0.70$ Project asset beta = $0.70 + 0.40 = 1.10$ Project discount rate if all-equity financed = $3\% + (1.1 \times 6\%) = 9.6\%$ say 10%7 *Additional tax, additional contribution and opportunity cost (\$'000)*

Year	1	2	3	4
Additional tax*	0	0	(59)	(137)
Opportunity cost**	(560)	(448)	(358)	(287)
Additional contribution***	34	63	140	184
Total cash flows	(526)	(385)	(277)	(240)
7% discount factor	0.935	0.873	0.816	0.763
Present value	(492)	(336)	(226)	(183)

Total present value = \$(1,237,000)

* Taxable profits/exchange rate \times 10%** Units \times contribution \times (1 – tax rate)*** Units \times contribution \times inflation \times (1 – tax rate)

8 Tax shield and subsidy benefits (GR'000/\$'000)

Year	1	2	3	4
	GR'000	GR'000	GR'000	GR'000
Annual tax shield*	3,240	3,240	3,240	3,240
Annual subsidy benefit**	15,120	15,120	15,120	15,120
Total benefit	18,360	18,360	18,360	18,360
Exchange rate	58.20	61.59	65.18	68.98
	\$'000	\$'000	\$'000	\$'000
Cash flow	315	298	282	266
5% discount rate	0.952	0.907	0.864	0.823
PV	300	270	244	219

Total present value = \$1,033,000

* Interest \times loan \times tax rate = 6% \times 270m \times 20% = 3.24m

** Interest gain \times loan \times (1 – tax rate) = 7% \times 270m \times 0.8 = 15.12m

(b) Triple bottom line (TBL) reporting involves providing a quantitative summary in terms of social, financial and environmental performance.

The **underlying principle** is that in order to evaluate a company's true performance against its objectives, and assess the risk to the investor, the investor must consider all three areas.

Under the TBL approach decision making should ensure that **each perspective is growing** but not at the **expense** of the others. That is, economic performance should not come at the expense of the environment or society. The idea is that an organisation which accommodates all three areas will enhance shareholder value as long as the costs of producing the report are less than the benefits that arise from it.

In the case of Tramont and production of X-IT, reporting on the impact of moving production to Gamala, including the environmental impact, will show Tramont in a good light and improve its reputation. This should in turn make it easier to attract and retain the best employees.

(c) Portfolio theory states that shareholders who hold a well-diversified portfolio will have diversified away the unsystematic or company-specific risk and will be left with systematic risk. Following this a shareholder cannot reduce risk further by undertaking **additional diversification** in the same system or market. A company may be able to achieve further diversification for its shareholders by investing in a system or market that the individual shareholders do not invest in themselves. Some studies have shown that well-diversified investors **can benefit from risk diversification** when companies invest in **emerging markets**.

In the case of Tramont and X-IT, it is unclear whether there will be any diversification benefits from the Gamalan investment. Any benefits are dependent on the **size of the investment** and the **nature** of the business operations in Gamala. Another issue is whether the investment represents an investment in a different system or market. If the investment is large and the operations are similar to undertaking a Gamalan company then shareholders in Tramont who do not hold similar companies' shares **may gain risk diversification benefits** from the investment.

55 Cigno

Workbook references. This is really a question about acquisition strategy and is mainly covered in Chapters 8-11.

Top tips. The 50-mark question mainly focused on core syllabus areas like acquisitions.

Part (a) of the exam often starts with a basic area requiring a distinction between a 'sell-off' and a management buy-in (MBI). Even if candidates did not know what an MBI is they should have been able to describe a sell-off and to score two of the four marks.

Part (b) required a report; four professional marks were available for format, structure and presentation.

Part (b)(i), for 18 marks, required an assessment of whether the proposed premium for the acquisition would result in value being created or destroyed for the predator's shareholders. This required an assessment of the value of the part of the acquired company that would be sold (using the price/earnings (P/E) method) and the value of the part of the company that remained. This latter calculation required the use of the free cash flow method discounted at a post-acquisition weighted average cost of capital (WACC). The question also required an assessment of the post-acquisition value of synergies again using the free cash flow method.

The challenge here was mainly to conceptualise how to attack the problem – the individual calculations were not unusual and have been tested many times before. Candidates who were unsure about the approach to take could have scored easy marks for valuing the disposal, the synergies and the post-acquisition WACC – this was worth ten of the marks.

Part (b)(ii), for eight marks, asked for assessment of the meaning of the numbers from bi and a discussion of the methods that had been used and the estimates that had been made. Candidates that had got stuck with the numbers may still have been able to gain about half of the marks for discussing the methods and the estimates.

Part (b)(iii), for four marks, required a brief discussion of the reputational and ethical issues associated with redundancies and tax savings.

Part (c), for six marks, asked for a discussion of a proposed takeover defence. This could have been satisfactorily answered by using the details of the proposal that were provided in the scenario.

Part (d), for six marks, asked for an explanation of the purpose of three common types of takeover regulation. Although the terminology used was a bit off-putting, with a bit of thought at least two of the three regulations were reasonably clear in their purpose and should have been easy to explain.

Easy marks. There were elements of this question (part (a), some of (b)(ii), (b)(iii), (c), (d), and the presentation marks in part (b)) that were available to candidates who struggled with the numerical content of this question. Targeting these easier marks is an essential element in exam technique for this exam.

Marking scheme

		Marks
(a)	Up to 2 marks for distinguishing the two forms of unbundling	4
(b) (i)	Appendix 1	1
	Anatra Co, manufacturing business, P/E ratio	1
	Estimate of the value created from sell-off	3
	Appendix 2	
	Cigno Co asset beta	1
	Combined company asset beta	1
	Combined company equity beta	1

		Marks
	Combined company cost of capital	1
	Appendix 3	
	Sales revenue, Years 1 to 4	1
	Operating profit, Years 1 to 4	1
	Taxation, Years 1 to 4	1
	Capital investment, Years 1 to 4	1
	Value from Years 1 to 4	1
	Value from Year 5 onwards	1
	Value for Cigno Co shareholders before impact of savings from tax and employee cost reduction	2
	Appendix 4	
	Value created from tax and employee cost savings	1
	Value for Cigno Co shareholders after impact of savings from tax and employee cost reduction	1
		<u>18</u>
(ii)	Discussion of values for the equity holders, additional costs/benefits not given	3–4
	Methods used and assumptions made	4–5
		<u>8</u>
(iii)	Reputation factors	1–2
	Ethical factors	1–2
	Comment on value	1–2
		<u>4</u>
Professional marks for part (b)		
	Report format	1
	Structure and presentation of the report	3
		<u>4</u>
(c)	1 to 2 marks per point	Max
		<u>6</u>
(d)	Up to 2 marks for explaining the purpose of each condition	6
		<u>50</u>

(a) Both forms of unbundling involve disposing of the non-core parts of the company.

The divestment through a sell-off normally involves selling part of a company as an entity or as separate assets to a third party for an agreed amount of funds or value. This value may comprise of cash and non cash based assets. The company can then utilise the funds gained in alternative, value-enhancing activities.

The MBI is a particular type of sell-off which involves selling a division or part of a company to an external management team, who will take up the running of the new business and have an equity stake in the business. An MBI is normally undertaken when it is thought that the division or part of the company can probably be run better by a different management team compared to the current one.

(b) Report to the BoD, Cigno Co

This report assesses the potential value of acquiring Anatra Co for the equity holders of Cigno Co, both with and without considering the benefits of the reduction in taxation and in employee costs. The possible issues raised by reduction in taxation and in employee costs are discussed in more detail below. The assessment also discusses the estimates made and the methods used.

Assessment of value created

Cigno Co estimates that the premium payable to acquire Anatra Co largely accounts for the benefits created from the acquisition and the divestment, before considering the benefits from the tax and employee costs saving. As a result, before these savings are considered, the estimated benefit to Cigno Co's shareholders of \$128 million (see Appendix 3) is marginal. Given that there are numerous estimations made and the methods used make various assumptions, as discussed below, this benefit could be smaller or larger. It would appear that without considering the additional benefits of cost and tax reductions, the acquisition is probably too risky and would probably be of limited value to Cigno Co's shareholders.

If the benefits of the taxation and employee costs saved are taken into account, the value created for the shareholders is \$5,609 million (see Appendix 4), and therefore significant. This would make the acquisition much more financially beneficial. It should be noted that no details are provided on the additional pre-acquisition and post-acquisition costs or on any synergy benefits that Cigno Co may derive in addition to the cost savings discussed. These should be determined and incorporated into the calculations.

Basing corporate value on the P/E method for the sell-off, and on the free cash flow valuation method for the absorbed business, is theoretically sound. The P/E method estimates the value of the company based on its earnings and on competitor performance. With the free cash flow method, the cost of capital takes account of the risk the investors want to be compensated for and the non-committed cash flows are the funds which the business can afford to return to the investors, as long as they are estimated accurately.

However, in practice, the input factors used to calculate the organisation's value may not be accurate or it may be difficult to assess their accuracy. For example, for the free cash flow method, it is assumed that the sales growth rate, operating profit margin, the taxation rate and incremental capital investment can be determined accurately and remain constant. It is assumed that the cost of capital will remain unchanged and it is assumed that the asset beta, the cost of equity and cost of debt can be determined accurately. It is also assumed that the length of the period of growth is accurate and that the company operates in perpetuity thereafter. With the P/E model, the basis for using the average competitor figures needs to be assessed; for example, have outliers been ignored; and the basis for the company's higher P/E ratio needs to be justified as well. The uncertainties surrounding these estimates would suggest that the value is indicative, rather than definitive, and it would be more prudent to undertake sensitivity analysis and obtain a range of values.

Key factors to consider in relation to the redundancies and potential tax savings

It is suggested that the BoD should consider the impact of the cost savings from redundancies and from the tax payable in relation to corporate reputation and ethical considerations.

At present, Cigno Co enjoys a good reputation and it is suggested that this may be because it has managed to avoid large-scale redundancies. This reputation may now be under threat and its loss could affect Cigno Co negatively in terms of long-term loss in revenues, profits and value; and it may be difficult to measure the impact of this loss accurately.

Whilst minimising tax may be financially prudent, it may not be considered fair. For example, currently there is ongoing discussion and debate from a number of governments and other interested parties that companies should pay tax in the countries they operate and derive their profits, rather than where they are based. Whilst global political consensus in this area seems some way off, it is likely that the debate in this area will increase in the future. Companies that are seen to be operating unethically with regard to this may damage their reputation and therefore their profits and value.

Nonetheless, given that Cigno Co is likely to derive substantial value from the acquisition, because of these savings, it should not merely disregard the potential savings. Instead it should

consider public relations exercises it could undertake to minimise the loss of reputation, and perhaps meet with the Government to discuss ways forward in terms of tax payments.

Conclusion

The potential value gained from acquiring and unbundling Anatra Co can be substantial if the potential cost savings are taken into account. However, given the assumptions that are made in computing the value, it is recommended that sensitivity analysis is undertaken and a range of values obtained. It is also recommended that Cigno Co should undertake public relations exercises to minimise the loss of reputation, but it should probably proceed with the acquisition, and undertake the cost saving exercise because it is likely that this will result in substantial additional value.

Report compiled by:

Date:

Appendix 1: Estimate of value created from the sell-off of the equipment manufacturing business

Average industry P/E ratio = $\$2.40/\$0.30 = 8$

Anatra Co's equipment manufacturing business P/E ratio = $8 \times 1.2 = 9.6$

Value from sell-off of equipment manufacturing business

Share of pre-tax profit = $30\% \times \$2,490\text{m} = \747m

After-tax profit = $\$747\text{m} \times (1 - 0.22) = \582.7m

Value from sell-off = $\$582.7\text{m} \times 9.6 = \$5,594\text{m}$ (approximately)

Appendix 2: Estimate of the combined company cost of capital

Anatra Co, asset beta = 0.68

Cigno Co, asset beta:

Equity beta = 1.10

Proportion of market value of debt = 40%; Proportion of market value of equity = 60%

Asset beta = $1.10 \times 0.60/(0.60 + 0.40 \times 0.78) = 0.72$

Combined company, asset beta

Market value of equity, Anatra Co = $\$3 \times 7,000\text{m}$ shares = $\$21,000\text{m}$

Market value of equity, Cigno Co = $60\% \times \$60,000\text{m} = \$36,000\text{m}$

Asset beta = $(0.68 \times 21,000 + 0.72 \times 36,000)/(21,000 + 36,000) = 0.71$ (approximately)

Combined company equity beta = $0.71 \times (0.6 + 0.4 \times 0.78)/0.6 = 1.08$

Combined company, cost of equity = $4.3\% + 1.08 \times 7\% = 11.86\%$

Combined company, cost of capital = $11.86\% \times 0.6 + 6.00\% \times 0.78 \times 0.4 = 8.99$, say 9%

Appendix 3: Estimate of the value created for Cigno Co's equity holders from the acquisition

Anatra Co, medical R&D value estimate:

Sales revenue growth rate = 5%

Operating profit margin = 17.25%

Tax rate = 22%

Additional capital investment = 40% of the change in sales revenue

Cost of capital = 9% (Appendix 2)

Free cash flow growth rate after 4 years = 3%

Current sales revenue = $70\% \times \$21,400\text{m} = \$14,980\text{m}$

Cash flows, Years 1 to 4

Year	1 \$m	2 \$m	3 \$m	4 \$m
Sales revenue	<u>15,729</u>	<u>16,515</u>	<u>17,341</u>	<u>18,208</u>
Profit before interest and tax	2,713	2,849	2,991	3,141
Tax	597	627	658	691
Additional capital investment	<u>300</u>	<u>314</u>	<u>330</u>	<u>347</u>
Free cash flows	<u>1,816</u>	<u>1,908</u>	<u>2,003</u>	<u>2,103</u>
Present value of cash flows (9% discount)	1,666	1,606	1,547	1,490

Value, Years 1 to 4: \$6,309m

Value, Year 5 onwards: $[\$2,103 \times 1.03 / (0.09 - 0.03)] \times 1.09^{-4} = \$25,575\text{m}$

Total value of Anatra Co's medical R&D business area = \$31,884m

Total value of Anatra Co following unbundling of equipment manufacturing business and absorbing medical R&D business:

\$5,594m (Appendix 1) + \$31,884m = \$37,478m (approximately)

Anatra Co, current market value of equity = \$21,000m

Anatra Co, current market value of debt = \$9,000m

Premium payable = $\$21,000\text{m} \times 35\% = \$7,350\text{m}$

Total value attributable to Anatra Co's investors = \$37,350m

Value attributable to Cigno Co's shareholders from the acquisition of Anatra Co before taking into account the cash benefits of potential tax savings and redundancies = Value following unbundling (\$37,478m) – Anatra's debt (\$9,000m) – price paid for Anatra (\$21,000m + \$7,350m) = \$128m

Appendix 4: Estimate of the value created from savings in tax and employment costs following possible redundancies

Cash flows, Years 1 to 4

Year	1 \$m	2 \$m	3 \$m	4 \$m
Cash flows (4% increase p.a.)	1,600	1,664	1,731	1,800
Present value of cash flows (9%)	1,468	1,401	1,337	1,275

Total value = \$5,481m

Value attributable to Cigno Co's shareholders from the acquisition of Anatra Co after taking into account the cash benefits of potential tax savings and redundancies = \$5,609m

(c) The feasibility of disposing of assets as a defence tool against a possible acquisition depends upon the type of assets sold and how the funds generated from the sale are utilised.

If the type of assets are fundamental to the continuing business then this may be viewed as disposing of the corporation's 'crown jewels'. Such action may be construed as being against protecting the rights of shareholders (similar to the conditions discussed in part (d) below). In order for key assets to be disposed of, the takeover regulatory framework may insist on the corporation obtaining permission from the shareholders first before carrying it out.

On the other hand, the assets may be viewed as not being fundamental to the core business and may be disposed of to generate extra funds through a sell-off (see part (a) above). This may make sense if the corporation is undertaking a programme of restructuring and reorganisation.

In addition to this, the company needs to consider what it intends to do with the funds raised from the sale of assets. If the funds are used to grow the core business and therefore enhancing value, then the shareholders would see this positively and the value of the corporation will probably increase. Alternatively, if there are no profitable alternatives, the funds could be returned to the shareholders through special dividends or share buybacks. In these circumstances, disposing of assets may be a feasible defence tactic.

However, if the funds are retained but not put to value-enhancing use or returned to shareholders, then the share price may continue to be depressed. And the corporation may still be an attractive takeover target for corporations which are in need of liquid funds. In these circumstances, disposing of assets would not be a feasible defence tactic.

(d) Each of the three conditions aims to ensure that shareholders are treated fairly and equitably.

The mandatory-bid condition through sell out rights allows remaining shareholders to exit the company at a fair price once the bidder has accumulated a certain number of shares. The amount of shares accumulated before the rule applies varies between countries. The bidder must offer the shares at the highest share price, as a minimum, which had been paid by the bidder previously. The main purpose for this condition is to ensure that the acquirer does not exploit their position of power at the expense of minority shareholders.

The principle of equal treatment condition stipulates that all shareholder groups must be offered the same terms, and that no shareholder group's terms are more or less favourable than another group's terms. The main purpose of this condition is to ensure that minority shareholders are offered the same level of benefits as the previous shareholders from whom the controlling stake in the target company was obtained.

The squeeze-out rights condition allows the bidder to force minority shareholders to sell their stake, at a fair price, once the bidder has acquired a specific percentage of the target company's equity. The percentage varies between countries but typically ranges between 80% and 95%. The main purpose of this condition is to enable the acquirer to gain a 100% stake of the target company and prevent problems arising from minority shareholders at a later date.

Note. Credit will be given for alternative, relevant approaches to the calculations, comments and suggestions/recommendations.

56 Lirio

Workbook references. Purchasing power parity theory is covered in chapter 5. Dividend capacity is covered in Chapter 16. Currency hedging is covered in Chapter 12.

Top tips. Where a 50-mark question covers a wide range of syllabus areas, as here, you need to focus on maximising your marks in the areas that you can do and not get too distracted by the areas that you find more difficult.

Part (a) – as is often the case, the 50-mark question starts with a basic area, here requiring an explanation of purchasing power parity theory.

Part (b)(i) required an assessment of the dividend capacity of the company. This is a topic that has been examined before.

Part (b)(ii) asked for assessment of the outcome of a currency hedge using either forwards, futures or options. This required a careful analysis of the appropriate part of the 'spread' to use and recognition that the \$ was the contract currency for the futures and options contracts. Apart from this, the calculations here have been tested many times in previous exam sittings.

In part (b)(iii) the question gave information about the impact of the project on the pattern of future dividends. This suggested the use of the dividend valuation model (DVM) to establish the value of the company before and after the project to see if the project would 'add value'. Those candidates who realised that the DVM was needed scored well here. However, in general this part of the question was poorly done because candidates were not able to see the need for DVM.

Part (b)(iv) asked for a discussion of the proposed methods of financing the project.

This could have been satisfactorily answered by using the details provided in the scenario.

The implication of the changing patterns of dividend (given in the question) resulting from the project is that a cut in the dividend was being considered to finance the project. However, many candidates missed this and therefore failed to discuss the potential impact of the project on dividend policy. This was the key issue in this part of the question.

Easy marks. There were easier marks in many elements of this compulsory question (part (a), some of (b)(i), (b)(ii), some of (b)(iv) and the presentation marks in part (b)). Targeting these easier marks is an essential element in exam technique for AFM.

Marking scheme

		Marks
(a)	Up to 2 marks per well-explained point	Max <u>6</u>
(b) (i)	Appendices 1 and 1.1	1
	Operating profit	1
	Interest paid	1
	Tax paid for normal activities	1
	Investment in working capital	1
	Investment in additional non-current assets	1
	Correct treatment of depreciation	1
	Cash flows remitted from Pontac Co	2
	Additional tax payable	1
		<u>9</u>

	Marks
(ii) Appendix 2	
Amount received based on forward contracts	1
Correctly identifying long contracts and purchasing call options	1
Expected futures price based on linear narrowing of basis	1
Amount received based on futures contracts	1
Recognition of small over-hedge when using futures contracts	1
Option contracts or futures contracts purchased	1
Premium paid in dollars	1
Amount received based on options contracts	2
1–2 marks for each well-discussed point	4
Reasonable recommendation	1
	<u>14</u>
(iii) Appendix 3 and project assessment	
Estimate of dividend growth rate (prior to project undertaken)	2
Estimate of corporate value (prior to project undertaken)	1
Annual dividend per share after transfer of funds to project	2
Estimate of value after project is undertaken	2
Concluding comments on project assessment	1
	<u>8</u>
(iv) Discussion of issues	
Limitations of method used	1–2
Signalling impact of change in dividend policy	1–2
Clientele impact of change in dividend policy	2–3
Rationale for not considering debt or equity	3–4
Other relevant discussion points	2–3
	<u>9</u>
Professional marks for part (b)	
Structure and presentation of the discussion paper	3
Clearly highlighting/emphasising areas for further discussion/detailed summary	1
	<u>4</u>
	<u>50</u>

(a) Purchasing power parity (PPP) predicts that the exchange rates between two currencies depend on the relative differences in the rates of inflation in each country. Therefore, if one country has a higher rate of inflation compared to another, then its currency is expected to depreciate over time. However, according to PPP the 'law of one price' holds because any weakness in one currency will be compensated by the rate of inflation in the currency's country (or group of countries, in the case of the euro).

Economic exposure refers to the degree by which a company's cash flows are affected by fluctuations in exchange rates. It may also affect companies which are not exposed to foreign exchange transactions, due to actions by international competitors.

If PPP holds, then companies may not be affected by exchange rate fluctuations, as lower currency value can be compensated by the ability to raise prices due to higher inflation levels. This depends on markets being efficient.

However, a permanent shift in exchange rates may occur, not because of relative inflation rate differentials, but because a country (or group of countries) lose their competitive positions. In this case the 'law of one price' will not hold, and prices readjust to a new and long-term or even permanent rate. For example, the UK £ to US\$ rate declined in the 20th century, as the US grew stronger economically and the UK grew weaker. The rate almost reached parity in

1985 before recovering. Since the financial crisis in 2009, it has fluctuated between roughly \$1.5 to £1 and \$1.7 to £1.

In such cases, where a company receives substantial amounts of revenue from companies based in countries with relatively weak economies, it may find that it is facing economic exposure and its cash flows decline over a long period of time.

(b) Discussion paper to the BoD, Lirio Co

Discussion paper compiled by:

Date:

Purpose of the discussion paper

The purpose of this discussion paper is:

- (i) To consider the implications of the BoD's proposal to use funds from the sale of its equity investment in the European company and from its cash flows generated from normal business activity over the next two years to finance a large project, instead of raising funds through equity and/or debt
- (ii) To assess whether or not the project adds value for Lirio Co or not

Background information

The funds needed for the project are estimated at \$40,000,000 at the start of the project. \$23,118,000 of this amount is estimated to be received from the sale of the equity investment (Appendices 2 and 3). This leaves a balance of \$16,882,000 (Appendix 3), which will be obtained from the free cash flows to equity (the dividend capacity) of \$21,642,000 (Appendix 1) expected to be generated in the first year. However, this would leave only \$4,760,000 available for dividend payments in the first year, meaning a cut in expected dividends from \$0.27/share to \$0.0595/share (Appendix 3). The same level of dividends will be paid in the second year as well.

Project assessment

Based on the dividend valuation model, Lirio Co's market capitalisation, and therefore its value, is expected to increase from approximately \$360 million to approximately \$403 million, or by just under 12% (Appendix 3). This would suggest that it would be beneficial for the project to be undertaken.

Possible issues

- 1 The dividend valuation model is based on a number of factors such as: an accurate estimation of the dividend growth rate, a non-changing cost of equity and a predictable future dividend stream growing in perpetuity. In addition to this, it is expected that the sale of the investment will yield €20,000,000 but this amount could increase or reduce in the next 3 months. The dividend valuation model assumes that dividends and their growth rate are the sole drivers of corporate value, which is probably not accurate.
- 2 Although the dividend irrelevancy theory proposed by Modigliani and Miller suggests that corporate value should not be affected by a corporation's dividend policy, in practice changes in dividends do matter for two main reasons. First, dividends are used as a signalling device to the markets and unexpected changes in dividends paid and/or dividend growth rates are not generally viewed positively by them. Changes in dividends may signal that the company is not doing well and this may affect the share price negatively.

- 3 Second, corporate dividend policy attracts certain groups of shareholders or clientele. In the main this is due to personal tax reasons. For example, higher rate taxpayers may prefer low dividend payouts and lower rate taxpayers may prefer higher dividend payouts. A change in dividends may result in the clientele changing and this changeover may result in excessive and possibly negative share price volatility.
- 4 It is not clear why the BoD would rather not raise the required finance through equity and/or debt. The BoD may have considered increasing debt to be risky. However, given that the current level of debt is \$70 million compared to an estimated market capitalisation of \$360 million (Appendix 3), raising another \$40 million through debt finance will probably not result in a significantly higher level of financial risk. The BoD may have been concerned that going into the markets to raise extra finance may result in negative agency type issues, such as having to make proprietary information public, being forced to give extra value to new equity owners, or sending out negative signals to the markets.

Areas for further discussion by the BoD

Each of these issues should be considered and discussed further by the BoD. With reference to point 1, the BoD needs to discuss whether the estimates and the model used are reasonable in estimating corporate value or market capitalisation. With reference to points 2 and 3, the BoD needs to discuss the implications of such a significant change in the dividend policy and how to communicate Lirio Co's intention to the market so that any negative reaction is minimised. With reference to point 4, the BoD should discuss the reasons for any reluctance to raise finance through the markets and whether any negative impact of this is perhaps less than the negative impact of points 2 and 3.

Appendix 1: Expected dividend capacity prior to large project investment

	\$'000
Operating profit ($15\% \times (1.08 \times \$300 \text{ million})$)	48,600
Less interest (5% of \$70 million)	(3,500)
Less taxation ($25\% \times (\$48.6 \text{ million} - 3.5 \text{ million})$)	(11,275)
Less investment in working capital ($\$0.10 \times (0.08 \times \$300 \text{ million})$)	(2,400)
Less investment in additional non-current assets ($\$0.20 \times (0.08 \times \$300 \text{ million})$)	(4,800)
Less investment in projects	<u>(8,000)</u>
Cash flows from domestic operations	18,625
Cash flows from Pontac Co's dividend remittances (see Appendix 1.1)	3,297
Additional tax payable on Pontac Co's profits (5% $\times \$5.6 \text{ million}$)	<u>(280)</u>
Dividend capacity	<u>21,642</u>

Appendix 1.1: Dividend remittances expected from Pontac Co

	\$'000
Total contribution $\$24 \times 400,000 \text{ units}$	9,600
Less fixed costs	(4,000)
Less taxation ($20\% \times \$5.6 \text{ million}$)	<u>(1,120)</u>
Profit after tax	<u>4,480</u>
Remitted to Lirio Co ($80\% \times \$4.48 \text{ million} \times 92\%$)	<u>3,297</u>

Appendix 2: Euro (€) investment sale receipt hedge

Lirio Co can use one of forward contracts, futures contracts or option contracts to hedge the € receipt.

Forward contract

Since it is a € receipt, the 1.1559 rate will be used.

$$€20,000,000 \times 1.1559 = \$23,118,000$$

Futures contracts

Go long to protect against a weakening € and use the June contracts to hedge as the receipt is expected at the end of May 20X6 or beginning of June 20X6 (in three months' time).

Opening basis = futures rate – spot rate

Here the June futures rate (per \$) is 0.8656 and the March spot rate (per \$) = 1 / 1.1585 = 0.8632.

So opening basis is $0.8656 - 0.8632 = 0.0024$

There are 4 months to the expiry of the June futures contract so we can assume that when the futures contracts are closed out, one month before expiry, then $\frac{1}{4}$ of this basis will remain. So closing basis is estimated as $0.0024 \times \frac{1}{4} = 0.0006$.

The effective futures rate can be estimated as opening futures rate – closing basis

Tutorial note. Other methods are possible.

Here this gives $0.8656 - 0.0006 = 0.8650$.

$$\text{Expected receipt} = €20,000,000 / 0.8650 = \$23,121,387$$

Number of contracts bought = $\$23,121,387 / \$125,000 = \text{approximately 185 contracts}$ (resulting in a very small over-hedge and therefore not material)

(Full credit will be given where the calculations are used to show the correction of the over-hedge using forwards.)

Option contracts

Purchase the June call option to protect against a weakening € and because receipt is expected at the end of May 20X6 or beginning of June 20X6.

Exercise price is 0.86, therefore expected receipt is $€20,000,000 / 0.8600 = \$23,255,814$

$$\text{Contracts purchased} = \$23,255,814 / \$125,000 = 186.05, \text{ say 186}$$

$$\text{Amount hedged} = \$125,000 \times 186 = \$23,250,000$$

$$\text{Premium payable} = 186 \times 125,000 \times 0.0290 = €674,250$$

$$\text{Premium in \$} = €674,250 \times 1.1618 = \$783,344$$

$$\text{Amount not hedged} = €20,000,000 - (186 \times 125,000 \times 0.8600) = €5,000$$

$$\text{Use forward contracts to hedge €5,000 not hedged. } €5,000 \times 1.1559 = \$5,780$$

(Full credit will be given if a comment on the under-hedge being immaterial and therefore not hedged is made, instead of calculating the correction of the under-hedge.)

$$\text{Total receipts} = \$23,250,000 + \$5,780 - \$783,344 = \$22,472,436$$

Advice and recommendation

Hedging using options will give the lowest receipt at \$22,472,436 from the sale of the investment, while hedging using futures will give the highest receipt at \$23,127,387, with the forward contracts giving a receipt of \$23,118,000.

The lower receipt from the option contracts is due to the premium payable, which allows the option buyer to let the option lapse should the € strengthen. In this case, the option would be allowed to lapse and Lirio Co would convert the € into \$ at the prevailing spot rate in three months' time. However, the € would need to strengthen significantly before the cost of the

option is covered. Given market expectation of the weakness in the € continuing, this is not likely to be the case.

Although futures and forward contracts are legally binding and do not have the flexibility of option contracts, they both give higher receipts. Hedging using futures gives the higher receipt, but futures require margin payments to be made upfront and contracts are marked to market daily. In addition to this, the basis may not narrow in a linear fashion and therefore the amount received is not guaranteed. All these factors create uncertainty in terms of the exact amounts of receipts and payments resulting on a daily basis and the final receipt.

On the other hand, when using forward contracts to hedge the receipt exposure, Lirio Co knows the exact amount it will receive. It is therefore recommended that Lirio Co use the forward markets to hedge the expected receipt.

(Note. It could be argued that in spite of the issues when hedging with futures, the higher receipt obtained from using futures markets to hedge means that they should be used. This is acceptable as well.)

Appendix 3: Estimate of Lirio Co's value based on the dividend valuation model

If the large project is not undertaken and dividend growth rate is maintained at the historic level

Dividend history

<i>Year to end of February</i>	<i>20X3</i>	<i>20X4</i>	<i>20X5</i>	<i>20X6</i>
Number of \$1 equity shares in issue ('000)	60,000	60,000	80,000	80,000
Total dividends paid (\$'000)	12,832	13,602	19,224	20,377
Dividend per share	\$0.214	\$0.227	\$0.240	\$0.255

Average dividend growth rate = $(0.255/0.214)^{1/3} - 1 = 1.0602$ (or say 6%)

Expected dividend in February 20X7 = $\$0.255 \times 1.06 = \0.270

Lirio Co, estimate of value if large project is not undertaken = $\$0.270/(0.12 - 0.06) = \4.50 per share or \$360 million market capitalisation

If the large project is undertaken

Funds required for project	\$40,000,000
Funds from sale of investment (Appendix 2)	<u>\$23,118,000</u>
Funds required from dividend capacity cash flows	<u>\$16,882,000</u>
Dividend capacity funds before transfer to project (Appendix 1)	\$21,642,000
Dividend capacity funds left after transfer	\$4,760,000
Annual dividend per share after transfer	\$0.0595
Annual dividend paid (end of February 20X7 and February 20X8)	\$0.0595
Dividend paid (end of February 20X9)	\$0.3100
New growth rate	7%

Lirio Co, estimate of value if large project is undertaken =

$\$0.0595 \times 1.12^{-1} + \$0.0595 \times 1.12^{-2} + \$0.3100 \times 1.12^{-3} + [\$0.3100 \times 1.07/(0.12 - 0.07)] \times 1.12^{-3} = \5.04 per share or \$403 million market capitalisation

(Note. A discussion paper can take many formats. The answer provides one possible format. Credit will be given for alternative and sensible formats; and for relevant approaches to the calculations and commentary.)

57 Morada

Workbook references. Risk management is covered in Chapter 2; cost of capital in Chapter 7.

Top tips. Part (b)(i) 17 marks – this was the hardest part of this question. It was important here to keep your nerve and to score the easier marks; these were available for calculating the current cost of equity and cost of capital (6 marks were available for this).

The key points in calculating the revised cost of capital were:

- Remembering that the market value of debt is needed for a WACC calculation and that this is not the same as the book value of debt. To work out the market value you need to calculate the present value of the future cash flows and discount at the company's pre-tax cost of debt.
- Read the question carefully, this told you to assume that the value of equity is unchanged under any proposal.
- Being aware that the information provided on movements in assets and liabilities was mainly relevant to part (bii).

Easy marks. Parts of this question are extremely challenging but it is important to target the easier areas and not to worry about getting every aspect of the calculations correct (this is unlikely to be achievable under exam conditions).

The discussion parts of this question – parts (a), (b)(iii) and (c) were worth about half of the marks (including the professional marks in part (b) and therefore need (almost) as much effort as the numerical areas.

In part (b)(iii) the easiest marks are for stating your assumptions – this was requested in the question and was worth up to 3 marks. Key assumptions include the assumption that the value of equity is unaffected by each proposal (which seems highly unlikely) and that the weightings used to calculate the asset beta in proposal 2 are accurate, and that any increase in earnings affects retained profits.

Marking scheme

		Marks
(a)	Relationship between business and financial risk	3
	Risk mitigation and risk diversification as part of a company's risk management strategy	<u>3</u> <u>6</u>
(b) (i)	Appendix 1	
	Prior to implementation of any proposal	
	Cost of equity	1
	Cost of debt	1
	Market value of equity	1
	Market value of debt	2
	Cost of capital	1
	After implementing the first director's proposal	
	Market value of debt	2
	Morada Co, asset beta	1
	Asset beta of travel services only	1
	Equity beta of travel services only	1
	Cost of equity	1
	Cost of capital	1

	Marks
After implementing the second director's proposal	
Market value of debt	2
Cost of equity	1
Cost of capital	<u>1</u>
	<u>17</u>
(ii) Appendix 2	
Adjusted earnings, first director's proposal	2
Financial position, first director's proposal	2
Adjusted earnings, second director's proposal	2
Financial position, second director's proposal	<u>1</u>
	<u>7</u>
(iii) Discussion	5–6
Assumptions	2–3
Reasoned recommendation	<u>1–2</u>
(Note. Maximum 8 marks if no recommendation given)	Max <u>9</u>
Professional marks for part (b)	
Report format	1
Structure and presentation of the report	<u>3</u>
	<u>4</u>
(c) 1 to 2 marks per point	Max <u>7</u>
	<u>50</u>

(a) The owners or shareholders of a business will accept that it needs to engage in some risky activities in order to generate returns in excess of the risk-free rate of return. A business will be exposed to differing amounts of business and financial risk depending on the decisions it makes. Business risk depends on the decisions a business makes with respect to the services and products it offers and consists of the variability in its profits. For example, it could be related to the demand for its products, the rate of innovation, actions of competitors, etc. Financial risk relates to the volatility of earnings due to the financial structure of the business and could be related to its gearing, the exchange rate risk it is exposed to, its credit risk, its liquidity risk, etc. A business exposed to high levels of business risk may not be able to take excessive financial risk, and vice versa, as the shareholders or owners may not want to bear risk beyond an acceptable level.

Risk management involves the process of risk identification, of assessing and measuring the risk through the process of predicting, analysing and quantifying it, and then making decisions on which risks to assume, which to avoid, which to retain and which to transfer. As stated above, a business will not aim to avoid all risks, as it will want to generate excess returns. Dependent on factors such as controllability, frequency and severity of the risk, it may decide to eliminate or reduce some risks from the business through risk transfer. Risk mitigation is the process of transferring risks out of a business through, for example, hedging or insurance, or avoiding certain risks altogether. Risk diversification is a process of risk reduction through spreading business activity into different products and services, different geographical areas and/or different industries to minimise being excessively exposed by focusing exclusively on one product/service.

(b) **Report to the BoD, Morada Co**

This report provides a discussion on the estimates of the cost of equity and the cost of capital and the impact on the financial position and the earnings after tax, as a result of the proposals put forward by the first director and the second director. The main assumptions made in drawing up the estimates will also be explained. The report concludes by recommending which of the two directors' proposals, if any, should be adopted.

Discussion

The table below shows the revised figures of the cost of equity and the cost of capital (Appendix 1), and the forecast earnings after tax for the coming year (Appendix 2), following each proposal from the first and second directors. For comparison purposes, figures before any changes are given as well.

	<i>Cost of equity</i> Appendix 1	<i>Cost of capital</i> Appendix 1	<i>Earnings after tax</i> Appendix 2
Current position	12.2%	10.0%	\$28.0 million
Following first director's proposal	11.6%	11.1%	\$37.8 million
Following second director's proposal	12.3%	9.8%	\$30.8 million

Under the first director's proposal, although the cost of equity falls due to the lower financial risk in Morada Co because of less debt, the cost of capital actually increases. This is because, even though the cost of debt has decreased, the benefit of the tax shield is reduced significantly due to the lower amount of debt borrowing. Added to this is the higher business risk, reflected by the asset beta, of Morada Co just operating in the travel services sector. This higher business risk and reduced tax shield more than override the lower cost of debt resulting in a higher cost of capital.

Under the second director's proposal, the cost of equity is almost unchanged. There has been a significant increase in the cost of debt from 4.7% to 6.2%. However, the cost of capital has not reduced significantly because the benefit of the tax shield is also almost eroded by the increase in the cost of debt.

If no changes are made, then the forecast earnings after tax as a percentage of non-current assets is 10% (\$28m/\$280m). Under the first director's proposal, this figure almost doubles to 19.3% (\$37.8m/\$196m) and, even if the one-off profit from the sale of non-current assets is excluded, this figure is still higher at 12.9% (\$25.2m/\$196m). Under the second director's proposal, this figure falls to 8.8% (\$30.8m/\$350m).

Assumptions

- 1 It is assumed that the asset beta of Morada Co is a weighted average of the asset betas of the travel services and the maintenance services business units, using non-current assets invested in each business unit as a fair representation of the size of each business unit and therefore the proportion of the business risk which that business unit represents within the company.
- 2 The assumption of the share price not changing after either proposal is not reasonable. It is likely that due to changes in the business and financial risk from implementing either proposal, the risk profile of the company will change. The changes in the risk profile will influence the cost of equity, which in turn will influence the share price.
- 3 In determining the financial position of Morada Co, it is assumed that the current assets will change due to changes in the profit after tax figure; therefore this is used as the balancing figure for each proposal.

Recommendation

It is recommended that neither the first director's proposal nor the second director's proposal should be adopted. The second director's proposal results in a lower return on investment and a virtually unchanged cost of capital. So there will not be a meaningful benefit for Morada Co. The first director's proposal does increase the return on investment but results in a higher cost of capital. If the reason for adopting either proposal is to reduce risk, then this is not achieved. The main caveat here is that where the assumptions made in the calculations are not reasonable, they will reduce the usefulness of the analysis.

Report compiled by:

Date:

(Note. Credit will be given for alternative and relevant points.)

Appendix 1: Estimates of cost of equity and cost of capital

Before either proposal is implemented

Cost of equity (Ke) = $3.8\% + 1.2 \times 7\% = 12.2\%$

Cost of debt (Kd) = $3.8\% + 0.9\% = 4.7\%$

Market value of equity (MV_e) = $\$2.88 \times 125\text{m shares} = \360m

Market value of debt (MVd)

Per \$100 $\$6.20 \times 1.047^{-1} + \$6.20 \times 1.047^{-2} + \$6.20 \times 1.047^{-3} + \$106.20 \times 1.047^{-4} = \105.36

Total MVd = $\$105.36/\$100 \times \$120\text{m} = \126.4m

Cost of capital = $(12.2\% \times \$360\text{m} + 4.7\% \times 0.8 \times \$126.4\text{m})/\$486.4\text{m} = 10.0\%$

If the first director's proposal is implemented

MV_e = \$360m

BV_d = $\$120\text{m} \times 0.2 = \24m

Kd = 4.4%

MV_d per \$100 $\$6.20 \times 1.044^{-1} + \$6.20 \times 1.044^{-2} + \$6.20 \times 1.044^{-3} + \$106.20 \times 1.044^{-4} = \106.47

Total MV_d = $\$106.47/\$100 \times \$24 = \25.6m

Morada Co, asset beta

$1.2 \times \$360\text{m}/(\$360\text{m} + \$126.4\text{m} \times 0.8) = 0.94$

To calculate the asset beta of travel services it will be assumed that it represents 70% of the value of the company (the question says that the % of the total book value of non-current assets can be used to represent the total size of each division, and says that 30% of the non-current assets belong to the repairs and maintenance division).

This means that the asset beta of travel $\times 0.7$ + asset beta of the repairs and maintenance division $\times 0.3 = 0.94$.

We are told that the asset beta of the repairs and maintenance division is 0.65 so:

Beta of travel $\times 0.7 + 0.65 \times 0.3 = 0.94$

So beta of travel $\times 0.7 = 0.94 - 0.195$

So asset beta of travel = $0.745 / 0.7 = 1.06$

This is now re-gearred to calculate the equity beta of travel services.

Equity beta of travel services = $1.06 \times (\$360\text{m} + \$25.6\text{m} \times 0.8)/\$360\text{m} = 1.12$

Ke = $3.8\% + 1.12 \times 7\% = 11.6\%$

Cost of capital = $(11.6\% \times \$360\text{m} + 4.4\% \times 0.8 \times \$25.6\text{m})/\$385.6 = 11.1\%$

If the second director's proposal is implemented

$$MV_e = \$360m$$

The basis points for the Ca3 rated bond is 240 basis points higher than the risk-free rate of interest, giving a cost of debt of 6.2%, therefore:

$$MV_d = BV_d = \$190m$$

Equity beta of the new, larger company = 1.21

$$Ke = 3.8\% + 1.21 \times 7\% = 12.3\%$$

$$\text{Cost of capital} = (12.3\% \times \$360m + 6.2\% \times 0.8 \times \$190m) / \$550m = 9.8\%$$

Appendix 2: Estimates of forecast after-tax earnings and forecast financial position

MORADA CO EXTRACTS FROM THE FORECAST AFTER-TAX EARNINGS FOR THE COMING YEAR

	Current forecast	Forecast: first director proposal	Forecast: second director proposal
	\$'000	\$'000	\$'000
Current forecast after-tax earnings	28,000	28,000	28,000
Interest saved due to lower borrowing (\$96m \times 6.2% \times 0.8)		4,762	
Interest payable on additional borrowing (\$70m \times 6.2% \times 0.8)			(3,472)
Reduction in earnings due to lower investment (9% \times \$84m)		(7,560)	
Additional earnings due to higher investment (9% \times \$70m)			6,300
Profit on sale of non-current assets (15% \times \$84m)		12,600	
Revised forecast after-tax earnings	<u>28,000</u>	<u>37,802</u>	<u>30,828</u>
Increase in after-tax earnings		9,802	2,828

MORADA CO EXTRACTS FROM THE FORECAST FINANCIAL POSITION FOR THE COMING YEAR

	Current forecast	Forecast: first director proposal	Forecast: second director proposal
	\$'000	\$'000	\$'000
Non-current assets	280,000	196,000	350,000
Current assets (balancing figure)	<u>48,000</u>	<u>43,702</u>	<u>57,828</u>
Total assets	<u>328,000</u>	<u>239,702</u>	<u>407,828</u>
Equity and liabilities			
Share capital (40c/share)	50,000	50,000	50,000
Retained earnings**	137,000	146,802	139,828
Total equity	<u>187,000</u>	<u>196,802</u>	<u>189,828</u>
Non-current liabilities (6.2% redeemable bonds)	120,000	24,000	190,000
Current liabilities	<u>21,000</u>	<u>18,900</u>	<u>28,000</u>
Total liabilities	<u>141,000</u>	<u>42,900</u>	<u>218,000</u>
Total liabilities and capital	<u>328,000</u>	<u>239,702</u>	<u>407,828</u>

** Note. With the two directors' proposals, the retained earnings amount is adjusted to reflect the revised forecast after-tax earnings.

(c) **(Note.** This is an open-ended question and a variety of relevant answers can be given by candidates depending on how the question requirement is interpreted. The following answer is just one possible approach which could be taken. Credit will be given for alternative, but valid, interpretations and answers therein.)

According to the third director, risk management involves more than just risk mitigation or risk diversification as proposed by the first and second directors. The proposals suggested by the first and the second directors are likely to change the makeup of the company, and cause uncertainty amongst the company's owners or clientele. This in turn may cause unnecessary fluctuations in the share price. She suggests that these changes are fundamental and more than just risk management tools.

Instead, it seems that she is suggesting that Morada Co should follow the risk management process suggested in part (a) above, where risks should be identified, assessed and then mitigated according to the company's risk appetite.

The risk management process should be undertaken with a view to increasing shareholder wealth, and therefore the company should consider what drives this value and what are the risks associated with these drivers of value. Morada Co may assess that some of these risks are controllable and some not controllable. It may assess that some are severe and others less so, and it may assess that some are likely to occur more frequently than others.

Morada Co may take the view that the non-controllable, severe and/or frequent risks should be eliminated (or not accepted). On the other hand, where Morada Co is of the opinion that it has a comparative advantage or superior knowledge of risks, and therefore is better able to manage them, it may come to the conclusion that it should accept these. For example, it may take the view that it is able to manage events such as flight delays or hotel standards, but would hedge against currency fluctuations and insure against natural disasters due to their severity or non-controllability.

Theory suggests that undertaking risk management may increase the value of a company if the benefits accruing from the risk management activity are more than the costs involved in managing the risks. For example, smoothing the volatility of profits may make it easier for Morada Co to plan and match long-term funding with future projects or to take advantage of market imperfections by reducing the amount of taxation payable, or it may reduce the costs involved with incidences of financial distress. In each case, though, the benefits accrued should be assessed against the costs involved.

Therefore, a risk management process is more than just mitigating risk through reducing financial risk as the first director is suggesting or risk diversification as the second director is suggesting. Instead it is a process of risk analysis and then about judgement of which risks to hedge or mitigate, and finally, which risk reduction mechanisms to employ, depending on the type of risk, the cost of the risk analysis and mitigation, and the benefits accruing from the mitigation.

58 Nente

Workbook references. Chapter 8 covers valuation of acquisitions, Chapter 2 covers performance measurement and Chapter 9 covers defensive tactics in a takeover.

Top tips. In part (a) do all the calculations first as appendices and then write the report based on these calculations. Make sure you have read all of the information in the scenario. Spotting the risk-free debt rate is difficult, but you are told 7% is 380 basis points over the government base rate so you can assume the risk-free rate is 3.2%.

In part (b) you should perform a couple of easy calculations to show financial performance and comment on what these mean for Nente Co.

Easy marks. The discussion in part (c) offers some relatively straightforward marks.

Examining team's comments. Answers which gave a report title but then did not structure the answer appropriately gained few professional marks.

Part (i) was generally done adequately. A significant number of candidates calculated the growth rate, although some misread the question, and read the growth rate information as: 'by 25%' instead of 'to 25%'. In a number of responses, when calculating the free cash flow to firm, errors were made such as including interest and when calculating the tax impact. Many candidates did not deduct the debt value from the free cash flow to get to the value per share. Some candidates did not divide the total value by the number of shares to get a share price.

A significant number of candidates had difficulty with part (ii) and especially with obtaining a value for the combined company based on combined company earnings, which included synergies and a modified P/E ratio. This is a fairly standard method of obtaining the value of the combined company and it was expected that most candidates should have been able to do these computations at AFM level.

Marking scheme

	Marks
(a) Appendix 1	
Based on PBIT, calculation of the growth rate	2
Calculation of free cash flows	2
Calculation of company value, equity value and value of each share	<u>3</u>
	7
Appendix 2	
Cash offer	
Estimate of value of combined company	3
Value created per share for Nente Co shareholders	1
Share-for-share offer	
Expected share price for the combined company	2
Value created for a Nente Co share	1
Value created for a Mije Co share	<u>1</u>
	8
Appendix 3	
PV of underlying asset	1
Value of exercise price	1
N(d ₁)	2
N(d ₂)	2
Value of call	1
Value added to Nente Co share	<u>1</u>
	8

	Marks
Discussion	
Nente Co shareholders	2-3
Mije Co shareholders	1-2
Assumptions made	2-3
Use of value of follow-on product	<u>2-3</u>
	Max 8
Professional marks	
Report format	1
Layout, presentation and structure	<u>3</u>
	4
(b) Profit level discussion	1-2
Financial gearing	2-3
Growth rates and dividends	2-3
Impact of follow-on product	<u>1-2</u>
	Max 8
(c) 1-2 marks for each defence covered	Max <u>7</u> <u>50</u>

(a) REPORT

To: The Board of Directors of Nente Co

From: A N Accountant

Date: X/X/XX

Re: Impact of the takeover proposal from Mije Co and the follow-on project

This report considers the value, to both Nente Co and Mije Co shareholders, based on a cash offer and also on a share-for-share offer. It discusses the potential reactions of these groups of shareholders to the alternative offers and how best to make use of the follow-on opportunity. All significant assumptions made in the assessments are also explained.

The appendices to this report show the detailed calculations for estimating an equity value for Nente Co, the value to shareholders of Nente Co and Mije Co of the acquisition under both a cash offer and a share-for-share exchange and the value of the follow-on product rights to Nente Co.

The results of the detailed calculations are shown here.

Estimated current price of a Nente Co share \$2.90 (Appendix 1)

<i>Estimated increase in share price</i>	<i>Nente Co</i>	<i>Mije Co</i>
	%	%

Cash offer (Appendix 2)	1.7	9.4
-------------------------	-----	-----

Share-for-share offer (Appendix 2)	17.9	6.9
------------------------------------	------	-----

Estimated value per share of the follow-on product 8.7% (Appendix 3)

The cash offer is **unlikely to be accepted** by Nente Co shareholders because the estimated gains are only slightly higher than the current share price, although being unlisted Nente Co shareholders may not be able to realise the current price should they wish to sell. The share-for-share exchange gives a much larger increase of 17.9% and is much more likely to be acceptable to Nente Co shareholders. It is also **higher than the expected return** from

the follow-on product and therefore based on the financial data the most attractive option for Nente Co shareholders is the takeover on a share-for-share exchange basis.

Mije Co shareholders are likely to **prefer the cash offer** so that they can maximise their own returns and not dilute their control of the company, but they may accept the share-for-share offer as this still offers an increase in value. Mije Co shareholders would need to consider whether these returns are in excess of any other investment opportunities that are available and whether the acquisition of Nente Co is the **best use of funds**.

There are a number of assumptions present in the calculations. For example, for calculating the current value of a Nente Co share the free cash flow model is used. This assumes that the growth rate and free cash flow exist in **perpetuity** and that the estimated cost of capital is appropriate. The takeover offer analysis is based on the assumption that the proposed synergy savings will be achieved and that the P/E **bootstrapping** approach is valid. For the calculation of the follow-on product value the option variables are estimates and an assumption is made that these will not change in the period before the decision is taken. The calculated value is based on the scenario that the option can only be exercised after two years, but it appears that the option can be exercised at any time within the two-year period.

The follow-on product has been treated separately from the takeover, but Nente Co could ask Mije Co to **take this into account** in its takeover offer. The value of the rights to Nente Co is \$609,021 (Appendix 3) and adds around 25c or 8.8% to the value of a Nente Co share. If Mije were to increase its offer by this value, or the rights could be sold prior to the takeover, then the return to a Nente Co shareholder would be $17.9\% + 8.8\% = 26.7\%$.

In conclusion, the preferred outcome for Nente Co shareholders would be to accept the share-for-share offer and to convince Mije Co to take the value of the follow-on product into consideration. Nente Co shareholders will need to be assured of the **accuracy of the calculations** provided in the appendices before they accept the offer.

Appendices

Appendix 1

Estimate of current value of Nente Co's equity based on free cash flows

Total value = Free cash flows $\times (1 + \text{growth rate } (g)) / (\text{Cost of capital } (k) - g)$

$k = 11\%$

Past growth rate = $(\text{latest profit before interest and tax (PBIT}) / \text{Earliest PBIT})^{1/\text{no of periods of growth}} - 1$

Past $g = (1,230/970)^{1/3} - 1 = 0.0824$

Future $g = 0.25 \times 0.0824 = 0.0206$

Free cash flow calculation

Free cash flow (FCF) = PBIT + non-cash flows – cash investment – tax

FCF = $1,230,000 + 1,206,000 - 1,010,000 - (1,230,000 \times 20\%) = \$1,180,000$

Total value = $\$1,180,000 \times 1.0206 / (0.11 - 0.0206) = \$13,471,007$

Equity value = $\$13,471,007 - \$6,500,000 = \$6,971,007$

Number of shares = $\$960,000 / \$0.40 = 2.4 \text{ million}$

Equity value per share = $\$6,971,007 / 2.4 \text{ million shares} = \2.90

Appendix 2

Cash offer

Gain in value to a Nente Co shareholder = $(\$2.95 - \$2.90) / \$2.90 = 1.7\%$

Additional earnings post-acquisition = $\$620,000 + \$150,000 = \$770,000$

Additional earnings per share (EPS) = \$770,000/10m = 7.7c per share

Using the P/E ratio to calculate the increase in share price = $15 \times 7.7c = \$1.16$

Additional value created = $\$1.16 \times 10 \text{ million} = \11.6 million

Less cost of acquisition = $(\$2.95 \times 2.4 \text{ million}) = \7.08 million

Value added for Mije Co shareholders = $11.6 \text{ million} - 7.08 \text{ million} = \4.52 million

Gain in value to a shareholder of Mije = $\$4.52 \text{ million}/10 \text{ million} = 45.2c$

$45.2c/480c = 9.4\%$

Share-for-share offer

Earnings of combined company = \$770,000 (from above) + \$3,200,000 = \$3,970,000

Total number of shares in combined number = $10 \text{ million} + (2.4 \text{ million} \times 2/3) = 11,600,000$

EPS of combined company = $\$3.97 \text{ million}/11.6 \text{ million} = 34.2c$

Expected share price using P/E ratio = $34.2 \times 15 = 513c = \5.13

Gain in value to a shareholder of Mije Co = $(\$5.13 - \$4.80)/\$4.80 = 6.9\%$

Current value of three shares in Nente Co = $\$2.90 \times 3 = \8.70

Gain in value to a shareholder of Nente Co = $(2 \times \$5.13) - \$8.70/\$8.70 = 17.9\%$

Appendix 3

Value of follow-on product

Present value (PV) of the cash inflows	2,434,000
PV of the option cost	(2,029,000)
Net present value (NPV) of the new product	405,000

Based on NPV, without considering the option to delay, the project would increase the value of Nente Co by \$405,000.

Value of the option to delay

Price of asset (PV of future positive cash flows)	\$2,434,000
Exercise price (initial cost – not discounted)	\$2,500,000
Time to expiry of option	2 years
Risk-free rate (government base rate = 7% – 380 basis points)	3.2%
Volatility	42%

$$d_1 = [\ln(2,434/2,500) + (0.032 + 0.5 \times 0.42^2) \times 2]/(0.42 \times 2^{0.5}) = 0.359$$

$$d_2 = 0.359 - (0.42 \times 2^{0.5}) = -0.235$$

$$N(0.36) = 0.5 + 0.1406 = 0.6406$$

$$N(-0.24) = 0.5 - 0.0948 = 0.4052$$

$$\begin{aligned} \text{Value of option} &= 2,434,000 \times 0.6406 - 2,500,000 \times 0.4052 \times e^{-(0.032 \times 2)} \\ &= \$1,559,220 - \$950,199 = \$609,021 \end{aligned}$$

This project increases the value of the company by \$609,021 or 25.4c per share (\$609,021/2.4 million).

In percentage terms this is an increase of about 8.8% (25.4c/290c).

(b) Nente Co has an **operating profit** margin of 14% (1,230/8,780) but the significant interest payments mean that profit after tax is approximately half of the PBIT figure. This profit after tax figure is less than the required annual investment in non-current assets and working capital.

Nente Co has a high level of **financial gearing**. When measured by book value, the gearing level is 73% ($6,500/(2,360 + 6,500)$). This high level of debt, coupled with rising

interest rates, means that the interest payments are high and **interest coverage** is currently 2.7 times.

Given that future growth levels are only expected to be 2% (from part (a) above) profit after tax is unlikely to **increase significantly** unless interest rates fall dramatically. The low level of profit after tax means that **no dividend** has been paid in the most recent period. The business angels will want to see a **return on their investment**, which is unlikely to be in the form of future dividends given these prospects. Therefore they are likely to be attracted by the prospect of an exit route through a sale of their equity stake.

The **follow-on product** should help to increase Nente Co's growth rate, but with the limited scope for expansion and lack of other product development it would appear that the business angels would need to sell their equity stakes to generate significant returns.

(c) There are a number of possible post-bid defences available to Mije Co.

Attempting to have the bid referred to the **competition authorities** seems unlikely to be successful, based on the size of Mije Co, and because this is a vertical merger rather than a horizontal one – which means Tianhe Co is unlikely to significantly increase its existing market share.

If it is specifically the Tianhe Co takeover that Mije Co wishes to defend against, then a **white knight** defence could be a successful tactic. This involves finding a friendly company to join in the bidding process and eventually acquire Mije Co. The difficulty will be in finding a willing friendly company.

A **counter-bid** does not seem to be appropriate given the relative market capitalisation of Mije Co compared to Tianhe Co. Tianhe Co has a current market value of \$245 million which is over 5 times the current market capitalisation of Mije Co of \$48 million.

A **crown jewels** defence would involve selling off Mije Co's most valuable assets to make it less attractive as an acquisition. This may mean that Tianhe Co is uninterested in continuing the takeover bid, but it could compromise Mije Co's current operations and as such the existing shareholders may object to this.

A **poison pill** defence attempts to make a company unattractive, normally by giving the right to existing shareholders to buy shares at a very low price. This could be used by Mije Co, but the existing shareholders need to be willing to put additional funds into the business. The shareholders are unlikely to do this if the takeover is actually in their best interest.

A **golden parachute** involves offering large benefits to key management personnel who would lose their position in the event of a takeover. This would then make the takeover more expensive for Tianhe Co and acts as a deterrent. This could be a good option for Mije Co to take to defend against this takeover.

Mock Exams

ACCA

Advanced Financial Management

Mock Examination 1

Sample questions

Questions

Time allowed 3 hours and 15 minutes

Section A THIS question is compulsory and MUST be attempted

Section B BOTH questions to be attempted

**DO NOT OPEN THIS EXAM UNTIL YOU ARE READY TO START
UNDER EXAMINATION CONDITIONS**

SECTION A: THIS QUESTION is compulsory and MUST be attempted

Question 1

Mlima Co is a private company involved in aluminium mining. About eight years ago, the company was bought out by its management and employees through a leveraged buyout (LBO). Due to high metal prices worldwide, the company has been growing successfully since the LBO. However, because the company has significant debt borrowings with strict restrictive covenants and high interest levels, it has had to reject a number of profitable projects. The company has currently two bonds in issue, as follows:

- A 16% secured bond with a nominal value of \$80 million, which is redeemable at par in 5 years. An early redemption option is available on this bond, giving Mlima Co the option to redeem the bond at par immediately if it wants to.
- A 13% unsecured bond with a nominal value of \$40 million, which is redeemable at par in 10 years.

Mlima Co's board of directors (BoD) has been exploring the idea of redeeming both bonds to provide it with more flexibility when making future investment decisions. To do so, the BoD has decided to consider a public listing of the company on a major stock exchange. It is intended that a total of 100 million shares will be issued in the newly listed company. From the total shares, 20% will be sold to the public, 10% will be offered to the holders of the unsecured bond in exchange for redeeming the bond through an equity-for-debt swap, and the remaining 70% of the equity will remain in the hands of the current owners. The secured bond would be paid out of the funds raised from the listing.

The details of the possible listing and the distribution of equity were published in national newspapers recently. As a result, potential investors suggested that, due to the small proportion of shares offered to the public and for other reasons, the shares should be offered at a substantial discount of as much as 20% below the expected share price on the day of the listing.

Mlima Co, financial information

It is expected that after the listing, deployment of new strategies and greater financial flexibility will boost Mlima Co's future sales revenue and, for the next 4 years, the annual growth rate will be 120% of the previous 2 years' average growth rate. After the 4 years, the annual growth rate of the free cash flows to the company will be 3.5%, for the foreseeable future. Operating profit margins are expected to be maintained in the future. Although it can be assumed that the current tax-allowable depreciation is equivalent to the amount of investment needed to maintain the current level of operations, the company will require an additional investment in assets of 30c per \$1 increase in sales revenue for the next four years.

EXTRACTS FROM MLIMA CO'S PAST THREE YEARS' STATEMENT OF PROFIT OR LOSS

Year ended	31 May 20X3	31 May 20X2	31 May 20X1
	\$m	\$m	\$m
Sales revenue	389.1	366.3	344.7
Operating profit	58.4	54.9	51.7
Net interest costs	17.5	17.7	18.0
Profit before tax	40.9	37.2	33.7
Taxation	10.2	9.3	8.4
Profit after tax	30.7	27.9	25.3

Once listed, Mlima Co will be able to borrow future debt at an interest rate of 7%, which is only 3% higher than the risk-free rate of return. It has no plans to raise any new debt after listing, but any

future debt will carry considerably fewer restrictive covenants. However, these plans do not take into consideration the Bahari project (see below).

Bahari project

Bahari is a small country with agriculture as its main economic activity. A recent geological survey concluded that there may be a rich deposit of copper available to be mined in the north-east of the country. This area is currently occupied by subsistence farmers, who would have to be relocated to other parts of the country. When the results of the survey were announced, some farmers protested that the proposed new farmland they would be moved to was less fertile and that their communities were being broken up. However, the protesters were intimidated and violently put down by the Government, and the state-controlled media stopped reporting about them. Soon afterwards, their protests were ignored and forgotten.

In a meeting between the Bahari Government and Mlima Co's BoD, the Bahari Government offered Mlima Co exclusive rights to mine the copper. It is expected that there are enough deposits to last at least 15 years. Initial estimates suggest that the project will generate free cash flows of \$4 million in the first year, rising by 100% per year in each of the next 2 years, and then by 15% in each of the 2 years after that. The free cash flows are then expected to stabilise at the Year 5 level for the remaining 10 years.

The cost of the project, payable at the start, is expected to be \$150 million, comprising machinery, working capital and the mining rights fee payable to the Bahari Government. None of these costs is expected to be recoverable at the end of the project's 15-year life.

The Bahari Government has offered Mlima Co a subsidised loan over 15 years for the full \$150 million at an interest rate of 3% instead of Mlima Co's normal borrowing rate of 7%. The interest payable is allowable for taxation purposes. It can be assumed that Mlima Co's business risk is not expected to change as a result of undertaking the Bahari project.

At the conclusion of the meeting between the Bahari Government and Mlima Co's BoD, the president of Bahari commented that working together would be like old times when he and Mlima Co's Chief Executive Officer (CEO) used to run a business together.

Other information

Mlima Co's closest competitor is Ziwa Co, a listed company which mines metals worldwide. Mlima Co's directors are of the opinion that after listing Mlima Co's cost of capital should be based on Ziwa Co's ungeared cost of equity. Ziwa Co's cost of capital is estimated at 9.4%, its geared cost of equity is estimated at 16.83% and its pre-tax cost of debt is estimated at 4.76%. These costs are based on a capital structure comprising of 200 million shares, trading at \$7 each, and \$1,700 million 5% irredeemable bonds, trading at \$105 per \$100. Both Ziwa Co and Mlima Co pay tax at an annual rate of 25% on their taxable profits.

It can be assumed that all cash flows will be in \$ instead of the Bahari currency and therefore Mlima Co does not have to take account of any foreign exchange exposure from this venture.

Required

(a) Prepare a report for the BoD of Mlima Co that:

- (i) Explains why Mlima Co's directors are of the opinion that Mlima Co's cost of capital should be based on Ziwa Co's ungeared cost of equity and, showing relevant calculations, estimate an appropriate cost of capital for Mlima Co. **(7 marks)**
- (ii) Estimates Mlima Co's value without undertaking the Bahari project and then with the Bahari project. The valuations should use the free cash flow methodology and the cost of capital calculated in part (i). Include relevant calculations. **(14 marks)**
- (iii) Advises the BoD whether or not the unsecured bond holders are likely to accept the equity-for-debt swap offer. Include relevant calculations. **(5 marks)**

(iv) Advises the BoD on the listing and the possible share price range, if a total of 100 million shares are issued. The advice should also include:

- (1) A discussion of the assumptions made in estimating the share price range
- (2) In addition to the reasons mentioned in the scenario above, a brief explanation of other possible reasons for changing its status from a private company to a listed one
- (3) An assessment of the possible reasons for issuing the share price at a discount for the initial listing

(12 marks)

Professional marks will be awarded in part (a) for the format, structure and presentation of the report.

(4 marks)

(b) Discuss the possible impact on, and response of, Mlima Co to the following ethical issues, with respect to the Bahari project:

- (i) The relocation of the farmers
- (ii) The relationship between the Bahari president and Mlima Co's CEO

Note. The total marks will be split equally between each part.

(8 marks)

(Total = 50 marks)

SECTION B: BOTH QUESTIONS to be attempted

Question 2

Retilon plc is a medium-sized UK company that trades with companies in several European countries. Trade deals over the next three months are shown below. Assume that it is now 20 April.

	Two months' time		Three months' time	
	Receipts	Payments	Receipts	Payments
France	–	€393,265	€491,011	€60,505
Germany	–	–	€890,217	€1,997,651
Denmark	–	–	Kr 8.6m	–
<i>Foreign exchange rates</i>				
		Dkroner/£		Euro €/£
Spot		10.68–10.71		1.439–1.465
Two months forward		10.74–10.77		1.433–1.459
Three months forward		10.78–10.83		1.431–1.456
<i>Annual interest rates (valid for 2 months or 3 months)</i>				
		Borrowing	Investing	
		%	%	
UK		7.50	5.50	
France		5.75	3.50	
Germany		5.75	3.50	
Denmark		8.00	6.00	

Futures market rates

Three-month euro contracts (125,000 euro contract size)

Contracts are for buying or selling euros. Futures prices are in £ per euro.

June	0.6964
September	0.6983
December	0.7013

Required

(a) (i) Using the forward market, money market and currency futures market as appropriate, devise a foreign exchange hedging strategy that is expected to maximise the cash flows of Retilon plc at the end of the three-month period.

Transactions costs and margin requirements may be ignored for this part of the question. Basis risk may be assumed to be zero at the time the contracts are closed out. Futures contracts may be assumed to mature at the month end. **(15 marks)**

(ii) Successive daily prices on the futures market for a June contract which you have sold are:

Selling price	0.6916
Day 1	0.6930
Day 2	0.6944
Day 3	0.6940

Initial margins are £1,000 per contract. Variation margin is 100% of the initial margin.

Spot exchange rates may be assumed not to change significantly during these three days.

For each of the three days, show the effect on your cash flow of the price changes of the contract. **(4 marks)**

(b) Discuss the advantages and disadvantages of forward contracts and currency futures for hedging against foreign exchange risk. **(6 marks)**

(Total = 25 marks)

Question 3

Staple Group is one of Barland's biggest media groups. It consists of four divisions, organised as follows:

- **Staple National** – the national newspaper, the *Daily Staple*. This division's revenues and operating profits have decreased for the last two years.
- **Staple Local** – a portfolio of 18 local and regional newspapers. This division's operating profits have fallen for the last five years and operating profits and cash flows are forecast to be negative in the next financial year. Other newspaper groups with local titles have also reported significant falls in profitability recently.
- **Staple View** – a package of digital channels showing sporting events and programmes for a family audience. Staple Group's board has been pleased with this division's recent performance, but it believes that the division will only be able to sustain a growth rate of 4% in operating profits and cash flows unless it can buy the rights to show more major sporting events. Over the last year, Staple View's biggest competitor in this sector has acquired two smaller digital broadcasters.
- **Staple Investor** – established from a business which was acquired three years ago, this division offers services for investors including research, publications, training events and conferences. The division gained a number of new clients over the last year and has thus shown good growth in revenues and operating profits.

Some of Staple Group's institutional investors have expressed concern about the fall in profitability of the two newspaper divisions.

The following summarised data relates to the group's last accounting year. The percentage changes in pre-tax profits and revenues are changes in the most recent figures compared with the previous year.

	Division				
	Total	National	Local	View	Investor
Revenues (\$m)	1,371.7	602.4	151.7	496.5	121.1
Increase/(decrease) in revenues (%)		(5.1)	(14.7)	8.2	16.5
Pre-tax profits (\$m)	177.3	75.6	4.5	73.3	23.9
Increase/(decrease) in pre-tax profits (%)		(4.1)	(12.6)	7.4	19.1
Post-tax cash flows (\$m)	120.2	50.7	0.3	53.5	15.7
Share of group net assets (\$m)	635.8	267.0	66.6	251.2	51.0
Share of group long-term liabilities (\$m)	230.9	104.4	23.1	93.4	10.0

Staple Group's board regards the *Daily Staple* as a central element of the group's future. The directors are currently considering a number of investment plans, including the development of digital platforms for the *Daily Staple*. The Finance Director has costed the investment programme at \$150 million. The board would prefer to fund the investment programme by disposing of parts or all of one of the other divisions. The following information is available to help assess the value of each division:

- 1 One of Staple Group's competitors, Postway Co, has contacted Staple Group's directors asking if they would be interested in selling 15 of the local and regional newspapers for \$60 million. Staple Group's Finance Director believes this offer is low and wishes to use the net assets valuation method to evaluate a minimum price for the Staple Local division.
- 2 Staple Group's Finance Director believes that a valuation using free cash flows would provide a fair estimate of the value of the Staple View division. Over the last year, investment in additional non-current assets for the Staple View division has been \$12.5 million and the

incremental working capital investment has been \$6.2 million. These investment levels will have to increase at 4% annually in order to support the expected sustainable increases in operating profit and cash flow.

3 Staple Group's Finance Director believes that the valuation of the Staple Investor division needs to reflect the potential it derives from the expertise and experience of its staff. The Finance Director has calculated a value of \$118.5 million for this division, based on the earnings made last year but also allowing for the additional earnings which he believes that the expert staff in the division will be able to generate in future years.

Assume a risk-adjusted, all-equity financed, cost of capital of 12% and a tax rate of 30%. Goodwill should be ignored in any calculations.

Staple Group's finance and human resources directors are looking at the staffing of the two newspaper divisions. The Finance Director proposes dismissing most staff who have worked for the group for less than two years, two years' employment being when staff would be entitled to enhanced statutory employment protection. The Finance Director also proposes a redundancy programme for longer-serving staff, selecting for redundancy employees who have complained particularly strongly about recent changes in working conditions. There is a commitment in Staple Group's annual report to treat employees fairly, communicate with them regularly and enhance employees' performance by structured development.

Required

(a) Evaluate the options for disposing of parts of Staple Group, using the financial information to assess possible disposal prices. The evaluation should include a discussion of the benefits and drawbacks to Staple Group from disposing of parts of Staple Group. **(19 marks)**

(b) Discuss the significance of the Finance Director's proposals for reduction in staff costs for Staple Group's relationships with its shareholders and employees and discuss the ethical implications of the proposals. **(6 marks)**

(Total = 25 marks)

Answers

**DO NOT TURN THIS PAGE UNTIL YOU HAVE
COMPLETED THE MOCK EXAM**

Plan of attack

Take a good look through the exam before diving in to answer questions.

- **Question 1** is a wide ranging question covering a number of different syllabus areas, including a major focus on syllabus section B (advanced investment appraisal).

This question, originally set as a real exam question in June 2013, required careful reading because it was complicated to understand what was going on and, as you would expect, some of the numerical parts to the question in (b)(i) were challenging.

It was important not to panic, and to try to adopt a logical approach, explaining your reasoning as you go.

- **Question 2** tests your understanding of currency hedging and is drawn from syllabus section E. Each exam will have a question that concentrates on this syllabus area (although this covers more than just currency hedging).
- **Question 3** tests your understanding of the business reconstructions syllabus section, and was originally set as real exam question in June 2016.

No matter how many times we remind you...

Always allocate your time according to the marks for the question in total and for the individual parts of each question. Also **always answer the question you were asked** rather than the question you wished you had been asked or the question you thought you had been asked.

You've got free time at the end of the exam...?

If you have allocated your time properly then you **shouldn't have time on your hands** at the end of the exam. If you find yourself with some time at the end, however, go back to **any parts of questions that you didn't finish** because you moved on to another question.

Forget about it!

Don't worry if you found the exam difficult – if you did, no doubt other students would too. If this was the real thing you would have to forget about it as soon as you leave the exam hall and **think about the next one**. If it was the last one, however – **celebrate!**

Question 1

Workbook references. Cost of capital and adjusted present value (APV) is covered in Chapter 6 and free cash flow valuations in Chapter 8. Stock exchange listings are covered in Chapter 7 and ethical issues in Chapter 1.

Top tips. For part (a)(i) you have to know which formula to use to calculate the ungeared cost of equity. It is the MM Proposition 2 formula which is given to you in the exam.

For part (a)(ii) you should have picked up from the question information that the Bahari project needs to be valued using the APV method.

To tackle part (a)(iii) you need to work out what the bond holders stand to gain from the swap and compare it to the current value of the bond in order to decide whether or not they are likely to accept it.

For part (b) make sure you only use the information contained in the question. Note that there is nothing saying the relationship between the president of Bahari and the CEO is inappropriate. Also consider what would happen to the farmers if Mlima Co does not take up the mining option. Note that your answer should be split evenly between the two issues.

Easy marks. There are numerous easy marks to be picked up in part (a)(ii) for calculating the values for Mlima. Part (a)(iv) also offers some easy marks for some straightforward observations.

Examining team's comments. Many candidates spent far too long on this question to the detriment of the rest of the exam. Good time management, an ability to work under pressure and making a reasonable attempt at all the requirements of all the questions are the key ingredients for success.

In part (a)(iii) few candidates could calculate the current value of the bonds, most incorrectly discounting by the coupon rate to get back to the \$40m. The subsequent advice given was poor, with little insight given as to why might the bond holders accept or not accept the offer, except to say in very general terms that if the equity value was greater than the current bond value they would probably accept the offer. Many answers displayed a lack of sound understanding of the subject.

For part (a)(iv) a sizeable number of candidates ignored or answered this part very superficially and therefore did not gain the majority of the 12 marks.

For part (b) answers tackled the first issue of relocation of farmers better than the second issue of the relationship between the leaders of the country and the company.

Marking scheme

		Marks
(a)	(i) Explanation of Mlima Co's cost of capital based on Ziwa Co's ungeared cost of equity Ziwa Co, cost of ungeared equity	3 4 <hr/> 7
	(ii) Sales revenue growth rates Operating profit rate Estimate of free cash flows and PV of free cash flows for Years 1 to 4 PV of free cash flows after Year 4 Base case Bahari project value Annual tax shield benefit Annual subsidy benefits PV of tax shield and subsidy benefits Value of the Bahari project	1 1 4 2 2 1 1 1 <hr/> 14

		Marks
(iii)	Calculation of unsecured bond value	2
	Comment	2
	Limitation	<u>1</u>
		5
(iv)	Comments on the range of values	3–4
	Discussion of assumptions	3–4
	Explanation for additional reasons for listing	2–3
	Assessment of reasons for discounted share price	2–3
	Conclusion	<u>1–2</u>
		Max 12
Professional marks		
	Report format	1
	Layout, presentation and structure	<u>3</u>
		4
(b)	Discussion of relocation of farmers	4–5
	Discussion of relationship between Bahari president and Mlima Co CEO	<u>4–5</u>
		Max <u><u>8</u></u> <u><u>50</u></u>

(a) Report

To: Board of Directors, Mlima Co
 From: AN Consultant
 Subject: Initial public listing: price range and implications
 Date: XX/XX/XX

This report considers a range of values for Mlima Co to consider in preparation for the proposed public listing. These values are based on 100 million shares being issued. The assumptions made in determining these values are discussed and the likelihood of the equity-for-debt swap being successful is also considered. Finally the report will evaluate other reasons for listing and also why the shares should be issued at a discount.

Mlima Co cost of capital

Ziwa Co's ungeared cost of equity represents the return Ziwa Co's shareholders would require if Ziwa Co was financed entirely by equity. This return would compensate the shareholders for the business risk of Ziwa Co's operations.

Since Mlima Co is in the same industry, and therefore faces the **same business risk**, this required rate of return should also compensate Mlima Co's shareholders. This rate would be used as Mlima Co's cost of capital as it is expecting to have no debt and therefore this rate **does not need adjusting for financial risk**. Therefore the cost of equity is also the cost of capital. This cost of capital is calculated in Appendix 1 as 11%.

Mlima Co estimated value

Using the cost of capital of 11%, the value of Mlima Co is calculated as \$564.9 million (see Appendix 2 for full calculation), before considering the proposed Bahari project. The value of the Bahari investment, without considering the tax shield and subsidy benefits from the subsidised government loan, does not exceed the initial investment. When the tax and subsidy benefits are considered, the present value of the Bahari project is \$21.5 million (see Appendix 3 for full calculation). This gives a total value for Mlima Co of just over \$586 million. This gives the **following potential share prices**, based on 100 million shares, including the effect of the suggested 20% share price discount.

Potential share price	Excluding Bahari project	Including Bahari project
Full value	\$5.65 per share	\$5.86 per share
20% discount	\$4.52 per share	\$4.69 per share

Equity-for-debt swap

The unsecured bond is currently estimated to be worth \$56.8 million (see Appendix 4 for full calculation). It is proposed that the existing bond holders will be offered a 10% stake in Mlima Co post-listing, which means that **only the value at \$5.86 per share would leave the bond holders better off**, and therefore would be the only acceptable price. If the lowest price of \$4.52 per share is used, then the equity stake would need to be around 12.6% for the bond holders to accept the offer ($56.8m/4.52 = 12.566$).

The bond value is based on a yield to maturity of 7%, because Mlima Co can borrow at 7%, so this is therefore its current yield. The yield could be **more accurately estimated** if it was based on future risk-free rates and the credit spreads for the company.

Assumptions

The main assumptions are over the **accuracy of the estimates** used in producing the valuation. The value of Mlima Co is based on estimated future growth rates, profit margins, tax rates and capital investment. The future growth rates and margins are based on **past data, which may not be a reliable indicator of future prospects**. The Bahari project includes estimated cash flows for 15 years and the reasonableness of these estimates needs to be considered to see if they are realistic.

The cost of capital used for Mlima Co is based on Ziwa Co's ungeared cost of equity, on the basis that the business risk is the same for both companies as they operate in the same industry. However, it is possible that the **business risks are different**, for example due to geographical locations, and therefore the cost of capital is not appropriate for Mlima Co. Accepting the Bahari project could also affect the business risk of Mlima Co.

The value of the Bahari project is based on the Bahari Government providing the promised subsidised loan. Mlima Co needs to consider whether the full subsidy will definitely be provided for the full 15 years and whether a change of government may change the position. There may also be other **political risks** which need to be assessed fully.

Transaction costs for the listing have been ignored as they are assumed to be insignificant. It should be confirmed that this is the case before making a final decision.

Reasons for a public listing

The main reason behind this public listing is to remove the debt from the company. Other reasons for pursuing a public listing include: a **gain in prestige** for the company by listing on a recognised stock exchange, having **greater access to sources of finance** and being able to raise funds more quickly as a result, providing shareholders with a value for their equity stake and enabling them to **realise their investment** if they wish to do so.

Issuing shares at a discount

Since the public will only be issued 20% of the share capital from the initial listing, they will be **minority shareholders** and have a limited ability to influence the decision making of Mlima Co. Even if they voted as a bloc, they would not be able to overturn the decision on their own. The discounted share price, would therefore compensate the shareholders for the **additional risk** of being minority shareholders. The position of the unsecured bond holders should also be considered. On the assumption that they hold 12.6% of the equity (as discussed earlier) they could form a bloc with the new shareholders of 32.6%, which would be **enough to influence company decisions**. Whether they would form a bloc with new shareholders or are more closely aligned with the interests of the current owners is something that should be looked into.

Shares are often issued at a discount to ensure that they all get sold. This is even more common for a new listing and the price of the shares does usually rise immediately after the listing.

Conclusion

A price range for the listing of between \$4.52 and \$5.86 per share has been calculated, depending on whether the Bahari project is undertaken and whether the shares are offered at a discount of 20%. It is recommended that Mlima Co consults the underwriters for the share issue, to carry out book-building to assess the price that potential investors are willing to pay.

If 20% of the shares (20 million shares) are sold to the public at \$4.52 per share, the listing will raise just over \$90 million. \$80 million would then be spent redeeming the secured bond, leaving just in excess of \$10 million of funds remaining. Mlima Co needs to consider whether these funds will be **sufficient to carry on its operations**. The Bahari investment may result in a change to the desired capital structure of the company, which may also have an impact on the cost of capital.

Becoming a listed company will also result in listing costs and **additional annual costs** to meet compliance and reporting requirements. These factors will need to be balanced against the benefits of listing before making a decision whether or not to proceed.

Appendices

Appendix 1: Mlima cost of capital

Ziwa Co market value of debt = $105/100 \times 1,700m = \$1,785m$

Ziwa Co market value of equity = $200m \times \$7 = \$1,400m$

Ziwa Co ungeared cost of equity using $k_{eg} = k_{eu} + (1 - t)(k_{eu} - k_d) D/E$

$16.83\% = k_{eu} + 0.75(k_{eu} - 4.76\%) \times 1,785/1,400$

$16.83\% + 4.55\% = 1.9563k_{eu}$

$k_{eu} = 10.93\%$ (say 11%)

Appendix 2: Value of Mlima Co prior to Bahari project

$$\text{Past 2 years' sales growth} = \sqrt{\frac{389.1}{344.7}} - 1 = 0.0625 \text{ or } 6.25\%$$

Expected growth for 4 years = $1.2 \times 6.25\% = 7.5\%$

Operating profit margin (historic)

20X3 $58.4/389.1 = 0.150$

20X2 $54.9/366.3 = 0.150$

20X1 $51.7/344.7 = 0.150$

Operating profit margin is expected to be 15%.

Year	1	2	3	4	4+
	\$m	\$m	\$m	\$m	\$m
Sales revenue (increasing at 7.5%)	418.3	449.7	483.4	519.7	
Operating profit (15%)	62.7	67.5	72.5	78.0	
Tax at 25%	(15.7)	(16.9)	(18.1)	(19.5)	
Additional capital investment (W1)	(8.8)	(9.4)	(10.1)	(10.9)	
Free cash flows	38.2	41.2	44.3	47.6	49.3*
Discount factor (11%)	0.901	0.812	0.731	0.659	8.787**
PV of free cash flows	34.4	33.5	32.4	31.4	433.2

Value of company = \$564.9m

* $47.6 \times 1.035 = 49.3$

** $1/(0.11 - 0.035) \times 0.659 = 8.787$

Working

Year	1	2	3	4
	\$m	\$m	\$m	\$m
Sales revenue	418.3	449.7	483.4	519.7
Increase in revenue	29.2	31.4	33.7	36.3
30% of increase	8.8	9.4	10.1	10.9

Appendix 3: Value of Bahari project

Base case

Year	Free cash flow	Discount factor	PV
	\$m	11%	\$m
0	(150)	1.000	(150.0)
1	4	0.901	3.6
2	8	0.812	6.5
3	16	0.731	11.7
4	18.4	0.659	12.1
5	21.2	0.593	12.6
6–15	21.2	3.492	74.0
			(29.5)

10-year annuity discounted for 5 years = 5.889×0.593

Annual tax shield benefit = $3\% \times 150\text{m} \times 25\% = \1.1m

Subsidy benefit = $4\% \times 150\text{m} \times 0.75 = \4.5m

Total annual benefit = $\$5.6\text{m}$

Annuity factor (7%, 15 years) = 9.108

PV of tax shield and subsidy benefit = $5.6\text{m} \times 9.108 = \51.0m

APV = $(\$29.5\text{m}) + \$51.0\text{m} = \$21.5\text{m}$

Appendix 4: Value of unsecured bond

Annual interest = $13\% \times 40\text{m} = \5.2m

Assume a yield to maturity of 7%. A 10-year annuity factor at 7% is 7.024

Discount factor for redemption of bond (7%, 10 years) is 0.508

Bond value = $5.2\text{m} \times 7.024 + 40\text{m} \times 0.508 = \56.8m

(b) The activities of Mlima Co are likely to be of greater interest and be **scrutinised more closely** once it is listed. The company needs to consider the ethical implications of both situations and whether Mlima Co is complying with its own ethical code (if it has one).

Regarding the relocation of the farmers, Mlima Co needs to judge where its responsibility lies. It may decide that this is a **matter between the farmers and the Government**, and that Mlima Co is not responsible (either directly or indirectly) for the current situation. If Mlima Co does not agree to the offer, it seems likely that the **mining rights would be given to another company** and so the farmers' situation would not improve by Mlima Co walking away from the deal. Mlima may be better off by influencing the Government over this issue by asking it to keep the farmers together and to offer them more fertile land. In addition, Mlima Co could offer jobs and training to any farmers who choose to remain where they are.

In the case of the Bahari president and Mlima Co's CEO, Mlima Co must ensure that any negotiation was transparent and there was **no bribery or other illegal practice involved**. If the company and the Government can show that decisions have been made in the **best interests** of the country and Mlima Co, and no individuals benefited from the decision, then it should not be seen negatively. Indeed, it is good for business to have strong relationships and this can create a **competitive advantage**.

Mlima should consider how it would respond to public scrutiny of these issues, possibly even pre-empting issues by releasing press statements to explain positions.

Question 2

Workbook references. Foreign currency hedging is covered in Chapter 12.

Top tips. It is not necessarily clear how best to tackle the futures part of (a)(i) given the absence of spot rates at the end of the contract. You need to come up with an answer that can be compared with the results on the forward and money markets. Our answer does this by saying that for the amount hedged, the results on the spot and futures market will balance out to give a net payment at the current futures price. This leaves in both instances a certain amount unhedged which can then be hedged on the forward market. We demonstrate this by using an example, although this may not be necessary to gain full marks. Most marks would be available for the money and futures market parts of the answer.

The caveat about the lack of basis risk is important. Part (a)(ii) illustrates the importance of variation margin.

Easy marks. The list in (b) represents basic knowledge in this area. Your answer needs to focus on cost, flexibility and risk of loss.

Marking scheme

		Marks
(a)	(i) Calculation of net receipts/payments	1
	Forward market hedge calculations	2
	Money market hedge – two-month payment calculation	2
	Money market hedge – three-month payment calculation	2
	Money market hedge – three-month receipt calculation	2
	Type of futures contract	1
	No of contracts	1
	Calculation of gain/loss on future	2
	Net position on futures	<u>2</u>
		15
	(ii) Calculation of Day 1	2
	Calculation of Day 2	1
	Calculation of Day 3	<u>1</u>
		4
(b)	Advantages of forward contracts	Max 2
	Disadvantages of forward contracts	Max 2
	Advantages of currency futures	Max 2
	Disadvantages of currency futures	Max <u>2</u>
		Max <u>6</u>
		<u>25</u>

(a)	(i)	Receipts	Payments
		Two months	€393,265
		Three months	Kr8.6m $491,011 + 890,217 - 60,505 - 1,997,651 = €676,928$

Forward market hedge

Two months

$$\text{Payment } \frac{€393,265}{1.433} = £274,435$$

Three months

$$\text{Payment } \frac{€676,928}{1.431} = £473,045$$

$$\text{Receipt } \frac{\text{Kr}8,600,000}{10.83} = £794,090$$

Money market hedge

(1) Two months payment

We need to invest now to match the €393,265 we require.

The interest rates are quoted per year so they need to be adjusted to become 2-month rates – this means multiplying the annual rate of 3.5% by 2/12, which gives 0.5833%.

$$\begin{aligned} \text{Amount to be invested} &= €393,265 / (1 + 0.005833) \\ &= €390,984 \end{aligned}$$

$$\text{Converting at spot rate } \frac{390,984}{1.439} = £271,705$$

To obtain £271,705, we have to borrow for 2 months.

Again, the interest rates are quoted per year so they need to be adjusted to become 2-month rates, so $7.5\% \times 2/12 = 1.25\%$.

$$\begin{aligned} \text{Amount to be paid to lender} &= 271,705 \times 1.0125 \\ &= £275,101 \end{aligned}$$

(2) Three months payment

Again we need to invest and the interest rates are quoted per year so they need to be adjusted to become 3-month rates, so $3.5\% \times 3/12 = 0.875\%$.

$$\text{Amount to be invested} = €676,928 / (1 + 0.00875) = €671,056$$

$$\text{Converting at spot rate } \frac{671,056}{1.439} = £466,335$$

Borrowing £466,335 for 3 months

Again, the interest rates are quoted per year so they need to be adjusted to become 3-month rates, so $7.5\% \times 3/12 = 1.875\%$.

$$\begin{aligned} \text{Amount to be paid to lender} &= 466,335 \times (1 + 0.01875) \\ &= £475,079 \end{aligned}$$

(3) Three months receipt

The interest rates are for borrowing over 3 months – this means multiplying the annual rate of 8% by 3/12, which gives 2%.

We need to borrow now to match the receipt we shall obtain.

$$\begin{aligned}\text{Amount to be borrowed} &= 8,600,000/1.02 \\ &= \text{Kr}8,431,373\end{aligned}$$

$$\text{Converting at spot rate } \frac{8,431,373}{10.71} = \text{£}787,243$$

Investing in the UK for 3 months will be at a rate of $5.5\% \times 3/12 = 1.375\%$.

$$\begin{aligned}\text{Amount to be received} &= 787,243 \times 1.01375 \\ &= \text{£}798,068\end{aligned}$$

Futures – 2 months

- Buy June futures as they mature just after the payment date
- Buy euro futures
- Number of contracts = $\frac{\text{€}393,265}{125,000} = 3.146$ (say 3 contracts)
- Tick size = $125,000 \times 0.0001 = \text{£}12.50$

Set up today (20 April)

- Euros of cover needed = 393,265
- Contract size 125,000
- Number of contracts 3 contracts
- June future: Buy euros at 0.6964

Outcome (20 June)

- Actual transaction at June spot rate**
- Actual cover (393,265)
- Spot rate 1.433 £(274,435)
- Compare to April spot (1.439)
- = £273,291 ∵ bad news in June

5 Futures – profit or loss

$$\begin{array}{ll} \text{April – to buy} & 0.6964 \\ \text{June – to sell} & \underline{0.6978}^{(1)} \\ & 0.0014 \text{ profit (14 ticks)} \end{array}$$

$$\begin{array}{ll} \text{Profit per contract} = \text{£}12.50 \times 14 & = \text{£}175 \\ \text{Total profit } (3 \times 175) & = \text{£}525 \end{array}$$

6 Net position

$$\begin{array}{ll} \text{Actual} & \text{£}(274,435) \\ \text{Future} & \underline{525} \\ & \underline{\underline{\text{£}(273,910)}} \end{array}$$

(1)

	End of April	End of June
June future	0.6964	0.6978
Spot (1/1.433)	<u>0.6978</u>	<u>0.6978</u>
Basis	<u>(0.0014)</u>	<u><u>NIL</u></u>
2 months' timing difference		0 months remaining

Alternative solution

$$\begin{aligned}\text{Effective futures rate} &= \text{opening futures price} - \text{closing basis} \\ &= 0.6964 - 0 = 0.6964 \\ &\text{€}393,265 \times 0.6964 = \text{£}273,870\end{aligned}$$

This solution is slightly less accurate (because it ignores the fact that the actual transaction and the amount hedged on the futures markets are in fact based on slightly different amounts) but is acceptable under exam conditions.

For the 3-month payment

- Buy September futures as they mature just after the payment date
- Buy euro futures
- Number of contracts = $676,928 \div 125,000 = 5.4$ (say 5 contracts)
- Tick size = $125,000 \times 0.0001 = \text{£}12.50$

Set up today (20 April)

1	Euros needed =	676,928
2	Contract size	€125,000
	Number of contracts =	$\frac{676,928}{125,000}$ ≈ 5 contracts
3	September future: Buy euros at 0.6983	

Outcome (20 July)

4	Actual transaction at July spot rate
	€676,928 @ 1.431 = £(473,045)
	Compare to April spot:
	€676,928 @ 1.439 = £470,416
	∴ bad news in July

5 Profit or loss

April – to buy	0.6983
July – to sell	<u>0.7002</u> ⁽¹⁾
	0.0019 profit

$$\begin{aligned}\text{Profit per contract} &= 19 \text{ ticks} \times \text{£}12.50 \\ &= \text{£}237.50\end{aligned}$$

$$\begin{aligned}\text{Total profit} &= \text{£}237.50 \times 5 \\ &= \text{£}1,187.50\end{aligned}$$

6 Net position

Actual transaction at	
July spot rate	£(473,045)
Future	<u>1,188</u>
	<u>£(471,857)</u>

(1)

	<i>End of April</i>	<i>End of July</i>	
September future	0.6983	0.7002	
Spot (1/1.439)	0.6949	0.6988	(1/1.431)
	<u>0.0034</u>	<u>0.0014</u>	
	$\times 2/5 =$		
5 months' timing difference		2 months' timing difference	

Alternative solution

$$\begin{aligned}\text{Effective futures rate} &= \text{opening futures price} - \text{closing basis} \\ &= 0.6983 - 0.0014 = 0.6969 \\ \text{€}676,928 \times 0.6969 &= (\text{£}471,751)\end{aligned}$$

This solution is slightly less accurate (because it ignores the fact that the actual transaction and the amount hedged on the futures markets are in fact based on slightly different amounts) but is acceptable under exam conditions.

Conclusion

For the three-month Kr receipt, the money market will maximise cash flow. For the two euro payments, the futures market should maximise cash flow assuming basis risk is negligible. If basis risk does have a significant impact, the forward market may be the best choice.

(ii) **Day 1** movement $0.6930 - 0.6916 = 14$ ticks loss. Extra payment of £175 ($14 \times £12.50$) is required. If the extra payment is not made, the contract will be closed out. Therefore:

Day 2 movement $0.6944 - 0.6930 = 14$ ticks loss, extra payment of £175.

Day 3 movement $0.6940 - 0.6944 = 4$ ticks profit. Profit $= 4 \times £12.50 = £50$; this can be taken in cash.

(b) **Advantages of forward contracts**

- (i) The contract can be tailored to the user's **exact requirements** with quantity to be delivered, date and price all flexible.
- (ii) The trader will **know in advance** how much money will be received or paid.
- (iii) **Payment is not required** until the contract is settled.

Disadvantages of forward contracts

- (i) The user may not be able to negotiate **good terms**; the price may depend upon the **size** of the **deal** and how the user is rated.
- (ii) Users have to **bear** the **spread** of the contract between the buying and selling price.
- (iii) Deals can only be **reversed** by going back to the original party and offsetting the original trade.
- (iv) The **creditworthiness** of the other party may be a problem.

Advantages of currency futures

- (i) There is a **single specified price** determined by the market, and not the negotiating strength of the customer.
- (ii) **Transactions costs** are generally **lower** than for forward contracts.
- (iii) The exact date of **receipt** or **payment** of the currency does not have to be **known**, because the futures contract does not have to be closed out until the actual cash receipt or payment is made.
- (iv) **Reversal** can easily take place in the market.
- (v) Because of the process of **marking to market**, there is no default risk.

Disadvantages of currency futures

- (i) The **fixing** of **quantity** and **delivery dates** that is necessary for the future to be traded means that the customer's risk may not be fully covered.
- (ii) Futures contracts may not be **available** in the **currencies** that the customer requires.
- (iii) **Volatile trading conditions** on the futures markets mean that the potential loss can be high.

Question 3

Workbook references. Valuations are covered in Chapter 8, and reorganisations in Chapter 15.

Easy marks. Part (b) offers easy marks if you address both parts of the question.

Examining team's comments. A sizeable number of candidates attempted to value the whole of the company instead of parts of the company.

Marking scheme

	Marks
(a) Sale of Staple Local	
Calculations/comments on figures	2
Discussion of benefits/drawbacks	3–4
Sale of Staple View	
Calculations/comments on figures	3
Discussion of benefits/drawbacks	3–4
Sale of Staple Investor	
Comments on figures	2
Discussion of benefits/drawbacks	3–4
Other points/conclusion	<u>2–3</u>
	Max 19
(b) Discussion of importance of different stakeholders and possible conflicts	3–4
Discussion of other ethical issues	<u>2–3</u>
	Max <u>6</u> <u>25</u>

(a) **Staple Local**

Net assets valuation = $15/18 \times \$66.6m = \$55.5m$.

It is assumed that the titles in this division are equal in size.

The division's pre-tax profits are \$4.5m and post-tax cash flows are \$0.3m, with losses forecast for the next year. Therefore any valuation based on current or future expected earnings is likely to be lower than the net assets valuation.

Benefits of selling Staple Local

The local newspapers seem to have the poorest prospects of any part of the group. Further investment may not make a big difference, if the market for local newspapers is in long-term decline.

The offer from Postway Co gives Staple Group the chance to gain cash immediately and to dispose of the papers. The alternative of selling the titles off piecemeal is an uncertain strategy, both in terms of the timescale required and the amounts which can be realised for individual titles. It is very likely that the titles with the best prospects would be sold first, leaving Staple Group with a remaining portfolio which is of very little value.

Drawbacks of selling Staple Local

The offer is not much more than a net asset valuation of the titles. The amount of cash from the sale to Postway Co will be insufficient for the level of investment required in the *Daily Staple*.

The digital platforms which will be developed for the *Daily Staple* could also be used to boost the local papers. Staff on the local titles could have an important role to play in providing content for the platforms.

Loss of the local titles may mean loss of economies of size. In particular, printing arrangements may be more economic if both national and local titles are printed at the same locations.

Staple View

Free cash flows to equity = $\$53.5m - \$12.5m - \$6.2m = \$34.8m$

Free cash flow valuation to equity = $\$34.8m (1.04)/(0.12 - 0.04) = \$452.4m$

The assumption of constant growth is most important in this valuation. It is possibly fairly conservative but, just as faster growth could be achieved by gaining the rights to broadcast more sporting events, results may be threatened if Staple View loses any of the rights which it currently has.

Benefits of selling Staple View

Present circumstances may be favourable for selling the television channels, given their current profitability. Staple Group may be able to obtain a better offer from a competitor than in the future, given recent acquisition activity in this sector.

Selling Staple View will certainly generate more cash than selling either of the smaller divisions. This will allow investment not only in the *Daily Staple*, but also in the other divisions, and possibly targeted strategic acquisitions.

Drawbacks of selling Staple View

The television channels have become a very important part of Staple Group. Investors may believe that the group should be focusing on further investment in this division rather than investing in the *Daily Staple*, which may be in decline.

Selling the television channels removes an important opportunity for cross-selling. Newspaper coverage can be used to publicise important programmes on the television channels and the television channels can be used for advertising the newspaper.

Staple View is a bigger part of the group than the other two divisions and therefore selling it is likely to mean a bigger reduction in the group's borrowing capacity.

Staple Investor

The valuation made by the Finance Director is questionable as it is based on one year's profits, which may not be sustainable. There is no information about how the additional earnings have been calculated whether the Finance Director has used a widely accepted method of valuation or just a best estimate. If a premium for additional earnings is justified, there is also no information about whether the benefit from staff's expertise and experience is assumed to be perpetual or just to last for a certain number of years.

Benefits of selling Staple Investor

This division appears to have great potential. Staple Group will be able to sell this division from a position of strength, rather than it being seen as a forced sale like selling the Staple Local division might be.

The division is in a specialist sector which is separate from the other areas in which Staple Group operates. It is not an integral part of the group in terms of the directors' current core strategy.

Drawbacks of selling Staple Investor

The division currently has the highest profit margin at 19.7% compared with Staple National (12.5%), Staple Local (3.0%) and Staple View (14.8%). It seems likely to continue to deliver good results over the next few years. Investors may feel that it is the part of the group which offers the safest prospect of satisfactory returns.

Investors may be happy with the structure of the group as it is, as it offers them some diversification. Selling the Staple Investor division and focusing more on the newspaper parts of the group may result in investors seeking diversification by selling some of the shareholding in Staple Group and investing elsewhere.

Although Staple Group's management may believe that the valuation gives a good indication of the division's true value, they may not be able to sell the division for this amount now. If the division remains within the group, they may achieve a higher price in a few years' time. Even if Staple Investor could be sold for the \$118.5 million valuation, this is less than the \$150 million required for the planned investment.

Conclusion

Selling the Staple View division offers the directors the best chance to obtain the funds they require for their preferred strategy of investment in the *Daily Staple*. However, the directors are not considering the possibility of selling the *Daily Staple*, perhaps in conjunction with selling the local newspapers as well. Although this could be seen as selling off the part of the group which has previously been essential to its success, it would allow Staple Group to raise the funds for further investment in the television channels and the Staple Investor division. It could allow the directors to focus on the parts of the group which have been the most successful recently and offer the best prospects for future success.

(b)

Stakeholder conflicts

If Staple Group takes a simple view of the role of stakeholders, it will prioritise the interest of shareholders over other stakeholders, particularly employees here, and take whatever actions are required to maximise profitability. However, in Staple Group's position, there may be a complication because of the differing requirements of shareholders. Some may want high short-term profits and dividends, which may imply significant cost cutting in underperforming divisions. Other shareholders may wish to see profits maximised over the long term and may worry that short-term cost cutting may result in a reduction of investment and adversely affect staff performance at an important time.

Transformational change of the newspaper business is likely to require the co-operation of at least some current employees. Inevitably redundancy will create uncertainty and perhaps prompt some staff to leave voluntarily. Staple Group's management may want to identify some key current employees who can lead the change and try to retain them.

Also the policy of making employees who have not been with the group very long redundant is likely to make it difficult to recruit good new employees. The group will probably create new roles as a result of its digital investment, but people may be unwilling to join the group if it has a reputation for bad faith and not fulfilling promises to develop its staff.

Ethical issues

The significance of what the firm's annual report says about its treatment of employees may depend on how specific it is. A promise to treat employees fairly is rather vague and may not carry much weight, although it broadly commits the firm to the ethical principle of objectivity. If, however, the policy makes more specific statements about engaging with employees and goes further in the statement beyond what is required by law, then Staple Group is arguably showing a lack of honesty if it does not fulfil the commitments it has made.

The suggestion that managers should ensure that employees who are perceived to be 'troublemakers' should be the first to be chosen for redundancy is dubious ethically. If managers do this, then they may be breaking the law, and would certainly be acting with a lack of honesty and transparency.

ACCA

Advanced Financial Management

Mock Examination 2 Specimen exam

Questions

Time allowed 3 hours and 15 minutes

Section A	THIS question is compulsory and MUST be attempted
Section B	BOTH questions to be attempted

**DO NOT OPEN THIS EXAM UNTIL YOU ARE READY TO START
UNDER EXAMINATION CONDITIONS**

SECTION A: THIS QUESTION is compulsory and MUST be attempted

Question 1

Cocoa-Mocha-Chai (CMC) Co is a large listed company based in Switzerland and uses Swiss Francs as its currency. It imports tea, coffee and cocoa from countries around the world, and sells its blended products to supermarkets and large retailers worldwide. The company has production facilities located in two European ports where raw materials are brought for processing, and from where finished products are shipped out. All raw material purchases are paid for in US dollars (US\$), while all sales are invoiced in Swiss francs (CHF).

Until recently CMC Co had no intention of hedging its foreign currency exposures, interest rate exposures or commodity price fluctuations, and stated this intent in its annual report. However, after consultations with senior and middle managers, the company's new board of directors (BoD) has been reviewing its risk management and operations strategies.

You are a financial consultant hired by CMC to work on the following two proposals which have been put forward by the BoD for further consideration:

Proposal one

Setting up a treasury function to manage the foreign currency and interest rate exposures (but not commodity price fluctuations) using derivative products. The treasury function would be headed by the Finance Director. The Purchasing Director, who initiated the idea of having a treasury function, was of the opinion that this would enable her management team to make better decisions. The Finance Director also supported the idea as he felt this would increase his influence on the BoD and strengthen his case for an increase in his remuneration.

In order to assist in the further consideration of this proposal, the BoD wants you to use the following upcoming foreign currency and interest rate exposures to demonstrate how they would be managed by the treasury function:

- (i) A payment of US\$5,060,000 which is due in 4 months' time; and
- (ii) A 4-year CHF60,000,000 loan taken out to part-fund the setting up of 4 branches (see proposal two below). Interest will be payable on the loan at a fixed annual rate of 2.2% or a floating annual rate based on the yield curve rate plus 0.40%. The loan's principal amount will be repayable in full at the end of the fourth year.

Additional information relating to proposal one

The current spot rate is US\$1.0635 per CHF1. The current annual inflation rate in the US is three times higher than Switzerland.

The following derivative products are available to CMC Co to manage the exposures of the US\$ payment and the interest on the loan:

Exchange-traded currency futures

Contract size CHF125,000 price quotation: US\$ per CHF1

3-month expiry 1.0647

6-month expiry 1.0659

Exchange-traded currency options

Contract size CHF125,000, exercise price quotation: US\$ per CHF1, premium: cents per CHF1

Exercise price	Call options		Put options	
	3-month expiry	6-month expiry	3-month expiry	6-month expiry
1.06	1.87	2.75	1.41	2.16
1.07	1.34	2.22	1.88	2.63

It can be assumed that futures and option contracts expire at the end of the month and transaction costs related to these can be ignored.

Over-the-counter products

In addition to the exchange-traded products, Pecunia Bank is willing to offer the following over-the-counter derivative products to CMC Co:

- (i) A forward rate between the US\$ and the CHF of US\$1.0677 per CHF1.
- (ii) An interest rate swap contract with a counterparty, where the counterparty can borrow at an annual floating rate based on the yield curve rate plus 0.8% or an annual fixed rate of 3.8%. Pecunia Bank would charge a fee of 20 basis points each to act as the intermediary of the swap. Both parties will benefit equally from the swap contract.

Alternative loan repayment proposal

As an alternative to paying the principal on the loan as one lump sum at the end of the fourth year, CMC Co could pay off the loan in equal annual amounts over the four years similar to an annuity. In this case, an annual interest rate of 2% would be payable, which is the same as the loan's gross redemption yield (yield to maturity).

Proposal two

This proposal suggested setting up four new branches in four different countries. Each branch would have its own production facilities and sales teams. As a consequence of this, one of the two European-based production facilities will be closed. Initial cost-benefit analysis indicated that this would reduce costs related to production, distribution and logistics, as these branches would be closer to the sources of raw materials and also to the customers. The operations and sales directors supported the proposal as, in addition to the above, this would enable sales and marketing teams in the branches to respond to any changes in nearby markets more quickly. The branches would be controlled and staffed by the local population in those countries. However, some members of the BoD expressed concern that such a move would create agency issues between CMC Co's central management and the management controlling the branches. They suggested mitigation strategies would need to be established to minimise these issues.

Response from the non-executive directors

When the proposals were put to the non-executive directors, they indicated that they were broadly supportive of the second proposal if the financial benefits outweigh the costs of setting up and running the four branches. However, they felt that they could not support the first proposal, as this would reduce shareholder value because the costs related to undertaking the proposal are likely to outweigh the benefits.

Required

- (a) Advise CMC Co on an appropriate hedging strategy to manage the foreign exchange exposure of the US\$ payment in four months' time. Show all relevant calculations, including the number of contracts bought or sold in the exchange-traded derivative markets. **(15 marks)**
- (b) Demonstrate how CMC Co could benefit from the swap offered by Pecunia Bank. **(6 marks)**

(c) Calculate the modified duration of the loan if it is repaid in equal amounts and explain how duration can be used to measure the sensitivity of the loan to changes in interest rates.

(7 marks)

(d) Prepare a memorandum for the board of directors (BoD) of CMC Co which:

(i) Discusses proposal one in light of the concerns raised by the non-executive directors;
and

(9 marks)

(ii) Discusses the agency issues related to proposal two and how these can be mitigated.

(9 marks)

Professional marks will be awarded in part (d) for the presentation, structure, logical flow and clarity of the memorandum.

(4 marks)

(Total = 50 marks)

SECTION B: BOTH QUESTIONS to be attempted

Question 2

You have recently commenced working for Burung Co and are reviewing a four-year project which the company is considering for investment. The project is in a business activity which is very different from Burung Co's current line of business.

The following net present value estimate has been made for the project:

All figures are in \$ million

Year	0	1	2	3	4
Sales revenue		23.03	36.60	49.07	27.14
Direct project costs		(13.82)	(21.96)	(29.44)	(16.28)
Interest		(1.20)	(1.20)	(1.20)	(1.20)
Profit		8.01	13.44	18.43	9.66
Tax (20%)		(1.60)	(2.69)	(3.69)	(1.93)
Investment/sale	(38.00)				4.00
Cash flows	(38.00)	6.41	10.75	14.74	11.73
Discount factors (7%)	1	0.935	0.873	0.816	0.763
Present values	(38.00)	5.99	9.38	12.03	8.95

Net present value is negative \$1.65 million, and therefore the recommendation is that the project should not be accepted.

Notes to NPV proposal

In calculating the net present value of the project, the following notes were made:

- 1 Since the real cost of capital is used to discount cash flows, neither the sales revenue nor the direct project costs have been inflated. It is estimated that the inflation rate applicable to sales revenue is 8% per year and to the direct project costs is 4% per year.
- 2 The project will require an initial investment of \$38 million. Of this, \$16 million relates to plant and machinery, which is expected to be sold for \$4 million when the project ceases, after taking any taxation and inflation impact into account.
- 3 Tax-allowable depreciation is available on the plant and machinery at 50% in the first year, followed by 25% per year thereafter on a reducing balance basis. A balancing adjustment is available in the year the plant and machinery is sold. Burung Co pays 20% tax on its annual taxable profits. No tax-allowable depreciation is available on the remaining investment assets and they will have a nil value at the end of the project.
- 4 Burung Co uses either a nominal cost of capital of 11% or a real cost of capital of 7% to discount all projects, given that the rate of inflation has been stable at 4% for a number of years.
- 5 Interest is based on Burung Co's normal borrowing rate of 150 basis points over the 10-year government yield rate.
- 6 At the beginning of each year, Burung Co will need to provide working capital of 20% of the anticipated sales revenue for the year. Any remaining working capital will be released at the end of the project.
- 7 Working capital and depreciation have not been taken into account in the net present value calculation above, since depreciation is not a cash flow and all the working capital is returned at the end of the project.

Further financial information

It is anticipated that the project will be financed entirely by debt, 60% of which will be obtained from a subsidised loan scheme run by the Government, which lends money at a rate of 100 basis points below the 10-year government debt yield rate of 2.5%. Issue costs related to raising the finance are 2% of the gross finance required. The remaining 40% will be funded from Burung Co's normal borrowing sources. It can be assumed that the debt capacity available to Burung Co is equal to the actual amount of debt finance raised for the project.

Burung Co has identified a company, Lintu Co, which operates in the same line of business as that of the project it is considering. Lintu Co is financed by 40 million shares trading at \$3.20 each and \$34 million debt trading at \$94 per \$100. Lintu Co's equity beta is estimated at 1.5. The current yield on government treasury bills is 2% and it is estimated that the market risk premium is 8%. Lintu Co pays tax at an annual rate of 20%.

Both Burung Co and Lintu Co pay tax in the same year as when profits are earned.

Required

- (a) Calculate the adjusted present value (APV) for the project, correcting any errors made in the net present value estimate above, and conclude whether the project should be accepted or not. Show all relevant calculations. **(15 marks)**
- (b) Comment on the corrections made to the original net present value estimate and explain the APV approach taken in part (a), including any assumptions made. **(10 marks)**

(Total = 25 marks)

Question 3

Hav Co is a publicly listed company involved in the production of highly technical and sophisticated electronic components for complex machinery. It has a number of diverse and popular products, an active research and development department, significant cash reserves and a highly talented management who are very good in getting products to market quickly.

A new industry that Hav Co is looking to venture into is biotechnology, which has been expanding rapidly, and there are strong indications that this recent growth is set to continue. However, Hav Co has limited experience in this industry. Therefore it believes that the best and quickest way to expand would be through acquiring a company already operating in this industry sector.

Strand Co

Strand Co is a private company operating in the biotechnology industry and is owned by a consortium of business angels and company managers. The owner-managers are highly skilled scientists who have developed a number of technically complex products, but have found it difficult to commercialise them. They have also been increasingly constrained by the lack of funds to develop their innovative products further.

Discussions have taken place about the possibility of Strand Co being acquired by Hav Co. Strand Co's managers have indicated that the consortium of owners is happy for the negotiations to proceed. If Strand Co is acquired, it is expected that its managers would continue to run the Strand Co part of the larger combined company.

Strand Co is of the opinion that most of its value is in its intangible assets, comprising intellectual capital. Therefore, the premium payable on acquisition should be based on the present value to infinity of the after-tax excess earnings the company has generated in the past three years, over the average return on capital employed of the biotechnological industry. However, Hav Co is of the opinion that the premium should be assessed on synergy benefits created by the acquisition and the changes in value, due to the changes in the price/earnings (P/E) ratio before and after the acquisition.

Financial Information

Given below are extracts of financial information for Hav Co for 20X3 and Strand Co for 20X1, 20X2 and 20X3:

Year ended 30 April	<i>Hav Co</i>	<i>Strand Co</i>		
	<i>20X3</i>	<i>20X3</i>	<i>20X2</i>	<i>20X1</i>
	\$m	\$m	\$m	\$m
Earnings before tax	1,980	397	370	352
Non-current assets	3,965	882	838	801
Current assets	968	210	208	198
Share capital (25c/share)	600	300	300	300
Reserves	2,479	183	166	159
Non-current liabilities	1,500	400	400	400
Current liabilities	354	209	180	140

The current average P/E ratio of the biotechnology industry is 16.4 times and it has been estimated that Strand Co's P/E ratio is 10% higher than this. However, it is thought that the P/E ratio of the combined company would fall to 14.5 times after the acquisition. The annual after-tax earnings will increase by \$140 million due to synergy benefits resulting from combining the two companies.

Both companies pay tax at 20% per annum and Strand Co's annual cost of capital is estimated at 7%. Hav Co's current share price is \$9.24 per share. The biotechnology industry's pre-tax return on capital employed is currently estimated to be 20% per annum.

Acquisition proposals

Hav Co has proposed to pay for the acquisition using one of the following three methods:

- 1 A cash offer of \$5.72 for each Strand Co share;
- 2 A cash offer of \$1.33 for each Strand Co share plus 1 Hav Co share for every 2 Strand Co shares; or
- 3 A cash offer of \$1.25 for each Strand Co share plus one \$100 3% convertible bond for every \$5 nominal value of Strand Co shares. In 6 years, the bond can be converted into 12 Hav Co shares or redeemed at par.

Required

- (a) Distinguish between the different types of synergy and discuss possible sources of synergy based on the above scenario. **(9 marks)**
- (b) Based on the two different opinions expressed by Hav Co and Strand Co, calculate the maximum acquisition premium payable in each case. **(6 marks)**
- (c) Calculate the percentage premium per share that Strand Co's shareholders will receive under each acquisition payment method and justify, with explanations, which payment method would be most acceptable to them. **(10 marks)**

(Total = 25 marks)

Answers

**DO NOT TURN THIS PAGE UNTIL YOU HAVE
COMPLETED THE MOCK EXAM**

Plan of attack

Take a good look through the exam before diving in to answer questions.

Option 1

It is normally sensible to start with the compulsory Section A question on the basis that leaving it to later runs the risk of having to rush the 50 mark question, which is very difficult to do.

- **Question 1** was originally set as a real exam question in June 2014. Make sure you don't get too bogged down on individual figures. Ensure you leave enough time to answer the discursive parts, especially part (d) and take care to make your discussion points relevant to the company in question.
- **Question 2** was originally set as a real exam question in June 2014. Adjusted present value is a commonly tested technique for AFM.
- **Question 3** was originally set as a real exam question in June 2013. Business valuations are also a commonly examined area in AFM. In part (c) it is important to simplify the calculations as much as possible given the limited marks available for the numerical part of this question (estimating that about half of the ten marks are available for discussion areas).

Option 2

If you are a bit worried about question 1, as may be the case here, you could manage your exam nerves by doing a section B question first, selecting the one you are most comfortable with. However, make sure you don't spend too much time on this question, regardless of how much you think you can write. If you are comfortable with the question but cannot answer it in the time allowed then you are probably writing too much.

No matter how many times we remind you...

Always allocate your time according to the marks for the question in total and for the individual parts of each question. Also **always answer the question you were asked** rather than the question you wished you had been asked or the question you thought you had been asked.

You've got free time at the end of the exam...?

Looks like you've slipped up on the time allocation. However, if you have, don't waste the last few minutes; go back to **any parts of questions that you didn't finish** because you moved on to another task.

Forget about it!

Forget about what? Excellent – you already have!

Question 1

Workbook references. Hedging is covered in Chapters 12 and 13.

Top tips. Focus on achieving a good attempt in the time available – where you get stuck on a part of the question you have to be ruthless with your time management and move on to the next requirement.

Easy marks. There are numerous easy marks to be picked up in part (a) for basic points on hedging and part (d) which is worth almost half the marks for the whole question.

Examining team's comments. The answers to the different parts of the question were variable. In part (a) many candidates offered little in the way of advice, limiting their answer to a recommendation, but with little discussion in support. From the poorer responses it was evident that some candidates did not expect this topic to be part of the 50-mark compulsory question and hoped to avoid risk management altogether.

Part (b) required candidates to demonstrate how a simple interest rate swap would operate. This part was not done well by many candidates. It seems that this area was not expected to be tested and therefore candidates were ill-prepared for it. As mentioned already, in order to achieve a comfortable pass in the AFM exam, a good knowledge of the entire AFM syllabus is necessary.

In part (c) the actual calculation of the duration was done reasonably well by candidates, but a surprising number of candidates did not seem to know how to use annuities to calculate the equal amounts of loan repayments. Few responses actually discussed how duration could be used to measure the sensitivity of a loan to interest rate changes, although many explained what duration was and its limitations.

Part (d)(i) required candidates to discuss the value of risk management and in what circumstances risk management would be useful. Few candidates answered this part well, although there was an article in *Student Accountant* a few years ago discussing this issue.

Part (d)(ii) was answered well by many candidates, and it was pleasing to see that not only were the issues discussed, but also the possible mitigation strategies.

Four professional marks were available for the memorandum for part (d). It was disappointing that many answers could not frame a memorandum adequately and gained few professional marks. Given that a number of scripts were awarded marks in the high 40s, gaining all the professional marks would have enabled these scripts to gain a pass mark.

It is important that answers to all the questions focus on good layout, structure, presentation and neatness (including legibility). Such an approach shows the markers that the candidate understands the topic area(s) and makes awarding marks a straightforward process.

Marking scheme

	Marks
(a) Calculation of payment using the forward rate	1
Going short on futures and purchasing put options	2
Predicted futures rate based on basis reduction	1
Futures: Expected payment and number of contracts	2
Options calculation using either 1.06 or 1.07 rate	3
Options calculation using the second rate (or explanation)	2
Advice (1 to 2 marks per point)	$\frac{4-5}{15}$
	Max <u>15</u>

		Marks
(b)	Comparative advantage and recognition of benefit as a result	2
	Initial decision to borrow fixed by CMC Co and floating by counterparty	1
	Swap impact	2
	Net benefit after bank charges	<u>1</u>
		<u>6</u>
(c)	Calculation of annual annuity amount	1
	Calculation of Macaulay duration	2
	Calculation of modified duration	1
	Explanation	<u>3</u>
		<u>7</u>
(d)	(i) 2–3 marks per point	Max <u>9</u>
	(ii) Discussion of the agency issues	3–4
	Discussion of mitigation strategies and policies	4–6
		Max <u>9</u>
Professional marks		
	Memorandum format	1
	Structure and presentation of the memorandum	<u>3</u>
		<u>4</u>
		<u>50</u>

(a) The US\$ payment of 5.06 million due in 4 months' time exposes CMC to the risk of a devaluation in the CHF over this period.

This risk can be managed in a number of ways.

(i) **Forward contracts**

The forward rate being offered of US\$1.0677 per CHF would mean that the cost of this payment would be fixed at:

$$\$5.06m/1.0677 = 4,739,159 \text{ CHF}$$

This would completely remove the possibility of negative (or positive) exchange rate movements impacting on the cost of this payment in CHF.

Forward contracts are a simple way of starting to hedge risk and carry no transaction costs, although they do carry default risk.

(ii) **Futures**

CMC would need to enter into contracts to sell CHF on the futures exchange. Six-month contracts would be needed.

The effective exchange rate on the futures market can be estimated as follows:

	Now	<i>In 4 months</i>
6-month future	1.0659	
Spot	1.0635	
Basis	<u>0.0024</u>	0.0008
		6 months remaining
		2 months remaining (0.0024 × 2/6)

The closing future price is estimated at spot in 6 months (assume this is 1.0659) + 0.0008 = 1.0667.

The futures contracts would be set up as follows:

$$\text{Number of contracts to sell } (\$5.06m/1.0659/125,000) = 38$$

In reality a margin payment would be needed to cover potential losses on these contracts.

Assuming that the closing spot = 1.0659 then the situation would be:

Actual transaction = a payment of \$5.06m/1.0659 = 4,747,162 CHF

Contract to sell at opening future 1.0659

Contract to buy at closing future rate 1.0667

Loss on future = 0.0008

Total losses = $0.0008 \times 38 \text{ contracts} \times 125,000 = \$3,800$ converted into CHF at closing spot = $3,800/1.0659 = 3,565$ CHF

Final outcome = actual + future = $4,747,162 + 3,565 = 4,750,727$ CHF

This is an effective rate of $\$5,060,000/4,750,727 = 1.0651$

This can also be estimated as the opening futures price – closing basis = $1.0659 - 0.0008 = 1.0651$

The treasury department would have to ensure that the future was closed out on the same date as the actual transaction.

There may be variation margin payments during the next four months if potential losses on these contracts exceed the initial margin.

This is less attractive than the forward contract.

(iii) **Currency options**

Because the contracts are in CHF, the contracts required will be to sell CHF ie put options. Six-month contracts will be needed.

As with futures, 38 contracts will be needed.

There is a choice of 2 options, 1.06 and 1.07 \$ to the CHF. The 1.07 is the better rate and therefore is more expensive.

The potential outcome of using both is set out below.

	1.06	1.07
Cost of setting up 38 put options (in \$)	102,600 (2.16 premium)	124,925 (2.63 premium)
Cost in CHF at today's spot rate of 1.0635	<u>96,474</u>	<u>117,466</u>

Assuming that the option is exercised

	<i>Use option</i>	<i>Use option</i>	
Cost in CHF	<u>\$5,035,000</u>	<u>\$5,082,500</u>	<u>\$</u>
	<u>-4,750,000</u>	<u>-4,750,000</u>	
	shortage in \$	surplus in \$	
	(\$5.06m –	(\$5.06m –	
	\$5.035m)	22,500	\$5.0825m)
	CHF at 1.0677	in CHF at	
	(fwd rate)	1.0677 fwd rate	
Premium in CHF	<u>-23,415</u>	<u>21,073</u>	
	(fwd rate)		
Net in CHF	<u>-96,474</u>	<u>-117,466</u>	
	(fwd rate)		
	<u>-4,869,889</u>	<u>-4,846,393</u>	

This is an uncertain outcome, and may be better if the CHF gets stronger over the next four months (because then the option would not need to be exercised).

Summary	CHF
Forward	4,739,159
Future	4,750,728
Option at 1.06	4,869,889
Option at 1.07	4,846,393

Based on this analysis I recommend using forwards which in any case are a simple and low cost way of beginning to hedge currency risk.

(b)

	CMC Co	Counterparty	Interest rate differential
Fixed rate	2.2%	3.8%	1.6%
Floating rate	Yield rate + 0.4%	Yield rate + 0.8%	0.4%

CMC Co has a comparative advantage in borrowing at the fixed rate and the counterparty has a comparative advantage in borrowing at the floating rate. Total possible benefit before Pecunia Bank's fee is 1.2% (1.6 – 0.4), which if shared equally results in a benefit of 0.6% each, for both CMC Co and the counterparty.

	CMC Co	Counterparty
CMC Co borrows at	2.2%	
Counterparty borrows at		Yield rate + 0.8%
Advantage	60 basis points	60 basis points
Net result	Yield rate – 0.2%	3.2%
SWAP		
Counterparty receives		Yield rate
CMC Co pays	Yield rate	
Counterparty pays		2.4%
CMC Co receives	2.4%	

After paying the 20 basis point fee, CMC Co will effectively pay interest at the yield curve rate and benefit by 40 basis points or 0.4%, and the counterparty will pay interest at 3.4% and benefit by 40 basis points or 0.4% as well.

(**Note.** Full marks will be given where the question is answered by estimating the arbitrage gain of 1.2% and deducting the fees of 0.4%, without constructing the above table.)

(c) Annuity factor, 4 years, 2% = 3.808

Equal annual amounts repayable per year = CHF60,000,000/3.808 = CHF15,756,303

Time	1	2	3	4	Total
Repayments (CHF'000)	15,756.3	15,756.3	15,756.3	15,756.3	
Df 2%	0.980	0.961	0.942	0.924	
PV ('000)	15,441.2	15,141.8	14,842.4	14,558.8	59,984.2
% of present value	15,441.2 ÷ 59,984.2	15,141.8 ÷ 59,984.2	14,842.4 ÷ 59,984.2	14,558.8 ÷ 59,984.2	0.24
	= 0.26	= 0.25	= 0.25	= 0.24	

Macaulay duration

$$\begin{aligned}
 & (0.26 \times 1 \text{ year} + \\
 & 0.25 \times 2 \text{ years} + \\
 & 0.25 \times 3 \text{ years} + \\
 & 0.24 \times 4 \text{ years}) \\
 & = 2.47 \text{ years}
 \end{aligned}$$

Modified duration = $2.47/1.02 = 2.42$ years

The size of the modified duration will determine how much the value of a bond or loan will change when there is a change in interest rates. A higher modified duration means that the fluctuations in the value of a bond or loan will be greater, hence the value of 2.42 means that the value of the loan or bond will change by 2.42 times the change in interest rates multiplied by the original value of the bond or loan.

The relationship is only an approximation because duration assumes that the relationship between the change in interest rates and the corresponding change in the value of the bond or loan is linear. In fact, the relationship between interest rates and bond price is in the form of a curve which is convex to the origin (ie non-linear). Therefore duration can only provide a reasonable estimation of the change in the value of a bond or loan due to changes in interest rates, when those interest rate changes are small.

(d) **MEMORANDUM**

From:

To: The Board of Directors, CMC Co

Date: XX/XX/XXXX

Subject: Discussion of the proposal to manage foreign exchange and interest rate exposures, and the proposal to move operations to four branches and consequential agency issues

This memo discusses the proposal of whether or not CMC Co should undertake the management of foreign exchange and interest rate exposure, and the agency issues resulting from the proposal to locate branches internationally.

(i) **Proposal One: Management of foreign exchange and interest rate exposure**

The non-executive directors are correct if CMC Co is in a situation where markets are perfect and efficient, where information is freely available and where securities are priced correctly. In this circumstance, risk management or hedging would not add value and, if shareholders hold well-diversified portfolios, unsystematic risk will be largely eliminated.

The position against hedging states that in such cases companies would not increase shareholder value by hedging or eliminating risk because there will be no further reduction in unsystematic risk. Furthermore, the cost of reducing any systematic risk will equal or be greater than the benefit derived from such risk reduction. Shareholders would not gain from risk management or hedging; in fact, if the costs exceed the benefits, then hedging may result in a reduction in shareholder value.

There are two main situations where reduction in volatility or risk may increase cash flows – where a firm could face significant financial distress costs due to high volatility in earnings; and where stable earnings increase certainty and the ability to plan for the future, thus resulting in stable investment policies by the firm.

Active hedging may also reduce agency costs. For example, unlike shareholders, managers and employees of the company may not hold diversified portfolios. Hedging allows the risks faced by managers and employees to be reduced. Additionally, hedging may allow managers to be less concerned about market movements which are not within their control and instead allow them to focus on business issues over which they can exercise control. This seems to be what the Purchasing Director is contending. On the other hand, the Finance Director seems to be more interested in increasing his personal benefits and not necessarily in increasing the value of CMC Co.

A consistent hedging strategy or policy may be used as a signalling tool to reduce the conflict of interest between bond holders and shareholders, and thus reduce restrictive covenants.

It is also suggested that until recently CMC Co had no intention of hedging and communicated this in its annual report. It is likely that shareholders will therefore have created their own risk management policies. A strategic change in the policy may have a negative impact on the shareholders and the clientele impact of this will need to be taken into account.

The case of whether to hedge or not is not clear cut and CMC Co should consider all the above factors and be clear about why it is intending to change its strategy before coming to a conclusion. Any intended change in policy should be communicated to the shareholders. Shareholders can also benefit from risk management because the risk profile of the company may change, resulting in a reduced cost of capital.

(ii) Proposal Two: International branches, agency issues and their mitigation

Principal–agent relationships can be observed within an organisation between different stakeholder groups. With the proposed branches located in different countries, the principal–agent relationship will be between the directors and senior management at CMC Co in Switzerland, and the managers of the individual branches. Agency issues can arise where the motivations of the branch managers, who are interested in the performance of their individual branches, diverge from the management at CMC Co headquarters, who are interested in the performance of the whole organisation.

These issues may arise because branch managers are not aware of, or appreciate the importance of, the key factors at corporate level. They may also arise because of differences in cultures and divergent backgrounds.

Mitigation mechanisms could involve:

- Monitoring policies
- Compensation policies
- Communication policies

Monitoring policies: These would involve ensuring that key aims and strategies are agreed between all parties before implementation, and results monitored to ensure adherence with the original agreements. Where there are differences, for example due to external factors, new targets need to be agreed. Where deviations are noticed, these should be communicated quickly.

Compensation packages: These should ensure that reward is based on achievement of organisational value and therefore there is every incentive for the branch managers to act in the best interests of the corporation as a whole.

Communication: Branch managers should be made fully aware of the organisational objectives, and any changes to these, and how the branch contributes to these, in order to ensure their acceptance of the objectives. The management at CMC Co headquarters should be fully aware of cultural and educational differences in the countries where the branches are to be set up and fully plan for how organisational objectives may nevertheless be achieved within these differences.

(Note. Credit will be given for alternative, relevant approaches to the calculations, comments and suggestions/recommendations.)

Question 2

Workbook references. APV technique is covered in Chapter 6.

Top tips. Make sure that you underline the key requirement words to identify all the aspects of a question. For example in part (b) there are three aspects to the question that will all score marks; these are regarding the corrections made (1), the approach taken (2) and the limitations of the method (3).

Easy marks. The comments in part (b) are an easy source of marks.

Examining team's comments. It was pleasing that candidates approached this question in a structured and systematic manner, and the majority of the responses achieved a pass mark.

Part (a) focused on the calculation of the APV with candidates being given the opportunity to make corrections to the original NPV calculations. This part was done well in most cases and the flexibility in marking allowed credit to be awarded for the follow-on approach even if errors were made earlier. Although many candidates knew the approach for the APV, some of the financing side-effect calculations were also not done correctly.

Part (b) focused on the comment on the corrections and explanation of the approach taken and assumptions made. This part was generally done well, although some answers did not make a sufficient number of good points to warrant a good pass being awarded. Many answers tended to repeat the points in slightly different ways and therefore got no additional marks.

Marking scheme

	Marks
(a) Inflated incremental profit	2
Taxation	2
Working capital	2
Estimate of discount rate	2
Net present value	1
Issue costs	1
Tax shield benefit	2
Subsidy benefit	1
Adjusted present value and conclusion	<u>2</u>
	15
(b) Corrections made	4–5
Approach taken	2–3
Assumptions made	<u>3–4</u>
	Max <u>10</u> <u>25</u>

(a) All figures are in \$ million – corrections are numbered

Year	0	1	2	3	4
(error 1) Sales revenue (inflated, 8% p.a.)		24.87	42.69	61.81	36.92
(error 1) Costs (inflated, 4% p.a.)		(14.37)	(23.75)	(33.12)	(19.05)
Incremental profit		10.50	18.94	28.69	17.87
(error 2) Interest (not relevant)		n/a	n/a	n/a	n/a
(error 3) Tax (W1)		(0.50)	(3.39)	(5.44)	(3.47)
(error 4) Working capital (W2)	(4.97)	(3.57)	(3.82)	4.98	7.38
Investment/sale of machinery	(38.00)				4.00
Cash flows	(42.97)	6.43	11.73	28.23	25.78
(error 5) Discount factors (12%, W3)	1	0.893	0.797	0.712	0.636
Present values	(42.97)	5.74	9.35	20.10	16.40

Base case net present value is approximately \$8.62 million.

Workings

1 All figures are in \$ million

Year	0	1	2	3	4
Incremental profit	10.50	18.94	28.69	17.87	
Capital allowances	8.00	2.00	1.50	0.50	
Taxable profit	2.50	16.94	27.19	17.37	
Tax (20%)	0.50	3.39	5.44	3.47	

2 All figures are in \$ million

Year	0	1	2	3	4
Working capital (20% of sales revenue)		4.97	8.54	12.36	7.38
Working capital required/(released)	4.97	3.57	3.82	(4.98)	(7.38)

$$3 \quad \beta_a = \left(\frac{V_e}{(V_e + V_d(1-t))} \right) \beta_e + \left(\frac{V_d(1-t)}{(V_e + V_d(1-t))} \right) \beta_d$$

Assuming the beta of debt = 0, Lintu Co's asset beta =

$$[\$128m/(\$128m + \$31.96m \times 0.8) \times 1.5 \text{ approx.} = 1.25]$$

Using the CAPM $E(r_i) = R_f + \beta (E(R_m - R_f))$

So the all-equity financed discount rate = $2\% + 1.25 \times 8\% = 12\%$

(error 6) Financing side effects

Issue costs $2/98 \times \$42.97m$ \$'000
(876.94)

Tax shield

Annual tax relief =

On the subsidised loan = $\$42.97m \times 60\% \times 0.015 \times 20\% = \$77,346$

On the rest of the loan = $\$42.97m \times 40\% \times 0.04 \times 20\% = \$137,504$

Total = $77,346 + 137,504 = \$214,850m \text{ p.a. for 4 years}$

This is discounted at the normal cost of debt which is 1.5% above the risk-free rate of 2.5% ie = 4%.

The present value of the tax relief annuity = 214.85×3.63

779.91

		\$'000
Annual subsidy benefit		
\$42.97m \times 60% \times 0.025 \times 80% = 515.64 ('000)		
The present value of the subsidy benefit annuity = 515.64 \times 3.63	1,871.77	
Total benefit of financing side effects	<u>1,774.74</u>	

Financing the project entirely by debt would add just under \$1.78 million to the value of the project, or approximately an additional 20% to the all-equity financed project.

The APV of the project is just under \$10.4 million and therefore it should be accepted.

Note. In calculating the present values of the tax shield and subsidy benefits, instead of the discount factor being based on the normal borrowing/default risk of the company, alternatively, 2% or 2.5% could be used depending on the assumptions made. Credit will be given where these are used to estimate the annuity factor, where the assumption is explained.

(b) Corrections made to the original net present value (numbers are referenced in the above calculations)

- 1 Cash flows are inflated and the nominal rate based on Lintu Co's all-equity financed rate is used (see below). Where different cash flows are subject to different rates of inflation, applying a real rate to non-inflated amounts would not give an accurate answer because the effect of inflation on profit margins is being ignored.
- 2 Interest is not normally included in the net present value calculations. Instead, it is normally imputed within the cost of capital or discount rate. In this case, it is included in the financing side effects.
- 3 The approach taken to exclude depreciation from the net present value computation is correct, but capital allowances need to be taken away from profit estimates before tax is calculated, reducing the profits on which tax is payable.
- 4 The impact of the working capital requirement is included in the estimate as, although all the working capital is recovered at the end of the project, the flows of working capital are subject to different discount rates when their present values are calculated.

Approach taken (relates to errors 5 and 6)

The value of the project is initially assessed considering only the business risk involved in undertaking the project. The discount rate used is based on Lintu Co's asset beta which measures only the business risk of that company. Since Lintu Co is in the same line of business as the project, it is deemed appropriate to use its discount rate, instead of 11% that Burung Co uses normally.

The impact of debt financing and the subsidy benefit are then considered. In this way, Burung Co can assess the value created from its investment activity and then the additional value created from the manner in which the project is financed.

Assumptions made

It is assumed that all figures used are accurate and any estimates made are reasonable. Burung Co may want to consider undertaking a sensitivity analysis to assess this.

It is assumed that the initial working capital required will form part of the funds borrowed but that the subsequent working capital requirements will be available from the funds generated by the project. The validity of this assumption needs to be assessed since the working capital requirements at the start of Years 2 and 3 are substantial.

It is assumed that Lintu Co's asset beta and all-equity financed discount rate represent the business risk of the project. The validity of this assumption also needs to be assessed. For example, Lintu Co's entire business may not be similar to the project, and it may undertake

other lines of business. In this case, the asset beta would need to be adjusted so that just the project's business risk is considered.

It is also assumed that there are no adverse side effects of taking on the extra debt eg a worsening credit rating which could impact Burung's trading position.

(Note. Credit will be given for alternative, relevant explanations.)

Question 3

Workbook references. Acquisitions are covered in Chapters 8 and 9.

Top tips. For part (a) make sure any synergies suggested are consistent with the given scenario, rather than a generic list. For example, research and development (R&D) synergies are more applicable in this scenario than in a general acquisition question.

For part (b) you may have slightly different numbers depending on roundings. Do not worry about this as full marks will still be given where roundings are sensible.

For part (c) you need to use the maximum premiums calculated in part (b). Ensure that you use whatever numbers you have calculated in order to gain any follow through marks. Also for part (c) ensure that you justify the recommendation you have made and that it is supported by the calculations.

Easy marks. You should be able to pick up some relatively straightforward marks in part (a) for distinguishing the different types of synergies as well as suggesting potential synergies in this scenario.

Examining team's comments. Part (b) was not done well on the whole. Few candidates knew how to approach answering this question and most tried to use the figures given in innovative but incorrect ways to get to an answer.

For part (c) some reasonable answers were provided for the cash only and the cash and shares methods of payment. The bond payment method was done less well and few answers justified the payment method that Strand Co's shareholders (the target company's shareholders) would prefer.

Marking scheme

		Marks
(a)	Distinguish between different synergies	1-2
	Evaluating possible financial synergies	2-3
	Evaluating possible cost synergies	1-2
	Evaluating possible revenue synergies	3-4
	Concluding comments	<u>1-2</u>
		Max 9
(b)	Average earnings and capital employed	1
	After-tax premium	1
	PV of premium (excess earnings)	1
	Hav Co and Strand Co values	1
	Combined company value	1
	Value created/premium (P/E method)	<u>1</u>
		6
(c)	Strand Co, value per share	1
	Cash offer premium (%)	1
	Cash and share offer premium (%)	2
	Cash and bond offer premium (%)	2
	Explanation and justification	<u>4-5</u>
		Max 10
		<u><u>25</u></u>

(a) Synergies arise from an acquisition when the value of the new, combined entity is greater than the sum of the two individual values before the acquisition. There are three types of synergies: revenue, cost and financial.

Revenue synergies create higher revenues for the combined entity, also creating a higher return on equity and an extended period of competitive advantage.

Cost synergies arise from eliminating duplication of functions and also from economies of scale due to the size of the new entity.

Financial synergies may result from the ability to increase debt capacity or from transferring group funds to companies where they can be best utilised.

In this scenario, there may be financial synergies available as Hav Co has significant cash reserves, but Strand Co is constrained by a lack of funds. This means that the new entity may have the funds to **undertake projects** that would have been rejected by Strand Co due to a lack of funds. The larger company may also have an increased debt capacity and therefore additional access to finance. It is also possible that the new entity will have a lower cost of capital as a result of the acquisition.

Cost synergies may be available, through the removal of duplication in areas such as head office functions, but also in R&D. These synergies are likely to be more short term. Other cost synergies may arise from a **stronger negotiating position** with suppliers due to the size of the new entity, meaning better credit terms and also lower costs.

Revenue synergies have the potential to be the biggest synergies from this acquisition, although they are likely to be the hardest to achieve, and also to sustain. Hav Co can help Strand Co with the marketing of its products, which should result in **higher revenues** and a longer period of **competitive advantage**. Combining the R&D activity and the technologies of both companies may mean products can be brought to market faster too. To achieve these synergies it is important to retain the services of the scientist managers of Strand Co. They have been used to complete autonomy as the managers of Strand Co, so this relationship should be managed carefully.

A major challenge in an effective acquisition is to **integrate processes and systems** between the two companies efficiently and effectively in order to gain the full potential benefits. Often, this is done poorly and can mean that the acquisition is ultimately seen as a failure. Hav Co needs to plan for this before proceeding with the acquisition.

(b) **Maximum premium based on excess earnings**

Average pre-tax earnings of Strand Co = $(397 + 370 + 352)/3 = \$373\text{m}$

Average capital employed = $[(882 + 210 - 209) + (838 + 208 - 180) + (801 + 198 - 140)]/3 = \869.3m

Excess annual premium (pre-tax) = $373 - (869.3 \times 0.2) = \199.1m

Post-tax annual premium = $\$199.1 \times 0.8 = \159.3m

PV of annual premium in perpetuity = $159.3/0.07 = \$2,275.7\text{m}$

The maximum premium payable is \$2,275.7m.

Maximum premium based on P/E ratio

Strand Co's estimated P/E ratio = $16.4 \times 1.10 = 18.04$

Strand Co's post-tax profit (most recent) = $397\text{m} \times 0.8 = \317.6m

Hav Co's post-tax profit = $1,980 \times 0.8 = \$1,584\text{m}$

Hav Co current value = $\$9.24 \times 2,400\text{m shares} = \$22,176\text{m}$

Strand Co current value = $18.04 \times \$317.6 = \$5,729.5\text{m}$

Value of combined company = $(1,584 + 317.6 + 140) \times 14.5 = \$29,603.2\text{m}$

Maximum premium = $29,603.2 - (22,176 + 5,729.5) = \$1,697.7\text{m}$

(c) Current value of a Strand Co share = \$5,729.5m/1,200m shares = \$4.77 per share
Maximum premium % based on excess earnings = $2,275.7/5,729.5 \times 100 = 39.7\%$
Maximum premium % based on P/E ratio = $1,697.7/5,729.5 \times 100 = 29.6\%$

Cash offer: premium % to Strand Co shareholder

$$(5.72 - 4.77)/4.77 \times 100 = 19.9\%$$

Cash and share offer: premium % to Strand Co shareholder

1 Hav Co share for 2 Strand Co shares

Hav Co share price = \$9.24

Price per Strand Co share = $9.24/2 = \$4.62$

Cash payment per Strand Co share = \$1.33

Total return = $4.62 + 1.33 = \$5.95$

$$\text{Premium} = (5.95 - 4.77)/4.77 \times 100 = 24.7\%$$

Cash and bond offer: premium % to Strand Co shareholder

Each share has nominal value of \$0.25 so \$5 is 20 shares

Bond value \$100/20 shares = \$5 per share

Cash payment per Strand Co share = \$1.25

Total return = $5 + 1.25 = \$6.25$

$$\text{Premium} = (6.25 - 4.77)/4.77 \times 100 = 31.0\%$$

Tutorial note. Although these evaluations have been carried out using the current share price given in the question, an equally valid approach would have been to have used a post-acquisition share price based on earlier calculations (although this would take longer and is less advisable given that it is likely that about half of the marks are available for the numerical element of this question).

Based on the calculations above, the cash plus bond offer will give the highest return to Strand Co shareholders. In addition, the **bond can be converted** to 12 Hav Co shares, giving a value per share of $\$8.33 (\$100/12)$, which is below the current share price and so already **in-the-money**. If the share price increases over the 6-year period, then the value of the bond should also increase. The bond will also earn interest of 3% per year for the holder.

The 31% return is the closest to the maximum premium based on excess earnings and higher than the maximum premium based on P/E ratios. Thus this method appears to **transfer more of the value** to the owners of Strand Co.

However, this payment method gives the **lowest initial cash payment** of the three methods being considered. This may make it seem more attractive to the Hav Co shareholders as well, although they stand to have their shareholding diluted most by this method, but not until six years have passed.

The cash and share offer gives a return in between the other options. Although the return is lower than the cash and bond offer, Strand Co's shareholders could **sell the Hav Co shares immediately** if they wish to. However, if the share price of Hav Co falls between now and the acquisition, the return to Strand Co shareholders will be lower.

The cash only offer gives an immediate return to Strand Co shareholders, but it is the **lowest return** and may also place a **strain on the cash flow** of Hav Co, which may need to increase borrowings as a result.

It seems most likely that Strand Co's shareholder/managers, who will continue to work in the new entity, will accept the mixed cash and bond offer. This maximises their current return and also gives them the chance to gain in the future when converting the bond. The choice of payment method could be influenced by the impact on personal taxation situations, though.

ACCA

Advanced Financial Management

Mock Examination 3

March/June 2018

Sample questions

Questions

Time allowed 3 hours and 15 minutes

Section A THIS question is compulsory and MUST be attempted

Section B BOTH questions to be attempted

**DO NOT OPEN THIS EXAM UNTIL YOU ARE READY TO START
UNDER EXAMINATION CONDITIONS**

SECTION A: THIS QUESTION is compulsory and MUST be attempted

Question 1

Chikepe Co is a large listed company operating in the pharmaceutical industry with a current market value of equity of \$12,600 million and a debt to equity ratio of 30:70, in market value terms. Institutional investors hold most of its equity shares. The company develops and manufactures antibiotics and anti-viral medicines. Both the company and its products have an established positive reputation among the medical profession, and its products are used widely. However, its rate of innovation has slowed considerably in the last few years and it has fewer new medical products coming into the market.

At a recent meeting of the board of directors (BoD), it was decided that the company needed to change its current strategy of growing organically to one of acquiring companies, in order to maintain the growth in its share price in the future. The members of the BoD had different opinions on the type of acquisition strategy to pursue.

Director A was of the opinion that Chikepe Co should follow a strategy of acquiring companies in different business sectors. She suggested that focusing on just the pharmaceutical sector was too risky and acquiring companies in different business sectors will reduce this risk.

Director B was of the opinion that Director A's suggestion would not result in a reduction in risk for shareholders. In fact, he suggested that this would result in agency related issues with Chikepe Co's shareholders reacting negatively and as a result, the company's share price would fall. Instead, Director B suggested that Chikepe Co should focus on its current business and acquire other established pharmaceutical companies. In this way, the company will gain synergy benefits and thereby increase value for its shareholders.

Director C agreed with Director B, but suggested that Chikepe Co should consider relatively new pharmaceutical companies, as well as established businesses. In her opinion, newer companies might be involved in research and development of innovative products, which could have high potential in the future. She suggested that using real options methodology with traditional investment appraisal methods such as net present value could help establish a more accurate estimate of the potential value of such companies.

The company has asked its finance team to prepare a report on the value of a potential target company, Foshoro Co, before making a final decision.

Foshoro Co

Foshoro Co is a non-listed pharmaceutical company established about 10 years ago. Initially Foshoro Co grew rapidly, but this rate of growth slowed considerably three years ago, after a venture capital equity backer exited the company by selling its stake back to the founding directors. The directors had to raise substantial debt capital to buy back the equity stake. The company's current debt to equity ratio is 60:40. This high level of gearing means that the company will find it difficult to obtain funds to develop its innovative products in the future.

The following financial information relates to Foshoro Co:

Extract from the most recent statement of profit or loss

	\$ million
Sales revenue	878.1
Profit before interest and tax	192.3
Interest	78.6
Tax	22.7
Profit after tax	91.0

In arriving at the profit before interest and tax, Foshoro Co deducted tax allowable depreciation and other non-cash expenses totalling \$112.0 million. It requires a cash investment of \$98.2 million in non-current assets and working capital to continue its operations at the current level.

Three years ago, Foshoro Co's profit after tax was \$83.3 million and this has been growing steadily to their current level. Foshoro Co's profit before interest and tax and its cash flows grew at the same growth rate as well. It is likely that this growth rate will continue for the foreseeable future if Foshoro Co is not acquired by Chikepe Co. Foshoro Co's cost of capital has been estimated at 10%.

Combined company: Chikepe Co and Foshoro Co

Once Chikepe Co acquires Foshoro Co, it is predicted that the combined company's sales revenue will be \$4,200 million in the first year, and its operating profit margin on sales revenue will be 20% for the foreseeable future.

After the first year, the sales revenue is expected to grow at 7% per year for the following three years. It is anticipated that after the first four years, the growth rate of the combined company's free cash flows will be 5.6% per year.

The combined company's tax allowable depreciation is expected to be equivalent to the amount of investment needed to maintain the current level of operations. However, as the company's sales revenue increases over the four-year period, the combined company will require an additional investment in assets of \$200 million in the first year and then \$0.64 per \$1 increase in sales revenue for the next three years.

It can be assumed that the asset beta of the combined company is the weighted average of the individual companies' asset betas, weighted in proportion of the individual companies' value of equity. It can also be assumed that the capital structure of the combined company remains at Chikepe Co's current capital structure level, a debt to equity ratio of 30:70. Chikepe Co pays interest on borrowings at a rate of 5.3% per annum.

Chikepe Co estimates that it will be able to acquire Foshoro Co by paying a premium of 30% above its estimated equity value to Foshoro Co's shareholders.

Other financial information

	<i>Equity beta</i>	<i>Asset beta</i>
Chikepe Co	1.074	0.800
Foshoro Co	2.090	0.950

The current annual government borrowing base rate is 2% and the annual market risk premium is estimated at 7%.

Both companies pay tax at an annual rate of 20%.

Chikepe Co estimates equity values in acquisitions using the free cash flow to firm method.

Future acquisitions

The BoD agreed that in the future it is likely that Chikepe Co will target both listed and non-listed companies for acquisition. It is aware that when pursuing acquisitions of listed companies, the company would need to ensure that it complied with regulations such as the mandatory bid rule and the principle of equal treatment to protect shareholders. The BoD is also aware that some listed companies may attempt to defend acquisitions by employing anti-takeover measures such as poison pills and disposal of crown jewels.

Required

(a) Compare and contrast the reasons for the opinions held by Director A and by Director B, and discuss the types of synergy benefits which may arise from the acquisition strategy suggested by Director B. **(9 marks)**

(b) Discuss how using real options methodology in conjunction with net present value could help establish a more accurate estimate of the potential value of companies, as suggested by Director C. **(5 marks)**

(c) Prepare a report for the board of directors of Chikepe Co which:

- (i) Estimates the current equity value of Foshoro Co; **(6 marks)**
- (ii) Estimates the equity value arising from combining Foshoro Co with Chikepe Co; **(11 marks)**
- (iii) Evaluates whether the acquisition of Foshoro Co would be beneficial to Chikepe Co's shareholders and discusses the limitations of the valuation method used in (c)(i) and (c)(ii) above. **(7marks)**

Professional marks will be awarded in part (c) for the format, structure and presentation of the report. **(4 marks)**

(d) Discuss how the mandatory bid rule and the principle of equal treatment protects shareholders in the event of their company facing a takeover bid, and discuss the effectiveness of poison pills and disposal of crown jewels as defensive tactics against hostile takeover bids. **(8 marks)**

(Total = 50 marks)

SECTION B: BOTH QUESTIONS TO BE ATTEMPTED

Question 2

Tippletine Co is based in Valliland. It is listed on Valliland's stock exchange but only has a small number of shareholders. Its directors collectively own 45% of the equity share capital.

Tippletine Co's growth has been based on the manufacture of household electrical goods. However, the directors have taken a strategic decision to diversify operations and to make a major investment in facilities for the manufacture of office equipment.

Details of investment

The new investment is being appraised over a four-year time horizon. Revenues from the new investment are uncertain and Tippletine Co's finance director has prepared what she regards as cautious forecasts. She predicts that it will generate \$2 million operating cash flows before marketing costs in Year 1 and \$14.5 million operating cash flows before marketing costs in Year 2, with operating cash flows rising by the expected levels of inflation in Years 3 and 4.

Marketing costs are predicted to be \$9 million in Year 1 and \$2 million in each of Years 2 to 4.

The new investment will require immediate expenditure on facilities of \$30.6 million. Tax allowable depreciation will be available on the new investment at an annual rate of 25% reducing balance basis. It can be assumed that there will either be a balancing allowance or charge in the final year of the appraisal. The finance director believes the facilities will remain viable after four years, and therefore a realisable value of \$13.5 million can be assumed at the end of the appraisal period.

The new facilities will also require an immediate initial investment in working capital of \$3 million. Working capital requirements will increase by the rate of inflation for the next three years and any working capital at the start of Year 4 will be assumed to be released at the end of the appraisal period.

Tippletine Co pays tax at an annual rate of 30%. Tax is payable with a year's time delay. Any tax losses on the investment can be assumed to be carried forward and written off against future profits from the investment.

Predicted inflation rates are as follows:

Year	1	2	3	4
	8%	6%	5%	4%

Financing the investment

Tippletine Co has been considering two choices for financing all of the \$30.6 million needed for the initial investment in the facilities:

- A subsidised loan from a government loan scheme, with the loan repayable at the end of the four years. Issue costs of 4% of the gross finance would be payable. Interest would be payable at a rate of 30 basis points below the risk free rate of 2.5%. In order to obtain the benefits of the loan scheme, Tippletine Co would have to fulfil various conditions, including locating the facilities in a remote part of Valliland where unemployment is high.
- Convertible loan notes, with the subscribers for the notes including some of Tippletine Co's directors. The loan notes would have issue costs of 4% of the gross finance. If not converted, the loan notes would be redeemed in six years' time. Interest would be payable at 5%, which is Tippletine Co's normal cost of borrowing. Conversion would take place at an effective price of \$2.75 per share. However, the loan note holders could enforce redemption at any time from the start of Year 3 if Tippletine Co's share price fell below \$1.50 per share. Tippletine Co's current share price is \$2.20 per share.

Issue costs for the subsidised loan and convertible loan notes would be paid out of available cash reserves. Issue costs are not allowable as a tax-deductible expense.

In initial discussions, the majority of the board favoured using the subsidised loan. The appraisal of the investment should be prepared on the basis that this method of finance will be used. However, the chairman argued strongly in favour of the convertible loan notes, as, in his view, operating costs will be lower if Tippletine Co does not have to fulfil the conditions laid down by the government of Valliland. Tippletine Co's finance director is sceptical, however, about whether the other shareholders would approve the issue of convertible loan notes on the terms suggested. The directors will decide which method of finance to use at the next board meeting

Other information

Humabuz Co is a large manufacturer of office equipment in Valliland. Humabuz Co's geared cost of equity is estimated to be 10.5% and its pre-tax cost of debt to be 5.4%. These estimates are based on a capital structure comprising \$225 million 6% irredeemable bonds, trading at \$107 per \$100, and 125 million \$1 equity shares, trading at \$3.20 per share. Humabuz Co also pays tax at an annual rate of 30% on its taxable profits.

Required

- (a) Calculate the adjusted present value for the investment on the basis that it is financed by the subsidised loan and conclude whether the project should be accepted or not. Show all relevant calculations. **(17 marks)**
- (b) Discuss the issues which Tippletine Co's shareholders who are not directors would consider if its directors decided that the new investment should be financed by the issue of convertible loan notes on the terms suggested.

Note. You are not required to carry out any calculations when answering part (b).

(8 marks)

(Total = 25 marks)

Question 3

The Adverane Group is a multinational group of companies with its headquarters in Switzerland. The Adverane Group consists of a number of fully-owned subsidiaries and Elted Co, an associate company based in the USA in which Adverane Group owns 30% of the ordinary equity share capital. Balances owing between the parent, Adverane Co, and its subsidiaries and between subsidiaries are settled by multilateral netting. Transactions between the parent and Elted Co are settled separately.

Transactions with Elted Co

Adverane Co wishes to hedge transactions with Elted Co which are due to be settled in four months' time in US\$. Adverane Co will owe Elted Co US\$3.7 million for a major purchase of supplies and Elted Co will owe Adverane Co US\$10.15 million for non-current assets. Adverane Group's treasury department is considering whether to use money markets or exchange-traded currency futures for hedging.

Annual interest rates available to Adverane Co

	<i>Investing rate</i>	<i>Borrowing rate</i>
Switzerland	2.7%	3.9%
USA	2.5%	3.7%

Exchange traded currency futures

Contract size CHF125,000, price quotation US\$ per CHF1

Three-month expiry: 1.1213

Six-month expiry: 1.1204

Netting

The balances owed to and owed by members of Adverane Group when netting is to take place are as follows:

<i>Owed by</i>	<i>Owed to</i>	<i>Local currency</i>
Adverane (Switzerland)	Bosha (Eurozone)	CHF15.90
Adverane (Switzerland)	Diling (Brazil)	CHF4.46
Bosha (Eurozone)	Cogate (USA)	€24.89
Bosha (Eurozone)	Diling (Brazil)	€18.57
Cogate (USA)	Adverane (Switzerland)	US\$27.08
Cogate (USA)	Diling (Brazil)	US\$5.68
Diling (Brazil)	Adverane (Switzerland)	BRL38.80
Diling (Brazil)	Bosha (Eurozone)	BRL51.20

Spot rates are currently as follows:

	CHF	€	US\$	BRL
1 CHF =	1.0000	0.9347–0.9369	1.1196–1.1222	3.1378–3.1760

The group members will make settlement in Swiss francs. Spot mid-rates will be used in calculations. Settlement will be made in the order that the company owing the largest net amount in Swiss francs will first settle with the company owed the smallest net amount in Swiss francs.

Transfer price arrangements

The Adverane Group board has been reviewing the valuation of inter-group transactions, as it is concerned that the current system is not working well. Currently inter-group transfer prices are mostly based on fixed cost plus a mark-up negotiated by the buying and selling divisions. If they cannot agree a price, either the sale does not take place or the central treasury department determines the margin. The board has the following concerns:

- Both selling and buying divisions have claimed that prices are unfair and distort the measurement of their performance.
- Significant treasury department time is being taken up dealing with disputes and then dealing with complaints that the price it has imposed is unfair on one or the other division.
- Some parts of the group are choosing to buy from external suppliers rather than from suppliers within the group.

As a result of the review, the Adverane Group board has decided that transfer prices should in future be based on market prices, where an external market exists.

Note. CHF is Swiss Franc, 3 is Euro, US\$ is United States dollar and BRL is Brazilian Real.

Required

- (a) Advise Adverane Co on, and recommend, an appropriate hedging strategy for the US\$ cash flows it is due to receive from, or pay to, Elted Co. **(9 marks)**
- (b) (i) Calculate the inter-group transfers which are forecast to take place. **(7 marks)**
 (ii) Discuss the advantages of multilateral netting by a central treasury function within the Adverane Group. **(3 marks)**
- (c) Evaluate the extent to which changing to a market-price system of transfer pricing will resolve the concerns of the Adverane Group board. **(6 marks)**

(Total = 25 marks)

Answers

**DO NOT TURN THIS PAGE UNTIL YOU HAVE
COMPLETED THE MOCK EXAM**

Plan of attack

Take a good look through the exam before diving in to answer questions.

- **Question 1** focussed on the valuations section of the syllabus. Some of the numerical parts to the question were challenging but equally some of the discussion areas (about half of the marks) were less so. It is important to target the easier areas and not to worry about getting every aspect of the calculations correct (this is unlikely to be achievable under exam conditions).
- **Question 2** tests your understanding of section B of the syllabus, advanced investment appraisal. Each exam will have a question that concentrates on this syllabus area (although this covers more than just currency hedging).
- **Question 3** mainly tests your understanding of currency hedging, which is part of syllabus section E (advanced risk management). Each exam will have a question that concentrates on this syllabus area).

No matter how many times we remind you...

Always allocate your time according to the marks for the question in total and for the individual parts of each question. Also, **always answer the question you were asked** rather than the question you wished you had been asked or the question you thought you had been asked.

You've got free time at the end of the exam...?

Looks like you've slipped up on the time allocation. However, if you have, don't waste the last few minutes; go back to **any parts of questions that you didn't finish** because you moved on to another task.

Question 1

Workbook references. Business valuations are covered in Chapter 8, and the strategic motives for making acquisitions and the regulations concerning acquisitions are covered in Chapter 9.

Top tips. For the written parts of the question it is essential to apply your points to the scenario however this should not involve copying out details from the scenario. Marks are awarded for providing insights about the information. Failing to add anything to scenario detail meant that sometimes candidates wrote a lot down but did not score well.

Easy marks. There are numerous easy marks to be picked up in part (a) for a comparison of the viewpoints of two directors and a discussion of possible synergy benefits. However, you will need to apply your knowledge to the scenario to score well eg it is not sufficient, for example, to just say that economies of scale will arise, some explanation is needed of how they will apply. Also part (b) required a discussion of a methodology which should be manageable, although many candidates had a gap in their knowledge in this subject area.

Examining team's comments. In part (b) some candidates demonstrated a lack of knowledge of real options, by stating that they could be purchased on the stock exchange or confusing real options with real return.

Part (c) (i) required a calculation of the equity value of the target using free cash flows. This part was answered well, although common mistakes here were including interest in the free tax flow calculation, using the tax figure given in the question rather than calculating tax on profit before interest and tax, and not carrying out the final part of the calculation, to calculate the value of equity.

Part (c) (ii) required a calculation of the equity value of the combined company using free cash flows. Many candidates scored the majority of marks for this part. The most common mistakes were not discounting the cash flows after Year 4 back to Year 0, failing to carry out all the stages of the cost of capital calculation and, once again, not completing the calculation by estimating the value of equity.

Part (c) (iii) candidates generally discussed enough limitations to score well on this part of the question, although some limited their marks giving insufficient detail. Saying that it is assumed all figures are accurate is not enough by itself to score a mark.

Professional marks in part (c) were awarded ... the number of candidates who scored full marks was disappointingly low. Some candidates failed to use a report format. Others did not clearly separate calculations and discussion, or give a proper conclusion.

Part (d) ... consideration of effectiveness should have meant that they considered whether the defences would be popular with the target's shareholders. Some candidates also discussed other possible defences, but scored no marks for these as they were not required by the question.

Marking scheme

		Marks
(a)	Compare and contrast the two directors' opinions	4-5
	Discussion of types of synergy benefits	4-5
		Max <u>9</u>
(b)	1-2 marks per point	Max <u>5</u>
(c)	(i) (Appendix 1)	
	Estimate of future growth rate	1
	Exclude interest from free cash flows	1
	Estimate of free cash flows	2
	Estimate of Foshoro Co's value	1
	Estimate of equity value of Foshoro Co	1
		<u>6</u>

(ii)	(Appendix 2)	
	Combined company asset beta	1
	Combined company equity beta	1
	Combined company cost of equity	1
	Combined company cost of capital	1
	Combined company sales revenue (or operating profits) (years 1 to 4)	1
	Combined company taxation amounts (years 1 to 4)	1
	Combined company additional asset investment (years 1 to 4)	1
	Combined company total value (years 1 to 4)	1
	Combined company value after first four years	1
	Combined company total market value	1
	Combined company market value of equity	1
		<u>11</u>
(iii)	(Discussion in report and appendix 3)	
	Evaluation of benefit to Chikepe Co shareholders	3-4
	Discussion of the limitations of the valuation method used	4
	Max	<u>7</u>
	Professional marks for part (c)	
	Report format	1
	Structure and presentation of the report	3
		<u>4</u>
(d)	Discussion of mandatory-bid rule and principle of equal treatment	3-4
	Discussion of effectiveness of poison pills and disposal of crown jewels	4-5
	Max	<u>8</u>
		<u>50</u>

(a) Director A's focus is on reducing the risk in the business through diversification and thereby increasing its value. A strategy of risk diversification resulting in greater value can work in situations where the equity holders are exposed to both unsystematic and systematic risks, for example, when their investment is concentrated in one company. In such situations, the shareholders would be subject to unsystematic risk and diversification would reduce this risk.

In the case of Chikepe Co, this is unlikely to be the case as a large proportion of shares are owned by institutional shareholders and it is likely that their investment portfolios are already well-diversified and therefore they are not exposed to unsystematic risk. Further diversification will be of no value to them. In fact, it may be construed that managers are only taking this action for their own benefit, as they may be closely tied to the company and therefore be exposed to total risk (both unsystematic and systematic risks). This may then become a source of agency related conflict between the management and the shareholders.

However, diversification overseas into markets which have some barriers to entry might reduce both systematic and unsystematic risks as well.

Director B, on the other hand, seems to be suggesting that Chikepe Co should focus on its core business and increase value through identifying areas of synergy benefits. It may be the case that Chikepe Co's management and directors are well placed to identify areas where the company can gain value by acquiring companies with potential synergy benefits.

The types of synergy benefits, which may arise in established pharmaceutical companies, can include:

Identifying undervalued companies, where the management is not effective in unlocking the true value of company. By replacing the existing management, Chikepe Co may be able to unlock the value of the company.

Acquiring companies which have strategic assets or product pipelines. Chikepe Co may be well placed to identify companies which have a number of product pipelines, which those companies are not exploiting fully. By acquiring such companies, Chikepe Co may be able to exploit the product pipelines.

Through acquisitions, Chikepe Co may be able to exploit economies of scope by eliminating process duplication or economies of scale where its size may enable it to negotiate favourable terms.

Foshoro Co may benefit if Chikepe Co acquires it because it is struggling to raise funding for its innovative products. Chikepe Co is an established company but has few new product innovations coming in the future. Therefore, it may have spare cash resources which Foshoro Co may be able to utilise.

(Note. Credit will be given for alternative valid discussion)

(b) Traditional investment appraisal methods such as net present value assume that an investment needs to be taken on a now or never basis, and once undertaken, it cannot be reversed. Real options take into account the fact that in reality, most investments have within them certain amounts of flexibility, such as whether or not to undertake the investment immediately or to delay the decision; to pursue follow-on opportunities; and to cancel an investment opportunity after it has been undertaken. Where there is increasing uncertainty and risk, and where a decision can be changed or delayed, this flexibility has value, known as the time value of an option.

Net present value captures just the intrinsic value of an investment opportunity, whereas real options capture both the intrinsic value and the time value, to give an overall value for an opportunity. When a company still has time available to it before a decision needs to be made, it may have opportunities to increase the intrinsic value of the investment through the strategic decisions it makes.

Investing in new companies with numerous potential innovative product pipelines may provide opportunities for flexibility where decisions can be delayed and the intrinsic value can be increased through strategic decisions and actions taken by the company. Real options try to capture the value of this flexibility within companies with innovative product pipelines, whereas net present value does not.

(c) **Report to the board of directors (BoD), Chikepe Co**

Introduction

This report evaluates whether the acquisition of Foshoro Co would be beneficial to Chikepe Co's shareholders by estimating the additional equity value created from the synergies resulting when the two companies are combined. The market values of equity of the two companies as separate entities are considered initially and then compared with the equity value of the two companies together. The free cash flow to firm valuation method is used to estimate the values of the companies and the limitations of this method are discussed.

The market value of equity of Chikepe Co is given as \$12,600 million.

Based on the free cash flow to firm valuation method:

- The current market value of equity of Foshoro Co is estimated at \$986 million (appendix 1); and
- The market value of equity of the combined company is estimated at \$14,993 million (appendix 2).

Therefore, the additional market value of equity arising from synergy benefits when the two companies are combined is estimated at \$1,407 million (appendix 3), which is then split between Foshoro Co's shareholders receiving \$296 million (a 30% premium) and Chikepe Co's shareholders receiving the balance of \$1,111 million, which is approximately 8.8% excess over the original equity value (appendix 3).

However, the valuation method used has a number of limitations, as follows:

- The values of both Foshoro Co and the combined company are based on estimations and assumptions, for example:
 - Foshoro Co's future growth rate of free cash flows is based on past growth rates and it is assumed that this will not change in the future;
 - It is not explained how Foshoro Co's cost of capital is estimated/calculated. Such an estimate may be more difficult to make for private companies;
 - The assumption of perpetuity is made when estimating the values of Foshoro Co and the combined company, and this may not be valid.
- The basis for the synergy benefits such as higher growth rates of sales revenue and profit margins needs to be explained and justified. It is not clear how these estimates have been made.
- Whereas it may be possible to estimate the asset beta of a listed company such as Chikepe Co, it may be more difficult to provide a reasonable estimate for the asset beta of Foshoro Co. Therefore, the estimate of the cost of capital of the combined company may not be accurate.
- The costs related to the acquisition process would need to be factored in.

Therefore, whereas the free cash flow method of estimating corporate values is theoretically sound, using it in practice to estimate values is open to errors and judgements.

Conclusion

The valuations indicate that Chikepe Co's shareholders would benefit from the acquisition of Foshoro Co and the value of their shares should increase by 8.8%. However, the method used to estimate the value created makes a number of estimates and assumptions. It is therefore recommended that a range of valuations is made under different assumptions and estimates, through a process of sensitivity analysis, before a final decision is made. As well as this, the limitations of the valuation method used should be well understood and taken into account.

Report compiled by:

Date

APPENDICES:

Appendix 1 (Part (c) (i)): Foshoro Co, estimate of current value

Cost of capital = 10%

Growth rate of profits and free cash flows = $(\$91.0m/\$83.3m)1/3 - 1 = 0.03 = 3\%$

Free cash flow to firm (FCFF) = PBIT + non-cash expenses – additional cash investment – tax

FCFF = $\$192.3m + \$112.0m - \$98.2m - (20\% \times \$192.3m) = \$167.6m$

Foshoro Co, estimated value = $(\$167.6m \times 1.03)/(0.10 - 0.03) = \$2,466.1m$

Current estimated market value of equity of Foshoro Co = $\$2,466.1m \times 40\% = \$986.4m$, say $\$986m$ approximately.

Appendix 2 (Part (c) (ii)): Estimate of value created from combining Chikepe Co and Foshoro Co

Asset beta of combined company = $(0.800 \times \$12,600m + 0.950 \times \$986.4m)/(\$12,600m + \$986.4m) = 0.811$

Equity beta of combined company = $0.811 \times (0.70 + 0.30 \times 0.80)/0.70 = 1.089$

Cost of equity, combined company = $2\% + 1.089 \times 7\% = 9.6\%$ approx.

Cost of capital, combined company = $9.6\% \times 0.7 + 5.3\% \times 0.3 \times 0.8 = 8\%$ approx.

Combined company, free cash flows and value computation (\$ millions)

Sales growth rate, years 2 to 4 = 7% per annum; operating profit margin = 20%

Year	1	2	3	4
Sales revenue	4,200	4,494	4,809	5,146
Operating profit	840	899	962	1,029
Less tax (20%)	(168)	(180)	(192)	(206)
Less additional investment in assets	(200)	(188)	(202)	(216)
Free cash flows	472	531	568	607
PV of free cash flows (8%)	437	455	451	446

	\$m
Present value (first four years)	1,789
Present value (after four years)	
$607 \times 1.056 / (0.08 - 0.056) \times 0.735$	19,630
Estimated market value of the combined company	<u>21,419</u>

Market value of equity of the combined company = $70\% \times \$21,419\text{m} = \$14,993\text{m}$

Appendix 3: Synergy benefits and their distribution

Additional market equity value created by combining the two companies

$\$14,993\text{m} - (\$12,600\text{m} + \$986\text{m}) = \$1,407\text{m}$

Therefore, synergy benefits resulting from combining the two companies: $\$1,407\text{m}$

Premium payable to Foshoro Co shareholders: $30\% \times \$986\text{m} = \296m

Balance of synergy benefits going to Chikepe Co's shareholders: $\$1,111\text{m}$

As a percentage of current value: $\$1,111\text{m} / \$12,600\text{m} \times 100\% = 8.8\%$

(d) Both the mandatory bid rule and the principle of equal treatment are designed to protect minority shareholders, where an acquirer has obtained a controlling interest of the target company. The mandatory bid rule provides minority shareholders with the opportunity to sell their shares and exit the target company at a specified fair share price. This price should not be lower than the highest price paid for shares, which have already been acquired within a specified period. The principle of equal treatment requires the acquiring company to offer the same terms to minority shareholders as were offered to the earlier shareholders from whom the controlling interest was acquired. Both these regulatory devices are designed to ensure that the minority shareholders are protected financially and are not exploited by the acquirer.

The purpose of both poison pills and disposal of crown jewels is to make the target company unattractive to the acquirer. Poison pills give existing shareholders in the target company the right to buy additional shares in their company at a discount once the acquiring company has bought a certain number of shares in the target company. The aim is to make the target company more expensive to purchase, as the acquirer needs to buy more shares. Disposal of crown jewels involves selling the target company's most valuable assets, and therefore making the target company less attractive to the acquirer. The effectiveness of either defence tactic can be limited, as the company's management would need its shareholders to authorise such moves (although there are ways in which poison pills can be incorporated without gaining prior authorisation from shareholders). Shareholders may not be willing to do this as they normally get premiums on their shares during takeover battles. Additionally, disposing of key strategic assets could substantially weaken a company's competitive advantage and therefore its future potential. Such action may be detrimental to the company and therefore shareholders would probably not approve that course of action.

Question 2

Workbook references. Adjusted present value (APV) is covered in Chapter 6.

Top tips. For part (a)(i) you have to know which formula to use to calculate the ungeared cost of equity. It is the MM Proposition 2 formula which is given to you in the exam.

Easy marks. There are numerous easy marks to be picked up in part (a)(i) in the net present value calculations although care will need to be taken over the timing of the tax cash flows because of the one year delay.

Examining team's comments. Part (a) required candidates to undertake an investment appraisal using the adjusted present value technique, where the loan that might be used to finance the investment had significant financing side effects. Most candidates scored reasonable marks on this part.

Part (b) required candidates to discuss an alternative form of loan finance (convertible loan notes) that could be used to fund the investment. This part was often omitted and generally was not well-answered when attempted, highlighting a number of weaknesses in student performance. There was a lack of knowledge with candidates failing to discuss important features of convertible loan finance, such as a company needing to have sufficient money to redeem the notes if necessary.

Candidates also failed to respond to the question verb 'Discuss', which generally requires some coverage of both advantages and disadvantages. Few answers said anything about the advantages of the convertible loan notes. Many answers failed to examine the terms from the shareholders' viewpoint, as the question required.

Marking scheme

	Marks
(a) Operating cash flow excluding marketing costs	1
Tax allowable depreciation	1
Taxation	2
Working capital	2
Discount factor	2
Base case NPV	1
Issue costs	1
Tax shield on loan	2
Subsidy	1
Tax shield on subsidy	1
Adjusted present value	1
Comments and conclusion	2
	<u>17</u>
(b) 1–2 marks per point	Max <u>8</u>
	<u>25</u>

(a)	0 \$000	1 \$000	2 \$000	3 \$000	4 \$000	5 \$000
Operating cash flow excluding marketing costs	2,000	14,500	15,225	15,834		
Marketing costs	(9,000)	(2,000)	(2,000)	(2,000)		
Cash flow before tax	(7,000)	12,500	13,225	13,834		

Year	0	1	2	3	4	5
Taxation (W1)					(310)	(4,328)
Investment	(30,600)				13,500	
Working capital (W2)	(3,000)	(240)	(194)	(172)	3,606	
Cash flows	(33,600)	(7,240)	12,306	13,053	30,630	(4,328)
Discount factor 9% (W3)	1.000	0.917	0.842	0.772	0.708	0.650
Discounted cash flows	(33,600)	(6,639)	10,362	10,077	21,686	(2,813)
Base case NPV		(927)				

Workings

1 Taxation

Year	$TAD = \text{Tax-allowable depreciation}$	Balance
		\$000
	Investment	30,600
1	TAD 25% reducing balance	(7,650)
		22,950
2	TAD 25% reducing balance	(5,738)
		17,212
3	TAD 25% reducing balance	(4,303)
		12,909
4	Balancing charge	591
		13,500

Year	1	2	3	4
	\$000	\$000	\$000	\$000
Cash flow before tax	(7,000)	12,500	13,225	13,834
Tax-allowable depreciation	(7,650)	(5,738)	(4,303)	591
Adjusted cash flow	(14,650)	6,762	8,922	14,425
Offset against previous losses		(14,650)	(7,888)	
Losses carried forward	(14,650)	(7,888)		
Taxable cash flow			1,034	14,425
Taxation at 30%			310	4,328
Year			4	5

2 Working capital

Year	1	2	3	4
	\$000	\$000	\$000	\$000
$3,000 \times 0.08$	(3,000 + 240)	(3,000 + 240 +	3,000 + 240 +	
$= 240$	$\times 0.06 = 194$	$194) \times 0.05$	$194 + 172$	$= 3,606$

3 Ungeared cost of equity

Humabuz Co

$$\text{MV debt} = \$225 \text{ million} \times 1.07 = \$240.8 \text{ million}$$

$$\text{MV equity} = 125 \text{ million} \times \$3.20 = \$400 \text{ million}$$

Ungeared cost of equity

$$k_e^i = k_e^i + (1 - t) (k_e^i - k_d) V_d / V_e$$

$$10.5\% = k_e^i + (1 - 0.3) (k_e^i - 5.4\%) (240.8 / 400)$$

$$10.5\% + 2.28\% = 1.42 k_e^i$$

$$k_e^i = 9\%$$

4 *Issue costs*

Debt: $(\$30,600,000/0.96) = \$31,875,000$

Debt issue costs: $\$31,875,000 \times 0.04 = \$1,275,000$

5 *Tax shield on loan*

Use PV of an annuity (PVA) for years 2 – 5 at 5% (assume 5% is cost of debt).

(**Note.** The risk-free rate of 2.5% could also be used for discounting.)

Subsidised loan: $\$30,600,000 \times (0.025 - 0.003) \times 0.3 \times (4.329 - 0.952) = \$682,000$

6 *Subsidy*

Benefit = $\$30,600,000 \times (0.05 - 0.022) \times 3.546 = \$3,038,000$

Tax relief lost = $\$30,600,000 \times (0.05 - 0.022) \times 0.3 \times (4.329 - 0.952) = \$868,000$

7 *Financing side effects*

	\$000
Issue costs (W4)	(1,275)
Tax shield on loan (W5)	682
Subsidy benefit (W6)	3,038
Tax relief lost on subsidy benefit (W6)	(868)
Total benefit of financing side effects	<u>1,577</u>

Conclusion

If base case net present value is used, the project has a negative net present value of \$927,000 and on that basis should be rejected. However, the financing side effects add \$1,577,000 to the value of the project, giving a positive adjusted present value of \$650,000. On that basis the project should be accepted. The revenues from the project appear to be uncertain and the realisable value at the end of the project may be optimistic. It would be useful to have an indication of the range of outcomes and an idea of the probability that the project will have a negative APV.

(b) **Advantages of convertible loan notes**

The investors may be happy that directors are demonstrating their commitment to the company by subscribing to convertible loan notes. The conversion rights mean that these directors will benefit if the share price increases, aligning their interests with shareholders.

The conversion terms also mean that the loan notes will not necessarily have to be repaid in a few years' time. This may be significant if Tippletine Co does not have the cash available for redemption then.

Drawbacks of convertible loan notes

The convertible loan notes would be treated as debt, increasing Tippletine Co's gearing, which may concern the other shareholders. The interest on the convertible loan notes will be payable before dividends and may leave less money for distribution to shareholders. Shareholders may doubt whether the higher interest burden on the convertible loan notes compared with the subsidised loan is compensated for by the lower costs of Tippletine Co not having to fulfil the government's requirements.

The other shareholders may be concerned by the interest rate on the convertible notes being Tippletine Co's normal cost of borrowing. The option to convert is an advantage for convertible loan note holders. They would often effectively pay for this option by receiving a lower rate of interest on the loan notes.

Shareholders would want to assess how likely conversion would be, that is how likely it would be the share price will rise above \$2.75. The option to convert may also change the balance of shareholdings, giving the directors who held the notes a greater percentage of share capital and possibly more influence over Tippeline Co. The other shareholders may be unhappy with this.

The shareholders may also have reservations about the loan note holders having the option to redeem if Tippeline Co's share price is low. This reduces the risk of providing the finance from the loan note holders' viewpoint. However, if the share price is low, Tippeline Co's financial results and cash flows may be poor and it may struggle to redeem the loan notes. Shareholders may also be concerned that there is no cap the other way, allowing Tippeline Co to force conversion if the share price reaches a high enough level.

(Note. Credit will be given for alternative relevant discussion)

Question 3

Workbook references. Currency hedging is covered in Chapter 11 (netting) and 12, and transfer pricing is covered in Chapter 16.

Top tips. For part (a) you have to use your time efficiently given the marks available – a short-cut approach to futures calculations is essential here.

Easy marks. There are numerous easy marks to be picked up in part (b) for calculating and discussing netting.

Examining team's comments. Many candidates spent far too long on this question to the detriment of the rest of the exam. Good time management, an ability to work under pressure and making a reasonable attempt at all the requirements of all the questions are the key ingredients for success.

Part (a) required candidates to determine a hedging strategy, having being given the choice of money market hedging and traded futures. A few candidates wasted time by not netting off the amounts owed and owing. Many candidates remembered how to carry out money market hedging, although a number treated the amount to be hedged as if it was a payment, not a receipt. Likewise, a number of candidates scored well on the futures hedging part of the question. A surprisingly common error was that candidates did not say clearly that the company should buy futures – this should have been an easy mark. Some candidates also adjusted the calculation of the number of contracts by the time period of the hedge – this adjustment is made in interest rate futures calculations, not currency futures calculations. There were a number of versions of the basis calculation, although many candidates did calculate basis correctly.

Part (b) (i) required multilateral netting calculations for subsidiaries operating in a number of countries with different currencies. Most candidates used a systematic approach and gained the majority of marks for this part. The main weakness was failing to follow the instructions given in the question scenario. A few candidates did not use the spot mid-rate to translate amounts, as the scenario required.

Part (b) (ii) asked for a discussion of the advantages of multilateral netting. Candidates tended to focus on lower transaction costs and hedging implications, with few considering the availability of more advantageous exchange rates and central treasury administration being easier. Some candidates focused on the words central treasury function and produced the lists they had learnt of the advantages and disadvantages of treasury centralisation, which was not what the question required.

Part (c) asked candidates to consider use of market-based transfer pricing as a means of resolving disputes and providing better performance measurement within a group. Candidates scored some marks through looking at how market price could be an acceptable measure to all parties. However, candidates generally failed to adopt a questioning approach to using market prices, which meant few scored high marks here. They did not discuss how difficult it would be to determine market price, ask whether there would need to be adjustment to allow for internal costs of transfer being lower or consider other problems of persuading divisions to buy internally. Few answers made any attempt to discuss performance measurement implications, an aspect of transfer pricing that is important both in AFM and also in Advanced Performance Management.

Marking scheme

		Marks
(a)	Calculation of net US\$ receipt	1
	Money market hedge	2
	Futures	
	Buy futures	1
	Predicted futures rate based on basis reduction	2
	Expected receipt	1
	Number of contracts	1
	Conclusion	1-2
		Max <u>9</u>
(b)	(i) CHF amounts owed and owing	2
	Totals owed and owing	2
	Net amounts owed	1
	Payments and receipts	2
		Max <u>7</u>
	(ii) Advantages – 1 mark each	Max <u>3</u>
(c)	Performance assessment	2-3
	Work of central treasury	2-3
	Buying internally	2-3
		Max <u>6</u>
		<u>25</u>

(a) Net receipt = $\$10,150,000 - \$3,700,000 = \$6,450,000$

Adverane Co will have a net dollar receipt in four months' time and needs to hedge against the Swiss Franc strengthening.

Money market

Borrow US\$: $\text{US\$6,450,000}/(1 + [0.037/3]) = \text{US\$6,371,419}$

Convert into CHF at spot rate: $\text{US\$6,371,419}/1.1222 = \text{CHF5,677,615}$

Invest in CHF: $\text{CHF5,677,615} \times (1 + [0.027/3]) = \text{CHF5,728,714}$

Futures

Buy Swiss Franc futures and use six-month futures contracts.

Basis

Assume that basis reduces to zero at contract maturity in a linear fashion.

Opening basis with 6 months to expiry of future = future – spot = $1.1204 - 1.1222 = -0.0018$

In 4 months' time, there are 2 months to the expiry of the future so the closing basis is estimated as $-0.0018 \times 2/6 = -0.0006$.

The effective futures rate is therefore opening future – closing basis = $1.1204 - -0.0006 = 1.1210$.

Expected receipt = $\$6,450,000/1.1210 = \text{CHF5,753,791}$

Number of contracts = CHF5,753,791/125,000 = 46.03 contracts, approximately 46 contracts

On the basis that futures give the higher expected receipt, they should be chosen, but Adverane Co should assess whether basis risk is likely to be significant. Adverane Co should also consider, as regards money market hedging, that CHF receipts could be used to pay off any existing CHF loans, or for other investment purposes, in which case the benefit to Adverane Co could be greater than hedging using futures.

(b) (i) Use mid-spot rates to translate amounts.

Owed by	Owed to	Local currency	CHF
		m	m
Adverane (Switzerland)	Bosha (Eurozone)	CHF15.90	15.90
Adverane (Switzerland)	Diling (Brazil)	CHF4.46	4.46
Bosha (Eurozone)	Cogate (USA)	€24.89	26.60
Bosha (Eurozone)	Diling (Brazil)	€18.57	19.84
Cogate (USA)	Adverane (Switzerland)	US\$27.08	24.16
Cogate (USA)	Diling (Brazil)	US\$5.68	5.07
Diling (Brazil)	Adverane (Switzerland)	BRL38.80	12.29
Diling (Brazil)	Bosha (Eurozone)	BRL51.20	16.22

Owed to	Adverane (Switzerland)	Bosha (Eurozone)	Cogate (USA)	Diling (Brazil)	Total
	CHFm	CHFm	CHFm	CHFm	CHFm
Adverane (Switzerland)			24.16	12.29	36.45
Bosha (Eurozone)	15.90			16.22	32.12
Cogate (USA)		26.60			26.60
Diling (Brazil)	4.46	19.84	5.07		29.37
Owed by	(20.36)	(46.44)	(29.23)	(28.51)	
Owed	36.45	32.12	26.60	29.37	
Net	<u>16.09</u>	<u>(14.32)</u>	<u>(2.63)</u>	<u>0.86</u>	

Under the terms of the arrangement, Bosha, the company with the largest debt, will pay Diling, the company with the smallest amount owed to it, CHF0.86 million. Bosha will pay Adverane CHF13.46 million and Cogate will pay Adverane CHF2.63 million.

(ii) The advantage of using a central treasury for multilateral netting is that the central treasury can coordinate the information about inter-group balances. There will be a smaller number of foreign exchange transactions, which will mean lower commission and transmission costs. There will be less loss of interest through money being in transit. The foreign exchange rates available may be more advantageous as a result of large transaction sizes resulting from consolidation. The netting arrangements should make cash flow forecasting easier in the group.

(c) Setting the transfer price at market price should enable a fair assessment of the performance of both the buying and selling divisions. Both internal and external sales will be accounted for at the same price. However, this may distort performance in that the costs of internal sales may be lower than external sales. For example, administration costs should be lower and there should be no costs of bad debts. These cost savings should be shared between the two divisions to give a fair picture. If the selling division has spare capacity, selling at incremental cost rather than market price may provide greater certainty that the buying division will use the selling division.

In theory, using market price should mean that the central treasury function has to intervene less. Simple market price provides an objective measure over which the divisions should agree. However, in reality, there may be complications that require central intervention. The market price may be difficult to determine or may fluctuate wildly, and central treasury may

have to decide which price to use. If it is decided that an allowance should be made for costs of internal transfer being lower, central treasury may have to determine what this should be as it may vary significantly between products and divisions.

Specifying the transaction takes place at market price is designed to ensure that the buying division buys from the selling division, rather than an external supplier if the buying and selling division have failed to agree a price. The implicit assumption is that the buying division will use the selling division because of better service from, and greater dependability of, dealing within the group. This may not necessarily be the case. If the buying division previously purchased internally as a result of a low transfer price, forcing it to pay market price may mean it chooses an external supplier for non-price reasons.

ACCA

Advanced Financial Management

Mock Examination 4

December 2018

Sample questions

Questions

Time allowed 3 hours and 15 minutes

Section A THIS question is compulsory and MUST be attempted

Section B BOTH questions to be attempted

**DO NOT OPEN THIS EXAM UNTIL YOU ARE READY TO START
UNDER EXAMINATION CONDITIONS**

SECTION A: THIS QUESTION is compulsory and MUST be attempted

Question 1

Around seven years ago, Opao Co, a private conglomerate company involved in many different businesses, decided to obtain a listing on a recognised stock exchange by offering a small proportion of its equity shares to the public. Before the listing, the company was owned by around 100 shareholders, who were all closely linked to Opao Co and had their entire shareholding wealth invested in the company. However, soon after the listing these individuals started selling their shares in Opao Co, and over a two-year period after the listing, its ownership structure changed to one of many diverse individual and institutional shareholders.

As a consequence of this change in ownership structure, Opao Co's board of directors (BoD) commenced an aggressive period of business reorganisation through portfolio and organisational restructuring. This resulted in Opao Co changing from a conglomerate company to a company focusing on just two business sectors: financial services and food manufacturing. The financial press reported that Opao Co had been forced to take this action because of the change in the type of its shareholders. The equity markets seem to support this action, and Opao Co's share price has grown strongly during this period of restructuring, after growing very slowly initially.

Opao Co recently sold a subsidiary company, Burgut Co, through a management buy-in (MBI), although it also had the option to dispose of Burgut Co through a management buy-out (MBO). In a statement, Opao Co's BoD justified this by stating that Burgut Co would be better off being controlled by the MBI team.

Opao Co is now considering acquiring Tai Co and details of the proposed acquisition are as follows:

Proposed acquisition of Tai Co

Tai Co is an unlisted company involved in food manufacturing. Opao Co's BoD is of the opinion that the range of products produced by Tai Co will fit very well with its own product portfolio, leading to cross-selling opportunities, new innovations, and a larger market share. The BoD also thinks that there is a possibility for economies of scale and scope, such as shared logistic and storage facilities, giving cost saving opportunities. This, the BoD believes, will lead to significant synergy benefits and therefore it is of the opinion that Opao Co should make a bid to acquire Tai Co.

Financial information related to Opao Co, Tai Co and the combined company

Opao Co

Opao Co has 2,000 million shares in issue and are currently trading at \$2.50 each.

Tai Co

Tai Co has 263 million shares in issue and the current market value of its debt is \$400 million. Its most recent profit before interest and tax was \$132.0 million, after deducting tax allowable depreciation and non-cash expenses of \$27.4 million. Tai Co makes an annual cash investment of \$24.3 million in non-current assets and working capital. It is estimated that its cash flows will grow by 3% annually for the foreseeable future. Tai Co's current cost of capital is estimated to be 11%.

Combined company

If Opao Co acquires Tai Co, it is expected that the combined company's sales revenue will be \$7,351 million in the first year and its annual pre-tax profit margin on sales will be 15.4% for the foreseeable future. After the first year, sales revenue will grow by 5.02% every year for the next three years. It can be assumed that the combined company's annual depreciation will be equivalent to the investment required to maintain the company at current operational levels. However, in order to increase the sales revenue levels each year, the combined company will require an additional investment of \$109 million in the first year and \$0.31 for every \$1 increase in sales revenue for each of the next three years.

After the first four years, it is expected that the combined company's free cash flows will grow by 2.4% annually for the foreseeable future. The combined company's cost of capital is estimated to be 10%. It is expected that the combined company's debt to equity level will be maintained at 40:60, in market value terms, after the acquisition has taken place.

Both Opao Co and Tai Co pay corporation tax on profits at an annual rate of 20% and it is expected that this rate will not change if Opao Co acquires Tai Co. It can be assumed that corporation tax is payable in the same year as the profits it is charged on.

Possible acquisition price offers

Opao Co's BoD is proposing that Tai Co's acquisition be made through one of the following payment methods:

- (i) A cash payment offer of \$4.40 for each Tai Co share, or
- (ii) Through a share-for-share exchange, where a number of Tai Co shares are exchanged for a number of Opao Co shares, such that 55.5% of the additional value created from the acquisition is allocated to Tai Co's shareholders and the remaining 44.5% of the additional value is allocated to Opao Co's shareholders, or
- (iii) Through a mixed offer of a cash payment of \$2.09 per share and one Opao Co share for each Tai Co share. It is estimated that Opao Co's share price will become \$2.60 per share when such a mixed offer is made.

Similar acquisitions in the food manufacturing industry have normally attracted a share price premium of between 15% and 40% previously.

Required

- (a) Distinguish between a management buy-out (MBO) and a management buy-in (MBI), and discuss why Opao Co's board of directors (BoD) might have sold Burgut Co through an MBI. **(4 marks)**
- (b) Explain what portfolio restructuring and organisational restructuring involve, and discuss possible reason(s) why the change in the type of shareholders may have made Opao Co change from being a conglomerate to one focusing on just two business sectors. **(5 marks)**
- (c) Prepare a report for the board of directors of Opao Co which:
 - (i) Estimates the value of equity of Opao Co and of Tai Co before the acquisition, and of the combined company after the acquisition; **(10 marks)**
 - (ii) Estimates the percentage gain in value for each Opao Co share and Tai Co share, under each of the cash, the share-for-share, and the mixed offers; **(12 marks)**
 - (iii) Evaluates the likely reaction of Opao Co's and Tai Co's shareholders to the acquisition offers. **(7 marks)**

Professional marks will be awarded in part (c) for the format, structure and presentation of the report. **(4 marks)**

- (d) Following the MBI, the BoD of Burgut Co announced that its intention was to list the company on a recognised stock exchange within seven years. The BoD is discussing whether to obtain the listing through an initial public offering (IPO) or through a reverse takeover, but it does not currently have a strong preference for either option.

Required

Distinguish between an IPO and a reverse takeover, and discuss whether an IPO or a reverse takeover would be an appropriate method for Burgut Co to obtain a listing. **(8 marks)**

(Total = 50 marks)

SECTION B: BOTH QUESTIONS TO BE ATTEMPTED

Question 2

Nutourne Co is a company based in the USA, supplying medical equipment to the USA and Europe. It is 30 November 20X8. Nutourne Co's treasury department is currently dealing with a sale to a Swiss customer of CHF12.3 million which has just been agreed, where the customer will pay for the equipment on 31 May 20X9. The treasury department intends to hedge the foreign exchange risk on this transaction using traded futures or options as far as possible. Any amount not hedged by a futures or option contract will be hedged on the forward market.

Exchange rates (quoted as US\$/CHF 1)

Spot	1.0292–1.0309
Three months forward	1.0327–1.0347
Six months forward	1.0358–1.0380

Currency futures (contract size CHF125,000, futures price quoted as US\$ per CHF1)

	Futures price
December	1.0318
March	1.0345
June	1.0369

Currency options (contract size CHF125,000, exercise price quotation US\$ per CHF1, premium: US cents per CHF1)

Exercise price	Calls			Puts		
	December	March	June	December	March	June
1.0375	0.47	0.50	0.53	0.74	0.79	0.86

Futures and options contracts mature at the month end.

Non-executive director's comments

A new non-executive director has recently been briefed about the work of the treasury department and has a number of questions about hedging activities. He wants to understand the significance of basis risk in relation to futures. He also wants to know the significant features of over-the-counter forward contracts and options, and why Nutourne Co prefers to use exchange-traded derivatives for hedging.

The non-executive director has also heard about the mark-to-market process and wants to understand the terminology involved, and how the process works, using the transaction with the Swiss customer as an example. The treasury department has supplied relevant information to answer his query. The contract specification for the CHF futures contract states that an initial margin of US\$1,450 per contract will be required and a maintenance margin of US\$1,360 per contract will also be required. The tick size on the contract is US\$0.0001 and the tick value is US\$12.50. You can assume that on the first day when Nutourne Co holds the futures contracts, the loss per contract is US\$0.0011.

Required

- (a) Evaluate which of the exchange-traded derivatives would give Nutourne Co the higher receipt, considering scenarios when the options are and are not exercised. **(12 marks)**
- (b) Discuss the benefits and drawbacks for Nutourne Co in using forward contracts compared with using over-the-counter currency options, and explain why Nutourne Co may prefer to use exchange-traded derivatives rather than over-the-counter derivatives to hedge foreign currency risk. **(7 marks)**
- (c) Explain to the non-executive director how the mark-to-market process would work for the CHF futures, including the significance of the data supplied by the treasury department. Illustrate your explanation with calculations showing what would happen on the first day, using the data supplied by the treasury department. **(6 marks)**

(Total = 25 marks)

Question 3

Amberle Co is a listed company with divisions which manufacture cars, motorbikes and cycles. Over the last few years, Amberle Co has used a mixture of equity and debt finance for its investments. However, it is about to make a new investment of \$150 million in facilities to produce electric cars, which it proposes to finance solely by debt finance.

Project information

Amberle Co's finance director has prepared estimates of the post-tax cash flows for the project, using a four-year time horizon, together with the realisable value at the end of four years:

Year	1 \$m	2 \$m	3 \$m	4 \$m
Post-tax operating cash flows	28.50	36.70	44.40	50.90
Realisable value				45.00

Working capital of \$6 million, not included in the estimates above and funded from retained earnings, will also be required immediately for the project, rising by the predicted rate of inflation for each year. Any remaining working capital will be released in full at the end of the project.

Predicted rates of inflation are as follows:

Year	1 8%	2 6%	3 5%	4 4%
------	---------	---------	---------	---------

The finance director has proposed the following finance package for the new investment:

	\$m
Bank loan, repayable in equal annual instalments over the project's life, interest payable at 8% per year	70
Subsidised loan from a government loan scheme over the project's life on which interest is payable at 3.1% per year	80
	<u>150</u>

Issue costs of 3% of gross proceeds will be payable on the subsidised loan. No issue costs will be payable on the bank loan. Issue costs are not allowable for tax.

Financial information

Amberle Co pays tax at an annual rate of 30% on profits in the same year in which profits arise.

Amberle Co's asset beta is currently estimated at 1.14. The current return on the market is estimated at 11%. The current risk-free rate is 4% per year.

Amberle Co's chairman has noted that all of the company's debt, including the new debt, will be repayable within three to five years. He is wondering whether Amberle Co needs to develop a longer term financing policy in broad terms and how flexible this policy should be.

Required

(a) Calculate the adjusted present value (APV) for the project and conclude whether the project should be accepted or not. **(15 marks)**

(b) Discuss the factors which may determine the long-term finance policy which Amberle Co's board may adopt and the factors which may cause the policy to change. **(10 marks)**

(Total = 25 marks)

Answers

**DO NOT TURN THIS PAGE UNTIL YOU HAVE
COMPLETED THE MOCK EXAM**

Plan of attack

Question 1 will cover a variety of different syllabus areas and will inevitably consist of parts that you find more straightforward and others that are extremely challenging. It is important to focus on the areas that you can manage and that you don't rush these. Do not get too distracted by the harder elements of the question. Remember that you are not aiming for 100%!

You should target the easier areas and not worry about getting every aspect of the calculations correct (this is unlikely to be achievable under exam conditions).

- **Question 2** requires careful planning, do not rush in. For example, it is easy to miss that part b concerns OTC options, not exchange traded options.
- **Question 3** looks at adjusted present value, this looks like a very manageable question and tests an area that you should be familiar with.

No matter how many times we remind you...

Always allocate your time according to the marks for the question in total and for the individual parts of each question. Also, **always answer the question you were asked** rather than the question you wished you had been asked or the question you thought you had been asked.

You've got free time at the end of the exam...?

Looks like you've slipped up on the time allocation. However, if you have, don't waste the last few minutes; go back to **any parts of questions that you didn't finish** because you moved on to another task.

Question 1

Workbook references. Business re-organisation is covered in Chapter 15, reverse takeovers in Chapter 9 and valuation techniques in Chapter 10. Financing a takeover is covered in Chapter 11.

Top tips. Don't panic - this question is not as bad as it looks on first read through, they rarely are. Use your first read through to actively plan parts a and b to help manage stress and to ensure that your first read through actually achieves something.

Easy marks. Over 60% of the marks (including professional marks) from parts a, b, ci and d are relatively manageable. **Don't rush** sections these in order to concentrate on the harder areas; it is important to maximise your marks in areas that you are strong in.

ACCA examining team's comments.

In terms of professional marks, some candidates did not provide a reasonable structure in their answer, nor put the answer to part (c) in a report format. These marks are relatively easy to obtain, and a well-structured response would provide candidates with a useful framework within which to provide a response. Such an approach will result in a much higher chance of success in the examination. Nevertheless, many candidates' answers were good, and they earned the majority of the professional marks.

Marking scheme

		Marks
(a)	Distinguishing between MBO and MBI	1-2
	Discussion of choice of MBI	2-3
		<u>Max</u> <u>4</u>
(b)	Explanation of portfolio restructuring and organisational restructuring	2
	Discussion of reason(s) for change in business focus	3
		<u>5</u>
(c) (i) (Appendix 1)		
	Equity value of Opao Co	1
	Tai Co, free cash flow to firm	2
	Estimate of value of Tai Co	1
	Estimate of equity value of Tai Co	1
	Combined company, free cash flows	2
	Value of combined company, years 1 to 4	1
	Value of combined company, after year 4	1
	Equity value of combined company	1
		<u>10</u>
(ii) (Appendix 2)		
	Cash offer, percentage gain, Tai Co	1
	Cash offer, percentage gain, Opao Co	2
	Share-for-share offer, share of additional value	1
	Share-for-share offer, Opao Co share value	1
	Share-for-share offer, total shares allocated to Tai Co	1
	Share-for-share offer, 2 Opao Co shares for 1 Tai Co share	1
	Share-for-share offer, percentage gain, Tai Co	1
	Share-for-share offer, percentage gain, Opao Co	1
	Mixed offer, percentage gain, Tai Co	1
	Mixed offer, percentage gain, Opao Co	2
		<u>12</u>

	Marks
(iii) (Report on proposed acquisition)	
Evaluation: Opao Co	3–4
Evaluation: Tai Co	3–4
	Max <u>7</u>
Professional marks for part (c)	
Report format	1
Structure and presentation of the report	3
	4
(d) Explanation of difference between an IPO and reverse takeover	3
Discussion of using an IPO or reverse takeover to obtain a listing	5
	8
	Total <u>50</u>

(a) A management buy-out (MBO) involves the purchase of a company by the management running that company. Hence Burgut Co's current management team would be buying Burgut Co from Opao Co. A management buy-in (MBI) involves selling Burgut Co to a management team brought in from outside the company.

Opao Co may have sold Burgut Co through a MBI for the following reasons. Opao Co's BoD may have felt that Burgut Co's current management team lacked fresh ideas and strategies which could have driven Burgut Co forward successfully. Instead, it may have felt that a fresh team, with skills and expertise gained externally, would have had the required innovative ideas and skills. It may be that the external team of managers may have had the finance available to move quickly, whereas the internal team of managers may not have had the finance in place to purchase Burgut Co at that time. It is also possible that the management teams within Burgut Co and Opao Co had disagreements in the past, and Opao Co's BoD may have believed the two management teams would not be able to work together in the future, if needed. Thus, the BoD may have felt that a fresh management team was the better option going forwards.

(b) Portfolio restructuring involves the acquisition of companies, or disposals of assets, business units and/or subsidiary companies through divestments, demergers, spin-offs, MBOs and MBIs. Organisational restructuring involves changing the way a company is organised. This may involve changing the structure of divisions in a business, business processes and other changes such as corporate governance.

The aim of either type of restructuring is to increase the performance and value of the business.

Opao Co, in going from a conglomerate business to one focusing on just two business areas, can be seen as restructuring its portfolio, as businesses and assets which are not part of financial services and food manufacturing are disposed of, and businesses focusing on these areas are acquired. Financial markets may take the view that focusing on food manufacturing and financial services has enabled Opao Co's senior management to concentrate on areas in which they have expertise. Whereas other businesses in which the senior management are not experts are disposed of. This activity leads to the maximisation of business value.

Shareholders are interested in maximising returns from their investments, which companies achieve through maximizing business value, whilst minimising the risks inherent in their investment activity. Shareholders who are closely linked to a particular business do not hold diversified investment portfolios, and therefore benefit from diversification of risk undertaken by a company, investing in many different areas. On the other hand, institutional shareholders and other shareholders, who hold diversified portfolios, would not benefit from a company undertaking risk management through diversification by becoming a conglomerate. Instead,

such companies would increase value by focusing on areas in which they have relative expertise, as Opao Co seems to do. So Opao Co's changing owner clientele has forced it to change its overall strategy. This strategy change was implemented through portfolio restructuring.

(c) **Report to the board of directors (BoD), Opao Co**

Introduction

This report provides an estimate of the additional value created if Opao Co were to acquire Tai Co, and the gain for each company's shareholders based on a cash offer, a share-for-share offer and a mixed offer. It evaluates the likely reaction of the two companies' shareholders to each payment method.

Summary of the estimates from the appendices

From appendix 1

Opao Co equity value pre-acquisition: \$5,000m

Tai Co equity value pre-acquisition: \$1,000m

Combined company equity value post-acquisition: \$6,720m

From appendix 2

Therefore, additional value based on synergy benefits is \$720m or 12% (\$720m/\$6,000m)

Estimated percentage gain in value

	Opao Co	Tai Co
Cash offer	11.2%	15.8%
Share-for-share offer	6.4%	40.0%
Mixed offer	9.7%	23.4%

Likely reactions

Tai Co's shareholders are likely to consider all the offers made, because they all fall within the range of premiums paid in previous acquisitions of 15% to 40%. The cash offer is at the lower end of the range, the share-for-share offer at the top end of the range and the mixed offer in between. It is likely that Tai Co's shareholders will be more attracted to the share-for-share offer as it maximises their return. However, this offer is reliant on the fact that the expected synergy benefits will be realised and Tai Co will probably need to analyse the likelihood of this. Cash payment, although much lower, gives a certainty of return. The mixed offer provides some of the certainty of a cash payment, but also offers a higher return compared to the cash offer. This return is roughly in the middle of the premium range. It may therefore prove to be the better option for Tai Co's shareholders.

Opao Co's shareholders benefit less from the acquisition compared to Tai Co's shareholders. In each case, they get less than the additional value created of 12%, with the cash payment offering the highest return of 11.2%, which is just below the 12% overall return. The share-for-share offer gives the least return at just over half (6.4%) of the overall return of 12%. Nevertheless, with this option, cash is retained within Opao Co and can be used for other value creating projects. Opao Co's shareholders may also prefer the mixed offer, because the return they are expecting to receive is between the cash and share-for-share offers. Also, less cash resources are used compared to the cash offer, and they still benefit from a significant proportion of the additional value created.

Conclusion

Based on the benefits accruing to both sets of shareholders, it is not possible to conclusively say that one method of acquisition payment would be acceptable to both sets of shareholders. However, both sets of shareholders may be persuaded that the mixed offer provides a reasonable compromise between the wholly cash and the wholly share-for-share prices. Given that synergy benefits are shared (even if not equally), both companies' share prices should increase if the acquisition proceeds, as long as the estimates when estimating the valuations are reasonably accurate.

Report compiled by:**Date****APPENDICES:****Appendix 1 (Part (c) (i)):****Equity value of Opao Co prior to acquisition**

$\$2.50/\text{share} \times 2,000\text{m shares} = \$5,000\text{m}$

Equity value of Tai Co prior to acquisition

Free cash flows to firm = $\$132.0\text{m} + \$27.4\text{m} - \$24.3\text{m} - (\$132.0\text{m} \times 0.2) = \108.7m

Company value = $\$108.7\text{m} \times 1.03/(0.11 - 0.03) = \$1,399.5\text{m}$, say $\$1,400\text{m}$

Equity value = $\$1,400\text{m} - \$400\text{m} = \$1,000\text{m}$

Equity value of combined company post acquisition**All amounts in \$ millions**

Year	1	2	3	4
Sales revenue (5.02% growth, yrs 2 to 4)	7,351	7,720	8,108	8,515
Pre-tax profit (15.4% of sales revenue)	1,132	1,189	1,249	1,311
Less: Tax (20%)	(226)	(238)	(250)	(262)
Less: Additional investment (\$0.31 per \$1, yrs 2 to 4)	(109)	(114)	(120)	(126)
Free cash flows	797	837	879	923
Present value of free cash flows (10%)	724	691	660	630

Combined company value: years 1 to 4 = $\$2,705\text{m}$

Combined company value: after year 4 = $923 \times 1.024/(0.1 - 0.024) \times 1.1^{-4} = \$8,494\text{m}$

Total combined company value = $\$11,199\text{m}$

Equity value ($60\% \times \$11,199\text{m}$) = $\$6,719.4\text{m}$, say $\$6,720\text{m}$

Appendix 2 (Part (c) (ii): Percentage gains for Tai Co and Opao Co shareholders under each payment method

Estimate of additional value created from acquisition due to synergy benefits

$\$6,720\text{m} - (\$5,000\text{m} + \$1,000\text{m}) = \720m

Tai Co, value per share = $\$1,000\text{m}/263\text{m shares} = \$3.80/\text{share approx.}$

Cash offer**Tai Co shareholders, percentage gain**

$(\$4.40 - \$3.80)/\$3.80 = \$0.60/\$3.80 = 15.8\%$

Opao Co shareholders, percentage gain

Amount of additional value created going to Tai Co shareholders = $\$0.60 \times 263\text{m shares} = \157.8m

Amount of additional value created going to Opao Co shareholders = $\$720\text{m} - \$157.8\text{m} = \$562.2\text{m}$

As a percentage = $(\$562.2\text{m}/2,000\text{m shares})/\$2.50 = 11.2\%$

Share-for-share offer

Share of additional value to Tai Co shareholders = $\$720m \times 0.555 = \$399.6m$

Share of additional value to Opao Co shareholders = $\$720m \times 0.445 = \$320.4m$

Opao Co equity value after acquisition = $\$5,320.4m$

Opao Co, estimated share price after acquisition = $\$5,320.4m/2,000m \text{ shares} = \$2.66/\text{share}$

Opao Co shares to be allocated to Tai Co shareholders = $(\$1,000m + \$399.6m)/\$2.66 = 526m \text{ shares approximately}$

Therefore, share-for-share offer will be 2 Opao Co shares for 1 Tai Co share [526/263 = 2]

Tai Co shareholders, percentage gain

$(\$2.66 \times 2 \text{ shares} - \$3.80 \times 1 \text{ share})/(\$3.80 \times 1 \text{ share}) = 40\%$

Opao Co shareholders, percentage gain

$(\$2.66 - \$2.50)/\$2.50 = 6.4\%$

Mixed offer

Tai Co shareholders, percentage gain

$((\$2.60 + \$2.09) - \$3.80)/\$3.80 = \$0.89/\$3.80 = 23.4\%$

Opao Co shareholders, percentage gain

Amount of additional value going to Tai Co shareholders = $\$0.89 \times 263m = \$234.1m$

Amount of additional value created going to Opao Co shareholders = $\$720m - \$234.1m = \$485.9m$

As a percentage = $(\$485.9m/2,000m \text{ shares})/\$2.50 = 9.7\%$

Tutorial note. Credit would also be given for using the post-acquisition price provided in the question to analyse the impact on Opao Co's shareholders with the mixed offer.

(d) The initial public offering (IPO) is the conventional way to obtain a listing where a company issues and offers shares to the public. When doing this, the company will follow the normal procedures and processes required by the stock exchange regarding a new issue of shares and will comply with the regulatory requirements.

Undertaking a reverse takeover enables a company to obtain a listing without going through the IPO process. The BoD of Burgut Co would initially take control of a 'shell' listed company by buying some shares in that company and taking over as its BoD. The 'shell' listed company was probably a normal listed company previously, but is no longer trading. New equity shares in the listed company would then be exchanged for Burgut Co's shares, with the external appearance that the listed company has taken over Burgut Co. But in reality Burgut Co has now effectively got a listing, having taken control of the listed company previously. Normally, the name of the original listed company would then be changed to Burgut Co.

Compared with an IPO, the main benefits of undertaking a reverse takeover are that it is cheaper, takes less time and ensures that Burgut Co will obtain a listing on a stock exchange. An IPO can cost between 3% and 5% of the capital being raised because it involves investment banks, lawyers, and other experts. A marketing campaign and issuing a prospectus are also needed to make the offering attractive and ensure shares to the public do get sold. A reverse takeover does not need any of these and therefore avoids the related costs. The IPO process can typically take one or two years to complete due to hiring the experts, the marketing process and the need to obtain a value for the shares. Additionally, the regulatory process and procedures of the stock exchange need to be complied with. With a reverse takeover, none of these are required and therefore the process is quicker. Finally, there is no

guarantee that an IPO will be successful. In times of uncertainty, economic downturn or recession, it may not attract the attention of investors and a listing may not be obtained. With reverse takeover, because the transaction is an internal one, between two parties, it will happen and Burgut Co will be listed.

However, obtaining a listing through a reverse takeover can have issues attached to it. The listed 'shell' company may have potential liabilities which are not transparent at the outset, such as potential litigation action. A full due diligence of the listed company should be conducted before the reverse takeover process is started. The IPO process is probably better at helping provide the senior management of Burgut Co with knowledge of the stock exchange and its regulatory environment. The involvement of experts and the time senior management need to devote to the listing process will help in this regard. Due to the marketing effort involved with an IPO launch, it will probably have an investor following, which a reverse takeover would not. Therefore, a company which has gone through an IPO would probably find it easier to raise extra funds, whilst a company which has gone through a reverse takeover may find it more difficult to raise new funding.

Overall, neither option of obtaining a listing has a clear advantage over the other. The choice of listing method depends on the company undertaking the listing and the purpose for which it is doing so.

(Note. Credit will be given for alternative valid areas of discussion.)

Question 2

Workbook references. Currency hedging is covered in Chapter 12.

Top tips. As ever, don't get obsessed with the parts of the question that seem (on first reading) especially difficult eg how to demonstrate the outcome if the options is not exercised in part a and the numerical part of part c. In AFM a solid answer to the majority of the question will secure a pass mark even if you do not manage to deal with the more complicated issues. Take care with the key issues in the question without worrying about getting everything right.

Easy marks. In part b and the first part of part c, the discussion points should be easy as long as you don't make your points too briefly.

ACCA examining team's comments.

Common errors included errors in calculating remaining basis, dividing by the exchange rates instead of multiplying and calculating the income received using forwards when the question scenario did not require this.

Marking scheme

		Marks
(a)	Futures	
	Sell futures now	1
	Number of contracts	1
	Forward hedge	1
	Predicted futures rate using basis	1
	Overall expected receipt	1
	Options	
	Purchase June put	1
	Premium	1
	Overall expected receipt	1
	Calculation of when option is a better choice	2
	Comments	<u>2</u>
		<u>12</u>
(b)	Advantages of forward contract	2–3
	Disadvantages of forward contract	2–3
	Reasons for using exchange-traded derivatives	<u>1–2</u>
		Max <u>7</u>
(c)	Significance of initial and maintenance margins	2
	Mark-to-market explanation	1
	Numerical illustration using Nutourne Co's figures	<u>3</u>
		<u>6</u>
		<u><u>25</u></u>

(a) Nutourne Co will have a Swiss Franc receipt in six months' time and needs to hedge against the dollar strengthening.

Futures

Sell Swiss futures and use June futures contracts.

No. of contracts = CHF12,300,000/125,000 = 98.4, say 98, hedging CHF12,250,000

Remainder to be hedged on the forward market is CHF12,300,000 – CHF12,250,000 = CHF 50,000

Receipt = CHF50,000 × 1.0358 = \$51,790

Calculation of futures price

Assume that basis reduces to zero at contract maturity in a linear fashion.

Estimate from opening June futures rate of 1.0369, with 7 months to expiry; this means that opening basis is 0.0077 (since the future is above the current spot of 1.0292 by this amount). At the end of May, with only 1 month to expiry this basis should fall to $1/7 \times 0.0077 = 0.0011$.

Predicted futures rate at the end of May = 1.0369 – 0.0011 = 1.0358

Expected receipt = CHF12,250,000 × 1.0358 = \$12,688,550

Outcome

	\$
Futures	12,688,550
Remainder on forward market	51,790
	<u>12,740,340</u>

Or

Calculation of futures price

Alternatively, use spot rate = 1.0292

Predicted futures rate at the end of May = 1.0292 + (6/7 × (1.0369 – 1.0292)) = 1.0358 (when the June futures contract is closed out in May).

Expected receipt = CHF12,250,000 × 1.0358 = \$12,688,550

Outcome

	\$
Futures	12,688,550
Remainder on forward market	51,790
	<u>12,740,340</u>

Options contract

Nutourne Co would purchase CHF June put options.

Number of contracts 98, as before.

Amount not hedged, hedged by forward contract CHF translated as \$51,790 as before.

Assuming the options are exercised:

	\$
Receipt (W1)	12,709,375
Premium (W2)	(105,350)
Forward contract	51,790
	<u>12,655,815</u>

Workings

1 Receipt

$$\text{CHF } 125,000 \times 98 \times 1.0375 = \$12,709,375$$

2 Premium

$$1.0375 \text{ options} = 98 \times 125,000 \times 0.0086 = \$105,350$$

The options would give the higher receipt if they were not exercised and the spot rate moved sufficiently in Nutourne Co's favour. If Nutourne Co allowed the option to lapse, it would obtain the same receipt as under the futures if the US\$/CHF spot rate was x , such that:

$$12,692,225 = 12,250,000x - 105,350$$

$$12,250,000x = 12,692,225 + 105,350$$

so that x is US\$1.0447 = CHF1.

Or

$$12,688,550 = 12,250,000x - 105,350$$

$$12,250,000x = 12,688,550 + 105,350$$

so that x is US\$1.0444 = CHF1.

Comments

If the options are exercised, the futures would give the higher receipt. The options give a lower receipt because of the premium which Nutourne Co has to pay. The futures will be subject to the risk that basis (the difference between the futures price and the spot price) may not decrease linearly as the futures approach maturity as assumed in the above calculations. This will mean that the hedge of the CHF 12,250,000 is imperfect, and the receipt may be unpredictable despite a futures hedge being taken out.

The options can also be allowed to lapse if for some reason the contract is not completed. If this happens, Nutourne Co will only have to settle the forward contract.

(b) Benefits of a forward contract

A forward contract would not involve payment of a large premium upfront to the counterparty.

A forward contract is a simple arrangement to understand, whereas the basis of calculation of the premium for an over-the-counter (OTC) option may be unclear.

A forward contract gives a certain receipt for the purposes of budgeting.

Drawbacks of a forward contract

A forward contract has to be fulfilled, even if the transaction which led to the forward contract being purchased is cancelled. Exchange rate movements may mean that the contract has to be fulfilled at an unfavourable rate. An OTC option can be allowed to lapse if it is not needed.

A forward contract does not allow the holder to take advantage of favourable exchange rate movements. An OTC option need not be exercised if the exchange rate moves in the holder's favour.

A forward contract may only be available for a short time period, depending on what currencies are involved. An OTC option may be purchased for a longer time period, over a year.

The rate offered on a forward contract will be determined by a prediction based on expected interest rates. The rate offered on an OTC option may be more flexible. This may suit a holder who is prepared to tolerate the risk of some loss in order to have the opportunity to take advantage of favourable exchange rate movements, but who wishes to use the option to set a limit to possible losses.

Reasons why exchange-traded derivatives are used

One of the main reasons why the treasury function uses exchange-traded derivatives is that the contracts can be bought and sold as required. Also, because the markets are regulated by an exchange, counterparty risk (the risk of the other party to the transaction defaulting) should be minimised.

(c) The mark-to-market process begins with Nutourne Co having to deposit an amount (the initial margin) in a margin account with the futures exchange when it takes out the futures. The margin account will remain open as long as the futures are open. The profit or loss on the futures is calculated daily and the margin account is adjusted for the profit or loss.

The maintenance margin is the minimum balance which has to be maintained on the margin account.

If the losses on the futures are so large that the balance on the margin account is less than the maintenance margin, then the futures exchange will make a demand (a margin call) for an extra payment (the variation margin) to increase the balance on the account back to the maintenance margin.

In the example, initial margin = $\$1,450 \times 98 = \$142,100$

Maintenance margin = $\$1,360 \times 98 = \$133,280$

Loss in ticks = $0.0011/0.0001 = 11$

Total loss = $11 \text{ ticks} \times \$12.50 \times 98 = \$13,475$

Balance on margin account = $\$142,100 - \$13,475 = \$128,625$

This is less than the maintenance margin, so Nutourne Co would have to deposit an extra $(\$133,280 - \$128,625) = \$4,655$ (the variation margin) to bring the balance on the margin account up to the maintenance margin.

Alternative solution

In some exchanges, a variation margin may be required to increase the balance on the account back to its initial margin level. Therefore, in this case, the variation margin amount would be $\$13,475$ (ie $\$142,100 - \$128,625$).

Question 3

Workbook references. Adjusted present value is covered in Chapter 6.

Top tips. Ensure that you don't over-obsess about the tricky part of the APV calculation (the interest element of the bank loan repayments). Time would be better invested in part (b) where up to 2 marks per discussion point is available (if the point is addressed to the scenario).

Easy marks. Time invested in reading the scenario carefully should have revealed the ungeared cost of capital and post -tax project cashflows are, effectively, provided in the question. This should mean that Step 1 in APV (evaluating the project as if ungeared) should be easily accomplished.

ACCA examining team's comments.

In part (a) the calculations related to the financing side effects proved more challenging. The majority of candidates were not able to deal with a loan payable in equal instalments. A minority of responses either did not discount the financing side effect cash flows at all or used the normal cost of capital used for the base case. Again, this demonstrated a mis-understanding of the purpose and relevance of the adjusted present value method of assessing capital investment projects.

Marking scheme

	Marks
(a) Working capital	2
Discount rate	1
Base case net present value	2
Issue costs	1
Tax shield benefit – subsidised loan	1
Tax shield benefit – bank loan	4
Subsidy benefit	1
Adjusted present value	1
Comments and conclusion	2
	<u>15</u>
(b) Factors determining long-term finance policy	5–6
Factors which cause policy to change	5–6
	Max <u>10</u>
	Total <u>25</u>

(a)

Year	0 \$m	1 \$m	2 \$m	3 \$m	4 \$m
Post-tax operating cash flows		28.50	36.70	44.40	50.90
Investment	(150.00)				
Realisable value					45.00
Working capital (W1)	(6.00)	(0.48)	(0.39)	(0.34)	7.21
Cash flows	(156.00)	28.02	36.31	44.06	103.11
Discount factor 12% (W2)	1.000	0.893	0.797	0.712	0.636
Present value	(156.00)	25.02	28.94	31.37	65.58
Base case net present value	(5.09)				

Base case net present value is approximately (\$5.09 million) and on this basis, the investment should be rejected.

Workings

1 Working capital

Year	0 \$m	1 \$m	2 \$m	3 \$m	4 \$m
Working capital		6.00	6.48	6.87	7.21
Required/(released)	6.00	0.48	0.39	0.34	(7.21)

2 Discount rate

Using asset beta

All-equity financed discount rate = $4\% + (11\% - 4\%) \times 1.14 = 12\%$

3 Issue costs

\$80 million/0.97 = \$82,474,227

Issue costs = $3\% \times \$82,474,227 = \$2,474,227$

There will be no issue costs for the bank loan.

4 Tax shield on subsidised loan

Use PV of an annuity (PVA) years 1 to 4 at 8% (normal borrowing rate)

$\$80m \times 0.031 \times 30\% \times 3.312 = \$2,464,128$

Note to markers

Full credit should be given if tax shield is discounted at the government interest rate of 3.1% rather than the normal borrowing rate of 8%.

5 Tax shield on bank loan

Annual repayment = $(\$70m/PVA \ 8\% \text{ Yr 1 - 4}) = (\$70m/3.312) = \$21,135,266$

Year	1 \$'000	2 \$'000	3 \$'000	4 \$'000
Opening balance	70,000	54,465	37,687	19,567
Interest at 8%	5,600	4,357	3,015	1,565
Repayment	(21,135)	(21,135)	(21,135)	(21,135)
Closing balance	<u>54,465</u>	<u>37,687</u>	<u>19,567</u>	<u>(3)</u>

Year	1	2	3	4
	\$'000	\$'000	\$'000	\$'000
Interest cost	5,600	4,357	3,015	1,565
Tax relief at 30%	1,680	1,307	905	470
Discount factor 8%	0.926	0.857	0.794	0.735
Present value	1,556	1,120	719	345
Net present value	3,740			
6 Subsidy benefit				
Benefit = \$80m × (0.08 – 0.031) × 70% × 3.312 = \$9,088,128				
7 Financing side effects				
Issue costs (W3)				\$'000
Tax shield on subsidised loan (W4)				(2,474)
Tax shield on bank loan (W5)				2,464
Subsidy benefit (W6)				3,740
Total benefit of financing side effects				9,088
				<u>12,818</u>

Financing the project in this way would add around \$12.82 million to the value of the project.

The adjusted present value of the project is around \$7.73 million and so the project should be accepted. Sensitivity analysis should be undertaken on all the significant variables. Further analysis may be needed, particularly of the assumptions which lie behind the post-tax cash flows, such as sales and the tax rate. The realisable value of \$45 million may be questionable. On the other hand, the time horizon of four years seems low and analysis should be done of potential cash flows beyond that time.

(b) Amberle Co's board can use various principles to determine its long-term finance mix. The directors may aim to follow consistent long-term policies, or they may have preferences which change as circumstances change.

Long-term policy factors

At present Amberle Co is using a mix of finance, raising the question of whether the directors are aiming for an optimal level of gearing, or there is a level which they do not wish gearing to exceed. If the board wishes to maintain gearing at an optimal level, this is likely to be determined by a balance of risks and advantages. The main risks are not being able to maintain the required level of payment to finance providers, interest to debt providers or required level of dividend to shareholders. Advantages may include lower costs of debt, tax relief on finance costs as shown in the APV calculation or, on the other hand, not being legally required to pay dividends in a particular year.

Another issue is whether Amberle Co's board has preferences about what source of finance should be used and in what order. One example of this is following the pecking order of retained earnings, then debt, then equity. The board may prefer this pecking order on the grounds that avoiding a new equity issue means that the composition of shareholdings is unchanged, or because retained earnings and longer term debt are judged low risk, or because the market will assume that an equity issue is being made because directors want to take advantage of Amberle Co's shares being over-priced. Other specific sources of finance may have benefits which attract the directors or drawbacks which deter them.

This investment highlights the aspect of whether the board prefers to match sources of finance with specific investments. Matching arguably gives greater flexibility and avoids committing Amberle Co to a long-term interest burden. However, to adopt this approach, the board will need assurance either that the investment will be able to meet finance costs and ultimately repayment burdens, or these can be met from surpluses from other operations.

Changing long-term financing policy

As well as deciding what financing mix or sources of finance they desire to use, the directors will also need to consider what factors would cause this decision to change.

A major change in the scope of the operations, with investment requirements being paramount, may cause a change in financing policy. Here the \$150 million investment has been financed entirely by medium-term debt. Amberle Co may have chosen solely to use debt if it has made a recent equity issue and does not feel it can make another one so soon afterwards. In addition, if Amberle Co expands its manufacture of electric cars, it may decide to sell off its motorbike or cycles divisions if they are performing less well. If part of the business is sold, the sale proceeds could help finance new investment in the cars division.

The board may also be flexible at times and take advantage of whatever source of finance seems to be offering the best terms for Amberle Co. Here the board is taking advantage of loan finance being available at a low cost, thanks to the government loan scheme.

A change in the business or economic environment may also lead to the board rethinking how the company is financed. An economic recession, leading to falling share prices, may mean that the results of a share issue are uncertain. On the other hand, an increase in economic or business risk may mean that lenders are less likely to lend at acceptable rates or will impose greater restrictions. If the directors are risk-averse, they may not seek new finance during a recession but instead rely on retained earnings to finance any expansion.

Mathematical tables and formulae

Formulae

Modigliani and Miller Proposition 2 (with tax)

$$k_e = k_e^i + (1-T)(k_e^i - k_d) \frac{V_d}{V_e}$$

The Capital Asset Pricing Model

$$E(r_i) = R_f + \beta_i (E(r_m) - R_f)$$

The asset beta formula

$$\beta_a = \left[\frac{V_e}{(V_e + V_d(1-T))} \beta_e \right] + \left[\frac{V_d(1-T)}{(V_e + V_d(1-T))} \beta_d \right]$$

The Growth Model

$$P_o = \frac{D_o(1+g)}{(r_e - g)}$$

Gordon's growth approximation

$$g = br_e$$

The weighted average cost of capital

$$WACC = \left[\frac{V_e}{V_e + V_d} \right] k_e + \left[\frac{V_d}{V_e + V_d} \right] k_d (1-T)$$

The Fisher formula

$$(1+i) = (1+r)(1+h)$$

Purchasing power parity and interest rate parity

$$S_1 = S_0 \times \frac{(1+h_c)}{(1+h_b)} \quad F_0 = S_0 \times \frac{(1+i_c)}{(1+i_b)}$$

Modified Internal Rate of Return

$$MIRR = \left[\frac{PV_R}{PV_I} \right]^{\frac{1}{n}} (1+r_e) - 1$$

The Black-Scholes option pricing model

$$c = P_a N(d_1) - P_e N(d_2) e^{-rt}$$

Where:

$$d_1 = \frac{\ln(P_a / P_e) + (r + 0.5s^2)t}{s\sqrt{t}}$$

$$d_2 = d_1 - s\sqrt{t}$$

The Put Call Parity relationship

$$p = c - P_a + P_e e^{-rt}$$

Present value table

Present value of 1 ie $(1 + r)^{-n}$

Where r = discount rate

n = number of periods until payment

Discount rate (r)

Periods

(n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	1
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	2
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	3
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	4
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	5
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	6
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	7
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	8
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	9
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	10
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	11
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	12
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	13
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	14
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	15
(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833	1
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694	2
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579	3
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482	4
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402	5
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335	6
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279	7
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233	8
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194	9
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162	10
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135	11
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112	12
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093	13
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078	14
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065	15

Annuity table

Present value of an annuity of 1 ie
$$\frac{1 - (1+r)^{-n}}{r}$$

Where r = discount rate

n = number of periods

Discount rate (r)

Periods

(n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606

(n)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675

Standard normal distribution table

	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990

This table can be used to calculate $N(d)$, the cumulative normal distribution functions needed for the Black-Scholes model of option pricing. If $d_i > 0$, add 0.5 to the relevant number above. If $d_i < 0$, subtract the relevant number above from 0.5.

Review Form – Advanced Financial Management (AFM) (02/19)

Name: _____

Address: _____

How have you used this Kit?

(Tick one box only)

- On its own (book only)
- On a course: college _____
- With 'correspondence' package
- Other _____

Why did you decide to purchase this Kit?

(Tick one box only)

- Have used the Workbook
- Have used other BPP products in the past
- Recommendation by friend/colleague
- Recommendation by a lecturer at college
- Saw advertising
- Other _____

During the past six months do you recall seeing/receiving any of the following?

(Tick as many boxes as are relevant)

- Our advertisement in *Student Accountant*
- Our advertisement in *Pass*
- Our advertisement in *PQ*
- Our brochure with a letter through the post
- Our website www.bpp.com

Which (if any) aspects of our advertising do you find useful?

(Tick as many boxes as are relevant)

- Prices and publication dates of new editions
- Information on product content
- Facility to order books off-the-page
- None of the above

Which BPP products have you used?

Workbook Other
Kit

Your ratings, comments and suggestions would be appreciated on the following areas.

Passing AFM

	Very useful	Useful	Not useful
Passing AFM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Questions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Top Tips etc in answers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Content and structure of answers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mock exam answers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questions

Top Tips etc in answers

Content and structure of answers

Mock exam answers

Overall opinion of this Kit

Excellent Good Adequate Poor

Do you intend to continue using
BPP products?

Yes

No

The BPP author of this edition can be emailed at: learningmedia@bpp.com



Review Form (continued)

TELL US WHAT YOU THINK

Please note any further comments and suggestions/errors below.