

ACCA



PAPER F9

**FINANCIAL
MANAGEMENT**

FOR EXAMS IN 2010

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PAPER F9

FINANCIAL MANAGEMENT

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In this January 2010 edition

- We discuss the **best strategies** for revising and taking your ACCA exams
- We show you how to be **well prepared** for your exam
- We give you **lots of great guidance** on tackling questions
- We show you how you can **build your own exams**
- We provide you with **three** mock exams including the **December 2009 exam**
- We provide the **ACCA examiner's answers** as well as our own to the June and December 2009 exams as an additional revision aid

Our **i-Pass** product also supports this paper.

FOR EXAMS IN 2010

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Question index

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

Questions set under the old syllabus *Financial Management and Control (FMC)* are included because their style and content are similar to those that appear in the Paper F9 exam.

Marks	Time allocation Mins	Page number	
		Question	Answer

Part A: Financial management function

1 ABC Co	25	45	3	57
2 RZP Co (FMC, 6/05)	25	45	4	58

Part B: Financial management environment

3 Tagna (FMC, 6/03, amended)	25	45	5	61
4 Phoenix	25	45	6	63

Part C: Working capital management

5 East Meets West Co	25	45	8	66
6 JIT and EOQ	25	45	8	68
7 TNG Co (FMC, 6/05)	25	45	9	70
8 PNP Co (FMC, 6/07)	25	45	10	72
9 Thorne Co (FMC, 12/05)	25	45	10	74
10 Velm Co (FMC, 6/03)	25	45	11	77
11 PCB Co	25	45	12	80
12 Special Gift Suppliers (FMC, 12/01)	25	45	13	82
13 Ulnad Co (Pilot paper)	25	45	14	84
14 PKA Co (12/07)	25	45	15	87
15 FLG Co (6/08)	25	45	16	90
16 HGR Co (6/09)	25	45	17	93

Part D: Investment appraisal

17 Preparation question: Investment appraisal	n/a	n/a	18	97
18 Chromex Co	25	45	18	98
19 Preparation question: NPV with inflation and tax	n/a	n/a	19	100
20 Charm Co (FMC, 6/06)	25	45	20	101
21 Trecor Co (Pilot paper)	25	45	20	103
22 Preparation question: Sensitivity analysis	n/a	n/a	21	105
23 Umunat Co (FMC, 12/04)	25	45	21	106
24 Duo Co (12/07)	25	45	22	109
25 SC Co (6/08)	25	45	22	112
26 Rupab Co (12/08)	25	45	23	115
27 PV Co (6/09)	25	45	24	118
28 AGD Co (FMC, 12/05)	25	45	24	121
29 Leaming Co (FMC, 12/02)	25	45	25	124
30 Preparation question: Bread Products Co	n/a	n/a	26	126

	Marks	Time allocation Mins	Page number	
			Question	Answer
31 Filtrex Co	25	45	26	129
32 Basril Co (FMC, 12/03)	25	45	27	131

Part E: Business finance

33 Tirwen Co (FMC, 12/04)	25	45	28	134
34 PG	25	45	29	136
35 Newsam Co	25	45	29	138
36 Arwin (FMC, 6/04)	25	45	31	141
37 Food retailers	25	45	32	143
38 CF Co	25	45	32	145
39 TFR Co (FMC, 6/07)	25	45	33	149
40 Echo Co (12/07)	25	45	34	152
41 JJG Co (6/09)	25	45	35	155

Part F: Cost of capital

42 XYZ Co	25	45	36	158
43 D Co	25	45	37	161
44 IML Co	25	45	37	164
45 KJI	25	45	38	166
46 WEB Co	25	45	39	168
47 CAP Co	25	45	40	170
48 FAQ	25	45	40	174
49 Droxfol Co (Pilot paper)	25	45	41	176
50 Burse Co (6/08)	25	45	42	179

Part G: Business valuations

51 MC	25	45	43	182
52 BST	25	45	44	185
53 Phobis Co (12/07)	25	45	44	188
54 THP Co (6/08)	25	45	45	192
55 Dartig Co (12/08)	25	45	46	195
56 KFP Co (6/09)	25	45	47	198

Part H: Risk management

57 Marton Co	25	45	48	201
58 SDT	25	45	49	204
59 BS	25	45	50	207
60 Nedwen Co (Pilot paper)	25	45	51	209
61 Boluje Co (12/08)	25	45	52	211
62 Preparation question: Interest rates	n/a	n/a	52	214
63 Preparation question: QW	n/a	n/a	53	216
64 Gorwa Co (12/08)	25	45	54	218

Mock exam 1

Questions 65 to 68

Mock exam 2

Questions 69 to 72

Mock exam 3 (December 2009)

Questions 73 to 76

Planning your question practice

Our guidance from page xviii shows you how to organise your question practice, either by attempting questions from each syllabus area or **by building your own exams** – tackling questions as a series of practice exams.

ACCA examiner's answers

The ACCA examiner's answers to questions marked '**Pilot paper**', '**12/07**', '**6/08**' or '**12/08**' can be found on the BPP website at the following link:

www.bpp.com/acca/examiner-solutions

Additional question guidance

Additional guidance to certain questions can be found on the BPP website at the following link:

www.bpp.com/acca/extra-question-guidance

Using your BPP Learning Media products

This Kit gives you the question practice and guidance you need in the exam. Our other products can also help you pass:

- **Learning to Learn Accountancy** gives further valuable advice on revision
- **Passcards** provide you with clear topic summaries and exam tips
- **Success CDs** help you revise on the move
- **i-Pass CDs** offer tests of knowledge against the clock

You can purchase these products by visiting www.bpp.com/mybpp.

You can view demonstrations of i-Learn and i-Pass products by visiting www.bpp.com/ACCA/study-materials. Scroll down the page until you find the sections for i-Learn and i-Pass and click on the appropriate 'View demo' button.

Topic index

Listed below are the key Paper F9 syllabus topics and the numbers of the questions in this Kit covering those topics.

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
Asset replacement decisions	30
Betas	44, 45, 46
Business valuation	51, 52, 53, 54, 55, 56, 61
Capital rationing	29, 31, 32
CAPM	26, 43, 44, 47, 48, 42
Cash management	9, 11, 13, 16, 38
Cash operating cycle	5, 8, 15
Competition policy	3, 18
Convertible loan notes	34, 35, 46, 53
Cost of capital	42, 43, 46, 50, 56
Corporate governance	1
Dividend policy	37, 40
EOQ	6, 7, 14, 15
Exchange rate risk	8, 14, 57, 58, 59, 60, 61
Financial intermediaries	4
Gearing	35, 36, 43, 49, 56
Inflation	5, 19, 60
Interest rate risk	62, 63
Interest rates	3, 62, 64
Inventory management	6, 7, 14
Investment appraisal	17, 18, 19, 20, 21, 22, 23, 26, 27
IRR	17, 20, 21, 24, 25, 27
Leasing	28, 40
Managerial reward schemes	2, 55
NPV	17, 19-32
Objectives	1, 14, 41
Overtrading	11, 64
Payback	17, 18, 23, 27
Pecking order	48, 56, 61
Project-specific discount rate	48
Ratio analysis	1, 2, 4, 15, 18, 33, 34, 35, 36, 37, 41, 45, 49
Receivables management	8, 10, 12, 14, 15, 16, 57, 64
Rights issue	33, 34, 40, 41, 54, 55
Risk and uncertainty	24
Risk/return trade-off	4
Sensitivity analysis	22, 23
Shareholder wealth maximisation	1, 3, 25, 41
SME's	38, 39
Sources of finance	34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 46, 54, 61
Stock market efficiency	44, 53, 54
Total shareholder return	1, 2
Value for money	3
Venture capital	38
WACC	26, 42, 43, 45, 46, 47, 48, 49, 50, 56
Working capital financing	5, 9, 10, 11, 12, 13, 15, 16, 29
Working capital management	5- 16

Using your BPP Learning Media Practice and Revision Kit

Tackling revision and the exam

You can significantly improve your chances of passing by tackling revision and the exam in the right ways. Our advice is based on feedback from ACCA examiners.

- We look at the dos and don'ts of revising for, and taking, ACCA exams
- We focus on Paper F9; we discuss revising the syllabus, what to do (and what not to do) in the exam, how to approach different types of question and ways of obtaining easy marks

Selecting questions

We provide signposts to help you plan your revision.

- A full **question index**
- A **topic index** listing all the questions that cover key topics, so that you can locate the questions that provide practice on these topics, and see the different ways in which they might be examined
- **BPP's question plan** highlighting the most important questions and explaining why you should attempt them
- **Build your own exams**, showing how you can practise questions in a series of exams

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 examiner rewards
- We include **examiners' comments** to show you where students struggled or performed well in the actual exam
- We refer to the **2009 BPP Study Text** (for exams in December 2009 and June 2010) for detailed coverage of the topics covered in questions
- In a bank at the end of this Kit we include the **examiner's answers** to the June and December 2009 papers. Used in conjunction with our answers they provide an indication of all possible points that could be made, issues that could be covered and approaches to adopt.

Attempting mock exams

There are three mock exams that provide practice at coping with the pressures of the exam day. We strongly recommend that you attempt them under exam conditions. **Mock exams 1 and 2** reflect the question styles and syllabus coverage of the exam; **Mock exam 3** is the December 2009 paper.

Revising F9

General exam support from BPP Learning Media

BPP Learning Media is committed to giving you the best possible support in your quest for exam success. With this in mind, we have produced **guidance** on how to revise and techniques you can apply to **improve your chances of passing** the exam. This guidance can be found on the BPP Learning Media web site at the following link:

www.bpp.com/acca/examtips/Revising-for-ACCA-exams.doc

A paper copy of this guidance is available by emailing learningmedia@bpp.com

As well as written guidance, an excellent presentation entitled '**Exam technique – advice from the experts at BPP Learning Media**' is available at the following link:

www.bpp.com/learningmedia/acca/accaexamskills/player.html

Topics to revise

The exam consists of four questions, all of which are compulsory. No one section in the syllabus is more important than another so there are no short-cuts. You will have to be able to answer questions on the **entire syllabus**.

Question practice

You need to practise exam standard and exam style questions on a regular basis.

As you get closer to the exam, try to do complete questions in 45 minutes so that you are able to work at an appropriate speed.

Make sure you practise written sections as well as the calculations.

Passing the F9 exam

Displaying the right qualities

The aim of Paper F9 is to develop the knowledge and skills expected of a finance manager in relation to investment, financing and dividend decisions.

You need to be able to communicate your understanding clearly in an exam context. Calculations and discussions are equally important so do not concentrate on the numbers and ignore the written parts.

You need to be able to:

- Discuss the role and purpose of the financial management function
- Assess and discuss the impact of the economic environment on financial management
- Discuss and apply working capital management techniques
- Carry out effective investment appraisal
- Identify and evaluate alternative sources of business finance
- Explain and calculate cost of capital and the factors that affect it
- Explain and apply risk management techniques in business

Avoiding weaknesses

Do not avoid any syllabus areas, they are all equally examinable. Make sure you can discuss techniques as well as apply them, you will not pass this exam with calculations alone.

Plan your answers to ensure you do not run out of time and miss out on easy marks.

Using the reading time

You will have 15 minutes reading time for Paper F9. Here are some helpful tips on how best to utilise this time.

- Speed read through the question paper, jotting down any ideas that come to you about any of the questions.
- Decide the order which you're likely to tackle the questions (probably easiest questions first, most difficult questions last).
- Spend the remainder of the reading time reading the question(s) you will do first in detail, jotting down proformas and plans (any proformas or plans written on the question paper should be reproduced in the answer booklet).
- When you can start writing, get straight on with the question(s) you have planned in detail. If you have looked at all the questions during the reading time, this should hopefully mean that you will find it easier to answer the more difficult questions when you come to them, as you will have been generating ideas and remembering facts while answering the easier questions.

Choosing which questions to answer first

You can use the planning time in the exam to choose the order in which to attempt the questions. You may prefer to attempt the questions that you are more confident about first. However, make sure you watch the time carefully and do not spend too long on any one question.

Alternatively, you could answer the questions in strict order. This will force you to spend an equal time on each question but make sure you leave plenty of space if you decide to move on and finish a question later.

Tackling questions

Write a short plan for each question containing bullet points per mark and **use** it to write your answer when the writing time begins.

If you get stuck, make an assumption, write it down and **move on**.

Make sure your answers are **focused** and **specific** to the organisation in the question. Show clear workings for your calculations and write full sentences in your explanations.

Never overrun on any question and once the 45 minutes is up, move on to the next.

Gaining the easy marks

Easy marks in this paper tend to fall into two categories.

Calculations

The calculations within a question will get progressively harder and easy marks will be available in the easy stages. Set out your calculations clearly and show all your workings in a clear format. Use a proforma, for example in complex NPV questions and slot the simpler figures into the proforma straight away before you concentrate on the figures that need a lot of adjustment.

Discussions

Discussions that are focused on the specific organisation in the question will gain more marks than regurgitation of knowledge. Read the question carefully and more than once, to ensure you are actually answering the specific requirements.

Pick out key words such as 'describe', 'evaluate' and 'discuss'. These all mean something specific: 'Describe' means to communicate the key features of; 'Evaluate' means to assess the value of; 'Discuss' means to examine in detail by argument.

Clearly label the points you make in discussions so that the marker can identify them all rather than getting lost in the detail. Provide answers in the form requested, particularly using report format if asked for and giving recommendations if required.

Exam formulae

Set out below are the formulae which you will be given in the exam, and formulae which you should learn. If you are not sure what the symbols mean, or how the formulae are used, you should refer to the appropriate chapter in this Study Text

Exam formulae	Chapter in Study Text
----------------------	------------------------------

Economic Order Quantity	5
--------------------------------	---

$$= \sqrt{\frac{2C_0D}{C_H}}$$

Miller-Orr Model	6
-------------------------	---

Return point = Lower limit + (1/3 × spread)

$$\text{Spread} = 3 \left[\frac{\frac{3}{4} \times \text{transaction cost} \times \text{variance of cash flows}}{\text{interest rate}} \right]^{\frac{1}{3}}$$

The Capital Asset Pricing Model	15
--	----

$$E(r_i) = R_f + \beta_i (E(r_m) - R_f)$$

The Asset Beta Formula	16
-------------------------------	----

$$\beta_a = \left[\frac{V_e}{(V_e + V_d(1-T))} \beta_e \right] + \left[\frac{V_d(1-T)}{(V_e + V_d(1-T))} \beta_d \right]$$

The Growth Model	17
-------------------------	----

$$P_0 = \frac{D_0(1+g)}{(K_e - g)} \text{ or } P_0 = \frac{D_0(1+g)}{(r_e - g)}$$

Gordon's Growth Approximation	17
--------------------------------------	----

$$g = br_e$$

The weighted average cost of capital	15
---	----

$$\text{WACC} = \left[\frac{V_e}{V_e + V_d} \right] k_e + \left[\frac{V_d}{V_e + V_d} \right] k_d (1-T)$$

The Fisher formula	19
---------------------------	----

$$(1 + i) = (1 + r)(1 + h)$$

Purchasing Power Parity and Interest Rate Parity

$S_1 = S_0 \times \frac{(1+h_c)}{(1+h_b)}$	19
--	----

$F_0 = S_0 \times \frac{(1+i_c)}{(1+i_b)}$	19
--	----

Formulae to learn

Profitability ratios include:

$$\text{ROCE} = \frac{\text{Profit from operations}}{\text{Capital employed}} \%$$

$$\text{ROCE} = \frac{\text{Profit from operations}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Capital employed}}$$

Profit margin \times Asset turnover

Debt ratios include:

$$\text{Gearing} = \frac{\text{Book value of debt}}{\text{Book value of equity}}$$

$$\text{Interest coverage} = \frac{\text{Profit from operations}}{\text{Interest}}$$

Liquidity ratios include:

$$\text{Current ratio} = \text{Current assets} : \text{Current liabilities}$$

$$\text{Acid Test ratio} = \text{Current assets} : \text{Current liabilities (less inventory)}$$

Shareholder investor ratios include:

$$\text{Dividend yield} = \frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$$

$$\text{Earnings per share} = \frac{\text{Profits distributable to ordinary shareholders}}{\text{Number of ordinary shares issued}}$$

$$\text{Price-earnings ratio} = \frac{\text{Market price per share}}{\text{EPS}}$$

$$\text{Av. collection period} = \frac{\text{Receivables}}{\text{(credit) sales}} \times 365 \text{ days}$$

Inventory days

$$(a) \text{ Finished goods: } \frac{\text{Finished goods}}{\text{Cost of sales}} \times 365 \text{ days}$$

$$(b) \text{ WIP: } \frac{\text{WIP}}{\text{Cost of production}} \times 365 \text{ days}$$

$$(c) \text{ Raw material: } \frac{\text{Raw material}}{\text{Raw material purchases}} \times 365 \text{ days}$$

$$\text{Av. payables period} = \frac{\text{Payables}}{\text{(credit)purchases}} \times 365 \text{ days}$$

$$\text{IRR} = a + \frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} (b - a)$$

$$\text{Equivalent annual cost} = \frac{\text{NPV of costs}}{\text{Annuity factor for the life of the project}}$$

$$\text{Cost of equity} = K_e = \frac{D_1}{P_0} + g$$

$$\text{Cost of debt} = K_d = \frac{i(1 - T)}{P_0}$$

$$\text{Cost of preference shares} = K_{\text{pref}} = \frac{\text{Preference Dividend}}{\text{Market Value}_{(\text{ex div})}} = \frac{d}{P_0}$$

$$\text{Profitability index} = \frac{\text{NPV of cash inflows}}{\text{Cash outflow}}$$

Exam information

The exam is a three-hour paper containing **four** compulsory 25 mark questions. There will be a mixture of calculations and discussion and the examiner's aim is to cover as much of the syllabus as possible.

Additional information

The Study Guide provides more detailed guidance on the syllabus.

December 2009

- 1 Lease or buy; NPV; investment decisions
- 2 Cost of debt; CAPM; WACC; dividend growth model; dividend policy
- 3 Ex rights price; EPS; transaction and translation risk; exchange rate hedging
- 4 Role financial intermediaries; forecast financial statements; working capital policy and management

This paper is Mock Exam 3 this Kit

June 2009

	<i>Questions in this Kit</i>
1 Weighted average cost of capital; business valuation; capital structure and the WACC	56
2 Capital investment decision making process: investment appraisal	27
3 Working capital financing strategy; forecast cash flow; foreign receivables management	16
4 Financial performance analysis; rights issue; sources of finance	41

Examiner's comments. This examination paper covered many syllabus areas and candidates who had omitted some parts of the syllabus from their study may have found it difficult as a consequence.

December 2008

	<i>Questions in this Kit</i>
1 Rights issues; business valuation; agency problem	55
2 Interest rate risk; overtrading; factoring	64
3 WACC; investment appraisal; CAPM	26
4 Debt finance; debt valuation; exchange rate risk	61

Examiner's comments. The examination paper was seen to have a good balance between calculation and discussion, as well as a good coverage of the syllabus. Unsuccessful candidates may have prepared poorly for the examination. This examination paper covered many areas of the syllabus and tended to be difficult for candidates who had omitted some sections of the syllabus from their study. Most answers were reasonably well presented, with very few scripts being drawn to the examiner's attention as difficult to read or difficult to follow.

June 2008

Questions in this Kit

1	Weighted average cost of capital: Calculation; discussion; comparison of CAPM with divided growth model	50
2	Business valuation: Dividend growth model calculation; rights issue pricing; P/E ratio method; EMH; debt v equity finance	54
3	Working capital: Discussion of level of investment; accounts receivable management; calculation using ratios; EOQ	15
4	Investment appraisal: Calculations of NPV and IRR; discussion of acceptability and limitations; shareholder wealth maximisation	25

Examiner's comments. Where candidates did not reach a pass standard, the main reason was a lack of preparation or a lack of understanding. Students should remember that all parts of the syllabus are examinable and producing answers with very little discussion is unwise. It is good exam practice to present answers clearly as this helps the marker.

December 2007

Questions in this Kit

1	Business valuation; convertible bond valuation; efficient market hypothesis	53
2	Investment appraisal: Calculations of NPV and IRR; risk and uncertainty	24
3	Sources of finance: Dividend policy; debt finance; rights issue; operating lease	40
4	Working capital management: Objectives; EOQ; accounts receivable; hedging payables	14

Examiner's comments. There was little evidence of any time pressure and some candidates scored very high marks. Failure to pass the exam appeared generally to be associated with a lack of preparation and revision, with some candidates producing very short answers, or answers with some calculations but with very little discussion. It was good to see many candidates providing clearly labelled workings and well laid-out calculations in their answers.

Pilot paper

Questions in this Kit

1	Weighted average cost of capital: Calculation; discussion; ratio analysis	49
2	Foreign currency: Risk; forecasts; forward market; money market hedge; futures contract	60
3	Working capital: Evaluation of credit policy; Miller-Orr; accounts receivable management; funding policy	13
4	Investment appraisal: Calculations of NPV and ROCE; strengths and weaknesses of IRR	21

Analysis of past papers

The table below provides details of when each element of the syllabus has been examined and the question number and section in which each element appeared

Covered in Text chapter		Dec 2009	June 2009	Dec 2008	June 2008	Dec 2007	Pilot Paper
	FINANCIAL MANAGEMENT FUNCTION						
1	Nature & purpose						
1	Objectives	3a,b	4a				
1	Stakeholders			1e			
	FINANCIAL MANAGEMENT ENVIRONMENT						
2	Economic environment						
3	Financial markets and institutions	4a					
	WORKING CAPITAL MANAGEMENT						
4, 5	Management	4b,d	3c	2b,c	3a,b,c,d	4a,b,c	3a,b,c
6	Funding strategies	4c	3a,b				3d
	INVESTMENT APPRAISAL						
7	Non-discounted cash flow techniques		2a,b				4b
8, 9	Discounted cash flow techniques	1a, b	2b,c	3b	1b, 4a,b,c, d	2a,b	4a,c
10	Risk and uncertainty					2c	
11	Specific investment decisions	1d,2b					
	BUSINESS FINANCE						
12	Sources of short-term finance	4a				3d	
12	Sources of long term-finance		4b,c	1a,4a	2b,e	3b,c	
13	Dividend policy	2d				3a	
14	Finance for SMEs						
	COST OF CAPITAL						
15	Calculation	2a,b,c	1a	3a	1a,c		1a
16	Gearing (capital structure)		1c	3c			1b,c
	BUSINESS VALUATIONS						
17	Valuation of shares		1b	1b,c,d	2a,c	1a	
17	Valuation of debt			4b		1b	
18	Efficient market hypothesis / practical considerations				2d	1c	
	RISK MANAGEMENT						
19	Causes of interest rate / exchange rate fluctuations	3c					
19	Hedging foreign currency risk	3d		4c,d			2b
20	Hedging interest rate risk			2a		4d	2a,c,d

Useful websites

The websites below provide additional sources of information of relevance to your studies for *Financial Management*.

- www.accaglobal.com
ACCA's website. Includes student section.
- www.bpp.com
Our website provides information about BPP products and services, with a link to the ACCA website.
- www.ft.com
This website provides information about current international business. You can search for information and articles on specific industry groups as well as individual companies.
- www.economist.com
Here you can search for business information on a week-by-week basis, search articles by business subject and use the resources of the Economist Intelligence Unit to research sectors, companies or countries.
- www.invweek.co.uk
This site carries business news and articles on markets from Investment Week and International Investment.
- www.pwglobal.com/uk
The PricewaterhouseCoopers website includes UK Economic Outlook
- www.bbc.co.uk
The website of the BBC carries general business information as well as programme-related content.

Planning your question practice

We have already stressed that question practice should be right at the centre of your revision. Whilst you will spend some time looking at your notes and Paper F9 Passcards, you should spend the majority of your revision time practising questions.

We recommend two ways in which you can practise questions.

- Use **BPP's question plan** to work systematically through the syllabus and attempt key and other questions on a section-by-section basis
- **Build your own exams** – attempt questions as a series of practice exams

These ways are suggestions and simply following them is no guarantee of success. You or your college may prefer an alternative but equally valid approach.

BPP's question plan

The BPP plan below requires you to devote a **minimum of 40 hours** to revision of Paper F9. Any time you can spend over and above this should only increase your chances of success.

- Step 1** **Review your notes** and the chapter summaries in the Paper F9 **Passcards** for each section of the syllabus.
- Step 2** **Answer the key questions** for that section. These questions have boxes round the question number in the table below and you should answer them in full. Even if you are short of time you must attempt these questions if you want to pass the exam. You should complete your answers without referring to our solutions.
- Step 3** **Attempt the other questions** in that section. For some questions we have suggested that you prepare **answer plans or do the calculations** rather than full solutions. Planning an answer means that you should spend about 30% of the time allowance for the questions brainstorming the question and drawing up a list of points to be included in the answer.
- Step 4** Attempt **Mock exams 1, 2 and 3** under strict exam conditions.

Syllabus section	2009 Passcards chapters	Questions in this Kit	Comments	Done <input checked="" type="checkbox"/>
Revision period 1				
Financial management	1-3	<input type="checkbox"/> 1	Answer in full. This straightforward question shows how ratio calculations can be combined with discussion.	<input type="checkbox"/>
		<input type="checkbox"/> 2	Answer in full. More valuable practice at combining ratios with discussion.	<input type="checkbox"/>
		3	Prepare an answer plan as this question covers a number of important areas.	<input type="checkbox"/>
Revision period 2				
Working capital management	4	5	Do the calculations and prepare an answer plan for the discussion parts.	<input type="checkbox"/>
Inventory management	5	7	Do the calculations and prepare an answer plan for the discussion parts.	<input type="checkbox"/>
		8	Do the calculations and prepare an answer plan for the discussion parts.	<input type="checkbox"/>
Revision period 3				
Cash management	6	<input type="checkbox"/> 13	Answer in full. This is the working capital management question from the Pilot Paper.	<input type="checkbox"/>
		<input type="checkbox"/> 15	Answer in full. This is the working capital management question from December 2007.	<input type="checkbox"/>
		<input type="checkbox"/> 16	Answer in full. This is the working capital management question from June 2008.	<input type="checkbox"/>
		<input type="checkbox"/> 15	Answer in full. This is the working capital management question from June 2009.	<input type="checkbox"/>
Revision period 4				
Investment appraisal	7-10	17	Do this question if you feel you need practice at basic investment appraisal techniques.	<input type="checkbox"/>
		19	Do this question if you feel you need practice at NPV techniques.	<input type="checkbox"/>
		<input type="checkbox"/> 23	Answer in full. This question tests your knowledge of risk appraisal.	<input type="checkbox"/>
		<input type="checkbox"/> 24	Answer in full. The investment appraisal question from December 2007.	<input type="checkbox"/>
		<input type="checkbox"/> 25	Answer in full. The investment appraisal question from June 2008.	<input type="checkbox"/>
		<input type="checkbox"/> 26	Answer in full. The investment appraisal question from December 2008.	<input type="checkbox"/>

Syllabus section	2009 Passcards chapters	Questions in this Kit	Comments	Done <input checked="" type="checkbox"/>
Revision period 5 Specific investment decisions	11	<input type="checkbox"/> 28	Answer in full. A classic lease v buy question.	<input type="checkbox"/>
		<input type="checkbox"/> 29	Answer in full. Another leasing question to practise which also covers capital rationing.	<input type="checkbox"/>
		<input type="checkbox"/> 30	Answer in full. This question provides practice at asset replacement calculations and also a detailed discussion on the limitations of NPV.	<input type="checkbox"/>
		<input type="checkbox"/> 32	Answer in full. A good test of your knowledge of capital rationing combining calculations and discussion.	<input type="checkbox"/>
Revision period 6 Sources of finance	12-13	<input type="checkbox"/> 33	Answer this Paper 2.4 question in full. It provides good practice of some important calculations.	<input type="checkbox"/>
		<input type="checkbox"/> 34	Answer in full. This question covers a wide range of calculations from this area of the syllabus.	<input type="checkbox"/>
		<input type="checkbox"/> 36	Answer in full. This question gives you valuable practice at doing ratio calculations and understanding their meaning.	<input type="checkbox"/>
Revision period 7 Sources of finance	12-14	34	Do the calculations and prepare answer plans for the written sections of this wide ranging sources of finance question.	<input type="checkbox"/>
		<input type="checkbox"/> 35	Answer in full. The question covers a range of syllabus areas and would be very useful to do under timed conditions.	<input type="checkbox"/>
		<input type="checkbox"/> 40	Answer in full. The sources of finance question from December 2007.	<input type="checkbox"/>
		<input type="checkbox"/> 41	Answer in full. The sources of finance question from June 2009.	<input type="checkbox"/>

Syllabus section	2009 Passcards chapters	Questions in this Kit	Comments	Done <input checked="" type="checkbox"/>
Revision period 8 Cost of capital	15	42	Do the calculations in parts (a) and (b) as they are essential techniques. Prepare answer plans for parts (c) and (d).	<input type="checkbox"/>
		<input type="checkbox"/> 43	Answer in full. This question gives you practice at these essential calculations as well as 13 marks for explanations.	<input type="checkbox"/>
		44	Do the CAPM calculations in parts (a) and (b).	<input type="checkbox"/>
		<input type="checkbox"/> 46	Answer in full. This question provides practice in a number of areas of the syllabus and shows they can be linked into one question.	<input type="checkbox"/>
Revision period 9 Cost of capital	15-16	<input type="checkbox"/> 47	Answer in full. A good test of various aspects of CAPM.	<input type="checkbox"/>
		<input type="checkbox"/> 48	Answer in full. A good test of your understanding of CAPM and project-specific discount rates.	<input type="checkbox"/>
		<input type="checkbox"/> 49	Answer in full. This is the cost of capital question from the Pilot Paper.	<input type="checkbox"/>
		<input type="checkbox"/> 50	Answer in full. The cost of capital question from June 2008.	<input type="checkbox"/>
Revision period 10 Business valuations	17 - 18	<input type="checkbox"/> 51	Answer in full. This is a classic business valuation question which is combined with sources of finance.	<input type="checkbox"/>
		52	Do the calculations in part (a), prepare brief notes on parts (b) and prepare a full answer for part (c) on how share markets work.	<input type="checkbox"/>
Revision period 11 Business valuations	17-18	<input type="checkbox"/> 53	Answer in full. The business valuation question from December 2007.	<input type="checkbox"/>
		<input type="checkbox"/> 54	Answer in full. The business valuation question from June 2008.	<input type="checkbox"/>
		<input type="checkbox"/> 55	Answer in full. The business valuation question from December 2008.	<input type="checkbox"/>
		<input type="checkbox"/> 56	Answer in full. The business valuation question from June 2009.	<input type="checkbox"/>

Syllabus section	2009 Passcards chapters	Questions in this Kit	Comments	Done <input checked="" type="checkbox"/>
Revision period 12 Exchange rate risk management	19	<input type="checkbox"/> 57	Answer in full. This question tests your knowledge of foreign currency risk as well as working capital management.	<input type="checkbox"/>
		<input type="checkbox"/> 58	Answer in full. An excellent test of various aspects of foreign currency risk management.	<input type="checkbox"/>
		59	Do the calculations in parts (a) and prepare answer plans for the written parts of the question.	<input type="checkbox"/>
		<input type="checkbox"/> 60	This is the risk management question from the Pilot Paper.	<input type="checkbox"/>
		<input type="checkbox"/> 61	Answer in full. A wide ranging question from December 2008.	<input type="checkbox"/>
Revision period 13 Interest rates	20	<input type="checkbox"/> 62	Answer in full. This question gives you practice at explaining various aspects of interest rates.	<input type="checkbox"/>
		<input type="checkbox"/> 63	Answer in full. A discussion question covering a range of interest rate topics.	<input type="checkbox"/>
		<input type="checkbox"/> 64	Answer in full. A wide ranging question from December 2008.	<input type="checkbox"/>

Build your own exams

Having revised your notes and the BPP Passcards, you can attempt the questions in the Kit as a series of practice exams.

	Practice exams					
	1	2	3	4	5	6
1	1	2	3	5	7	8
2	9	10	11	13	18	20
3	29	31	28	33	34	36
4	43	44	47	57	58	59

Whichever practice exams you use, you must attempt **Mock exams 1, 2 and 3** at the end of your revision.

Questions

ACCA examiner's answers

The ACCA examiner's answers to questions marked 'Pilot paper', '12/07', '6/08' or '12/08' or, can be found on the BPP website at the following link:

www.bpp.com/acca/examiner-solutions

Additional question guidance

Additional guidance to certain questions can be found on the BPP website at the following link:

www.bpp.com/acca/extra-question-guidance

FINANCIAL MANAGEMENT FUNCTION

Questions 1 and 2 cover Financial Management Function, the subject of Part A of the BPP Study Text for Paper F9.

1 ABC Co**45 mins**

Summary financial information for ABC Co is given below, covering the last two years.

	<i>Current year</i>	<i>Previous year</i>
	€'000	€'000
Revenue	74,521	68,000
Cost of sales	28,256	25,772
Salaries and wages	20,027	19,562
Other costs	11,489	9,160
Profit before interest and tax	14,749	13,506
Interest	1,553	1,863
Tax	4,347	3,726
Profit after interest and tax	8,849	7,917
Dividends payable	4,800	3,100
Shareholders' funds	39,900	35,087
Long term debt	<u>14,000</u>	<u>17,500</u>
Number of shares in issue ('000)	14,000	14,000
P/E ratio (average for year)		
ABC Co	14.0	13.0
Industry	15.2	15.0

Required

- (a) Using profitability, debt, and shareholders' investment ratios, discuss the performance of ABC Co over the last two years. **(12 marks)**
- (b) Explain why how accounting profits may not be the best measure of a company's achievements. **(5 marks)**
- (c) Discuss how good corporate governance procedures can help to manage under-performance in private sector companies. **(8 marks)**

(Total = 25 marks)

2 RZP Co (FMC, 6/05)

45 mins

As assistant to the Finance Director of RZP Co, a company that has been listed on the London Stock Market for several years, you are reviewing the draft Annual Report of the company, which contains the following statement made by the chairman:

'This company has consistently delivered above-average performance in fulfilment of our declared objective of creating value for our shareholders. Apart from 20X2, when our overall performance was hampered by a general market downturn, this company has delivered growth in dividends, earnings and ordinary share price. Our shareholders can rest assured that my directors and I will continue to deliver this performance in the future'.

The five-year summary in the draft Annual Report contains the following information:

Year	20X4	20X3	20X2	20X1	20X0
Dividend per share	2.8p	2.3p	2.2p	2.2p	1.7p
Earnings per share	19.04p	14.95p	11.22p	15.84p	13.43p
Price/earnings ratio	22.0	33.5	25.5	17.2	15.2
General price index	117	113	110	105	100

A recent article in the financial press reported the following information for the last five years for the business sector within which RZP Co operates:

Share price growth	average increase per year of 20%
Earnings growth	average increase per year of 10%
Nominal dividend growth	average increase per year of 10%
Real dividend growth	average increase per year of 9%

You may assume that the number of shares issued by RZP Co has been constant over the five-year period. All price/earnings ratios are based on end-of-year share prices.

Required

- (a) Analyse the information provided and comment on the views expressed by the chairman in terms of:
- growth in dividends per share;
 - share price growth;
 - growth in earnings per share.

Your analysis should consider both arithmetic mean and equivalent annual growth rates. **(13 marks)**

- (b) Calculate the total shareholder return (dividend yield plus capital growth) for 20X4 and comment on your findings. **(3 marks)**
- (c) Discuss the factors that should be considered when deciding on a management remuneration package that will encourage the directors of RZP Co to maximise the wealth of shareholders, giving examples of management remuneration packages that might be appropriate for RZP Co. **(9 marks)**

(Total = 25 marks)

FINANCIAL MANAGEMENT ENVIRONMENT

Questions 3 and 4 cover Financial Management Environment, the subject of Part B of the BPP Study Text for Paper F9.

3 Tagna (FMC, 6/03, amended)

45 mins

Tagna is a medium-sized company that manufactures luxury goods for several well-known chain stores. In real terms, the company has experienced only a small growth in turnover in recent years, but it has managed to maintain a constant, if low, level of reported profits by careful control of costs. It has paid a constant nominal (money terms) dividend for several years and its managing director has publicly stated that the primary objective of the company is to increase the wealth of shareholders. Tagna is financed as follows:

	\$m
Overdraft	1.0
10 year fixed interest bank loan	2.0
Share capital and reserves	4.5
	<u>7.5</u>

Tagna has the agreement of its existing shareholders to make a new issue of shares on the stock market but has been informed by its bank that current circumstances are unsuitable. The bank has stated that if new shares were to be issued now they would be significantly under-priced by the stock market, causing Tagna to issue many more shares than necessary in order to raise the amount of finance it requires. The bank recommends that the company waits for at least six months before issuing new shares, by which time it expects the stock market to have become strong-form efficient.

The financial press has reported that it expects the Central Bank to make a substantial increase in interest rate in the near future in response to rapidly increasing consumer demand and a sharp rise in inflation. The financial press has also reported that the rapid increase in consumer demand has been associated with an increase in consumer credit to record levels.

Required

- (a) On the assumption that the Central Bank makes a substantial interest rate increase, discuss the possible consequences for Tagna in the following areas:
- (i) sales;
 - (ii) operating costs; and,
 - (iii) earnings (profit after tax). (10 marks)
- (b) Explain and compare the public sector objective of 'value for money' and the private sector objective of 'maximisation of shareholder wealth'. (6 marks)
- (c) Outline the economic problems caused by monopoly and explain the role of government in maintaining competition between companies. (9 marks)

(Total = 25 marks)

4 Phoenix

45 mins

Phoenix has carried on business for a number of years as a retailer of a wide variety of consumer products and it operates from a number of stores. In recent years the entity has found it necessary to provide credit facilities to its customers in order to maintain growth in revenue. As a result of this decision the liability to its bankers has increased substantially. Extracts from the financial statements for the year are provided below.

INCOME STATEMENTS FOR THE YEARS ENDED 30 JUNE

	20X7	20X8	20X9
	\$m	\$m	\$m
Revenue	1,850	2,200	2,500
Cost of sales	(1,250)	(1,500)	(1,750)
Gross profit	600	700	750
Other operating costs	(550)	(640)	(700)
Profit from operations	50	60	50
Interest from credit sales	45	60	90
Interest payable	(25)	(60)	(110)
Profit before taxation	70	60	30
Income tax expense	(23)	(20)	(10)
Profit for the year	<u>47</u>	<u>40</u>	<u>20</u>

STATEMENTS OF FINANCIAL POSITION AT 30 JUNE

	20X7	20X8	20X9
	\$m	\$m	\$m
Property, plant and equipment	278	290	322
Inventories	400	540	620
Trade receivables	492	550	633
Cash	12	12	15
	<u>1,182</u>	<u>1,392</u>	<u>1,590</u>
Share capital	90	90	90
Reserves	282	292	282
	372	382	372
Bank loans	320	520	610
Other interest bearing borrowings	200	200	320
Trade payables	270	270	280
Tax payable	20	20	8
	<u>1,182</u>	<u>1,392</u>	<u>1,590</u>

Other information

- Depreciation charged for the three years in question was as follows.

Year ended 30 June	20X7	20X8	20X9
	\$m	\$m	\$m
	55	60	70

- The other interest bearing borrowings are secured by a floating charge over the assets of Phoenix. Their repayment is due on 30 June 20Y9.
- The bank loans are unsecured. The maximum lending facility the bank will provide is \$630m.
- Over the past three years the level of credit sales has been:

Year ended 30 June	20X7	20X8	20X9
	\$m	\$m	\$m
	300	400	600

The entity offers extended credit terms for certain products to maintain market share in a highly competitive environment.

Given the steady increase in the level of bank loans which has taken place in recent years, the entity has recently written to its bankers to request an increase in the lending facility. The bank is concerned at the steep escalation in the level of the loans and has requested an urgent meeting.

Required

- (a) Using suitable ratios, analyse the information provided and recommend what action should be taken. **(12 marks)**
- (b) Explain what is meant by the 'risk/return trade-off' and its relevance to the bank in assessing the request for further loan finance. **(5 marks)**
- (c) A bank is an example of a financial intermediary. Explain the role of financial intermediaries and their usefulness to the private investor. **(8 marks)**

(Total = 25 marks)

WORKING CAPITAL MANAGEMENT

Questions 5 to 16 cover Working Capital Management, the subject of Part C of the BPP Study Text for Paper F9.

5 East Meets West Co

45 mins

You are an accounting technician working at East Meets West Co, a company that manufactures and distributes clothing. You have estimated the following figures for the coming year:

Sales	\$5,600,000
Average receivables	\$506,000
Gross profit margin	25% on sales
Average inventories	
Finished goods	\$350,000
Work in progress	\$550,000
Raw materials	\$220,000
Average payables	\$210,000

Material costs represent 50% of the total cost of sales.

East Meets West Co imports most of its materials from overseas countries, especially Pernisia. The high inflation rates in Pernisia have meant that the company's cost of materials has risen rapidly over recent years. This has led to a significant deterioration in the company's margins, which, coupled with its increasing liquidity problems, is making the shareholders nervous.

Required

- (a) Calculate the cash operating cycle, to the nearest day. **(6 marks)**
- (b) Suggest four methods of reducing the length of the cash operating cycle. **(4 marks)**
- (c) Discuss:
 - (i) The significance of trade payables in a firm's working capital cycle; and **(4 marks)**
 - (ii) The dangers of over-reliance on trade credit as a source of finance. **(4 marks)**
- (d) Explain the general problems associated with inflation. **(7 marks)**

(Total = 25 marks)

6 JIT and EOQ

45 mins

PS Co has an opportunity to engage in a just-in-time stock delivery arrangement with its main customer, which normally takes 90 days to settle accounts with PS Co. The customer accounts for 20% of PS Co's annual turnover of \$20 million. This involves borrowing \$0.5m on overdraft to invest in dedicated handling and transport equipment. This would be depreciated over five years on a straight-line basis. The customer is uninterested in the early payment discount but would be prepared to settle after 60 days and to pay a premium of 5% over the present price in exchange for guarantees regarding product quality and delivery. PS Co judges the probability of failing to meet these guarantees in any one year at 5%. Failure would trigger a penalty payment of 10% of the value of total sales to this customer (including the premium). PS Co borrows from the bank at 13%.

Required

- (a) Calculate the improvement in *profits before tax* to be expected in the first trading year after entering into the JIT arrangement. Comment on your results. **(8 marks)**
- (b) Suggest the benefits PS Co might expect to derive from a JIT agreement in addition to the benefits specified in the question. **(6 marks)**
- (c) SP Co purchases many hundreds of components each year from external suppliers for assembling into products. It uses 40,000 units pa of one particular component. It is considering converting its purchasing, delivery and stock control of this item to a just-in-time system. This will raise the number of orders placed

but lower the administrative and other costs of placing and receiving orders. If successful, this will provide the model for switching most of its inwards supplies on to this system. Details of actual and expected ordering and carrying costs are given in the table below.

	<i>Actual</i>	<i>Proposed</i>
Ordering cost per order (O)	\$100	\$25
Purchase cost per item (P)	\$2.50	\$2.50
Inventory holding cost (as a percentage of the purchase cost) (I)	20%	20%

To implement the new arrangements will require 'one-off' reorganisation costs estimated at \$4,000 which will be treated as a revenue item for tax purposes. The rate of corporation tax is 30% and SP can obtain finance at 12%. The effective life span of the new system can be assumed to be eight years.

Required

- (i) Determine the effect of the new system on the Economic Order Quantity (EOQ).
- (ii) Determine whether the new system is worthwhile in financial terms.

Note. EOQ is given by $EOQ = \sqrt{\frac{2C_0D}{C_H}}$. **(11 marks)**

(Total = 25 marks)

7 TNG Co (FMC, 6/05)

45 mins

TNG Co expects annual demand for product X to be 255,380 units. Product X has a selling price of \$19 per unit and is purchased for \$11 per unit from a supplier, MKR Co. TNG places an order for 50,000 units of product X at regular intervals throughout the year. Because the demand for product X is to some degree uncertain, TNG maintains a safety (buffer) inventory of product X which is sufficient to meet demand for 28 working days. The cost of placing an order is \$25 and the storage cost for Product X is 10 cents per unit per year.

TNG normally pays trade suppliers after 60 days but MKR has offered a discount of 1% for cash settlement within 20 days.

TNG Co has a short-term cost of debt of 8% and uses a working year consisting of 365 days.

Required

- (a) Calculate the annual cost of the current ordering policy. Ignore financing costs in this part of the question. **(4 marks)**
- (b) Calculate the annual saving if the economic order quantity model is used to determine an optimal ordering policy. Ignore financing costs in this part of the question. **(5 marks)**
- (c) Determine whether the discount offered by the supplier is financially acceptable to TNG Co. **(4 marks)**
- (d) Critically discuss the limitations of the Economic Order Quantity model as a way of managing inventory. **(4 marks)**
- (e) Discuss the advantages and disadvantages of using just-in-time inventory management methods. **(8 marks)**

(Total = 25 marks)

8 PNP Co (FMC, 6/07)

45 mins

The following financial information relates to PNP Co for the year just ended:

	£'000
Turnover	5,242.0
Variable cost of sales	3,145.0
Inventory	603.0
Receivables	744.5
Payables	574.5

Segmental analysis of receivables

	<i>Balance</i> £	<i>Average payment period</i>	<i>Discount</i>	<i>Bad debts</i> £
Class 1	200,000	30 days	1.0%	none
Class 2	252,000	60 days	nil	12,600
Class 3	110,000	75 days	nil	11,000
Overseas receivables	<u>182,500</u>	90 days	nil	<u>21,900</u>
	<u>744,500</u>			<u>45,500</u>

The receivable balances given are before taking account of bad debts. All sales are on credit. Production and sales take place evenly throughout the year. Current sales for each class of receivables are in proportion to their relative year-end balances before bad debts. The overseas receivables arise from regular export sales by PNP to the USA. The current spot rate is \$1.7348/£ and the three-month forward rate is \$1.7367/£.

It has been proposed that the discount for early payment be increased from 1.0% to 1.5% for settlement within 30 days. It is expected that this will lead to 50% of existing Class 2 receivables becoming Class 1 receivables, as well as attracting new business worth £500,000 in turnover. The new business would be divided equally between Class 1 and Class 2 receivables. Fixed costs would not increase as a result of introducing the discount or by attracting new business. PNP finances receivables from an overdraft at an annual interest rate of 8%.

Required

- Calculate the net benefit or cost of increasing the discount for early payment and comment on the acceptability of the proposal. **(9 marks)**
- Calculate the current cash operating cycle and the revised cash operating cycle caused by increasing the discount for early payment. **(4 marks)**
- Determine the effect of using a forward market hedge to manage the exchange rate risk of the outstanding overseas receivables. **(2 marks)**
- Identify and explain the key elements of a receivables management system suitable for PNP Co. **(10 marks)**

(Total = 25 marks)

9 Thorne Co (FMC, 12/05)

45 mins

Thorne Co values, advertises and sells residential property on behalf of its customers. The company has been in business for only a short time and is preparing a cash budget for the first four months of 20X6. Expected sales of residential properties are as follows.

	20X5	20X6	20X6	20X6	20X6
Month	December	January	February	March	April
Units sold	10	10	15	25	30

The average price of each property is \$180,000 and Thorne Co charges a fee of 3% of the value of each property sold. Thorne Co receives 1% in the month of sale and the remaining 2% in the month after sale. The company has nine employees who are paid on a monthly basis. The average salary per employee is \$35,000 per year. If more than 20 properties are sold in a given month, each employee is paid in that month a bonus of \$140 for each additional property sold.

Variable expenses are incurred at the rate of 0.5% of the value of each property sold and these expenses are paid in the month of sale. Fixed overheads of \$4,300 per month are paid in the month in which they arise. Thorne Co pays interest every three months on a loan of \$200,000 at a rate of 6% per year. The last interest payment in each year is paid in December.

An outstanding tax liability of \$95,800 is due to be paid in April. In the same month Thorne Co intends to dispose of surplus vehicles, with a net book value of \$15,000, for \$20,000. The cash balance at the start of January 20X6 is expected to be a deficit of \$40,000.

Required

- (a) Prepare a monthly cash budget for the period from January to April 20X6. Your budget must clearly indicate each item of income and expenditure, and the opening and closing monthly cash balances. **(10 marks)**
- (b) Discuss the factors to be considered by Thorne Co when planning ways to invest any cash surplus forecast by its cash budgets. **(5 marks)**
- (c) Discuss the advantages and disadvantages to Thorne Co of using overdraft finance to fund any cash shortages forecast by its cash budgets. **(5 marks)**
- (d) Explain how the Baumol model can be employed to reduce the costs of cash management and discuss whether the Baumol cash management model may be of assistance to Thorne Co for this purpose. **(5 marks)**

(Total = 25 marks)

10 Velm Co (FMC, 6/03)

45 mins

Velm Co sells stationery and office supplies on a wholesale basis and has an annual turnover of \$4,000,000. The company employs four people in its sales ledger and credit control department at an annual salary of \$12,000 each. All sales are on 40 days' credit with no discount for early payment. Bad debts represent 3% of turnover and Velm Co pays annual interest of 9% on its overdraft. The most recent accounts of the company offer the following financial information:

Velm Co: Statement of Financial Position as at 31 December 20X2

	\$'000	\$'000
Non-current assets		17,500
<i>Current assets</i>		
Inventory of goods for resale	900	
Receivables	550	
Cash	<u>120</u>	
		<u>1,570</u>
		<u>19,070</u>
<i>Equity and liabilities</i>		
Ordinary shares	3,500	
Reserves	<u>11,640</u>	
		15,140
<i>Non-current liabilities</i>		
12% Debenture due 20Y0		2,400
<i>Current liabilities</i>		
Trade payables	330	
Overdraft	<u>1,200</u>	
		<u>1,530</u>
		<u>19,070</u>

Velm Co is considering offering a discount of 1% to customers paying within 14 days, which it believes will reduce bad debts to 2.4% of turnover. The company also expects that offering a discount for early payment will reduce the average credit period taken by its customers to 26 days. The consequent reduction in the time spent chasing customers where payments are overdue will allow one member of the credit control team to take early retirement. Two-thirds of customers are expected to take advantage of the discount.

Required

- (a) Using the information provided, determine whether a discount for early payment of 1 per cent will lead to an increase in profitability for Velm Co. **(5 marks)**
- (b) Discuss the relative merits of short-term and long-term debt sources for the financing of working capital. **(6 marks)**
- (c) Discuss the different policies that may be adopted by a company towards the financing of working capital needs and indicate which policy has been adopted by Velm Co. **(7 marks)**
- (d) Outline the advantages to a company of taking steps to improve its working capital management, giving examples of steps that might be taken. **(7 marks)**

(Total = 25 marks)

11 PCB Co

45 mins

PCB Co manufacture printed circuit boards for use in pocket calculators. It is now December 20X8. Since the year 20X5 business has been expanding very rapidly and the company has now encountered a liquidity problem, as illustrated by the most recent balance sheets reproduced below.

PCB Co Statement of Financial Position extracts

	<i>As at 30 November 20X8</i>	<i>As at 30 November 20X7</i>
	\$	\$
Non-current assets	<u>308,000</u>	<u>264,000</u>
<i>Current assets</i>		
Inventory	220,000	95,000
Receivables	210,000	108,000
Cash	Nil	1,750
	<u>430,000</u>	<u>204,750</u>
<i>Current liabilities</i>		
Bank	158,000	41,250
Trade payables	<u>205,000</u>	<u>82,500</u>
Net current assets	<u>67,000</u>	<u>81,000</u>
<i>Capital and reserves</i>		
Issued share capital	18,000	18,000
Reserves	<u>357,000</u>	<u>327,000</u>
Equity		
Shareholders' funds	<u>375,000</u>	<u>345,000</u>

Other information

- (a) Sales for the year to 30 November 20X7 were \$1.7 million, yielding a gross profit of \$330,000, and a net profit before tax of \$82,000.
- (b) The tax rate on company profits is 30%.
- (c) For the year ending 30 November 20X7 dividends of \$35,000 were paid out.
- (d) At the beginning of the year to 30 November 20X8 the company bought some new manufacturing equipment and recruited six more sales staff.
- (e) Sales for the year to 30 November 20X8 were \$3 million, with a gross profit of \$450,000, and net profit before tax of \$60,000.
- (f) Dividends payable for the year to 30 November 20X8 amounted to \$12,000.

Required

- (a) Illustrating your answer with figures taken from the question, explain why it is not unusual for manufacturing companies to face a cash shortage when sales are expanding very rapidly. **(7 marks)**

- (b) Explain why PCB Co has not increased its net profit, despite the large increase in sales between 20X7 and 20X8. **(5 marks)**
- (c) How has the mix of funding used by PCB changed between the two years, and what are the implications of such changes in terms of investor and payable risks? **(7 marks)**
- (d) Suggest ways in which PCB might seek to resolve its current funding problems, and avoid the risks associated with overtrading. **(6 marks)**

(Total = 25 marks)

12 Special Gift Suppliers (FMC, 12/01)

45 mins

Special Gift Suppliers Co is a wholesale distributor of a variety of imported goods to a range of retail outlets. The company specialises in supplying ornaments, small works of art, high value furnishing (rugs, etc) and other items that the chief buyer for the company feels would have a market. In seeking to improve working capital management, the financial controller has gathered the following information.

	<i>Months</i>
Average period for which items are held in inventory	3.5
Average receivables collection period	2.5
Average payables payment period	2.0

Required

- (a) Calculate Special Gift Suppliers' funding requirement for working capital measured in terms of months. **(2 marks)**

In looking to reduce the working capital funding requirement, the financial controller of Special Gift Suppliers is considering factoring credit sales. The company's annual turnover is \$2.5m of which 90% are credit sales. Bad debts are typically 3% of credit sales. The offer from the factor is conditional on the following.

- The factor will take over the sales ledger of Special Gift Suppliers completely.
- 80% of the value of credit sales will be advanced immediately (as soon as sales are made to the customer) to Special Gift Suppliers, the remaining 20% will be paid to the company one month later. The factor charges 15% per annum on credit sales for advancing funds in the manner suggested. The factor is normally able to reduce the receivables' collection period to one month.
- The factor offers a 'no recourse' facility whereby they take on the responsibility for dealing with bad debts. The factor is normally able to reduce bad debts to 2% of credit sales.
- A charge for factoring services of 4% of credit sales will be made.
- A one-off payment of \$25,000 is payable to the factor.

The salary of the Sales Ledger Administrator (\$12,500) would be saved under the proposals and overhead costs of the credit control department, amounting to \$2,000 per annum, would have to be reallocated. Special Gift Suppliers' cost of overdraft finance is 12% per annum. Special Gift Suppliers pays its sales force on a commission only basis. The cost of this is 5% of credit sales and is payable immediately the sales are made. There is no intention to alter this arrangement under the factoring proposals.

Required

- (b) Evaluate the proposal to factor the sales ledger by comparing Special Gift Suppliers' existing receivable collection costs with those that would result from using the factor (assuming that the factor can reduce the receivables collection period to one month). **(8 marks)**
- (c) As an adviser to Special Gift Suppliers Co, write a report to the financial controller that outlines:
- How a credit control department might function
 - The benefits of factoring
 - How the financing of working capital can be arranged in terms of short and long term sources of finance

In particular, make reference to:

- (1) The financing of working capital or net current assets when short term sources of finance are exhausted
- (2) The distinction between fluctuating and permanent current assets.

(15 marks)

(Total = 25 marks)

13 Ulnad Co (Pilot paper)

45 mins

Ulnad Co has annual sales revenue of \$6 million and all sales are on 30 days' credit, although customers on average take ten days more than this to pay. Contribution represents 60% of sales and the company currently has no bad debts. Accounts receivable are financed by an overdraft at an annual interest rate of 7%.

Ulnad Co plans to offer an early settlement discount of 1.5% for payment within 15 days and to extend the maximum credit offered to 60 days. The company expects that these changes will increase annual credit sales by 5%, while also leading to additional incremental costs equal to 0.5% of turnover. The discount is expected to be taken by 30% of customers, with the remaining customers taking an average of 60 days to pay.

Required

- (a) Evaluate whether the proposed changes in credit policy will increase the profitability of Ulnad Co. **(6 marks)**
- (b) Renpec Co, a subsidiary of Ulnad Co, has set a minimum cash account balance of \$7,500. The average cost to the company of making deposits or selling investments is \$18 per transaction and the standard deviation of its cash flows was \$1,000 per day during the last year. The average interest rate on investments is 5.11%.
Determine the spread, the upper limit and the return point for the cash account of Renpec Co using the Miller-Orr model and explain the relevance of these values for the cash management of the company. **(6 marks)**
- (c) Identify and explain the key areas of accounts receivable management. **(6 marks)**
- (d) Discuss the key factors to be considered when formulating a working capital funding policy. **(7 marks)**

(Total = 25 marks)

14 PKA Co (12/07)

45 mins

PKA Co is a European company that sells goods solely within Europe. The recently-appointed financial manager of PKA Co has been investigating the working capital management of the company and has gathered the following information:

Inventory management

The current policy is to order 100,000 units when the inventory level falls to 35,000 units. Forecast demand to meet production requirements during the next year is 625,000 units. The cost of placing and processing an order is €250, while the cost of holding a unit in stores is €0.50 per unit per year. Both costs are expected to be constant during the next year. Orders are received two weeks after being placed with the supplier. You should assume a 50-week year and that demand is constant throughout the year.

Accounts receivable management

Domestic customers are allowed 30 days' credit, but the financial statements of PKA Co show that the average accounts receivable period in the last financial year was 75 days. The financial manager also noted that bad debts as a percentage of sales, which are all on credit, increased in the last financial year from 5% to 8%.

Accounts payable management

PKA Co has used a foreign supplier for the first time and must pay \$250,000 to the supplier in six months' time. The financial manager is concerned that the cost of these supplies may rise in euro terms and has decided to hedge the currency risk of this account payable. The following information has been provided by the company's bank:

Spot rate (\$ per €):	1.998 ± 0.002
Six months forward rate (\$ per €):	1.979 ± 0.004

Money market rates available to PKA Co:

	Borrowing	Deposit
One year euro interest rates:	6.1%	5.4%
One year dollar interest rates:	4.0%	3.5%

Assume that it is now 1 December and that PKA Co has no surplus cash at the present time.

Required

- (a) Identify the objectives of working capital management and discuss the conflict that may arise between them. **(3 marks)**
- (b) Calculate the cost of the current ordering policy and determine the saving that could be made by using the economic order quantity model. **(7 marks)**
- (c) Discuss ways in which PKA Co could improve the management of domestic accounts receivable. **(7 marks)**
- (d) Evaluate whether a money market hedge, a forward market hedge or a lead payment should be used to hedge the foreign account payable. **(8 marks)**

(Total = 25 marks)

15 FLG Co (6/08)

45 mins

FLG Co has annual credit sales of \$4.2 million and cost of sales of \$1.89 million. Current assets consist of inventory and accounts receivable. Current liabilities consist of accounts payable and an overdraft with an average interest rate of 7% per year. The company gives two months' credit to its customers and is allowed, on average, one month's credit by trade suppliers. It has an operating cycle of three months.

Other relevant information:

Current ratio of FLG Co	1.4
Cost of long-term finance of FLG Co	11%

Required

- (a) Discuss the key factors which determine the level of investment in current assets. **(6 marks)**
- (b) Discuss the ways in which factoring and invoice discounting can assist in the management of accounts receivable. **(6 marks)**
- (c) Calculate the size of the overdraft of FLG Co, the net working capital of the company and the total cost of financing its current assets. **(6 marks)**
- (d) FLG Co wishes to minimise its inventory costs. Annual demand for a raw material costing \$12 per unit is 60,000 units per year. Inventory management costs for this raw material are as follows:

Ordering cost:	\$6 per order
Holding cost:	\$0.5 per unit per year

The supplier of this raw material has offered a bulk purchase discount of 1% for orders of 10,000 units or more. If bulk purchase orders are made regularly, it is expected that annual holding cost for this raw material will increase to \$2 per unit per year.

Required

- (i) Calculate the total cost of inventory for the raw material when using the economic order quantity. **(4 marks)**
- (ii) Determine whether accepting the discount offered by the supplier will minimise the total cost of inventory for the raw material. **(3 marks)**

(Total = 25 marks)

16 HGR Co (6/09)

45 mins

The following financial information relates to HGR Co:

Statement of financial position at the current date (extracts)	\$000	\$000	\$000
Non-current assets			48,965
<i>Current assets</i>			
Inventory		8,160	
Accounts receivable		<u>8,775</u>	
		16,935	
<i>Current liabilities</i>			
Overdraft	3,800		
Accounts payable	<u>10,200</u>		
		14,000	
Net current assets			<u>2,935</u>
Total assets less current liabilities			<u>51,900</u>

Cash flow forecasts from the current date are as follows:

	Month 1	Month 2	Month 3
Cash operating receipts (\$000)	4,220	4,350	3,808
Cash operating payments (\$000)	3,950	4,100	3,750
Six-monthly interest on traded bonds (\$000)		200	
Capital investment (\$000)			2,000

The finance director has completed a review of accounts receivable management and has proposed staff training and operating procedure improvements, which he believes will reduce accounts receivable days to the average sector value of 53 days. This reduction would take six months to achieve from the current date, with an equal reduction in each month. He has also proposed changes to inventory management methods, which he hopes will reduce inventory days by two days per month each month over a three-month period from the current date. He does not expect any change in the current level of accounts payable.

HGR Co has an overdraft limit of \$4,000,000. Overdraft interest is payable at an annual rate of 6.17% per year, with payments being made each month based on the opening balance at the start of that month. Credit sales for the year to the current date were \$49,275,000 and cost of sales was \$37,230,000. These levels of credit sales and cost of sales are expected to be maintained in the coming year. Assume that there are 365 working days in each year.

Required:

- (a) Discuss the working capital financing strategy of HGR Co. **(7 marks)**
- (b) For HGR Co, calculate:
- (i) the bank balance in three months' time if no action is taken; and
 - (ii) the bank balance in three months' time if the finance director's proposals are implemented.

Comment on the forecast cash flow position of HGR Co and recommend a suitable course of action.

(10 marks)

- (c) Discuss how risks arising from granting credit to foreign customers can be managed and reduced.

(8 marks)

(Total = 25 marks)

INVESTMENT APPRAISAL

Questions 17 to 32 cover Investment Appraisal, the subject of Part D of the BPP Study Text for Paper F9.

17 Preparation question: Investment appraisal

Rainbow Co, a medium-sized company specialising in the manufacture and distribution of equipment for babies and small children, is evaluating a new capital expenditure project. In a joint venture with another separate company, it has invented a remote controlled pushchair, one of the first of its kind on the market. It has been unable to obtain a patent for the invention, but is sure that it will monopolise the market for the first three years. After this, it expects to be faced with stiff competition.

The details are set out below.

- (1) The project has an immediate cost of \$2,100,000.
- (2) Sales are expected to be \$1,550,000 per annum for years 1 to 3, falling to \$650,000 per annum for the two years after that. No further sales of the product are expected after the end of this five-year period.
- (3) Cost of sales is 40% of sales.
- (4) Distribution costs represent 10% of sales.
- (5) 20% of net profits are payable to the joint venture partner the year after the profits are earned.
- (6) The company's cost of capital is 5%.

Required

- (a) Calculate the net present value of the project at the company's required rate of return.
Assume that all cash flows arise annually in arrears unless otherwise stated. Conclude whether the project is financially viable.
- (b) Calculate the project's internal rate of return (IRR) to the nearest percent.
- (c) Calculate the project's simple payback period. Assume all cash flows arise at the end of the year apart from the immediate investment costs.

18 Chromex Co

45 mins

It is now June 20X8. Chromex Co manufactures bicycles for the UK and European markets, and has made a bid of \$150 million to take over Bexell Co, their main UK competitor, which is also active in the German market. Chromex currently supplies 24% of the UK market and Bexell has a 10% share of the same market.

Chromex anticipates labour savings of \$700,000 per year, created by more efficient production and distribution facilities, if the takeover is completed. In addition, the company intends to sell off surplus land and buildings with a balance sheet value of \$15 million, acquired in the course of the takeover.

Total UK bicycle sales for 20X7 were \$400 million. For the year ended 31 December 20X7, Bexell reported an operating profit of \$10 million, compared with a figure of \$55 million for Chromex. In calculating profits, Bexell included a depreciation charge of \$0.5 million.

Note. The takeover is regarded by Chromex in the same way as any other investment, and is appraised accordingly.

Required

- (a) 'Despite the theoretical limitations of the payback method of investment appraisal, it is the method most used in practice.'

Discuss this statement briefly.

(5 marks)

- (b) Assuming that the bid is accepted by Bexell, calculate the payback period (pre-tax) for the investment, if the land and buildings are immediately sold for \$5 million less than the balance sheet valuation, and Bexell's sales figures remain static.

(3 marks)

- (c) Chromex has also appraised the investment in Bexell by calculating the present value of the company's future expected cash flows. What additional information to that required in (b) would have been necessary? **(5 marks)**
- (d) Explain how and why the UK Government might seek to intervene in the takeover bid for Bexell. **(6 marks)**
- (e) Suggest four ratios, which Chromex might usefully compute in order to compare the financial performance of Bexell with that of companies in the same manufacturing sector. You should include in your answer a justification of your choice of ratios. Briefly explain why it is important to base a comparison on companies in the same sector. **(6 marks)**

(Total = 25 marks)

19 Preparation question: NPV with inflation and tax

PQP Co is a wholesaler of specialist books which is keen to explore the financial implications of making a significant investment in equipment and the development of a website.

Due to the fast-changing nature of the equipment and the Internet software, PQP's management has set a project lifetime of three years, ie the equipment will be replaced at the end of 20X6 and a new website designed. €60,000 would be paid for the new equipment on 31 December 20X3. The supplier has agreed to pay €10,000 as a trade-in price in December 20X6.

PQP's estimated final sales for the current accounting year (which ends on 31 December 20X3) are €1,200,000. The company's costs behave in such a way that its contribution to sales ratio for 20X3 is expected to be 40% and its net margin 10%. A considerable proportion of PQP's total fixed costs are marketing expenses. The proposed project will lead to savings in this area. So, in 20X4 fixed costs (at 31 December 20X4 prices) will total €316,800.

Sales estimates are shown below.

	<i>Total sales if no investment (at 31 December 20X3 prices)</i>	<i>Total sales with investment (at 31 December 20X3 prices)</i>
	€	€
Year to 31 December 20X4	1,240,000	1,288,000
Year to 31 December 20X5	1,265,000	1,325,000
Year to 31 December 20X6	1,290,000	1,362,000

From 1 January 20X4 inflation will have the following effects on PQP's operations.

- (i) Sales prices will increase by 5% per annum.
(ii) All costs (ie variable and fixed) will increase by 10% per annum.

The increase in sales will mean that PQP will carry an additional investment in working capital as follows (all at 31 December 20X3 prices).

20X3	An initial	€20,000
20X4	Another	€10,000
20X5	Reduced to	€15,000
20X6	Reduced to	€0

This investment will also be affected by inflation from 1 January 20X4, at the same annual rate as the variable and fixed costs, ie 10%.

The website would be designed and installed during the first four months of 20X4. It will cost €150,000 (at 20X4 prices) payable at the end of 20X4. The suppliers will be paid a retaining/advisory fee of €10,000 in both 20X5 and 20X6. These are at 31 December 20X4 prices and it is anticipated that, due to inflation, they will increase at the same rate as all other costs.

PQP has a nominal cost of capital of 10% and pays tax at an annual rate of 30% in the year profits are earned. It can claim capital allowances on a 25% reducing balance basis.

Required

Advise the management of PQP whether it should proceed with the proposed investment. Your recommendation should be supported by relevant workings and a calculation of NPV.

20 Charm Co (FMC, 6/06)

45 mins

Charm Co, a software company, has developed a new game, 'Fingo', which it plans to launch in the near future. Sales of the new game are expected to be very strong, following a favourable review by a popular PC magazine. Charm Co has been informed that the review will give the game a 'Best Buy' recommendation. Sales volumes, production volumes and selling prices for 'Fingo' over its four-year life are expected to be as follows.

Year	1	2	3	4
Sales and production (units)	150,000	70,000	60,000	60,000
Selling price (\$ per game)	\$25	\$24	\$23	\$22

Financial information on 'Fingo' for the first year of production is as follows:

Direct material cost	\$5.40 per game
Other variable production cost	\$6.00 per game
Fixed costs	\$4.00 per game

Advertising costs to stimulate demand are expected to be \$650,000 in the first year of production and \$100,000 in the second year of production. No advertising costs are expected in the third and fourth years of production. Fixed costs represent incremental cash fixed production overheads. 'Fingo' will be produced on a new production machine costing \$800,000. Although this production machine is expected to have a useful life of up to ten years, government legislation allows Charm Co to claim the capital cost of the machine against the manufacture of a single product. Capital allowances will therefore be claimed on a straight-line basis over four years.

Charm Co pays tax on profit at a rate of 30% per year and tax liabilities are settled in the year in which they arise. Charm Co uses an after-tax discount rate of 10% when appraising new capital investments. Ignore inflation.

Required

- Calculate the net present value of the proposed investment and comment on your findings. **(11 marks)**
- Calculate the internal rate of return of the proposed investment and comment on your findings. **(5 marks)**
- Discuss the reasons why the net present value investment appraisal method is preferred to other investment appraisal methods such as payback, return on capital employed and internal rate of return. **(9 marks)**

(Total = 25 marks)

21 Trecor Co (Pilot paper)

45 mins

Trecor Co plans to buy a new machine to meet expected demand for a new product, Product T. This machine will cost \$250,000 and last for four years, at the end of which time it will be sold for \$5,000. Trecor Co expects demand for Product T to be as follows:

Year	1	2	3	4
Demand (units)	35,000	40,000	50,000	25,000

The selling price for Product T is expected to be \$12.00 per unit and the variable cost of production is expected to be \$7.80 per unit. Incremental annual fixed production overheads of \$25,000 per year will be incurred. Selling price and costs are all in current price terms.

Selling price and costs are expected to increase as follows:

	Increase
Selling price of Product T:	3% per year
Variable cost of production:	4% per year
Fixed production overheads:	6% per year

Other information

Trecor Co has a real cost of capital of 5.7% and pays tax at an annual rate of 30% one year in arrears. It can claim capital allowances on a 25% reducing balance basis. General inflation is expected to be 5% per year.

Trecor Co has a target return on capital employed of 20%. Depreciation is charged on a straight-line basis over the life of an asset.

Required

- (a) Calculate the net present value of buying the new machine and comment on your findings (work to the nearest \$1,000). **(13 marks)**
- (b) Calculate the before-tax return on capital employed (accounting rate of return) based on the average investment and comment on your findings. **(5 marks)**
- (c) Discuss the strengths and weaknesses of internal rate of return in appraising capital investments. **(7 marks)**
- (Total = 25 marks)**

22 Preparation question: Sensitivity analysis

A company is considering a project with the following cash flows.

<i>Year</i>	<i>Initial investment</i>	<i>Variable costs</i>	<i>Cash inflows</i>	<i>Net cash flows</i>
	\$'000	\$'000	\$'000	\$'000
0	11,000			
1		(3,200)	10,300	7,100
2		(3,200)	10,300	7,100

Cash flows arise from selling 1,030,000 units at \$10 per unit. The company has a cost of capital of 9%.

Required

- (a) Calculate the NPV of the project.
- (b) Measure the sensitivity of the project to changes in the following variables.
- (i) Initial investment
 - (ii) Sales volume
 - (iii) Selling price
 - (iv) Variable costs
 - (v) Cost of capital
- (c) Outline the weaknesses of sensitivity analysis.

23 Umunat Co (FMC, 12/04)

45 mins

Umunat Co is considering investing \$50,000 in a new machine with an expected life of five years. The machine will have no scrap value at the end of five years. It is expected that 20,000 units will be sold each year at a selling price of \$3.00 per unit. Variable production costs are expected to be \$1.65 per unit, while incremental fixed costs, mainly the wages of a maintenance engineer, are expected to be \$10,000 per year. Umunat Co uses a discount rate of 12% for investment appraisal purposes and expects investment projects to recover their initial investment within two years.

Required

- (a) Explain why risk and uncertainty should be considered in the investment appraisal process. **(5 marks)**
- (b) Calculate and comment on the payback period of the project **(4 marks)**
- (c) Evaluate the sensitivity of the project's net present value to a change in the following project variables:
- (i) sales volume;
 - (ii) sales price;
 - (iii) variable cost;
- and discuss the use of sensitivity analysis as a way of evaluating project risk. **(10 marks)**
- (d) Upon further investigation it is found that there is a significant chance that the expected sales volume of 20,000 units per year will not be achieved. The sales manager of Umunat Co suggests that sales volumes could depend on expected economic states that could be assigned the following probabilities:

Economic state	Poor	Normal	Good
Probability	0.3	0.6	0.1
Annual sales volume (units)	17,500	20,000	22,500

Calculate and comment on the expected net present value of the project. **(6 marks)**

(Total = 25 marks)

24 Duo Co (12/07)

45 mins

Duo Co needs to increase production capacity to meet increasing demand for an existing product, 'Quago', which is used in food processing. A new machine, with a useful life of four years and a maximum output of 600,000 kg of Quago per year, could be bought for \$800,000, payable immediately. The scrap value of the machine after four years would be \$30,000. Forecast demand and production of Quago over the next four years is as follows:

Year	1	2	3	4
Demand (kg)	1.4 million	1.5 million	1.6 million	1.7 million

Existing production capacity for Quago is limited to one million kilograms per year and the new machine would only be used for demand additional to this.

The current selling price of Quago is \$8.00 per kilogram and the variable cost of materials is \$5.00 per kilogram. Other variable costs of production are \$1.90 per kilogram. Fixed costs of production associated with the new machine would be \$240,000 in the first year of production, increasing by \$20,000 per year in each subsequent year of operation.

Duo Co pays tax one year in arrears at an annual rate of 30% and can claim capital allowances (tax-allowable depreciation) on a 25% reducing balance basis. A balancing allowance is claimed in the final year of operation.

Duo Co uses its after-tax weighted average cost of capital when appraising investment projects. It has a cost of equity of 11% and a before-tax cost of debt of 8.6%. The long-term finance of the company, on a market-value basis, consists of 80% equity and 20% debt.

Required

- Calculate the net present value of buying the new machine and advise on the acceptability of the proposed purchase (work to the nearest \$1,000). **(13 marks)**
- Calculate the internal rate of return of buying the new machine and advise on the acceptability of the proposed purchase (work to the nearest \$1,000). **(4 marks)**
- Explain the difference between risk and uncertainty in the context of investment appraisal, and describe how sensitivity analysis and probability analysis can be used to incorporate risk into the investment appraisal process. **(8 marks)**

(Total = 25 marks)

25 SC Co (6/08)

45 mins

SC Co is evaluating the purchase of a new machine to produce product P, which has a short product life-cycle due to rapidly changing technology. The machine is expected to cost \$1 million. Production and sales of product P are forecast to be as follows:

Year	1	2	3	4
Production and sales (units/year)	35,000	53,000	75,000	36,000

The selling price of product P (in current price terms) will be \$20 per unit, while the variable cost of the product (in current price terms) will be \$12 per unit. Selling price inflation is expected to be 4% per year and variable cost inflation is expected to be 5% per year. No increase in existing fixed costs is expected since SC Co has spare capacity in both space and labour terms.

Producing and selling product P will call for increased investment in working capital. Analysis of historical levels of working capital within SC Co indicates that at the start of each year, investment in working capital for product P will need to be 7% of sales revenue for that year.

SC Co pays tax of 30% per year in the year in which the taxable profit occurs. Liability to tax is reduced by capital allowances on machinery (tax-allowable depreciation), which SC Co can claim on a straight-line basis over the four-year life of the proposed investment. The new machine is expected to have no scrap value at the end of the four-year period.

SC Co uses a nominal (money terms) after-tax cost of capital of 12% for investment appraisal purposes.

Required

- (a) Calculate the net present value of the proposed investment in product P. **(12 marks)**
- (b) Calculate the internal rate of return of the proposed investment in product P. **(3 marks)**
- (c) Advise on the acceptability of the proposed investment in product P and discuss the limitations of the evaluations you have carried out. **(5 marks)**
- (d) Discuss how the net present value method of investment appraisal contributes towards the objective of maximising the wealth of shareholders. **(5 marks)**

(Total = 25 marks)

26 Rupab Co (12/08)

45 mins

Rupab Co is a manufacturing company that wishes to evaluate an investment in new production machinery. The machinery would enable the company to satisfy increasing demand for existing products and the investment is not expected to lead to any change in the existing level of business risk of Rupab Co.

The machinery will cost \$2.5 million, payable at the start of the first year of operation, and is not expected to have any scrap value. Annual before-tax net cash flows of \$680,000 per year would be generated by the investment in each of the five years of its expected operating life. These net cash inflows are before taking account of expected inflation of 3% per year. Initial investment of \$240,000 in working capital would also be required, followed by incremental annual investment to maintain the purchasing power of working capital.

Rupab Co has in issue five million shares with a market value of \$3.81 per share. The equity beta of the company is 1.2. The yield on short-term government debt is 4.5% per year and the equity risk premium is approximately 5% per year.

The debt finance of Rupab Co consists of bonds with a total book value of \$2 million. These bonds pay annual interest before tax of 7%. The par value and market value of each bond is \$100.

Rupab Co pays taxation one year in arrears at an annual rate of 25%. Capital allowances (tax-allowable depreciation) on machinery are on a straight-line basis over the life of the asset.

Required

- (a) Calculate the after-tax weighted average cost of capital of Rupab Co. **(6 marks)**
- (b) Prepare a forecast of the annual after-tax cash flows of the investment in nominal terms, and calculate and comment on its net present value. **(8 marks)**
- (c) Explain how the capital asset pricing model can be used to calculate a project-specific discount rate and discuss the limitations of using the capital asset pricing model in investment appraisal. **(11 marks)**

(Total = 25 marks)

27 PV Co (6/09)

45 mins

PV Co is evaluating an investment proposal to manufacture Product W33, which has performed well in test marketing trials conducted recently by the company's research and development division. The following information relating to this investment proposal has now been prepared.

Initial investment	\$2 million
Selling price (current price terms)	\$20 per unit
Expected selling price inflation	3% per year
Variable operating costs (current price terms)	\$8 per unit
Fixed operating costs (current price terms)	\$170,000 per year
Expected operating cost inflation	4% per year

The research and development division has prepared the following demand forecast as a result of its test marketing trials. The forecast reflects expected technological change and its effect on the anticipated life-cycle of Product W33.

Year	1	2	3	4
Demand (units)	60,000	70,000	120,000	45,000

It is expected that all units of Product W33 produced will be sold, in line with the company's policy of keeping no inventory of finished goods. No terminal value or machinery scrap value is expected at the end of four years, when production of Product W33 is planned to end. For investment appraisal purposes, PV Co uses a nominal (money) discount rate of 10% per year and a target return on capital employed of 30% per year. Ignore taxation.

Required:

- Identify and explain the key stages in the capital investment decision-making process, and the role of investment appraisal in this process. **(7 marks)**
- Calculate the following values for the investment proposal:
 - net present value;
 - internal rate of return;
 - return on capital employed (accounting rate of return) based on average investment; and
 - discounted payback period. **(13 marks)**
- Discuss your findings in each section of (b) above and advise whether the investment proposal is financially acceptable. **(5 marks)**

(Total = 25 marks)

28 AGD Co (FMC, 12/05)

45 mins

AGD Co is a profitable company which is considering the purchase of a machine costing \$320,000. If purchased, AGD Co would incur annual maintenance costs of \$25,000. The machine would be used for three years and at the end of this period would be sold for \$50,000. Alternatively, the machine could be obtained under an operating lease for an annual lease rental of \$120,000 per year, payable in advance.

AGD Co can claim capital allowances on a 25% reducing balance basis. The company pays tax on profits at an annual rate of 30% and all tax liabilities are paid one year in arrears. AGD Co has an accounting year that ends on 31 December. If the machine is purchased, payment will be made in January of the first year of operation. If leased, annual lease rentals will be paid in January of each year of operation.

Required

- Using an after-tax borrowing rate of 7%, evaluate whether AGD Co should purchase or lease the new machine. **(12 marks)**
- Explain and discuss the key differences between an operating lease and a finance lease. **(8 marks)**

- (c) The after-tax borrowing rate of 7% was used in the evaluation because a bank had offered to lend AGD Co \$320,000 for a period of five years at a before-tax rate of 10% per year with interest payable every six months.

Required

- (i) Calculate the annual percentage rate (APR) implied by the bank's offer to lend at 10% per year with interest payable every six months. **(2 marks)**
- (ii) Calculate the amount to be repaid at the end of each six-month period if the offered loan is to be repaid in equal instalments. **(3 marks)**

(Total = 25 marks)

29 Leaminger Co (FMC, 12/02)

45 mins

Leaminger Co has decided it must replace its major turbine machine on 31 December 20X2. The machine is essential to the operations of the company. The company is, however, considering whether to purchase the machine outright or to use lease financing.

Purchasing the machine outright

The machine is expected to cost \$360,000 if it is purchased outright, payable on 31 December 20X2. After four years the company expects new technology to make the machine redundant and it will be sold on 31 December 20X6 generating proceeds of \$20,000. Capital allowances for tax purposes are available on the cost of the machine at the rate of 25% per annum reducing balance. A full year's allowance is given in the year of acquisition but no writing down allowance is available in the year of disposal. The difference between the proceeds and the tax written down value in the year of disposal is allowable or chargeable for tax as appropriate.

Leasing

The company has approached its bank with a view to arranging a lease to finance the machine acquisition. The bank has offered two options with respect to leasing which are as follows:

	<i>Finance lease</i>	<i>Operating lease</i>
Contract length (years)	4	4
Annual rental	\$135,000	\$140,000
First rent payable	31 December 20X3	31 December 20X2

General

For both the purchasing and the finance lease option, maintenance costs of \$15,000 per year are payable at the end of each year. All lease rentals (for both finance and operating options) can be assumed to be allowable for tax purposes in full in the year of payment. Assume that tax is payable one year after the end of the accounting year in which the transaction occurs. For the operating lease only, contracts are renewable annually at the discretion of either party. Leaminger Co has adequate taxable profits to relieve all its costs. The rate of tax on profits can be assumed to be 30%. The company's accounting year-end is 31 December. The company's annual after tax cost of capital is 10%.

Required

- (a) Calculate the net present value at 31 December 20X2, using the after tax cost of capital, for
- purchasing the machine outright;
 - using the finance lease to acquire the machine; and
 - using the operating lease to acquire the machine.
- Recommend the optimal method. **(12 marks)**
- (b) Assume now that the company is facing capital rationing up until 30 December 20X3 when it expects to make a share issue. During this time the most marginal investment project, which is perfectly divisible, requires an outlay of \$500,000 and would generate a net present value of \$100,000. Investment in the turbine would reduce funds available for this project. Investments cannot be delayed.

Calculate the revised net present values of the three options for the turbine given capital rationing. Advise whether your recommendation in (a) would change. **(5 marks)**

- (c) As their business advisor, prepare a report for the directors of Leaminger Co that assesses the issues that need to be considered in acquiring the turbine with respect to capital rationing. **(8 marks)**

(Total = 25 marks)

30 Preparation question: Bread Products Co

Bread Products Co is considering the replacement policy for its industrial size ovens which are used as part of a production line that bakes bread. Given its heavy usage each oven has to be replaced frequently. The choice is between replacing every two years or every three years. Only one type of oven is used, each of which costs \$24,500. Maintenance costs and resale values are as follows.

<i>Year</i>	<i>Maintenance per annum</i>	<i>Resale value</i>
	\$	\$
1	500	
2	800	15,600
3	1,500	11,200

Original cost, maintenance costs and resale values are expressed in current prices. That is, for example, maintenance for a two year old oven would cost \$800 for maintenance undertaken now. It is expected that maintenance costs will increase at 10% per annum and oven replacement cost and resale values at 5% per annum. The money discount rate is 15%.

Required

- (a) Calculate the preferred replacement policy for the ovens in a choice between a two year or three year replacement cycle.
- (b) Identify the limitations of net present value techniques when applied generally to investment appraisal.

31 Filtrex Co

45 mins

- (a) Explain how cash shortages can restrict the investment opportunities of a business. **(5 marks)**
- (b) Distinguish between 'hard' and 'soft' capital rationing, explaining why a company may deliberately choose to restrict its capital expenditure. **(5 marks)**
- (c) Filtrex Co is a medium-sized, all equity-financed, unquoted company which specialises in the development and production of water- and air-filtering devices to reduce the emission of effluents. Its small but ingenious R & D team has recently made a technological breakthrough which has revealed a number of attractive investment opportunities. It has applied for patents to protect its rights in all these areas. However, it lacks the financial resources required to exploit all of these projects, whose required outlays and post-tax NPVs are listed in the table below. Filtrex's managers consider that delaying any of these projects would seriously undermine their profitability, as competitors bring forward their own new developments. All projects are thought to have a similar degree of risk.

<i>Project</i>	<i>Required outlay</i>	<i>NPV</i>
	\$	\$
A	150,000	65,000
B	120,000	50,000
C	200,000	80,000
D	80,000	30,000
E	400,000	120,000

The NPVs have been calculated using as a discount rate the 18% post-tax rate of return which Filtrex requires for risky R & D ventures. The maximum amount available for this type of investment is \$400,000, corresponding to Filtrex's present cash balances, built up over several years' profitable trading. Projects A and C are mutually exclusive and no project can be sub-divided. Any unused capital will either remain

invested in short-term deposits or used to purchase marketable securities, both of which offer a return well below 18% post-tax.

Required

- (i) Advise Filtrex Co, using suitable supporting calculations, which combination of projects should be undertaken in the best interests of shareholders; and
 - (ii) Suggest what further information might be obtained to assist a fuller analysis. **(9 marks)**
- (d) Explain how, apart from delaying projects, Filtrex Co could manage to exploit more of these opportunities. **(6 marks)**
- (Total = 25 marks)**

32 Basril Co (FMC, 12/03)

45 mins

Basril Co is reviewing investment proposals that have been submitted by divisional managers. The investment funds of the company are limited to \$800,000 in the current year. Details of three possible investments, none of which can be delayed, are given below.

Project 1

An investment of \$300,000 in work station assessments. Each assessment would be on an individual employee basis and would lead to savings in labour costs from increased efficiency and from reduced absenteeism due to work-related illness. Savings in labour costs from these assessments in money terms are expected to be as follows:

Year	1	2	3	4	5
Cash flows (\$'000)	85	90	95	100	95

Project 2

An investment of \$450,000 in individual workstations for staff that is expected to reduce administration costs by \$140,800 per annum in money terms for the next five years.

Project 3

An investment of \$400,000 in new ticket machines. Net cash savings of \$120,000 per annum are expected in current price terms and these are expected to increase by 3.6% per annum due to inflation during the five-year life of the machines.

Basril Co has a money cost of capital of 12% and taxation should be ignored.

Required

- (a) Determine the best way for Basril Co to invest the available funds and calculate the resultant NPV:
 - (i) on the assumption that each of the three projects is divisible;
 - (ii) on the assumption that none of the projects are divisible. **(10 marks)**
 - (b) Explain how the NPV investment appraisal method is applied in situations where capital is rationed. **(3 marks)**
 - (c) Discuss the reasons why capital rationing may arise. **(7 marks)**
 - (d) Discuss the meaning of the term 'relevant cash flows' in the context of investment appraisal, giving examples to illustrate your discussion. **(5 marks)**
- (Total = 25 marks)**

BUSINESS FINANCE

Questions 33 to 41 cover Business Finance, the subject of Part E of the BPP Study Text for Paper F9.

33 Tirwen Co (FMC, 12/04)

45 mins

Tirwen Co is a medium-sized manufacturing company which is considering a 1 for 5 rights issue at a 15% discount to the current market price of \$4.00 per share. Issue costs are expected to be \$220,000 and these costs will be paid out of the funds raised. It is proposed that the rights issue funds raised will be used to redeem some of the existing loan stock at par. Financial information relating to Tirwen Co is as follows:

<i>Current statement of financial position</i>	\$'000	\$'000
Non-current assets		6,550
<i>Current assets</i>		
Inventory	2,000	
Receivables	1,500	
Cash	300	
		3,800
		10,350
Ordinary shares (par value 50c)		2,000
Reserves		1,500
12% loan notes 2X12		4,500
<i>Current liabilities</i>		
Trade payables	1,100	
Overdraft	1,250	
		2,350
		10,350
Other information:		
Price/earnings ratio of Tirwen Co:		15.24
Overdraft interest rate:		7%
Tax rate:		30%
Sector averages: debt/equity ratio (book value):		100%
interest cover:		6 times

Required

- (a) Ignoring issue costs and any use that may be made of the funds raised by the rights issue, calculate:
 - (i) the theoretical ex rights price per share;
 - (ii) the value of rights per existing share. **(3 marks)**
- (b) What alternative actions are open to the owner of 1,000 shares in Tirwen Co as regards the rights issue? Determine the effect of each of these actions on the wealth of the investor. **(6 marks)**
- (c) Calculate the current earnings per share and the revised earnings per share if the rights issue funds are used to redeem some of the existing loan notes. **(6 marks)**
- (d) Evaluate whether the proposal to redeem some of the loan notes would increase the wealth of the shareholders of Tirwen Co. Assume that the price/earnings ratio of Tirwen Co remains constant. **(3 marks)**
- (e) Discuss the reasons why a rights issue could be an attractive source of finance for Tirwen Co. Your discussion should include an evaluation of the effect of the rights issue on the debt/equity ratio and interest cover. **(7 marks)**

(Total = 25 marks)

34 PG

45 mins

- (a) PG Co has a paid-up ordinary share capital of \$4,500,000 represented by 6 million shares of 75c each. It has no loan capital. Earnings after tax in the most recent year were \$3,600,000. The P/E ratio of the company is 15.

The company is planning to make a large new investment which will cost \$10,500,000, and is considering raising the necessary finance through a rights issue at 800c.

Required

- (i) Calculate the current market price of PG Co's ordinary shares. **(2 marks)**
- (ii) Calculate the theoretical ex-rights price, and state what factors in practice might invalidate your calculation. **(6 marks)**
- (iii) Briefly explain what is meant by a deep-discounted rights issue, identifying the main reasons why a company might raise finance by this method. **(3 marks)**
- (b) As an alternative to a rights issue, PG Co might raise the \$10,500,000 required by means of an issue of convertible loan notes at par, with a coupon rate of 6%. The loan notes would be redeemable in seven years' time. Prior to redemption, the loan notes may be converted at a rate of 11 ordinary shares per \$100 nominal loan notes.

Required

- (i) Explain the term *conversion premium* and calculate the conversion premium at the date of issue implicit in the data given. **(4 marks)**
- (ii) Identify the advantages to PG Co of issuing convertible loan notes instead of the rights issue to raise the necessary finance. **(5 marks)**
- (iii) Explain why the market value of convertible loan notes is likely to be affected by the dividend policy of the issuing company. **(5 marks)**

(Total = 25 marks)

35 Newsam Co

45 mins

It is now December 20X4. Newsam Co is a quoted company which produces a range of branded products all of which are well-established in their respective markets, although overall sales have grown by an average of only 2% per annum over the past decade. The board of directors is currently concerned about the company's level of financial gearing, which although not high by industry standards, is near to breaching the covenants attaching to its 15% debenture issue, made in 20W2 at a time of high market interest rates. Issued in order to finance the acquisition of the premises on which it is secured, the debenture is repayable at par value of \$100 per unit at any time during the period 20X4-X7.

There are two covenants attaching to the debenture, which state:

'At no time shall the ratio of debt capital to shareholders' fund exceed 50%. The company shall also maintain a prudent level of liquidity, defined as a current ratio at no time outside the range of the industry average (as published by the corporate credit analysts, Creditex), plus or minus 20%.'

Newsam's most recent set of accounts is shown in summarised form below. The buildings have been depreciated since 20W2 at 4% per annum, and most of the machinery is only two or three years old, having been purchased mainly via a bank overdraft. The interest rate payable on the bank overdraft is currently 9%. The finance director argues that Newsam should take advantage of historically low interest rates on the European money markets by issuing a medium-term Eurodollar bond at 5%. The dollar is currently selling at a premium of about 1% on the three-month forward market.

Newsam's ordinary shares currently sell at a P/E ratio of 14, and look unattractive compared to comparable companies in the sector which exhibit an average P/E ratio of 18. According to the latest published credit assessment by Creditex, the average current ratio for the industry is 1.35. The loan stock currently sell in the market at \$15 above par.

Summarised financial accounts for Newsam Co for the year ended 30 June 20X4

STATEMENT OF FINANCIAL POSITION AS AT 30 JUNE 20X4

	\$m	\$m
Assets employed		
<i>Non-current (net):</i>		
Land		5.0
Premises		4.0
Machinery and vehicles		<u>11.0</u>
		<u>20.0</u>
<i>Current:</i>		
Inventory	2.5	
Receivables	4.0	
Cash	<u>0.5</u>	
		<u>7.0</u>
		<u>27.0</u>
<i>Financed by:</i>		
Ordinary shares (25c par value)		5.0
Reserves		10.0
<i>Long-term payables:</i>		
15% Loan notes 20X4-X7		<u>5.0</u>
<i>Current liabilities:</i>		
Payables	4.0	
Bank overdraft	<u>3.0</u>	
		<u>7.0</u>
		<u>27.0</u>

INCOME STATEMENT EXTRACTS FOR THE YEAR ENDED 30 JUNE 20X4

	\$m
Sales	<u>28.00</u>
Operating profit	3.00
Interest payable	<u>(1.00)</u>
Profit before tax	2.00
Taxation	<u>(0.66)</u>
Profit after tax	1.34
Dividend	<u>(0.70)</u>
Retained profit	<u>0.64</u>

Required

- (a) Calculate appropriate gearing ratios for Newsam Co using:
 - (i) book values; and
 - (ii) market values. **(3 marks)**
- (b) Assess how close Newsam Co is to breaching the debenture covenants. **(3 marks)**
- (c) Discuss whether Newsam Co's gearing is in any sense 'dangerous'. **(6 marks)**
- (d) Discuss what financial policies Newsam Co might adopt:
 - (i) in order to lower its capital gearing; and
 - (ii) to improve its interest cover. **(9 marks)**
- (e) Explain what strategy a company might be pursuing when raising capital in the form of convertible debt as distinct from raising straight debt or straight equity. **(4 marks)**

(Total = 25 marks)

36 Arwin (FMC, 6/04)

45 mins

Arwin plans to raise \$5m in order to expand its existing chain of retail outlets. It can raise the finance by issuing 10% loan notes redeemable in 2X15, or by a rights issue at \$4.00 per share. The current financial statements of Arwin are as follows.

<i>Income statement for the last year</i>	\$'000
Sales	50,000
Cost of sales	<u>30,000</u>
Gross profit	20,000
Administration costs	<u>14,000</u>
Profit before interest and tax	6,000
Interest	<u>300</u>
Profit before tax	5,700
Taxation at 30%	<u>1,710</u>
Profit after tax	3,990
Dividends	<u>2,394</u>
Retained earnings	<u>1,596</u>

<i>Statement of Financial Position extract</i>	\$'000
Net non-current assets	20,100
Net current assets	4,960
12% loan notes 2X10	<u>2,500</u>
	<u>22,560</u>
Ordinary shares, par value 25c	2,500
Retained profit	<u>20,060</u>
	<u>22,560</u>

The expansion of business is expected to increase sales revenue by 12% in the first year. Variable cost of sales makes up 85% of cost of sales. Administration costs will increase by 5% due to new staff appointments. Arwin has a policy of paying out 60% of profit after tax as dividends and has no overdraft.

Required

- (a) For each financing proposal, prepare the forecast income statement after one additional year of operation. **(5 marks)**
- (b) Evaluate and comment on the effects of each financing proposal on the following:
- (i) Financial gearing;
 - (ii) Operational gearing;
 - (iii) Interest cover;
 - (iv) Earnings per share. **(12 marks)**
- (c) Discuss the dangers to a company of a high level of gearing, including in your answer an explanation of the following terms:
- (i) Business risk;
 - (ii) Financial risk. **(8 marks)**
- (Total = 25 marks)**

37 Food retailers

45 mins

Food Retailers: Ordinary Shares, Key Stock Market Statistics

Company	Current	Share price (cents)		Dividend Yield (%)	P/E ratio
		52 week high	52 week low		
Ply	63	112	54	1.8	14.2
Axis	291	317	187	2.1	13.0
Spin	187	201	151	2.3	21.1

Required

- (a) Illustrating your answer by use of data in the table above, define and explain the term P/E ratio, and comment on the way it may be used by an investor to appraise a possible share purchase. **(7 marks)**
- (b) Using data in the above table, calculate the dividend cover for Spin and Axis, and explain the meaning and significance of the measure from the point of view of equity investors. **(8 marks)**
- (c) Under what circumstances might a company be tempted to pay dividends which are in excess of earnings, and what are the dangers associated with such an approach?
You should ignore tax in answering this question. **(6 marks)**
- (d) The directors of AXIS Co are currently considering whether to raise finance by means of a debenture issue or an issue of preference shares.
Describe the reasons why the directors might choose to issue loan notes rather than preference shares to raise the required finance. **(4 marks)**

(Total = 25 marks)

38 CF Co

45 mins

CF Co is about to commence trading as a wholesaler of hats. CF's only shareholders, Mr and Mrs Topper, worked as employees of a hat retailer for many years, but have recently been made redundant. They intend to subscribe \$200,000 as the initial share capital.

Sales in 20X2 are expected to be as follows.

	Units
January	2,400
February	3,600
March	4,800
Thereafter	9,600 each month

The average selling price of each hat is to be \$10. All sales will be made on credit terms, requiring settlement two months after the date of sale. However, if settlement is made by customers within one month, a 2.5% cash discount will be given. Of the total sales, 60% are expected to be settled two months after the date of sale and 40% (before any discount is deducted) are expected to be settled one month after the date of sale.

The average purchase price for each hat will be \$7. CF intends to make purchases at the end of each month in order to maintain inventories at a sufficient level to cover the following month's sales. Initially, therefore, purchases of 2,400 hats will be made in December 20X1. Payment for purchases will be made one month in arrears.

Non-current assets are expected to cost \$250,000, payable on 1 January 20X2. Depreciation on these assets will be \$5,000 each month, commencing January 20X2. These assets are likely to have a low net realisable value.

Annual rent is expected to be \$24,000 and will be payable quarterly in advance, commencing January 20X2.

Monthly wages are expected to be \$4,000 and are payable in the month they are incurred. Other overheads are expected to be \$6,000 each month, half of which are payable in the month they are incurred and half are payable one month later.

Required

- (a) Prepare a monthly cash budget for CF Co for the period January 20X2 to May 20X2 inclusive. It should show the expected net cash flow for each month and the cumulative budgeted cash surplus or deficit at the end of each month. Assume for the purposes of this cash budget that the bank has not provided any loan finance. Ignore interest charges and taxation payments. **(8 marks)**
- (b) Discuss the finance needs of CF. **(5 marks)**
- (c) Explain and evaluate the sources of finance available to small businesses for non-current assets. **(8 marks)**
- (d) Describe four circumstances in which a business might seek venture capital finance. **(4 marks)**

(Total = 25 marks)

39 TFR Co (FMC, 6/07)

45 mins

TFR Co is a small, profitable, owner-managed company which is seeking finance for a planned expansion. A local bank has indicated that it may be prepared to offer a loan of \$100,000 at a fixed annual rate of 9%. TFR Co would repay \$25,000 of the capital each year for the next four years. Annual interest would be calculated on the opening balance at the start of each year. Current financial information on TFR Co is as follows:

Current turnover	\$210,000
Net profit margin	20%
Annual taxation rate	25%
Average overdraft	\$20,000
Average interest on overdraft	10% per year
Dividend payout ratio	50%
Shareholders funds	\$200,000
Market value of non-current assets	\$180,000

As a result of the expansion, turnover would increase by \$45,000 per year for each of the next four years, while net profit margin would remain unchanged. No capital allowances would arise from investment of the amount borrowed.

TFR Co currently has no other debt than the existing and continuing overdraft and has no cash or near-cash investments. The non-current assets consist largely of the building from which the company conducts its business. The current dividend payout ratio has been maintained for several years.

Required

- (a) Assuming that TFR is granted the loan, calculate the following ratios for TFR Co for each of the next four years.
- (i) interest cover
 - (ii) medium to long-term debt/equity ratio
 - (iii) return on equity
 - (iv) return on capital employed **(10 marks)**
- (b) Comment on the financial implications for TFR Co of accepting the bank loan on the terms indicated above. **(8 marks)**
- (c) Discuss the difficulties commonly faced by small firms such as TFR Co when seeking additional finance. **(7 marks)**

(Total = 25 marks)

40 Echo Co (12/07)

45 mins

The following financial information relates to Echo Co:

Income statement information for the last year

	<i>\$m</i>	
Profit before interest and tax	12	
Interest	<u>3</u>	
Profit before tax	9	
Income tax expense	<u>3</u>	
Profit for the period	6	
Dividends	<u>2</u>	
Retained profit for the period	<u>4</u>	

Balance sheet information as at the end of the last year

	<i>\$m</i>	<i>\$m</i>
Ordinary shares, par value 50c	5	
Retained earnings	<u>15</u>	
Total equity		20
8% loan notes, redeemable in three years' time		<u>30</u>
Total equity and non-current liabilities		<u>50</u>

Average data on companies similar to Echo Co:

Interest coverage ratio	8 times
Long-term debt/equity (book value basis)	80%

The board of Echo Co is considering several proposals that have been made by its finance director. Each proposal is independent of any other proposal.

Proposal A

The current dividend per share should be increased by 20% in order to make the company more attractive to equity investors.

Proposal B

A bond issue should be made in order to raise \$15 million of new debt capital. Although there are no investment opportunities currently available, the cash raised would be invested on a short-term basis until a suitable investment opportunity arose. The loan notes would pay interest at a rate of 10% per year and be redeemable in eight years' time at par.

Proposal C

A 1 for 4 rights issue should be made at a 20% discount to the current share price of \$2.30 per share in order to reduce gearing and the financial risk of the company.

Required

- Analyse and discuss Proposal A. (5 marks)
- Evaluate and discuss Proposal B. (7 marks)
- Calculate the theoretical ex rights price per share and the amount of finance that would be raised under Proposal C. Evaluate and discuss the proposal to use these funds to reduce gearing and financial risk. (7 marks)
- Discuss the attractions of operating leasing as a source of finance. (6 marks)

(Total = 25 marks)

41 JJG Co (6/09)

45 mins

JJG Co is planning to raise \$15 million of new finance for a major expansion of existing business and is considering a rights issue, a placing or an issue of bonds. The corporate objectives of JJG Co, as stated in its *Annual Report*, are to maximise the wealth of its shareholders and to achieve continuous growth in earnings per share. Recent financial information on JJG Co is as follows:

	20X8	20X7	20X6	20X5
Turnover (\$m)	28.0	24.0	19.1	16.8
Profit before interest and tax (\$m)	9.8	8.5	7.5	6.8
Earnings (\$m)	5.5	4.7	4.1	3.6
Dividends (\$m)	2.2	1.9	1.6	1.6
Ordinary shares (\$m)	5.5	5.5	5.5	5.5
Reserves (\$m)	13.7	10.4	7.6	5.1
8% Bonds, redeemable 20Y5 (\$m)	20	20	20	20
Share price (\$)	8.64	5.74	3.35	2.67

The par value of the shares of JJG Co is \$1.00 per share. The general level of inflation has averaged 4% per year in the period under consideration. The bonds of JJG Co are currently trading at their par value of \$100. The following values for the business sector of JJG Co are available:

Average return on capital employed	25%
Average return on shareholders' funds	20%
Average interest coverage ratio	20 times
Average debt/equity ratio (market value basis)	50%
Return predicted by the capital asset pricing model	14%

Required:

- (a) Evaluate the financial performance of JJG Co, and analyse and discuss the extent to which the company has achieved its stated corporate objectives of:
- maximising the wealth of its shareholders;
 - achieving continuous growth in earnings per share.

Note: up to 7 marks are available for financial analysis.

(12 marks)

- (b) If the new finance is raised via a rights issue at \$7.50 per share and the major expansion of business has not yet begun, calculate and comment on the effect of the rights issue on:
- the share price of JJG Co;
 - the earnings per share of the company; and
 - the debt/equity ratio.

(6 marks)

- (c) Analyse and discuss the relative merits of a rights issue, a placing and an issue of bonds as ways of raising the finance for the expansion.

(7 marks)

(Total = 25 marks)

COST OF CAPITAL

Questions 42 to 50 cover Cost of Capital, the subject of Part F of the BPP Study Text for Paper F9.

42 XYZ Co

45 mins

XYZ Co is a large company whose 200 million \$1 shares are listed on a major international stock exchange. It manufactures a variety of concrete and clay building materials. It has decided to replace 100 of its grinding machines with 100 of a new type of machine that has just been launched. The company is unable to issue any further equity and is therefore considering alternative methods of financing the new machines.

The company's accounting year end is 31 December.

Option 1 – Issue debt to purchase the machines

The machines are expected to cost \$720,000 each on 31 December 20X1 and on average are expected to have a useful economic life of 10 years. After this time, the company expects to scrap the machines, but it has no idea what proceeds would be generated from the sale.

If XYZ Co issues debt, it would do so on 31 December 20X1 for the full purchase price of the machines in order to finance the investment. The debt would be issued at a discount of 10% of par value (that is, at \$90 per \$100 nominal) being redeemable at par on 31 December 20Y1 (in ten years' time) and carrying a coupon annual interest rate of 6%. Debt interest is tax allowable and the corporation tax rate can be assumed to be 30% (ignore any tax on the redemption). If this option is chosen, the share price on 31 December 20X1 is expected to be \$1.50, and the cost of equity 10%.

The debt would be secured by fixed and floating charges.

Option 2 – Long-term lease

The machines can be leased with equal annual rentals payable in arrears. The lease term would be eight years, but this can be extended indefinitely at the option of the company at a nominal rent. The lease cannot be cancelled within the minimum lease term of eight years. The company would need to pay its own maintenance costs.

Option 3 – Short-term leases

The machines can be leased using a series of separate annual contracts. Maintenance costs would be paid by the lessor under these contracts but, even so, the average lease rentals would be much higher than under option 2. There is no obligation on either party to sign a new annual contract on the termination for the previous lease contract.

Required

- Calculate the after tax cost of debt at 31 December 20X1 to be used in Option 1. **(8 marks)**
- Calculate the weighted average cost of capital for Option 1. **(4 marks)**
- Discuss the appropriateness of using the after tax cost of debt or the weighted average cost of capital to evaluate XYZ Co's investment in grinding machines. **(5 marks)**
- Write a memorandum to the directors of XYZ Co which identifies the factors that should be considered when deciding which of the three methods of financing the grinding machines is the most appropriate. **(8 marks)**

(Total = 25 marks)

43 D Co

45 mins

The summarised Statement of Financial Position of D Co at 30 June 20X9 was as follows.

	\$'000	\$'000
Non-current assets		15,350
Current assets	5,900	
Creditors falling due within one year	<u>(2,600)</u>	
Net current assets		3,300
9% loan notes		<u>(8,000)</u>
		<u>10,650</u>
Ordinary share capital (25c shares)		2,000
7% preference shares (\$1 shares)		1,000
Share premium account		1,100
Retained earnings		<u>6,550</u>
		<u>10,650</u>

The current price of the ordinary shares is 135c ex dividend. The dividend of 10c is payable during the next few days. The expected rate of growth of the dividend is 9% per annum. The current price of the preference shares is 77c and the dividend has recently been paid. The loan notes interest has also been paid recently and the loan notes are currently trading at \$80 per \$100 nominal. Assume that D Co issued the loan notes one year ago to finance a new investment. Company income tax is at the rate of 30%.

Required

- (a) Calculate the gearing ratio for D Co using:
- (i) Book values
 - (ii) Market values (5 marks)
- (b) Calculate the company's weighted average cost of capital (WACC), using the respective market values as weighting factors. (7 marks)
- (c) Explain how the capital asset pricing model would be used as an alternative method of estimating the cost of equity, indicating what information would be required and how it would be obtained. (8 marks)
- (d) Discuss the reasons why D Co may have issued loan notes rather than preference shares to raise the required finance. (5 marks)

(Total = 25 marks)

44 IML Co

45 mins

IML Co is an all equity financed listed company. It develops customised software for clients which are mainly large civil engineering companies. Nearly all its shares are held by financial institutions.

IML Co's chairman has been dissatisfied with the company's performance for some time. Some directors were also concerned about the way in which the company is perceived by financial markets. In response, the company recently appointed a new finance director who advocated using the capital asset pricing model as a means of evaluating risk and interpreting the stock market's reaction to the company.

The following initial information was put forward by the finance director for two rival companies operating in the same industry:

	<i>Beta</i>
AZT Co	0.7
BOR Co	1.4

The *finance director* notes that the risk-free rate is 5% each year and the expected rate of return on the market portfolio is 15% each year.

The *chairman* set out his concerns at a meeting of the board of directors: 'I fail to understand these calculations. AZT Co operates largely in overseas markets with all the risk which that involves, yet you seem to be arguing that it is a lower risk company than BOR Co, whose income is mainly derived from long-term contracts in our domestic

building industry. I am very concerned that we can take too much notice of the stock market. Take last year for instance, we had to announce a loss and the share price went up.'

Required

- (a) Calculate, using the capital asset pricing model, the required rate of return on equity of:
- (i) AZT Co
 - (ii) BOR Co **(4 marks)**
- (b) Calculate the beta of IML Co, assuming its required annual rate of return on equity is 17% and the stock market uses the capital asset pricing model to calculate the beta, and explain the significance of the beta factor. **(6 marks)**
- (c) As the new finance director, write a memorandum to the chairman which explains, in language understandable to a non-financial manager, the following:
- (i) The assumptions and limitations of the capital asset pricing model; and
 - (ii) An explanation of why IML Co's share price could rise following the announcement of a loss.
- In so doing, discuss the observations and concerns expressed by the chairman. You may refer, where appropriate, to your calculations in (a) and (b) above. **(15 marks)**

(Total = 25 marks)

45 KJI

45 mins

The following financial information is available for KJI.

	20X6	20X7	20X8	20X9
Earnings attributed to ordinary shareholders	\$200m	\$225m	\$205m	\$230m
Number of ordinary shares	2,000m	2,100m	2,100m	1,900m
Price per share	220c	305c	290c	260c
Dividend per share	5c	7c	8c	8c

Assume that share prices are as at the last day of each year.

Required

- (a) Calculate KJI's earnings per share, dividend yield, dividend cover and price/ earnings ratio. Explain the meaning of each of these terms and why investors use them, and what limitations they may have. **(8 marks)**
- (b) Explain why the changes that occurred in the figures calculated in (a) above over the past four years might have happened. **(6 marks)**

The following is an extract from the Statement of Financial Position of LI Co, a company in the same industry as KJI, at 31 December 20X9.

	\$'000
Ordinary shares of 50c each	5,200
Reserves	4,850
9% preference shares of \$1 each	4,500
14% loan notes	5,000
Total long-term funds	<u>19,550</u>

The ordinary shares are quoted at 80c. Assume the market estimate of the next ordinary dividend is 4c, growing thereafter at 12% per annum indefinitely. The preference shares which are irredeemable are quoted at 72c and the loan notes are quoted at par. Tax on profits is 33%.

Required

- (c) Use the relevant data above to calculate the company's weighted average cost of capital (WACC), ie the return required by the providers of the three types of capital, using the respective market values as weighting factors. **(6 marks)**

- (d) Assume that the loan notes have recently been issued specifically to fund the company's expansion programme under which a number of projects are being considered. It has been suggested at a project appraisal meeting that because these projects are to be financed by the loan notes, the cutoff rate for project acceptance should be the after-tax interest rate on the loan notes rather than the WACC. Discuss this suggestion. **(5 marks)**

(Total = 25 marks)

46 WEB Co

45 mins

WEB Co operates a low-cost airline and is a listed company. By comparison to its major competitors it is relatively small, but it has expanded significantly in recent years. The shares are held mainly by large financial institutions.

The following are extracts from WEB Co's budgeted Statement of Financial Position at 31 May 20X2.

Ordinary shares of \$1	\$m
Reserves	100
9% loan notes 20X5 (at nominal value)	50
	<u>200</u>
	<u>350</u>

Dividends have grown in the past at 3% a year, resulting in an expected dividend of \$1 per share to be declared on 31 May 20X2. (Assume for simplicity that the dividend will also be paid on this date.) Due to expansion, dividends are expected to grow at 4% a year from 1 June 20X2 for the foreseeable future. The price per share is currently \$10.40 ex div, and this is not expected to change before 31 May 20X2.

The existing loan notes are due to be redeemed at par on 31 May 20X5. The market value of these loan notes at 1 June 20X2 is expected to be \$100.84 (ex interest) per \$100 nominal. Interest is payable annually in arrears on 31 May and is allowable for tax purposes. Tax is payable on profits at a rate for of 30%. Assume taxation is payable at the end of the year in which the taxable profits arise.

New finance

The company has now decided to purchase three additional aircraft at a cost of \$10 million each. The board has decided that the new aircraft will be financed in full by an 8% bank loan on 1 June 20X2.

Required

- (a) Calculate the expected weighted average cost of capital of WEB Co at 31 May 20X2. **(8 marks)**
- (b) Without further calculations, explain the impact of the new bank loan on WEB Co's
- (i) Cost of equity
 - (ii) Cost of debt
 - (iii) Weighted average cost of capital (using the traditional model). **(8 marks)**
- (c) Explain and distinguish
- (i) A bank loan
 - (ii) Loan notes

In so doing, explain why, in the circumstances of WEB Co, the cost of debt may be different for the two types of security. **(4 marks)**

- (d) Explain why WEB might decide to raise capital in the form of a convertible debt issue rather than straight equity or debt. **(5 marks)**

(Total = 25 marks)

47 CAP Co

45 mins

CAP Co is a listed company that owns and operates a large number of farms throughout the world. A variety of crops are grown.

Financing structure

The following is an extract from the Statement of Financial Position of CAP Co at 30 September 20X2.

	\$ million
Ordinary shares of \$1 each	200
Reserves	100
9% irredeemable \$1 preference shares	50
8% loan notes 20X3	250
	<u>600</u>

The ordinary shares were quoted at \$3 per share ex div on 30 September 20X2. The beta of CAP Co's equity shares is 0.8, the annual yield on treasury bills is 5%, and financial markets expect an average annual return of 15% on the market index.

The market price per preference share was \$0.90 ex div on 30 September 20X2.

Loan notes interest is paid annually in arrears and is allowable for tax at a rate of 30%. The loan notes were priced at \$100.57 ex interest per \$100 nominal on 30 September 20X2. Loan notes are redeemable on 30 September 20X3.

Assume that taxation is payable at the end of the year in which taxable profits arise.

A new project

Difficult trading conditions in European farming have caused CAP Co to decide to convert a number of its farms in Southern Europe into camping sites with effect from the 20X3 holiday season. Providing the necessary facilities for campers will require major investment, and this will be financed by a new issue of loan notes. The returns on the new campsite business are likely to have a very low correlation with those of the existing farming business.

Required

- Using the capital asset pricing model, calculate the required rate of return on equity of CAP Co at 30 September 20X2. Ignore any impact from the new campsite project. Briefly explain the implications of a Beta of less than 1, such as that for CAP Co. **(5 marks)**
- Calculate the weighted average cost of capital of CAP Co at 30 September 20X2 (use your calculation in answer to requirement (a) above for the cost of equity). Ignore any impact from the new campsite project. **(10 marks)**
- Without further calculations, identify and explain the factors that may change CAP Co's equity beta during the year ending 30 September 20X3. **(5 marks)**
- Explain the limitations of the capital asset pricing model. **(5 marks)**

(Total = 25 marks)

48 FAQ

45 mins

FAQ is a profitable, listed manufacturing company, which is considering a project to diversify into the manufacture of computer equipment. This would involve spending \$220 million on a new production plant.

It is expected that FAQ will continue to be financed by 60% debt and 40% equity. The debt consists of 10% loan notes, redeemable at par after 10 years with a current market value of \$90. Any new debt is expected to have the same cost of capital.

FAQ pays tax at a rate of 30% and its ordinary shares are currently trading at 453c. The equity beta of FAQ is estimated to be 1.21. The systematic risk of debt may be assumed to be zero. The risk free rate is 6.75% and market return 12.5%.

The estimated equity beta of the main competitor in the same industry as the new proposed plant is 1.4, and the competitor's capital gearing is 35% equity and 65% debt by book values.

Required

- (a) Calculate the after-tax cost of debt of FAQ's loan notes. (3 marks)
 - (b) Calculate a project-specific discount rate for the proposed investment. (9 marks)
 - (c) Discuss the problems that may be encountered in applying this discount rate to the proposed investment. (8 marks)
 - (d) Explain briefly what is meant by pecking order theory. (5 marks)
- (Total = 25 marks)**

49 Droxfol Co (Pilot paper)

45 mins

Droxfol Co is a listed company that plans to spend \$10m on expanding its existing business. It has been suggested that the money could be raised by issuing 9% loan notes redeemable in ten years' time. Current financial information on Droxfol Co is as follows.

Income statement information for the last year

		\$000
Profit before interest and tax	7,000	
Interest	(500)	
Profit before tax	<u>6,500</u>	
Tax	(1,950)	
Profit for the period	<u>4,550</u>	

Statement of Financial Position for the last year

	\$000	\$000
Non-current assets		20,000
Current assets		<u>20,000</u>
Total assets		<u>40,000</u>
<i>Equity and liabilities</i>		
Ordinary shares, par value \$1	5,000	
Retained earnings	<u>22,500</u>	
Total equity		27,500
10% loan notes	5,000	
9% preference shares, par value \$1	<u>2,500</u>	
Total non-current liabilities		7,500
Current liabilities		<u>5,000</u>
Total equity and liabilities		<u>40,000</u>

The current ex div ordinary share price is \$4.50 per share. An ordinary dividend of 35 cents per share has just been paid and dividends are expected to increase by 4% per year for the foreseeable future. The current ex div preference share price is 76.2 cents. The loan notes are secured on the existing non-current assets of Droxfol Co and are redeemable at par in eight years' time. They have a current ex interest market price of \$105 per \$100 loan note. Droxfol Co pays tax on profits at an annual rate of 30%.

The expansion of business is expected to increase profit before interest and tax by 12% in the first year. Droxfol Co has no overdraft.

Average sector ratios:

Financial gearing: 45% (prior charge capital divided by equity share capital on a book value basis)
 Interest coverage ratio: 12 times

Required

- (a) Calculate the current weighted average cost of capital of Droxfol Co. (9 marks)
- (b) Discuss whether financial management theory suggests that Droxfol Co can reduce its weighted average cost of capital to a minimum level. (8 marks)

(c) Evaluate and comment on the effects, after one year, of the loan note issue and the expansion of business on the following ratios:

- (i) Interest coverage ratio.
- (ii) Financial gearing.
- (iii) Earnings per share.

Assume that the dividend growth rate of 4% is unchanged.

(8 marks)

(Total = 25 marks)

50 Burse Co (6/08)

45 mins

Burse Co wishes to calculate its weighted average cost of capital and the following information relates to the company at the current time:

Number of ordinary shares	20 million
Book value of 7% convertible debt	\$29 million
Book value of 8% bank loan	\$2 million
Market price of ordinary shares	\$5.50 per share
Market value of convertible debt	\$107.11 per \$100 bond
Equity beta of Burse Co	1.2
Risk-free rate of return	4.7%
Equity risk premium	6.5%
Rate of taxation	30%

Burse Co expects share prices to rise in the future at an average rate of 6% per year. The convertible debt can be redeemed at par in eight years' time, or converted in six years' time into 15 shares of Burse Co per \$100 bond.

Required

- (a) Calculate the market value weighted average cost of capital of Burse Co. State clearly any assumptions that you make. **(12 marks)**
- (b) Discuss the circumstances under which the weighted average cost of capital can be used in investment appraisal. **(6 marks)**
- (c) Discuss whether the dividend growth model or the capital asset pricing model offers the better estimate of the cost of equity of a company. **(7 marks)**

(Total = 25 marks)

BUSINESS VALUATIONS

Questions 51 to 56 cover Business Valuations, the subject of Part G of the BPP Study Text for Paper F9.

51 MC

45 mins

MC provides a range of services to the medical and healthcare industry. These services include providing locum (temporary) cover for healthcare professionals (mainly doctors and nurses), emergency call-out and consultancy/advisory services to government-funded health organisations. The company also operates a research division that has been successful in recent years in attracting funding from various sources. Some of the employees in this division are considered to be leading experts in their field and are very highly paid.

A consortium of doctors and redundant health-service managers started the company some years ago. It is still owned by the same people, but has since grown into an organisation employing over 100 full-time staff throughout the UK. In addition, the company uses specialist staff employed in state-run organisations on a part-time contract basis. The owners of the company are now interested in either obtaining a stock market quotation, or selling the company if the price accurately reflects what they believe to be the true worth of the business.

Summary financial statistics for MC and a competitor company, which is listed on the UK Stock Exchange, are shown below. The competitor company is broadly similar to MC but uses a higher proportion of part-time to full-time staff and has no research capability.

	<i>MC</i> <i>Last year end:</i> <i>31.3.20X0</i>	<i>Competitor</i> <i>Last year end:</i> <i>31.3.20X0</i>
Shares in issue (m)	10	20
Earnings per share (pence)	75	60
Dividend per share (pence)	55	50
Net asset value (£m)	60	75
Debt ratio (outstanding debt as % of total financing)	10	20
Share price (pence)	N/A	980
Expected rate of growth in earnings and dividends (% per annum)	8	7

Notes

- 1 The treasurer of the company has provided the forecast growth rate for MC. The forecast for the competitor is based on published information.
- 2 The net assets of MC are the net book values of land, buildings, equipment and vehicles plus net working capital.
- 3 Sixty per cent of the shares in the competitor company are owned by the directors and their relatives or associates.
- 4 MC uses a 'rule-of-thumb' discount rate of 15% to evaluate its investments. The cost of equity of the competitor has been calculated to be 13%.
- 5 Assume that growth rates in earnings and dividends are constant per annum.

Required

Assume that you are an independent consultant retained by MC to advise on the valuation of the company and on the relative advantages of a public flotation versus outright sale.

Prepare a report for the directors that:

- (a) Produces a range of share prices at which shares in MC might be issued. Use whatever information is available. Explain the methods of valuation that you have used and discuss their suitability for providing an appropriate valuation of the company. **(16 marks)**
- (b) Discusses the relative advantages of flotation and direct sale of shares. **(6 marks)**
- (c) Recommends a course of action that the company should take. **(3 marks)**

(Total = 25 marks)

52 BST

45 mins

BST Motors Co (BST) is a long-established listed company. Its main business is the retailing of new and used motor cars and the provision of after-sales service. It has sales outlets in most of the major towns and cities in the country. It also owns a substantial amount of land and property that it has acquired over the years, much of which it rents or leases on medium-long term agreements. Approximately 80% of its net current asset value is land and buildings.

The company has grown organically for the last few years but is now considering expanding by acquisition.

SM owns a number of car showrooms in wealthy, semi-rural locations. All of these showrooms operate the franchise of a well-known major motor manufacturer. SM is a long-established private company with the majority of shares owned by the founding family, many of whom still work for the company. The major shareholders are now considering selling the business if a suitable price can be agreed. The Managing Director of SM, who is a major shareholder, has approached BST to see if they would be interested in buying SM. He has implied that holders of up to 50% of SM's shares might be willing to accept BST shares as part of the deal.

The forecast earnings of BST for the next financial year are \$35 million. According to the Managing Director of SM, his company's earnings are expected to be \$4 million for the next financial year.

Financial statistics and other information on BST and SM are shown below:

	<i>BST</i>	<i>SM</i>
Shares in issue (millions)	25	1.5
Earnings per share (cents)	112.5	153
Dividend per share (cents)	50.6	100
Share price (cents)	1237	N/A
Net asset value attributable to equity (\$m)	350	45
Debt ratio (outstanding debt as percentage of total market value of company)	20	0
Forecast growth rate percentage (constant, annualised)	4	5
Cost of equity	9%	N/A

SM does not calculate a cost of equity, but the industry average for similar companies is 10%

Required

Assume you are a financial manager working with BST. Advise the BST Board on the following issues in connection with a possible bid for SM:

- Methods of valuation that might be appropriate and a range of valuations for SM within which BST should be prepared to negotiate. **(10 marks)**
- The financial factors relating to both companies that might affect the bid. **(5 marks)**
- Explain the practical considerations in the valuation of shares and businesses. **(10 marks)**

(Total = 25 marks)

53 Phobis Co (12/07)

45 mins

- Phobis Co is considering a bid for Danoca Co. Both companies are stock-market listed and are in the same business sector. Financial information on Danoca Co, which is shortly to pay its annual dividend, is as follows:

Number of ordinary shares	5 million
Ordinary share price (ex div basis)	\$3.30
Earnings per share	40.0c
Proposed payout ratio	60%
Dividend per share one year ago	23.3c
Dividend per share two years ago	22.0c
Equity beta	1.4

Other relevant financial information	
Average sector price/earnings ratio	10
Risk-free rate of return	4.6%
Return on the market	10.6%

Required

Calculate the value of Danoca Co using the following methods.

- (i) price/earnings ratio method;
- (ii) dividend growth model;

and discuss the significance, to Phobis Co, of the values you have calculated, in comparison to the current market value of Danoca Co. **(11 marks)**

- (b) Phobis Co has in issue 9% bonds which are redeemable at their par value of \$100 in five years' time. Alternatively, each bond may be converted on that date into 20 ordinary shares of the company. The current ordinary share price of Phobis Co is \$4.45 and this is expected to grow at a rate of 6.5% per year for the foreseeable future. Phobis Co has a cost of debt of 7% per year.

Required

Calculate the following current values for each \$100 convertible bond:

- (i) market value;
- (ii) floor value;
- (iii) conversion premium. **(6 marks)**

- (c) Distinguish between weak form, semi-strong form and strong form stock market efficiency, and discuss the significance to a listed company if the stock market on which its shares are traded is shown to be semi-strong form efficient. **(8 marks)**

(Total = 25 marks)

54 THP Co (6/08)

45 mins

THP Co is planning to buy CRX Co, a company in the same business sector, and is considering paying cash for the shares of the company. The cash would be raised by THP Co through a 1 for 3 rights issue at a 20% discount to its current share price.

The purchase price of the 1 million issued shares of CRX Co would be equal to the rights issue funds raised, less issue costs of \$320,000. Earnings per share of CRX Co at the time of acquisition would be 44.8c per share. As a result of acquiring CRX Co, THP Co expects to gain annual after-tax savings of \$96,000.

THP Co maintains a payout ratio of 50% and earnings per share are currently 64c per share. Dividend growth of 5% per year is expected for the foreseeable future and the company has a cost of equity of 12% per year.

Information from THP Co's statement of financial position:

<i>Equity and liabilities</i>	\$000
Shares (\$1 par value)	3,000
Reserves	4,300
	<u>7,300</u>
<i>Non-current liabilities</i>	
8% loan notes	5,000
Current liabilities	2,200
Total equity and liabilities	<u>14,500</u>

Required

- (a) Calculate the current ex dividend share price of THP Co and the current market capitalisation of THP Co using the dividend growth model. **(4 marks)**

- (b) Assuming the rights issue takes place and ignoring the proposed use of the funds raised, calculate:
- the rights issue price per share;
 - the cash raised;
 - the theoretical ex rights price per share; and
 - the market capitalisation of THP Co. **(5 marks)**
- (c) Using the price/earnings ratio method, calculate the share price and market capitalisation of CRX Co before the acquisition. **(3 marks)**
- (d) Assuming a semi-strong form efficient capital market, calculate and comment on the post acquisition market capitalisation of THP Co in the following circumstances:
- THP Co does not announce the expected annual after-tax savings; and
 - the expected after-tax savings are made public. **(5 marks)**
- (e) Discuss the factors that THP Co should consider, in its circumstances, in choosing between equity finance and debt finance as a source of finance from which to make a cash offer for CRX Co. **(8 marks)**
- (Total = 25 marks)**

55 Dartig Co (12/08)

45 mins

Dartig Co is a stock-market listed company that manufactures consumer products and it is planning to expand its existing business. The investment cost of \$5 million will be met by a 1 for 4 rights issue. The current share price of Dartig Co is \$2.50 per share and the rights issue price will be at a 20% discount to this. The finance director of Dartig Co expects that the expansion of existing business will allow the average growth rate of earnings per share over the last four years to be maintained into the foreseeable future.

The earnings per share and dividends paid by Dartig over the last four years are as follows:

	20X3	20X4	20X5	20X	20X7
Earnings per share (cents)	27.7	29.0	29.0	30.2	32.4
Dividend per share (cents)	12.8	13.5	13.5	14.5	15.0

Dartig Co has a cost of equity of 10%. The price/earnings ratio of Dartig Co has been approximately constant in recent years. Ignore issue costs.

Required

- Calculate the theoretical ex rights price per share prior to investing in the proposed business expansion. **(3 marks)**
- Calculate the expected share price following the proposed business expansion using the price/earnings ratio method. **(3 marks)**
- Discuss whether the proposed business expansion is an acceptable use of the finance raised by the rights issue, and evaluate the expected effect on the wealth of the shareholders of Dartig Co. **(5 marks)**
- Using the information provided, calculate the ex div share price predicted by the dividend growth model and discuss briefly why this share price differs from the current market price of Dartig Co. **(6 marks)**

At a recent board meeting of Dartig Co, a non-executive director suggested that the company's remuneration committee should consider scrapping the company's current share option scheme, since executive directors could be rewarded by the scheme even when they did not perform well. A second non-executive director disagreed, saying the problem was that even when directors acted in ways which decreased the agency problem, they might not be rewarded by the share option scheme if the stock market were in decline.

Required

- Explain the nature of the agency problem and discuss the use of share option schemes as a way of reducing the agency problem in a stock-market listed company such as Dartig Co. **(8 marks)**

(Total = 25 marks)

56 KFP Co (6/09)

45 mins

KFP Co, a company listed on a major stock market, is looking at its cost of capital as it prepares to make a bid to buy a rival unlisted company, NGN. Both companies are in the same business sector. Financial information on KFP Co and NGN is as follows:

	KFP Co		NGN	
	\$m	\$m	\$m	\$m
Non-current assets		36		25
Current assets	7		7	
Current liabilities	<u>3</u>		<u>4</u>	
Net current assets		<u>4</u>		<u>3</u>
Total assets less current liabilities		<u>40</u>		<u>28</u>
Ordinary shares, par value 50c	15		5	
Retained earnings	<u>10</u>		<u>3</u>	
Total equity		25		8
7% bonds, redeemable at par in seven years' time		15		
9% bonds, redeemable at par in two years' time				<u>20</u>
Total equity and non-current liabilities		<u>40</u>		<u>28</u>

Other relevant financial information:

Risk-free rate of return	4.0%
Average return on the market	10.5%
Taxation rate	30%

NGN has a cost of equity of 12% per year and has maintained a dividend payout ratio of 45% for several years. The current earnings per share of the company is 80c per share and its earnings have grown at an average rate of 4.5% per year in recent years.

The ex div share price of KFP Co is \$4.20 per share and it has an equity beta of 1.2. The 7% bonds of the company are trading on an ex interest basis at \$94.74 per \$100 bond. The price/earnings ratio of KFP Co is eight times.

The directors of KFP Co believe a cash offer for the shares of NGN would have the best chance of success. It has been suggested that a cash offer could be financed by debt.

Required:

- (a) Calculate the weighted average cost of capital of KFP Co on a market value weighted basis. **(10 marks)**
- (b) Calculate the total value of the target company, NGN, using the following valuation methods:
 - (i) Price/earnings ratio method, using the price/earnings ratio of KFP Co; and
 - (ii) Dividend growth model. **(6 marks)**
- (c) Discuss the relationship between capital structure and weighted average cost of capital, and comment on the suggestion that debt could be used to finance a cash offer for NGN. **(9 marks)**

(Total = 25 marks)

RISK MANAGEMENT

Questions 57 to 64 cover Risk Management, the subject of Part H of the BPP Study Text for Paper F9.

57 Marton Co

45 mins

Marton Co produces a range of specialised components, supplying a wide range of UK and overseas customers, all on credit terms. 20% of UK turnover is sold to one firm. Having used generous credit policies to encourage past growth, Marton now has to finance a substantial overdraft and is concerned about its liquidity. Marton borrows from its bank at 13% per annum interest. No further sales growth in volume or value terms is planned for the next year.

In order to speed up collection from UK customers, Marton is considering two alternative policies.

Option one

Factoring on a with-recourse, service only basis, the factor administering and collecting payment from Marton's UK customers. This is expected to generate administrative savings of £200,000 per annum and to lower the average receivable collection period by 15 days. The factor will make a service charge of 1% of Marton's UK turnover and also provide credit insurance facilities for an annual premium of £80,000.

Option two

Offering discounts to UK customers who settle their accounts early. The amount of the discount will depend on speed of payment as follows.

Payment within 10 days of despatch of invoices: 3%

Payment within 20 days of despatch of invoices: 1.5%

It is estimated that UK customers representing 20% and 30% of Marton's sales respectively will take up these offers, the remainder continuing to take their present credit period.

In addition, Marton is concerned about the risk of its overseas earnings. All overseas customers pay in US dollars and Marton does not hedge currency risk, invoicing at the prevailing spot rate, which is currently US\$1.45:£1. It is considering the use of an overseas factor and also hedging its US dollar income on the forward market. Its bank has offered to buy all of its dollar earnings at a fixed rate of US\$1.55:£1. Marton's advisers estimate the following chances of various dollar/sterling rates of exchange:

<i>US Dollars per £</i>	<i>Probability</i>
1.60	0.1
1.50	0.2
1.45	0.4
1.40	0.2
1.30	0.1

Extracts from Marton's most recent accounts are given below.

	£'000	£'000
<i>Sales (all on credit)</i>		
Home	20,000	
Export	<u>5,000</u>	
		25,000
<i>Cost of sales</i>		<u>(17,000)</u>
Operating profit		8,000
Current assets		
Inventory	2,500	
Receivables*	4,500	
Cash	<u>—</u>	

*There are no overseas receivables at the year end.

Note. Taxes and inflation can be ignored in this question.

Required

- (a) Calculate the relative costs and benefits *in terms of annual profit before tax* of each of the two proposed methods of reducing domestic receivables, and recommend the most financially advantageous policy. Comment on your results. **(13 marks)**
- (b) Briefly outline the services provided by an overseas factor. **(4 marks)**
- (c) (i) Calculate the maximum loss which Marton can sustain through movements in the dollar/sterling exchange rate if it does not hedge overseas sales. **(2 marks)**
- (ii) Calculate the maximum opportunity cost of selling dollar earnings forward at US\$1.55:£1. **(2 marks)**
- (iii) Briefly discuss whether Marton should hedge its foreign currency risk. **(4 marks)**
- (Total = 25 marks)**

58 SDT

45 mins

SDT plc is a UK based manufacturer of a wide range of printed circuit boards (PCBs) that are used in a variety of electrical products. SDT exports over 90% of its production to assembly plants owned by large multinational electronics companies all around the world. Two companies (A and B) require SDT to invoice them in a single currency, regardless of the export destination of the PCBs. The chosen currencies are the Japanese Yen (Company A) and the US\$ (Company B) respectively. The remaining export sales all go to European customers and are invoiced in Euros.

The variable cost and export price per unit PCB are shown below.

<i>Market</i>	<i>Unit variable cost (£)</i>	<i>Unit export sales price</i>
Company A	2.75	Yen 632.50
Company B	4.80	US\$ 10.2678
Europe	6.25	Euro 12.033

Goods are supplied on 60 day credit terms.

The following receipts for export sales are due in 60 days:

Company A	Yen 9,487,500
Company B	US\$ 82,142
Europe	Euro 66,181

The foreign exchange rates to be used by SDT in evaluating its revenue from the export sales are as follows.

	<i>Yen/£</i>	<i>US\$/£</i>	<i>Euro/£</i>
Spot market	199.887 ± 0.9	1.7723 ± 0.0103	1.4708 ± 0.0105
2 months forward	198.850 ± 1.182	1.7663 ± 0.0112	1.4644 ± 0.0140
3 months forward	197.230 ± 1.202	1.7559 ± 0.0118	1.4566 ± 0.0155
1 year forward	189.575 ± 1.417	1.7131 ± 0.0180	1.4251 ± 0.0175

The Managing Director of SDT believes that the foreign exchange markets are efficient and so the likelihood that SDT will make foreign exchange gains is the same as the likelihood that it will make foreign exchange losses. Furthermore, any exchange risk is already diversified across three currencies, each from countries in very different economic regions of the world. The Managing Director has therefore recommended that the Treasury Department should not hedge any foreign exchange risks arising from export sales.

Required

- (a) Critically comment on the validity of the views and recommendations expressed by the Managing Director and explain how currency hedging might nevertheless be beneficial to SDT. **(6 marks)**
- (b) (i) Calculate the sterling value of the contribution earned from exports to each of the customers (A, B and Europe) assuming that SDT:

- (1) Hedges the risk in the forward market; **(3 marks)**
- (2) Does not hedge the risk and the relevant spot exchange rates in two months' time are as follows:
- Two month spot*
- Yen/£ 201.405 ± 1.225
- US\$/£ 1.770 ± 0.005
- Euro/£ 1.464 ± 0.004

(3 marks)

- (ii) Calculate the average contribution to sales ratio in each of the above scenarios and advise SDT accordingly on whether to hedge its foreign exchange exposure. **(3 marks)**
- (c) Comment on why (based on relative risk analysis) a company might seek to generate higher rates of return from export sales compared to domestic sales. **(6 marks)**
- (d) If the payment from Company B is received late, briefly explain what risk SDT is taking in hedging B's payment in the forward market, and how this risk could be avoided. **(4 marks)**

(Total = 25 marks)

59 BS

45 mins

BS is an importer/exporter of heavy machinery for a variety of industries. It is based in the UK but trades extensively with the USA. Assume that you are a newly appointed management accountant with BS. The company does not have a separate treasury function and it is part of your duties to assess and manage currency risks. You are concerned about the recent fluctuations in the exchange rate between US\$ and sterling and are considering various methods of hedging the exchange risk involved. Assume it is now the end of March. The following transactions are expected on 30 June.

Sales receipts	\$450,000
Purchases payable	\$250,000

Economic data

- The spot rate of exchange is US\$1.6540-1.6590 to the £.
- The three-month forward rate that will apply for this contract is \$1.6513/£
- Annual interest rates for three months' borrowing are: USA 6 per cent; UK 9 per cent.
- Annual interest rates for three months' lending are: USA 4 per cent; UK 6.5 per cent.

Required

- (a) Calculate the net sterling receipts that BS can expect from its transactions if the company hedges the exchange risk using each of the following alternatives:
- (i) The forward foreign exchange market
- (ii) The money market
- Accompany your calculations with brief explanations of your approach and recommend the most financially advantageous alternative for BS. Assume transaction costs would be 0.2 per cent of the US\$ transaction value under either method, paid at the beginning of the transaction (ie now). **(10 marks)**
- (b) Explain the factors the company should consider before deciding to hedge the risk using the foreign currency markets, and identify any alternative actions available to minimise risk. **(5 marks)**
- (c) Discuss the causes of exchange rate fluctuations. **(10 marks)**

(Total = 25 marks)

60 Nedwen Co (Pilot paper)

45 mins

Nedwen Co is a UK-based company which has the following expected transactions.

One month: Expected receipt of \$240,000
One month: Expected payment of \$140,000
Three months: Expected receipts of \$300,000

The finance manager has collected the following information:

Spot rate (\$ per £): 1.7820 ± 0.0002
One month forward rate (\$ per £): 1.7829 ± 0.0003
Three months forward rate (\$ per £): 1.7846 ± 0.0004

Money market rates for Nedwen Co:

	<i>Borrowing</i>	<i>Deposit</i>
One year sterling interest rate:	4.9%	4.6
One year dollar interest rate:	5.4%	5.1

Assume that it is now 1 April.

Required

- (a) Discuss the differences between transaction risk, translation risk and economic risk. **(6 marks)**
 - (b) Explain how inflation rates can be used to forecast exchange rates. **(6 marks)**
 - (c) Calculate the expected sterling receipts in one month and in three months using the forward market. **(3 marks)**
 - (d) Calculate the expected sterling receipts in three months using a money-market hedge and recommend whether a forward market hedge or a money market hedge should be used. **(5 marks)**
 - (e) Discuss how sterling currency futures contracts could be used to hedge the three-month dollar receipt. **(5 marks)**
- (Total = 25 marks)**

61 Boluje Co (12/08)

45 mins

Three years ago Boluje Co built a factory in its home country costing \$3.2 million. To finance the construction of the factory, Boluje Co issued peso-denominated bonds in a foreign country whose currency is the peso. Interest rates at the time in the foreign country were historically low. The foreign bond issue raised 16 million pesos and the exchange rate at the time was 5.00 pesos/\$.

Each foreign bond has a par value of 500 pesos and pays interest in pesos at the end of each year of 6.1%. The bonds will be redeemed in five years' time at par. The current cost of debt of peso-denominated bonds of similar risk is 7%.

In addition to domestic sales, Boluje Co exports goods to the foreign country and receives payment for export sales in pesos. Approximately 40% of production is exported to the foreign country.

The spot exchange rate is 6.00 pesos/\$ and the 12-month forward exchange rate is 6.07 pesos/\$. Boluje Co can borrow money on a short-term basis at 4% per year in its home currency and it can deposit money at 5% per year in the foreign country where the foreign bonds were issued. Taxation may be ignored in all calculation parts of this question.

Required

- (a) Briefly explain the reasons why a company may choose to finance a new investment by an issue of debt finance. **(7 marks)**
 - (b) Calculate the current total market value (in pesos) of the foreign bonds used to finance the building of the new factory. **(4 marks)**
 - (c) Assume that Boluje Co has no surplus cash at the present time:
 - (i) Explain and illustrate how a money market hedge could protect Boluje Co against exchange rate risk in relation to the dollar cost of the interest payment to be made in one year's time on its foreign bonds. **(4 marks)**
 - (ii) Compare the relative costs of a money market hedge and a forward market hedge. **(2 marks)**
 - (d) Describe other methods, including derivatives, that Boluje Co could use to hedge against exchange rate risk. **(8 marks)**
- (Total = 25 marks)**

62 Preparation question: Interest rates

- (a) It is 30 June. Bash Co will need a £20 million 6 month fixed rate loan from 1 October. The company wants to hedge using an FRA. The relevant FRA rate is 7% on 30 June.
 - (i) Explain how FRAs work and state what FRA is required in this situation.
 - (ii) Calculate the result of the FRA and the effective loan rate if the 6 month FRA benchmark rate has moved to
 - (1) 6%
 - (2) 9%
- (b) Describe the likely implications to a typical company of lower interest rates.
- (c) If you were the Financial Director of a company with a large investment programme and no capital gearing, explain what changes might result to both the investment programme and its financing as a result of falling interest rates.

63 Preparation question: QW

Assume that you are treasurer of QW, a company with diversified, international interests. The company wishes to borrow £10 million for a period of three years. Your company's credit rating is good and current market data suggests that you could borrow at a fixed rate of interest at 8 per cent per annum or at a floating rate of LIBOR + 0.2 per cent per annum. You believe that interest rates are likely to fall over the next three years, and favour borrowing at a floating rate.

You have been in the post for twelve months, having been recruited from a large financial institution. You have a keen interest in using financial derivatives (such as futures and options) to both manage risk and generate revenue. Some board members have expressed concern that your activities may be involving the company in unnecessary risk.

Required

- (a) Describe and discuss different types of interest rate risk.
- (b) Explain the meaning and use of financial derivatives, in general terms, and the advantages and disadvantages of their use for companies such as QW.
- (c) Describe the characteristics and benefits of interest rate swaps compared with other forms of interest-rate-risk management, such as forward rate agreements and interest rate futures.

64 Gorwa Co (12/08)

45 mins

The following financial information related to Gorwa Co:

		20X7		20X6
		\$'000		\$'000
Sales (all on credit)		37,400		26,720
Cost of sales		<u>34,408</u>		<u>23,781</u>
Operating profit		2,992		2,939
Finance costs (interest payments)		<u>355</u>		<u>274</u>
Profit before taxation		<u>2,637</u>		<u>2,665</u>
		20X7		20X6
	\$'000	\$'000	\$'000	\$'000
Non-current assets		13,632	12,750	
Current assets				
Inventory	4,600		2,400	
Trade receivables	<u>4,600</u>		<u>2,200</u>	
	9,200		4,600	
Current liabilities				
Trade payables	4,750		2,000	
Overdraft	<u>3,225</u>		<u>1,600</u>	
	7,975		3,600	
Net current assets		<u>1,225</u>		<u>1,000</u>
		14,857		13,750
8% Bonds		<u>2,425</u>		<u>2,425</u>
		<u>12,432</u>		<u>11,325</u>
Capital and reserves				
Share capital		6,000		6,000
Reserves		<u>6,432</u>		<u>5,325</u>
		<u>12,432</u>		<u>11,325</u>

The average variable overdraft interest rate in each year was 5%. The 8% bonds are redeemable in ten years' time.

A factor has offered to take over the administration of trade receivables on a non-recourse basis for an annual fee of 3% of credit sales. The factor will maintain a trade receivables collection period of 30 days and Gorwa Co will save \$100,000 per year in administration costs and \$350,000 per year in bad debts. A condition of the factoring agreement is that the factor would advance 80% of the face value of receivables at an annual interest rate of 7%.

Required

- Discuss, with supporting calculations, the possible effects on Gorwa Co of an increase in interest rates and advise the company of steps it can take to protect itself against interest rate risk. **(7 marks)**
- Use the above financial information to discuss, with supporting calculations, whether or not Gorwa Co is overtrading. **(10 marks)**
- Evaluate whether the proposal to factor trade receivables is financially acceptable. Assume an average cost of short-term finance in this part of the question only. **(8 marks)**

(Total = 25 marks)

Answers

ACCA examiner's answers

The ACCA examiner's answers to questions marked 'Pilot paper', '12/07', '6/08' or '12/08' can be found on the BPP website at the following link:

www.bpp.com/acca/examiner-solutions

Additional question guidance

Additional guidance to certain questions can be found on the BPP website at the following link:

www.bpp.com/acca/extra-question-guidance

1 ABC Co

Text references. Performance analysis and corporate governance are covered in Chapter 1.

Top tips. Don't be tempted in part (a) to calculate endless ratios and not leave enough time for the discussion. This type of analysis is an essential skill for the F9 exam so make sure you are happy with the technique.

In parts (b) and (c) make sure you answer the specific requirement and don't simply regurgitate textbook knowledge.

(a) **Ratio analysis**

	<i>Current year</i>	<i>Previous year</i>
<i>Profitability</i>		
ROCE		
(PBIT/Long-term capital)	$14,749 / (39,900 + 14,000) = 27.4\%$	$13,506 / (35,087 + 17,500) = 25.7\%$
<i>Debt</i>		
Gearing (Debt/Equity)	$14,000 / 39,900 = 35.1\%$	$17,500 / 35,087 = 49.9\%$
Interest coverage (PBIT/Interest)	$14,749 / 1,553 = 9.5$	$13,506 / 1,863 = 7.2$
<i>Shareholders' investment</i>		
EPS	$8,849 / 14,000 = \text{€}0.63$	$7,917 / 14,000 = \text{€}0.57$
Share price (P/E × EPS)	$14.0 \times 0.63 = \text{€}8.82$	$13.0 \times 0.57 = \text{€}7.41$
Dividend per share	$4,800 / 14,000 = \text{€}0.34$	$3,100 / 14,000 = \text{€}0.22$
Dividend yield (DPS/Share price)	$0.34 / 8.82 = 3.85\%$	$0.22 / 7.41 = 2.97\%$

The performance of ABC Co

A shareholder of ABC Co would probably be reasonably pleased with their performance over these two years.

Growth of income

The company has grown in terms of turnover and profits. **Turnover** has grown by 9.6% $((74,521 - 68,000) / 68,000 \times 100\%)$ and **return on capital employed** has increased from 25.7% to 27.4%. There may be some concern over the 25.4% increase $((11,489 - 9,160) / 9,160 \times 100\%)$ in **other costs** and more information would be needed to determine if this is a one-off increase or a worrying long-term trend.

Salaries and wages have only increased by 2.4% $((20,027 - 19,562) / 19,562 \times 100\%)$ so employees may be less pleased with the situation. Employee discontent could create problems for the business in future.

Gearing

The financial risk that the shareholders are exposed to does not appear to be a problem area as **gearing** has decreased from 49.9% to 35.1% and **interest cover** is more than sufficient. The company may want to consider increasing gearing to invest in suitable projects and generate further growth.

Shareholder return

The **shareholders' investment ratios** all indicate that shareholders' wealth has increased. The **share price** has increased by 19% $((8.82 - 7.41) / 7.41 \times 100\%)$. The **total shareholder return** is $(P_1 - P_0 + P_1) / P_0 = (8.82 - 7.41 + 0.34) / 7.41 = 23.6\%$. This is probably sufficient to satisfy shareholders. The **P/E ratio** reflects the market's appraisal of the share's future prospects and this has improved. It is still lower than the industry average which suggests that more growth could be achieved.

(b) **Manipulation**

Accounting profits can be **manipulated** to some extent by choices of **accounting policies**. For example, the depreciation amount will depend on the basis of calculation of depreciation and development costs can be **capitalised** instead of being written off to the income statement.

Risk

Profit does not take account of **risk**. Shareholders will be very interested in the level of risk, and maximising profits may be achieved by increasing risk to unacceptable levels.

Volume of investment

Profits on their own take no account of the **volume of investment** that it has taken to earn the profit. Profits must be related to the volume of investment to have any real meaning.

Short-term performance

Profits are reported every year (with half-year interim results for quoted companies). They are measures of **short-term** historic performance, whereas a company's performance should ideally be judged over a longer term and **future** prospects considered as well as past profits.

- (c) **Corporate governance** is the system by which organisations are directed and controlled.

Those directors who have the power to direct and control the organisation also have the duty of accountability to the organisation's stakeholders.

Although the directors' role is a key one in deciding how the divergent interests of the various stakeholders should be promoted, the directors primary duty is to **enhance the value of shareholders' investment** over time.

Corporate governance regulation aims to control the ability of the directors to promote their own interests and ensure adequate disclosure of their activities. This is achieved by the use of independent non-executive directors to staff committees that monitor the following areas:

- (i) The management and **reduction of risk**. This is monitored by an **audit committee** staffed by non-executives and ensures that areas of risks are being identified and managed in an appropriate way.
- (ii) **Incentives** to senior management to maximise shareholder wealth. This is monitored by a **remuneration committee** to ensure the incentives are appropriate and not over-generous.
- (iii) Good governance provides a **framework** for an organisation to pursue its strategy in an **ethical and effective** way from the perspective of all stakeholder groups affected, and offers safeguards against misuse of resources, physical or intellectual. This is achieved by giving non-executive directors significant voting power at board level and by separating the role of the MD and the chairman to ensure that one individual does not exercise excessive power.

Businesses that **comply** with corporate governance regulations can therefore help to manage under-performance by:

- (i) Identifying the under-performing areas as part of their **risk-management** processes.
- (ii) Ensuring that management is **incentivised** to deal with issues that have been identified.
- (iii) Controlling the **corporate strategy** of the company and ensuring it is effective and well thought out.

2 RZP Co

Text reference. Performance analysis is covered in Chapter 1.

Top tips. It is important to read the question clearly. Thus, in part (a) the question states exactly what you are required to calculate. So for instance, share price growth for each year and then the arithmetic mean and equivalent annual growth rates.

Easy marks. Set out your workings to part (a) in a table such as that in our answer. It helps the marker and allows you to pick out key figures for calculating means and growth rates. Don't worry if you had trouble with the equivalent annual growth rate, the discussion areas in part (c) are a source of easier marks.

Examiner's comments. Part (a) required candidates to analyse information provided, and comment on views expressed by a chairman on dividend growth, share price growth, and earnings growth. Candidates who commented on the chairman's views without analysing the information provided gained little credit.

The requirement in part (b) was to calculate total shareholder return and comment on the result. The question explained that total shareholder return was dividend yield plus capital growth. Most candidates were unable to calculate dividend yield.

Part (c) asked for a discussion of the factors to be considered when deciding on a management remuneration package that would encourage shareholder wealth maximisation. The key to answering this part was an awareness of how the actions of managers might lead to an increase or decrease in shareholder wealth.

Marking scheme

		Marks
(a)	Growth in dividends per share: analysis/discussion	4–5
	Share price growth: analysis/discussion	4–5
	Growth in earnings per share: analysis/discussion	4–5
		Maximum
		13
(b)	Calculation of total shareholder return	2
	Comment	1
		—
		3
(c)	Discussion of factors	5–6
	Examples of appropriate remuneration packages	4–5
		Maximum
		9
		<u>25</u>

(a)

Year	20X4	20X3	20X2	20X1	20X0
Dividend per share	2.8p	2.3p	2.2p	2.2p	1.7p
Annual dividend growth	21.7%	4.5%	nil	29.4%	
General price index	117	113	110	105	100
Real dividend per share	2.4p	2.0p	2.0p	2.1p	1.7p
Annual dividend growth	20.0%	nil	(4.8)%	23.5%	
Earnings per share	19.04p	14.95p	11.22p	15.84p	13.43p
Annual earnings growth	27.3%	33.2%	(29.2)%	17.9%	
Price/earnings ratio	22.0	33.5	25.5	17.2	15.2
Share price	418.9p	500.8p	286.1p	272.4p	204.1p
Annual share price growth	(16.3)%	75.0%	5.0%	33.5%	

(i) Average dividend growth:
 Arithmetic mean = $(21.7 + 4.5 + 0 + 29.4)/4 = 55.6/4 = 13.9\%$
 Equivalent annual growth rate = $[(2.8/1.7)^{0.25} - 1] \times 100 = 13.3\%$
 Average real dividend growth:
 Arithmetic mean = $(20.0 + 0 - 4.8 + 23.5)/4 = 38.7/4 = 9.7\%$
 Equivalent annual growth rate = $[(2.4/1.7)^{0.25} - 1] \times 100 = 9.0\%$

(ii) Average share price growth:
 Arithmetic mean = $(-16.3 + 75.0 + 5.0 + 33.5)/4 = 97.2/4 = 24.3\%$
 Equivalent annual growth rate = $[(418.9/204.1)^{0.25} - 1] \times 100 = 19.7\%$

(iii) Average earnings per share growth:
 Arithmetic mean = $(27.3 + 33.2 - 29.2 + 17.9)/4 = 49.2/4 = 12.3\%$
 Equivalent annual growth rate = $[(19.04/13.43)^{0.25} - 1] \times 100 = 9.1\%$

The claim that the company has delivered growth every year in dividends, earnings and ordinary share price (apart from 20X2), is largely borne out by the above figures, with a couple of exceptions. No growth in real dividends occurred in 20X3, and the company's share price fell by 16.3% in 20X4. In fact, the statement should try to explain the reasons for the decline in share price in order to reassure shareholders, rather than gloss over it.

The statement also claims that RZP Co has consistently delivered above-average performance. Without information on sector averages for individual years, it is not possible to comment authoritatively here. The average growth rates for the sector cannot be used to comment on performance in individual years. If the company has consistently delivered above-average performance, however, the company's average annual growth rates should be greater than the sector averages.

Comparison of growth rates:

	<i>Arithmetic mean</i>	<i>Equivalent annual rate</i>	<i>Sector</i>
Nominal dividends	13.9%	13.3%	10%
Real dividends	9.7%	9.0%	9%
Earnings per share	12.3%	9.1%	10%
Share price	24.3%	19.7%	20%

If the sector average growth rates are arithmetic mean growth rates, the chairman's statement is technically correct. The basis on which the sector average growth rates have been prepared should therefore be clarified, in order to determine whether the chairman's statement is correct. Overall however, the company looks to be performing in line with the sector average, whatever method of calculation is used.

- (b) The dividend yield and capital growth for 20X4 are calculated by reference to the 20X3 end-of-year share price.

The dividend yield is 0.56% ($100 \times 2.8/500.8$) and the capital growth is -16.35% ($100 \times (418.9 - 500.8)/500.8$). The total shareholder return is therefore -15.8% ($0.56 - 16.35$).

This negative total shareholder return conflicts with the chairman's claim to have delivered growth in dividends and share price in 20X4. Share prices may be affected by other factors than corporate activity, however, and it is possible that the negative return may represent a good performance when compared to the sector as a whole.

- (c) The objectives of managers may conflict with the objectives of shareholders, so management remuneration packages are often designed to **encourage goal congruence**. It is also interesting to note that in recent years there has been a tendency to remove managerial remuneration packages from the control of the very managers who benefit. **Remuneration committees** exist in listed companies aim to reduce managerial self-interest and encourage remuneration packages that support the achievement of shareholder wealth rather than purely managerial goals.

Packages need to motivate managers while supporting the achievement of shareholder wealth maximisation. The following factors need to be considered.

Performance measure

The managerial performance measure selected for use in the remuneration package should support the achievement of the primary objective of shareholder wealth maximisation. It could be linked to share price changes or **total shareholder return**.

The managerial performance measure should relate to factors under a manager's **control**. For example, if some items on a division's profit statement are not controlled by a divisional manager (eg head office overheads), these items should be excluded from the performance measure.

Performance measures should include **non-financial** measures (eg market share, defect levels, customer satisfaction). If they do not, managers may resort to short-term cost cutting measures to achieve profit targets. The managerial performance measure might be linked to industry best practice.

Type of reward

A **cash bonus** will be a powerful incentive for managers to improve their performance and achieve targets. However, most companies will also want their senior managers to have a **direct incentive to increase** the

share price of the company. **Share options** can be used but they can encourage **risk-taking**. Risky investments can dramatically increase the share price if successful but the managers will not suffer a loss on the share options if they fail.

Management remuneration packages for RZP Co

RZP Co has delivered earnings growth of more than 20% in both 20X3 and 20X4. If annual earnings growth were to be part of a remuneration package for RZP Co, earnings growth should be compared to the sector, and any bonus made conditional upon long term performance.

Alternatively, remuneration packages may be based on a performance measure linked to stock market performance, such as total shareholder return compared to average share price growth for the sector, or compared to growth in a stock market index. This would be consistent with shareholder wealth maximisation, and is likely to work well if the managers were to receive shares or share options as part of the remuneration package. However, factors such as general economic changes or market conditions can have an effect on share prices, and so managers may fail to be rewarded when circumstances are beyond their control.

3 Tagna

Text references. The financial management environment is covered in Chapter 2.

Top tips. You should answer this well provided you read the question and are guided by what the examiner wants. In part (a) he wants a specific discussion on the three areas outlined. In part (b), an explanation of the terms used and a comparison between the two. Part (c) requires a more precise and detailed commentary on monopoly.

Easy marks. Any written element provided you know what you are writing about.

Examiner's comments. Many answers to part (a) lacked depth of discussion but were generally on the right track. One common misconception was to confuse financing costs with operating costs. Most answers to part (b) correctly defined and discussed the concepts of economy, efficiency and effectiveness (input, process and output), and were able to provide good answers on maximising shareholder wealth. Even good answers failed to recognise that a company in the private sector might be able to pursue 'value for money' and 'shareholder wealth maximisation' at the same time. Part (c) on the economic problems caused by monopoly and the role of government in maintaining competition was often answered well. There was a tendency to list points rather than discuss them, but the key aspects of the topic were usually identified. Good answers focused on the need to monitor markets and to have in place appropriate and effective legislation.

Marking scheme

	Marks
(a) Up to 2 marks for each detailed consequence	10
(b) Value for money	3
Maximisation of shareholder wealth	<u>3</u>
	6
(c) Meaning of monopoly	1
Discussion of economic problems of monopoly	5
Discussion of role of government	<u>3</u>
	<u>9</u>
	<u>25</u>

- (a) (i) If interest rates increase significantly, it is likely to have an adverse impact on Tagna's sales. As it sells luxury goods, it could be expected that these would be the first to be sacrificed by consumers if they are feeling 'the pinch' in other areas (such as mortgage payments) and their disposable income

is reduced. The cost of consumer credit might also be pushed up to dampen spending, further denting consumer confidence and the willingness to spend money on luxury items.

- (ii) Interest rates may also push up input costs such as materials and labour, although this would probably not be seen as immediately as an effect of higher interest rates upon sales, as the effect of the rise would have to make itself felt throughout the economy. Wages could go up as a result of inflation, but this will be countered by the effect of the interest rate increase on consumer demand.
 - (iii) Profit after tax will fall as a result of the interest rate increase, both for the reasons outlined above but also because the cost of servicing Tagna's overdraft will increase. With a fall in sales, increased operating costs and increased interest charges, there is likely to be a significant fall in earnings. As Tagna's profits have been low, this could represent a real threat to future profitability and dividend payments.
- (b) Public sector organisations are generally set up with a prime objective which is not related to making profits. These organisations exist to pursue non-financial aims, such as providing a service to the community. However, there will be financial constraints which limit what any such organisation can do. A not-for-profit organisation **needs finance** to pay for its operations, and the major financial constraint is the amount of funds that it can obtain. Having obtained funds, a not-for-profit organisation should seek to get **value for money** from use of the funds:
- (i) **Economy**: not spending \$2 when the same thing can be bought for \$1
 - (ii) **Efficiency**: getting the best use out of what money is spent on
 - (iii) **Effectiveness**: spending funds so as to achieve the organisation's objectives

Since managing government (for example) is different from managing a company, a different framework is needed for **planning and control**. This is achieved by:

- setting **objectives** for each
- **careful planning** of public expenditure proposals
- emphasis on getting **value for money**

A private sector organisation has as its primary objective the making of sufficient profits to provide a satisfactory return for its owners and to keep the business operating.

So, it is job of senior management to **maximise the market value** of the company. Specifically, the main financial objective of a company should be to maximise the wealth of its ordinary shareholders. Within this context, the financial manager seeks to ensure that investments earn a **return**, for the benefit of shareholders. Part of this job will involve attracting funds from the market, such as new investors, but as with public sector organisations it is also important that the operations of the company are run economically and efficiently.

- (c) Regulation can be defined as any form of state interference with the operation of the free market. This could involve regulating demand, supply, price, profit, quantity, quality, entry, exit, information, technology, or any other aspect of production and consumption in the market.

An important role for the government is the regulation of markets when these fail to bring about an efficient use of resources. In response to the existence of market failure, and as an alternative to taxation and public provision of production, the state often resorts to regulating economic activity. Where one company's large share or complete domination of the market is leading to inefficiency or excessive profits, the state may intervene, for example through controls on prices or profits, in order to try to reduce the effects of this power. Abuse of a dominant position will cause economic problems and economic inefficiency, because there will be no incentive for the company to improve its processes or cut its costs, as it can pass on all inefficiencies to customers in the form of higher prices.

In a pure **monopoly**, there is only one firm, the sole producer of a good, which has no closely competing substitutes. In practice government policy is concerned not just with situations where one firm has a 100% market share, but other situations where an organisation has a significant market share. In the UK, a monopoly is said to occur if an organisation controls 25% or more of the market. The Office of Fair Trading and the Competition Commission monitor the market.

The Competition Commission can be asked to investigate what could be called 'oligopoly situations' involving explicit or implicit collusion between firms. The Commission must decide whether or not any

monopoly is acting 'against the public interest. In its report, the Commission will say if a monopoly situation has been found to exist and, if so, will make recommendations to deal with it. These may involve various measures.

- Price cuts
- Price and profit controls
- Removal of entry barriers

4 Phoenix

Text references. Performance analysis is covered in Chapter 1, working capital ratios in Chapter 4 and financial intermediation in Chapter 2.

Top tips. Do not spend too long on the ratios in part (a) at the expense of the written sections. The key to this question is why the entity is running out of cash.

In part (b) make sure you relate your answer to the bank in the scenario, do not just write everything you know about the risk/return trade-off. As we have said in the Passing F9 section of the front pages of this kit, make sure your answers are focused and specific to the organisation in the question.

In (c), note who are classified as financial intermediaries; they are not the same as independent financial advisers.

(a) Accounting ratios

	20X7	20X8	20X9
1 <i>Profit margin</i>			
$\frac{\text{Profit before interest}}{\text{Revenue}} \times 100\%$	$\frac{(50 + 45)}{1,850} \times 100\%$	$\frac{(60 + 60)}{2,200} \times 100\%$	$\frac{(50 + 90)}{2,500} \times 100\%$
	= 5.1%	= 5.5%	= 5.6%
2 <i>Operating costs</i>			
$\frac{\text{Other operating costs}}{\text{Revenue}} \times 100\%$	$\frac{550}{1,850} \times 100\%$	$\frac{640}{2,200} \times 100\%$	$\frac{700}{2,500} \times 100\%$
	= 29.7%	= 29.1%	= 28.0%
3 <i>Inventory turnover</i>			
$\frac{\text{Cost of sales}}{\text{Inventory}}$	$\frac{1,250}{400}$	$\frac{1,500}{540}$	$\frac{1,750}{620}$
	= 3.1 times	= 2.8 times	= 2.8 times
4 <i>Trade receivables turnover</i>			
$\frac{\text{Trade receivables}}{\text{Credit sales}} \times 365$	$\frac{492}{(300 + 45)} \times 365$	$\frac{550}{(400 + 60)} \times 365$	$\frac{633}{(600 + 90)} \times 365$
	= 521 days	= 436 days	= 335 days

(Note: Interest from credit sales has been added, as this is likely to be included in the trade receivables figure)

5 <i>Cash generated from operations</i>	20X8	20X9
	\$m	\$m
Profit before interest	120	140
Depreciation	60	70
Increase in inventory	(140)	(80)
Increase in trade receivables	(58)	(83)
Increase in trade payables	—	10
	<u>(18)</u>	<u>57</u>

6	<i>ROCE</i>		20X7	20X8	20X9
	$\frac{\text{Profit before interest}}{\text{Net assets + borrowings}} \times 100\%$		$\frac{95}{(372 + 520)} \times 100\%$	$\frac{120}{(382 + 720)} \times 100\%$	$\frac{140}{(372 + 930)} \times 100\%$
			= 10.7%	= 11.0%	= 10.8%
7	<i>Interest cover</i>				
	$\frac{\text{Profit before interest}}{\text{Interest payable}}$		$\frac{95}{25} = 3.8$	$\frac{120}{60} = 2.0$	$\frac{140}{110} = 1.3$
8	<i>Gearing</i>				
	$\frac{\text{Borrowings}}{\text{Net assets + borrowings}}$		$\frac{520}{892} = 58.3\%$	$\frac{720}{1,102} = 65.3\%$	$\frac{930}{1,302} = 71.4\%$
9	<i>Asset turnover</i>				
	$\frac{\text{Revenue}}{\text{Net assets + borrowings}}$		$\frac{1,850}{892} = 2.1$	$\frac{2,200}{1,102} = 2.1$	$\frac{2,500}{1,302} = 1.92$

Bank lending

The main reason for the steep increase in bank lending is due to the entity not generating **sufficient cash** from its operating activities over the past three years.

For the year ended 30 June 20X8, the entity had a **net cash deficiency** on operating activities of \$18m.

In addition, for at least the past two years, the cash generated from operating activities has not been sufficient to cover **interest payable**. Therefore those payments, together with tax and dividends, have had to be covered by borrowings.

As at 30 June 20X9, bank borrowings were \$610m out of a total facility of \$630m. Payment of the proposed dividends alone would increase the borrowings to the limit.

Operating review

Although **revenue** has been rising steadily over the period, **operating profit** has remained almost static.

Over this period the **profit margin** has risen, but not as much as would be expected. The **cost of sales** have risen in almost the same proportion as revenue. This may be due to increased costs of raw materials, as inventories have risen steeply; but the **turnover of inventory** has been falling or static over the same period.

There has also been a large increase in **trade receivables**. Both the increase in inventories and trade receivables have had to be financed out of operating activities leading to the present pressure on borrowings.

Although the number of days sales in trade receivables has fallen steadily over the period, the trade receivables at the end of June 20X9 still represent nearly a year's credit sales. This is excessive and seems to imply a **poor credit control policy**, even taking into account the extended credit terms being granted by the company.

Recommendations

The entity needs to undertake an urgent review of its **credit terms** in order to reduce the levels of trade receivables.

Inventory levels are also extremely high (representing over four months' sales) and should be reviewed.

Operating costs also need to be kept under control in order to generate more cash from sales.

(b) **The risk/return trade-off**

There is a **trade-off** between **risk and return**. Investors in riskier assets expect to be compensated for the risk. In the case of ordinary shares, investors hope to achieve their return in the form of an increase in the share price (a capital gain) as well as from dividends. In general, the **higher the risk** of the security, the **more important is the capital gain** component of the expected yield.

In the same way, **higher-risk borrowers** must **pay higher yields** on their borrowing to compensate lenders for the greater risk involved. Banks will assess the creditworthiness of the borrower and set a rate of interest on its loan at a certain mark-up above its base rate. The higher the risk, the higher the interest rate.

Phoenix has become an increasingly risky prospect and, if the bank can be persuaded to increase the lending facility, it is likely that the rate of interest charged will be increased.

(c) **The role of financial intermediaries**

A financial intermediary is an institution that links lenders with borrowers, by obtaining deposits from lenders and then re-lending them to borrowers. In the UK, the intermediaries include:

- Commercial banks
- Finance houses
- Building societies
- National Savings Bank
- Insurance companies
- Pension funds
- Unit trust companies
- Investment trust companies

Benefits of financial intermediation

(i) **Reduction of risk through pooling**

Since financial intermediaries lend to a large number of individuals and organisations, any losses suffered through default by borrowers or through capital losses are effectively pooled and borne as costs by the intermediary. Provided that the intermediary is itself financially sound, the lender should not run the risk of losing his investment. Bad debts are borne by the financial intermediary in its re-lending operation.

(ii) **Maturity transformation**

An example of this is the building society, which allows depositors to have immediate access to their savings while lending to mortgage holders for 25 years. The intermediary takes advantage of the continual turnover of cash between borrowers and investors to achieve this.

(iii) **Convenience**

They provide a simple way for the lender to invest, without him having personally to find a suitable borrower directly. All the investor has to decide is for how long the money is to be deposited and what sort of return is required; all he then has to do is to choose an appropriate intermediary and form of deposit.

(iv) **Regulation**

There is a comprehensive system of regulation in place in the financial markets that is aimed at protecting the investor against negligence or malpractice.

(v) **Information**

Intermediaries can offer a wide range of specialist expert advice on the various investment opportunities that is not directly available to the private investor.

Benefits of financial intermediaries

Financial intermediaries therefore have many benefits to offer the private investor, both in terms of general information and the investments available.

5 East Meets West Co

Text references. Working capital is covered in Chapter 4 and inflation is discussed in Chapter 2.

Top tips. Part (a) requires you to calculate each part of the cash operating cycle, with three types of inventory. In part (b) make sure you apply your suggestions to this particular organisation. In (c)(i) it is helpful to explain the components of working capital and their inter-relationships linking working capital with cash. In (c)(ii) you should consider not only the direct costs and dangers of reliance on trade credit, but also some of the potential dangers that it entails in terms of threat to supplies of goods and the potential to obtain credit from new suppliers in the future.

Part (d) requires you to use your knowledge of economics from Part B of the syllabus. It is important to remember that discussion parts of exam questions may cover a number of different areas of the syllabus.

(a)	Cost of sales	$= 5,600,000 \times (100 - 25)\%$ $= \$4,200,000$	
	Purchases	$= 4,200,000 \times 50\%$ $= \$2,100,000$	
	Raw material inventory period	$\frac{\text{Raw materials}}{\text{Purchases}} \times 365$ $\frac{220,000}{2,100,000} \times 365$	Days 38.2
	Credit taken from suppliers	$\frac{\text{Payables}}{\text{Purchases}} \times 365$ $\frac{210,000}{2,100,000} \times 365$	(36.5)
	Work in progress	$\frac{\text{Work in progress}}{\text{Cost of sales}} \times 365$ $\frac{550,000}{4,200,000} \times 365$	47.8
	Finished goods	$\frac{\text{Finished goods}}{\text{Cost of sales}} \times 365$ $\frac{350,000}{4,200,000} \times 365$	30.4
	Credit allowed to receivables	$\frac{\text{Receivables}}{\text{Sales}} \times 365$ $\frac{506,000}{5,600,000} \times 365$	33.0
			<u>112.9</u>

(b) The cash operating cycle can be reduced in the following ways

(i) **Reduce raw material inventory**

Arrangements can be made with suppliers so raw materials are only ordered when they are needed for production.

(ii) **Credit taken from suppliers**

East Meets West could negotiate a **longer credit period** from suppliers.

(iii) **Reduce work-in-progress**

Work-in-progress might be reduced by using **more advanced technology** or improving **production processes**.

(iv) **Reduce finished goods inventory**

Finished goods inventory could be reduced by not holding as much **safety inventory** to guard against unexpected demands.

(v) **Reduce receivables**

Credit control procedures could be **tightened**, or incentives such as discounts be offered for early payment.

(c) (i) **Working capital**

The net working capital of a business can be defined as its current assets less its current liabilities. The management of working capital is concerned with ensuring that **sufficient liquid resources** are maintained within the business. For the majority of businesses, particularly manufacturing businesses, trade payables will form the major part of the current liabilities figure, and will be a significant element in the make-up of the working capital balance.

Trade credit period

It follows that the trade credit period taken will be a major determinant of the working capital requirement of the company. This is calculated (in days) as the total value of trade payables divided by the level of credit purchases times 365. The actual length of the period will depend partly on the credit terms offered by suppliers and partly on the decisions made by the company. For example, the company may choose to negotiate longer terms with its suppliers although this may be at the expense of any available settlement discounts.

Cash conversion cycle

A link can be made between working capital and liquidity by means of the **cash conversion cycle**. This measures the length of time that elapses between a firm paying for its various purchases and receiving payment for its sales. It can be calculated as the receivable days plus the inventory holding period less the trade credit period, and it measures the length of time for which net current assets must be financed.

This emphasises the important role of the trade credit period in the overall liquidity of the company.

(ii) **Importance of trade payables**

For many firms, trade payables provide a very important source of short-term credit. Since very few companies currently impose interest charges on overdue accounts, taking extended credit can appear to be a very cheap form of short-term finance. However, such a policy entails some risks and costs that are not immediately apparent, as follows.

- (1) If discounts are being forgone, the **effective cost** of this should be evaluated – it may be more beneficial to shorten the credit period and take the discounts.
- (2) If the company gains a reputation for slow payment this will **damage its credit references** and it may find it difficult to obtain credit from new suppliers in the future.
- (3) Suppliers who are having to wait for their money may seek recompense in other ways, for example by raising prices or by placing a lower priority on new orders. Such actions could do **damage** to both the **efficiency and profitability** of the company.
- (4) Suppliers may place the company '**on stop**' until the account is paid. This can jeopardise supplies of essential raw materials which in turn could cause production to stop: this will obviously provide the company with a high level of unwanted costs.

(d) **Problems with inflation**

(i) **Increase in raw material prices**

The **raw material prices** that a business faces may increase, but the business may not be able to pass these increases on to its customers in the form of higher prices for its finished goods.

(ii) **Uncertainty**

Inflation may lead to **economic uncertainty**, which decreases the demand for consumer goods. Increased uncertainty will also mean that **business decision-making** becomes more difficult. Businesses also have to **expend resources** keeping track of price changes.

(iii) **Higher interest rates**

Governments or the central bank may counter inflation by raising interest rates, and this will make the cost of borrowing for businesses more expensive and **limit their** opportunities to invest.

(iv) **Decreased overseas demand**

If a business in Pernisia has to raise its prices because it **faces increased costs**, it may come under increasing pressure from overseas competitors who do not face the same price increases.

(v) **Change in the value of debt**

Payables will be disadvantaged by inflation, as it will mean a **fall in the real value of debt**, although receivables will be advantaged for the same reason.

6 JIT and EOQ

Text references. Inventory management is covered in Chapter 5.

Top tips. It is easy to go off on the wrong track when answering (a). Make quite sure you know what you are going to do before you start! Don't forget you are asking for the effect on *profit*, not cash flow. The effect of the investment in equipment is shown as the sum of interest cost and depreciation.

Remember also that the reduced receivable payment period will be on an increased sales value.

In (b), it is the company's perspective you are concerned with, not its customers'.

In (c) we use the annuity factor to discount the cash flow. Don't forget the tax. You may not have covered this part of the syllabus yet so just read through the answers for now.

(a) **Improvement in first year profit before tax attributable to the JIT agreement**

		\$'000	\$'000
Equipment: interest cost	$13\% \times \$0.5\text{m}$		(65.00)
depreciation cost	$\$0.5\text{m}/5$		(100.00)
Main customer:			
Original value of annual sales	$20\% \times \$20\text{m}$	4,000.00	
Increased value of annual sales	$1.05 \times \$4\text{m}$	<u>4,200.00</u>	
Increase in sales			200.00
Original receivables	$90/365 \times \$4\text{m}$	986.30	
Revised receivables	$60/365 \times \$4.2\text{m}$	<u>690.41</u>	
Reduction in receivables		<u>295.89</u>	
Annual interest saving from reduction in receivables	$13\% \times 295.89$		38.47
Penalty payment for default	$10\% \times \$4.2\text{m}$	420	
Expected value of penalty	$5\% \times \$420,000$		(21.00)
Net benefit to year 1 profits			<u>52.47</u>

The **JIT arrangement** appears to be worthwhile in expected value terms.

Other considerations

However, the expected value figure conceals the risk of adverse results if the company fails to meet delivery guarantees: the 'worst case' scenario in one year is that a penalty of \$420,000 is payable (more than 5% of operating profit). The directors should make sure that the company is insured against all the normal risks outside its direct control (eg fire, theft, flood) and also invest in a total quality programme to underpin the JIT arrangement by eliminating any defective output.

(b) **Other benefits from the JIT agreement**

Closer relationship between organisations

The Just in Time arrangement with its major customer will promote a closer relationship between the two organisations. This will lower PS's **medium term operating risk** and enable it to plan its own materials requirements, although in the short term the company must be prepared to be very flexible in its delivery procedures. It may also result in PS entering into JIT arrangements with its own suppliers. The strengthened link between the companies may result in further co-operation in other fields (eg design of new products).

Just in time and total quality

A **Just in Time arrangement** with a customer works best when the company uses a **Total Quality** approach to eliminate defective products from its output. The growing reputation for 'zero defectives' is an advantage of implementing the system effectively. This growing reputation will boost PS's sales and enable it to negotiate JIT arrangements with other customers.

(c) (i) The **Economic Order Quantity (EOQ)** can be found as follows.

$$\text{EOQ} = \sqrt{\frac{2 \times \text{demand (units)} \times \text{ordering cost}}{\text{holding cost}}}$$

Before reorganisation

Demand = 40,000 units per annum
Ordering cost = \$100 per order
Holding cost = 20% × \$2.50

$$\text{EOQ} = \sqrt{\frac{2 \times 40,000 \times 100}{0.2 \times 2.50}}$$

$$\text{EOQ} = \sqrt{16,000,000} = 4,000 \text{ units}$$

After reorganisation

Demand = 40,000 units per annum
Ordering cost = \$25 per order
Holding cost = 20% × \$2.50

$$\text{EOQ} = \sqrt{\frac{2 \times 40,000 \times 25}{0.2 \times 2.50}}$$

$$\text{EOQ} = \sqrt{4,000,000} = 2,000 \text{ units}$$

(ii) Implementation of the new system will affect both the total ordering costs per annum and the inventory holding cost. **Under the existing system** these costs are as follows.

Ordering cost

EOQ is 4,000 units; demand is 40,000 units.
Number of orders per year is therefore 10.
Cost per order is \$100.

Total ordering cost per annum (\$100 × 10) = 1,000

Carrying cost

EOQ is 4,000 units.
Average inventory is therefore 2,000 units.

Cost is 2,000 × \$2.50 × 20% = 1,000

Total annual cost 2,000

Under the proposed system the costs would become as follows.

Ordering cost

EOQ is 2,000 units; demand is 40,000 units.	\$
Number of orders per year is therefore 20. Cost per order is \$25.	
Total ordering cost per annum ($\$25 \times 20$) =	500

Carrying cost

EOQ is 2,000 units. Average inventory is therefore 1,000 units.	
Cost is $1,000 \times \$2.50 \times 20\%$	500
Total annual cost	<u>1,000</u>

The **annual cost saving** is therefore \$1,000 ($\$2,000 - \$1,000$). This will give rise to an **after tax cash flow** of \$700 ($\$1,000 \times (1 - 0.3)$). The cash flows can now be **discounted** at the cost of finance of 12%. It is **assumed** that tax is payable in the year in which it arises, and that the reorganisation costs are fully tax allowable.

		\$
Year 0	$\$4,000 \times (1 - 0.3) \times 1.000 =$	(2,800.00)
Years 1-8	$\$700 \times 4.968 =$	<u>3,477.60</u>
NPV of reorganisation		<u>677.60</u>

7 TNG Co

Text references. Inventory management is covered in Chapter 5.

Top tips. This question is made up of five smaller parts. Part (e) is written and could be answered separately to the other parts. You could do this part first as long as you leave space in your answer book.

Easy marks. Using the EOQ model to calculate the requirements of part (b).

Examiner's comments. Many candidates who attempted this question gained high marks. Part (a) asked for a calculation of the cost of the current ordering policy of a company. Three costs were needed: the cost of ordering inventory, the annual cost of the buffer inventory held, and the annual cost of additional inventory equal to half of the order size. A common problem was an inability to calculate the cost of holding inventory, the most common error being including buffer inventory but omitting half of the order size, or vice versa. Most answers calculated the annual ordering cost correctly.

Candidates were asked in part (b) to calculate the economic order quantity (the formula for this was provided in the formulae sheet), and the annual saving if an EOQ-based optimal ordering policy were used rather than the current policy. Answers were often of an acceptable standard, although tending to show similar errors to those found in part (a). Most answers were able to calculate correctly the economic order quantity, allowing for errors carried forward from part (a).

Part (c) asked for an evaluation of whether a discount offered by a supplier was financially acceptable. Answers showed that there were many ways to prove that the offered discount was financially acceptable and many answers gained full credit.

The requirement in part (d) was to discuss the limitations of the economic order quantity model as a way of managing inventory. Many answers gained good marks by focusing on the limitations imposed by the assumptions underlying the model, such as constant demand, zero lead time, and constant ordering cost and holding cost.

A discussion of the advantages and disadvantages of using just-in-time inventory management methods was required in part (e) and many answers gained high marks, although there was a tendency to list brief points rather than offer the discussion that was asked for.

Marking scheme

		Marks
(a)	Annual ordering cost	1
	Annual holding cost	2
	Annual cost of current policy	<u>1</u>
		4
(b)	Calculation of economic order quantity	1
	Annual ordering cost	1
	Annual holding cost	1
	Annual cost of EOQ policy	1
	Saving from using EOQ policy or discussion	<u>1</u>
		5
(c)	Analysis	2-3
	Discussion	<u>1-2</u>
		Maximum
(d)	Discussion of limitations of EOQ model	4
(e)	Advantages of JIT inventory management methods	4-5
	Disadvantages of JIT inventory management methods	<u>4-5</u>
		Maximum
		<u>8</u>
		<u>25</u>

- (a) Current order size = 50,000 units
 Average number of orders per year = demand/order size = 255,380/50,000 = 5.11 orders
Annual ordering cost = 5.11 × \$25 = \$127.75
 Buffer inventory held = 255,380 × 28/365 = 19,591 units
 Average inventory held = 19,591 + (50,000/2) = 44,591 units
Annual holding cost = 44,591 × 0.1 = \$4,459.10
Annual cost of current ordering policy = 4,459.10 + 127.75 = \$4,587
- (b) Economic order quantity:

$$EOQ = \sqrt{\frac{2 \times \text{demand} \times \text{ordering cost}}{\text{holding cost}}} = \sqrt{\frac{2 \times 255,380 \times 25}{0.1}}$$
 = 11,300 units
 Average number of orders per year = 255,380/11,300 = 22.6 orders
Annual ordering cost = 22.6 × \$25 = \$565.00
 Average inventory held = 19,591 + (11,300/2) = 25,241 units
Annual holding cost = 25,241 × 0.1 = \$2,524.10
Annual cost of EOQ ordering policy = 2,524.10 + 565.00 = \$3,089
 Saving compared to current policy = \$4,587 – \$3,089 = \$1,498
- (c) Annual credit purchases = 255,380 × \$11 = \$2,809,180
 Current payables = \$2,809,180 × 60/365 = \$461,783
 Payables if discount is taken = \$2,809,180 × 20/365 = \$153,928
 Reduction in payables = \$461,783 – \$153,928 = \$307,855
 Finance cost increase = \$307,855 × 8% = \$24,628
 Discount gained = \$2,809,180 × 1% = \$28,092
 Net benefit of taking discount = \$28,092 – \$24,628 = \$3,464
 The discount is therefore financially worthwhile.
- (d) Some businesses attempt to control inventories on a 'scientific' basis by balancing the costs of inventory shortages against those of inventory holding. The economic order quantity (EOQ) model can be used to decide the optimum order size for inventories which will minimise the costs of ordering inventories plus inventoryholding costs.

The calculation of EOQ is based upon a set formula which has two main inputs – holding cost and ordering cost, which must be known with certainty and which are assumed not to change. It is also assumed that demand is constant, the lead time is constant or zero and purchase costs per unit are constant (ie there are no bulk discounts). In practice, all of these assumptions are likely to be unrealistic – costs are going to vary and demand will never be constant.

- (e) Some manufacturing companies have sought to reduce their inventories of raw materials and components to as low a level as possible. Just-in-time procurement and stockless production are terms which describe a policy of obtaining goods from suppliers at the latest possible time (ie when they are needed) and so avoiding the need to carry any materials or components inventory.

Introducing just-in-time (JIT) inventory management methods have been said to deliver the following potential benefits.

- Reduction in inventory holding costs
- Reduced manufacturing lead times
- Improved labour productivity
- Reduced scrap/rework/warranty costs – improved quality
- Price reductions on purchased materials
- Reduction in the number of accounting transactions
- Stronger relationship between buyer and supplier

Reduced inventory levels mean that a lower level of investment in working capital will be required.

JIT will not be appropriate in some cases. For example, a restaurant might find it preferable to use the traditional economic order quantity approach for staple non-perishable food inventories, but adopt JIT for perishable and 'exotic' items. In a hospital, a stock-out could quite literally be fatal and so JIT would be quite unsuitable. There is little room for error in such a system, so if there are likely to be supplier delays or variable delivery times that could have disastrous consequences, then JIT is not suitable. The system also makes the buyer heavily dependent on the supplier for both delivery and quality of supply.

8 PNP Co

Text references. Managing working capital is covered in Chapter 5 and forward market hedging in Chapter 19.

Top tips. Make sure you show your workings clearly in part (a) as there are various correct approaches you could take regarding bad debts and payment periods. You will find this question time-pressured so aim to gain as many of the easy marks as possible rather than aim for a perfect answer.

Part (d) requires a full explanation and your suggestions must be suitable for this company so, as we say in the passing F9 section of the front pages, don't just simply write a list of points learnt from a textbook.

Easy marks. Part (b) should be a very straightforward calculation of standard liquidity ratios. If you have learnt the subject matter part (d), it should be a straightforward explanation.

Marking scheme

		Marks
(a)	Increased contribution	1
	Decrease in bad debts	1
	Increase in current Class 1 discount	1
	Discount from transferring Class 2 debtors	1
	Discount from new Class 1 debtors	1
	Increase in bad debts	1
	Increase in financing cost	2
	Net benefit of proposal	1
	Comment	1
	Maximum	9

(b)	Current cash operating cycle	2	
	Revised cash operating cycle	<u>2</u>	4
(c)	Current dollar value of overseas debtors	1	
	Forward sterling value of overseas debtor	<u>1</u>	2
(d)	Credit policy	2-3	
	Credit assessment	2-3	
	Credit control	2-3	
	Collection of amounts due	2-3	
	Overseas debtors	<u>2-3</u>	
		Maximum	<u>10</u>
			<u>25</u>

(a) **Evaluation of proposal**

Workings

Contribution: sales ratio = $(5,242 - 3,145)/5,242 \times 100 = 40\%$

Bad debts ratio for Class 2 receivables = $12,600/252,000 \times 100 = 5\%$

Increase in Class 1 receivables from new business = $250,000 \times 30/365 = \text{£}20,548$

Increase in Class 2 receivables from new business = $250,000 \times 60/365 = \text{£}41,096$

Current sales of Class 1 receivables = $200,000 \times 365/30 = \text{£}2,433,333$

Current sales of Class 2 receivables = $252,000 \times 365/60 = \text{£}1,533,000$

	£	£
Benefits		
Increased contribution ($500,000 \times 40\%$)	200,000	
Decrease in bad debts ($12,600 \times 0.5$)	<u>6,300</u>	206,300
Costs		
Increase in Class 1 discount ($2,433,333 \times 0.5\%$)	12,167	
Discount cost of transferring Class 2 receivables ($1,533,000 \times 50\% \times 1.5\%$)	11,498	
Discount cost of new Class 1 receivables ($250,000 \times 1.5\%$)	3,750	
Increase in bad debts from new Class 2 receivables ($41,096 \times 5\%$)	2,055	
Increase in financing cost from new receivables ($(20,548 + 41,096) \times 8\%$)	<u>4,932</u>	
Net benefit		<u>34,402</u>
		<u>171,898</u>

The proposed change to the early payment discount is financially acceptable.

Some of the assumptions made concerning bad debts and payment periods may be debateable but the net benefit is sufficiently large to make a **favourable recommendation** anyway.

(b) **Current cash operating cycle**

Inventory days = $603/3,145 \times 365 = 70$ days

Payables days = $574.5/3,145 \times 365 = 67$ days

Receivables days = $744.5/5,242 \times 365 = 52$ days

Cash operating cycle = $70 + 52 - 67 = 55$ days

Following the implementation of the increased discount for early payment, total receivables will increase by $\text{£}61,644$ ($20,548 + 41,096$) to $\text{£}806,144$ and turnover will have increased to $\text{£}5,742,000$. This results in a slight fall in receivable days to 51 days ($806,144/5,742,000 \times 365$) and therefore a **slight fall** of one day in the cash operating cycle to **54 days**.

(c) Current sterling value of overseas receivables = $\text{£}182,500$

Current dollar value of overseas receivables = $182,500 \times 1.7348 = \$316,601$

A **forward market hedge** (ie a forward exchange contract) will lock the sterling value of the receivables at the three-month forward rate.

Hedged sterling value of overseas receivables in three months = $316,601/1.7367 = \text{£}182,300$

This is **less** than the current sterling value of the overseas receivables because sterling is expected to appreciate against the dollar.

(d) There are four key areas of accounts receivable management.

(i) **Formulation of policy**

A **framework** needs to be established within which the management of accounts receivable in PNP takes place. Elements of the framework to be considered include establishing the **terms of trade** such as the period of credit offered and **early settlement discounts**. PNP must also consider whether to **charge interest** on overdue accounts. Laid-down procedures will be needed for granting credit to new customers and determining what to do when accounts become overdue.

(ii) **Assessment of creditworthiness**

Information relating to a new customer needs to be analysed. The information may come from bank references, trade references or credit reference agency reports.

The greater the amount of credit being granted and the possibility of repeat business, the more credit analysis is needed.

(iii) **Credit control**

Accounts receivable' payment records must be **monitored** continually. This depends on successful sales ledger administration.

Credit monitoring can be simplified by a system of **in-house credit ratings**. For example, a company could have five credit-risk categories for its customers. These credit categories or ratings could be used to decide either individual credit limits for customers within that category or the frequency of the credit review. PNP uses a segmental analysis of its accounts receivable.

A **customer's payment record** and the **accounts receivable aged analysis** should be examined regularly, as a matter of course. Breaches of the credit limit, or attempted breaches of it, should be brought immediately to the attention of the credit controller.

(iv) **Collection of amounts due**

PNP needs to have in place agreed procedures for dealing with overdue accounts. Examples include instituting reminders or final demands, chasing payment by telephone or making a personal approach. If this does not work, the company could refuse to grant any more credit to the customer, hire a specialist debt collecting agency or, as a last resort, take legal action.

The overall **debt collection policy** of the firm should be such that the administrative costs and other costs incurred in debt collection do not exceed the benefits from incurring those costs.

PNP needs to consider how **overseas receivables differ from domestic receivables** and set up specific policies for these customers. For example, they may take longer to pay and will need to be financed for longer. There is also the issue of **exchange rate risk** to be considered. The **credit risk** from overseas receivables can be reduced using advances against collection, requiring payment through bills of exchange, arranging documentary letters of credit or using export factoring.

9 Thorne Co

Text reference. Cash management is covered in Chapter 6.

Top tips. Use a proforma for the cash budget and show your workings clearly. Make sure your answers in the written sections relate specifically to the company in question.

Easy marks. There are lots of opportunities for gaining at least a couple of marks in each of the three shorter parts.

Marking scheme

		Marks
(a)	Credit sales	2
	Cash sales	1
	Proceeds from asset disposal	1
	Salaries	1
	Bonus	1
	Expenses	1
	Fixed overheads	1
	Taxation and interest	1
	Closing balances	<u>1</u>
		10
(b)	Discussion of factors	5
(c)	Discussion of advantages and disadvantages	5
(d)	Discussion of Baumol model	2-3
	Discussion of applicability in this case	<u>2-3</u>
		<u>5</u>
		<u>25</u>

(a) Cash budget

	<i>Jan</i> \$'000	<i>Feb</i> \$'000	<i>March</i> \$'000	<i>April</i> \$'000
Receipts				
Fee on sale (W1)	54	63	99	144
Receipt on sale of vehicles				<u>20</u>
	<u>54</u>	<u>63</u>	<u>99</u>	<u>164</u>
Payments				
Salaries	26.25	26.25	26.25	26.25
Bonus (W2)			6.3	12.6
Variable expenses (W3)	9	13.5	22.5	27
Fixed overheads	4.3	4.3	4.3	4.3
Interest on loan			3.0	
Tax liability				<u>95.80</u>
	<u>39.55</u>	<u>44.05</u>	<u>62.35</u>	<u>165.95</u>
Net cash flow	<u>14.45</u>	<u>18.95</u>	<u>36.65</u>	<u>(1.95)</u>
Balance b/fwd	<u>(40.00)</u>	<u>(25.55)</u>	<u>(6.6)</u>	<u>30.05</u>
Balance c/fwd	<u>(25.55)</u>	<u>(6.6)</u>	<u>30.05</u>	<u>28.10</u>
<i>Working 1</i>				
	<i>Jan</i>	<i>Feb</i>	<i>March</i>	<i>April</i>
Receipts				
Unit sales	10	15	25	30
	\$'000	\$'000	\$'000	\$'000
Fee at 3% × \$180,000 × numbers sold	54	81	135	162
Received				
– 1% in month of sale	18	27	45	54
– 2% in following month				
(January receipt relates to December sale)	<u>36</u>	<u>36</u>	<u>54</u>	<u>90</u>
	<u>54</u>	<u>63</u>	<u>99</u>	<u>144</u>

Working 2

	<i>Jan</i>	<i>Feb</i>	<i>March</i>	<i>April</i>
Receipts				
Unit sales	10	15	25	30
	\$'000	\$'000	\$'000	\$'000
Bonus based on numbers sold over 20	0	0		
– \$140 × 9 × numbers sold over 20	0	0	6.3	12.6

Working 3

	<i>Jan</i>	<i>Feb</i>	<i>March</i>	<i>April</i>
Receipts				
Unit sales	10	15	25	30
	\$'000	\$'000	\$'000	\$'000
Variable overheads at 0.5% × \$180,000 × numbers sold	9	13.5	22.5	27

(b) **Factors to consider when investing any cash surplus**

The cash budget for Thorne Co shows an increase in sales over the period, which suggests higher sales as the spring approaches. However, the payment of tax in April meant that a trend of increasing net cash flows was temporarily reversed.

Thorne needs to consider the following when investing any surpluses:

- (i) Short-term investments with no capital risk as these may be called upon at any time. Short-term investments include bank deposit accounts, certificates of deposit, term bills and gilts, which are short-dated.

In choosing between these, Thorne Co will consider the size of the surplus, the length of time it is available, the yield offered and the risk associated with each instrument.

- (ii) On an annual basis, look at any surpluses and invest these in longer-term higher yield assets. The company will most probably call on these at some stage to fund expansion but needs to pick the investments carefully.

The investment of cash balances is part of the treasury function of a company. It is unlikely that Thorne Co is of a size to sustain a full time treasury activity but nonetheless there is a definite benefit in closely managing any surpluses.

(c) **Advantages and disadvantages of using overdraft finance to fund cash shortages**

Thorne Co has budgeted deficits in two of the months in the forecast. These are short term in nature so it is unlikely that a long-term loan will be required to fund these.

Typically, temporary deficits are funded by an **overdraft** granted by the company's bank where interest is charged on the overdrawn amount at a rate over base.

Advantages of overdraft finance include its flexibility and that interest is only due on the actual overdrawn amount. The rate of interest is flexible as it is variable and linked to a base rate and so can go down as well as up.

Disadvantages of overdraft finance include the risk of an interest rate increase as the rate is not fixed. Also, the overdraft is repayable on demand. Banks usually ask for some collateral when lending such as a fixed or floating charge on the company's assets.

(d) **The Baumol model and cash management**

A number of different cash management models indicate the **optimum amount of cash** that a company should hold. One such model is based on the idea that deciding on optimum cash balances is like deciding on optimum inventory levels, and suggests the optimum amount to be transferred regularly from investments to current account.

We can distinguish two types of cost which are involved in obtaining cash:

- (i) The **fixed cost** represented, for example, by the issue cost of equity finance or the cost of negotiating an overdraft
- (ii) The **variable cost** (opportunity cost) of keeping the money in the form of cash

The inventory approach has the following drawbacks for companies such as Thorne Co.

- (i) In reality, it is unlikely to be **possible to predict amounts required** over future periods with much certainty.
- (ii) No **buffer inventory** of cash is allowed for. There may be costs associated with running out of cash.
- (iii) There may be other **normal costs** of holding cash, which increase with the average amount held.
- (iv) It assumes **constant transaction costs** and **interest rates**.

10 Velm Co

Text references. Working capital management is covered in Chapters 4, 5 and 6.

Top tips. There isn't much to calculate here so just make sure you know your receivable days formula and think about the relationship between receivables and cash flow.

Most of the marks on this question are for a discussion of working capital in one form or another. So think about sources of finance and policies for managing working capital. The final part of the question does need you to think a bit more widely about cashflow and business policy.

Easy marks. Any of the discussion parts.

Examiner's comments. Part (a) was answered moderately well. Most candidates were able to identify the savings in bad debts and salary, and the cost of the discount, but the calculations of the reduced financing cost arising from the discount were often confused. In general, the approach taken by most candidates would have been improved if they had focused on the incremental costs and benefits. Good answers to part (b) on the relative merits of short and long-term finance for the financing of working capital discussed factors such as relative cost, availability, security and risk. Part (c) asked candidates to discuss the different policies that could be adopted towards the financing of working capital – a discussion of aggressive, conservative and matching policies was expected. Part (d) on working capital management was generally answered pretty well. There was a general tendency to mix up the answers to parts (b), (c) and (d).

Marking scheme

		Marks
(a)	Reduction in receivables	1
	Cost of discount	1
	Reduction in financing cost	1
	Reduction in bad debts and salary saving	1
	Calculation of net benefit and conclusion	<u>1</u>
		5
(b)	Risks of short-term finance	2
	Cost of short-term finance	1
	Risks of long-term finance	1
	Cost of long-term finance	1
	Discussion and conclusion	<u>1</u>
		6
(c)	Permanent and fluctuating current assets	2
	Explanation of financing policies	4
	Discussion and link to Velm Co	<u>1</u>
		7

(d)	Advantages of working capital management	2	
	Credit management	2	
	Inventory management	2	
	Discussion and link to Velm Co	1	
		<u>7</u>	<u>25</u>

- (a) Receivables are currently taking on average $(\$550,000/\$4,000,000) \times 365 = 50$ days to pay. This is in excess of Velm's stated terms. The discount, to be taken up by 2/3 of customers, will cost the company $\$4,000,000 \times 1\% \times 2/3 = \$26,667$. It is stated that this will bring the receivables' payment period down to 26 days, which is represented by a new receivables level of $(\$4,000,000 - \$26,667) \times 26/365 = \$283,000$. This is a reduction in receivables of $\$267,000$. At current overdraft costs of 9%, this would be a saving of $\$267,000 \times 0.09 = \$24,030$.

Bad debts would decrease from 3% to 2.4% of turnover, which saves a total of $\$4,000,000 \times 0.006 = \$24,000$. There would also be a salary saving from early retirement of $\$12,000$.

So the net effect on Velm's profitability is as follows:

	\$	
Saving on overdraft costs	24,030	
Decreased bad debts	24,000	
Salary saving	12,000	
Less: cost of discount	(26,667)	
	<u>33,363</u>	net saving

- (b) Short-term sources of finance include overdrafts and short-term loans. Long-term sources of finance include loan notes and long-term loans. The choice is between cheaper but riskier short-term finance and more expensive but less risky long-term debt. A customer might ask the bank for a short term overdraft facility when the bank would wish to suggest a loan instead; alternatively, a customer might ask for a loan when an overdraft would be more appropriate.

In most cases, when a customer wants finance to help with **'day to day' trading** and cash flow needs, an overdraft would be the appropriate method of financing. The customer should not be short of cash all the time, and should expect to be in credit in some days, but in need of an overdraft on others.

When a customer wants to borrow from a bank for only a short period of time, even for the purchase of a major non-current asset such as an item of plant or machinery, an overdraft facility might be **more suitable** than a loan, because the customer will stop paying interest as soon as his account goes into credit.

However, when a customer wants to borrow from a bank, but cannot see his way to repaying the bank except over the course of a few years, the required financing is best catered for by the provision of a loan rather than an overdraft facility.

Advantages of an overdraft over a loan

- (i) The customer **only pays interest when he is overdrawn**.
- (ii) The bank has the flexibility to **review** the customer's overdraft facility periodically, and perhaps agree to additional facilities, or insist on a reduction in the facility.
- (iii) An overdraft can do the same job as a **loan**: a facility can simply be renewed every time it comes up for review.
- (iv) Being short-term debt, an overdraft will not affect the calculation of a company's **gearing**.

Bear in mind, however, that overdrafts are technically **repayable on demand**, so even though they are cheaper than longer term sources of debt finance, they are more risky.

Advantages of a long term loan

- (i) Both the customer and the bank know exactly what the repayments of the loan will be and how much interest is payable, and when. This makes planning (budgeting) simpler.
- (ii) The customer does not have to worry about the bank deciding to reduce or withdraw an overdraft facility before he is in a position to repay what is owed. There is an element of 'security' or 'peace of mind' in being able to arrange a loan for an agreed term. However, long term finance is generally more expensive than short term finance.
- (iii) Loans normally carry a facility letter setting out the precise terms of the agreement.

Working capital policies can be characterised as **conservative**, **moderate** and **aggressive**. A conservative policy would finance working capital needs primarily from long term sources of finance, so all long term assets and some fluctuating current assets. However, Velm Co is following an aggressive financing policy as long term debt only makes up 2.75% (40/1,450) of non-cash current assets and most finance is provided by short term debt (\$1,530k).

- (c) As a general rule, assets which yield profits over a long period of time should be financed by long-term funds. This is an application of the **matching principle**.

In this way, the returns made by the asset will be sufficient to pay either the interest cost of the loans raised to buy it, or dividends on its equity funding.

If, however a long-term asset is financed by short-term funds, the company cannot be certain that when the loan becomes repayable, it will have enough cash (from profits) to repay it.

Under a moderate or matching approach, a company would normally finance short-term assets partly with short-term funding and partly with long-term funding. However, Velm appears to be conducting an aggressive financing policy, as short term finance is being used for most of its current assets. This is a higher risk source of finance.

- (d) Every business needs adequate **liquid resources** to maintain day-to-day cash flow. It needs enough to pay wages and salaries as they fall due and enough to pay payables if it is to keep its workforce and ensure its supplies.

Maintaining adequate working capital is not just important in the **short term**. Sufficient liquidity must be maintained in order to ensure the **survival of the business** in the long term as well. Even a profitable company may fail if it does not have adequate cash flow to meet its liabilities as they fall due.

On the other hand, an excessively conservative approach to working capital management resulting in **high levels of cash holdings** will harm profits because the opportunity to make a return on the assets tied up as cash will have been missed.

If the turnover periods for inventories and receivables lengthen, or the payment period to payables shortens, then the **operating cycle** will lengthen and the investment in working capital will have to increase. This will increase costs (and decrease shareholder wealth) so it is important that receivables are properly managed and chased up, inventory is maintained at optimum levels (perhaps using the economic order quantity model), and full advantage is taken of suppliers' credit terms.

Since a company must have adequate cash inflows to survive, management should plan and control cash flows as well as profitability. **Cash budgeting** is an important element in short-term cash flow planning. If a budget reveals that a short-term cash shortage can be expected, steps will be taken to meet the problem (perhaps by arranging a bigger bank overdraft facility).

In summary, **working capital management** seeks to improve cash flows by reducing inventories and receivables, taking more credit, or even negotiating a higher bank overdraft facility.

11 PCB Co

Text references. Working capital management is covered in Chapters 4, 5 and 6.

Top tips. This question requires an understanding of working capital and the causes and consequences of overtrading. There is plenty of information available in the example that you will find helpful to analyse and incorporate in your answer, in order to provide a good illustration of the points that you make.

The symptoms in (a) are common signs which you will often see in questions on overtrading. The basic point is that increased activity requires more cash to pay for increased assets (fixed and current), and greater levels of expenditure. Ideally the cash should come from long-term sources (shareholders and long-term lenders), but short-term sources (bank overdraft) will have to be used if long-term sources are not available. The result is the lack of matching described in (c).

(b) is all about using the other information given in the question to come up with reasons for the change in the profit figures.

Note in (c) that the company is in a precarious position, needing more finance (preferably long-term), but will find it difficult to obtain more finance because it is in a precarious position. Even if the interest burden can be sustained, it may be at the expense of shareholders' income.

In (d) you need to consider both sides of the problem, whether and how the growth in non-cash assets and expenditure can be controlled, and possible internal and external sources of finance obtained. PCB is the sort of company in which venture capitalists often invest, but venture capitalists must be convinced that PCB is a worthwhile investment.

- (a) Manufacturing companies generally have a relatively **long operating cycle** and a correspondingly large working capital requirement. When the level of sales increases, there is an increased investment in:
- (i) **Inventory**, as additional raw materials are purchased to produce the additional goods.
 - (ii) **Staff costs**, both direct in production, and indirect in sales and credit control overhead.
 - (iii) **Receivables** since most manufacturing companies sell on credit, and additional sales will therefore translate into a higher level of receivables.

Need for working capital investment

The company may also need to purchase equipment to increase its capacity. All of these areas require an immediate investment of cash, in advance of the cash flow benefits of the additional sales and operating profits being felt. Although the company may also benefit from an increased level of payables, this will not be enough to offset the other factors, and therefore additional cash will be required to finance this process.

Problems of PCB

This problem can be illustrated using PCB as an example.

- (i) During the last year, **sales** have **increased** by \$1.3m from \$1.7m to \$3m, an increase of 76%.
- (ii) There has been **additional investment** of \$44,000 in **non-current assets** during the same period.
- (iii) The **level of inventory** has **more than doubled** from \$95,000 to \$220,000.
- (iv) **Receivables** have **increased** by \$102,000 from \$108,000 to \$210,000, an increase of 94%.
- (v) **Six additional sales** staff have been **recruited**.
- (vi) This has resulted in a **massive increase** in the **bank overdraft** of \$116,750 from \$41,250 to \$158,000, and in the level of trade payables, which has increased by nearly 150% from \$82,500 to \$205,000.

The cash resources at the start of the year were only \$1,750, and the increased level of trading has been financed entirely from short-term bank borrowings and trade payables.

(b) The change in the trading position has been as follows.

	Y/e 30.11.X8		Y/e 30.11.X7		Change
Sales	3,000,000		1,700,000		+76%
Gross profit	450,000	15%	330,000	19%	+36%
Net profit before tax	60,000	2%	82,000	5%	-27%

Both gross and net margins have fallen. Contributory factors are likely to include the following.

- (i) **Selling prices may have been reduced** to achieve the increase in sales. This will result in depressed gross margins.
- (ii) The additional investment in non-current assets will have led to an **increase in the depreciation charge**.
- (iii) **Interest costs will have increased** due to the higher level of bank borrowings.
- (iv) **Staff costs will have increased** because of the larger number of sales staff now employed.

(c) **Increase in debt levels**

It has been seen that there has been a large increase in the level of short-term borrowings in the form of bank loans and trade payables. The ratio of equity: bank debt has fallen from 8.4 times ($\$345,000 \div \$41,250$) to 2.4 times ($\$375,000 \div \$158,000$), and the real level of reliance on debt is even higher if the increase in the level of trade payables is taken into account. In effect, PCB has financed its expansion wholly by using short-term debt.

Dangers of PCB's position

(i) **Lack of matching**

The company should **match long-term assets with long-term funds**. At present, both the increase in working capital and the increase in non-current assets are being financed out of short-term debt.

(ii) **Exceeding terms of trade**

Although the use of trade payables as a source of finance is attractive because there is rarely any interest charge, it is likely that PCB is **exceeding its terms of trade**, since the increase in the level of payables is so much greater than the increase in the level of sales. It is therefore running the risk of losing the goodwill of its suppliers.

(iii) **Inability to obtain credit**

The current state of the funding means that, on the basis of the balance sheet figures, PCB may find it **hard to obtain additional credit** from existing or new suppliers. This is because of the high level of financial risk now being carried by the trade payables who have no security for their credit.

(iv) **Problems with bank**

There is no information on the **nature of any agreements** that PCB has with the bank over funding, or any indication as to the size of the overdraft limit. However, as the level of short-term funding increases, the bank will want to review the current and forecast trading situation with the company before increasing its stake in the company any further. It would be in the interest of both parties if the existing overdraft were replaced with some form of secured medium-term bank debt.

(v) **Increase in risk levels**

The current situation represents an **increase** in the **level of risk** carried by the equity shareholders. As the gearing increases, so the level of the **interest charge will increase**, and thus there will be greater volatility in the level of returns to equity, particularly if the business is cyclical in nature. The current cash shortage also means that even if the company continues to be profitable, it will be difficult to sustain the level of dividend payments. This situation is already arising, since dividends have been cut drastically from \$35,000 in 20X7 to \$12,000 in 20X8.

(d) The main needs of PCB are to reduce its reliance on short-term debt and to ease its current cash shortage. This could be achieved in the following ways.

(i) **Conversion of loan**

The short-term bank loan could be **converted** to a **longer-term loan** or debenture as discussed in (c) above.

(ii) **Increase equity**

The company could seek to **increase the level of equity investment**, which would reduce the level of gearing to a safer level. The exact means by which this should be achieved is difficult to specify, since it is not clear from the question whether PCB is a quoted or unquoted company.

(iii) **Venture capital**

It is possible that additional funding in the form of **venture capital** could be appropriate, given the fact that the company is growing. However, PCB would need to satisfy potential investors that it will be able to improve its earnings performance as well as its sales performance.

(iv) **Improved inventory and receivable control**

As has already been shown, certain elements of working capital have increased at a faster rate than the sales growth would appear to warrant. In particular, there appears to be scope for improving the **control of inventory and receivables**. If both these elements were restricted to a 76% increase in line with the growth in sales, this would release over \$72,000 of working capital. This would reduce the need for additional external funding.

12 Special Gift Suppliers

Text references. Working capital management is covered in Chapters 4, 5 and 6.

Top tips. There are one or two traps in (b). Bad debts in the existing arrangement are effectively a double cost; not only is there the cost of writing them off but there is also the cost of financing them before they are written off. Because the factor's services are no-recourse Special Gift Suppliers will not bear *any* costs of bad debts; the factor's reduction of bad debts to 2% does not affect Special Gift Suppliers. Note also that the full factor's fee is not charged but only the interest. This is because you are making a comparison of what would happen if you did or did not use the factor on an annual basis; as the factor's fee is one-off, the annual cost is the interest you could have earned if you hadn't paid that fee. If the \$25,000 had been an annual payment, you would have charged the full amount (and factoring would not have been worthwhile).

(c) offers good opportunities to score marks although you must make sure you spend sufficient time discussing permanent working capital; it is easy to spend too long on discussion of credit status. Credit control's role covers monitoring as well as initial granting of credit, and possibly a factor might be able to manage receivables more efficiently as well as providing finance.

Examiner's comment. (a) was straightforward and generally answered well. Answers to (b) were disappointing with a lot of duplication of figures. Answers to (c) were generally good, particularly on credit control. Discussion of the permanent elements of working capital tended to be more variable.

(a) Funding requirement = Average inventory holding period
+ Average receivables' collection period
– Average payables' payment period
= 3.5 + 2.5 – 2.0
= 4.0 months

(b) **Current arrangements**

	\$
Bad debts ($3\% \times 90\% \times \$2.5\text{m}$)	67,500
Salary of sales ledger administrator	12,500
Cost of financing debts ($90\% \times (2.5/12) \times 12\% \times \2.5m)	56,250
	<u>136,250</u>

Factor

	\$
Cost of advancing funds ($90\% \times 80\% \times (1/12) \times 15\% \times \2.5m)	22,500
Cost of financing remaining debts ($90\% \times 20\% \times (1/12) \times 12\% \times \2.5m)	4,500
Charge for factoring services ($4\% \times 90\% \times \$2.5\text{m}$)	90,000
One-off payment to factor ($25,000 \times 12\%$)	3,000
	<u>120,000</u>

Hence it is worthwhile to factor the debts.

(c) To: Financial Controller, Special Gift Department

From: Adviser

Subject: Working capital

Date: 27 September 20X2

This report covers a number of aspects of managing working capital.

(i) **Functioning of a credit control department**

The credit control department should be involved with customers at all stages of the credit control cycle.

- (1) When customers **first request credit**, the credit control department should **obtain references** and **credit ratings**, **analyse their accounts** and obtain other information such as **press comment** as appropriate. Staff may also **visit the customer**. A **credit limit** should be recommended based on the information obtained; initially the limit should be **low**, and only raised over time if the **customer's payment record** is good.
- (2) When the customer makes an order, the credit control department should check whether the **new order** will cause the customer to **exceed** their limits.
- (3) Staff should also **review regularly** the **appropriateness of credit limits**, and **check the aged receivable listing** to see if debts are overdue and **report problems to designated senior managers**.
- (4) The credit control department will be responsible for issuing documentation such as **monthly statements** and **demands for payment**. Staff should **maintain contacts** with other departments, trying to ensure that orders are not accepted from customers who are in difficulties. The department will **pursue slow payers**, ultimately **employing debt collectors** and **initiating legal action**.
- (5) The **department's procedures** should be set out in a **credit control manual**.

(ii) **Benefits of factoring**

- (1) The business can **pay its suppliers promptly**, and so be able to take advantage of any early payment discounts that are available.
- (2) **Optimum inventory levels** can be **maintained**, because the business will have enough cash to pay for the inventories it needs.
- (3) **Growth** can be **financed** through **sales** rather than by injecting fresh external capital.
- (4) The business gets **finance linked** to its **volume of sales**. In contrast, overdraft limits tend to be determined by historical balance sheets.
- (5) The **managers** of the business **do not** have to **spend their time** on the problems of **slow paying receivables**.
- (6) The business does **not incur** the **costs** of **running** its own **sales ledger department**, and can use the **expertise** of receivable management that the factor has.
- (7) Because they are managing a number of sales ledgers, factors can **manage receivables more efficiently** than individual businesses through economies of scale.

(iii) **Financing of working capital**

Types of current assets

- (1) The **permanent current assets** businesses hold will include a minimum level of receivables owing money, and minimum balances of inventory and cash held for safety reasons. These minimum levels represent permanent working capital.
- (2) **Fluctuating current assets** are assets held over and above the minimum amounts.

Aggressive management

If working capital is managed **aggressively**, all **fluctuating assets** plus a **certain proportion of permanent current assets** will be **financed by short-term capital** such as **bank overdrafts** and **trade payables**. Aggressive management will mean that there is an **increased risk of cash flow** and **liquidity problems**. Businesses may also suffer **higher interest costs** on short-term sources of finance.

Use of long-term capital

If short-term methods cannot be used, **long-term funding** such as **long-term loans** or **share capital** not tied up in funding non-current assets will be used to support **working capital**. This will mean that working capital is managed **conservatively**, with **all non-current assets** and **permanent current assets**, as well as part of **fluctuating current assets**, being **financed by long-term capital**. When fluctuating current assets are low, there will be surplus cash which the company will be able to invest in marketable securities.

13 Ulnad Co

Text references. Working capital management is covered in Chapters 4, 5 and 6.

Top tips. In part (a), think logically about the change in costs as a result of the credit policy and set out your workings clearly. In part (b) don't forget to explain your findings as well as do the calculation. Parts (c) and (d) require full explanations so don't just simply write a list of points.

Easy marks. There are 4 easy marks available in part (b) for simply using the Miller-Orr formulae given to you in the exam. If you have learnt the subject matter in for parts (c) and (d), they should be straightforward explanations.

Marking scheme

		Marks
(a)	Increase in financing cost	2
	Incremental costs	1
	Cost of discount	1
	Contribution from increased sales	1
	Conclusion	1
		<hr style="width: 100%; border: 0.5px solid black;"/>
		6
(b)	Calculation of spread	2
	Calculation of upper limit	1
	Calculation of return point	1
	Explanation of findings	2
		<hr style="width: 100%; border: 0.5px solid black;"/>
		6
(c)	Policy formulation	1-2
	Credit analysis	1-2
	Credit control	1-2
	Collection of amounts due	1-2
		<hr style="width: 100%; border: 0.5px solid black;"/>
	Maximum	6

(d)	Analysis of assets	1-2	
	Short-term and long-term debt	2-3	
	Discussion of policies	2-3	
	Other factors	1-2	
		Maximum	<u>7</u>
			<u>25</u>

(a) **Evaluation of change in credit policy**

Current average collections period = 30 + 10 = 40 days

Current accounts receivable = \$6m × 40/365 = \$657,534

Average collection period under new policy = (30% × 15 days) + (70% × 60 days) = 46.5 days

New level of credit sales = \$6m × 1.05 = \$6.3m

Accounts receivable after policy change = \$6.3m × 46.5/365 = \$802,603

Increase in financing cost = \$(802,603 – 657,534) × 7% = \$10,155

	\$
Increase in financing cost	10,155
Incremental costs (\$6.3m × 0.5%)	31,500
Cost of discount (30% × \$6.3m × 1.5%)	<u>28,350</u>
Increase in costs	70,005
Contribution from increased sales (\$6m × 5% × 60%)	<u>180,000</u>
Net benefit of policy change	<u>109,995</u>

The proposed policy will therefore increase the profitability of Ulnad Co.

(b) **Determination of spread**

Daily interest rate = 5.11/365 = 0.014% per day

Variance of cash flows = 1,000 × 1,000 = \$1,000,000 per day

Transaction cost = \$18 per transaction

$$\begin{aligned} \text{Spread} &= 3 \times ((0.75 \times \text{transaction cost} \times \text{variance}) / \text{interest rate})^{1/3} \\ &= 3 \times ((0.75 \times 18 \times 1,000,000) / 0.00014)^{1/3} = 3 \times 4,585.7 = \$13,757 \end{aligned}$$

Lower limit = \$7,500

Upper limit = \$(7,500 + 13,757) = \$21,257

Return point = 7,500 + (13,757/3) = \$12,086

Relevance of the values

The Miller-Orr model takes account of **uncertainty** in relation to cash flows. The cash balance of Renpec Co is allowed to vary between the lower and upper **limits** calculated by the model.

If the cash balance reaches an **upper limit** the firm **buys sufficient securities** to return the cash balance to a normal level (called the 'return point'). When the cash balance reaches a lower limit, the firm sells securities to bring the balance back to the return point.

The Miller-Orr model therefore helps Renpec Co to decrease the risk of running out of cash, while avoiding the loss of profit caused by having unnecessarily high cash balances.

(c) **Key areas of accounts receivable management**

There are four key areas of accounts receivable management.

(i) **Formulation of policy**

A **framework** needs to be established within which the management of accounts receivable in an organisation takes place. Elements of the framework to be considered include establishing the **terms of trade** such as the period of credit offered and **early settlement discounts**. The organisation must

also consider whether to **charge interest** on overdue accounts. Laid-down procedures will be needed for granting credit to new customers and determining what to do when accounts become overdue.

(ii) **Assessment of creditworthiness**

Information relating to a new customer needs to be analysed. The information may come from bank references, trade references or credit reference agency reports.

The greater the amount of credit being granted and the possibility of repeat business, the more credit analysis is needed.

(iii) **Credit control**

Accounts receivable' payment records must be **monitored** continually. This depends on successful sales ledger administration.

Credit monitoring can be simplified by a system of **in-house credit ratings**. For example, a company could have five credit-risk categories for its customers. These credit categories or ratings could be used to decide either individual credit limits for customers within that category or the frequency of the credit review.

A **customer's payment record** and the **accounts receivable aged analysis** should be examined regularly, as a matter of course. Breaches of the credit limit, or attempted breaches of it, should be brought immediately to the attention of the credit controller.

(iv) **Collection of amounts due**

A company needs to have in place agreed procedures for dealing with overdue accounts. Examples include instituting reminders or final demands, chasing payment by telephone or making a personal approach. If this does not work, the company could refuse to grant any more credit to the customer, hire a specialist debt collecting agency or, as a last resort, take legal action.

The overall **debt collection policy** of the firm should be such that the administrative costs and other costs incurred in debt collection do not exceed the benefits from incurring those costs.

(d) **Formulating a working capital funding policy**

In order to understand working capital financing decisions, assets can be divided into three different types.

Non-current (fixed) assets are long-term assets from which an organisation expects to derive benefit over a number of periods. For example, buildings or machinery.

Permanent current assets are the amount required to meet long-term minimum needs and sustain normal trading activity. For example, inventory and the average level of accounts receivable.

Fluctuating current assets are the current assets which vary according to normal business activity. For example due to seasonal variations.

Fluctuating current assets together with **permanent** current assets form part of the working capital of the business, which may be financed by either long-term funding (including equity capital) or by current liabilities (short-term funding).

Short-term sources of funding are usually **cheaper** and **more flexible** than long-term ones. However short-term sources are **riskier** for the borrower as interest rates are more volatile in the short term and they may not be renewed.

The matching principle suggests that long-term finance should be used for long-term assets. A **balance** between risk and return might be best achieved by a **moderate approach** to working capital funding. This is a policy of **maturity matching** in which long-term funds finance permanent assets while short-term funds finance non-permanent assets. This means that the maturity of the funds **matches** the maturity of the assets.

A **conservative approach** to financing working capital involves all non-current assets and permanent current assets, as well as part of the fluctuating current assets, being financed by long-term funding. This is less risky and less profitable than a matching policy. At times when fluctuating current assets are low, there will be **surplus cash** which the company will be able to invest in marketable securities.

Finally, an organisation may adopt an **aggressive approach** to financing working capital. Not only are fluctuating current assets all financed out of short-term sources, but so are some of the permanent current assets. This policy represents an **increased risk** of liquidity and cash flow problems, although potential returns will be increased if short-term financing can be obtained more cheaply than long-term finance.

Other factors that influence a working capital funding policy include **previous management attitudes to risk**; this will determine whether there is a preference for a conservative, aggressive or moderate approach. Secondly, **previous funding decisions** will determine the current position being considered in policy formulation. Finally, the **size of the organisation** will influence its ability to access different sources of finance. For example, a small company may have to adopt an aggressive working capital funding policy because it cannot raise additional long-term finance.

14 PKA Co

Text references. Working capital management is covered in Chapters 4 and 5. Hedging foreign currency risk is covered in Chapter 19.

Top tips. Part (b) requires a methodical step-by-step approach. Make sure you show all your workings so you can gain marks throughout even if you make a mistake or get stuck.

In part (c) you must answer the specific requirements of the question. Identify the two problem areas and discuss how to address them. Don't just write everything you know about receivables management.

Easy marks. Part (a) provides three easy marks for a textbook explanation and the calculations in part (d) are straightforward if you have learnt the techniques.

Examiner's comments. There were many good answers to part (a) and most candidates gained high marks. However, some answers tended to be somewhat general rather than focusing on the objectives of working capital management and some answers were much too long for the three marks on offer.

In part (b) many candidates incorrectly calculated the holding costs of each policy. Some candidates failed to consider the buffer inventory in calculating holding costs. Others used the re-order inventory level as the buffer level, failing to reduce inventory by consumption during the lead time it took for orders to arrive after being placed. Others added the re-order level to order quantity before dividing by two to calculate average inventory level, when only the order quantity is averaged.

Candidates failing to gain high marks in part (c) tended to offer a limited number of possible methods, for example by focusing at length on factoring to the exclusion of internal accounts receivables management methods. Despite the requirement to discuss domestic accounts receivable, some candidates discussed export factoring and exchange rate hedging.

In part (d) some candidates offered discursive answers, for which they gained little credit since the question asked for an evaluation of hedging methods.

Many candidates were unable to calculate correctly the spot and forward exchange rates from the information provided. Many candidates failed to compare all three hedges from a common time horizon perspective, ie either from the current time or from three months hence.

Marking scheme

		Marks
(a)	Profitability and liquidity	1
	Discussion of conflict between objectives	<u>2</u>
		3
(b)	Cost of cutting ordering policy	3
	Cost of EOQ-based ordering policy	3
	Saving by using EOQ model	<u>1</u>
		7

(c)	Reduction of bad debts	3-4	
	Reduction of average receivable period	3-4	
	Discussion of other improvements	<u>1-2</u>	
		Maximum	7
(d)	Money market hedge	3	
	Forward market hedge	2	
	Lead payment	2	
	Evaluation	<u>1</u>	
			<u>8</u>
			<u>25</u>

(a) **Objectives of working capital management**

The two main objectives of working capital management are to ensure it has **sufficient liquid resources** to continue in business and to **increase its profitability**.

Every business needs adequate **liquid resources** to maintain day-to-day cash flow. It needs enough to pay wages, salaries and accounts payable if it is to keep its workforce and ensure its supplies.

Maintaining adequate working capital is not just important in the short term. Adequate liquidity is needed to ensure the **survival** of the business in the long term. Even a profitable company may fail without adequate cash flow to meet its liabilities.

On the other hand, an excessively conservative approach to working capital management resulting in high levels of cash holdings will **harm profits** because the opportunity to make a return on the assets tied up as cash will have been missed.

These two objectives will often **conflict** as liquid assets give the lowest returns.

(b) **Cost of current ordering policy**

Minimum inventory level = re-order level – (average usage × average lead time)

Average usage per week = 625,000 units/ 50 weeks = 12,500 units

Average lead time = 2 weeks

Re-order level = 35,000 units

Minimum inventory level = 35,000 – (12,500 × 2) = 10,000 units

$$\begin{aligned} \text{Average inventory} &= \text{Minimum level} + \frac{\text{reorder quantity}}{2} \\ &= 10,000 + (100,000/2) \\ &= 60,000 \text{ units} \end{aligned}$$

Annual holding cost = 60,000 × €0.50 = €30,000

Annual ordering cost = €250 × (625,000/100,000) = €1,563

Annual total cost = 30,000 + 1,563 = **€31,563**

Economic order quantity

$$\text{EOQ} = \sqrt{\frac{2C_0D}{C_H}} = \sqrt{\frac{2 \times 250 \times 625,000}{0.5}} = 25,000 \text{ units.}$$

Number of orders per year = 625,000/25,000 = 25

Annual ordering cost = €250 × 25 = €6,250

Annual holding cost = (10,000 + (25,000/2)) × €0.50 = €11,250

Annual total cost = 11,250 + 6,250 = **€17,500**

Saving as a result of using the economic order quantity model = 31,563 – 17,500 = **€14,063** per year

(c) **Areas for improvement**

The two areas of concern are the increase in the percentage of bad debts from 5% to 8% of sales and the excessive credit period being taken by customers.

Reducing the percentage of bad debts

The key to reducing the percentage of bad debts is to assess the **credit worthiness** of customers. The risks and costs of a customer defaulting will need to be balanced against the profitability of the business provided by that customer.

PKA Co needs to examine its system for checking the credit worthiness of customers and instigate a policy or improve the current policy. For example, new customers should give **two good references**, including one from a bank, before being granted credit; **credit ratings** might be **checked** through a credit rating agency; a **new customer's credit limit** should be **fixed** at a **low level** and only increased if his payment record subsequently warrants it.

Reducing the average accounts receivable period

The average accounts receivable period was over twice the agreed 30 day credit period. This is costly for PKA in terms of the **opportunity costs of interest** on additional borrowed funds and also the **loss of opportunity to make a return** on the money tied up.

Encouraging early payment

PKA first needs to find out whether **competitors'** receivables periods are similarly long. If they are, PKA would have to be careful not to lose business as a result of over-stringent credit control action. A better approach would be to **encourage** early payment, perhaps through early settlement discounts.

Improved credit control procedures

If competitors are not experiencing the same problems, PKA needs to examine its own credit control policies and procedures. For example, accounts **receivable' payment records** must be **monitored** continually. This depends on successful sales ledger administration.

A customer's payment record and the **accounts receivable aged analysis** should be examined regularly, as a matter of course. Breaches of the credit limit, or attempted breaches of it, should be brought immediately to the attention of the credit controller.

PKA needs to have in place agreed procedures for dealing with **overdue accounts**. Examples include instituting reminders or final demands, chasing payment by telephone or making a personal approach. If this does not work, the company could refuse to grant any more credit to the customer, hire a specialist debt collecting agency or, as a last resort, take legal action.

(d) **Money market hedge**

Money market hedging would involve borrowing in euros, converting the money borrowed into dollars and putting the money on deposit until the time the transaction is completed, hoping to take advantage of favourable interest rate movements.

\$ interest rate over six months = 3.5/2 = 1.75%

\$s required now in order to have \$250,000 in six months' time = 250,000/1.0175 = \$245,700

Current spot selling rate = 1.998 – 0.002 = \$1.996 per €

Cost of \$s to be deposited = 245,700/1.996 = €123,096

€ interest rate over six months = 6.1/2 = 3.05%

Value of € loan in six months' time = 123,096 × 1.0305 = **€126,850**

Forward market hedge

Forward exchange contracts hedge against transaction exposure by allowing the importer to arrange for a bank to buy a quantity of foreign currency at a future date, at a rate of exchange determined when the forward contract is made.

Six months forward rate = $1.979 - 0.004 = \$1.975$ per €
 € cost using forward market hedge = $250,000/1.975 = \text{€}126,582$

Lead payment

A lead payment is a **payment in advance**. This is particularly useful if the currency in which the payment is to be made is appreciating, as is the case here.

€ cost now = $250,000/1.996 = \text{€}125,251$

This money would need to be borrowed so there is an interest cost.

€ value of loan in six months' time = $125,251 \times 1.0305 = \text{€}129,071$

Conclusion

All of the hedging methods relate to six months in the future so can be directly compared. The lead payment is the most expensive method and the **forward market hedge is the cheapest**. It is therefore recommended that a forward market hedge be used.

15 FLG Co

Text references. Working capital is covered in Chapters 4 and 5.

Top tips. Make sure you read the requirement in part (a), so that your answer refers to factors which determine the level of investment in current assets and not working capital funding strategies.

Set your workings out clearly in parts (c) and (d) to get the maximum number of marks.

Easy marks. Parts (a) and (b) require general discussions which should provide easy marks if you have learnt the necessary material.

Examiner's comments. In part (a), candidates who answered the actual question requirement gained high marks. In part (b) many candidates discussed relevant points in relation to factoring and received credit accordingly. Discussions of invoice discounting tended to be variable in quality, with a significant number of students believing incorrectly that invoice discounting meant early settlement discounts.

The variable quality of the answers to part (c) indicates a need for candidates to ensure, not only that they are familiar with accounting ratios, but also that they are familiar with the accounting items to which the ratios relate, in this case sales, cost of sales, inventory, trade receivables, trade payables and so on. Many candidates were unable to calculate the inventory turnover period, given the operating cycle, the average collection period and the average payable period. Many candidates were also unable to work backwards from the provided ratios, for example to calculate the level of receivables given the average collection period and the amount of credit sales. Some candidates omitted the overdraft when calculating net working capital, indicating unfamiliarity with the structure of the balance sheet.

Many candidates gained high marks in part (d) by offering a comprehensive answer. Candidates who did not gain high marks appeared to be unsure of the meaning of the variables in the EOQ, even though the units of each were clearly specified in the question.

Marking scheme

		Marks
(a)	Discussion of key factors	6
(b)	Discussion of factoring	4-5
	Discussion of invoice discounting	<u>1-2</u>
	Maximum	6

(c)	Value of inventory	1	
	Accounts receivable and accounts payable	1	
	Current liabilities	1	
	Size of overdraft	1	
	Net working capital	1	
	Total cost of financing working capital	<u>1</u>	6
(d)	(i)		
	Economic order quantity	1	
	Ordering cost and holding cost under EOQ	1	
	Inventory cost under EOQ	1	
	Total cost of inventory with EOQ policy	<u>1</u>	4
	(ii)		
	Ordering cost and holding cost with discount	1	
	Inventory cost with discount	1	
	Total cost of inventory with bulk purchase discount	1	
	Conclusion	<u>1</u>	
	Maximum		<u>3</u>
			<u>25</u>

(a) **Factors which determine the level of investment in current assets**

The level of working capital will depend on the policy of the organisation and the industry in which it operates.

Industry in which organisation operates

Some industries, such as ship building, will have long operating cycles and high levels of investment in working capital, due to the length of time required to manufacture goods. Other industries such as supermarkets will have rapid inventory turnover and have short operating cycles.

Working capital policy

Organisations have to decide what are the most important risks relating to working capital, and therefore whether to adopt a conservative, aggressive or moderate approach.

A conservative approach

A conservative working capital management policy aims to **reduce the risk of operational breakdown** by holding high levels of working capital.

Customers are allowed generous payment terms to stimulate demand, finished goods inventories are high to ensure availability for customers, and raw materials and work in progress are high to minimise the risk of running out of inventory and consequent downtime in the manufacturing process. Suppliers are paid promptly to ensure their goodwill, again to minimise the chance of stock-outs.

However, the cumulative effect on these policies can be that the firm carries a high burden of unproductive assets, resulting in a **financing cost** that can destroy **profitability**. A period of rapid expansion may also cause severe cash flow problems as working capital requirements outstrip available finance. Further problems may arise from inventory obsolescence and lack of flexibility to customer demands.

An aggressive approach

An aggressive working capital management policy aims to **reduce this financing cost and increase profitability** by cutting inventories, speeding up collections from customers, and delaying payments to suppliers.

The potential disadvantage of this policy is an increase in the chances of **system breakdown** through running out of inventory or **loss of goodwill** with customers and suppliers.

However, modern manufacturing techniques encourage inventory and work in progress reductions through just-in-time policies, flexible production facilities and improved quality management. Improved customer

satisfaction through quality and effective response to customer demand can also mean that credit periods are shortened.

These characteristics are useful for comparing and analysing the different ways individual organisations deal with working capital and the **trade off** between **risk and return**.

- (b) Some companies use **factoring** and **invoice discounting** to help short-term liquidity or to reduce administration costs.

Factoring

Factoring is an arrangement to have debts collected by a factor company, which **advances** a proportion of the money it is due to collect. This is usually up to 80% of the face value of invoices raised. The finance is repaid once the invoices have been settled and the balance is passed to the issuing company after deduction of a **fee**. This fee is equivalent to an **interest charge** on the cash advanced.

Factoring usually involves **administration** of the client's invoicing, sales accounting and debt collection service and **credit protection** for the client's debts, whereby the factor takes over the risk of loss from bad debts and so 'insures' the client against such losses. This is known as a **non-recourse** service. However, if a **non-recourse** service is provided the factor, not the firm, will decide what action to take against non-payers.

Invoice discounting

Invoice discounting is the purchase (by the provider of the discounting service) of trade debts at a discount. Invoice discounting enables the company from which the debts are purchased to raise working capital.

The invoice discounter does not take over the administration of the client's sales ledger.

A client should only want to have some invoices discounted when he has a **temporary cash shortage**, and so invoice discounting tends to consist of one-off deals.

- (c) Operating cycle = 3 months

	Months
Receivables	2
Payables	(1)
Inventory (balancing figure)	<u>2</u>
Operating cycle	<u>3</u>

$$\text{Level of inventory} = 2/12 \times \$1.89\text{m} = \$315,000$$

$$\text{Accounts receivable} = 2/12 \times \$4.2\text{m} = \$700,000$$

$$\text{Accounts payable} = 1/12 \times \$1.89\text{m} = \$157,500$$

$$\text{Current ratio} = \text{Current assets}/\text{current liabilities} = 1.4$$

$$1.4 = (315,000 + 700,000)/\text{current liabilities}$$

$$\text{Current liabilities} = (315,000 + 700,000)/1.4 = \$725,000$$

$$\text{Current liabilities} = \text{Accounts payable} + \text{overdraft}$$

$$725,000 = 157,500 + \text{overdraft}$$

$$\text{Overdraft} = 725,000 - 157,500 = \$567,500$$

$$\begin{aligned} \text{Net working capital} &= \text{Current assets} - \text{current liabilities} \\ &= 315,000 + 700,000 - 725,000 \\ &= \$290,000 \end{aligned}$$

Cost of financing working capital

Overdraft	7% × \$567,500	\$ 39,725
Long-term finance	11% × \$290,000	<u>31,900</u>
Total cost		<u>71,625</u>

(d) (i)

$$\begin{aligned} \text{EOQ} &= \sqrt{\frac{2 \times \text{demand (units)} \times \text{ordering cost}}{\text{holding cost}}} \\ &= \sqrt{\frac{2 \times 60,000 \times 6}{0.5}} \\ &= \sqrt{1,440,000} \\ &= 1,200 \text{ units} \end{aligned}$$

Number of orders per year = $60,000/1,200 = 50$ orders

Annual ordering cost = $50 \times \$6 = \300

Average inventory held = $1,200/2 = 600$ units

Annual holding cost = $600 \times 0.5 = \$300$

Inventory cost = $60,000 \times \$12 = \$720,000$

Total cost of inventory using EOQ = $720,000 + 300 + 300 = \$720,600$

(ii) Order size for bulk discounts is 10,000

Number of orders per year = $60,000/10,000 = 6$

Annual ordering cost = $6 \times \$6 = \36

Average inventory = $10,000/2 = 5,000$ units

Annual holding cost = $5,000 \times \$2 = \$10,000$

Inventory cost = $60,000 \times \$12 \times 99\% = \$712,800$

Total cost of inventory with discount = $712,800 + 36 + 10,000 = \$722,836$

Using the **EOQ approach** will result in a slightly lower inventory cost.

16 HGR Co

Text reference. Working capital financing and cash flow forecasting are covered in Chapter 6 and receivables management in Chapter 5.

Top tips. This is a time pressured question that will need to be carefully planned to obtain the maximum marks. Parts (a) and (c) should be straightforward discussions, provided you answer the specific requirements. Part (b) has some tricky parts in calculating the effect of the finance director's proposals. If you get stuck, make an assumption and move on.

Easy marks. The easiest marks are probably for the discussion parts, provided you have sufficient knowledge of this area of the syllabus.

Examiner's comments. In part (a) some candidates ignored the word 'financing' and discussed working capital strategy in general. Better answers recognised the aggressive financing strategy and discussed how current assets could be divided into fluctuating and permanent current assets, linking this via the matching principle to the use of short-term and long-term finance.

Many candidates had great difficulty in part (b). Common errors included failing to recognise that the opening balance was the overdraft, calculating annual rather than monthly interest and including cash flows other than those given in the question. The general standard of answers showed that many candidates need further preparation in the important area of cash flow preparation.

Some answers in part (c) were one-sided concentrating on exchange rate risk rather than on credit risk.

Marking scheme

		Marks
(a)	Analysis of current assets	
	Short-term and long-term finance	1-2
	Matching principle	2-3
	Financing approach used by company	1-2
		<u>1-2</u>
	Maximum	7
(b)	Bank balance if no action is taken	2
	Bank balance if action is taken	5
	Working capital management implications	1-2
	Advice on course of action	1-2
		<u>1-2</u>
	Maximum	10
(c)	Relevant discussion	<u>8</u>
		<u>25</u>

(a) **Working capital financing strategy of HGR Co**

Working capital can be financed using **short-term** finance or **long-term** finance or a mixture of the two.

Short-term finance

An **overdraft** is an example of short-term finance. It is **flexible** as it is used as and when it is needed and **variable interest** is charged. It is however **risky** as it can be withdrawn at any time by the bank and the **interest rate** charged may be **higher** than a short-term loan. In general, the **term structure** of interest rates suggests that short-term debt finance has a **lower cost** than long-term debt finance.

HGR Co has an overdraft facility of \$4 million and at the current date is using nearly all of this facility. 83% ($14,000,000/16,935,000 \times 100$) of current assets are financed from short-term sources in the form of the overdraft and trade payables.

Long-term finance

The **matching principle** suggests that long-term finance should be used for long-term investments. In terms of working capital finance, this means that long-term finance should be matched with **permanent current assets** and **non-current assets**.

Permanent current assets are the amount required to meet long-term minimum needs and sustain normal trading activity. For example, inventory and the average level of accounts receivable. As a business grows, the level of permanent current assets will grow.

17% ($2,935,000/16,935,000 \times 100$) of HGR's current assets are financed from equity finance and traded bonds, which are long-term sources of finance.

HGR Co's policy

HGR Co's working capital financing policy is **aggressive** as it mostly consists of short-term finance. This policy represents an **increased risk** of liquidity and cash flow problems, although potential returns will be increased if short-term financing can be obtained more cheaply than long-term finance.

(b) **Bank balance in three months' time if no action is taken**

Month	1	2	3
	\$000	\$000	\$000
Receipts	4,220	4,350	3,808
Payments	(3,950)	(4,100)	(3,750)
Interest on bonds		(200)	
Overdraft interest (W3)	(19)	(18)	(18)
Capital investment			(2,000)
Net cash flow	251	32	(1,960)
Opening balance	<u>(3,800)</u>	<u>(3,549)</u>	<u>(3,517)</u>
Closing balance	<u>(3,549)</u>	<u>(3,517)</u>	<u>(5,477)</u>

Bank balance in three months' time if the finance director's proposals are implemented

Month	1	2	3
	\$000	\$000	\$000
Receipts	4,220	4,350	3,808
Payments	(3,950)	(4,100)	(3,750)
Interest on bonds		(200)	
Overdraft interest (W3)	(19)	(15)	(13)
Capital investment			(2,000)
Accounts receivable (W1)	270	270	270
Inventory (W2)	<u>204</u>	<u>204</u>	<u>204</u>
Net cash flow	725	509	(1,481)
Opening balance	<u>(3,800)</u>	<u>(3,075)</u>	<u>(2,566)</u>
Closing balance	<u>(3,075)</u>	<u>(2,566)</u>	<u>(4,047)</u>

Workings

- (1) Reduction in accounts receivable days
Current accounts receivable days = $(8,775/49,275) \times 365 = 65$ days
Reduction in days over 6 months = $65 - 53 = 12$ days
Monthly reduction = $12/6 = 2$ days
Each receivables day is equivalent to $8,775,000/65 = \$135,000$
Monthly reduction in accounts receivable = $2 \times 135,000 = \$270,000$
- (2) Reduction in inventory days
Current inventory days = $(8,160/37,250) \times 365 = 80$ days
Each inventory day is equivalent to $8,160,000/80 = \$102,000$
Monthly reduction in inventory = $102,000 \times 2 = \$204,000$
- (3) Overdraft interest
Monthly overdraft interest rate = $\sqrt[12]{1.0617} - 1$
 $= 1.005 - 1$
 $= 0.005$ or 0.5%

If no action is taken:

Period 1 interest = $3,800,000 \times 0.5\% = \$19,000$

Period 2 interest = $3,549,000 \times 0.5\% = \$17,745$

Period 3 interest = $3,517,000 \times 0.5\% = \$17,585$

If action is taken:

Period 1 interest = $3,800,000 \times 0.5\% = \$19,000$

Period 2 interest = $3,075,000 \times 0.5\% = \$15,375$

Period 3 interest = $2,566,000 \times 0.5\% = \$12,830$

Comment

The cash flow forecast shows that, if no action is taken, HGR Co will **exceed its overdraft limit** of \$4 million by \$1.48 million in three months' time.

If the finance director's suggestions for action are taken, the bank balance will **improve** but the overdraft limit will still be exceeded by \$47,000.

Following this 3 month period, the bank balance will continue to improve by \$270,000 per month due to the **reduction in accounts receivable**. Further information would be needed on other future cash flows to forecast whether the overdraft would then return to under the limit.

The main reason why there is a cash shortfall is the **capital expenditure** of \$2 million. This is a **long-term** investment that should be financed using long-term sources of finance, such as equity or bonds. If this were to happen, the overdraft balance would be \$3.48 million at the end of three months if no action was taken, and \$2.05 million if the finance director's suggestions were implemented.

HGR Co could raise finance through **long-term debt** using the \$48,965,000 of non-current assets as security. The six-monthly interest payment of \$200,000 suggests that HGR Co is not highly geared so there is room for more long-term debt finance.

Recommendation

HGR Co should implement the finance director's suggestion for working capital management and use long-term debt to finance the capital expenditure.

(c) Risks arising from granting credit to foreign customers

Foreign debts raise the following special problems. When goods are sold abroad, the customer might ask for credit. Exports take time to arrange, and there might be complex paperwork. Transporting the goods can be slow, if they are sent by sea. These **delays in foreign trade** mean that exporters often build up **large investments** in inventories and accounts receivable. These working capital investments have to be financed somehow.

The **risk of bad debts** can be greater with foreign trade than with domestic trade. If a foreign customer refuses to pay a debt, the exporter must pursue the debt in the debtor's own country, where procedures will be subject to the laws of that country.

How risks can be managed and reduced

A company can reduce its investment in foreign accounts receivable by insisting on **earlier payment** for goods. Another approach is for an exporter to arrange for a **bank to give cash for a foreign debt**, sooner than the exporter would receive payment in the normal course of events. There are several ways in which this might be done.

Where the exporter asks his bank to handle the collection of payment (of a bill of exchange or a cheque) on his behalf, the bank may be prepared to make an **advance** to the exporter against the collection. The amount of the advance might be 80% to 90% of the value of the collection.

Negotiation of bills or cheques is similar to an advance against collection, but would be used where the bill or cheque is payable outside the exporter's country (for example in the foreign buyer's country).

Discounting bills of exchange is where a bank buys the bill before it is due and credits the value of the bill after a discount charge to the company's account.

Export factoring could be considered where the exporter pays for the specialist expertise of the factor in order to reduce bad debts and the amount of investment in foreign accounts receivable.

Documentary credits provide a method of payment in international trade, which gives the exporter a secure risk-free method of obtaining payment. The buyer (a foreign buyer, or a UK importer) and the seller (a UK exporter or a foreign supplier) first of all agree a contract for the sale of the goods, which provides for payment through a documentary credit. The buyer then requests a bank in his country to issue a letter of credit in favour of the exporter. The issuing bank, by issuing its letter of credit, guarantees payment to the beneficiary.

Countertrade is a means of financing trade in which goods are exchanged for other goods.

Export credit insurance is insurance against the risk of non-payment by foreign customers for export debts. If a credit customer defaults on payment, the task of pursuing the case through the courts will be lengthy, and it might be a long time before payment is eventually obtained.

Premiums for export credit insurance are however very high and the benefits are sometimes not fully appreciated.

17 Preparation question: Investment appraisal

(a), (b)

	0	1	2	3	4	5	6
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Sales		1,550	1,550	1,550	650	650	
Cost of sales (40% sales)		(620)	(620)	(620)	(260)	(260)	
Distribution costs (10% sales)		(155)	(155)	(155)	(65)	(65)	
Net profits		775	775	775	325	325	
Royalty to joint venture partner (20% net profits)			(155)	(155)	(155)	(65)	(65)
Investment	(2,100)						
Net cash flows	(2,100)	775	620	620	170	260	(65)
Discount factor 5%	1.000	0.952	0.907	0.864	0.823	0.784	0.746
Present value	(2,100)	738	562	536	140	204	(48)
Discount factor 10%	1.000	0.909	0.826	0.751	0.683	0.621	0.564
Present value	(2,100)	704	512	466	116	161	(37)

Net present value at 5% is \$32,000. The project is (just) financially viable.

Net present value at 10% is (\$178,000)

$$\text{IRR} \approx a + \left(\left(\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \right) (b - a) \right) \%$$

$$\text{IRR} \approx 5 + \left[\frac{32}{(32 + 178)} \times (10 - 5) \right]$$

≈ 5.76%, say 6%

(c) **Payback period**

Cumulative cash flows

Year	\$'000
0	(2,100)
1	(1,325)
2	(705)
3	(85)
4	85

Payback period is 4 years.

18 Chromex Co

Text references. Payback is covered in Chapter 7, government intervention in Chapter 2 and ratio analysis in Chapter 1.

Top tips. Section (a) is the type of part-question that may well occur on your paper; a discussion of one or other methods of investment appraisal. In (b) the calculations must be based on *cash flows* and not profits.

In (d) you should consider the specifics of the Chromex bid in order to assess the probability of a referral to the Competition Commission. You do not need to have a detailed understanding of the Commission's work, but you should be able to show that you understand the type of issues that it addresses and the actions that it may take in this type of case. Do not forget that EU legislation may also be relevant in this situation.

You are not required to *calculate* any ratios in (e) and you should not waste time in trying to do so. However it is important to explain why you have arrived at your choice – you may find it helpful to structure your answer around the four categories into which financial ratios are commonly divided. (e) represents a good test not only of your knowledge of ratios, but what determines the usefulness of ratio analysis.

(a) Payback

The payback method of project appraisal involves calculating the period of time that it is likely to take to recoup the initial outlay on a project, and then comparing this with what the company defines as an acceptable period. If the payment period is less than that defined as acceptable, and provided that there are no other constraints for example capital rationing, the project will be accepted.

Limitations of payback

- (i) It **ignores** the **timing of cash flows** within the payback period, the cash flows at the payback period and therefore the total project return.
- (ii) It **ignores** the time **value of money**.
- (iii) It is **unable** to **distinguish between projects** with the same payback period.
- (iv) It **tends to favour short term** (often smaller) projects over longer term projects.
- (v) It takes account of the **risk** of the timing of cash flows but **not** the **variability** of those cash flows.

Popularity of payback

- (i) It is **simple to calculate** and **simple to understand**, and this may be important when management resources are limited. It is similarly helpful in communicating information about minimum requirements to managers responsible for submitting projects.
- (ii) It **can be used** as a **screening device** as a first stage in eliminating obviously inappropriate projects prior to more detailed evaluation.
- (iii) The fact that it tends to **bias in favour of short term projects** means that it tends to minimise both financial and business risk.
- (iv) It can be used when there is a **capital rationing situation** to identify those projects which generate additional cash for investment quickly.

- (b) The **payback period** is calculated on the basis of the **incremental cash flows** arising to Chromex following the acquisition.

The annual cash flows will be:

	\$'000
Operating profit	10,000
Add back non-cash items:	
Depreciation	500
Annual labour savings	700
Annual incremental cash flow	<u>11,200</u>

The net cost of the acquisition is the bid value of \$150m *less* the actual income of \$10m (\$15m-\$5m) received from the sale of the land and buildings, ie \$140m.

The payback period is therefore $140\text{m} \div 11.2\text{m} = 12.5 \text{ years}$

(c) **Additional information required**

- (i) Details of the **timescale** over which the investment is to be assessed
- (ii) **Annual cashflow forecasts** for the appraisal period, adjusted for inflation as necessary
- (iii) An appropriate estimate of the **cost of capital** to be used in the calculations
- (iv) An estimate of the **terminal value**, ie the amount that could be realised from the investment at the end of the period
- (v) An indication of the proposed **financing mix** in order to account for the effect of the tax shield on debt interest
- (vi) Information on the effective rate of **tax** on profit and the possibility of claiming **tax allowable depreciation**

(d) **Competition authorities**

Chromex already supplies nearly one quarter of the UK bicycle market, and the Bexell acquisition would push the market share up to 34%. In view of this it is possible that the government might decide that there is a potential monopoly situation and refer the bid to the **Competition Commission**. The role of the Commission would be to assess the likely effect of the bid on the **public interest**. If it decides that the bid could have an adverse effect on the public, for example due to the restriction of choice, it may request the companies involved to change the terms of the deal. One of the main effects of this would obviously be to delay the progress of the bid. In reaching its decision, the government must also take into account whether the proposals contravene any of the EU regulations on fair competition.

(e) **Choice of ratios**

There are a large number of ratios that could be chosen in this context. However, a range of ratios should be chosen to ensure that an analysis is made of the four main areas of company performance as follows.

	Performance area	Ratios that could be selected
1	Profitability and return	Return on sales Return on investment Asset turnover
2	Debt and gearing	Gearing ratio Debt ratio Interest cover
3	Liquidity	Current ratio Quick ratio Receivable payment period Payable payment period Inventory turnover
4	Shareholders' investment ratios	Dividend yield Earnings per share Price/earnings ratio Dividend cover Earnings yield

Some of the reasons why comparison should be based on companies in the same sector are as follows.

(i) **Working capital requirements**

Different industries have very **different working capital requirements**. For example, a supermarket will have a much lower level of receivables than an aerospace manufacturer due to the differing levels of credit sales. Similarly, manufacturing businesses generally require a much greater investment in inventories than do service businesses. This makes a meaningful comparison of the liquidity ratios impossible.

(ii) **Fixed costs**

Different industries have **different levels of fixed costs**. For example, the fixed costs of a small management consultancy will be much lower than those of a capital equipment manufacturer. Different cost structures make it difficult to compare relative levels of profitability and gearing.

(iii) **Business risk**

There will be **different levels of business risk and earnings volatility** in different industrial sectors. Again, this makes it impossible to compare the investment and gearing ratios of different companies.

19 Preparation question: NPV with inflation and tax

NPV calculation

	20X3	20X4	20X5	20X6
	€	€	€	€
Website (W1)		(150,000)	(11,000)	(12,100)
Extra sales (W2)		50,400	66,150	83,349
Extra variable costs (W3)		(31,680)	(43,560)	(57,499)
Fixed costs saved (W4)		79,200	87,120	95,832
Extra profit/ loss		(52,080)	98,710	109,582
Tax @ 30%		15,624	(29,613)	(32,875)
Hardware	(60,000)			10,000
Working capital (W5)	(20,000)	(13,000)	14,850	18,150
WDA @ 30% (W6)	4,500	3,375	2,531	4,594
	(75,500)	(46,081)	86,478	109,451
Discount factor (10%)	1.000	0.909	0.826	0.751
PV	(75,500)	(41,888)	71,431	82,198

NPV €36,241

As the NPV is positive, management should proceed with the investment.

Workings

(1) *Website*

	20X3	20X4	20X5
Cost	€150,000	€11,000 (10,000 × 1.1)	€12,100 (10,000 × 1.1 ²)

(2) *Extra sales*

€50,400 (48,000 × 1.05)	€66,150 (60,000 × 1.05 ²)	€83,349 (72,000 × 1.05 ³)
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(3) *Extra variable costs*

€31,680 (48,000 × 60% × 1.1)	€43,560 (60,000 × 60% × 1.1 ²)	€57,499 (72,000 × 60% × 1.1 ³)
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(4) *Savings in fixed costs*

	20X4	20X5	20X6
€79,200 (€1.2m × 30% × 1.1) - €316,800)	€87,120 (€79,200 × 1.1)	€95,832 (€87,120 × 1.1)	

(5) *Working capital*

	20X3	20X4	20X5	20X6
	€	€	€	€
Investment (@ 20X3 prices)	20,000	30,000	15,000	0
Investment (@ inflated prices)	20,000	33,000	18,150	0
Year move (@ inflated prices)	(20,000)	(13,000)	14,850	18,150

(6) <i>Capital allowances</i> (25% reducing balance)			
	€		€
20X3	60,000		
	<u>(15,000)</u>	× 30%=	4,500
20X4	45,000		
	<u>(11,250)</u>	× 30%=	3,375
20X5	33,750		
	<u>(8,438)</u>	× 30%=	2,531
20X6	25,312		
	<u>(10,000)</u>		
Balancing allowance	<u>15,312</u>	× 30%=	4,594

20 Charm Co

Text references. Investment appraisal methods are covered in Chapters 7, 8 and 9.

Top tips. Be careful with the fixed costs in part (a). They are relevant but incremental does not mean variable. Make sure you focus on NPV in part (c).

Easy marks. The calculations in parts (a) and (b) should be straightforward and gain easy marks.

Examiner's comments. This was the most popular question on this paper and many answers gained high marks in parts (a) and (b). Many answers showed a shallow understanding of the issues in part (c).

Marking scheme

		Marks
(a)	Sales revenue	1
	Material costs	1
	Variable production costs	1
	Advertising	1
	Incremental fixed costs	2
	Taxation	1
	Capital allowance tax benefits	1
	Discount factors	1
	Net present value	1
	Comment	<u>1</u>
		11
(b)	Net present value	1
	IRR	3
	Comment	<u>1</u>
		5
(c)	Up to 2 marks for each detailed point made	<u>9</u>
		<u>25</u>

(a) **Calculation of net present value of proposed investment**

Year	1	2	3	4
	\$'000	\$'000	\$'000	\$'000
Sales	3,750	1,680	1,380	1,320
Direct materials	(810)	(378)	(324)	(324)
Variable production cost	(900)	(420)	(360)	(360)
Advertising	(650)	(100)		
Fixed costs (W1)	(600)	(600)	(600)	(600)
Operating cash flow	790	182	96	36
Tax at 30%	(237)	(55)	(29)	(11)
Tax saved by capital allowance (W2)	60	60	60	60
Net cash flow	613	187	127	85
10% discount factors	0.909	0.826	0.751	0.683
Present value	557.2	154.5	95.4	58.1

Workings

- (1) Fixed costs in year 1 = 150,000 × \$4.

This is a one-off increase in fixed costs and will not then vary with production.

- (2) Tax saved by capital allowance = \$800,000/4 × 30% = \$60,000 per annum

Total present value = \$865,200

Net present value = \$(865,200 – 800,000) = \$65,200

This net present value is **positive** and the investment is therefore worthwhile on financial grounds. However this does depend on very high sales in the first year which may not be achievable.

(b) **Calculation of NPV using a discount rate of 20%**

Year	1	2	3	4
	\$'000	\$'000	\$'000	\$'000
Net cash flow	613	187	127	85
20% discount factors	0.833	0.694	0.579	0.482
Present value	510.6	129.8	73.5	41.0

Net present value = \$(754,900 – 800,000) = – \$45,100

Using the formula

$$\text{IRR} \approx a + \left(\left(\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \right)^{b-a} \right) \%$$

$$\text{IRR} \approx 10 + \left[\frac{65,200}{65,200 + 45,100} \times (20 - 10) \right] \% = 15.91\%, \text{ say } 16\%$$

An IRR of 16% is higher than the discount rate of 10% used to appraise new investments. The investment is therefore financially acceptable.

(c) The net present value method of investment appraisal has a number of **advantages** over other methods.

- (i) It is based on **cash flows** not accounting profit unlike ROCE. Accounting profits are subject to a number of different accounting treatments and cash flows can add to the wealth of the shareholders via increased dividends.
- (ii) NPV looks at cash flows throughout the **whole** of an investment period unlike payback, which ignores cash flows after the end of the payback period. This avoids the incorrect rejection of projects with later high returns, although it is unlikely in practice that payback would be used in isolation.
- (iii) NPV incorporates the **time value of money** by using discounted cash flows whereas ROCE and payback do not. This means that it takes account of the fact that \$1 today is worth more than \$1 in

one year's time. Discounted payback can be used but this will still ignore cash flows after the payback period.

- (iv) NPV is viewed as being **technically superior** to IRR and **simpler to calculate**. It reflects the amount of the initial value rather than a relative measure of return and represents the change in total market value that will occur if the investment project is accepted. Other investment appraisal methods do not directly show the potential increase in shareholder wealth, which is a primary financial management objective.
- (v) The NPV method is superior for ranking **mutually exclusive projects** in order of attractiveness. IRR will give an incorrect indication where discount rates are less than the IRR of incremental cash flows.
- (vi) Where cash flow patterns are **non-conventional**, for example where the sign of the net cash flow changes in successive periods, there may be several IRRs which decision makers must be aware of to avoid making the wrong decision. NPV however can accommodate these non-conventional cash flows.
- (vii) When discount rates are expected to **differ** over the life of the project, such variations can be incorporated easily into NPV calculations, but not into IRR calculations.
- (viii) An assumption underlying the NPV method is that any net cash inflows generated during the life of the project will be **reinvested at the cost of capital** (that is, the discount rate). The IRR method, on the other hand, assumes these cash flows can be reinvested to earn a return equal to the IRR of the original project, which is not necessarily reasonable.

21 Trecor Co

Text references. Investment appraisal is covered in Chapters 7, 8 and 9.

Top tips. In part (a), set out your workings clearly to gain the maximum number of marks for your workings. Do as much of the NPV calculation as you possibly can, as marks are awarded for each stage. Make an assumption and carry on if you get stuck on any part. Nominal cash flows are used so the nominal discount rate must be calculated and used.

Remember to deduct depreciation from the cash flows in part (b) to calculate accounting profit.

Write a full answer with clearly made and well supported arguments in part (c). As we say in Passing F9 in the front pages of this kit, don't just list the strengths and weaknesses.

Easy marks. Part (b) is a straightforward relatively simple calculation. Part (c) is a standard textbook discussion and you should be able to gain most of the marks.

Marking scheme

		Marks
(a)	Discount rate	1
	Inflated sales revenue	2
	Inflated variable cost	1
	Inflated fixed production overheads	1
	Taxation	2
	Capital allowance tax benefits	3
	Discount factors	1
	Net present value	1
	Comment	1
		13
(b)	Calculation of average annual accounting profit	2
	Calculation of average investment	2
	Calculation of return on capital employed	1
		5

(c)	Strengths of IRR	2-3
	Weaknesses of IRR	5-6
	Maximum	<u>7</u>
		<u>25</u>

(a) **Calculation of NPV**

Nominal discount rate:

$$(1 + i) = (1 + r)(1 + h) = 1.057 \times 1.05 = 1.10985$$

$$i = 11\%$$

	1	2	3	4	5
	\$'000	\$'000	\$'000	\$'000	\$'000
Sales (W1)	433	509	656	338	
Variable cost (W2)	<u>284</u>	<u>338</u>	<u>439</u>	<u>228</u>	
Contribution	149	171	217	110	
Fixed production overheads	<u>27</u>	<u>28</u>	<u>30</u>	<u>32</u>	
Net cash flow	122	143	187	78	
Tax		(37)	(43)	(56)	(23)
CA tax benefits (W3)		<u>19</u>	<u>14</u>	<u>11</u>	<u>30</u>
After-tax cash flow	122	125	158	33	7
Disposal				5	
After-tax cash flow	<u>122</u>	<u>125</u>	<u>158</u>	<u>38</u>	<u>7</u>
Discount factors	<u>0.901</u>	<u>0.812</u>	<u>0.731</u>	<u>0.659</u>	<u>0.593</u>
Present values	<u>110</u>	<u>102</u>	<u>115</u>	<u>25</u>	<u>4</u>

	\$
PV of benefits	356,000
Investment	250,000
NPV	106,000

Workings

1		1	2	3	4
	<i>Year</i>				
	Demand (units)	35,000	40,000	50,000	25,000
	Selling price (\$/unit)	12.36	12.73	13.11	13.51
	Sales (\$/year)	<u>432,600</u>	<u>509,200</u>	<u>655,500</u>	<u>337,750</u>
2		1	2	3	4
	<i>Year</i>				
	Demand (units)	35,000	40,000	50,000	25,000
	Variable cost (\$/unit)	8.11	8.44	8.77	9.12
	Sales (\$/year)	<u>283,850</u>	<u>337,600</u>	<u>438,500</u>	<u>228,000</u>
3	Capital allowances			Tax benefits	
		\$			\$
	1 250,000 × 0.25 =	62,500	62,500 × 0.3 =	18,750	
	2 62,500 × 0.75 =	46,875	46,875 × 0.3 =	14,063	
	3 46,875 × 0.75 =	35,156	25,156 × 0.3 =	10,547	
	4 By difference	<u>100,469</u>	100,469 × 0.3 =	<u>30,141</u>	
	250,000 – 5,000 =	<u>245,000</u>		<u>73,501</u>	

(b) **Calculation of before-tax return on capital employed (ROCE)**

$$\text{Cash flow before tax} = 122 + 143 + 187 + 78 = \$530,000$$

$$\text{Total depreciation} = (250,000 - 5,000) = \$245,000$$

$$\text{Average annual accounting profit} = (530 - 245)/4 = \$71,250$$

$$\text{Average investment} = (250,000 + 5,000)/2 = \$127,500$$

$$\text{ROCE} = 71,250/127,500 \times 100 = 56\%$$

The target ROCE is 20% and the expected ROCE is significantly higher than this so the purchase of the machine can be recommended.

(c) **Strengths of IRR**

The main advantage of the IRR method is that the information it provides is **more easily understood** by managers than NPV, especially non-financial managers. It gives a **relative measure** of the value of a proposed investment in the form of a percentage which can be compared with the company's cost of capital or the rates of interest and inflation.

IRR is a **discounted cash flow method** and so takes account of the **time value** of money: the concept that \$1 received today is not equal to \$1 received in the future.

IRR considers cash flows over the **whole** of the project life and is sensitive to both the amount and the **timing** of cash flows.

Weaknesses of IRR

IRR ignores the **relative sizes** of investments. It therefore does not measure the absolute increase in company value, and therefore shareholder wealth, which will be created by an investment.

Where cash flow patterns are **non-conventional**, for example cash flows change from positive to negative during the life of the project, there may be **several IRRs** which decision makers must be aware of to avoid making the wrong decision. When **discount rates** are **expected to differ** over the life of the project, such **variations** can be incorporated easily into **NPV** calculations, but not into IRR calculations.

Mutually exclusive projects are two or more projects from which only one can be chosen. Examples include the choice of a factory location or the choice of just one of a number of machines. The IRR and NPV methods can, however, give **conflicting rankings** as to which project should be given priority. Where there is a conflict, NPV always offers the **technically correct investment advice**.

Despite the advantages of the NPV method over the IRR method, the **IRR method** is **widely used** in practice.

22 Preparation question: Sensitivity analysis

(a) **NPV calculation**

Year	Discount factor 9%	PV of initial investment \$'000	PV of variable costs \$'000	PV of cash inflows \$'000	PV of net cash flow \$'000
0	1.000	(11,000)			(11,000)
1	0.917		(2,934)	9,445	6,511
2	0.842		(2,694)	8,673	5,979
		<u>(11,000)</u>	<u>(5,628)</u>	<u>18,118</u>	<u>1,490</u>

The project has a positive NPV and would appear to be worthwhile.

Note. The NPV calculation is presented in this format to help the sensitivity calculation.

(b) **Sensitivity of each project variable.**

(i) **Initial investment**

$$\text{Sensitivity} = \frac{1,490}{11,000} \times 100\% = 13.5\%$$

(ii) **Sales volume**

$$\text{Sensitivity} = \frac{1,490}{18,118 - 5,628} \times 100\% = 11.9\%$$

(iii) **Selling price**

$$\text{Sensitivity} = \frac{1,490}{18,118} \times 100\% = 8.2\%$$

(iv) **Variable costs**

$$\text{Sensitivity} = \frac{1,490}{5,628} \times 100\% = 26.5\%$$

(v) **Cost of capital.** We need to calculate the IRR of the project. Let us try discount rates of 15% and 20%. (9% produced a very positive NPV so the IRR must be much higher.)

Year	Net cash flow \$'000	Discount factor 15%	PV \$'000	Discount factor 20%	PV \$'000
0	(11,000)	1	(11,000)	1	(11,000)
1	7,100	0.870	6,177	0.833	5,914
2	7,100	0.756	5,368	0.694	4,927
			NPV = <u>815</u>		NPV = <u>(159)</u>

$$\text{IRR} = 15 + \left[\frac{815}{815 + 159} \times (20 - 15) \right] = 19.2\%$$

The cost of capital can therefore increase by 113% before the NPV becomes negative.

The elements to which the NPV appears to be **most sensitive** are the **selling price** followed by the **sales volume**. Management should thus pay particular attention to these factors so that they can be carefully monitored.

(c) The **weaknesses of sensitivity analysis** are:

- (i) The method requires that **changes** in each key variable are **isolated**. However management is more interested in the combination of the effects of changes in two or more key variables.
- (ii) Looking at factors in isolation is unrealistic since they are often **interdependent**.
- (iii) Sensitivity analysis does not examine the **probability** that any particular variation in costs or revenues might occur.
- (iv) **Critical factors** may be those over which managers have no control.
- (v) In itself it does not provide a decision rule. Parameters defining **acceptability** must be laid down by managers.

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Text references. Dealing with risk is covered in Chapter 10.

Top tips. This question has four parts which include both written and numerical elements. Therefore a fair chance to show both skills. In part (a) you must define and distinguish risk and uncertainty. In parts (b) and (d) you need to know the techniques required.

Easy marks. In part (a), a general discussion of risk and uncertainty can get you up to 5 marks.

Examiner's comments. In part (a), many candidates did not draw an adequate distinction between risk (which can be quantified) and uncertainty (which cannot). Many obtained full marks in part (b), but candidates need to note that incremental fixed costs are relevant for any appraisal decision. The answers offered for part (c) were of variable quality, with only a small number of answers correctly evaluating the sensitivity of the project's NPV to changes in the specified variables. In part (d), the majority of candidates calculated the expected sales volume but did not comment on the ENPV. Few noted that the NPV of the worst case was negative, and that there was a 30% chance of this occurring. Some managers might regard a 30% chance of negative returns as an unacceptable risk. As in part (b), many candidates calculated and discounted itemised annual cash flows for each year of the project life, when an annuity factor approach would have saved a considerable amount of time.

Marking scheme

		Marks
(a)	Discussion of risk	2
	Discussion of uncertainty	1
	Value of considering risk and uncertainty	<u>2</u>
		5
(b)	Calculation of payback period	2
	Discussion of payback period	<u>2</u>
		4
(c)	Calculation of net present value	2
	Sensitivity of NPV to sales volume	2
	Sensitivity of NPV to sales price	2
	Sensitivity of NPV to variable cost	1
	Discussion of sensitivity analysis	<u>3</u>
		10
(d)	Calculation of expected value of sales	1
	Calculation of expected net present value	1
	Discussion of expected net present value	<u>4</u>
		6
		<u>25</u>

- (a) The terms **risk** and **uncertainty** are often used interchangeably but a distinction should be made between them. With risk, there are **several possible outcomes**, which upon the basis of past relevant experience, can be **quantified**. In areas of uncertainty, again there are several possible outcomes, but with little past experience, it will be **difficult to quantify** its likely effects.

A risky situation is one where we can say that there is a 70% probability that returns from a project will be in excess of \$100,000 but a 30% probability that returns will be less than \$100,000. If, however, no information can be provided on the returns from the project, we are faced with an uncertain situation. Managers need to exercise caution when assessing future cash flows to ensure that they make appropriate decisions. If a project is too risky, it might need to be rejected, depending upon the prevailing **attitude to risk**.

In general, risky projects are those whose future cash flows, and hence the project returns, are likely to be **variable**. The greater the variability is, the greater the risk. The problem of risk is more acute with capital investment decisions than other decisions because estimates of cash flows might be for several years ahead, such as for major construction projects. Actual costs and revenues may vary well above or below budget as the work progresses.

- (b) Assuming that cash flows occur evenly throughout the year:

$$\text{Contribution per unit} = \$3.00 - \$1.65 = \$1.35$$

$$\text{Total contribution} = 20,000 \text{ units} \times \$1.35 = \$27,000 \text{ per year}$$

$$\text{Annual cash flow} = \$27,000 - \$10,000 = \$17,000$$

$$\text{Payback} = \$50,000 / \$17,000 = 2.9 \text{ years}$$

This **exceeds** the company's **hurdle payback period** of two years. Payback is often used as a first screening method. By this, we mean that the first question to ask is: 'How long will it take to pay back its cost?' Umunat has a **target payback**, and so it might be tempted to reject this project. However, a project should not be evaluated on the basis of payback alone. If a project gets through the payback test, it ought then to be evaluated with a more sophisticated investment appraisal technique, such as NPV. Payback ignores the **timing of cash flows** within the payback period, the cash flows **after the end** of payback period and therefore the total project return. It also ignores the **time value of money** (a concept incorporated into more sophisticated appraisal methods).

(c)

Year	Investment	Contribution	Fixed costs	Net	Discount factor	Total
	\$	\$	\$	\$	12%	\$
0	(50,000)			(50,000)	1.000	(50,000)
1-5		27,000	(10,000)	17,000	3.605	<u>61,285</u>
						<u>11,285</u>

NPV of sales revenue = $20,000 \times \$3.00 \times 3.605 = \$216,300$

NPV of variable costs = $20,000 \times \$1.65 \times 3.605 = \$118,965$

NPV of contribution = $\$97,335$.

(i) **Sensitivity to sales volume**

For an NPV of zero, contribution has to decrease by $\$11,285$. This represents a reduction in sales of $11,285/97,335 = 11.6\%$

(ii) **Sensitivity to sales price**

As before, for an NPV of zero, contribution has to decrease by $\$11,285$. This represents a reduction in selling price of $11,285/216,300 = 5.2\%$

(iii) **Sensitivity to variable cost**

As before, for an NPV of zero, contribution has to decrease by $\$11,285$. This represents an increase in variable costs of $11,285/118,965 = 9.5\%$

The basic approach of sensitivity analysis is to calculate the project's NPV under alternative assumptions to determine how sensitive it is to changing conditions. An indication is thus provided of those variables to which the NPV is most sensitive (critical variables) and the extent to which those variables may change before the investment results in a negative NPV.

Sensitivity analysis therefore provides an indication of why a project might fail. Management should review critical variables to assess whether or not there is a strong possibility of events occurring which will lead to a negative NPV. Management should also pay particular attention to controlling those variables to which the NPV is particularly sensitive, once the decision has been taken to accept the investment.

(d) Expected sales = $(17,500 \times 0.3) + (20,000 \times 0.6) + (22,500 \times 0.1) = 19,500$ units

Expected contribution = $19,500 \text{ units} \times \$1.35 = \$26,325$

Year	Investment	Contribution	Fixed costs	Net	Discount factor	Total
	\$	\$	\$	\$	12%	\$
0	(50,000)			(50,000)	1.000	(50,000)
1-5		26,325	(10,000)	16,325	3.605	<u>58,852</u>
						<u>8,852</u>

The expected net present value is positive, but it represents a value that would never actually be achieved, as it is an amalgamation of various probabilities. Examining each possibility:

Worst case (sales of 17,500 units, 30% probability):

Year	Investment	Contribution	Fixed costs	Net	Discount factor	Total
	\$	\$	\$	\$	12%	\$
0	(50,000)			(50,000)	1.000	(50,000)
1-5		23,625	(10,000)	13,625	3.605	<u>49,118</u>
						<u>(882)</u>

We already know the NPV of sales of 20,000 units to be $\$11,285$

Best case (sales of 22,500, 10% probability):

Year	Investment	Contribution	Fixed costs	Net	Discount factor	Total
	\$	\$	\$	\$	12%	\$
0	(50,000)			(50,000)	1.000	(50,000)
1-5		30,375	(10,000)	20,375	3.605	<u>73,452</u>
						<u>23,452</u>

The managers of Umunat will need to satisfy themselves as to the accuracy of this latest information, but the fact that there is a 30% chance that the project will produce a negative NPV could be considered too high a risk.

It can be argued that assigning probabilities to expected economic states or sales volumes gives the managers information to make better investment decisions. The difficulty with this approach is that probability estimates of project variables can carry a high degree of uncertainty and subjectivity.

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Text references. Investment appraisal is covered in Chapters 8 and 9 and risk in Chapter 10.

Top tips. In part (a), set out your workings clearly to gain the maximum number of marks for your workings. Do as much of the NPV calculation as you possibly can, as marks are awarded for each stage. Make an assumption and carry on if you get stuck on any part. Don't forget to comment on the acceptability of the proposed purchase in both parts (a) and (b).

Part (c) is a straightforward regurgitation of textbook knowledge.

Easy marks. There are plenty of easy marks available throughout this question provided you have done your revision thoroughly.

Examiner's comments. Many candidates gained very high marks in part (a).

A number of candidates lost straightforward marks by failing to comment on the calculated NPV, or by simply saying 'accept' without referring to the NPV decision rule. The reason for accepting an investment project must be clearly explained.

Many candidates gained full marks in part (b). Some candidates lost marks through the incorrect application of linear interpolation in calculating IRR. A number of candidates lost a straightforward mark by not commenting on their calculated IRR.

In part (c), many candidates were not able to explain the difference between risk and uncertainty in investment appraisal. Answers that offered numerical examples of sensitivity analysis or probability analysis gained credit, although candidates should note that sensitivity analysis is not a method of measuring or predicting risk.

Marking scheme

		Marks
(a)	After-tax weighted average cost of capital	2
	Annual contribution	2
	Fixed costs	1
	Taxation	1
	Capital allowance tax benefits	3
	Scrap value	1
	Discount factors	1
	Net present value	1
	Comment	<u>1-2</u>
	Maximum	13

(b)	Net present value calculation	1	
	Internal rate of return calculation	2	
	Comment	<u>1-2</u>	
		Maximum	4
(c)	Risk and uncertainty	2-3	
	Discussion and sensitivity analysis	2-3	
	Discussion and probability analysis	<u>2-3</u>	
		Maximum	<u>8</u>
			<u>25</u>

(a) **Weighted average cost of capital**

$$\begin{aligned}
 \text{WACC} &= \left[\frac{V_e}{V_e + V_d} \right] k_e + \left[\frac{V_d}{V_e + V_d} \right] k_d (1 - T) \\
 &= (0.8 \times 11\%) + (0.2 \times 8.6\% (1 - 30\%)) \\
 &= 8.8\% + 1.2\% \\
 &= 10\%
 \end{aligned}$$

Calculation of NPV

	1	2	3	4	5
	\$'000	\$'000	\$'000	\$'000	\$'000
Contribution (W1)	440	550	660	660	
Fixed costs	<u>(240)</u>	<u>(260)</u>	<u>(280)</u>	<u>(300)</u>	
Net cash flow	200	290	380	360	
Taxation		(60)	(87)	(114)	(108)
CA tax benefits (W2)		60	45	34	92
Scrap value				30	
After-tax cash flow	200	290	338	310	(16)
Discount factor @10%	<u>0.909</u>	<u>0.826</u>	<u>0.751</u>	<u>0.683</u>	<u>0.621</u>
Present values	<u>182</u>	<u>240</u>	<u>254</u>	<u>212</u>	<u>(10)</u>
		\$'000			
PV of benefits		878			
Investment		800			
NPV		78			

Workings

1	Year	1	2	3	4	
	Additional demand (kg)	400,000	500,000	600,000	700,000	
	Output of new machine	400,000	500,000	600,000	600,000	
	Contribution per kg (8 - 5 - 1.9)	1.10	1.10	1.10	1.10	
	Contribution per year	<u>440,000</u>	<u>550,000</u>	<u>660,000</u>	<u>660,000</u>	
2	<i>Capital allowances</i>					
	Year		\$	Year	\$	
	1	800,000 × 0.25 =	200,000	2	200,000 × 0.3 =	60,000
	2	200,000 × 0.75 =	150,000	3	150,000 × 0.3 =	45,000
	3	150,000 × 0.75 =	<u>112,500</u>	4	112,500 × 0.3 =	33,750
			462,500			
	Scrap value		<u>30,000</u>			
			492,500			
	4	By difference	<u>307,500</u>	5	307,500 × 0.3 =	92,250
			<u>800,000</u>			

The acceptability of the proposed purchase

The net present value is **positive** so the proposed purchase is **financially acceptable**. However the machine has a maximum output of only 600,000 kg and additional demand **exceeds this** in the fourth year. The machine is also only viable for four years so more investment will be needed in the relatively short term. It would therefore be advisable to include these additional investment requirements in a **more detailed and longer reaching appraisal**.

It would also be advisable to look in more detail at **other issues** raised by this analysis. For example **constant selling prices and variable costs** have been assumed but it might be more realistic to build in an element of **inflation**. **Fixed costs** and demand may also increase in a **less linear**, controlled manner.

It is important to bring these issues into this project appraisal so that an informed decision can be made and uncertainties dealt with.

(b) Internal rate of return

	1	2	3	4	5
	\$'000	\$'000	\$'000	\$'000	\$'000
After-tax cash flow	200	290	338	310	(16)
Discount factor @15%	0.870	0.756	0.658	0.572	0.497
Present values	<u>174</u>	<u>219</u>	<u>222</u>	<u>177</u>	<u>(8)</u>
		\$			
PV of benefits		784			
Investment		800			
NPV		(16)			

$$\text{IRR} \approx a + \left(\left(\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \right) (b - a) \right) \%$$

$$\text{where } a = 10\%$$

$$b = 15\%$$

$$\text{NPV}_a = 78$$

$$\text{NPV}_b = (16)$$

$$\text{IRR} \approx 10 + \left[\left(\frac{78}{78 + 16} \right) \times (15 - 10) \right]$$

$$\approx 10 + 4.15$$

$$\approx 14.2\%$$

The acceptability of the proposed purchase

The internal rate of return is approximately 14% which is **greater** than the 10% weighted average cost of capital used for investment appraisal by Duo Co. This means that the project is **financially acceptable** using the IRR criteria but the limitations of the NPV method discussed above also apply to IRR.

(c) Risk and uncertainty

Risk can be applied to a situation where there are several possible outcomes and, on the basis of past relevant experience, probabilities can be assigned to the various outcomes that could prevail. The risk of a project increases as the **variability of returns** increases.

Uncertainty can be applied to a situation where there are several possible outcomes but there is little past relevant experience to enable the probability of the possible outcomes to be predicted. Uncertainty increases as the **project life** increases.

Sensitivity analysis

The basic approach of sensitivity analysis is to **calculate the project's net present value (NPV)** under **alternative assumptions** to determine how sensitive it is to changing conditions. An indication is thus

provided of those variables to which the NPV is most sensitive (**critical variables**) and the **extent** to which those variables **may change** before the investment results in a negative NPV.

Sensitivity analysis therefore provides an indication of why a project might fail. Management should review critical variables to assess whether or not there is a strong possibility of events occurring which will lead to a negative NPV. Management should also pay particular attention to controlling those variables to which the NPV is particularly sensitive, once the decision has been taken to accept the investment.

Weaknesses of sensitivity analysis

The method requires that **changes** in each key variable are **isolated**. However management is more interested in the combination of the effects of changes in two or more key variables and looking at factors in isolation is unrealistic since they are often **interdependent**.

Sensitivity analysis does not examine the **probability** that any particular variation in costs or revenues might occur and **critical factors** may be those over which managers have no control.

Probability analysis

A **probability distribution** of 'expected cash flows' can often be estimated, recognising there are several possible outcomes, not just one. An **expected value of NPV** can be calculated and risk measured by calculating the **worst possible outcome** and its probability and/or the probability that the project will **fail to achieve a positive NPV**.

Weaknesses of probability analysis

An investment may be **one-off**, and 'expected' NPV may never actually occur. Also, **assigning probabilities** to events is highly **subjective**. Finally, expected values **do not evaluate the range** of possible NPV outcomes.

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Text references. Investment appraisal is covered in Chapters 8 and 9.

Top tips. Read the detail in the question very carefully so that you deal with each aspect of part (a) correctly. For example, the question specifies straight-line capital allowances, not reducing balance. For working capital, you need to calculate the initial and incremental amounts of investment. Working capital is recovered in the last two years of the investment. Make an assumption and carry on if you get stuck on any part.

Make sure you answer the specific requirements of the discussions in part (c) and (d) and do not just write everything you know about NPV.

Easy marks. Using the standard proforma for the calculations in part (a) will help you to gain easy marks even if you get stuck on the harder aspects. Part (b) should provide an easy three marks if you are sufficiently familiar with this technique.

Examiner's comments. Many answers to part (a) gained high marks and dealt correctly with most of the issues involved with the calculation. The treatment of working capital investment was a source of regular errors, however. Many answers put the investment in working capital at the end, rather than at the start, of each year, and included total investment rather than incremental investment. Another common error was to treat investment in working capital as tax-allowable (and even to call it a fixed cost), when in fact it has no tax effect at all.

Many answers gained high marks in part (b) and produced a result consistent with findings in part (a). Markers noted that some candidates made illogical choices of discount rates in their calculations, choosing to work for example with two negative NPV values, rather with one positive and one negative NPV value. While linear interpolation and linear extrapolation use the same mathematical approach, candidates should note that interpolation is more likely to be accurate than extrapolation in calculating IRR.

It was pleasing to note that very few candidates confused IRR with accounting rate of return (return on capital employed).

Part (c) asked for advice on the acceptability of the investment project and discussion of the limitations of the NPV and IRR evaluations performed. Most answers correctly advised on acceptability in terms that were consistent with their earlier evaluations. Many answers struggled to discuss the limitations of the evaluations in any depth, tending to offer one or two general criticisms of the NPV and IRR appraisal methods. Better answers discussed the limiting assumptions underlying the values selected for the project variables and the reasons why, for example, fixed costs had been omitted.

In part (d), few answers were able to explain why accepting positive NPV projects will increase shareholder wealth. A general discussion of the advantages of the NPV investment appraisal method over other investment appraisal methods was not asked for or required.

Marking scheme

		Marks
(a)	Inflated sales revenue	2
	Inflated variable costs	2
	Capital allowances	2
	Taxation	1
	Working capital	3
	Discount factors	1
	Net present value calculation	<u>1</u>
		12
(b)	Net present value calculation	1
	Internal rate of return calculation	<u>2</u>
		3
(c)	Net present value comment	1
	Internal rate of return comment	1-2
	Discussion of limitations	<u>3-4</u>
	Maximum	5
(d)	Discussion of shareholder wealth maximisation	1-2
	Link to share price maximisation	1-2
	Discussion of NPV investment appraisal method	<u>2-3</u>
	Maximum	<u>5</u>
		<u>25</u>

(a)	Calculation of NPV				
	0	1	2	3	4
	\$	\$	\$	\$	\$
Sales revenue (W1)		728,000	1,146,390	1,687,500	842,400
Variable costs (W2)		<u>441,000</u>	<u>701,190</u>	<u>1,041,750</u>	<u>524,880</u>
Contribution		287,000	445,200	645,750	317,520
Taxation @ 30%		(86,100)	(133,560)	(193,725)	(95,256)
Capital expenditure	(1,000,000)				
Working capital (W3)	(50,960)	(29,287)	(37,878)	59,157	58,968
Tax benefit of tax depreciation (W4)		<u>75,000</u>	<u>75,000</u>	<u>75,000</u>	<u>75,000</u>
Net cash flow	(1,050,960)	246,613	348,762	586,182	356,232
Discount factor @ 12%	1.000	0.893	0.797	0.712	0.636
Present value	<u>(1,050,960)</u>	<u>220,225</u>	<u>277,963</u>	<u>417,362</u>	<u>226,564</u>
NPV		\$91,154			

Workings

1 Sales revenue

Year	1	2	3	4
Selling price (× 1.04)	\$20.80	\$21.63	\$22.50	\$23.40
Sales volume in units	35,000	53,000	75,000	36,000
Sales revenue	<u>\$728,000</u>	<u>\$1,146,390</u>	<u>\$1,687,500</u>	<u>\$842,400</u>

2 Variable costs

Year	1	2	3	4
Variable cost (× 1.05)	\$12.60	\$13.23	\$13.89	\$14.58
Sales volume in units	35,000	53,000	75,000	36,000
Variable cost	<u>\$441,000</u>	<u>\$701,190</u>	<u>\$1,041,75</u>	<u>\$524,880</u>

3 Working capital

Year	0	1	2	3	4
	\$	\$	\$	\$	\$
Sales revenue	728,000	1,146,390	1,687,500	842,400	
Working capital requirement @ 7%	50,960	80,247	118,125	58,968	
Incremental working capital cash flow	(50,960)	(29,287)	(37,878)	59,157	58,968

4 Tax benefit of tax depreciation

Depreciation = \$1,000,000/4 = \$250,000 per year

Tax benefit = 30% × \$250,000 = \$75,000

(b) Calculation of internal rate of return

Net cash flow	(1,050,960)	246,613	348,762	586,182	356,232
Discount factor @ 20%	1.000	0.833	0.694	0.579	0.482
Present value	<u>(1,050,960)</u>	<u>205,429</u>	<u>242,041</u>	<u>339,399</u>	<u>171,704</u>
NPV		(92,387)			

$$\text{IRR} \approx a + \left(\left(\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \right) (b - a) \right) \%$$

$$\text{IRR} \approx 12 + \left[\frac{91,154}{91,154 + 92,387} \times (20 - 12) \right] \% = 16\%$$

(c) Acceptability of the proposed investment in product P

The **NPV is positive** so the proposed investment can be recommended on financial grounds.

The **IRR is greater** than the **discount rate** of 12% used by SC Co for investment appraisal purposes so the proposed investment is again financially acceptable. The investment has **conventional cashflows** (an initial cash outflow followed by a series of inflows) and will therefore only have **one** IRR.

Limitations of the evaluations

Forecast sales volumes have been used for both investment appraisal methods and the accuracy of the results is therefore heavily dependant on the accuracy of these forecasts. Product P has a **short product life-cycle** which makes forecast sales volumes particularly unpredictable.

It would be useful to carry out **'what if'** and **sensitivity analysis** to give a more informed picture of what would happen if sales volumes were better or worse than predicted.

The analysis has used **predicted inflation rates** for sales price and variable costs which do not change over the four year period. This is unlikely in reality as price increases will vary according to **prevailing economic conditions** and **unexpected events**. Again, sensitivity analysis would help to assess the effects on the viability of the product if inflation was higher than expected.

Fixed costs have not been included in the investment appraisal. This is because SC has **spare capacity** in both space and labour terms so it is assumed that fixed costs will not change as a result of the investment. This assumption may be questionable in the longer term, especially as production of product P in Year 3 will be **double** that in Year 1.

(d) **The objective of maximising shareholder wealth**

The maximisation of shareholder wealth is usually assumed to be the **primary objective** of private sector companies.

Shareholder wealth comes from **dividends** and **capital gain** from the increase in the share price. The price of a company's shares will go up when the company makes attractive profits. However, these profits should be achieved without taking **business** and **financial risks** which worry shareholders.

The link to NPV

If a company undertakes an investment project with a positive NPV, the **market value** of the company should **increase by the amount of the NPV**. In theory, therefore, shareholder wealth is maximised if the company invests in all available projects with a positive NPV.

The **cost of capital** used in NPV calculations to discount cash flows represents the **rate of return** that investors expect to be paid for putting funds into the company. It is therefore the **minimum return** that a company should make from its own investments to earn the cash flows out of which investors can be paid their return.

However, the sometimes **long-term** nature of NPV may conflict with judgements on a business that are concerned with its (short-term) profits. **Managers' remuneration** may depend upon the level of annual profits, and they may thus be unwilling to risk large initial expenditure on a project that only offers good returns in the significantly uncertain long-term.

There may also be factors that help maximise wealth, but **cannot be quantified for NPV** purposes, for example investment in a loss-making project for strategic reasons such as obtaining an initial share in an important market.

26 Rupab Co

Text references. WACC is covered in Chapter 15, investment appraisal in Chapter 8 and CAPM in Chapter 15.

Top tips. This question should not cause too many problems provided you have practised the necessary techniques. Don't forget to use a proforma for the NPV and clearly show your workings. In part (c) you need to describe the technique rather than actually do the calculations so just imagine that you are calculating a project specific cost of capital and simply write an explanation of how to do it.

Easy marks. There are plenty of easy marks available in the straightforward calculations.

Examiner's comments. In part (a) there were a number of areas where marks were lost. Some candidates mistook the equity risk premium for the return on the market. Another error was to calculate the cost of debt by linear interpolation when, since the market value and the par value of the bond were the same, the cost of debt was equal to the bond interest rate. Some answers were unable to calculate the market values of equity and debt.

In part (b) many candidates were not able to deal correctly with initial investment, incremental investment and recovery of working capital. The initial investment was frequently mistimed, being placed in year one rather than at the start of the investment. The recovery of working capital was often omitted. Working capital was sometimes invested every year at its initial amount, or the inflated total investment in working capital was invested in full every year. Better candidates included in their cash flow forecast only the incremental annual investment.

Although the question specified straight-line capital allowances or tax-allowable depreciation, some candidates used the 25% reducing balance method. Credit cannot be given where the requirements of the question are ignored. Common errors with the treatment of tax included ignoring the fact that tax liabilities were one year in arrears: treating working capital investment as a tax-allowable deduction (it is not); giving tax benefits on the initial investment in addition to the benefit received through capital allowances; including capital allowances as a cash flow; and treating capital allowance tax benefits as a cost rather than a benefit.

Although the weighted average cost of capital from part (a) was already in nominal terms, some candidates treated as a real discount rate and used the Fisher equation to calculate a nominal discount rate. A clear understanding of the distinction between real and nominal terms approaches is required in investment appraisal.

In part (c), although many candidates were able to identify and discuss some limitation of the CAPM, these discussions often were very general in nature, rather than focussing on using the CAPM in investment appraisal. This reflected the inability of a number of candidates to explain correctly how the CAPM could be used to calculate a project specific discount rate. Better answers referred to proxy companies, un gearing equity betas to give proxy asset betas, averaging asset betas, re gearing, and calculating a project-specific discount rate using the CAPM formula.

Some discussion of business risk and financial risk was also relevant here. Weaker answers often did little more than identify and describe the variables in the CAPM formula, before stating that these variables were subjective and hard to calculate, or that the CAPM was better than the dividend growth model, which was not relevant to the question asked. Some answers were very brief for the number of marks available.

Marking scheme

		Marks
(a)	Cost of equity	2
	Cost of debt	1
	Market value of equity	1
	Market value of debt	1
	WACC calculation	1
		6
(b)	Inflated cash flows	1
	Tax on cash flows	1
	Capital allowance tax benefits	1
	Working capital – initial investment	1
	Working capital – incremental investment	1
	Working capital – recovery	1
	NPV calculation	1
	Comment	1
		8
(c)	Explanation of use of CAPM	5-6
	Discussion of limitations	6-7
		11
		25

(a) Weighted average cost of capital

$$\begin{aligned} \text{Cost of equity} &= R_f + \beta_i (E(r_m) - R_f) \\ &= 4.5 + (1.2 \times 5) = 10.5\% \end{aligned}$$

The company's bonds are trading at par and therefore the before-tax cost of debt is the same as the interest rate on the bonds, which is 7%.

$$\text{After-tax cost of debt} = 7 \times (1 - 0.25) = 5.25\%$$

$$\text{Market value of equity} = 5\text{m} \times \$3.81 = \$19.05 \text{ million}$$

Market value of debt is equal to its par value of \$2 million

$$\text{WACC} = \left[\frac{V_e}{V_e + V_d} \right] k_e + \left[\frac{V_d}{V_e + V_d} \right] k_d (1 - T)$$

$$\left[\left(\frac{19.05}{19.05 + 2} \right) \times 10.5\% \right] + \left[\left(\frac{2}{19.05 + 2} \right) \times 5.25\% \right]$$

$$= 9.5\% + 0.5\%$$

$$= 10\%$$

(b) **Net present value calculation**

Year	0	1	2	3	4	5	6
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Cash inflows (W1)		700.4	721.4	743.0	765.3	788.3	
Tax on cash inflows @ 25%			(175.1)	(180.4)	(185.8)	(191.3)	(197.1)
		700.4	546.3	562.6	579.5	597.0	(197.1)
Tax benefit of capital allowances (W2)			125.0	125.0	125.0	125.0	125.0
After-tax cash flows		700.4	671.3	687.6	704.5	722.0	(72.1)
Initial investment	(2,500.0)						
Working capital (W3)	(240.0)	(7.2)	(7.4)	(7.6)	(7.9)	270.1	
Net cash flows	(2,740.0)	693.2	663.9	680.0	696.6	992.1	(72.1)
Discount factor @ 10%	1.000	0.909	0.826	0.751	0.683	0.621	0.564
Present values	(2,740.0)	630.1	548.4	510.7	475.8	616.1	(40.7)
NPV		0.4					

Workings

1 *Inflated cash flows*

$$\text{Year 1} = 680 \times 1.03 = 700.4$$

$$\text{Year 2} = 700.4 \times 1.03 = 721.4$$

2 *Capital allowance tax benefits*

$$\text{Annual capital allowance (straight-line basis)} = \$2.5\text{m}/5 = \$500,000$$

$$\text{Annual tax benefit} = \$500,000 \times 0.25 = \$125,000 \text{ per year}$$

3 *Working capital*

Year	0	1	2	3	4	5	6
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Working capital ($\times 1.03$)	240.0	247.2	254.6	262.2	270.1		
Incremental investment		(7.2)	(7.4)	(7.6)	(7.9)	270.1	

Comment

The net present value is positive and the investment is therefore **financially acceptable**. It is however only **marginally** positive and any change in the assumptions underlying the forecast data could easily turn the NPV into a negative value. For example, net cash flows are assumed to be constant in real terms and this is unlikely in reality.

(c) **A project specific discount rate**

If a company plans to invest in a project which involves **diversification into a new business**, the investment will involve a different level of **systematic risk** from that applying to the company's existing business. A discount rate should be calculated which is **specific** to the project, and which takes account of both the project's systematic risk and the company's gearing level. The discount rate can be found using the **capital asset pricing model (CAPM)**.

The first step is to get an estimate of the systematic risk characteristics of the project's operating cash flows by obtaining **published beta values** for companies in the industry into which the company is planning to diversify.

The next step is to **adjust these beta values** to allow for the company's capital **gearing** level. This adjustment is done in two stages.

- (i) Convert the beta values of other companies in the industry to **ungeared betas**, using the formula:

$$\beta_a = \beta_e \left(\frac{V_e}{V_e + V_d(1 - T)} \right)$$

- (ii) Having obtained an ungeared beta value β_a , **convert it back** to a **geared beta** β_e , which reflects the company's own gearing ratio, using the formula:

$$\beta_e = \beta_a \left(\frac{V_e + V_d(1 - T)}{V_e} \right)$$

Having estimated a project-specific geared beta, the CAPM is used to estimate a project-specific cost of equity and a project-specific cost of capital, based on a weighting of this cost of equity and the cost of the company's debt capital.

Limitations of the CAPM

The practical limitation is **finding the required information**. It is difficult to identify other firms with **identical operating characteristics** and estimates of beta values from share price information are not wholly accurate. They are based on **statistical analysis of historical data**, and estimates using one firm's data will differ from estimates using another firm's data. If the firm for which an equity beta is being estimated has **opportunities for growth**, estimates of the equity beta based on other firms' data may be inaccurate.

It is **hard to estimate** returns on projects under different economic environments, market returns under different economic environments and the probabilities of the various environments. It may also be hard to determine the **risk-free rate of return**.

The **theoretical assumptions** underlying CAPM can also be criticised. It assumes a **perfect capital market** and that all investors have **diversified portfolios**. In reality, markets are at most only semi-strong efficient and investors are not always rational.

27 PV Co

Text reference. Investment appraisal is covered in Chapters 7, 8 and 9.

Top tips. Plan your answer to part (a) and use headings to give it a clear structure. In part (b), the NPV is positive at 10% so it is best to then use a second higher discount rate when calculating the IRR. This will give a more accurate result than using, say, 5%. Remember that you must use profit, not cash flow in a ROCE calculation, so you need to subtract total depreciation from the total net cash flow.

Easy marks. The calculations in part (b) should be straightforward provided you have practised using the techniques.

Examiner's comments. In part (a), better answers identified and discussed identification screening, analysis and evaluation, approving, implementation and monitoring. Poorer answers looked at different aspects of the analysis and evaluation stage, or went off track by discussing the relative merits of the investment appraisal methods required in part (b).

In part (b) some candidates introduced capital allowances and taxation into their answers, but this was not required by the question. There is no point doing unnecessary calculations in the exam, as marks will be lost elsewhere due to time pressure. Most candidates calculated correctly the NPV, although some answers did not handle inflation correctly, or omitted the fixed costs, or calculated and used (unnecessarily) a real discount rate. Most candidates were not able to correctly calculate the ROCE. The most common error was using average annual net cash flow, rather than average annual accounting profit. Many candidates were able to calculate discounted payback, although some used an unnecessary amount of rounding eg giving 3 years rather than 2.9 years.

In part (c) many candidates failed to recognise the superiority of the NPV method. Better answers gave reasons why ROCE cannot be relied upon.

ACCA examiner's answer. The examiner's answer to this question is included at the back of this kit.

Marking scheme

		Marks
(a)	Identification of decision-making stages	1-2
	Explanation of decision-making stages	4-6
	Role of investment appraisal	<u>1-2</u>
		Maximum 7
(b)	Inflated income	2
	Inflated operating costs	2
	Discount factors	1
	Net present value	1
	Internal rate of return	3
	Return on capital employed	2
	Discounted payback	<u>2</u>
		13
(c)	Discussion of investment appraisal findings	4
	Advice on acceptability of project	<u>1</u>
		<u>5</u>
		<u>25</u>

(a) Key stages in the capital investment decision-making process

A typical **model for investment decision making** has a number of distinct stages. Origination of proposals, project screening, analysis and acceptance, monitoring and review.

Origination of proposals

Investment proposals may come from an analysis of strategic choices, analysis of the business environment, research and development or legal requirements.

The overriding feature of any proposal is that it should be **consistent** with the organisation's **overall strategy** to achieve its **objectives**. Some alternatives will be rejected early on. Others will be more thoroughly evaluated.

Project screening

Each proposal must be subject to detailed screening. To enable a **qualitative evaluation** of a proposal to be made, a number of key questions might be asked before any financial analysis is undertaken. For example, what is the purpose of the project, does it 'fit' with the organisation's long-term objectives, does the project expose the organisation to unnecessary risk, how long will the project last and what factors are key to its success.

Only if the project passes this initial screening will more detailed financial analysis begin.

Analysis and acceptance

Investment proposals then need to be analysed in depth to determine which offer the most attractive opportunities. This analysis will include a **financial analysis** of the project, a comparison of the outcome of the financial analysis to predetermined acceptance criteria and a consideration of the project in the light of the capital budget for the current and future operating periods.

The most suitable proposals are then passed to a senior authority for consideration and **approval**. Go/no go decisions on projects may be made at different levels within the **organisational hierarchy**, depending on the type of investment, its perceived riskiness and the amount of expenditure required.

Monitoring and review

During the project's progress, **project controls** should be applied to ensure that capital spending does not exceed the amount authorised, the implementation of the project is not delayed and the anticipated benefits are eventually obtained.

(b) (i) Calculation of NPV

Year	0	1	2	3	4
	\$	\$	\$	\$	\$
Investment	(2,000,000)				
Income (W1)		1,236,000	1,485,400	2,622,000	1,012,950
Operating costs (W2)		(676,000)	(789,372)	(1,271,227)	(620,076)
Net cash flows	(2,000,000)	560,000	696,028	1,350,773	392,874
Discount factor 10%	1.000	0.909	0.826	0.751	0.683
Present value	(2,000,000)	509,040	574,919	1,014,430	268,333
NPV		366,722			

Workings

(1) Calculation of income

Year	1	2	3	4
Inflated selling price (\$/unit)	20.60	21.22	21.85	22.51
Demand (units/year)	60,000	70,000	120,000	45,000
Income (\$/year)	1,236,000	1,485,400	2,622,000	1,012,950

(2) Calculation of operating costs

Year	1	2	3	4
Inflated variable cost (\$/unit)	8.32	8.65	9.00	9.36
Demand (units/year)	60,000	70,000	120,000	45,000
Variable costs (\$/year)	499,200	605,500	1,080,000	421,200
Inflated fixed costs (\$/year)	176,800	183,872	191,227	198,876
Operating costs (\$/year)	676,000	789,372	1,271,227	620,076

(ii) Calculation of IRR

Year	0	1	2	3	4
	\$	\$	\$	\$	\$
Net cash flow	(2,000,000)	560,000	696,028	1,350,773	392,874
Discount factor 20%	1.000	0.833	0.694	0.579	0.482
Present values	(2,000,000)	466,480	483,043	782,098	189,365
NPV		(79,014)			

$$IRR = a + \left(\left(\frac{NPV_a}{NPV_a - NPV_b} \right) (b - a) \right) \%$$

$$IRR = 10 + \left[\frac{366,722}{366,722 + 79,014} \times (20 - 10) \right] \% = 18.2\%$$

(iii) Calculation of ROCE

$$\begin{aligned} \text{Total cash inflow} &= 560,000 + 696,028 + 1,350,773 + 392,874 \\ &= \$2,999,675 \end{aligned}$$

Total depreciation = initial investment as there is no scrap value

$$\begin{aligned} \text{Total accounting profit} &= 2,999,675 - 2,000,000 \\ &= \$999,675 \end{aligned}$$

$$\begin{aligned} \text{Average annual accounting profit} &= 999,675/4 \\ &= \$249,919 \end{aligned}$$

$$\begin{aligned}\text{Average investment} &= 2,000,000/2 \\ &= \$1,000,000\end{aligned}$$

$$\begin{aligned}\text{ROCE} &= 249,919/1,000,000 \times 100 \\ &= 25\%\end{aligned}$$

(iv) **Calculation of discounted payback**

Year	0	1	2	3
	\$	\$	\$	\$
Present value of cash flows	(2,000,000)	509,040	574,919	1,014,430
Cumulative PV	(2,000,000)	(1,490,960)	(916,041)	98,389

$$\begin{aligned}\text{Discounted payback period} &= 2 + (916,041/1,014,430) \\ &= 2.9 \text{ years}\end{aligned}$$

(c) **NPV**

The investment proposal has a positive NPV of \$366,722 and is therefore **financially acceptable**. The NPV decision rule will always give the **correct investment advice** on financial grounds.

IRR

The result of the IRR calculation also indicates that the investment proposal is acceptable as the calculated IRR of 18.2% is **higher** than the 10% **return required** by PV Co. If the IRR result had been less than 10%, the NPV result would still have been preferred.

ROCE

The calculated ROCE of 25% is **less** than the target return of 30% but this is not a reliable method compared to NPV. The hurdle rate appears to be too high and may be **out of date**.

Discounted payback

There is no target given for a payback period but payback is expected to be well into the lifecycle of the project. The project's lifecycle is quite **short** at 4 years and it would therefore be useful to conduct a **sensitivity analysis** of demand to ensure the risk is acceptable.

Conclusion

The NPV and IRR both indicate that the project is financially acceptable, and subject to further analysis of the risks of the project, it should go ahead.

28 AGD Co

Text references. Leasing is covered in Chapter 11.

Top tips. This question is in three parts. Nearly 50% of the marks are available for a purchase or lease investment appraisal and a further eight marks for a discussion of operating and finance leases.

The remainder of the marks, five in total, can be earned for a tail end two-part question requiring you to calculate APRs and repayments of loans.

All three parts could be answered separately.

Easy marks. The question is split into two smaller calculation elements in part (c) that will gain you easy marks if you know how to calculate APRs and repayments. The written part allows you to list what you know of both types of lease but you need to note the differences as required in the question. Look at using pro forma workings for the investment appraisal in part (a).

Examiner's comments. While many candidates made errors in this popular question, answers were usually of a satisfactory overall standard. Common errors included timing the investment when borrowing to buy as occurring at the end of the first year, omitting the tax savings on the maintenance costs incurred by buying the asset, and omitting the tax savings on the lease rental payments.

The overall standard of answers to part (b) was not strong and many candidates used a 'double-list' approach that supports contrast rather than discussion. A degree of confusion between finance leasing and lease-purchase was in evidence, but this was dealt with sympathetically.

Many candidates either did not answer part (c) or gave answers that were incorrect. The overall standard of answers was very poor.

Marking scheme

		Marks
(a)	Purchase price	1
	Sale proceeds	1
	Capital allowances	1
	Balancing allowance	1
	Capital allowance tax benefits	1
	Maintenance costs	1
	Maintenance cost tax benefits	1
	NPV of borrowing to buy	1
	Lease rentals	1
	Lease rental tax benefits	1
	NPV of leasing	1
	Selection of cheapest option	1
		<u>12</u>
(b)	Explanation and discussion	
	Finance lease	4-5
	Operating lease	4-5
	Maximum	8
(c)	Annual percentage rate	2
	Amount of equal instalments	3
		<u>5</u>
		<u><u>25</u></u>

(a) (i) Net present value of purchasing machine

	Year 0	Year 1	Year 2	Year 3	Year 4
	\$'000	\$'000	\$'000	\$'000	\$'000
<i>Cash outflows</i>					
Capital costs	(320)				
Annual maintenance costs	<u>(320)</u>	<u>(25)</u>	<u>(25)</u>	<u>(25)</u>	<u>0</u>
<i>Cash inflows</i>					
Disposal proceeds				50	
Taxation (at 30% in following year)			8	8	8
Writing down allowances (W)			<u>24</u>	<u>18</u>	<u>39</u>
			<u>32</u>	<u>76</u>	<u>47</u>
Net cash flows	<u>(320)</u>	<u>(25)</u>	<u>7</u>	<u>51</u>	<u>47</u>
Discount at 7%	<u>1.000</u>	<u>0.935</u>	<u>0.873</u>	<u>0.816</u>	<u>0.763</u>
PV of cash flow	<u>(320)</u>	<u>(23)</u>	<u>6</u>	<u>42</u>	<u>36</u>
NPV of cash flow	\$259,000				

Working

Writing down allowances

	\$'000	Capital allowance \$'000	Tax benefit \$'000	Year of cash flow
Initial investment	320			
Allowances at 25% pa on a reducing balance basis over 3 years				
Year 1	(80)	(80)	24	Y2
	240			
Year 2	(60)	(60)	18	Y3
	180			
Year 3				
Proceeds on sale	(50)			
Balancing allowance	130		39	Y4

(ii) **Net present value of leasing machine**

	Year 0 \$'000	Year 1 \$'000	Year 2 \$'000	Year 3 \$'000	Year 4 \$'000
<i>Cash outflows</i>					
Annual lease rentals	(120)	(120)	(120)		
	(120)	(120)	(120)		
<i>Cash inflows</i>					
Taxation (at 30% in following year) – tax deduction for lease rentals			36	36	36
Net cash flows	(120)	(120)	(84)	36	36
Discount at 7%	1.000	0.935	0.873	0.816	0.763
PV of cash flow	(120)	(112)	(73)	29	27
NPV of cash flow	\$249,000				

Therefore the machine should be **leased** rather than purchased.

(b) **Key differences between operating and finance leases**

Finance lease

A finance lease is an agreement between the user of the leased asset and a provider of finance that covers the majority of the asset's useful life.

Key features of a finance lease

- (i) The provider of finance is usually a **third party finance house** and not the original provider of the equipment.
- (ii) The **lessee is responsible for the upkeep**, servicing and maintenance of the asset.
- (iii) The lease has a **primary period**, which covers all or most of the useful economic life of the asset. At the end of the primary period the lessor would not be able to lease the equipment to someone else because it would be worn out.
- (iv) It is common at the end of the primary period to allow the lessee to continue to lease the asset for an indefinite **secondary period**, in return for a very low nominal rent, sometimes known as a 'peppercorn' rent.
- (v) The lessee bears most of the risks and rewards and so the asset is shown on the lessee's balance sheet.

Operating leases are rental agreements between a lessor and a lessee

Key features of an operating lease

- (i) The lessor supplies the equipment to the lessee.
 - (ii) The **lessor is responsible for the upkeep**, servicing and maintenance of the asset.
 - (iii) The lease period is fairly short, less than the expected economic life of the asset. At the end of one lease agreement the lessor can either lease the same equipment to someone else and obtain a rent for it or sell it second-hand.
 - (iv) The asset is not shown on the lessee's balance sheet.
- (c) (i) **Annual percentage rate (APR)** on a 10% loan by the bank with two six-monthly interest payments. As interest is due every six months, this is equivalent to 5% every six months. As this would be compounded, therefore the APR would be $(1.05 \times 1.05 - 1) = 0.1025$ or 10.25%
- (ii) The term of the loan is \$320,000 at 10% pa over 5 years with six-monthly payments of interest. In (i) above, we established that the rate was 5% every six months. There are 10 equal payments due. Treating this as an annuity at 5% over 10 periods gives a discount rate of 7.722. Therefore dividing \$320,000/7.722 gives **\$41,440** as each equal payment due.

29 Leaming Co

Text references. Leasing and capital rationing are covered in Chapter 11.

Top tips. Make sure you take into account all the detail given in the question; it's easy to miss or misinterpret the timing of flows or the maintenance costs. Note that annuity factors can be used to save time in (a) (ii) and (iii), whereas in (a) (i) a more complicated calculation is required. Most points in the NPV calculation were worth 1 mark, although 3 marks were available for the capital allowances.

The key point in (b) is that capital rationing affects the purchase and operating lease options, but does not affect the finance lease option since the first payments do not take place until capital rationing has ended.

Examiner's comment. There were a number of errors in (a) that many candidates made including: omitting maintenance costs and their tax benefits from the purchase and finance lease calculations; including the writing down allowance rather than the tax benefit of the writing down allowance in the purchase calculation; including the tax benefits of writing down allowances in the lease calculations (they were only available on ownership); only considering one year of the operating lease.

In (b) few candidates recognised the opportunity cost element in the purchase and operating lease options. Candidates gained marks for using a profitability index approach. Many answers in (c) just consisted of a discussion of hard and soft capital rationing. Few candidates considered the short-term cash flows, the cost of capital, the possibility of failure to renew the operating lease, other alternatives to immediate purchasing and other sources of finance.

(a) (i) Purchase	20X2	20X3	20X4	20X5	20X6	20X7
	\$	\$	\$	\$	\$	\$
Purchase price	(360,000)					
Rental		(15,000)	(15,000)	(15,000)	(15,000)	
Tax on rental			4,500	4,500	4,500	4,500
Tax allowable depreciation (W)		27,000	20,250	15,188	11,391	28,172
Disposal proceeds					20,000	
Net cash flow	(360,000)	12,000	9,750	4,688	20,891	32,672
Discount factor	1.000	0.909	0.826	0.751	0.683	0.621
Present value	(360,000)	10,908	8,054	3,521	14,269	20,289
Net present value =	\$(302,959)					

Working

Tax allowable depreciation

<i>Year of claim</i>	<i>Depreciation</i> \$	<i>Tax saved</i> \$	<i>Year of tax payment/saving</i>
20X2	90,000	27,000	20X3
20X3	67,500	20,250	20X4
20X4	50,625	15,188	20X5
20X5	37,969	11,391	20X6
20X6	93,906	28,172	20X7

Depreciation

20X2	$360,000 \times 25\% = 90,000$
20X3-5	75% of previous year
20X6	Balancing allowance = Purchase price – Depreciation – Sale proceeds = $360,000 - 90,000 - 67,500 - 50,625 - 37,969 - 20,000$ = 93,906

(ii) **Finance lease**

<i>Year</i>		<i>Cash flow</i> \$	<i>Discount factor</i> 10%	<i>Present value</i> \$
20X3-6	Rental and maintenance (135,000 + 15,000)	(150,000)	3.170	(475,500)
20X4-7	Tax on payments	45,000	2.882*	129,690
	Present value			<u>(345,810)</u>

$$\begin{aligned}
 20X4-7 \text{ factor} &= \text{Year 1-5 Factor} - \text{Year 1 Factor} \\
 &= 3.791 - 0.909 \\
 &= 2.882
 \end{aligned}$$

(iii) **Operating lease**

<i>Year</i>		<i>Cash flow</i> \$	<i>Discount factor</i> 10%	<i>Present value</i> \$
20X2-5	Rental	(140,000)	3.487	(488,180)
20X3-6	Tax on rental	42,000	3.170	133,140
	Present value			<u>(355,040)</u>

Based on these calculations, **purchase** would appear to be the best option.

- (b) Every \$ of year 0 expenditure will involve a loss of profit of $100,000/500,000 = 20c$

Purchase

	\$
Present value	(302,959)
Profits foregone ($360,000 \times 0.20$)	<u>(72,000)</u>
Revised present value	<u>(374,959)</u>

Finance lease

\$345,810 as before.

Operating lease

	\$
Present value	(355,040)
Profits foregone ($140,000 \times 0.20$)	<u>(28,000)</u>
Revised present value	<u>(383,040)</u>

If capital rationing applies, the finance lease is the best option.

(c)

REPORT

To: Directors
From: Business Adviser
Date: 14 November 20X2
Subject: Acquisition of turbine

This report covers the issues influencing the decision to acquire the turbine.

Effect of capital rationing

Without capital rationing, the most economic decision would be to purchase the turbine; with capital rationing taking out a finance lease would appear to be the best decision.

Continued capital rationing

However this analysis assumes capital rationing only lasts for a single period. Existence of capital rationing in future periods will mean a greater loss of profits if we have used lease finance (because rentals have to be paid), than if the machine is purchased outright (where the only costs after initial purchase are maintenance costs).

Postponement of purchase decision

The implications of taking out an operating lease until the period of capital rationing has ended and then purchasing a new turbine need to be investigated. Maybe a turbine purchased in a couple of years' time will incorporate technological advances and thus be able to be used beyond 20X6.

Cash flow patterns

Cash flow patterns may be a significant factor in the financing decision. The purchase option requires a significant upfront cash payment. The rental cash flows are evenly spread over the next few years.

Cost of capital

Connected to the last point, the current cost of capital may not be appropriate for assessing the decision, if new sources of finance are needed, particularly to provide short-term funds if acquisition results in a cash shortage. The financial risk of the company may change as a result.

Renewal of operating lease

We need to assess the possibility that the operating lease will not be renewed by the lessor or the rentals raised significantly. However using an operating lease does give us the flexibility to cancel the arrangement if business conditions change.

Problems with the turbine

If the turbine breaks down, the lessor will have to deal with the problems if Leaminger has taken out an operating lease, but the company will have to solve the problems and incur costs if it uses a finance lease or purchases the machine outright. If the warranty has expired when the problems arise, Leaminger could incur significant extra costs.

30 Preparation question: Bread Products Co

Text references. Asset replacement decisions are covered in Chapter 11.

Top tips. In part (a), we have shown you two methods, you should choose whichever method you find easiest. The large number of marks available in (b) indicated that the points you raised needed to be discussed in a degree of depth; one-line answers would not have been enough.

- (a) In order to compare the replacement policies, we must calculate the costs of each approach over a number of complete cycles. The timescale to be used will be the lowest common multiple of the lifecycles, ie $2 \times 3 = 6$ years.

All costs and revenues will be inflated into nominal terms, and then discounted at the nominal rate of 15%.

The first stage is to calculate the nominal costs and revenues over the six year period, and then to apply 15% discount factors to find the NPV cost of each policy.

Replace every two years (Revenues shown as credits)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Oven purchase (+ 5% pa)	24,500		27,011		29,780		
Maintenance (+ 10% pa)		550	968	666	1,171	805	1,417
Resale proceeds (+ 5% pa)			(17,199)		(18,962)		(20,905)
Total cash flow	24,500	550	10,780	666	11,989	805	(19,488)
15% discount factors	1.000	0.870	0.756	0.658	0.572	0.497	0.432
PV cash flow	24,500	479	8,150	438	6,858	400	(8,419)
Total PV cost over 6 years	<u>32,406</u>						

Replace every three years (Revenues shown as credits)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Oven purchase (+ 5% pa)	24,500			28,362			
Maintenance (+ 10% pa)		550	968	1,997	732	1,288	2,657
Resale proceeds (+ 5% pa)				(12,965)			(15,009)
Total cash flow	24,500	550	968	17,394	732	1,288	(12,352)
15% discount factors	1.000	0.870	0.756	0.658	0.572	0.497	0.432
PV cash flow	24,500	479	732	11,445	419	640	(5,336)
Total PV cost over 6 years	<u>32,879</u>						

A two year replacement cycle is to be preferred since this costs the least in present value terms.

Alternative method

<i>Replace every two years</i>				
	Year 0	Year 1	Year 2	
Oven purchase	(24,500)			
Maintenance (+10% pa)		(500)	(968)	
Resale proceeds (+5% pa)			17,199	
Net	(24,500)	(550)	16,231	
Discount factor @ 15%	1.000	0.870	0.756	
PV	(24,500)	(479)	12,271	
NPV	(12,708)			
2 year annuity factor	1,626			
Equivalent annual cost	<u>(7,815)</u>			
<i>Replace every three years</i>				
	Year 0	Year 1	Year 2	Year 3
Oven purchase	(24,500)			
Maintenance (+10% pa)		(550)	(968)	(1,997)
Resale proceeds (+5% pa)				12,965
Net	(24,500)	550	(968)	10,968
Discount factor @ 15%	1.000	0.870	0.756	0.658
PV	(24,500)	(479)	(732)	7,217
NPV	(18,493)			
3 year annuity factor	(2.284)			
Equivalent annual cost	<u>(8,097)</u>			

(b) Limitations of net present value techniques

(i) Shareholder wealth maximisation

NPV is based on the **assumption that the primary aim of the organisation is to maximise the wealth of the ordinary shareholders**. This is valid for many companies, but in some investment decisions there may be other overriding factors that make the NPV approach less relevant. This is

particularly true when the investment under consideration is fundamental to the strategic direction of the business.

(ii) **Public sector problems**

The technique is **difficult to apply in the public sector**, partly due to methods of accounting, and partly because other organisational aims will be more important than the maximisation of profit. Public sector operations are commonly judged in terms of economy, efficiency and effectiveness, and the NPV approach can only provide a partial answer to these issues.

(iii) **Discount rate**

A major problem in the use of NPV in practice is the **choice of the discount rate**. It is generally accepted that the rate to be used should be the cost of capital, but this in itself may be difficult to determine. The problem is particularly tricky when the size of the investment means that the company will need to acquire a significant amount of additional capital, and there is uncertainty about the cost of new funds.

(iv) **Risk**

A related problem to the choice of the discount rate is the **incorporation of risk**. The simplest approach is to apply a risk premium to the cost of capital, but the amount of this is subjective. Other approaches include the use of sensitivity analysis and probability analysis, but these too have limitations, and involve the use of subjective judgements.

(v) **Subjectivity**

It follows from (iv) that NPV techniques may appear to be very scientific and rational whereas in fact there is a large component of subjectivity in the assumptions and forecasts used. However, this **subjectivity is masked** by the precise format in which results are communicated.

(vi) **Cash flow timing**

The technique **assumes that all cash flows arise at the end of the time period** (which is usually one year). This is obviously untrue, and large fluctuations in this pattern may distort the results. Breaking the analysis down into small periods leads to complication, and may be unsatisfactory due to the problems of forecasting in such a precise way.

(vii) **Long-term measure**

Although the NPV approach may lead to the correct financial decision in the long-term, this **timescale may be too long** to be appropriate for the business to use in practice. For example, it could lead to an unacceptable reduction in short-term accounting profits which will impact upon the share price and on confidence in the company. Similarly, it may conflict with incentive arrangements for managers, which are usually geared to short-term profitability.

(viii) **Non quantifiable costs and benefits**

Some costs and benefits that arise are not quantifiable. There may be important non-financial factors that are relevant to the decision, but which are difficult to quantify. For example, undertaking a new investment may enhance the standing of the company, making it more attractive to customers, investors and potential employees. This could have an important impact on the performance of the company, but cannot be quantified in an NPV analysis.

31 Filtrex Co

Text references. Capital rationing is covered in Chapter 11.

Top tips. (a) is a good summary of why long-term profits don't always lead to positive cash flows. (b) demonstrates why capital rationing may be a matter of choice; certain sources of funds may not be felt desirable and projects have to be properly controlled.

(c)(i) of the question can be approached by means of the Profitability Index (PI); the optimal mix of project can then be found by trial and error. In addition you need to be clear about mutual exclusivity and indivisibility. Mutual exclusivity means that if you choose one project, you cannot choose other projects with which the chosen project is mutually exclusive. Indivisibility means that you cannot carry out part of a project; it is all or nothing.

In (d) it is helpful to consider the situation from the point of view of developing the projects themselves and in terms of alternative sources of funds.

(a) Cash shortages

A period of capital rationing is often associated with more general problems of cash shortage. Possible reasons for this include the following.

- (i) The business has become **loss making** and is unable to cover the depreciation charge. Since one purpose of the depreciation charge is to allow for the cost of the assets used in the profit and loss account, the implication is that there will be insufficient cash with which to replace these assets when necessary.
- (ii) High inflation may mean that even though the business is profitable in historical cost terms, it is still failing to **generate sufficient funds** to replace assets.
- (iii) If the business is growing it may face a **shortage of working capital** with which to finance expansion, and this may result in a period of capital rationing.
- (iv) If the business is **seasonal or cyclical** it may **face times of cash shortage** despite being fundamentally sound. In this situation, there may be a periodic need for capital rationing.
- (v) A **large one-off item of expenditure** such as a property purchase may mean that the company faces a temporary shortage of cash for further investment.

Investment opportunities

A further reason for capital rationing arises in the situation where the company has **more investment opportunities** available than the **funds allocated** to the capital budget permit. This means that projects must be ranked for investment, taking into account both financial and strategic factors.

(b) Hard capital rationing

Hard capital rationing describes the situation when a firm is prevented from undertaking attractive investments for reasons external to the firm.

Soft capital rationing

Soft capital rationing describes the position when management places a limit on the amount of capital investment that may be undertaken: it is due to factors internal to the firm.

Reasons for the deliberate restriction of capital expenditure include the following.

- (i) Management may decide to **limit the funds available** to those which can be generated from retained earnings, for the following reasons.
 - (1) They **do not wish to issue further equity** to prevent outsiders from gaining control of the business.
 - (2) They **do not wish to raise further equity** to avoid earnings dilution.
 - (3) They **do not wish to commit the company** to meeting large fixed interest payments on additional debt capital.
- (ii) A **capital budgeting procedure** may be used to ensure that only the best projects are undertaken.

- (iii) The **number of projects** undertaken may be **restricted** in order to ensure that there are adequate management resources available for them to realise their full potential.

(c) (i) **Profitability index**

When resources are limited, the aim must be to maximise the productivity of the scarce resource, in this case capital. It is therefore helpful to calculate the **Profitability Index (PI)** for each project to determine which delivers the most NPV per dollar of investment.

<i>Project</i>	<i>Outlay</i> \$	<i>NPV</i> \$	<i>PI(NPV/Outlay)</i>
A	150,000	65,000	0.43
B	120,000	50,000	0.42
C	200,000	80,000	0.40
D	80,000	30,000	0.38
E	400,000	120,000	0.30

On this basis, project A is the most attractive since it shows the highest PI, and project E is the least attractive. Since the projects are not divisible and projects A and C are mutually exclusive it is not possible simply to work down the rankings to determine the optimum combination. Instead this must be done algebraically or by trial and error. Various combinations of projects can be evaluated using the latter approach.

	<i>Outlay</i> \$	<i>NPV</i> \$
A, B, D	350,000	145,000
B, C, D	400,000	160,000
E	400,000	120,000

It appears that the **optimum combination** of projects is B, C and D. As well as delivering the highest NPV it also has the **benefit that all the funds available** for investment are used and Filtrex does not face the choice between investments showing a poorer return or returning excess funds to its shareholders.

(ii) **Useful further information**

- (1) The **possibility of raising additional finance** and at what cost.
- (2) If **rationing** is to continue, then the **effect on the NPV of postponing projects becomes relevant**. If all the projects are equally postponable than Filtrex should select those which provide the fastest flow of funds in order to finance those which have been postponed as quickly as possible.
- (3) It has been assumed that all the projects carry a **similar degree of risk**. If this is not the case then Filtrex should allow for this, for example by the use of sensitivity analysis in its evaluations.
- (4) It may be that some of the projects carry a **greater strategic significance** than others. Information on this area should also be taken into account in the investment decision.

(d) **Further opportunity**

Filtrex might consider some of the **following options** as a means of exploiting more of these opportunities.

(i) **Sale of patent rights**

It could accept that it will be **unable to manage** all the **later stages** of development itself and could decide to sell some of the patent rights once they have been obtained.

(ii) **Joint ventures**

It could seek **joint venture partners** to share in the development.

(iii) **Licensing or franchising**

Some of the areas may be appropriate for **licensing or franchising** with a royalty being payable to Filtrex. This in turn could help to finance the development of those projects which are retained for in-house promotion.

(iv) **Additional finance**

It could seek additional finance in the following forms.

- (1) **Further equity** by way of a rights issue or, by agreement with existing shareholders, via a public issue.
- (2) **Debt finance secured** on the **assets**. This should be possible since the company is currently ungeared.
- (3) **Debt finance secured** against the **working capital** ie factoring or invoice discounting.
- (4) It may be possible to arrange a **sale and leaseback** of some of the company's property or equipment.
- (5) Depending on its location and business there may be the possibility of applying for **grant aid**, for example from one of the EU regional development funds.

32 Basril Co

Text references. Capital rationing is covered in Chapter 11.

Top tips. In part (a) calculate the NPVs for each project first and then look at the best combination of divisible or indivisible projects. Part (b) just needs a short answer. Part (c) needs a longer explanation of capital rationing and the use of key terms as highlighted in the answer. Part (d) asks you to explain and how you apply relevant cashflow calculations in investment appraisal.

Easy marks. Setting out formats for calculating NPVs in part (a). In part (c) providing definitions of hard and soft capital rationing.

Examiner's comments. This question asked for optimal selection under capital rationing, an explanation of how NPV is applied under capital rationing, a discussion of the causes of capital rationing, and an explanation of the term 'relevant cost' in the context of investment appraisal.

Part (a), required three projects with a variety of cash flow profiles to be evaluated. Good answers calculated the NPV and profitability index, and gave the optimum investment schedule and total NPV for the cases of divisible and non-divisible projects. Errors included: failing to calculate profitability indexes, not calculating the total NPV (even though required by the question), failing to account correctly for inflation in the case of the project where real cash flows were provided (inflating real cash flows to money terms or deflating the nominal rate were both acceptable), and using annuity factors rather than discount factors in calculations.

Marking scheme

			Marks
(a)	(i)	NPV of project 1	1
		NPV of project 2	1
		NPV of project 3	2
		Calculation of profitability indices	2
		Optimum investment schedule	2
		Selection of optimum combination	2
(b)	NPV decision rule	1	
	Link to perfect capital markets	1	
	Explanation to ranking problem and solution	1	
			3

(c)	Hard capital rationing	3	
	Soft capital rationing	4	
		<u>7</u>	7
(d)	Explanation of relevant cash flows	2	
	Examples of relevant cash flows	3	
		<u>5</u>	<u>25</u>

(a)	(i)	Project 1			
		\$	12% discount factor	\$	
		Initial investment	(300,000)	1	(300,000)
		Year 1	85,000	0.893	75,905
		Year 2	90,000	0.797	71,730
		Year 3	95,000	0.712	67,640
		Year 4	100,000	0.636	63,600
		Year 5	95,000	0.567	53,865
					<u>32,740</u>
		Profitability	332,740/300,000		1.11
		Project 2			
		\$		12% discount factor	\$
		Initial investment	(450,000)	1	(450,000)
		Year 1	140,800	0.893	125,734
		Year 2	140,800	0.797	112,218
		Year 3	140,800	0.712	100,250
		Year 4	140,800	0.636	89,549
		Year 5	140,800	0.567	79,834
					<u>57,585</u>
		Profitability	507,585/450,000		1.13
		Project 3			
		\$		12% discount factor	\$
		Initial investment	(400,000)	1	(400,000)
		Year 1	124,320	0.893	111,018
		Year 2	128,796	0.797	102,650
		Year 3	133,432	0.712	95,004
		Year 4	138,236	0.636	87,918
		Year 5	143,212	0.567	81,201
					<u>77,791</u>
		Profitability	477,791/400,000		1.19

The most profitable projects are Projects 3 and 2, so if they are **divisible** it is suggested that Basril invests \$400k in Project 3 for an NPV of \$77,791, and the remaining \$400k in Project 2 for an NPV of $400/450 \times \$57,584 = \$51,186$.

- (ii) If the projects are **indivisible**, then Basril can either invest in Project 1 + Project 2 at a cost of \$750,000, or Project 1 + Project 3 at a cost of \$700,000 (Project 2 + Project 3 would cost too much). The NPV of 1 + 2 = \$32,740 + \$57,584 = \$90,324. The NPV of 1 + 3 = \$32,740 + \$77,791 = \$110,531. Therefore the best combination is Projects 1 and 3.

Examiner's comments. Part (b) required a discussion of how the NPV approach is applied via the profitability index in the case where capital is rationed and projects are divisible, and via the NPV of possible combinations in the case where projects are indivisible. Other valid answers discussed single-period and multiple period capital rationing, and linear programming as a solution in multiple-period capital rationing.

- (b) When capital is rationed, a company cannot invest in every opportunity that comes its way with a positive NPV. The basic approach in such circumstances is to rank all investment opportunities so that the NPVs can be maximised from the use of the available funds.

Ranking in terms of absolute NPVs will normally give incorrect results, because it leads to the selection of large projects, each of which has a high individual NPV but which may have, in total, a lower NPV than a large number of smaller projects with lower individual NPVs.

Ranking should therefore be carried out in terms of what is called the profitability index. This ratio measures the present value of future cash flows per \$1 of investment, and so indicates which investments make the best use of the limited resources available. Projects may or may not be divisible when performing this analysis. Different combinations of projects will need to be assessed.

Examiner's comments. Part (c) asked candidates to explain the causes of capital rationing, and many answers discussed hard and soft capital rationing, as well as offering examples of each. Credit was given to answers that explained in more general terms why a company might find its investment funds to be restricted, as long as the reasons had credibility.

- (c) **Capital rationing** is a situation in which a company has a limited amount of capital to invest in potential projects, such that the different possible investments need to be compared with one another in order to allocate the capital available most effectively. If an organisation is in a capital rationing situation it will not be able to enter into all projects with positive NPVs because there is not enough capital for all of the investments.

Soft capital rationing is brought about by internal factors; **hard capital rationing** is brought about by external factors.

Soft capital rationing may arise for one of the following reasons.

- (i) Management may be reluctant to issue additional share capital because of concern that this may lead to outsiders gaining control of the business.
- (ii) Management may be unwilling to issue additional share capital if it will lead to a dilution of earnings per share.
- (iii) Management may not want to raise additional debt capital because they do not wish to be committed to large fixed interest payments.
- (iv) Management may wish to limit investment to a level that can be financed solely from retained earnings. They may not want to grow the company too quickly.

Hard capital rationing may arise for one of the following reasons.

- (i) Raising money through the stock market may not be possible if share prices are depressed.
- (ii) There may be restrictions on bank lending due to government control.
- (iii) Lending institutions may consider an organisation to be too risky (eg, too highly geared, poor prospects) to be granted further loan facilities.
- (iv) The costs associated with making small issues of capital may be too great.

Examiner's comments. Part (d) asked for an explanation, with examples, of 'relevant cost' in the context of investment appraisal. Weaker answers showed a lack of understanding of cost classification.

- (d) When appraising an investment project, it is essential that only those cash flows relevant to the project be taken into account, otherwise an incorrect investment decision could be made. A 'relevant cash flow' is an incremental cash flow that arises or changes as a direct result of the investment being made.

Some costs will be sunk before an investment decision is made. An example would be research and development or market research costs into the viability of a new product. Once incurred, such costs become irrelevant to the decision as to whether or not to proceed, and so should be excluded from the analysis.

Cash flows that would be relevant include an increase in production overheads or labour costs, new purchases that are necessary, and any incremental tax effects.

It is important to note that any interest payments on the finance for a new project are relevant to the project decision, but are not taken into account in any NPV calculation. The interest payments will already be 'built in' to the calculation in the discount factor that is being applied.

33 Tirwen Co

Text references. Sources of finance are covered in Chapter 12.

Top tips. This question needs to be answered in sequence. Take each part in turn and remember some earlier analysis may be useful in later parts of the question, for instance in parts (c) to (e).

Easy marks. In part (a), the calculation of the theoretical ex-rights price per share. Make sure you are confident in calculating this.

In part (c) calculation of current EPS and earnings.

Examiner's comments. In part (a), almost all candidates calculated correctly the theoretical ex-rights price per share, but some calculated the value of rights per new share rather than per existing share. Some candidates disregarded the instruction to ignore issue costs. Answers to part (b) indicated that many candidates are unclear about the effect of a rights issue on shareholder wealth. Candidates could have calculated the current EPS in part (c) by dividing the share price by the PE ratio, but a significant number divided reserves by the number of shares. In part (d), the share price following redemption of some of the loan notes was found by multiplying the revised earnings per share by the constant price/earnings ratio. Most answers to part (e) did not include an evaluation of the effect of the rights issue on the debt/equity ratio and interest cover, even though this was required by the question. A comparison with sector averages was also required in order to gain full marks.

Marking scheme

		Marks
(a)	Theoretical ex rights price per share	2
	Values of rights per existing share	<u>1</u>
		3
(b)	Effect on wealth of exercising rights	2
	Effect on wealth of sale of rights	2
	Discussion of rights issues and shareholder wealth	<u>2</u>
		6
(c)	Current earnings per share	1
	Current earnings	1
	Funds raised via rights issue	1
	Interest saved by redeeming loan notes	1
	Revised earnings	1
	Revised earnings per share	<u>1</u>
		6
(d)	Expected share price after redeeming loan notes	1
	Comparison with theoretical ex rights price	1
	Discussion and conclusion	<u>1</u>
		3
(e)	Effect of rights issue on debt/equity ratio	2
	Effect of rights issue on interest cover	2
	Discussion and link to Tirwen Co	<u>3</u>
		7
		<u><u>25</u></u>

- (a) (i) Issue price of new shares = $85\% \times \$4.00 = \3.40 . The theoretical ex-rights price = $((5 \times \$4.00) + \$3.40)/6 = \$3.90$.
- (ii) The value of rights per existing share = $(\$3.90 - \$3.40)/5 = 10c$
- (b) Choices open to the investor are to either **refuse the offer**, **take up the offered rights** or **sell the rights** (or a combination).

If the investor does not subscribe to the offer, a loss of \$100 will occur, being the difference between the value of 1,000 shares before the rights issue (\$4,000) and the value of 1,000 shares after the rights issue (\$3,900).

If the investor takes up the offered rights, he will purchase an additional 200 shares at \$3.40 = \$680. This will give the investor 1,200 shares at \$3.90 each = \$4,680. This is equal to the sum of the value of 1,000 shares before the rights issue (\$4,000) plus the cash subscribed. As a result there is no overall change in wealth. Some cash has merely been transferred into shares.

If the rights are sold (1,000 rights at 10c each) then again there is no overall change in wealth. The \$100 proceeds plus the value of the shares after the rights issue (1,000 shares at \$3.90 each = \$3,900) is the same as the value of the holding before the rights issue. Part of the wealth has been converted from shares into cash.

- (c) Current EPS = share price / PE ratio = $\$4.00 / 15.24 = 26.25c$

Number of shares = $\$2,000,000 / 50c = 4$ million

Earnings = number of shares \times EPS = $4m \times 0.2625 = \$1,050,000$

Funds raised from rights issue = $4m / 5 = 800,000 \times \$3.40 = \$2,720,000$

Net of issue costs = \$2,500,000.

If this is entirely used to redeem loan notes, this will save $\$2,500,000 @ 12\% = \$300,000$

	\$	
Earnings before tax	1,500,000	\$1.05 m grossed up for 30% tax rate
Debenture interest	540,000	\$4.5m @ 12%
Overdraft interest	87,500	\$1.25m @ 7%
Current PBIT	2,127,500	
Revised interest cost	(327,500)	\$540k + \$87.5k - \$300k
	1,800,000	
Tax at 30%	(540,000)	
Revised profit after tax	<u>1,260,000</u>	
Total new shares	4,800,000	
Revised EPS	26.25	

- (d) As it is stated that the PE ratio will remain constant, and EPS has not changed, this means that the share price will remain unchanged at $EPS \times PE = 26.25c \times 15.24 = \4.00 . As the theoretical ex rights price is \$3.90 for each share, this results in a gain of 10c per share.
- (e) **Debt equity ratio** (using debenture debt only)

Current: $4,500 / 3,500 = 129\%$

This is above the sector average. If \$2.5m of debenture debt is redeemed:

$2,000 / 6,000 = 33\%$

If the debt is not reduced:

$4,500 / 6,000 = 75\%$

These are both less than the sector average, and will indicate reduced financial risk.

Interest cover

Current: 2,127,500 / 627,500 3.4

If \$2.5m of debenture debt is redeemed:

2,127,500 / 327,500 6.5

Thus interest cover improves to above the sector average.

A rights issue is therefore an attractive source of finance for Tirwen, although it must be noted that equity finance is relatively more expensive than debt finance and will affect the company's cost of capital when assessing projects in the future.

A rights issue will decrease gearing and improve interest cover if the funds are used to redeem some of the debenture debt. The reduction in debt on the balance sheet will make it more likely that Tirwen can raise additional finance in the future, perhaps at a cheaper rate.

34 PG

Text references. Sources of finance are covered in Chapter 12.

Top tips. Be warned if you got (a) (i) wrong that manipulation of the earnings and price formulae may come up in this paper. (a)(ii) brings out the limitations of the theoretical ex rights price calculation. Actual price movements depend on the state of the market, the degree of market efficiency and, very importantly, the risk profile.

In (b) (ii) you are only asked about the advantages of issuing convertible loan notes; the principal feature is short-term benefits from being able to raise funds at limited cost, with possible adverse consequences (dilution of earnings, change in control) only happening long-term.

The dividend valuation model is at the heart of the answer to (b) (iii). You may not have covered this yet so read through the answer provided.

- (a) (i) The **current market price** can be found by multiplying the earnings per share (EPS) by the price/earnings (P/E) ratio.
- EPS is $\$3.6/6m = 60c$ per share
- P/E ratio is 15
- Market price of shares is $15 \times 60c = \mathbf{\$9.00}$ per share
- (ii) In order to raise \$10,500,000 at a price of 800 cents, the company will need to issue an additional 1,312,500 ($\$10,500,000/\8.00) shares.
- Following the investment, the total number of shares in issue will be 7,312,500 (6,000,000 + 1,312,500).
- At this point, the total value of the company will be:
- $(6m \times \$9) + \$10,500,000 = \$64,500,000$
- The **theoretical ex-rights price** will therefore be $\$64.5m/7.3125m = \mathbf{\$8.82}$.

Problems with calculations

- (1) The **costs of arranging the issue** have not been included in the calculations.
- (2) The **market view** of the **quality of the new investment** will affect the actual price of the company's shares.
- (3) If the **issue is not fully subscribed** and a significant number of shares remain with the underwriters, this will **depress the share price**.
- (4) The effect of the new investment on the **risk profile** of the company and the expected **future dividend stream** could also cause the share price to differ from that predicted.

- (5) The price of the shares depends not only on the financial performance of the company, but also on the **overall level of demand** in the stock market. If the market moves significantly following the announcement of the issue, this will affect the actual price at which the shares are traded.

(iii) **Features of deep discounted rights issue**

In a **deep-discounted** rights issue, the new shares are priced at a **large discount** to the current market price of the shares. The purpose of this is to ensure that the issue is well subscribed and that shares are not left with the underwriters, and thus this form of issue pricing is attractive when the inventory market is particularly volatile. However, the shares cannot be issued at a price which is below their nominal value.

Disadvantage of deep discounted rights issue

The main drawback to this approach is that a **larger number of shares** will need to be **issued** in order to raise the required amount of finance, and this will lead to a larger dilution of earnings per share and dividends per share.

(b) (i) **Conversion premium**

The **conversion premium** is the **difference** between the **issue value** of the **notes** and the **conversion value** as at the date of issue. In other words it is the measure of the additional expense involved in buying shares via the convertible loan notes as compared with buying the shares on the open market immediately.

In this case, \$100 loan notes can be converted into 11 ordinary shares. The **effective price** of these shares is therefore \$9.09 per share.

The **current market price** of the shares is \$9.00. The **conversion premium** is therefore \$9.00 – \$9.00 = **9 cents**. This can also be expressed in percentage terms as **1%** (0.09/9).

(ii) **Advantages of issuing convertible loan notes**

- (1) **Convertibles** should be **cheaper than equity** because they offer greater security to the investor. This may make them particularly attractive in fast growing but high-risk companies.
- (2) **Issue costs** are **lower** for loan notes than for equity.
- (3) **Interest** on the **loan notes** is **tax deductible**, unlike dividends on ordinary shares.
- (4) There is **no immediate change** in the **existing structure** of control, although this will change over time as conversion rights are exercised.
- (5) There is no **immediate dilution** in **earnings** and **dividends per share**.

(iii) **Dividend policy**

Dividend policy is one of the major factors which determines the share price. Under the **dividend valuation model**, the share price is held to be directly related both to the current dividend and to the expected future growth in dividends:

$$P_0 = \frac{D_0(1+g)}{(r-g)}$$

where: P_0 = market price of shares
 D_0 = current level of dividend
 r = required rate of return
 g = expected annual growth in dividend

Impact of dividend growth

Thus it can be seen that dividend growth is important in determining the likely market value of the shares. As has already been discussed above, the market value of the shares is very important in determining the price of convertibles, and therefore the dividend policy of the company will have an important effect on the value of convertible loan notes.

35 Newsam Co

Text references. Gearing and capital structure is discussed in Chapter 14.

Top tips. This question offered a substantial amount of accounting information to enable you to illustrate the answers numerically but, more importantly, to allow an opportunity to show your expertise in interpreting accounting statements. (a) does not specify the ways in which the gearing has been calculated. You should therefore define clearly your basis of calculation of gearing and explain the reasons for your choice.

Note carefully how the market price of the shares is arrived at in (a) if you failed to get that part of the question correct.

The availability in (c) of 6 marks should have suggested that the answer was not clear-cut. Despite the bank reservations, Newsam does not do too badly on the important measures of interest cover and asset backing.

In (d) do not limit your discussion to the options suggested in the question, but consider what else might be available to Newsam. Note that some of the measures proposed (revaluation of non-current assets and brands) do not bring any additional funds, they just make the balance sheet 'look better'. As a quoted company, Eurodollar funding is available for Newsam.

(a) Capital gearing

Capital gearing is concerned with a company's **long-term capital structure**. The covenants attaching to the debenture do not define clearly what they mean by capital gearing in this context, in particular whether the bank overdraft should be included as long-term debt capital. However, since it appears that the overdraft has been used principally to finance non-current assets in the form of machinery rather than as a source of working capital, it is probably reasonable to argue that it should be included as part of the prior charge capital. The gearing ratio can thus be defined as:

$$\frac{\text{Prior charge capital}}{\text{Shareholders' funds}} = \frac{\text{Debentures + overdraft}}{\text{Ordinary shares + reserves}}$$

The gearing ratios can now be calculated.

(i) **Book values:** $\frac{\$5.0\text{m} + \$3.0\text{m}}{\$5.0 + \$10.0\text{m}} = 53.3\%$

(ii) Market values

Market value of loan notes:

$$\$5.0\text{m} \times 115\% = \$5.75\text{m}$$

$$\text{Market price of shares} = \text{P/E ratio} \times \text{Earnings per share}$$

$$= \text{P/E} \times \frac{\text{Profit after tax}}{\text{Number of shares}}$$

$$= 14 \times \$1.34\text{m}/20\text{m} = 93.8\text{c}$$

$$\text{Market value of equity} = \text{Market price} \times \text{number of shares}$$

$$= 93.8\text{c} \times 20\text{m} = \$18.76\text{m}$$

$$\text{Gearing ratio} = \frac{\$5.75\text{m} + \$3.0\text{m}}{\$18.76\text{m}} = 46.6\%$$

(b) Terms of covenant

It appears from the calculations above that if calculated on the basis of **book values**, Newsam has already breached the covenant relating to the gearing level. If the gearing is calculated using **market values**, then Newsam has not yet breached this covenant, but with a gearing of 46.6% is very close to doing so. If short-term payables were included, the gearing measures would be increased.

The required liquidity range for the current ratio is 1.08 ($1.35 \times 80\%$) to 1.62 ($1.35 \times 120\%$). Newsam's current ratio (current assets: current liabilities) is 1.0 (\$7.0m:\$7.0m). The company is therefore in breach of the covenant with respect to liquidity.

(c) **Dangers of high gearing**

A **high gearing level** only constitutes a danger when the level and volatility of earnings is such that the company is at risk of being unable to meet the interest payments as they fall due. If this situation arises the company could be forced to **liquidate assets** to meet the demands of its payables, and this in turn could jeopardise its operating viability. It follows that the absolute level of gearing cannot be used to assess the financial risk faced by the company. It is more helpful to assess the level of interest cover in the light of the degree of volatility in earnings.

Interest coverage

Interest coverage can be calculated as the rate of operating profit: interest payable. In Newsam's case, the cover is currently 3.0 times (\$3.0m:\$1.0m). There is little evidence available on which to assess earnings stability, but the fact that sales growth has been steady rather than spectacular may be taken to imply that earnings are not especially volatile. If this is the case then the existing level of gearing does not appear to be dangerous.

Quality of asset backing

A further factor to take into account is the **quality of the asset backing** since this will influence the attitude of its lenders if Newsam faces problems in repaying its debt. Land and buildings currently appear in the accounts at \$9.0m, and it is of crucial importance to know how this relates to **current market valuations**. If this figure is conservative then the payables' security could be fairly good. Land and buildings at \$9m represent 75% of the value of total payables (including trade payables). It is unlikely that anything close to the book valuation of plant and machinery and inventory could be realised in the event of a forced sale; however, it is to be hoped that the major part of the receivables figures is collectable. Thus, in summary, the company appears to have adequate asset backing in the event of a forced restructuring or liquidation.

Conclusion

The factors discussed above, when taken together, suggest that the **level of gearing** is not particularly dangerous. However, if the company is actually in breach of its debenture covenants, the courses of action available to the debenture holders and their attitude towards the situation will be of key importance in determining the true dangers of the company's position.

(d) (i) **Operating leases**

If the company is to **lower its capital gearing** it needs either to **increase** the value of its **issued share capital** and reserves or to **decrease the size of its borrowings**. Since growth is low and cash resources relatively small it seems unlikely the company will be able to repay much of the debt in the short-term future from operational funds. However, one option might be to **convert** some of the owned plant and vehicles onto **operating leases** and thus reduce the size of the bank overdraft.

Sale and leaseback

Similarly the company might be able to raise funds through a **sale and leaseback** of property which could be used to reduce the level of debt. There may also be some scope to reduce the level of working capital through improving inventory and receivable turnovers and increasing the amount of credit taken from suppliers. However, the opportunities are likely to be limited: for example, the average debt collection period could probably not be reduced much below the current level of 52 days.

Increasing shareholders' funds

Policies that could be used to increase the size of shareholders' funds include the following.

(1) **Non-current asset revaluation**

It is implied that land and buildings have not been revalued since their acquisition twelve years ago. Despite a slump in the property market it is possible that land and buildings may be

undervalued, and a revaluation could result in a **strengthening of reserves** and hence an improvement in the capital gearing.

(2) **Rights issue**

The reaction of the market to a rights issue will depend on the **rating** of the company and the **purpose** for which the issue is being made. In this case, growth has been slow, the P/E ratio is low in relation to the sector average implying a low rating, and the purpose of the issue is not to finance new growth opportunities but to reduce the level of debt. Given a relatively flat market, investors are unlikely to view such an issue positively. As a result the issue would need to be **priced** at a **relatively large discount** to make it attractive; this in turn would increase the earnings dilution and impact badly upon the share price.

(3) **Placing**

The company may find it easier to make a placing with the institutions. However, it might need to gain the agreement of the shareholders to forgo their pre-emptive rights in this situation.

(4) **Brand capitalisation**

The appearance of the balance sheet could be improved by this method, but investors and payables may not place much weight on such a valuation.

(ii) **Reduction in interest charges**

In order to improve the level of interest coverage, Newsam will need to **reduce the level of its interest charges**. Options available include the following.

(1) **Redeem the loan notes and replace with additional overdraft**

This would reduce the interest cost as follows.

$$\$5\text{m} \times (15\% - 9\%) = \$0.3\text{m}$$

The interest coverage would then become:

$$\$3\text{m} \div (\$1.0\text{m} - \$0.3\text{m}) = 4.3 \text{ times}$$

(2) **Redeem the loan notes and replace with Eurodollar bond**

This would reduce the interest cost:

$$\$5\text{m} \times (15\% - 5\%) = \$0.5\text{m}$$

The interest coverage would become:

$$\$3\text{m} \div (\$1.0\text{m} - \$0.5\text{m}) = 6 \text{ times}$$

The improvement in interest coverage makes this appear an attractive option. However if the dollar continues to strengthen in the manner suggested by the forward rates, at 4% per annum, this would effectively wipe out the benefit by the end of the first year.

(3) **Redeem the loan notes and replace medium to long-term debt**

A medium term bank loan would be a possibility.

Although probably more expensive than the overdraft or eurodollar bond, this would be free from the risk of foreign currency movements and would offer more security than the use of short-term finance which is repayable on demand.

Conclusion

It is therefore suggested that, unless Newsam has significant dollar incomes, it should investigate the possibility of a medium-term sterling loan.

(e) **Convertibles**

Companies normally issue convertibles in the expectation that the **holders will exercise their options**. Convertibles can therefore be seen as a form of **delayed equity**. They are attractive to the firm when the

price of the ordinary shares is **abnormally low** at the date of issue, and at times when to issue a further tranche of equity would result in a significant drop in earnings per share. However they also carry the risk that the **share price will not rise** in line with expectations at the time of issue and that holders will not therefore convert. If the loan notes are dated, then the company must have funds in place to **allow redemption** on the due date. Convertibles also have a short term benefit in that interest payments are allowable against tax.

Consequences of issuing convertibles

Convertibles therefore may form part of the strategy of a company whose objective is to raise new equity, but which for various reasons does not wish to go directly to the market in the short term. They are often preferable to straight loan notes since they **do not commit the company indefinitely** to the payment of large interest bills. They further allow the company to **widen the investment base** by attracting investors looking for a guaranteed short term income plus the possibility of a capital gain at a later date. They have also recently formed a part of the strategy of companies that wished to **manipulate their reported gearing** and earnings per share, since they could choose whether to show them as equity or debt. However, this loophole has now been closed.

36 Arwin

Text references. Gearing and the capital structure decision is covered in Chapter 14.

Top tips. This question expected you to prepare a forecast income statement which would then be used in part (b) to calculate various ratios. Provided you know your ratios, parts (a) and (b) should be comfortably answered and a passmark attained already. Part (c) needs a formal discussion of the two types of risk. So define them and explain them in the context of the types of gearing already calculated.

Easy marks. The requirements of part (a) involved simple calculations.

Examiner's comments. This was a popular question, but many candidates experienced difficulty in producing forecast income statements for both of the financing proposals. Candidates must have a good understanding of sources of finance to be successful. The most common error was to omit fixed costs. Many markers commented that the standard of answers to part (b) was poor, with some candidates showing that they did not know how to calculate common ratios. Some even attempted to answer this part of the question without calculating any ratios at all. It is impossible to make reasoned comments in the absence of analysis. For example, the claim that earnings per share will decrease if more shares are issued will not be true if earnings have increased due to the investment of the funds raised. Most answers to part (c) were of an acceptable standard, although candidates often failed to frame their answers according to the wording of the question.

Marking scheme

		Marks
(a)	Sales and administration cost	1
	Cost of sales	1
	Interest	1
	Profit after tax	1
	Retained earnings	<u>1</u>
		5
(b)	Revised share capital and reserves	1
	Financial gearing	2
	Operational gearing	2
	Interest cover	2
	Earnings per share	2
	Calculation of current values	1
	Discussion	<u>2</u>
		12

(c)	Explanation of business risk	1
	Explanation of financial risk	1
	Up to 2 marks for each danger of high gearing	<u>6</u>

8
25

(a)		<i>Debt finance</i>	<i>Equity finance</i>	
		\$'000	\$'000	
	Sales	56,000	56,000	$50,000 \times 1.12$
	Variable cost of sales	(28,560)	(28,560)	$30,000 \times 85\% \times 1.12$
	Fixed cost of sales	<u>(4,500)</u>	<u>(4,500)</u>	
	Gross profit	22,940	22,940	
	Administration costs	<u>(14,700)</u>	<u>(14,700)</u>	$14,000 \times 1.05$
	PBIT	8,240	8,240	
	Interest	<u>(800)</u>	<u>(300)</u>	Debt finance cost $10\% \times \$5m = \$500k$ in addition to existing \$300k
	Profit before tax	7,440	7,940	
	Tax at 30%	<u>(2,232)</u>	<u>(2,382)</u>	
	Profit after tax	5,208	5,558	
	Dividends at 60%	<u>(3,125)</u>	<u>(3,335)</u>	
	Retained earnings	<u>2,083</u>	<u>2,223</u>	

(b)		<i>Current</i>	<i>Debt finance</i>	<i>Equity finance</i>
	<i>Financial gearing</i>			
	Debt/equity ratio:			
	Debt	2,500	7,500	2,500
	Share capital and reserves	22,560	24,643	29,783
	Debt/equity ratio %	11.1%	30.4%	8.4%
	<i>Operational gearing</i>	<i>Current</i>	<i>Debt finance</i>	<i>Equity finance</i>
	Contribution/PBIT			
	Contribution	24,500	27,440	27,440
	PBIT	6,000	8,240	8,240
	Operational gearing	4.1	3.3	3.3
	<i>Interest coverage</i>	<i>Current</i>	<i>Debt finance</i>	<i>Equity finance</i>
	PBIT	6,000	8,240	8,240
	Debt interest	300	800	300
	Interest coverage	20	10.3	27.5
	<i>Earnings per share</i>	<i>Current</i>	<i>Debt finance</i>	<i>Equity finance</i>
	Profit after tax	3,990	5,208	5,558
	Number of shares	10,000	10,000	11,250
	EPS	39.9	52.1	49.4

The **debt finance proposal** increases EPS by the largest amount, but will reduce interest coverage and increase financial gearing. Whether these changes are acceptable depends both upon sector averages and the response of investors and managers. A decision to use equity finance would decrease financial gearing but would increase interest coverage. EPS would increase too. A decrease in operational gearing would result from both proposals.

- (c) (i) **Business risk**, the inherent risk of doing business for a company, refers to the risk of making only low profits, or even losses, due to the nature of the business that the company is involved in. One way of measuring business risk is by calculating a company's operating gearing or 'operational gearing'.

$$\text{Operating gearing} = \frac{\text{Contribution}}{\text{Profit before interest and tax (PBIT)}}$$

The significance of operating gearing is as follows.

- (1) **If contribution is high but PBIT is low**, fixed costs will be high, and only just covered by contribution. Business risk, as measured by operating gearing, will be high.
 - (2) **If contribution is not much bigger than PBIT**, fixed costs will be low, and fairly easily covered. Business risk, as measured by operating gearing, will be low.
- (ii) A high level of debt creates financial risk. This is the risk of a company not being able to meet other obligations as a result of the need to make interest payments. The proportion of debt finance carried by a company is therefore as significant as the level business risk. . Financial risk can be seen from different points of view.
- (1) **The company** as a whole. If a company builds up debts that it cannot pay when they fall due, it will be forced into liquidation.
 - (2) **Payables**. If a company cannot pay its debts, the company will go into liquidation owing payables money that they are unlikely to recover in full.
 - (3) **Ordinary shareholders**. A company will not make any distributable profits unless it is able to earn enough profit before interest and tax to pay all its interest charges, and then tax. The lower the profits or the higher the interest-bearing debts, the less there will be, if there is anything at all, for shareholders.

37 Food retailers

Text references. Sources of finance are covered in Chapter 12 and shareholder ratios in Chapter 1.

Top tips. In (a), as well as commenting on the P/E ratios given in the table, you could also calculate high and low P/E ratios for the year and use this information to illustrate the meaning of the ratio to investors.

In (b), it is possible to calculate the level of dividends using the share price information and the dividend yield, and then to calculate earnings using the share price information and the P/E ratio. These figures can then be used to calculate the dividend cover. However, it is quicker to take the inverse of the product of the two ratios, and this is the method illustrated in the suggested solution.

(c) is a good illustration of the importance of being able to predict market sentiment, as there are various different standpoints the market could take.

(a) Price-earnings ratio

The **price earnings (P/E) ratio** is regarded by many as the most important yardstick for assessing the relative worth of a share. It is calculated as:

$$\frac{\text{Market price of share}}{\text{EPS}}$$

This can also be expressed as:

$$\frac{\text{Total market value of equity}}{\text{Total earnings}}$$

The P/E ratio is a measure of the **relationship** between the **market value** of a company's shares and the **earnings** from those shares. It is an important ratio because it relates **two key variables** for investors, the market price of a share and its earnings capacity.

Stock market appraisal

The value of the P/E ratio reflects the **market's appraisal** of the share's future prospects. In other words, if one company has a higher P/E ratio than another it is because investors either expect its earnings to increase faster than the other's, or they consider that it is a less risky company or in a more secure industry.

Influence of market efficiency

The level of the ratio will change directly in response to changes in the share price and may vary widely during the course of the year as **events alter investor perceptions**. The extent and timing of changes will depend on the **efficiency** of the market; the stronger the level of efficiency, the more the market will be able to anticipate events.

Comparisons

Earnings potential is strongly related to the sector in which the business operates, and therefore P/E **comparisons** are only valid in respect of **companies in the same market** sectors. They can be used in this case since all the companies are publicly quoted food retailers.

Price earnings ratios of companies being compared

Using the information given in the table, the P/E ratio for Axis is 13.0. This means that it would take thirteen years for the earnings from the share to equal the price paid for it. The ratio for Spin is 21.1, the higher ratio meaning that the time taken for the earnings to **equal** the price of the share is 21.1 years. The reason for the higher level is that investors expect **earnings** from Spin to rise at a **faster rate** than those from Axis. The P/E ratio gives no indication of itself as to *why* earnings are expected to increase at different rates, although possibilities include superior management quality or more aggressive investment plans.

Ply has a current share price of 63 cents and a P/E ratio of 14.2. Earnings for last year were therefore 4.437 cents per share (63/14.2). At its high point for the year when the share price was 112, the P/E ratio was 25.2, while at its low point, the P/E ratio was 12.2. The figures also demonstrate that Spin has the **lowest level of volatility**, Axis the **highest**. This appears to reinforce the point made above that investors are confident about Spin's prospects (hence the P/E ratio has not altered much over the year), but are rather less sure about Axis's future.

(b) Dividend cover

The dividend cover is the number of times that the actual dividend could be paid out of current profits. It indicates the **proportion of distributable profits** for the year that is being **retained** by the company and the level of risk that the company will not be able to maintain the same dividend payments in future years, should earnings fall.

Calculation of dividend cover

In this case, the ratio must be approached by means of the dividend yield and the P/E ratio:

$$P/E = \frac{\text{Market share price}}{\text{Earnings}}$$

$$\text{Div yield} = \frac{\text{Dividend paid}}{\text{Market share price}}$$

$$P/E \times \text{Div yield} = \frac{\text{Dividend paid}}{\text{Earnings}} \quad (\text{since the Market share price cancels out})$$

This is the inverse of the dividend cover, and therefore:

$$\text{Dividend cover} = 1 \div (P/E \times \text{div yield})$$

	<i>P/E</i>	<i>Div yield</i>	<i>P/E × div yield</i>	<i>Dividend cover</i>
Spin	21.1	2.3%	0.4853	2.06 times
Axis	13.0	2.1%	0.2730	3.66 times

Comparisons

As with the P/E ratio, comparisons with other companies in the same sector are a lot more valuable than comparisons with companies in different sectors, as the 'typical rate' for different business sectors will vary widely.

Dividend covers of companies being compared

The lower level of dividend cover for Spin means that the company has paid out nearly **half** of its **earnings** in the form of dividends, while Axis has only paid out less than one third. This suggests that Axis has **retained a higher proportion of profits** for **reinvestment** within the business. If earnings are very volatile, the figures could suggest that Spin might have **problems** in continuing to **pay out dividends** at this level in the future. However as indicated above, the market appears confident about Spin's future, and rates Axis rather lower despite Axis retaining more funds for future expansion.

(c) Payment of dividends from reserves

If a company pays dividends in excess of earnings, then this payment must be made out of **reserves**. The effect of this will be to **reduce the net asset value** of the business.

Reasons for payment from reserves

- (i) The company believes that it must continue to pay a **high level of dividends** in order to **support the share price**. If profits for the year are too low to support the previous level of dividends, the directors may decide that it should make a payment out of reserves rather than reduce the level of dividends.
- (ii) If a company has a **high level of reserves** for which it **cannot find** an attractive **investment opportunity**, it may decide that it is appropriate to repay part of those reserves to investors by means of a dividend payment.

Problems with payment from reserves

- (i) The fall in the net asset value of the business may make it **more vulnerable** to a **takeover bid**.
- (ii) The market may see the payment out of reserves as a **desperate measure** on the part of the directors, and this may trigger a **significant drop in the share price**.
- (iii) Payment of dividends that are in excess of earnings could lead to a **shortage of cash** for the business.

(d) Reasons for using loan notes

- (i) **Loan notes** are a **cheaper form of finance** than preference shares because debenture interest is tax deductible, unlike preference dividends.
- (ii) **Loan stock** are **more attractive** to **investors** because they are secured against the company's assets.
- (iii) **Debenture holders rank before preference shareholders** in the event of a liquidation.
- (iv) **Issue costs** should be **lower for loan notes** than for preference shares.

38 CF Co

Text references. Cash budgets are explained in Chapter 6, sources of finance for SMEs are covered in Chapter 14 and venture capital in Chapter 12.

Top tips. Sources of finance discussion questions are very likely to be combined with cash flow or working capital calculations.

As with all cash budget questions, you should start your answer to (a) by setting up the proforma and slotting the easy figures such as non-current assets, rent and wages in, before going on to calculate sales and purchases. You should set out your workings for calculating the monthly sales clearly so as to avoid careless errors.

Make sure your answers in part (b) relate specifically to small businesses and are not a general description of sources of finance.

The common thread in (c) is that venture capital is often provided for a major business development in the medium to long-term, and would not normally be provided to sort out short-term day-to-day problems.

(a) **Cash budget for the period January 20X2 to May 20X2**

	January	February	March	April	May
	\$	\$	\$	\$	\$
<i>Receipts</i>					
Share capital	200,000				
Sales (W1)		9,360	28,440	40,320	66,240
Total receipts	<u>200,000</u>	<u>9,360</u>	<u>28,440</u>	<u>40,320</u>	<u>66,240</u>
<i>Payments</i>					
Non-current assets	250,000				
Material purchases (W2)	16,800	25,200	33,600	67,200	67,200
Wages	4,000	4,000	4,000	4,000	4,000
Overheads	3,000	6,000	6,000	6,000	6,000
Rent	6,000			6,000	
Total payments	<u>279,800</u>	<u>35,200</u>	<u>43,600</u>	<u>83,200</u>	<u>77,200</u>
Net cash flow	(79,800)	(25,840)	(15,160)	(42,880)	(10,960)
Opening cash balance	0	(79,800)	(105,640)	(120,800)	(163,680)
Closing cash balance	<u>(79,800)</u>	<u>(105,640)</u>	<u>(120,800)</u>	<u>(163,680)</u>	<u>(174,640)</u>

Workings

1 *Sales receipts*

	January	February	March	April	May
Units sold	2,400	3,600	4,800	9,600	9,600
Turnover (\$10/unit)	24,000	36,000	48,000	96,000	96,000
Rec'd after 1 mth (before discount)		9,600	14,400	19,200	38,400
Rec'd after 1 mth (net of discount)		9,360	14,040	18,720	37,440
Rec'd after 2 mths			14,400	21,600	28,800
Total sales receipts		<u>9,360</u>	<u>28,440</u>	<u>40,320</u>	<u>66,240</u>

2 *Material purchases payments*

	January	February	March	April	May
Units sold	2,400	3,600	4,800	9,600	9,600
Purchases \$7/unit	16,800	25,200	33,600	67,200	67,200

(b) The cash budget for the first five months of trading by CF Co shows that the company will need additional financing throughout this period. The cash flow problem in this case has two components:

- (1) There is a **large non-current asset investment** required in the first month of operation, the size of which exceeds the initial capital injection.
- (2) Sales are **not forecast** to **reach a steady state** until April, and receipts from customers lag the sales.

Normal pattern

Once sales have stabilised, the typical **monthly cash flow** will be as follows:

	\$	\$
Sales: 9,600 units × \$10 × 60%	57,600	
9,600 units × \$10 × 40% × 97.5%	<u>37,440</u>	
Total receipts		95,040
Purchases: 9,600 units × \$7	67,200	
Wages	4,000	
Overhead	6,000	
Rent (monthly charge)	<u>2,000</u>	
Total payments		79,200
Net monthly cash flow		<u>15,840</u>

The cash deficit at the end of May is forecast to be \$174,640. It will therefore take **just over eleven months** for the **deficit to be eliminated, assuming that cash flows are in line** with forecasts.

CF will need to consider obtaining an **overdraft** from the bank and must also consider the need for **longer term funds** (loans or equity funds) to finance the permanent element of working capital and non-current assets.

(c) **Matching of funding**

A general principle of financing is that the funding term should match the asset life. Therefore, non-current assets should normally be financed using **long-term sources of funds**.

Possible finance sources

There is a wide variation in the size and type of non-current assets, from photocopiers to new buildings, and therefore the relative amount of funds required, and the most appropriate form of funding will vary. However, the following sources of finance could be considered by a small business.

(i) **Retained earnings**

Relatively small asset purchases, such as a new computer, can often be financed using cash arising from retentions, and thus no additional external funds will be required.

(ii) **Leasing and hire purchase**

These can also be considered for **smaller assets**. They can be used to spread the cost of the asset over its **useful life**. The main types of agreement available are:

- **Operating leases**. These are generally for a period less than the economic life of the asset. The risks and rewards of ownership remain with the lessor. However, in areas where there is a fast rate of technological change, such as computers, they have the advantage of giving flexibility to the lessee.
- **Finance leases**. These generally cover the whole economic life of the asset, and the risks and rewards of ownership are transferred to the lessee.
- **Hire purchase**. This is a form of instalment credit, whereby the ownership of the goods passes to the customer on payment of the final credit instalment.

(iii) **Secured loan**

Depending on the nature of the asset, it may be possible to obtain a **secured bank loan** (either medium or long-term) against the asset being purchased. The **Loan Guarantee Scheme** is an example of a government initiative to help small businesses. It is intended to help small businesses to get a loan from the bank, when a bank would otherwise be unwilling to lend because the business cannot offer the security that the bank would want.

Under the scheme, the bank can lend up to a certain limit without security over **personal** assets or a personal guarantee being required of the borrower. However, all available **business** assets must be used as security if required. The government will guarantee for example, 75% of the loan, while the borrower must pay an annual percentage premium on the guaranteed part of the loan.

(iv) **Mortgage**

This may be appropriate if the assets being acquired are **land or buildings**.

(v) **Grants**

A grant is a sum of money given to an individual or business for a specific project or purpose. A grant usually covers only part of the total costs involved.

Grants to help with **business development** are available from a variety of sources, such as the government, European Union, Regional Development Agencies, local authorities and some charitable organisations.

These grants may be linked to business activity or a specific industry sector. Some grants are linked to specific geographical areas, eg those in need of economic regeneration.

(vi) **Venture capital**

This form of finance may be appropriate for larger investments related to expansion or new product development. Venture capital is essentially **risk capital**, and has the advantage that new equity funds are provided, generally for a restricted time period at the end of which the investor will seek an exit from the business. The benefit of this is that in the longer term the ownership structure of the business is unchanged.

(vii) **Other sources of equity**

These include further investments from the existing shareholders, the use of a '**business angel**', or possibly some form of Alternative Investment Market (AIM) flotation. The AIM route is only likely to be appropriate for significant long-term expansions.

If the company does not go down the AIM route, it may have difficulty in obtaining equity finance, because of its liquidity problems or because shareholders will find it difficult to sell their shares.

Enterprise capital funds (ECFs) were launched in the UK in 2005. ECFs are designed to be commercial funds, investing a combination of private and public money in small high-growth businesses. They are based on a variant of the Small Business Investment Company (SBIC) programme that has operated in the United States for the past 45 years. The SBIC programme has supported the early growth of companies such as FedEx, Apple, Intel and AOL.

For investment below £500,000 most SMEs can access an informal funding network of their friends, families and business angels. Once companies require funding above £2m they are usually quite established, generating revenues and therefore perceived as lower risk and are able to secure funding from institutional investors. The gap between these two finance situations is known as the 'equity gap'.

ECFs provide Government match funding for business angels and venture capitalists to help small and medium sized businesses bridge the equity gap. Each ECF will be able to make equity investments of up to £2 million into eligible SMEs that have genuine growth potential but whose funding needs currently are not met.

(d) **Expansion**

A private company might want to invest **more capital** in an **expansion** programme, but be unable to raise the funds internally or from a bank loan. It might therefore seek venture capital.

Management buy-out

A business might need capital for a **management buyout**. The management team buying out the business is unlikely to have enough capital of its own to buy the entire business.

Research and development

A business might want capital to invest in **research and development**, which would be regarded as a high-risk venture. Other sources of finance might therefore be unavailable.

Low share price

A public company might need **extra equity finance** but be unable to issue more shares because its share price is currently below par. (Companies are forbidden by law to issue shares at below their nominal value.)

Start-ups

Venture capital is sometimes available for **company start-ups**.

39 TFR Co

Text references. Gearing and capital structure are covered in Chapter 14.

Top tips. This is a time consuming question, which requires you to first produce forecast income statements for four years. Further calculations are needed to illustrate your comments in part (b). You will need to plan your answers carefully and really watch the time. Make sure your comments reflect that TFR is small and owner-managed, so don't suggest financing solutions more suitable for large quoted companies.

Easy marks. Part (c) should provide some easy marks and is an important topic to have learnt.

Marking scheme

		Marks
(a)	Forecast income statements	2
	Interest cover	2
	Debt/equity ratio	2
	Return on equity	2
	Return on capital employed	<u>2</u>
		10
(b)	Cash flow implications	3
	Dividend implications	2
	Other relevant discussion, including ratios	<u>3-5</u>
		Maximum
(c)	Discussion of difficulties faced by small companies	<u>7</u>
		<u>25</u>

(a) Income statements for TFR Co for the four-year period

Year	Current	Year 1	Year 2	Year 3	Year 4
	\$	\$	\$	\$	\$
Turnover	210,000	255,000	300,000	345,000	390,000
Expenses (80%)	<u>168,000</u>	<u>204,000</u>	<u>240,000</u>	<u>276,000</u>	<u>312,000</u>
Net profit (20%)	42,000	51,000	60,000	69,000	78,000
Interest (W)	<u>2,000</u>	<u>11,000</u>	<u>8,750</u>	<u>6,500</u>	<u>4,250</u>
Profit before tax	40,000	40,000	51,250	62,500	73,750
Tax (25%)	<u>10,000</u>	<u>10,000</u>	<u>12,812</u>	<u>15,625</u>	<u>18,438</u>
Profit after tax	30,000	30,000	38,438	46,875	55,313
Dividend (50%)	<u>15,000</u>	<u>15,000</u>	<u>19,219</u>	<u>23,438</u>	<u>27,656</u>
Retained profit	<u>15,000</u>	<u>15,000</u>	<u>19,219</u>	<u>23,438</u>	<u>27,656</u>
Equity finance	200,000	215,000	234,219	257,657	285,313
Debt finance	nil	75,000	50,000	25,000	nil
Interest cover (times)	21.0	4.6	6.9	10.6	18.4
Debt/equity (%)	nil	35	21	10	nil
Return on equity (%)	15	14	16	18	19
ROCE (%)	21	18	21	24	27
ROCE (%)*	19	16	20	23	26

*Including the existing and continuing overdraft in capital employed

Working

Annual interest (assuming the continuing overdraft is maintained at the current level)

Year 1 interest payment = $100,000 \times 0.09 = 9,000 + 2,000 = \$11,000$

Year 2 interest payment = $75,000 \times 0.09 = 6,750 + 2,000 = \$8,750$

Year 3 interest payment = $50,000 \times 0.09 = 4,500 + 2,000 = \$6,500$

Year 4 interest payment = $25,000 \times 0.09 = 2,250 + 2,000 = \$4,250$

(b) Financial implications for TFR Co of accepting bank loan

Meeting the annual loan payments

The main issue is whether TFR Co will be able to meet the annual payments of interest and capital. The cash flow forecast has assumed that there is no difference between profit and cash, and that inflation can be ignored. The annual cash surplus after meeting interest and tax payments is therefore assumed to be equal to retained profit.

Year	1	2	3	4
	\$	\$	\$	\$
Retained profit	15,000	19,219	23,438	27,656
Capital repayment	<u>25,000</u>	<u>25,000</u>	<u>25,000</u>	<u>25,000</u>
Net cash flow	<u>(10,000)</u>	<u>(5,781)</u>	<u>(1,562)</u>	<u>2,656</u>

These net cash flow figures show that TFR Co **will not be able to meet the annual capital repayments**. A possible solution would be to **change the current dividend policy** of paying a constant proportion of profit after tax as dividends. For example, TFR could cut its dividend now and then increase it in the future as profitability allows. As TFR Co is owner-managed, this change will depend on the extent to which the owner or owners rely on dividend income.

The figures below show the **amount of profit available** in each year before dividends are paid. The annual cash flow shortfall is less than the annual dividend payment, so such a change in dividend policy would probably allow the loan to be accepted.

Year	1	2	3	4
	\$	\$	\$	\$
Profit after tax	30,000	38,438	46,875	55,313
Capital repayment	<u>25,000</u>	<u>25,000</u>	<u>25,000</u>	<u>25,000</u>
Available funds	<u>5,000</u>	<u>13,438</u>	<u>21,875</u>	<u>30,313</u>

Year 5 key financial indicators

Assuming that no turnover growth occurs after the fourth year, the key financial information in Year 5 will be as follows.

	\$
Turnover	390,000
Expenses	<u>312,000</u>
Net profit	78,000
Interest	<u>2,000</u>
Profit before tax	76,000
Tax	<u>19,000</u>
Profit after tax	57,000
Dividend	<u>28,500</u>
Retained profit	<u>28,500</u>
Equity finance	313,813
Debt finance	nil
Interest cover (times)	39
Debt/equity (%)	nil
Return on equity (%)	18
ROCE (%)	25
ROCE (%)*	23

*Including the existing and continuing overdraft in capital employed

Financial analysis

If the interest and capital payments are kept up, **financial risk** will be lower than its current level at the end of four years. After five years, **interest cover** has increased from its current level of 21 times to 39 times. However it fluctuates considerably during this period. It is quite low at 4.6 times at the end of the first year but at the end of the second year, it has improved to 6.9 times. There are further increases in subsequent years.

The **debt/equity ratio** peaks at 35% at the end of the first year and then falls rapidly with TFR Co returning to its current ungeared position after five years.

Both **return on equity (ROE)** and **return on capital employed (ROCE)** improve with growth in turnover, but are lower than current levels in the first and second years after the loan is taken out. At the end of five years ROE has improved to 18% from 15% and ROCE from 19% to 23%.

These figures indicate that TFR should be able to expand its business using debt finance, provided interest and capital repayments can be met. However, the **continuing overdraft** cannot be ignored when assessing financial risk. An average overdraft of \$20,000 is quite large for a company with an annual turnover of \$210,000. TFR Co may therefore consider asking for a **longer repayment period**, with lower annual capital repayments, if it plans to reduce the size of the overdraft or if it is concerned about future cash flow problems.

(c) Difficulties faced by small firms when seeking finance

Debt finance

The main handicap that small companies such as TFR Co face in accessing funds is the problem of **uncertainty**. A small company may not have the **business history nor larger track record** that larger organisations possess. Larger enterprises are subject by law to **more public scrutiny**; their accounts have to contain more detail and be audited, they receive more press coverage and so on. Because of the uncertainties involved, banks often use **credit scoring** systems to **control exposure**.

Because the information is not available in other ways, small companies will have to provide it when they seek finance. They will need to give a business plan, list of the firm's assets, details of the experience of directors and managers and show how they intend to provide security for sums advanced.

A common problem is often that the banks will be **unwilling** to increase loan funding without an increase in **security** given (which the owners may be unwilling or unable to give), or an increase in equity funding (which may be difficult to obtain).

A further problem is the **maturity gap**. It is particularly difficult for small companies to obtain medium term loans due to a mismatching of the maturity of assets and liabilities. Longer term loans are easier to obtain than medium term loans as longer loans can be secured with mortgages against property.

In general, banks tend to ask for **personal guarantees** from owners and will set interest rates at **higher levels** than those charged to larger companies. TFR Co has non-current assets which are much greater in terms of value than the amount of its overdraft and so the company may be able to offer these as security for a loan.

Equity finance

Small firms such as TFR often face an **equity gap**. There are unlikely to be any wealthy individuals willing to invest in this company because there are likely to be more attractive investments elsewhere. A major problem with obtaining equity finance can be the inability of the small firm to offer an easy **exit route** for any investors who wish to sell their stake.

Solutions

There are a range of solutions which have been created to help with these problems. A **Business Angel network** can bring potential investors and small companies together, with the added bonus that the Business Angel may have expertise and experience to offer that could be useful in a small company situation. The owner of TFR Co may wish to look into this possibility.

There may be other government initiatives designed to help small businesses which could also be investigated.

40 Echo Co

Text references. Dividend policy is covered in Chapter 13, gearing and capital structure in Chapter 14, sources of finance in Chapter 12 and operating leases in Chapter 11.

Top tips. This is a wide-ranging sources of finance question which really tests your knowledge of this area of the syllabus. It is also very time pressured so don't spend too long on any one part. Use ratio analysis to support your discussion of financial risk.

Easy marks. Part (c) is a straightforward regurgitation of textbook knowledge but make sure you answer the question and discuss the attractions of operating leasing rather than everything you know about leasing.

Examiner's comments. In part (a), many candidates calculated correctly the increased dividend per share and then offered very little by way of discussion in order to gain any further marks.

In part (b), the sector average debt/equity ratio (D/E) was provided, but many candidates chose to calculate capital gearing ($D/(D + E)$) in the mistaken belief that this was the debt to equity ratio. Comparison with the sector average gearing was therefore pointless, since the gearing ratios were on a different basis. Some candidates also calculated incorrectly the interest coverage, dividing interest into profit before tax or profit after tax, rather than into profit before interest and tax.

It was surprising to see many candidates attempting to calculate the cost of debt (internal rate of return) of the bond issue. The bonds were to be issued and redeemed at par and so their cost of debt was the same as their interest rate, as these unnecessary calculations confirmed (where they were made correctly).

In part (c), many candidates were able to calculate the theoretical ex rights price and the finance raised, and went on to calculate the effect of the rights issue on the gearing of the company. Some candidates mistakenly assumed that the proceeds of the right issue would be used to redeem some of the existing debt, but the question did not specify this and in practice this might not be possible. Very few candidates recognised that, just as with the proposal to make a bond issue, there had been no evaluation of the funding needs of the company.

In part (d) many answers offered an explanation of operating leasing, but very little discussion of its attractions as a source of finance to a company. Many answers did not compare leasing as a source of finance with borrowing to buy.

Marking scheme

		Marks
(a)	Discussion of proposal to increase dividend	5
(b)	Evaluation of debt finance proposal	3–4
	Discussion of debt finance proposal	4–5
	Maximum	7
(c)	Theoretical ex rights price per share	1
	Amount of finance raised	1
	Evaluation of rights issue proposal	2–3
	Discussion of rights issue proposal	3–4
Maximum		7
(d)	Discussion of attractions of leasing	6
		<u>25</u>

(a) **Proposal A – Increasing the dividend per share**

The dividend paid last year was \$2m which equates to 20c per share ($2/5 \times 0.5$). A 20% increase would result in a dividend payment of **24c**, a total dividend of \$2.4m (2×1.2). This would **reduce dividend cover** from 3 times ($6/2$) to 2.5 times ($6/2.4$).

Dividends as a signal to investors

The ultimate objective in any financial management decisions is to **maximise shareholders' wealth**. This wealth is basically represented by the **current market value** of the company, which should largely be determined by the **cash flows arising from the investment decisions** taken by management

Shareholders will look at a number of factors when analysing investments and not just dividends. They will be particularly interested in the **business** and **financial risk** of the company and will not necessarily be impressed with a large increase in dividends.

The dividend declared can be interpreted as a **signal** from directors to shareholders about the strength of underlying project cash flows. Investors usually expect a **consistent dividend policy** from the company, with stable dividends each year or, even better, **steady dividend growth**.

Modigliani and Miller

Modigliani and Miller (MM) proposed that in a tax-free world, shareholders are indifferent between dividends and capital gains, and the value of a company is determined solely by the 'earning power' of its assets and investments.

MM argued that if a company with investment opportunities decides to pay a dividend, so that **retained earnings** are **insufficient** to finance all its investments, the shortfall in funds will be made up by **obtaining additional funds** from outside sources. If a company pursues a consistent dividend policy, 'each corporation would tend to attract to itself a clientele consisting of those preferring its particular payout ratio, but one clientele would be entirely as good as another in terms of the valuation it would imply for the firm'.

Conclusion

The proposal to increase the dividend should be rejected as it will not generate any additional funds for the company and shareholders will not necessarily be attracted by the increase.

(b) **Proposal B – Bond issue**

Gearing

Echo Co current debt/equity (book value basis) = $30/20 \times 100\% = 150\%$

After bond issue debt/equity = $45/20 \times 100\% = 225\%$

Average debt/equity = 80%

Echo Co is currently **very highly geared** with a debt to equity ratio based on book values of almost twice that of the average of similar companies. A bond issue would increase the gearing to even higher levels.

Interest coverage

Echo Co interest coverage ratio = $12/3 = 4$ times

After bond issue interest coverage ratio = $12/(3 + (1.5)) = 2.7$ times

Average interest coverage ratio = 8 times

Echo Co currently has **half** the interest coverage of similar companies which indicates a much higher level of **financial risk**. The bond issue would further increase this risk and Echo could have difficulty making the interest payments.

The interest on the existing loan notes is \$2.4m ($8\% \times \$30m$) and the total interest charge in the income statement is \$3m. This implies that Echo Co also has an **overdraft** which further increases the level of financial risk.

Lack of investment opportunities

There are currently no suitable investment opportunities available and the bond issue proceeds would be invested short-term. The return on short-term investments will be **lower** than the interest charged on the loan notes, so there will be an **opportunity cost** which will decrease shareholder wealth. There is a significant **risk** that a suitable investment opportunity requiring exactly \$15m will not be found.

Loan redemption

The current loan notes are due to be redeemed in three years' time and this would be followed five years later by a repayment of the bond issue. This raises issues for the **financial planning** of the company which needs to consider how best to **refinance**.

Conclusion

The proposal to make a bond issue should be rejected as the level of financial risk is already too high.

(c) Proposal C – Rights issue

Rights issue price = $\$2.30 \times 80\% = \1.84

Theoretical ex-rights price

	\$
4 shares @ \$2.30	9.20
1 share @ \$1.84	1.84
<u>5</u>	<u>11.04</u>

Theoretical ex-rights price (TERP) = $11.04/5 = \$2.21$

Number of new shares to be issued = $(5/0.5)/4 = 2.5$ million

Amount of finance that would be raised = $\$1.84 \times 2.5\text{m} = \4.6 million

Gearing

Current debt/equity = $30/20 = 150\%$

After rights issue debt/equity = $30/24.6 = 122\%$

As discussed in part (b), the current level of **financial risk** of Echo Co is unacceptably high and needs to be reduced. The rights issue would reduce the level of gearing to 122% but this is still higher than the average for similar companies.

Interest coverage

Current interest coverage ratio = $12/3 = 4$ times

Current return on equity = $6/20 \times 100 = 30\%$

Assuming the rate of return on the new equity will be the same:

After-tax return on the new funds = $4.6\text{m} \times 30\% = \1.38 million

Before-tax return on the new funds = $1.38\text{m} \times (9/6) = \2.07 million

After rights issue interest coverage = $(12 + 2.07)/3 = 4.7$ times

The interest coverage ratio would improve after the rights issue but again, is still worse than the average for similar companies.

Purpose of the rights issue

The aim of the rights issue is to **reduce the level of gearing and the financial risk** of the company. To some extent, this would be achieved but, in order to make more of a significant impact, the level of debt would need to be reduced much further. The amount of refinancing required is much greater than \$4.6m and there is no indication that a suitable investment has been identified.

Unless more information can be provided on how the rights issue proceeds could be effectively used, the rights issue proposal cannot be recommended.

Note: You could sensibly have assumed that the equity raised will be used to reduce debt – this will result in a different gearing calculation and interest coverage ratio

(d) **Operating leases**

An operating lease is a lease where the lessor retains most of the risks and rewards of ownership. It is a rental agreement between a lessor and a lessee with the lessor **supplying** the equipment to the lessee. The lessor is **responsible** for **servicing and maintaining** the leased equipment

Protection against obsolescence

A key advantage of an operating lease for the lessee is that the equipment is leased for a **shorter period** than its expected useful life. In the case of high-technology equipment, if the equipment becomes out of date before the end of its expected life, the lessee does not have to keep on using it. The lessor will bear the risk of having to sell obsolete equipment secondhand.

Source of finance

As a source of finance, leasing is particularly attractive to small companies or those who find it **difficult to raise debt finance**. There is no commitment to interest payments, and no need to use existing assets for security. If the lessee gets into financial difficulties, the asset will simply be returned to the lessor who retains legal title.

Cost

The lessor may be able to obtain the asset at a **cheaper** price than the lessee. This can be due to bulk buying economies, lower finance costs and/or more effective use of tax benefits. The lower cost can then be passed on to the lessee in the form of lower lease payments.

Off-balance sheet financing

The leased equipment does not have to be shown in the **lessee's** published **balance sheet**, and so the lessee's balance sheet shows no increase in its gearing ratio.

41 JJG Co

Text reference. Measuring the achievement of objectives is covered in Chapter 1, rights issues and sources of finance in Chapter 12.

Top tips. In part (a) use the corporate objectives as headings for your financial analysis and calculate the ratios suggested by the given industry averages. Use a clear layout for your calculations to help the marker. Part (b) requires calculations and comments on the effect of the rights issue. Plan your answer to part (c) so that you answer the specific requirements of the question in sufficient detail.

Easy marks. There are plenty of easy marks available for the calculations in this question but don't spend too much time on the calculations at the expense of the discussion marks.

Examiner's comments. In part (a) many candidates had difficulty in calculating accounting ratios to compare with the sector averages provided. Many candidates did not understand the significance of the inclusion in the question of an average sector value for the return predicted by the CAPM.

Many answers to part (c) had little or no analysis and compared the three financing methods only in general terms.

ACCA examiner's answer. The examiner's answer to this question is included at the back of this kit.

Marking scheme

		Marks
(a)	Relevant financial analysis	6–7
	Shareholder wealth discussion	2–3
	Earnings per share growth discussion	2–3
	Comment on financial performance	1–2
	Maximum	12
(b)	Share price calculation and comment	2–3
	Earnings per share calculation and comment	2–3
	Debt/equity ratio calculation and comment	1–2
	Maximum	6
	(c)	Financial analysis
Discussion of rights issue and placing		2–3
Discussion of bond issue		2–3
Maximum		7
		<u>25</u>

(a) Financial analysis

	20X8	20X7	20X6	20X5
Turnover (\$m)	28.0	24.0	19.1	16.8
Turnover growth	17%	26%	14%	
Geometric average growth = $3\sqrt{\frac{28.0}{16.8}} - 1 = 18.6\%$				
Profit before interest and tax (\$m)	9.8	8.5	7.5	6.8
PBIT growth	15%	13%	10%	
Geometric average growth = $3\sqrt{\frac{9.8}{6.8}} - 1 = 13.0\%$				
Earnings (\$m)	5.5	4.7	4.1	3.6
Earnings per share (cents)	100	85	75	66
EPS growth	18%	13%	14%	
Geometric average growth = $3\sqrt{\frac{100}{66}} - 1 = 14.9\%$				
Dividends (\$m)	2.2	1.9	1.6	1.6
Dividends per share (cents)	40	35	29	29
DPS growth	14%	21%	nil	
Geometric average growth = $3\sqrt{\frac{40}{29}} - 1 = 11.3\%$				
Ordinary shares (\$m)	5.5	5.5	5.5	5.5
Reserves (\$m)	13.7	10.4	7.6	5.1
Shareholders' funds (\$)	19.2	15.9	13.1	10.6
8% Bonds, redeemable 20Y5 (\$m)	20	20	20	20
Capital employed (\$m)	39.2	35.9	33.1	30.6
Profit before interest and tax (\$m)	9.8	8.5	7.5	6.8
Return on capital employed	25%	24%	23%	22%
Earnings (\$m)	5.5	4.7	4.1	3.6
Return on shareholders' funds	29%	30%	31%	34%
8% Bonds, redeemable 20Y5 (\$m)	20	20	20	20
Market value of equity (\$m)	47.5	31.6	18.4	14.7
Debt/equity ratio (market value)	42%	63%	109%	136%

Share price (cents)	864	574	335	267
Dividends per share (cents)	40	35	29	
Total shareholder return				
$\frac{\text{Increase in sharevalue} + \text{Dividend}}{\text{Share value at start of period}}$	57%	82%	36%	

Evaluation of financial performance

The increase in **turnover** has been inconsistent whereas there has been a **continual growth in ROCE** to 25% in 20X8. This is now the same as the industry average.

Return on shareholder funds has been consistently higher than the 20% industry average, although it has declined every year. The **debt/equity ratio** has been falling as a result of the increase in shareholder funds, but until 20X8 it was higher than the industry average.

Maximising the wealth of shareholders

The wealth of shareholders is increased by dividends received and capital gains from the movement of share prices. **Total shareholder return** is a measure which combines the increase in share price and dividends paid. The shareholders of JJG Co had a total return of 57% in 20X8 compared with a **return predicted by the capital asset pricing model** of 14%. In 20X7 it was even higher at 82%.

It would therefore appear that shareholders wealth has increased by **more** than was to be expected. This may however have happened as a result of a **general increase** in share prices rather than the specific actions of the company. The share price is over 3 times higher in 20X8 than in 20X5 but dividends per share have not increased to the same extent. It is therefore difficult to know whether shareholder wealth has been maximised.

Achieving continuous growth in earning per share

Earnings per share have increased every year with an average growth rate of 14.9% This objective has therefore been achieved.

(b) (i) Calculation of theoretical ex-rights price per share

Current share price = \$8.64 per share

Current number of shares = 5.5 million shares

Finance to be raised = \$15m

Rights issue price = \$7.50 per share

Number of shares issued = $15\text{m}/7.50 = 2$ million shares

Theoretical ex rights price per share = $((5.5\text{m} \times 8.64) + (2\text{m} \times 7.50))/7.5\text{m} = \mathbf{\$8.34}$ per share

The **share price would fall** from \$8.64 to \$8.34 per share but there would be no effect on shareholder wealth.

(ii) Effect of rights issue on earnings per share

Current EPS = 100 cents per share

Revised EPS = $100 \times 5.5\text{m}/7.5\text{m} = \mathbf{73}$ cents per share

The **EPS would fall** from 100 cents per share to 73 cents per share but there would be no effect on shareholder wealth.

(iii) Effect of rights issue on the debt/equity ratio

Current debt/equity ratio = $20/47.5 \times 100 = 42\%$

Revised market value of equity = $7.5\text{m} \times 8.34 = \62.55 million

Revised debt/equity ratio = $20/62.55 \times 100 = \mathbf{32\%}$

The debt/equity ratio would **fall** from 42% to 32%, which is well below the sector average value and would signal a reduction in financial risk.

(c) **Bond issue**

The **debt/equity ratio** is currently 42% ($20/47.5 \times 100$) and is less than the sector average value of 50%.

The **interest coverage ratio** is a useful indicator of risk as it looks at the extent to which interest payments are covered by profits.

	20X8	20X7	20X6	20X5
Profit before interest and tax (\$m)	9.8	8.5	7.5	6.8
Bond interest (\$m) ($8\% \times \$20m$)	1.6	1.6	1.6	1.6
Interest coverage ratio (times)	6.1	5.3	4.7	4.3

The interest coverage ratio has improved but is still **below** the industry average and is low enough to give cause for concern. It indicates that **more debt** would be **inadvisable**.

A bond issue would probably need to be **secured** and JIG Co would need to consider whether it has **sufficient non-current assets**.

Equity finance

A **placing** and a **rights issue** are both ways of issuing equity finance and would also **reduce gearing**. If the business expansion results in increased profits, **interest coverage** would also improve and financial risk would fall.

A **placing** is an arrangement whereby the shares are not all offered to the public, but instead, the sponsoring market maker arranges for most of the issue to be bought by a **small number of investors**, usually institutional investors such as pension funds and insurance companies. This would **dilute** ownership and control.

A **rights issue** is an offer to existing shareholders inviting them to subscribe cash for new shares in proportion to their existing holdings. Provided existing shareholders take up their rights, a rights issue **will not dilute** ownership and control.

A rights issue or a placing will not require **security** unlike a bond issue.

42 XYZ Co

Text references. Cost of capital is covered in Chapter 15 and sources of finance in Chapter 12.

Top tips. In (a), the actual values relating to the debt being raised have been used in the suggested solution. It would be equally appropriate to use values based on a \$100 unit of debt. The exceptions to the rule about using WACC to appraise investments should be noted in (c). In (d) you should take into account operational as well as financial factors.

A table format for comparisons will not always be appropriate, but in (d) it provides a clear way of giving the detail needed on each option.

In (a) five marks were available for the two calculations necessary to find the IRR and three marks for the interpolation. In (b) you would have been given credit for using the cost of debt that you calculated in (a) and using market values of share capital and debt. In (c) most of the marks were available for explaining the importance of capital structure and financial risk. Answers to (d) needed to be quite broad to gain marks, covering cash flow, risk and security, but also mentioning financial reporting implications.

- (a) The **after tax cost of debt equates** to the **discount rate** at which the cost of the debt over the ten year period is zero. This can be estimated by trying different discount rates and then interpolating.

In order to raise \$72m, XYZ Co must issue \$80m of debt, since the debt is to be issued at a **discount** of 10% on par value ($\$72m \div 0.9 = \$80m$).

The **annual interest cost** net of tax will be $\$80m \times 6\%(1 - 0.3) = \$3.6m$.

The cash flows will be as follows:

Year	Cash flow \$m	5% discount factors	PV \$m	6% discount factors	PV \$m
0	Issue proceeds (72)	1.000	(72)	1.000	(72)
1-10	Interest 3.36	7.722	25.95	7.360	24.73
10	Capital repayment 80	0.614	49.12	0.558	44.64
			<u>3.07</u>		<u>(2.63)</u>

Calculate the cost of debt using an IRR calculation.

$$\begin{aligned} \text{IRR} &= a\% + \left[\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \times (b - a) \right] \% \\ &= 5\% + \frac{3.07(6\% - 5\%)}{3.07 + 2.63} = 5.54\% \end{aligned}$$

The **after tax cost of debt** is therefore 5.54%

(b) $V_E = 200 \text{ million} \times \1.50
 $= 300 \text{ million}$

$$\begin{aligned} \text{WACC} &= \left(\frac{V_E}{V_E + V_D} \right) k_e + \left(\frac{V_D}{V_E + V_D} \right) k_d(1 - T) \\ &= \left(\frac{300}{300 + 72} \right) \times 10 + \left(\frac{72}{300 + 72} \right) \times 5.54 \\ &= 9.14\% \end{aligned}$$

(c) **Cost of debt**

The cost of debt is an inappropriate rate to use, as it fails to recognise **any impact** on **existing providers** of finance.

Return in excess of cost of capital

Any new investment undertaken by a company should generate a return in **excess** of the **overall cost of capital** to the company. This is the **minimum return** that a company should make on its own investments, to earn the cash flows out of which investors can be paid their return.

Use of WACC

The current **weighted average cost of capital** should generally be used to **evaluate projects**. This is because the **marginal cost of new capital** should be **roughly equal** to the **weighted average cost of current capital**, provided that the **company's capital structure changes slowly** over time.

Exceptions to use of WACC

- (i) Where the new investment has **different business risk characteristics** from the company's existing operations, and thus the **return required** by shareholders (**the cost of equity**) might **change** as a result of undertaking the investment.
- (ii) Where the **finance** that is raised to fund the new investment **substantially changes** the **capital structure** and the perceived **financial risk** of investing in the company.

Implications for XYZ

XYZ Co is a large listed company, and therefore the **size** of this **investment**, although large, is unlikely to have a significant impact on the capital structure. The project itself is concerned with the **replacement of existing assets**, and is therefore unlikely to change the level of business risk faced by the company. There is therefore no reason why the weighted average cost of capital should not be used in this case, and the after tax cost of the new debt should not therefore be used to evaluate the investment.

- (d) To: Board of Directors, XYZ Co
 From: Management Accountant
 Date: 11 December 20X1
 Subject: Choice of financing method

Introduction

This memorandum deals with the factors that should be considered when deciding which of the three methods of financing the grinding machines is the most appropriate.

Operational effects

These can be summarised as follows:

Option 1	Option 2	Option 3
Use of the machines guaranteed for the full 10 year useful life .	Use of the machines guaranteed for the full 10 year useful life .	Use of the machines would have to be renegotiated annually , with resulting insecurity.
XYZ tied into this technology for the full 10 year life of the machines. If the technology is superseded, change could be difficult and expensive.	XYZ tied into this technology for at least eight years of the ten year life of the machines.	The use of a series of annual contracts means that in the event of technological change, XYZ would be able to adapt quickly and would not need to write off obsolete plant.
XYZ responsible for maintenance .	XYZ responsible for maintenance .	Lessor responsible for maintenance . This could have quality implications.
Payables' security is a fixed charge over the machines and a floating charge over other assets.	Lessor's security is over the machines alone .	Lessor's security is over the machines alone .

Financial effects

Option 1	Option 2	Option 3
Interest payments on the debt interest would be tax allowable .	The interest element of the annual payments would be allowable against tax.	Although the lease rentals are higher than under option 2, they would be fully tax allowable .
XYZ would be able to claim tax allowable depreciation on the purchase of the machines.	Tax allowable depreciation is not available .	Tax allowable depreciation is not available .
Annual costs would be low , being only the interest payments on the debt.	Annual costs would be higher for the first eight years, but would be insignificant for the final two years.	Annual costs would be the highest for each of the ten years.
XYZ would have to find \$8m to repay the debt at the end of the ten year period. Some of this might be recoverable from machine sale proceeds, but these are uncertain.	There would be no terminal costs at the end of the ten year period.	There would be no terminal costs at the end of the ten year period.
Key balance sheet ratios may be affected by including assets and debt on the balance sheet.	Key balance sheet ratios may be affected by including assets and debt on the balance sheet.	Assets and finance are off balance sheet .

Conclusions

The key factors to be considered are:

(i) **Operational**

Technological flexibility may be important, and **responsibility for maintenance** could prove expensive.

(ii) **Cash flow**

The different options have **different cash flow patterns**.

(iii) **Cost**

The total cost of the different options over the ten year life of the project should be evaluated using **discounted cash flow techniques**.

(iv) **Taxation**

The company should consider whether it could use all the **tax allowable depreciation** available under option 1, and whether it has sufficient annual income to benefit from the tax savings on expenses under options 2 and 3.

Signed: Management Accountant

43 D Co

Text references. Cost of capital is covered in Chapter 15.

Top tips. Unusually for gearing and WACC calculations the company has preference shares as well as equity shares and debt. As (a) does not specify which gearing ratio to use, you should begin your answer by stating how you are calculating gearing. Remember that you include reserves when you are calculating gearing using book values, and they should be excluded when you are calculating gearing using market values.

In (b) it is important to set out clearly which formula you're using; it demonstrates to the marker that you understand the principles. You wouldn't however need to define as we have done the symbols used in a formula that you are given on the exam paper. If you were unsure on how to calculate the cost of preference shares, you do so in exactly the same way as you calculate the cost of equity shares with g equalling 0. Note also that you do not adjust the cost of preference share capital for tax, but you must adjust the cost of loan notes for tax.

In (c) any answer on the CAPM must focus on the different types of risk.

In (d) you should consider the viewpoint of the investor as well as the viewpoint of the company.

(a) The **gearing ratio** can be calculated using the following expression:

$$\text{Gearing} = \frac{\text{Prior charge capital}}{\text{Prior charge capital} + \text{equity}}$$

(i) **Using book values**, prior charge capital includes:

	<i>Book value</i>
	\$'000
9% loan notes	8,000
7% preference shares	1,000
	<u>9,000</u>
Equity:	
Ordinary share capital	2,000
Share premium account	1,100
Retained earnings	6,550
	<u>9,650</u>

$$\text{Gearing} = \frac{9,000}{9,000 + 9,650} = 48.3\%$$

(ii) Using **market values**, prior charge capital includes:

	<i>Market value</i> \$'000
9% loan notes @ 80c per \$1	6,400
7% preference shares @ 77c per \$1	770
	7,170

Equity:

Ordinary shares @ \$1.35 per 25c nominal value 10,800

$$\text{Gearing} = \frac{7,170}{7,170 + 10,800} = 39.9\%$$

(b) The **weighted average cost of capital (WACC)** can be found using the following expression:

$$\text{WACC} = \left[\frac{V_E}{V_E + V_P + V_D} \right] k_e + \left[\frac{V_P}{V_E + V_P + V_D} \right] k_{\text{pref}} + \left[\frac{V_D}{V_E + V_P + V_D} \right] k_d (1 - T)$$

where:

k_e = cost of equity

k_{pref} = cost of preference shares

$k_d (1 - T)$ = cost of debt (after tax)

V_E = market value of equity in the firm

V_P = market value of preference shares in the firm

V_D = market value of debt in the firm

The next step is to calculate the cost of the different sources of capital in D Co:

Cost of equity (k_e)

This can be found using the dividend growth model:

$$k_e = \frac{d_0 (1 + g)}{p_0} + g$$

where: d_0 = current level of dividends

g = dividend growth rate in perpetuity

p_0 = current market price of equity

$$\begin{aligned} k_e &= \frac{10(1 + 0.09)}{135} + 0.09 \\ &= 17.1\% \end{aligned}$$

Cost of preference shares (k_{pref})

This can be found by dividing the preference dividend rate by the market price of the shares:

$$\begin{aligned} k_{\text{pref}} &= \frac{7}{77} \\ &= 9.1\% \end{aligned}$$

Although preference shares are included with prior charge capital, the dividend is not allowable for tax, and therefore no adjustment needs to be made for this.

Cost of loan notes (k_{net})

The after tax cost of the loan notes can be found using the following expression:

$$k_d = \frac{i(1-T)}{p_0}$$

where: i = rate of debenture interest

p_0 = market price of loan notes

T = rate of tax

$$\begin{aligned} k_d &= \frac{9(1-0.3)}{80} \\ &= 7.9\% \end{aligned}$$

The WACC can now be calculated:

$$\begin{aligned} \text{WACC} &= \frac{(17.1 \times 10,800)}{17,970} + \frac{(9.1 \times 770)}{17,970} + \frac{(7.9 \times 6,400)}{17,970} \\ &= 13.5\% \end{aligned}$$

(c) Role of CAPM

The **capital asset pricing model** (CAPM) provides an alternative to the dividend valuation model in calculating the cost of equity. Unlike the dividend valuation model, the CAPM seeks to differentiate between the various types of risk faced by a firm and to allow for the fact that new projects undertaken may carry a different level of risk from the existing business.

Systematic risk

The model focuses on the level of **systematic risk** attaching to the firm, in other words, that element of risk which is common to all investments and which cannot be avoided by diversification. The model uses the **beta factor** as a measure of an individual share's volatility of expected returns as against the market average. A beta factor of less than 1.0 indicates that the expected volatility is less than that of the market as a whole, and vice versa.

Formulation of model

The model can be formulated as follows:

$$E(r_i) = R_f + \beta_i (E(r_m) - R_f)$$

where: $E(r_i)$ = cost of equity capital

β_i = beta factor for the firm's equity

$E(r_m)$ = market rate of return

R_f = risk free rate of return

Thus the additional information that would be required is as follows.

Beta factor

This can be calculated statistically from historical records of:

- (i) The **returns earned** by the **share** in terms of capital gains/losses and dividends
- (ii) The **overall returns** earned by the market

Market rate of return

The average annual rate of return on the securities market as a whole. This can be calculated from historical records.

Risk free rate of return

This is generally taken to be the rate of return on government bonds.

(d) **Reasons for using loan notes**

- (i) **Loan notes** are a **cheaper form of finance** than preference shares because debenture interest is tax deductible, unlike preference dividends.
- (ii) **Loan notes** are **more attractive** to **investors** because they are secured against the company's assets.
- (iii) **Debenture holders rank before preference shareholders** in the event of a liquidation.
- (iv) **Issue costs** should be **lower for loan notes** than for preference shares.

44 IML Co

Text references. CAPM is covered in Chapter 15 and the efficient market hypothesis in Chapter 18.

Top tips. Although this looks like a question on the CAPM, the final part of the question requires a discussion of the efficient markets hypothesis and you may not have come across this yet in your studies. It is covered in part G of the syllabus and again illustrates that questions may cover different parts of the syllabus.

Note the requirement for the discussion in (c) to be comprehensible to a non-financial manager. Discussion of the assumptions and limitations of CAPM carried most marks in (c), although to score heavily the efficient markets hypothesis and the chairman's assertions also needed to be discussed, and the calculations carried out in (a) and (b) used in support.

- (a) The required rate of return on equity can be found using the capital asset pricing model:

$$E(r_i) = R_f + \beta_i (E(r_m) - R_f)$$

AZT Co

$$\begin{aligned} E(r_i) &= 5\% + 0.7(15\% - 5\%) \\ &= \mathbf{12\%} \end{aligned}$$

BOR Co

$$\begin{aligned} E(r_i) &= 5\% + 1.4(15\% - 5\%) \\ &= \mathbf{19\%} \end{aligned}$$

- (b) The beta for IML can be found using the same expression:

$$17\% = 5\% + \beta(15\% - 5\%) \quad E(r_i)$$

$$\beta = \frac{(17\% - 5\%)}{(15\% - 5\%)}$$

The beta factor = 1.2

The **beta factor** is a measure of the volatility of the return on a share relative to the stock market. If for example a share price moved at three times the market rate, its beta factor would be 3.0. The beta factor indicates the level of **systematic risk**, the risk of making an investment that cannot be diversified away. It is used in the capital asset pricing model to determine the level of return required by investors; the higher the level of systematic risk, the higher the required level of return.

- (c) To: The Chairman
From: Finance Director
Date: 20 November 20X1
Subject: The Capital Asset Pricing Model (CAPM) and stock market reactions

(i) **Assumptions and limitations of CAPM**

Diversification

Under the CAPM, the return required from a security is **related** to its **systematic risk** rather than its total risk. Only the risks that **cannot** be **eliminated** by diversification are **relevant**. The assumption is that investors will hold a **fully diversified portfolio** and therefore deal with the unsystematic risk themselves. However, in practice, markets are **not totally efficient** and investors do not all hold fully

diversified portfolios. This means that total risk is relevant to investment decisions, and that therefore the relevance of the CAPM may be limited.

Excess return

In practice, it is difficult to determine the excess return ($R_m - R_f$). **Expected rather than historical returns** should be used, although historical returns are used in practice.

Risk-free rate

It is similarly difficult to **determine the risk-free rate**. A risk-free investment might be a government security; however, interest rates vary with the term of the debt.

Risk aversion

Shareholders are risk averse, and therefore **demand higher returns** in compensation for increased levels of risk.

Beta factors

Beta factors based on historical data may be a **poor basis** for future **decision making**, since evidence suggests that beta values fluctuate over time.

Unusual circumstances

The CAPM is **unable to forecast accurately returns for companies with low price/earnings ratios**, and to take account of **seasonal 'month-of-the-year' effects** and **'day-of-the-week' effects** that appear to influence returns on shares.

Possible reasons for the apparent discrepancy in betas for AZT Co and BOR Co

The Chairman has expressed the view that AZT Co is a higher risk company than BOR because it operates in overseas markets. This factor gives rise to its **lower beta value**. Its returns are likely to have a **lower correlation** with those of the stock market as a whole, and therefore it has a **lower level of systematic risk**. It is also possible that the **level of total risk** faced by AZT Co is lower because it is **better diversified** than BOR.

Efficient markets hypothesis

The way in which the stock market responds to information released by a company can be understood with reference to the **efficient markets hypothesis (EMH)**. It is generally accepted that most stock markets demonstrate a **semi-strong form of market efficiency**. This means that share prices **respond immediately** to all **publicly available information**, but not to information available only to insiders.

Implications of efficient markets hypothesis

- It is **not possible** consistently to **beat the market** (on a risk-adjusted basis) without the use of inside information
- **Past share prices** are **not a predictor** of future share prices
- The price of a share reflects **market expectations** of future performance
- Investors behave **rationally** and are not deceived by manipulation of accounting figures

(ii) IML's position

This can help to explain the situation of IML Co. The effect of an announcement of either profit or loss on the share price will not depend simply on the **magnitude** of the profit or loss, but in the relationship between the **announcement** and what the **market was expecting**. In this case, the company announced a loss and the share price rose. The market might have been expecting the **loss** to be **much larger** than it actually was, and the share price therefore adjusted in response to what was effectively good news. Alternatively, it could be that investors looked not simply at the loss, but at the **future prospects** of the company and decided that these were better than had been expected. The share price would then rise accordingly.

Signed:

Finance Director

45 KJI

Text references. Shareholder ratios are covered in Chapter 1 and cost of capital in Chapters 15 and 16.

Top tips. The main difficulty in part (a) is answering all the parts in the time available; providing explanations, uses and limitations is a lot to do in the time you are given. You would maximise your mark-scoring by giving some commentary on every ratio as well as calculating them.

Part (b) is asking you not to describe the changes but to **explain why** they happened. It thus tests your imagination and your understanding of the most plausible reasons for changes – a share capital increase is caused by a share issue, but what sort of share issue? The question also tests your understanding of the **interaction** of various ratios; a decision to increase dividends may leave the dividend yield unchanged, but it may cause the dividend cover to fall. You also would gain credit by linking events (company buying back shares) with impact on market and share price (market becomes uncertain of company's intentions.)

Part (c) is another weighted average cost of capital calculation with the complications of preference shares and tax. Part (d) demonstrates why WACC should be used by companies for assessing investment. If you are unsure about this, think about the effect of the new funding and investments on the overall capital structure of the firm, and the implications of this for raising finance in the future.

(a)

		20X6	20X7	20X8	20X9
1	Equity earnings (\$m)	200	225	205	230
2	Number of shares (m)	2,000	2,100	2,100	1,900
3	Price per share (cents)	220	305	290	260
4	Dividend per share (cents)	5	7	8	8
<i>Solution:</i>					
5	Earnings per share (= 1 ÷ 2)	10.0c	10.7c	9.8c	12.1c
	Dividend yield (= 4 ÷ 3)	2.3%	2.3%	2.8%	3.1%
	Dividend cover (= 5 ÷ 4)	2.0	1.5	1.2	1.5 times
	Price/earnings ratio (= 3 ÷ 5)	22.0	28.5	29.6	21.5 times

Earnings per share

Earnings per share (EPS) shows the amount of profit after tax attributable to each ordinary share. Although a high EPS generally indicates success, care must be taken in interpreting the trend in EPS when there have been **share issues**, especially rights issues at heavily discounted prices or bonus issues, both of which result in a fall in EPS. Similar problems are encountered when warrants or convertible loan notes are issued.

Dividend yield

The **dividend yield** shows the ordinary dividend as a rate of return on the share value. The figures shown in this example are *after* basic rate income tax, whereas they are normally shown gross. The figure is of limited use because it shows **only part of the return** to the **equity investor**.

Dividend cover

The **dividend cover** shows how many times bigger the EPS is than the dividend per share. A **high dividend cover** shows that a **large proportion** of **equity earnings** is being **reinvested for growth**.

Price/earnings ratio

The **price/earnings ratio** (P/E ratio) shows how many times bigger the share price is than the EPS. In general, the bigger the EPS, the more the share is in demand, though care must be taken when making comparisons because whereas EPS is a historical result, the **share price** is **based on future expectations** and is affected by both risk and growth factors. Consequently, abnormal results can often arise from a crude use of P/E ratios.

(b) **Trends in 20X7**

In 20X7, **share capital was increased by 5%**, probably through a **rights issue**. Equity earnings increased more than proportionately, resulting in a 7% increase in EPS, indicating a successful year. **Demand** for the company's **shares rose swiftly**, either because of a **general stock market rise** or because of **high expectations** of KJI's future growth, and the share price rose by approximately 40%. This caused a **big rise in P/E** and allowed a 40% increase in dividend per share with no fall in dividend yield. The dividend cover fell, however, because the dividend increased much more than earnings.

Trends in 20X8

The company's **earnings and EPS fell in 20X8**, either because of normal cyclical business risks or possibly because the high 20X7 dividend left insufficient cash for reinvestment. However, the company gave a 'bullish' signal to the market by **increasing its dividend per share**, indicating future prospects of a swift recovery and increased growth. As a result, the **dividend yield increased** and, although the share price fell in line with earnings, there was no disproportionate drop in demand for the company's shares, as shown by the stability of the P/E.

Trends in 20X9

There was 12% **earnings growth** in 20X9. The company used some of its cash to **buy back ordinary shares**. This is possibly because it offered shareholders the choice between a cash and a scrip dividend. Share capital reduced by about 10%, resulting in a big increase in earnings per share. Although 20X9 was a successful year for earnings, **demand for the company's shares fell**, as shown by the drop in share price and P/E. It is possible that the market has become **uncertain** of the company's **future plans**, as a result of the share issue and share buy-back in quick succession.

(c) **Assumptions**

It is assumed that the **market prices** of the shares and loan notes are **quoted excluding dividend** and interest. Since the WACC is to be calculated based on market values, the cost of reserves can be ignored.

Cost of equity

The dividend valuation model taking into account growth will be used.

$$k_e = \frac{d_1}{p_0} + g$$

where:

k_e	=	cost of equity
d_1	=	next year's dividends
g	=	annual rate of growth in dividends
p_0	=	market price of shares (ex div)

In this case:

k_e	=	$4/80 + 0.12$
	=	17.0%

Cost of preference shares

$$k_{pref} = d/p_0$$

where:

k_{pref}	=	cost of preference shares
d	=	preference dividend (9c)
p_0	=	market price of shares (72c)
k_{pref}	=	$9/72$
	=	12.5%

Cost of loan notes

It is assumed that the loan notes are irredeemable. The after tax cost to the company will be calculated.

$$k_d = \frac{i(1 - T)}{p_0}$$

where:

$$\begin{aligned}
 k_d &= \text{cost of loan notes} \\
 I &= \text{annual interest payment (14c)} \\
 p_0 &= \text{market price of loan notes (100c)} \\
 T &= \text{rate of tax (33\%)} \\
 k_d &= \frac{14(1-0.33)}{100} \\
 &= 9.4\%
 \end{aligned}$$

Weighted average cost of capital (WACC)

	<i>No in issue</i>	<i>Market price</i>	<i>Market Value</i>
	\$	\$	\$
Equity	10,400,000	0.80	8,320,000
Preference shares	4,500,000	0.72	3,240,000
Loan notes	5,000,000	1.00	5,000,000
			<u>16,560,000</u>

$$\text{WACC} = 17.0 \left[\frac{8,320}{16,560} \right] + 12.5 \left[\frac{3,240}{16,560} \right] + 9.4 \left[\frac{5,000}{16,560} \right] = 13.8\%$$

(d) Required rate of return

It is not usually correct to regard the **required rate of return** for an individual project as the cost of the actual source of funds that will be used to finance it, even where the funds can be traced directly. Debt is cheaper than equity only because there is an **equity base** which takes the risk – if the equity funds were not there then the company could not borrow. Each year some profits should be retained to increase the equity base, thus allowing further borrowing to take place. The borrowing is not independent of equity funds, and thus it is appropriate to combine the two in arriving at the cost of capital to be used in project appraisal.

WACC

The WACC reflects the company's **long-term capital structure**, and therefore capital costs. The capital structure generally changes only very slowly over time, and therefore the marginal cost of new capital should be approximately equal to the WACC. The **WACC** is therefore a more appropriate yardstick for the evaluation of new projects.

- (ii) Managers should be **discouraged** from attempting to **manipulate** their **accounting results**, since the truth will be realised quickly, and prices adjusted accordingly.
- (iii) The company may concentrate on producing **constantly improving financial results** at the expense of the company's **responsibility to other stakeholders** in the business, such as its employees and the environment.

46 WEB Co

Text references. Cost of capital is covered in Chapter 15, capital structure theories in Chapter 16 and sources of finance in Chapter 12.

Top tips. In part (a) make sure you recognise that the debt is redeemable and use market values for the WACC. In the written parts of the question, you must focus on the question requirements and not just write everything you know about different sources of finance.

(a) **Cost of equity**

$$k_e = \frac{d_0(1+g)}{P_0} + g$$
$$= \frac{1(1+0.04)}{10.40} + 0.04$$
$$= 14\%$$

Cost of debt

Year		Cash Flow \$	Discount Factor 10%	PV \$	Discount Factor 5%	PV \$
0	Market value	(100.84)	1.000	(100.84)	1.000	(100.84)
1-3	Interest (after tax)	6.30	2.487	15.67	2.723	17.15
3	Capital repayment	100.00	0.751	75.10	0.864	86.40
				<u>(10.07)</u>		<u>2.71</u>

$$k_d = 5 + \left(\left(\frac{2.71}{2.71 - 10.07} \right) \times (10 - 5) \right)$$
$$= 6.06\%$$

WACC

$$WACC = \left(\frac{V_E}{V_E + V_D} \right) k_e + \left(\frac{V_D}{V_E + V_D} \right) k_d$$

$$V_E = 100 \times 10.40$$
$$= \$1,040 \text{ million}$$

$$V_D = 200 \times 1.0084$$
$$= \$201.68 \text{ million}$$

$$WACC = \left(\frac{1,040}{(1,040 + 201.68)} \right) \times 14 + \left(\frac{201.68}{(1,040 + 201.68)} \right) \times 6.06$$
$$= 12.71\%$$

(b) (i) **Cost of equity**

The **cost of equity** will rise if the company takes out extra loans. The **interest and debt repayment** burden will increase the risk that WEB will not be able to pay dividends, and also increase the risk that WEB will run into financial difficulties through not being able to meet its loan commitments. If liquidation occurs, debtholders will rank before equityholders. Equity investors will demand an increased level of return to compensate for this risk.

(ii) **Cost of debt**

According to the traditional view, the **cost of debt** will remain unchanged up to a certain level of gearing. Above that level it will increase, because of the financial risk that the company will not be able to meet its commitments, and hence interest or even principal lent may be jeopardised.

(iii) **Weighted average cost of capital**

According to the traditional view, the **weighted average cost of capital** will fall initially as debt capital is introduced, because debt at first has a lower cost than equity, being a lower-risk investment. Ultimately however the weighted average cost of capital will rise as risk levels increase, resulting in the rise in the cost of equity becoming more significant, and ultimately the cost of debt will rise. The **optimum level of gearing** is where **the company's weighted average cost of capital is minimised**.

(c) **Bank loan**

A **bank loan** is a loan of a specific amount from a bank for a set period. **Repayment** may be in **instalments** or at the end of the **loan**, and **interest** will be payable on the amount outstanding. Security is likely to be in the form of a **floating charge** over the company's assets.

Loan notes

Loan notes are issued by the company, backed by a **written acknowledgement** of the debt given under seal containing **provisions on payment of interest** and the **terms of repayment of principal**. It may be held by more than one lender. Loan notes of listed companies can be **traded**, and they may be **redeemable** (repayable at a certain time), **convertible** (can be converted into share capital at a certain time) or **irredeemable**.

The cost of debt may differ because:

- (i) Loan note holders can **trade** the loan notes and may therefore accept a lower yield in return for **better liquidity**.
- (ii) The **security** that the bank demands may differ from the security given to the loan note holders. A lower rate of interest may be accepted in return for stronger security.
- (iii) The loan notes cover a **different period** from the bank loan. When the loan notes were issued, expectations about the **level of interest rates** and the **business and financial risks faced by WEB** may have been different.

(d) **Convertibles**

Companies normally issue convertibles in the expectation that the **holders will exercise their options**. Convertibles can therefore be seen as a form of **delayed equity**.

- (i) They are **attractive** to the firm when the price of the ordinary shares is abnormally low at the date of issue, and at times when to issue a further tranche of equity would result in a significant drop in earnings per share.
- (ii) However they also carry the **risk** that the **share price will not rise in line** with expectations at the time of issue and that holders will not therefore convert.
- (iii) If the loan notes are dated, then the company must have funds in place to allow redemption on the due date.
- (iv) Convertibles also have a short-term benefit in that **interest payments** are **allowable against tax**.

Strategic implications of convertibles

Convertibles therefore may form part of the strategy of a company whose objective is to raise new equity, but which for various reasons does not wish to go directly to the market in the short term.

- (i) They are often preferable to straight loan notes since they **do not commit the company indefinitely** to the payment of large interest bills.
- (ii) They further allow the company to **widen the investment base** by attracting investors looking for a guaranteed short term income plus the possibility of a capital gain at a later date.

47 CAP Co

Text references. The capital asset pricing model is covered in Chapter 15.

Top tips. In (a) you should give a brief definition of the beta factor and what it measures. This will help you to explain the implications of a beta factor of less than one. Remember that preference shares do not count as equity for these purposes and should be ignored at this stage of the calculations.

In (b) there are a number of valid approaches that can be used to find the cost of the loan notes. The most usual of these, using the internal rate of return, is described in the suggested solution. Using 5% as we have means you only need to calculate one rate. It is equally correct to use a higher and lower rate, say 7% and 4%, and then to use interpolation to find the discount rate at which the NPV approaches zero.

In (c) you may find it helpful to think in terms of financial factors and factors affecting the level of business risk when structuring your answer.

Easy marks. Limitations of CAPM should always represent straightforward marks.

- (a) The cost of equity can be found using the following formula:

$$E(r_i) = R_f + \beta_i (E(r_m) - R_f)$$

where $E(r_i)$ is the cost of equity capital – expected equity return
 R_f is the risk-free rate of return
 $E(r_m)$ is the return from the market as a whole
 β is the beta factor of the individual security

Here: $R_f = 5\%$ (annual yield on treasury bills)
 $E(r_m) = 15\%$
 $\beta_i = 0.8$
 $E(r_i) = 5\% + (15\% - 5\%)0.8$
 $= 13\%$

The required rate of return on equity of CAP Co at 30 September 20X2 is therefore 13%.

Beta factor levels

The beta factor is a measure of **systematic risk**, that is, the element of risk that cannot be avoided by **diversification**. The beta factor measures the **variability in returns** for a given security in relation to the variation in returns for the market as a whole.

A beta factor of 1.0 means that if the market goes up by x%, all other things being equal, one would expect the return on the security to go up by x% as well. A beta factor of less than 1.0 means that the return on the security is likely to be less variable than the return on the market as a whole. A beta value of 0.8 means that if the market returns go up by 5%, the return on the security would only be expected to go up by 4% ($5\% \times 0.8$). Similarly, if the market returns fall by 5%, the return on the security would only be expected to fall by 4%.

- (b) **Weighted average cost of capital**

The weighted average cost of capital (WACC) is the **average cost** of the **company's finance** weighted according to the proportion each element bears to the total pool of capital. Weighting is usually based on market values, current yields and costs after tax. Where market values can be used, as in this case, reserves can be ignored.

Equity

The cost of equity has already been calculated at 13%.

The market value of equity (V_E) is the number of shares in issue multiplied by the market price (ex div):

$$\begin{aligned} V_E &= 200\text{m} \times \$3 \\ &= \$600\text{m} \end{aligned}$$

Preference shares

Preference shares are irredeemable. The interest on preference shares is not tax deductible. The cost of the preference shares (k_{pref}) is therefore:

$$k_{\text{pref}} = D/P_0$$

where: D = annual dividend in perpetuity
 P_0 = current ex div price
 $k_{\text{pref}} = 9\%/0.90$
 $= 10\%$

The market value of the preference shares (V_P) is the number of shares in issue multiplied by the market price (ex div):

$$V_p = 50m \times \$0.90$$

$$= \$45m$$

Loan notes

The loan notes pay interest of 8%, which is allowable against tax. Tax is paid at the end of the year in which taxable profits arise, in other words, at the same time as the interest payment at the end of year 1.

Since the net cost of the interest is 5.6% ($8\% \times 0.7$), and the current market price of the notes is just above par, we will try an initial rate of return of 5%.

Year	Cash flow \$	5% disc factors	Present value \$	
0 Market value	(100.57)		1.00	(100.57)
1 Interest	8.00	0.952	7.62	
1 Tax saved	(2.40)	0.952	(2.28)	
1 Redemption	100.00	0.952	<u>95.20</u>	
Net present value				<u>(0.03)</u>

This net present value is virtually zero, and therefore the effective cost of the loan notes is 5%.

The market value of the loan notes (V_D) is the number of units in issue multiplied by the market price:

$$V_D = 250m \times \$100.57/100.00$$

$$= \$251.4m$$

WACC

	MV
Equity	600.0
Preference shares	45.0
Loan notes	<u>251.4</u>
Total	<u>896.4</u>

$$WACC = \left[\frac{V_E}{V_E + V_P + V_D} \right] k_e + \left[\frac{V_P}{V_E + V_P + V_D} \right] k_{pref} + \left[\frac{V_D}{V_E + V_P + V_D} \right] k_d$$

$$= \left[\frac{600.0}{896.4} \right] \times 13 + \left[\frac{45}{896.4} \right] \times 10 + \left[\frac{251.4}{896.4} \right] \times 5$$

$$= 10.6\%$$

(c) Factors affecting equity beta

CAP Co's equity beta will be affected by factors that change the perceived **volatility in returns** to the ordinary shareholders. These will include **financial factors**, such as the **change in gearing**, and other factors related to effect of the new investment on the systematic risk of the company's activities.

Rise in gearing

Following the new issue of loan notes, the **gearing will rise**. This in turn is likely to affect the **volatility** of the returns to equity in relation to the market index. As a consequence, the beta may rise.

Effect of diversification

Since the returns on the campsite business are likely to have a very **low correlation** with those of the existing farming business, the effect of the new investment will be to **smooth out the earnings pattern**. This will reduce the volatility of the returns to equity. However the beta value will be affected by how the **campsite returns vary** in relation to **returns on the market portfolio**, and they may **vary more or less** than the **returns from the farming activities**. The equity beta will be the weighted average of the betas of the two sorts of activity.

Refinancing

As well as raising new debt, the company also has to redeem its existing debt in 20X3. If it replaces existing debt with similar debt, there will be little or no effect on the beta. However, if the debt is **replaced by equity** and gearing reduced, volatility of returns on equity and hence the **beta factor** are likely to fall.

Investor perceptions

This is a major diversification by CAP, and investors may perceive this to be a **risky strategy**. As a consequence in the short-term, the beta could rise to reflect this. Investors may feel that CAP managers **lack the skills required** to manage campsites, as managing camping sites is a very different job from farming. As a consequence this will increase the risk of the new investment, and hence the equity beta may rise. There are also **start-up costs** associated with the new investments. These may depress the profits in the first year of trading, which in turn may cause investors to perceive the new business to be riskier than it really is. The effect of this will be to cause a short-term rise in the beta value.

Industry

Events within the farming and tourism industries, and perceptions of how they are doing, may also affect the beta levels.

(d) Diversification

Under the CAPM, the return required from a security is **related** to its **systematic risk** rather than its total risk. Only the risks that **cannot be eliminated** by diversification are **relevant**. The assumption is that investors will hold a **fully diversified portfolio** and therefore deal with the unsystematic risk themselves. However, in practice, markets are **not totally efficient** and investors do not all hold fully diversified portfolios. This means that total risk is relevant to investment decisions, and that therefore the relevance of the CAPM may be limited.

Excess return

In practice, it is difficult to determine the excess return ($R_m - R_f$). **Expected rather than historical returns** should be used, although historical returns are used in practice.

Risk-free rate

It is similarly difficult to **determine the risk-free rate**. A risk-free investment might be a government security; however, interest rates vary with the term of the debt.

Risk aversion

Shareholders are risk averse, and therefore **demand higher returns** in compensation for increased levels of risk.

Beta factors

Beta factors based on historical data may be a **poor basis** for future **decision making**, since evidence suggests that beta values fluctuate over time.

Unusual circumstances

The CAPM is unable to forecast accurately returns for companies with low price/earnings ratios, and to take account of seasonal 'month-of-the-year' effects and 'day-of-the-week' effects that appear to influence returns on shares.

48 FAQ

Text reference. Calculating a project-specific cost of capital is covered in Chapter 16.

Top tips. The calculations in this question should be quite straightforward provided you have practised using the formulae. Follow a logical approach to part (b). Set out your workings clearly so that, even if you make a mistake, you can gain maximum marks for the method used.

Over half of the marks are available for discussion so, as we say in the Passing F9 section of the front pages of this kit, make sure you are able to discuss as well as use these techniques.

Easy marks. You must learn the problems associated with the capital asset pricing model as this is a highly examinable topic and could provide easy marks in your exam.

(a) **After-tax cost of debt**

Year		Cash flow	Discount Factor	PV \$	Discount factor	PV \$
0	Market value	(90)	1.000	(90.00)	1.000	(90.00)
1–10	Interest (net of tax)	7	6.145	43.02	7.722	54.05
10	Capital repayment	100	0.386	38.60	0.614	61.40
				<u>(8.38)</u>		<u>25.45</u>

The approximate cost of redeemable debt capital is, therefore:

$$5 + \left(\frac{25.45}{25.45 - -8.38} \times (10 - 5) \right) = 8.76\%$$

(b) **Project-specific beta**

$$\beta_a = \beta_e \frac{V_e}{V_e + V_d(1 - T)}$$

where: β_a = asset beta
 β_e = equity beta
 V_e = proportion of equity in capital structure
 V_d = proportion of debt in capital structure
 T = tax rate

For the competitor company:

$$\beta_a = 1.4 \left(\frac{35}{35 + 65(1 - 0.30)} \right) = 0.609$$

Re-gearing:

$$\beta_e = \frac{\beta_a(V_e + V_d(1 - T))}{V_e}$$

$$\beta_e = \frac{0.609(40 + 60(1 - 0.3))}{40} = 1.248$$

Cost of equity

$$E(r_e) = R_f + \beta (E(r_m) - R_f)$$

where: $E(r_e)$ = cost of equity
 R_f = risk free rate of return
 $E(r_m)$ = market rate of return
 $E(r_e) = 6.75\% + (12.5\% - 6.75\%) \times 1.248 = 13.93\%$

WACC

$$(13.93 \times 0.4) + (8.76 \times 0.6) = 10.83\%$$

Note: This final step of calculating the WACC is shown for completeness and is unlikely to be tested in the exam.

(c) **The capital asset pricing model**

The discount rate has been calculated using the **capital asset pricing model (CAPM)**. The CAPM produces a required return based on the expected return of the market $E(r_M)$, the risk-free interest rate (R_f) and the variability of project returns relative to the market returns (β). Its main advantage when used for investment appraisal is that it produces a discount rate which is based on the **systematic** risk of the individual investment. Systematic risk is the market risk which cannot be diversified away. It can be used to **compare projects of all different risk classes** and is therefore superior to an NPV approach which uses only one discount rate for all projects, regardless of their risk.

Practical problems

Problems in estimating

It is **hard to estimate** returns on projects under different economic environments, market returns under different economic environments and the probabilities of the various environments.

Single period model

The CAPM is really just a **single period model**. Few investment projects last for one year only and to extend the use of the return estimated from the model to more than one time period would require both project performance relative to the market and the economic environment to be reasonably stable.

Complications over time

In theory, it should be possible to apply the CAPM for each time period, thus arriving at successive discount rates, one for each year of the project's life. In practice, this would exacerbate the estimation problems mentioned above and also make the discounting process much more cumbersome.

Risk-free rate

It may be **hard to determine the risk-free rate of return**. Government securities are usually taken to be risk-free, but the return on these securities varies according to their term to maturity.

Beta formula

There are also problems with using the **geared and ungeared beta formula** for calculating a firm's equity beta from data about other firms. It is difficult to identify other firms with **identical operating characteristics** and there may be **differences in beta values** between firms caused by different cost structures or size differences between firms.

(d) **Pecking order theory**

Pecking order theory has been developed as an alternative to traditional theory. It states that firms will prefer retained earnings to any other source of finance, and then will choose debt, and last of all equity. The order of preference will be:

- Retained earnings
- Straight debt
- Convertible debt
- Preference shares
- Equity shares

Consequences of pecking order theory

Businesses will try to match **investment opportunities** with **internal finance** provided this does not mean excessive changes in dividend payout ratios. If it is **not possible to match investment opportunities** with **internal finance**, surplus internal funds will be invested; if there is a deficiency of internal funds, external finance will be issued in the pecking order, starting with straight debt.

Establishing an **ideal debt-equity mix** will be problematic, since internal equity funds will be the first source of finance that businesses choose, and external equity funds the last.

49 Droxford Co

Text references. Cost of capital is covered in Chapter 15, sources of finance and their impact on financial ratios are discussed in Chapter 14.

Top tips. In part (a), you need to rearrange the formula given to you for the dividend growth model so that you can calculate the cost of equity. Remember to use market values in the formula for weighted average cost of capital.

The discussion in part (b) covers a very important and highly examinable area and you must be familiar with both the traditional view and that of Modigliani and Miller.

In part (c) you must comment on your calculations as well as just do the number crunching. You should calculate gearing using market values but you will have to use book values in order to compare the position in one year's time.

Easy marks. The cost of capital calculations are straightforward marks if you have practised and the ratio calculations in part (c) have plenty of easy marks available if you can remember how to do them. You are given the formula for the financial gearing ratio.

Marking scheme

		Marks
(a)	Calculation of market values	2
	Calculation of cost of equity	2
	Calculation of cost of preference shares	1
	Calculation of cost of debt	2
	Calculation of WACC	<u>2</u>
		9
(b)	Relative costs of equity and debt	1
	Discussion of theories of capital structure	7-8
	Conclusion	<u>1</u>
Maximum		8
(c)	Analysis of interest coverage ratio	2-3
	Analysis of financial gearing	2-3
	Analysis of earnings per share	2-3
	Comment	<u>2-3</u>
	Maximum	
		<u>25</u>

(a) Weighted average cost of capital

<i>Market values</i>	\$ million
Equity (5m × \$4.50)	22.500
Preference shares (2.5m × \$0.762)	1.905
10% loan notes (5m × (105/100))	<u>5.250</u>
	<u>29.655</u>

$$\begin{aligned}
 \text{Cost of equity using dividend growth model} &= \frac{D_0(1+g)}{P_0} + g \\
 &= \frac{35(1+0.04)}{450} + 0.04 \\
 &= 12.09\%
 \end{aligned}$$

$$\text{Cost of preference shares} = \frac{D}{P_0} = \frac{9}{76.2} = 11.81\%$$

Cost of debt:

Year		Cash flow	Discount factor	PV	Discount factor	PV
		\$	10%	\$	5%	\$
0	Market value	(105)	1.000	(105)	1.000	(105)
1 – 8	After tax interest	7	5.335	37.34	6.463	45.24
8	Redemption	100	0.467	46.70	0.677	67.70
				<u>(20.96)</u>		<u>7.94</u>

$$\begin{aligned} \text{Using interpolation, cost of debt} &= a + \left(\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \right) (b - a) \% \\ &= 5 + \left(\frac{7.94}{7.94 + 20.96} \times 5 \right) \\ &= 6.37\% \end{aligned}$$

$$\text{WACC} = [(12.09\% \times 22.5) + (11.81\% \times 1.905) + (6.37\% \times 5.25)] / 29.655 = 11.05\%$$

(b) **Sources of finance**

The sources of long-term finance for Droxfol Co are ordinary shares, preference shares and loan notes and the rate of return expected by investors depends on the **relative risks** of each type of finance. Equity is the most risky and therefore has the highest cost of capital and the loan notes are the least risky with the lowest cost of capital.

Therefore, if we ignore taxation, the weighted average cost of capital would be expected to decrease if equity is replaced by debt.

Traditional view

In the **traditional view** of capital structure, ordinary shareholders are relatively **indifferent** to the addition of small amounts of debt so the WACC falls as a company gears up.

However, as equity is replaced by debt and gearing increases, **financial risk** will increase so the cost of equity will rise and this will offset the effect of cheaper debt.

The before-tax cost of debt will also increase at high levels of gearing due to the risk of bankruptcy and this **bankruptcy risk** will further increase the cost of equity.

A company can therefore gear up using debt and reduce its WACC to a **minimum**. When the WACC is minimised, the **market value** of the company, equal to the present value of its cash flows, will be maximised.

Beyond this minimum point, the WACC will increase due to the effect of increasing financial and bankruptcy risk.

Modigliani and Miller

In contrast to this traditional view, **Modigliani and Miller**, assuming a perfect market and ignoring tax, demonstrated that the WACC remained constant as a company increased its gearing. They argued that the increase in the cost of equity due to financial risk **exactly balanced** the decrease in WACC caused by the lower before-tax cost of debt.

In a perfect capital market, there is no bankruptcy risk so the WACC and therefore the market value of the company is constant at all gearing levels. The market value of a company depends on its **business risk** only. This means that Droxfol Co cannot reduce its WACC to a minimum.

However, corporate tax does exist and interest payments on debt reduce tax liability, so it could be argued that WACC falls as gearing increases and Droxfol Co could reduce its WACC to a minimum by taking on as much debt as possible.

The assumption of a perfect capital market is unrealistic and so bankruptcy risk and other costs of servicing debt will increase as gearing increases and this will offset the value of the tax shield.

Conclusion

In conclusion, Droxford Co should be able to reduce its WACC by gearing up, but the minimum WACC achievable may be hard to determine.

(c) (i) **Interest coverage ratio**

Current interest coverage ratio = $7,000/500 = 14$ times
 Increased profit before interest and tax = $7,000 \times 1.12 = \$7.84\text{m}$
 Increased interest payment = $\$0.5\text{m} + (\$10\text{m} \times 9\%) = \1.4m
 Interest coverage ratio after one year = $7.84/1.4 = 5.6$ times

The current interest coverage of Droxford Co is higher than the sector average of 12 times and can be considered quite safe. However, after the new issue of loan notes, the interest coverage ratio falls to less than half of the sector average and could indicate that Droxford Co may find it difficult to meet the interest payments.

(ii) **Financial gearing**

Financial gearing = $\frac{\text{Prior charge capital}}{\text{Equity share capital}}$

Current financial gearing at book values = $\frac{5,000 + 2,500}{5,000 + 22,500} \times 100 = 27.3\%$

Ordinary dividend after one year = $\$0.35 \times 5\text{m} \times 1.04 = \1.82 million

Preference dividend = $2,500 \times 0.09 = \$225,000$

INCOME STATEMENT AFTER ONE YEAR

	\$'000	\$'000
Profit before interest and tax		7,840
Interest		(1,400)
Profit before tax		6,440
Income tax expense		(1,932)
Profit for the period		4,508
Preference dividends	225	
Ordinary dividends	<u>1,820</u>	
Retained earnings		<u>(2,045)</u> <u>2,463</u>

Financial gearing after one year = $\frac{5,000 + 10,000 + 2,500}{5,000 + 22,500 + 2,463} = 58.4\%$

The current financial gearing of Droxford Co is around 40% $((45 - 27.3)/45)$ less than the sector average. After the loan note issue, it is predicted to be 30% $((58.4 - 45)/45)$ more than the sector average. This increase in, and level of, financial gearing may be of concern to investors and the stock market. However, if the company continues to grow at 12% per annum, financial gearing will gradually reduce as the proportion of debt to equity falls.

(iii) **Earnings per share (EPS)**

EPS = $\frac{\text{Profit attributable to ordinary shareholders}}{\text{Number of ordinary shares}}$

Current EPS = $\frac{4,550 - 225}{5,000} = 0.865 = 86.5$ cents per share

EPS after one year = $\frac{4,508 - 225}{5,000} = 0.857 = 85.7$ cents per share

Any decrease in EPS tends to be disliked by investors as it is seen as a key ratio. However, this decrease is relatively small and the expected future growth in earnings should quickly reverse it.

In conclusion, the issue of new debt is likely to have a **negative impact** on the company's financial position at least in the short-term.

Droxfol Co will also need to consider whether it has sufficient non-current asset **security** for a new debt issue as the existing loan notes are already secured on the existing assets. The new loan notes may need to be secured on any new non-current assets bought which may not be sufficient.

The company must also consider the future **redemption** of the loan notes. The existing loan notes are due to be redeemed in eight years' time and an additional need for re-financing only two years later may cause difficulties. They may need to consider a **longer maturity** for the new loan notes.

In view of this, Droxfol Co should also consider an **equity issue** and compare its potential impact on the company's financial position.

50 Burse Co

Text references. Cost of capital is covered in Chapter 15.

Top tips. In part (a), the cost of equity has to be calculated using the capital asset pricing model (CAPM) as there is insufficient data in the question to use the dividend growth model. The risk-free rate of return, the equity beta and the equity risk premium (this is the difference between the market return and the risk-free return) are given, and so the cost of equity can be calculated from the CAPM formula. For the convertible debt calculation you need to assume that conversion is likely to occur, and then calculate the cost of debt using the current market value, the after-tax interest rate, the conversion value after six years and use the IRR method.

Part (b) is a straightforward discussion, provided you have done the necessary reading.

If you understand the formula for the dividend growth model, part (c) should be a straightforward explanation of the uncertainties behind each variable in the formula. You can take a similar approach with the capital asset pricing model.

Easy marks. Each part of the calculations in part (a) will gain marks so, if you get stuck, make an assumption and move on. Don't spend too long on this part of the question as there are plenty of easier marks available in parts (b) and (c).

Examiner's comments. Answers to part (a) of the question were of variable quality. A common error was to confuse the equity risk premium with the return on the market, resulting in a cost of equity less than the cost of debt. Such a result is inconsistent with the risk-return hierarchy.

Many candidates ignored the bank loan, or assumed that it was not relevant, and lost credit as a result.

Finding the cost of debt of the convertible bonds proved to be a challenge for many candidates. Some candidates stated simply that they assumed the bonds were to be redeemed rather than converted and lost marks as a result, even if they calculated correctly the cost of debt of the bond with redemption after eight years. Students gained credit for any parts of this evaluation that were carried out correctly.

Many candidates were able to calculate market weights correctly, although some chose to ignore the current bond market price and calculate a market price based on the present value of the conversion value. Credit was given where method was correct but calculation errors were made.

In Part (b) candidates who were not aware of the restrictions on the use of the WACC in investment appraisal tended to discuss how the WACC is calculated, or to suggest that WACC could be used if a company had debt in its capital structure. Credit could also have been gained here through discussing risk-adjusted discount rates and the link between project-specific discount rates and the WACC.

In part (c) weaker answers simply outlined the two models and their constituent variables. Better answers compared and contrasted the two models, and argued for the superiority of the CAPM.

Marking scheme

		Marks
(a)	Calculation of cost of equity	2
	Calculation of cost of convertible debt	5
	Calculation of cost of bank loan	1
	Calculation of market values	2
	Calculation of WACC	<u>2</u>
		12
(b)	Discussion of business risk	2-3
	Discussion of financial risk	1-2
	Discussion of other relevant factors	1-2
	Maximum	<u>1-2</u>
		6
(c)	Discussion of dividend growth model	2-3
	Discussion of capital asset pricing model	2-3
	Conclusion	1-2
	Maximum	<u>1-2</u>
		<u>7</u>
		<u>25</u>

(a) Cost of equity

The required rate of return on equity can be found using the capital asset pricing model:

$$\begin{aligned}
 E(r_i) &= R_f + \beta_i (E(r_m) - R_f) \\
 E(r_i) &= 4.7\% + (1.2 \times 6.5\%) \\
 &= \mathbf{12.5\%}
 \end{aligned}$$

Cost of convertible debt

$$\text{Conversion value} = P_0 (1 + g)^n R$$

Where P_0 is the current share price
 g is the expected annual growth of the share price
 n is the number of years to conversion
 R is the number of shares received on conversion

$$\begin{aligned}
 \text{Conversion value} &= \$5.50 \times (1 + 0.06)^6 \times 15 \\
 &= \$117.03 \text{ per bond}
 \end{aligned}$$

We can therefore assume that **conversion will take place** as the conversion value is much greater than par value.

The **annual interest cost** net of tax will be $7\% \times (1 - 0.3) = \$4.90$ per bond

The cash flows will be as follows:

Year		Cash flow \$m	10% discount factors	PV \$m	5% discount factors	PV \$m
0	Market value	(107.11)	1.000	(107.11)	1.000	(107.11)
1-6	Interest	4.90	4.355	21.34	5.076	24.87
6	Conversion value	117.03	0.564	66.00	0.746	87.30
				<u>(19.77)</u>		<u>5.06</u>

Calculate the cost of convertible debt using an IRR calculation.

$$\begin{aligned} \text{IRR} &= a\% + \left[\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \times (b - a) \right] \% \\ &= 5\% + \frac{5.06(10\% - 5\%)}{5.06 + 19.77} = 6.02\% \end{aligned}$$

The **after tax cost of convertible debt** is therefore **6.02%**

Cost of bank loan

$$\begin{aligned} \text{After-tax interest rate} &= 8\% \times (1 - 0.3) \\ &= \mathbf{5.6\%} \end{aligned}$$

Market values

$$\text{Market value of equity} = 20\text{m} \times \$5.50 = \$110\text{m}$$

$$\text{Market value of convertible debt} = 29\text{m} \times 107.11/100 = \$31.06\text{m}$$

$$\text{Market value of bank loan} = \$2\text{m}$$

$$\text{Total market value} = \$(110.00 + 31.06 + 2)\text{m} = \$143.06\text{m}$$

Weighted average cost of capital

$$\text{WACC} = \left(\frac{V_E}{V_E + V_D} \right) k_e + \left(\frac{V_D}{V_E + V_D} \right) k_d$$

In this case, we have two costs of debt so:

$$\begin{aligned} \text{WACC} &= \left(\frac{110}{143.06} \right) \times 12.5\% + \left(\frac{31.06}{143.06} \right) \times 6.02\% + \left(\frac{2}{143.06} \right) \times 5.6\% \\ &= 9.61\% + 1.31\% + 0.08\% \\ &= \mathbf{11\%} \end{aligned}$$

- (b) The weighted average cost of capital is the **average** cost of the company's finance and represents the average return required as compensation for the **risks** of the investment.

Business risk

The WACC can only be used if the **business risk** of the proposed investment is similar to the business risk of existing operations. This would involve the **expansion of existing business**. If the proposed investment is in a different type of business, a **project-specific cost of capital** should be used which reflects the changing risk. The technique to use involves changing the beta in the capital asset pricing model.

Financial risk

The WACC can only be used where the **existing capital structure** will be maintained. This means that the finance for the project will be raised in the **same proportions** as the existing finance.

The finance that is raised to fund a new investment might substantially change the capital structure and the perceived **financial risk** of investing in the company. If this is the case, again a project-specific cost of capital can be calculated which reflects the changing financial risk.

Size of the project

The WACC can only be used if the project being appraised is **small** relative to the company. If the project is large in scale, it is more likely to cause a change in risk and make the WACC inappropriate.

- (c) **Dividend growth model**

There are a number of problems with the dividend growth model. It uses a set figure for g which assumes that **dividends grow smoothly**. In reality, dividends change according to decisions made by managers who

do not necessarily repeat historical trends. It is therefore very difficult to accurately predict the future dividend growth rate.

The other main problem is how to incorporate **risk**. The dividend growth model does not explicitly consider risk, particularly **business risk**. The company may change its area of business operations and the economic environment is notoriously uncertain. The **share price** will however fall as risk increases, leading to an increased cost of equity.

The model also ignores the effects of **taxation** and assumes there are **no issue costs** for new shares.

Capital asset pricing model

The main advantage that the CAPM has over the dividend valuation model is that it does **explicitly consider risk**. The CAPM is based on a comparison of the **systematic risk** of individual investments with the risks of all shares in the market. Systematic risk is risk that cannot be diversified away and an investor will require a **higher return** to compensate for higher risk. This higher return is the higher cost of equity that is calculated using the CAPM formula.

The formula does however require **estimates** to be made of **excess return**, the **risk-free rate** and **beta values**. All of these can be difficult to estimate, but are more reliable than the dividend growth rate used in the dividend valuation model.

Conclusion

The CAPM does explicitly consider risk and uses estimated values that are more reliable than those used in the dividend valuation model. It can therefore be said that CAPM offers the better estimate of the cost of equity of a company.

51 MC

Text references. Business valuation is covered in Chapter 15 and equity issues in Chapter 12.

Top tips. This question addresses a number of areas of knowledge, including share valuation, and the issues surrounding a stock market flotation. The answer is required in a report format, and you should map out an appropriate structure that will allow you to address all the key issues as succinctly as possible.

Important points brought out by the discussion are when each method is useful and the **problems** with the figures used (for example balance sheets not including intangible assets, difficulties with figures of comparable companies).

Note that the discussion in (b) focuses on the aims of shareholders and management. A conclusion, recommending a method and price, would be essential even if the question had not required it.

Easy marks. Knowing the advantages and limitations of each valuation method always earns marks in business valuation questions.

Marking scheme

	Marks
(a) 3-4 marks for each method discussed. Max 10 for discussions not supported by calculations	16
(b) Up to 2 marks for each advantage/disadvantage/point of comparison	6
(c) Reasonable conclusions based on previous analysis	3
	<u>25</u>

To: Board of Directors, MC
From: Independent Consultant
Date: 31 December 20X0
Re: Valuation of MC

Introduction

This report deals with the alternative methods available for the valuation of the shares in the company. It also seeks to highlight some of the key issues to be addressed in arriving at an appropriate valuation for this type of company, and looks at the relative merits of public flotation versus an outright sale of the business.

(a) Company valuation

There are three main valuation techniques that could be appropriate in this situation:

- Net assets basis
- Price/earnings ratio
- Dividend valuation model

These will be discussed in more detail below.

(i) Net assets basis

The net asset value of MC is £60m or £6 per share.

This method is most commonly used to arrive at a **break-up value** for businesses with a significant amount of non-current assets. However, it is **less appropriate for service businesses**, and in particular for those in which the majority of the value is in the form of human and/or intellectual capital. In the latter type of company, a net assets valuation can be attempted if the intangibles are included as assets in the balance sheet. However, a significant part of the value of MC resides in its research division, and this is not reflected at all in the company's present balance sheet.

Although it could be argued that items such as brands should be included in the balance sheet so as to make the market more aware of the true value of the company, in reality it is extremely difficult both to **arrive** at and to **retain** an appropriate measure of these types of items.

A further argument against the incorporation of this type of intangible is that if the company is **publicly quoted**, and if the market shows **semi-strong or strong form efficiency**, then the market price of the shares should reflect this information in any case.

In view of these points, there is little point in attempting a net assets valuation for MC at the present time. The inappropriateness of this can be illustrated with reference to the competitor, which would have a theoretical net assets based valuation of £75m as compared with a market capitalisation of £196m (£9.80 share price × 20m shares in issue).

(ii) Price/earnings ratio

This method **compares the earnings information** of the company with that of other **companies of similar size** and characteristics that operate in the same markets, to arrive at an appropriate market price for the shares. The information that has been provided for the quoted competitor will be used to arrive at an initial price, but this will need to be adjusted to reflect the fact that the competitor lacks MC's research capability.

The **price/earnings (P/E) ratio** is calculated by **dividing the market price of the shares** by the **earnings per share**. The competitor has a P/E ratio of 16.3 (980p/60p). Although this is likely to be above the average for quoted industrial companies as a whole, it does not appear to be unreasonably high for the medical sector. Given that MC is forecasting better growth prospects than the competitor, and also has a research capability, it seems reasonable to value the company on a P/E of around 18 times. This would value MC at £135m ($18 \times 75p \times 10m$ shares in issue).

However, if the shares were to be offered on the open market, it would be prudent to price them at a **discount** to this to reflect the fact that the company would be a new entrant to the stock market, despite an eleven year trading history. Pricing at a discount will also make the issue more attractive to investors and thereby help to obtain a good take-up of shares.

Valuation on a P/E of 18 implies a price of £13.50 per share. If the shares were to be offered at a discount of, say, 15%, this would result in an offer price of around £11.50 per share, and a market capitalisation of £115m.

(iii) **Dividend valuation model**

The dividend valuation model has the central assumption that the **market value** of shares is **directly related** to the **expected future dividends** on those shares. It can be expressed as:

$$P_0 = \frac{d_0(1+g)}{(k_e - g)}$$

Since the shares are not yet quoted, it is **not possible to say** exactly what the **shareholders' net cost of capital** is likely to be. However, it might be reasonable to use the competitor's cost of equity of 13% for an initial estimate. This is better than using the 'rule of thumb' discount rate of 15%, as MC has a lower financial risk than the competitor (the debt ratio is much lower) and a higher dividend per share and growth rate.

This cost of equity can now be used in the dividend valuation model to estimate the market value of MC:

$$P_0 = \frac{d_0(1+g)}{(k_e - g)}$$

$$P_0 = \frac{(55p \times 10m) \times (1+8\%)}{(13\% - 8\%)}$$

$$P_0 = £118.8m$$

The dividend valuation model values the company at £118.8m, or £11.88 per share. This assumes a growth rate of 8%. However, in reality, the **potential growth** rate may be **higher** since the company is currently evaluating investments at a discount rate that is above the estimated cost of capital. This means that it may be turning down investments that would in fact add value to the company and hence result in higher dividends and a higher growth rate.

(b) **The relative advantages of flotation and direct sale**

The following points should be considered when deciding which option is to be preferred.

(i) **Aims of existing owners**

The **aims of the existing owners** are important in determining the best course of action. If a significant number of the existing consortium wish to **maintain control** over the business in the future, then they are more likely to be able to achieve this if the company is floated rather than sold.

(ii) **Market for shares**

Flotation will create a **wider market** for the **company's shares**. This has the twin benefits that it will be **easier** for the company to **raise additional capital** to finance expansion, and that the existing shareholders will be able to realise all or part of their holding. However, if MC is to achieve a good price, the existing owners should aim to retain the major part of their holding for a reasonable period following the flotation.

(iii) **Share option schemes**

Flotation will allow the company to offer **share option schemes** to its employees, which should **assist** in the **recruitment** and **retention of good staff**. This is particularly important in a company such as MC, where a significant part of the value in the company is linked to the knowledge base and research capability. Retaining a high proportion of the key staff will be vital to the success of any change in ownership, and must be taken into account in the structuring of either the sale or the flotation.

(iv) **Costs of flotation**

Flotation will be an **expensive process** and will mean that the company has to comply with the stringent Stock Exchange regulations. It will put extra administrative burdens on the management and will cost more to organise than would a direct sale of the business.

(c) **Conclusions and recommendations**

(i) **Sale price**

The calculations suggest that the company should achieve a **sale price** of at least £120m. This compares with a **market capitalisation** of the **competitor** of £196m. Since MC has better growth prospects and also has a research base, which the competitor lacks, it may be able to achieve a better price than this, but £120m should be regarded as the base price in any negotiations.

(ii) **Stock market quotation**

It is also recommended that the company should opt for a **Stock Market quotation** rather than for a direct sale. Given the current state of the market for this type of stock, it should be able to achieve a good price, and flotation will also give flexibility to the owners in allowing them to realise a part of their investment, while at the same time retaining control over the future direction of the business.

52 BST

Text references. Business valuation is covered in Chapter 17 and market efficiency in Chapter 18.

Top tips. In (a), you are not told what methods to use so you have to identify relevant information. You are given the net assets value, given all the information for the price-earnings, market capitalisation calculation, and given an indication of future growth that you can use in the dividend valuation model calculation.

Key factors in (b) are quality of forecasts, assets being purchased, effect on dividend policy and post-acquisition savings.

Part (c) is a straightforward discussion of factors affecting share prices.

(a) **Methods of valuation and range of values for SM**

Net assets

The book value of SM's **net assets attributable to equity shareholders** is \$45 million. This figure may need to be adjusted for **increased or decreased market values** of assets, particularly SM's property holding. However in any case, for a going concern, the book value of assets is a poor indicator of their economic value, which depends on their **income-generating capacity**, rather than their historical cost or realisable value. Here also SM has a **franchise** generating earnings that will not be reflected in the balance sheet.

Price/earnings model

SM's existing earnings per share is \$1.53, and number of shares is 1.5 million, giving total equity earnings of \$2.295 million. Taking the 5% growth figure given, next year's earnings would be **\$2.410 million**. However, the managing director is estimating \$4 million for next year. This figure cannot be accepted at face value and would need to be substantiated.

In the absence of any better information, BST's P/E ratio could be applied to these earnings figures. This is $1237/112.5 = 10.996$, say 11.

The range of values for SM's valuation would be between \$2.410 million \times 11 and \$4 million \times 11 ie between **\$26.5 million and \$44 million**.

This valuation is dependent upon the **P/E ratio**. Arguably a lower ratio should be used as SM is unquoted, but it is difficult to say how much lower. Also BST's ratio may not be typical of the industry.

Dividend valuation model

Again there is a range of values depending on whether the MD's forecast earnings are believed.

Last year's total dividends were $1.5\text{m} \times 100 \text{ cents} = \1.5 m . A 5% increase next year would give $\$1.575$ million. The cost of equity for similar firms is 10% and the expected growth rate 5%.

So on this basis the expected company value = $\$1.575\text{m}/(0.1 - 0.05) = \mathbf{\$31.5 \text{ million}}$.

SM's dividend payout ratio (dividend/earnings) is $100 / 153 = 0.654$.

Based on the MD's forecast earnings of $\$4$ million, next year's dividend would be $\$4\text{m} \times 0.654 = \mathbf{\$2.616 \text{ million}}$.

The forecast company value would be $\$2.616 \text{ million}/(0.1 - 0.05) = \52.3 million .

The **drawbacks** of this method are:

- (i) The assumption that SM's **cost of equity** is the **same as similar firms** may be misleading.
- (ii) The **assumption of constant dividend growth** at that rate may be **misleading**. Dividend policy may change on takeover.
- (iii) Share price is **not normally** just a **function of dividend policy**; future expected earnings are also a key factor.

Summary

Based on valuation of assets and income earning capacity, SM appears to have a value **anywhere between \$25 million and \$52 million**. The higher earnings-based figures are heavily dependent on the MD's forecast of next year's earnings that may well be overstated. Because the net asset value is towards the top end of the valuation range, BST could probably look at a value of between **\$40 million and \$45 million**, but will need to carry out further investigations on likely asset values.

(b) Financial factors that may affect the bid

Financial factors relating to BST

- (i) Like SM, the **forecast of next year's earnings** may be **overstated**. Current earnings = $\$1.125 \times 25 \text{ million} = \28.125 million . 4% growth (given) gives $\$29.25 \text{ million}$, but BST's forecast for next year is $\$35 \text{ million}$.
- (ii) The **total market value of the company's shares** is **below the net asset value**. $25\text{m shares} \times \$12.37 = \$309.25\text{m}$ that is below the $\$350\text{m}$ net asset value. This may indicate that the company possesses **under-utilised assets**, or alternatively that its assets are overstated in value. On the face of it, the company would be better broken up than operating as a going concern. All these factors will be of interest to any of SM's shareholders who would be considering receiving BST shares. It will also interest the market and BST's low market value may mean that it becomes a takeover target itself.
- (iii) BST has a fairly **high gearing ratio**. If BST lacks cash and has to borrow more in order to buy out those 50%+ shareholders of SM who do not wish to have BST shares, this may have the effect of increasing the company's cost of capital.
- (iv) BST has a **lower dividend payout ratio** than SM. This may discourage some of SM's shareholders from accepting BST's shares.
- (v) **Strategically** it is **unclear** why BST is buying SM; whilst BST may be trying to diversify, SM may not be a big enough acquisition to make it worth diversifying. There may be better investment opportunities.

Relevant financial factors relating to SM

- (i) Next year's **forecast earnings** may be **overstated**. However, some of the directors may be taking **higher salaries** than **realistic market levels**, and the ongoing future profitability of the company may be higher if these people are replaced with lower cost managers.
- (ii) Like BST, **asset value** is **high**. The net asset valuation is in fact higher than some of the other valuations, and SM's shareholders are unlikely to accept an offer below net asset value.
- (iii) The company is **ungeared**, which is advantageous, as it enables BST to borrow to fund part of the acquisition.
- (iv) The **'quality' of SM's earnings** is probably **higher** than BST's, as it operates in up-market areas.

- (v) Selling SM to a listed company represents a good way for SM's shareholders to **realise the value of their investment**. However, many of the shareholders are likely to lose their jobs and may find it difficult to find equivalent positions. The bid may therefore be opposed by a substantial number of shareholders.
 - (vi) There are likely to be many areas where **costs can be saved** as a result of the acquisition of SM. This may make it worthwhile for BST to pay a higher price for SM.
 - (vii) BST is likely to have **good access to SM's business documentation** as SM has contacted BST. This should enable BST to calculate a more accurate valuation.
- (c) The **fundamental theory of share values** states that the realistic market price of a share can be derived from a valuation of estimated future dividends. The value of a share will be the discounted present value of all future expected dividends on the shares, discounted at the shareholders' cost of capital.

If the fundamental analysis theory of share values is correct, the price of any share will be **predictable**, provided that all investors have the same information about a company's expected future profits and dividends, and a known cost of capital.

However, share prices are also affected by a number of other factors.

Marketability and liquidity of shares

In financial markets, **liquidity** is the **ease of dealing** in the shares, how easily can the shares can be bought and sold without significantly moving the price?

In general, large companies, with hundreds of millions of shares in issue, and high numbers of shares changing hands every day, have good liquidity. In contrast, small companies with few shares in issue and thin trading volumes, can have very poor liquidity.

The **marketability** of shares in a private company, particularly a minority shareholding, is generally very limited, a consequence being that the price can be difficult to determine.

Shares with restricted marketability may be subject to sudden and large falls in value and companies may act to improve the marketability of their shares with a **stock split**. A stock split occurs where, for example, each ordinary share of \$1 each is split into two shares of 50c each, thus creating cheaper shares with **greater marketability**. There is possibly an added psychological advantage, in that investors may expect a company which splits its shares in this way to be planning for substantial earnings growth and dividend growth in the future.

As a consequence, the market price of shares may benefit. For example, if one existing share of \$1 has a market value of \$6, and is then split into two shares of 50c each, the market value of the new shares might settle at, say, \$3.10 instead of the expected \$3, in anticipation of strong future growth in earnings and dividends.

Availability and sources of information

An efficient market is one where the prices of securities bought and sold reflect all the **relevant information** available. Efficiency relates to how quickly and how accurately prices adjust to new information. Information comes from financial statements, financial databases, the financial press and the internet.

It has been argued that shareholders see **dividend decisions** as passing on **new information** about the company and its prospects. A dividend increase is usually seen by markets to be good news and a dividend decrease to be bad news, but it may be that the market will react to the difference between the actual dividend payments and the market's **expectations** of the level of dividend. For example, the market may be expecting a cut in dividend but if the actual decrease is less than expected, the share price may rise.

Market imperfections and pricing anomalies

Various types of anomaly appear to support the views that irrationality often drives the stock market, including the following.

- **Seasonal month-of-the-year effects**, day-of-the-week effects and also hour-of-the-day effects seem to occur, so that share prices might tend to rise or fall at a particular time of the year, week or day.

- There may be a **short-run overreaction** to recent events. For example, the stock market crash in 1987 when the market went into a free fall, losing 20% in a few hours.
- Individual shares or shares in small companies may be neglected.

Market capitalisation

The market capitalisation or **size** of a company has also produced some pricing anomalies.

The return from investing in **smaller** companies has been shown to be **greater** than the average return from all companies in the long run. This increased return may compensate for the greater risk associated with smaller companies, or it may be due to a start from a lower base.

Investor speculation

Speculation by investors and market sentiment is a major factor in the behaviour of share prices.

Behavioural finance is an alternative view to the efficient market hypothesis. It attempts to explain the market implications of the **psychological** factors behind investor decisions and suggests that **irrational investor behaviour** may significantly affect share price movements. These factors may explain why share prices appear sometimes to over-react to past price changes.

53 Phobis Co

Text references. Business valuations are covered in Chapter 17, convertible bonds in Chapter 12 and market efficiency in Chapter 18.

Top tips. In part (a) don't forget to discuss the values you calculate or you will lose 4 valuable marks.

You will probably have found the calculations in part (b) trickier. If you could not remember the formula for the calculation of the conversion value, you could have worked it out using a logical approach. You may also have been confused by the term 'floor value' but this simply means the value of the bond if it is not converted. The most important aspect of this is to not panic and don't spend too long on any one part of a question. If you get stuck, move on!

Easy marks. The calculations in part (a) are very straightforward if you have practised these valuation calculations. The discussion in part (c) should be easy if you have learnt the material on the efficient market hypothesis.

Examiner's comments. Answers to part (a) often failed to gain many marks, mainly because candidates did not calculate company values.

A number of candidates were unable to distinguish between some of the variables given in the question, for example confusing dividend per share with earnings per share, return on the market with cost of equity, and equity beta with retention ratio.

Even though the current market value of the company (number of shares multiplied by share price) was needed, a number of candidates failed to calculate it. The level of discussion was often limited, although some candidates demonstrated that they were aware of the weaknesses of the valuation models used.

Many candidates either failed to answer part (b), or showed in their answers that they did not understand how to calculate the present value of a stream of future cash flows (which is what the market value of a bond is equivalent to).

A number of candidates were not aware of the difference between interest rate, cost of debt and share price growth rate and used their values interchangeably. Some candidates introduced an assumed tax rate, when the question made no reference to taxation at all. There were indications of candidates learning a computation method, without acquiring an understanding of the concepts underlying it. Candidates must understand the importance, in financial management, of discounting future values in order to obtain present values, since this is used in investment appraisal, bond valuation, share valuation and company valuation.

A number of candidates did not understand and could not discuss market efficiency, in part (c) and very few correctly discussed the significance of semi-strong market efficiency to a company. Overall, many answers to this question were not of a pass standard.

Marking scheme

		Marks
(a)	Price/earnings ratio value of company	2
	Proposed dividend per share	1
	Average dividend growth rate	1
	Cost of equity using CAPM	1
	Dividend growth model value of company	2
	Discussion	4
		11
(b)	Conversion value	1
	Market value	2
	Floor value	2
	Conversion premium	1
		6
(c)	Weak form efficiency	1-2
	Semi-strong form efficiency	1-2
	Strong form efficiency	1-2
	Significance of semi-strong form efficiency	2-3
	Maximum	8
		25

(a) (i) **Price/earnings ratio method of valuation**

Market value = P/E ratio × EPS

EPS = 40.0c

Average sector P/E ratio = 10

Value of shares = 40.0 × 10 = \$4.00 per share

Number of shares = 5 million

Value of Danoca Co = **\$20 million**

(ii) **Dividend growth model method of valuation**

$$P_0 = \frac{D_0(1+g)}{K_e - g}$$

Note: The formula sheet in this exam uses r_e instead of k_e

D_0 can be found using the proposed payout ratio of 60%.

$D_0 = 60\% \times 40c = 24c$

$$(1+g)^2 = \frac{\text{Proposed dividend}}{\text{Dividend two years ago}}$$

$$(1+g)^2 = \frac{24.0}{22.0}$$

$$1+g = \sqrt[2]{1.091} = 1.045$$

$$g = 4.5\%$$

$$\begin{aligned}
 k_e = r_e = E(r_i) &= R_f + \beta_i(E(r_m) - R_f) \\
 &= 4.6 + (1.4 \times (10.6 - 4.6)) \\
 &= 4.6 + (1.4 \times 6) \\
 &= 13\%
 \end{aligned}$$

$$\begin{aligned}
 \text{Value of shares} &= \frac{0.24 \times (1 + 0.045)}{0.13 - 0.045} \\
 &= \$2.95
 \end{aligned}$$

Value of Danoca Co = **\$14.75 million**

Discussion of the values calculated

P/E ratio

The current share price of Danoca is \$3.30 which equates to a P/E ratio of 8.25 (3.30/0.4). This is **lower** than the average sector P/E ratio of 10 which suggests that the market does not view the **growth prospects** of Danoca as favourably as an average company in that business sector.

This implies that an acquisition by Phobis could result in **improved financial performance** of Danoca, assuming that Phobis has the competences and skills to transfer to Danoca.

Dividend growth

The dividend growth model method of valuation resulted in a value of \$14.75m which is **lower** than the current market capitalisation of Danoca of \$16.5m (\$3.30 × 5m). The current share price may be artificially high due to bid rumours but shareholders are unlikely to accept a valuation much lower than this.

The dividend growth model uses an estimated expected growth rate and a calculated cost of equity, both of which are **subject to error**.

The model assumes that **investors act rationally and homogeneously** and this may not be true. Shareholders may have different expectations and the stock market may not be completely efficient, both of which will make this method of valuation less reliable.

(b) (i) **Dividend growth model method of valuation**

$$\text{Conversion value} = P_0(1 + g)^n R$$

where P_0 = current ex-dividend ordinary share price = 4.45

g = expected annual growth of the ordinary share price = 6.5%

n = number of years to conversion = 5

R = number of shares received on conversion = 20

$$\begin{aligned}
 \text{Conversion value} &= 4.45 \times (1 + 0.065)^5 \times 20 \\
 &= \$122
 \end{aligned}$$

The conversion value is **higher** than the redemption value of \$100 so **conversion is expected**.

The current market value is the sum of the present value of the future interest payments and the present value of the bond's conversion value.

Present value of \$9 interest per annum for five years at 7% = $9 \times 4.100 = \$36.90$

Present value of the conversion value = $122.00 \times 0.713 = \$86.99$

Current market value of convertible bond = $36.90 + 86.99 = \mathbf{\$123.89}$

(ii) **Floor value**

The floor value is the sum of the present value of the future interest payments and the present value of the redemption value.

Present value of \$9 interest per annum for five years at 7% = $9 \times 4.100 = \$36.90$

Present value of the redemption value = $100.00 \times 0.713 = \$71.30$

Floor value of convertible bond = $36.90 + 71.30 = \$108.20$

(iii) **Conversion premium**

Conversion premium = current market value – current conversion value

Current conversion value = $\$4.45 \times 20 = \89.00

Current market value = $\$123.89$

Conversion premium = $123.89 - 89.00 = \$34.89$

As an amount per share = $34.89/20 = \$1.75$

(c) Stock market efficiency

If a stock market is efficient, share prices should vary in a **rational way** and will reflect the **amount of relevant information** that is available. The **efficient market hypothesis** identifies three forms of efficiency; weak, semi-strong and strong.

Weak form efficiency

Under the weak form hypothesis of market efficiency, share prices reflect all available information about **past** changes in the share price.

Since new information arrives unexpectedly, changes in share prices should occur in a **random fashion**. If it is correct, then using technical analysis to study past share price movements will not give anyone an advantage, because the information they use to predict share prices is already reflected in the share price.

Semi-strong form efficiency

If a stock market displays semi-strong efficiency, current share prices reflect both:

- **All relevant information** about **past price movements** and their implications, and
- **All knowledge** which is **available publicly**

This means that individuals cannot 'beat the market' by reading the newspapers or annual reports, since the information contained in these will be reflected in the share price.

Stock markets are usually presumed to be semi-strong efficient.

Strong form efficiency

If a stock market displays a strong form of efficiency, share prices reflect **all** information whether publicly available or not:

- From past price changes
- From public knowledge or anticipation
- From specialists' or experts' insider knowledge (eg investment managers)

Significance to a listed company of semi-strong efficiency

The main consequence for financial managers will be that they simply need to **concentrate** on **maximising the net present value** of the **company's investments** in order to maximise the wealth of shareholders.

Managers need not worry, for example, about the effect on share prices of financial results in the published accounts because investors will make **allowances** for **low profits** or **dividends** in the current year if higher profits or dividends are expected in the future.

There is little point in financial managers attempting strategies that will attempt to mislead the markets. There is no point for example in trying to identify a correct date when **shares** should be **issued**, since share prices will always reflect the true worth of the company.

The market will identify any attempts to **window dress the accounts** and put an optimistic spin on the figures.

54 THP Co

Text references. Business valuations are covered in Chapter 17 and rights issues in Chapter 12.

Top tips. This question has a quite complicated scenario that you need to read very carefully. There are linkages between the requirements so, if you can't answer one part, make an assumption and use your own figure in the next part.

Easy marks. Three easy marks are available at the start for application of the dividend valuation model to value a company. There are also straightforward marks available for the calculations in parts (b) and (c).

Examiner's comments. The first step in part (a) was to calculate the current dividend per share, which surprisingly many candidates found difficult. Only one calculation, multiplying the earnings per share of the company by its payout ratio, was needed, but some candidates used half a page of calculations to produce the same answer. This highlights the importance of being familiar with the accounting ratios included in the F9 syllabus. Candidates then needed to use the formula for the DGM given in the formula sheet. Candidates must be familiar with the formulae provided in the examination paper. Some candidates did not understand 'market capitalisation' and offered no answer here for what was a straightforward calculation.

A significant number of candidates showed that they were unfamiliar with the part of the syllabus examined in part (b) and gave answers that gained little credit. Some answers ignored the share price they had calculated in part (a) and assumed a different market price prior to the rights issue, frequently the company's ordinary share par value. Candidates should be aware that rights issues will not be made at a discount to par value. Many 'own error' marks were awarded in marking this part of the question, following on from an assumed share price. In calculating market capitalisation after the rights issue, many answers neglected to subtract the issue costs.

Answers to part (c) were often incomplete or adopted an incorrect methodology, for example calculating the price/earnings ratio of the target company when the question did not give the information needed for this.

In part (d) many candidates did not offer any calculations to support their discussion, or offered calculations that did not relate to the question asked.

In part (e) good answers focused on the circumstances of the company, considered its current capital structure, and discussed such factors as financial risk, current and expected interest rates, security and servicing costs, while weak answers offered a brief list of points with no discussion.

Marking scheme

		Marks
(a)	Dividend per share	1
	Ex-dividend share price	2
	Market capitalisation	<u>1</u>
		4
(b)	Rights issue price	1
	Cash raised	1
	Theoretical ex-rights price per share	1
	Market capitalisation	<u>2</u>
		5
(c)	Calculation of price/earnings ratio	1
	Price/earnings ratio valuation	<u>2</u>
		3
(d)	Calculations of market capitalisation	2-3
	Comment	<u>3-4</u>
	Maximum	5
(e)	Relevant discussion	6-7
	Links to scenario in question	<u>2-3</u>
	Maximum	<u>8</u>
		<u>25</u>

(a)
$$p_0 = \frac{d_0(1+g)}{k_e - g}$$

$d_0 = 64c \times 50\% = 32c$ per share

$g = 5\%$

$k_e = 12\%$

Share price = $\frac{0.32(1+0.05)}{(0.12-0.05)} = \mathbf{\$4.80}$

Market capitalisation = $\$4.80 \times 3m$ shares = **\$14.4m**

(b) (i) **Rights issue price per share** = $\$4.80 \times (1 - 20\%) = \mathbf{\$3.84}$

(ii) It is a 1 for 3 rights issue so number of new shares = $3m/3 = 1m$

Cash raised = $1m \times \$3.84 = \mathbf{\$3.84m}$

(iii) **Theoretical ex-rights price** = $((3 \times \$4.80) + \$3.84)/4 = \mathbf{\$4.56}$

(iv) **Market capitalisation**

	\$m
Market capitalisation from part (a)	14.4
Cash raised from rights issue	3.84
Issue costs	<u>(0.32)</u>
	<u>17.92</u>

The market capitalisation of THP Co after the rights issue is **\$17.92m**, and the share price is $\$17.92/4 = \mathbf{\$4.48}$

(c) P/E ratio of THP Co = Share price/earnings per share
 $= 480/64$
 $= 7.5$

Earnings per share of CRX Co = 44.8c

Using the P/E ratio of THP Co:

Share price of CRX Co = $0.448 \times 7.5 = \$3.36$

Market capitalisation = $\$3.36 \times 1\text{m shares} = \3.36m

(d) (i) **No announcement**

In a semi-strong efficient capital market, current share price reflects all relevant information about **past price movements** and all knowledge which is **available publicly**. If the announcement is not made, the information in the expected savings will not be reflected in the share price of THP Co.

The market capitalisation of THP Co after the acquisition will therefore be equal to its value after the rights issue plus the market capitalisation of CRX Co less cash paid to buy CRX Co.

This amounts to:

$\$14.4\text{m}$ (from part a) + $\$3.36\text{m}$ (from part c) = $\$17.76\text{m}$

= **$\$17.76\text{m}$**

This is equivalent to a **share price of \$4.44** ($17.76/4$). The market capitalisation has **fallen** as, without the information on additional earnings, THP Co has apparently paid $\$3.52\text{m}$ for a company that is only worth $\$3.36\text{m}$.

(ii) **An announcement is made**

In a semi-strong form efficient capital market, the information will be **reflected quickly and accurately** in the share price of THP Co.

The value of the business should increase by the present value of the annual after-tax savings. A quick way to calculate this is to multiply the additional earnings by the P/E ratio:

$\$96,000 \times 7.5 = \0.72m

This gives a **revised market capitalisation of \$18.48m** ($17.76 + 0.72$) which is equivalent to a **share price of \$4.62** ($18.48/4$).

This makes the acquisition much more attractive to the shareholders of THP Co as their shareholder wealth has increased. The **capital gain** on the shares is 14c per share ($4.62 - 4.48$).

This does however assume that the market has not already **anticipated** the savings before they are actually announced.

(e) There are a number of factors to be considered in the choice between debt and equity finance.

Gearing and financial risk

Debt finance tends to be relatively **low risk** for the debtholder as it is interest-bearing and can be secured. The **cost of debt** to a company is therefore relatively **low**. The greater the proportion of debt, the more **financial risk** to the shareholders of the company so the **higher** is their required return.

Financial risk can be measured by the **gearing ratio**. For THP, gearing is currently 68.5% ($5,000/7,300 \times 100$). If **equity finance** is used, this will **decrease** to 45% ($5,000/(7,300 + 3,840) \times 100$). If debt finance is used, gearing will **increase** to 121% ($(5,000 + 3,840)/7,300 \times 100$).

The relative acceptability of these levels of gearing depends on THP's desired level of financial risk.

Objectives

If the primary financial objective of THP Co is to **maximise shareholder wealth**, it should aim to minimise its WACC. This can be achieved by **increasing the amount of debt** in its capital structure. The limit to this is the point at which gearing is so high that costs of **financial distress** are incurred. For example, bankruptcy risk and restrictive covenants imposed by debt providers.

Security

The choice of finance may be determined by the assets the business is willing or able to offer as **security**. This can be in the form of a **fixed charge** on specific assets, or a **floating charge** on a class of assets. More information would be needed on the availability of such assets.

Investors are likely to expect a **higher return** on unsecured debt to compensate them for the extra risk.

Expectations

If **economic conditions** are buoyant, THP Co will be more willing to take on extra debt and commitment to pay interest than if business is suffering in an economic downturn. Lenders are also likely to be more cautious and less willing to lend if the economy is struggling.

Control

A key **advantage of debt finance** for a company's shareholders is that existing shareholdings will not be **diluted**. Debt providers may however impose covenants restricting dividend payment.

A **rights issue** will also not dilute existing patterns of ownership and control provided existing shareholders take up their rights. If the amount of new equity finance required is sufficiently large, new shares may be issued to **new** investors, for example in a **placing**, and this will dilute existing shareholdings.

55 Dartig Co

Text references. Rights issues are covered in Chapter 12, business valuation in Chapter 17 and the agency problem in Chapter 1.

Top tips. You need to recognise the need to calculate the growth rate of dividends in this question which you can then use in part (b) and part (d). If this is too tricky, state a suitable figure and carry on with the calculations. Make sure you write suitably detailed points in the discussion parts and don't just focus on the calculations.

Easy marks. There are easy marks available for the calculations in parts (a) and (d). Good knowledge of the early part of the syllabus will enable you to gain easy marks for the explanations in part (e).

Examiner's comments. In part (a) many candidates gained full marks for their calculations. Weaker answers made errors as regards the form of the issue (it was 1 for 4, not 4 for 1), or thought the theoretical ex rights price was the rights issue price, or calculated the value of the rights. In part (b) a number of candidates were not able to calculate the price/earnings ratio by dividing the current share price by the current EPS. Calculating the EPS after the expansion by multiplying the current EPS by the average historic EPS growth rate was also a problem for some candidates, who were unable to calculate average historic growth rate, or who applied the growth rate to the average EPS rather than the current EPS. Some students were also unfamiliar with the PER valuation method, even though this is discussed in the study texts.

Better answers in part (c) looked to compare the theoretical rights price per share (the share price before the rights issue funds were invested) with the share price after the investment had taken place (for example the share price calculated in part (b)), or to compare the return from the investment (for example, total shareholder return, which is the sum of capital gain and dividend yield) with the cost of equity.

Many candidates gained full marks in part (d). Marks were lost where candidates used EPS rather than dividend per share in the dividend growth model, or were not able to calculate the dividend growth rate, or used incorrect values in the dividend growth model. A surprising number of candidates did not use the dividend growth model given in the formula sheet, but used the rearranged version of the formula that is used to calculate the cost of equity. Some candidates mistakenly thought that the cost of equity calculated by this formula was the same as the share price.

Marking scheme

		Marks
(a)	Rights issue price	1
	Theoretical ex-rights price per share	<u>2</u>
		3
(b)	Existing P/E ratio	1
	Revised EPS	1
	Share price using P/E method	<u>1</u>
		3
(c)	Discussion of share price comparisons	3-4
	Calculation of capital gain and comment	<u>1-2</u>
	Maximum	5
(d)	Average dividend growth rate	2
	Ex-div market price per share	2
	Discussion	<u>2</u>
		6
(e)	Discussion of agency problem	4-5
	Discussion of share option schemes	<u>4-5</u>
	Maximum	8
		<u>25</u>

- (a) (i) Rights issue price = $\$2.50 \times 80\% = \2.00 per share

Theoretical ex-rights price

	\$
4 shares @ \$2.50	10.00
<u>1 share @ \$2.00</u>	<u>2.00</u>
<u>5</u>	<u>12.00</u>

Theoretical ex-rights price (TERP) = $12.00/5 = \$2.40$

- (b) Average growth rate of earnings per share:

$$1 + g = \sqrt[4]{\frac{32.4}{27.7}}$$

$$1 + g = 1.03996$$

$$g = 4\%$$

EPS following expansion = $32.4 \times 1.04 = 33.7$ cents per share

Current P/E ratio = $250/32.4 = 7.7$ times

Share price following expansion = $\$0.337 \times 7.7 = \2.60

- (c) A company will only be able to raise finance if investors think the **returns** they can expect are satisfactory in view of the **risks** they are taking. The proposed business expansion will be an acceptable use of the rights issue funds if it **increases shareholder wealth**.

This can be measured by looking at the effect on the **share price**. The current share price is \$2.50 and the future share price predicted by the P/E method is \$2.60. This indicates that shareholder wealth would increase. However, the capital gain is actually larger than this as shareholders will obtain new shares at a discount, resulting in a theoretical ex-rights price of \$2.40. The **capital gain for shareholders** is therefore $\$2.60 - \$2.40 = 20$ cents per share.

Alternatively, we can consider the effect on **total shareholder wealth**. The rights issue involves 2.5 million shares (\$5m/\$2 per share). There were therefore 10 million shares (2.5×4) before the investment and

Dartig was worth \$25m ($10\text{m} \times \2.50). After the investment, Dartig is worth \$27.5m ($12.5\text{m} \times \$2.60 - \5m) which is a **capital gain** of \$2.5m.

If investors believe that the expansion will enable the business to grow even further, the capital gain could be even greater. If however, investors do not share the company's confidence in the future, the share price could fall.

(d) **Dividend growth model method of valuation**

$$P_0 = \frac{D_0(1+g)}{r_e - g}$$

Cost of equity (r_e) = 10%

$$g = \sqrt[4]{\frac{15.0}{12.8}} - 1 = 4\%$$

Alternative approach

Using the Gordon growth model $g = br_e$

Average payout ratio over the last 4 years has been 47%, so the average retention ratio has been 53%.

$$g = 53\% \times 10\% = 5.3\%$$

$$D_0 = \$0.15$$

$$P_0 = \frac{0.15(1+0.04)}{0.1-0.04}$$

$$= \$2.60$$

This is 10 cents per share more than the current share price of Dartig Co.

Reasons for difference in share price

The dividend growth model assumes that the **historical trend** of dividend per share payments will **continue into the future**. The future dividend growth rate may however differ from the average historical dividend growth rate, and the current share price may incorporate a more conservative estimate of the future dividend growth rate.

The **cost of equity** of Dartig Co may not be 10%. It may be difficult to make a confident estimate of the cost of capital.

The dividend valuation model assumes that investors act **rationally** and **homogeneously**. In reality, different shareholders will have different expectations and there may be a degree of **inefficiency** in the capital market on which the shares of Dartig Co are traded.

(e) **The agency problem**

Although ordinary shareholders are the owners of the company to whom the board of directors are accountable, the actual powers of shareholders tend to be restricted, except in companies where the shareholders are also the directors. The **day-to-day** running of a company is the responsibility of **management**.

Shareholders are often ignorant about their company's current situation and future prospects. They have no right to inspect the books of account, and their forecasts of future prospects are gleaned from the annual report and accounts, stockbrokers, investment journals and daily newspapers. The relationship between management and shareholders is sometimes referred to as an **agency relationship**, in which managers act as agents for the shareholders.

The **agency problem** refers to the fact that the managers of a company may act in ways which do not lead to shareholder wealth maximisation. There is a **divorce of ownership from control**. If managers hold none or very little of the equity shares of the company they work for, what is to stop them from working inefficiently,

not bothering to look for profitable new investment opportunities, or giving themselves high salaries and perks?

Share option schemes

Goal congruence may be better achieved and the agency problem better dealt with by offering organisational **rewards** (more pay and promotion) for the achievement of certain levels of performance.

In a **share option scheme**, selected employees are given a number of share options, each of which gives the holder the right after a certain date to subscribe for shares in the company at a fixed price. The value of an option will increase if the company is successful and its share price goes up.

Schemes based on shares can **motivate managers** to act in the long-term interests of the organisation by doing things to increase the organisation's market value, for example by investing in projects with positive net present values.

However, it is possible that managers may be rewarded for poor performance if **share prices in general** are rising. An opposite effect would occur if share prices in general are falling and managers may not be rewarded for good performance.

A further problem is deciding on a **share option exercise price** and a **share option exercise date** that will spur managers to concentrate on increasing shareholder wealth and be demanding, rather than being easily achievable.

56 KFP Co

Text references. Cost of capital is covered in Chapter 15, business valuation in Chapter 17 and the capital structure decision in Chapter 16.

Top tips. This is a wide ranging question and you must ensure that you answer the specific requirements of each question.

Make sure you use the CAPM formula to calculate the cost of equity and the IRR formula to calculate the cost of debt in part (a). In part (b) you need to assume that the dividend growth rate is the same as the earnings per share growth rate given in the question.

Part (c) is asking for a discussion of optimal capital structure theory, not the use of WACC in investment appraisal. You need to calculate the current gearing of the bidding company and consider the effect of adding more debt equal to the value of the target company. We have used book values in this calculation, but you could have used market values.

Easy marks. There are easy marks available for the calculations, especially in part (a) which should be very straightforward if you have practised this technique.

Examiner's comments. In part (a) many candidates gained full marks but some answers lost marks because they included the debt of the target company in their calculation.

Many candidates had difficulty in calculating the dividend per share in part (b). This indicates a lack of understanding of the payout ratio.

Some answers in part (c) failed to answer the question or were very general in nature.

ACCA examiner's answer. The examiner's answer to this question is included at the back of this kit.

Marking scheme

		Marks
(a)	Cost of equity calculation	2
	Correct use of taxation rate	1
	Cost of debt calculation	3
	Market value of equity	1
	Market value of debt	1
	WACC calculation	2
		10
(b)	Price/earnings ratio value of company	2
	Current dividend per share	1
	Dividend growth model value of company	3
		6
(c)	Traditional view of capital structure	1-2
	Miller and Modigliani and capital structure	2-3
	Market imperfections	1-2
	Other relevant discussion	1-2
	Comment on debt finance for cash offer	2-3
	Maximum	<u>9</u>
		<u>25</u>

(a) Cost of equity

Using the CAPM: $E(r_i) = R_f + \beta_i (E(r_m) - R_f)$

$$\begin{aligned} E(r_i) &= 4\% + 1.2(10.5\% - 4\%) \\ &= 11.8\% \end{aligned}$$

Cost of debt

After-tax interest payment = $100 \times 7\% \times (1 - 30\%) = \4.90

Year		Cash flow \$m	10% discount factors	PV \$m	5% discount factors	PV \$m
0	Market value	(94.74)	1.000	(94.74)	1.000	(94.74)
1-7	Interest	4.90	4.868	23.85	5.786	28.35
7	Capital repayment	100.00	0.513	51.30	0.711	71.10
				<u>(19.59)</u>		<u>4.71</u>

Calculate the cost of debt using an IRR calculation.

$$\begin{aligned} \text{IRR} &= a\% + \left[\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \times (b - a) \right] \% \\ &= 5\% + \frac{4.71(10\% - 5\%)}{4.71 + 19.59} \\ &= 6\% \end{aligned}$$

The **after tax cost of debt** is therefore 6%

Number of shares issued by KFP Co = $\$15\text{m}/0.5 = 30$ million shares

$$\begin{aligned} V_E &= 30 \text{ million} \times \$4.20 \\ &= \$126 \text{ million} \end{aligned}$$

$$\begin{aligned} V_D &= 15 \text{ million} \times 94.74/100 \\ &= \$14.211 \end{aligned}$$

$$\begin{aligned}
 \text{WACC} &= k_e \left(\frac{V_E}{V_E + V_D} \right) + k_d \left(\frac{V_D}{V_E + V_D} \right) \\
 &= 11.8 \left(\frac{126}{126 + 14.211} \right) + 6 \left(\frac{14.211}{126 + 14.211} \right) \\
 &= 10.6\% + 0.6\% \\
 &= \mathbf{11.2\%}
 \end{aligned}$$

(b) (i) **Price/earnings ratio method**

Earnings per share of NGN = 80c per share

P/E ratio of KFP Co = 8

Share price of NGN = EPS × P/E of KFP co
 = 80c × 8
 = 640c = \$6.40

Number of ordinary shares of NGN = 5/0.5 = 10 million shares

Value of NGN = \$6.40 × 10 million shares
 = **\$64 million**

(ii) **Dividend growth model**

Payout ratio = 45%

Dividend per share of NGN = 80c × 45% = 36c

As the payout ratio has been maintained for several years, we can assume that recent earnings growth of 4.5% is the same as the dividend growth rate.

$$P_o = \frac{D_o(1+g)}{K_e - g}$$

$$\begin{aligned}
 \text{Value of shares} &= \frac{0.36 \times (1 + 0.045)}{0.12 - 0.045} \\
 &= \$5.02
 \end{aligned}$$

Value of NGN = \$5.02 × 10 million shares
 = **\$50.2 million**

(c) **Capital structure**

In general, equity is considered to be **riskier** than debt finance and is therefore **more expensive**. There are contrasting views on the relationship between the choice of equity or debt finance and the effect on the weighted average cost of capital (WACC).

Traditional view

The traditional view of capital structure is that there is an **optimal capital structure** and the company can minimise its WACC and therefore increase its total value, by a suitable use of debt finance in its capital structure.

As the level of gearing increases, the **cost of debt** remains **unchanged** up to a certain level of gearing. Beyond this level, the cost of debt will rise. The **cost of equity** rises as the level of gearing increases and financial risk increases. The **WACC** therefore falls initially as the proportion of debt capital increases, and then begins to increase as the rising cost of equity becomes more significant.

The **optimum level of gearing** is where the company's WACC is **minimised**.

Modigliani and Miller

Modigliani and Miller stated that in a **perfect capital market with no taxes**, a company's capital structure would have **no effect** on its WACC.

As the level of gearing increases, the cost of equity rises at a rate that exactly cancels out the effect of cheaper debt. This combines to keep the **WACC constant**.

The effect of tax

Modigliani and Miller modified their assumption of no tax and admitted that **tax relief** on interest payments does lower the WACC. The tax savings arising are the **tax shield** and this enables the WACC to **fall** up to a gearing of 100%. This suggests that companies should have a capital structure made up entirely of debt. This does not happen in practice due to the existence of **market imperfections** such as bankruptcy risk and agency costs, which undermine the tax advantages at high levels of gearing.

Pecking order theory

Pecking order theory has been developed as an alternative to traditional theory. It states that firms will prefer **retained earnings** to any other sources of finance, and then will choose debt and last of all equity.

Companies may therefore choose not to seek to minimise their WACC.

Using debt to finance a cash offer for NGN

The amount of finance required is between \$50.2 million and \$64 million. This may be even higher if a **premium** is required to persuade NGN's owners to sell.

The **current gearing** (debt/equity) ratio for KFP Co is 60% (15m/25m). After the acquisition, debt would increase by at least \$50.2m of bid finance and \$20m of existing NGN debt. Gearing would therefore **increase** to 341% (15 + 50.2 + 20/25).

This is a very high level of gearing and KFP Co would need to consider the **risks** associated with this, such as not being able to pay the interest and potential bankruptcy. The key question is whether the benefits to be gained from the acquisition outweigh the additional costs and risks of the amount of debt finance required.

57 Marton Co

Text references. Working capital management is covered in Chapters 4, 5 and 6. Foreign currency risk is covered in Chapter 19.

Top tips. This is a wide-ranging question on management of receivables, both domestic and foreign and makes an excellent revision question for the subject. In part (b) the emphasis should have been on the specific services offered by *overseas* as opposed to domestic factors.

- (a) Relative costs and benefits of the two proposals for reducing UK receivables

Option 1: factoring

Top tips. A 'with recourse' service implies that the factor does not guarantee against bad debts. Marton can therefore choose whether it takes up the credit insurance facilities or not. Unfortunately the question does not give any information about the current or expected level of bad debts which would be useful in making this decision. We have assumed that the insurance is taken up, but we cannot put in any figure for bad debts saved.

The question gives no indication of the level of bad debts which are being borne at the moment. It is therefore impossible to say whether the credit insurance is worthwhile or not. If the credit insurance is compulsory, then the factoring agreement is non-recourse, not with-recourse.

UK sales are £20 million in 365 days.

If the **receivable collection period** is reduced by 15 days, the reduction in receivables will be:

$$15/365 \times £20 \text{ million} = £821,918.$$

The cash inflow is used to reduce the overdraft, giving an annual interest saving of:

$$13\% \times £821,918 = £106,849.$$

Thus:

	£	£
Administrative savings		200,000
Annual interest saved		<u>106,849</u>
Total savings		306,849
Factor's service charge: 1% × \$20 million	200,000	
Credit insurance (if taken)	<u>80,000</u>	
		<u>280,000</u>
Net benefit to profit before tax		<u>26,849</u>

Option 2: prompt settlement discounts

The effect of the discount scheme is that 50% of UK receivables will pay faster than before. The remaining 50% are unchanged.

Before the discount scheme is in place, 50% of UK receivables is 50% × £4.5 million = £2.25 million.

After the scheme is introduced:

<i>Customers</i>		<i>Sales value</i>		<i>Receivables</i>
		£'000		£'000
Paying within 10 days:	20%	4,000	4,000 × 10/365	109,589
Paying within 20 days:	<u>30%</u>	<u>6,000</u>	6,000 × 20/365	<u>328,767</u>
	<u>50%</u>	<u>10,000</u>		<u>438,356</u>

After the discount scheme gets going, the value of receivables for 50% of the sales will be reduced from £2,250,000 to £438,356. The remaining receivables will be unchanged.

Reduction in receivables = £2,250,000 – £438,356 = £1,811,644.

Again, the resulting cash inflow is used to reduce the overdraft, saving interest:

		£	£
Annual interest saving:	13% × £1,811,644		235,514
Cost of discount:			
Customers paying within 10 days	20% × £20m × 3%	120,000	
Customers paying within 20 days	30% × £20m × 1.5%	<u>90,000</u>	
			<u>210,000</u>
Net gain			<u>25,514</u>

Top tips. Because there will be a transition period during the first few months while receivables move from £2,250,000 down to £438,356, the annual interest saving figure is slightly overstated. In this style of question you are not expected to calculate the accurate interest saving figure by looking at receivables month by month.

On the basis of the above figures, the factoring option appears to be marginally better. Two other considerations weigh in favour of factoring:

(i) **Need for credit insurance**

It is not obvious that the **credit insurance** is required. An examination of the current level of bad debts is needed. If the credit insurance can be avoided, there is a clear advantage to the factoring agreement.

(ii) **Risk**

Risk is far lower for the **factoring** scheme than the discount scheme. The estimates of proportions of receivables taking the discount in the prompt payment scheme are subject to extreme uncertainty and the vagaries of human nature. For example, some large customers may insist on the discount and then pay late. By contrast, all the key elements of the factoring scheme are negotiable 'up front' and can be written into the contract. For example, if the factor does not pay within the agreed period, the service fee is reduced or avoided.

(iii) **Customer confidence**

The disadvantage of factoring, that it supposedly reduces customer confidence, is probably not significant. The customers most likely to be 'put off' are those who are aiming to take more credit than they are entitled to do.

Conclusion

It is therefore recommended that the factoring services are used.

(b) **Overseas factoring**

For a company with annual overseas credit sales of at least £250,000, **overseas factors** offer the same basic facilities as domestic factors. Broadly, these facilities are the collection of debts, sales ledger management and provision of flexible finance based on the size of the sales ledger.

Non-recourse factoring

Non-recourse factoring means that the factor will bear the risk of bad debts. With recourse means that the factor can return to the principal and say that a debt is irrecoverable. For overseas sales especially, non-recourse factoring is preferable and can be a cheaper alternative than using documentary letters of credit.

Additional services

Overseas factors offer two additional services which are valuable to firms without much experience of exporting:

(i) **Handling export sales documentation**

(ii) Providing a **credit rating service** on potential overseas customers

(c) (i) **Losses** on sales receipts will be **sustained** if the dollar weakens relative to sterling, ie if there are more dollars to each pound.

		£
Current export sales in £		5,000,000
Spot exchange rate \$/£	1.45	
Current \$ value of export sales at spot rate 1.45 \$/£	\$7,250,000	
Maximum forecast \$/£	1.60	
£ value of \$7.25 million at 1.60 \$/£		4,531,250
Maximum exchange loss if no hedge used		<u>(468,750)</u>

(ii)

		£
Agreed forward rate for \$/£	1.55	
Selling \$7.25m forward at 1.55 \$/£ gives		4,677,419
Best possible result is when \$/£ strengthens to	1.30	
£ value of \$7.25 million at 1.30 \$/£		5,576,923
Maximum opportunity cost		<u>(899,504)</u>

(iii) **Hedging**

Hedging foreign currency risk means taking action to reduce that risk in the sense that the cash flow is made more predictable and the chance of a large unexpected currency loss is eliminated.

Benefits and drawbacks

The advantage of predictable cash flows is that cash planning is made easier and it is easier to raise loans. However, it must be recognised that in eliminating the chance of a large loss, the company loses the chance of currency gains and can also pay a high price to bankers in the long run unless it is dealing in very large sums of foreign currency.

Forward contracts

A popular currency hedge is the forward contract of the type described in this question. However the forward rate given (1.55 \$/£) appears to be very expensive compared with the most likely value of the future \$/£ spot rate estimated by the company's advisors (1.45 \$/£). This estimate must be

investigated further, as it may be inaccurate. In general, it is likely to be better to confine forward contracts to high value dollar sales, bearing the risk on lower value invoices.

Borrowing in dollars

If Marton's dollar receivables are fairly constant in value, an alternative and better hedging technique would be to **switch some of its borrowing** from sterling to US dollars (ie take out a US dollar overdraft). The amount of borrowing should be roughly equal to the value of dollar receivables. Any loss on the receivables is then countered by an equal and opposite gain on the overdraft and vice versa.

58 SDT

Text references. Foreign currency risk is covered in Chapter 19.

Top tips. Note the requirements in (a) require **critical** commentary, which should have indicated to you the need to explain why the director's views were wrong.

The main problem in (b) appears to have been identifying which figure you had to calculate, indicating you needed to read the question carefully. The greater of the two relevant exchange rates is used in every calculation, as in each case SDT is receiving the foreign currency, and is having to pay the higher amount to obtain each £ that it wants.

(c) is a straightforward look at the higher risks that mean a higher return is required. (d) can bring in debtor management as well as option forward contracts.

(a) The main problems with the Managing Director's views are:

(i) **Conditions for efficiency**

The conditions for efficiency are **market liquidity, full information and freely floating currencies**. In practice liquidity and information available varies between currencies. Many currencies are at most subject to managed floating, floating within limits decided (possibly in secret) by governments. However conditions for efficiency will apply more to the major currencies in the scenario, and gains and losses from each individual currency may be equally likely.

(ii) **Limited range of currencies**

Although the managing director is correct in saying that the risk is diversified, it is not diversified across all currencies. It is possible that the £ may move in an **adverse direction** against each of the three currencies, if for example the UK's inflation rate was higher than other major nations or because of interdependence between the economies. In fact the currencies quoted are known as the Triad because the countries are similar markets, so in practice there might be **positive correlation between the three** and hence diversification over them will increase the risk of losses.

(iii) **Hedging sales only**

Foreign exchange risk is enhanced because it is only in one direction, for **sales**. As purchases are all in £, there is no matching of sales and purchases in the same currency which will limit foreign exchange risk.

Currency hedging may be beneficial for the following reasons, although it will incur costs:

(i) **Risk limitation**

Hedging risk can mean that the amounts SDT receives can be **fixed**, and SDT is not **subject to adverse fluctuations**. In an efficient market, prices respond to new information, so shocks may have unexpected effects on exchange rates.

(ii) **Size of possible losses**

Because SDT exports over 90% of its production, **potential losses** from adverse events could be **very large**.

(iii) **Improved forecasting**

Fixing the amounts to be received will also help **internal forecasting and budgeting procedures**.

Conclusion

Bearing these considerations in mind, SDT needs to consider hedging risk

(b) (i) (1) **A**

$$\begin{aligned}\text{Contribution} &= (9,487,500/200.032) - (2.75 \times 9,487,500/632.50) \\ &= 47,430 - 41,250 \\ &= \text{£}6,180\end{aligned}$$

B

$$\begin{aligned}\text{Contribution} &= (82,142/1.7775) - (4.80 \times 82,142/10.2678) \\ &= 46,212 - 38,400 \\ &= \text{£}7,812\end{aligned}$$

Europe

$$\begin{aligned}\text{Contribution} &= (66,181/1.4784) - (6.25 \times 66,181/12.033) \\ &= 44,765 - 34,375 \\ &= \text{£}10,390\end{aligned}$$

(2) **A**

$$\begin{aligned}\text{Contribution} &= (9,487,500/202.63) - 41,250 \\ &= 46,822 - 41,250 \\ &= \text{£}5,572\end{aligned}$$

B

$$\begin{aligned}\text{Contribution} &= (82,142/1.7750) - 38,400 \\ &= 46,277 - 38,400 \\ &= \text{£}7,877\end{aligned}$$

Europe

$$\begin{aligned}\text{Contribution} &= (66,181/1.4680) - 34,375 \\ &= 45,082 - 34,375 \\ &= \text{£}10,707\end{aligned}$$

(ii) **Hedging**

$$\text{Contribution to sales ratio} = \frac{6,180 + 7,812 + 10,390}{47,430 + 46,212 + 44,765} = 17.62\%$$

Not hedging

$$\text{Contribution/sales ratio} = \frac{5,572 + 7,877 + 10,707}{46,822 + 46,277 + 45,082} = 17.48\%$$

Hedging leads to a higher contribution per sale than not hedging and accordingly SDT should hedge its foreign exchange exposure.

(c) **Reasons for generating higher rates of return**

Businesses will try to generate higher contributions from export sales as they appear to be riskier than domestic sales.

Foreign exchange risk

Foreign exchange risk will mean that the **receipts** are **uncertain**, unless the exports are **invoiced** in the **domestic currency**.

Physical risk

Because of the greater distances, there may be an increased risk of the goods being **lost, damaged or stolen in transit**, or the documents accompanying the goods going astray.

Credit risk

There may be a higher risk in allowing customers credit because **researching** their suitability is more difficult than domestic customers. Payments may be **slower** from **overseas customers**, and it may be difficult and costly to monitor and pursue customers who fail to pay promptly or at all.

Trade risk

Because of the large distances travelled, there may be a risk that the customers **do not accept the goods** when delivered, or that the order is cancelled in transit.

Political risk

Overseas governments may impose a **variety of rules and restrictions**, including **higher quality standards** than are imposed in the company's own domestic market.

Risk mitigation

The effects of all these risks can be mitigated by **hedging techniques** for foreign exchange currency, **insuring** against the **risks** or reducing the risk of problems by, for example, using **credit reference agencies** to report on customers. However all of these will have a cost, and increased sales revenues will cover those costs.

Investment

If costs of investment are **higher abroad** than at home, increased revenues will be required to cover these. This includes not only capital costs, but also costs of investing in administration and specialist trading and treasury staff.

(d) Risk

The risk is that SDT will be forced to **buy currency at a poorer spot rate**, in order to be able to sell it to the bank at the forward rate. If the customer subsequently fulfils the contract, SDT may not be able to recoup the loss it has made. Alternatively SDT may take out another forward contract up until the time that the customer is expected to pay, but this may be on poorer terms than the original contract. **Transaction costs** will also be incurred.

Risk reduction procedures

- (i) The risk can be avoided by taking out **insurance** against the possibility of the customers failing to fulfil their obligations, although a premium will be payable.
- (ii) SDT could **reduce the risk of the customers paying late** by offering a discount for payment on time; the cost then would be the amount of the discount. Alternatively SDT could specify **penalties** for late payment; this would reduce the cost for SDT if payment was late.
- (iii) SDT could take out an **option forward contract** that would give it some leeway as to the date the contract will be fulfilled. However there would be **increased transaction costs**, and SDT would have to accept the worst exchange rate over the period the option could be exercised.

Text references. Foreign currency risk is covered in Chapter 19.

Top tips. In (a) don't forget to convert the transaction costs at today's spot rate. (a) (ii) needs to be read carefully; the term annual rate for **three months' borrowing** indicates that the rate given just needs to be divided by 4 rather than the principles of compound interest be applied. Remember that you want \$200,000 in three months time, so what you are effectively doing is calculating the present value of that amount now.

(b) is only worth five marks and is asking for two sets of points; this indicates that the examiner doesn't want very much more than two lists. Within those lists you can however give indications of what is important to BS.

Part (c) requires a full discussion of causes of exchange rate fluctuations not just a list of factors.

- (a) (i) Since both the receipts and payments are expected to occur **on the same date**, BS plc need only hedge the net amount, ie a receipt of \$200,000 (\$450,000 – \$250,000). To hedge this transaction, a three-month forward contract to sell dollars will be required.

The **transaction cost** will be paid immediately in US\$. BS must therefore **buy dollars now** to cover this at the spot rate of \$1.6540/£.

The net receipt can now be calculated:

	£
Sterling proceeds in 3 months' time: \$200,000 ÷ 1.6513	121,117
Transaction costs: \$200,000 × 0.2% ÷ 1.6540	<u>(242)</u>
Net receipt	<u>120,875</u>

- (ii) Since the company is expecting to receive dollars, to effect a money market hedge it will need to **borrow dollars now** in anticipation. The sum to be borrowed must be just enough so that the receipt in three months' time will repay the loan and the interest due for the period.

The money will be borrowed in the US at an annual rate of 6%. This equates to a three month rate of 1.5% (6%/4). The amount to be borrowed in dollars is therefore \$200,000 ÷ 1.015 = \$197,044. These dollars will be sold now at the spot rate of \$1.6590/£ to realise £118,773.

This **sterling amount** can now be invested in the UK at an annual rate of 6.5%. This equates to a three-month rate of 1.625%. The value of the deposit at the end of the three month period when the dollar loan is repaid will be £118,773 × 1.01625 = £120,703.

The transaction cost will be the same as for the forward market hedge. The net receipt under this method will therefore be £120,703 – £242 = **£120,461**.

The receipts are highest if the **forward market hedge** is used, and this will therefore be the **preferred method**.

(b) **Factors to consider**

- (i) The **relative costs** of the different options
- (ii) The **ability of the staff to manage the techniques**, given that there is not a specialist treasury department
- (iii) The **attitude of the company to risk**
- (iv) The **size of the transaction** in relation to the company's overall operations, and therefore the scale of the risks involved
- (v) The **perceived level of risk** attached to the currencies in question

Alternative options to minimise risk

- (i) **Operating bank accounts in foreign currencies.** This is only an option if the company has regular transactions in the currencies in question.
- (ii) The **use of multilateral netting.** This will only be possible if there are a large number of foreign currency transactions.
- (iii) The company could consider the **use of swaps and option contracts.**

- (iv) The company could consider the **cost and viability** of insisting that more of its contracts are denominated in sterling.

(c) **The causes of exchange rate fluctuations**

Currency supply and demand

The exchange rate between two currencies – ie the buying and selling rates, both 'spot' and forward – is determined primarily by supply and demand in the foreign exchange markets. Demand comes from individuals, firms and governments who want to buy a currency and supply comes from those who want to sell it.

Supply and demand for currencies are in turn influenced by:

- The rate of inflation, compared with the rate of inflation in other countries
- Interest rates, compared with interest rates in other countries
- The balance of payments
- Sentiment of foreign exchange market participants regarding economic prospects
- Speculation
- Government policy on intervention to influence the exchange rate

Interest rates

The difference between spot and forward rates reflects differences in interest rates. If this were not so, then investors holding the currency with the lower interest rates would switch to the other currency for (say) three months, ensuring that they would not lose on returning to the original currency by fixing the exchange rate in advance at the forward rate. If enough investors acted in this way (known as arbitrage), forces of supply and demand would lead to a change in the forward rate to prevent such risk-free profit making.

The principle of **interest rate parity** links the foreign exchange markets and the international money markets.

Inflation

Purchasing power parity theory predicts that the exchange value of foreign currency depends on the relative purchasing power of each currency in its own country and that spot exchange rates will vary over time according to relative price changes.

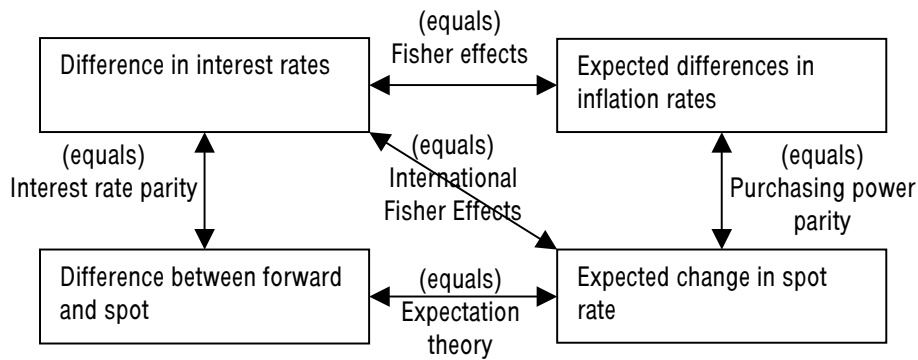
In the real world, exchange rates move towards purchasing power parity only over the long term.

Countries with relatively **high** rates of inflation will generally have high nominal rates of interest, partly because high interest rates are a mechanism for reducing inflation, and partly because of the **Fisher effect**: higher nominal interest rates serve to allow investors to obtain a high enough real rate of return where inflation is relatively high.

According to the international Fisher effect, interest rate differentials between countries provide an unbiased predictor of future changes in spot exchange rates. The currency of countries with relatively high interest rates is expected to depreciate against currencies with lower interest rates, because the higher interest rates are considered necessary to compensate for the anticipated currency depreciation. Given free movement of capital internationally, this idea suggests that the real rate of return in different countries will equalise as a result of adjustments to spot exchange rates.

Four-way equivalence

The four-way equivalence model states that in equilibrium, differences between forward and spot rates, differences in interest rates, expected differences in inflation rates and expected changes in spot rates are equal to one another.



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Text references. Foreign currency risk is covered in Chapter 19.

Top tips. In part (a), using numerical examples will help you to discuss the differences between the different types of risk.

The purchasing power parity formula relating inflation rates to exchange rates is on the formula sheet so you simply need to be able explain what it means in part (b).

Parts (c) and (d) are standard hedging calculations that you should be able to do if you have practised the methods.

Easy marks. There are five parts to this question, each with a relatively small mark allocation so you should be able to pick up marks on some parts, even if you find this part of the syllabus challenging.

Marking scheme

		Marks
(a)	Transaction risk	2
	Translation risk	2
	Economic risk	<u>2</u>
		6
(b)	Discussion of purchasing power parity	4-5
	Discussion of interest rate parity	<u>1-2</u>
	Maximum	6
(c)	Netting	1
	Sterling value of 3-month receipt	1
	Sterling value of 1-year receipt	<u>1</u>
		3
(d)	Evaluation of money market hedge	4
	Comment	<u>1</u>
		5
(e)	Definition of currency futures contract	1-2
	Initial margin and variation margin	1-2
	Buying and selling of contracts	1-2
	Hedging the three-month receipt	<u>1-2</u>
	Maximum	<u>5</u>
		<u>25</u>

(a) **Transaction risk**

This is the risk of adverse exchange rate movements occurring in the course of **normal international trading transactions**. This arises when the prices of imports or exports are fixed in foreign currency terms and there is movement in the exchange rate between the date when the price is agreed and the date when the cash is paid or received in settlement.

For example, a sale worth \$3,000 when the exchange rate is \$1.7820 per £ has an expected sterling value of £1,684. If the dollar has **depreciated** against sterling to \$1.8500 per £ when the transaction is settled, the sterling receipt will have fallen to £1,622.

Transaction risk therefore affects cash flows so companies often choose to **hedge** or protect themselves against transaction risk.

Translation risk

This is the risk that the organisation will make exchange losses when the accounting results of its foreign branches or subsidiaries are **translated** into the home currency. Translation losses can result, for example, from restating the book value of a foreign subsidiary's assets at the exchange rate on the balance sheet date.

For example, an asset is valued on a balance sheet at \$14 million and was acquired when the exchange rate was \$1.79 per £. One year later, the exchange rate has moved to \$1.84 per £ and the balance sheet value of the asset has changed from \$7.82 million to \$7.61 million, resulting in an **unrealised** (paper) **loss** of \$0.21 million.

Translation risk does not affect cash flows so does not **directly** affect shareholder wealth. However, **investors** may be influenced by the changing values of assets and liabilities so a company may choose to hedge translation risk through, for example **matching the currency of assets and liabilities**. For example an asset denominated in euros would be financed by a euro loan.

Economic risk

This refers to the effect of exchange rate movements on the **international competitiveness** of a company. For example, a UK company might use raw materials which are priced in US dollars, but export its products mainly within the EU. A depreciation of sterling against the dollar or an appreciation of sterling against other EU currencies will both erode the competitiveness of the company. Economic exposure can be difficult to avoid, although **diversification of the supplier and customer base** across different countries will reduce this kind of exposure to risk.

(b) **Purchasing power parity theory**

Purchasing power parity theory states that the exchange rate between two currencies is the same in equilibrium when the purchasing power of currency is the same in each country.

The theory predicts that the exchange value of foreign currency depends on the relative purchasing power of each currency in its own country and that **spot exchange rates will vary over time according to relative price changes**.

Formally, purchasing power parity can be expressed in the following formula.

$$F_0 = S_0 \times \frac{(1+i_c)}{(1+i_b)}$$

Where F_0 = expected spot rate
 S_0 = current spot rate
 i_c = expected inflation rate in country c
 i_b = expected inflation rate in country b

This relationship has been found to hold true in the longer term and so tends to be used for forecasting exchange rates a number of years into the future, rather than for forecasting less than one year ahead.

For shorter periods, forward rates can be calculated using **interest rate parity theory**, which suggests that changes in exchange rates reflect differences between interest rates in different countries.

(c) **Forward market**

Net receipt in one month = $$(240,000 - 140,000) = \$100,000$

Nedwen Co needs to sell \$s at an exchange rate of $1.7829 + 0.0003 = \$1.7832$ per £

Sterling value of net receipt = $\$100,000/1.7832 = £56,079$

Receipt in three months = $\$300,000$

Nedwen Co needs to sell \$s at an exchange rate of $1.7846 + 0.0004 = \$1.7850$ per £

Sterling value of receipt = $\$300,000/1.7850 = £168,067$

(d) **Money market hedge**

Expected receipt after three months = $\$300,000$

\$ interest rate over three months = $5.4/4 = 1.35\%$

\$s to borrow now in order to have $\$300,000$ liability after three months = $\$300,000/1.0135 = \$296,004$

Spot rate for selling \$s = $1.7820 + 0.0002 = \$1.7822$ per £

Sterling deposit from borrowed \$s at spot = $\$296,004/1.7822 = £166,089$

Sterling interest rate over three months = $4.6/4 = 1.15\%$

Value in three months of sterling deposit = $£166,089 \times 1.0115 = \$167,999$

In conclusion, the forward market is marginally preferable to the money market hedge for the \$ receipt expected after three months.

(e) A **currency futures contract** is a standardised contract for the sale or purchase at a set future date of a set quantity of currency.

A **future** represents a commitment to an additional transaction in the future **that limits the risk** of existing commitments.

It is traded on a **futures market** and **settlement** takes place in three-monthly cycles ending in March, June, September and December.

The **contract price** is the price at which the futures contract can be bought or sold. For all currency futures the contract price is in US dollars. The contract price is the figure which is traded on the futures exchange. It changes continuously and is the basis for computing gains or losses.

When a currency futures contract is bought or sold, the buyer or seller is required to deposit a sum of money with the exchange. This is called the **initial margin**. If losses are incurred as exchange rates and therefore currency futures prices change, the buyer or seller may be called on to deposit additional funds with the exchange. This is the **variation margin**. In the same way profits are credited to the margin account on a **daily basis**.

Most currency futures contracts are **closed out** before their settlement dates by undertaking the **opposite** transaction to the initial futures transaction. For example, if the initial transaction is buying currency futures, it is closed out by selling currency futures. A gain made on the futures transaction will **offset** a loss made on the currency markets and vice versa.

Nedwen Co expects to receive $\$300,000$ in three months' time and would want to hedge against an **appreciation** (strengthening) in sterling as this would reduce the sterling receipt. This could be achieved by **buying** sterling futures contracts. As it is now 1st April, Nedwen would buy June futures contracts. In June, Nedwen would **buy** the same number of futures and exchange the $\$300,000$ receipt on the currency market.

61 Boluje Co

Text references. Debt finance is covered in Chapters 12 and 14, debt valuation in Chapter 17 and exchange rate risk in Chapter 19.

Top tips. Your written answers must be in enough detail to get the available marks in this question. An answer plan is essential in parts (a) and (d) to make sure your answer is logical, sensible and answers the specific requirements of the question. You can answer these parts even if you struggle with the calculations in parts (b) and (c).

Easy marks. There are easy marks available for straightforward explanations of textbook knowledge, provided you have revised these areas of the syllabus.

Examiner's comments. In part (a) answers were of variable quality, with some candidates writing very little while others gained full marks. Weaker answers discussed other sources of finance, such as leasing or preference shares, or focussed on the disadvantages of equity finance, indicating perhaps that candidates had prepared for a question about equity, but were unprepared for a question about debt.

Good answers in part (b) calculated the interest payable in pesos on each bond, the market value of each bond as just described, and then the total market value by multiplying the market value per bond by the number of bonds issued. Weaker answers sought to calculate the internal rate of return of the bond, which was unnecessary as the cost of debt was given in the question. Internal rate of return is not equal to market value.

Answers to part (c) were again of very variable quality. Many candidates were unable to calculate the annual peso interest required by the illustration of the money market hedge. Both the interest rate and the par value of the bond issue were given in the question, and multiplying one by the other gives the amount of interest to be paid. Some candidates invented a cash flow to illustrate the money market hedge: candidates who invented a future peso receipt failed to notice that the interest rates given in the question could not then be used, since the peso rate was a deposit rate and the dollar rate was a borrowing rate. Weaker answers tried to hedge a future dollar payment, when the question stated that the dollar was the home currency.

Many candidates gave good answers to part (d), even if some answers tended to be a list rather a description.

Marking scheme

		Marks
(a)	Relevant discussion	7
(b)	Market value of each foreign bond	3
	Total market value of foreign bonds	<u>1</u>
		4
(c)	(i) Explanation of money market hedge	2
	Illustration of money market hedge	<u>2</u>
		4
	(ii) Comparison with forward market hedge	2
(d)	Discussion of natural hedge	1-2
	Description of other hedging methods	<u>6-7</u>
	Maximum	<u>8</u>
		<u>25</u>

(a) Debt finance

A company has a choice when deciding how to finance a new investment. **Pecking order theory** suggests that the company will first choose **retained earnings** if they are available rather than go to the trouble of obtaining external finance and have to live up to the demands of external finance providers.

The next choice in the pecking order is **debt finance** which will be preferred to equity finance. Perhaps the current shareholders will be unwilling to **contribute additional capital**; possibly the company does not wish to involve outside shareholders who will have more onerous requirements than current members.

Other reasons for choosing debt finance may include **lesser cost** and **easier availability**, particularly if the company has little or no existing debt finance. Debt finance provides **tax relief** on interest payments.

According to the traditional theory of capital structure, the weighted average cost of capital will fall initially as debt is introduced, as debt has a **lower cost** than equity. It will continue to fall until the **optimal capital structure** is achieved. The company can therefore **increase its market value** by increasing the level of debt finance up to this point.

The use of debt is a **signal of confidence in the company's cash flows** and the use of debt is a **discipline on management** as careful cash flow management is needed. A new, growing business will find it difficult to forecast cash flows with any certainty so high levels of gearing are unwise.

- (b) Annual interest paid per foreign bond = $500 \times 6.1\% = 30.5$ pesos

Redemption value of each foreign bond = 500 pesos

Cost of debt of peso-denominated bonds = 7% per year

Market value of each foreign bond

Period		Cash flow Pesos	Discount factor 7%	Present value Pesos
1-5	Interest	30.5	4.100	125.05
5	Redemption	500	0.713	356.50
				<u>481.55</u>

Current total market value of foreign bonds = $16\text{m} \times (481.55/500) = \mathbf{15,409,600}$ pesos

- (c) (i) Interest payment in one year's time = $16\text{m} \times 6.1\% = 976,000$ pesos

A **money market hedge** would involve placing on deposit an amount of pesos that, with added interest, would be enough to pay the peso-denominated interest in one year. The interest on the peso-denominated deposit is **guaranteed** and therefore Boluje Co would be protected against any unexpected or adverse exchange rate movements prior to the interest payment being made.

Peso deposit required = $976,000 / 1.05 = 929,524$ pesos

Dollar equivalent at spot = $929,524 / 6 = \$154,921$

Dollar cost in one year's time = $154,921 \times 1.04 = \mathbf{\$161,118}$

- (ii) Cost of **forward market hedge** = $976,000 / 6.07 = \mathbf{\$160,790}$

The forward market hedge is slightly cheaper.

- (d) **Hedging against exchange rate risk**

Matching receipts and payments

Wherever possible, a company that expects to make payments and have receipts in the same foreign currency should plan to **offset its payments against its receipts in the currency**. For example, Boluje receives income in pesos from its export sales and makes interest payments in pesos. Since the company will be setting off foreign currency receipts against foreign currency payments, it does not matter whether the currency strengthens or weakens against the company's 'domestic' currency because there will be no purchase or sale of the currency.

The process of matching is made simpler by having **foreign currency accounts** with a bank. Receipts of foreign currency can be credited to the account pending subsequent payments in the currency.

Leading and lagging

A **lead payment** is a payment in advance which would not be beneficial to Boluje as the peso is **depreciating** against the dollar.

A **lagged payment** involves delaying payments beyond their due date. This is also inadvisable as late payments risk a problem with suppliers.

Foreign currency derivatives

Currency futures

A **currency futures contract** is a standardised contract for the sale or purchase at a set future date of a set quantity of currency. A **future** represents a commitment to an additional transaction in the future **that limits the risk** of existing commitments. It is traded on a **futures market** and **settlement** takes place in three-monthly cycles. Most currency futures contracts are **closed out** before their settlement dates by undertaking the **opposite** transaction to the initial futures transaction. For example, if the initial transaction is buying currency futures, it is closed out by selling currency futures. A gain made on the futures transaction will **offset** a loss made on the currency markets and vice versa.

The **disadvantages** of futures contracts are that the **contracts cannot be tailored** to the user's exact requirements. **Hedge inefficiencies** are caused by having to deal in a **whole number of contracts** and by **basis risk** (the risk that the futures contract price may move by a different amount from the price of the underlying currency or commodity) .

Currency options

A **currency option** is a right of an option holder to buy (call) or sell (put) foreign currency at a specific exchange rate at a future date. Currency options protect against **adverse exchange rate movements** while allowing the investor to take advantage of favourable exchange rate movements. They are particularly useful in situations where the cash flow is not certain to occur (eg when tendering for overseas contracts).

Companies can choose whether to buy a tailor-made currency option from a bank, suited to the company's specific needs (**over-the-counter** options), or a standard option, in certain currencies only, from an options exchange (**traded** options). Buying a currency option involves **paying a premium**, which is the most the buyer of the option can lose.

The **drawbacks** of currency options are that the **cost** depends on the **expected volatility** of the **exchange rate** and options must be paid for **as soon** as they are **bought**.

Currency swaps

Currency swaps effectively involve the exchange of debt from one currency to another. A swap is a formal agreement whereby two organisations contractually agree to exchange payments on different terms, eg in different currencies, or one at a fixed rate and the other at a floating rate. Currency swaps can provide a hedge against exchange rate movements for **longer periods** than the forward market, and can be a means of obtaining finance from new countries.

Swaps are **easy to arrange** and are **flexible** since they can be arranged in any size and are reversible. **Transaction costs are low**, only amounting to legal fees, since there is no commission or premium to be paid.

62 Preparation question: Interest rates

Text reference. Interest rate risk is covered in Chapter 20.

Top tips. This is the only type of calculation on interest rate hedging that is examinable so make sure you are competent at this calculation and can explain it.

You should go through (b) very carefully, as the points are very important. (c) develops the issue of how changes in the cost of capital affect financial policy. Note that changes in the cost of capital will affect **investing** decisions (because the weighted average cost of capital is lower and returns are increased due to a rise in demand), and **financing** decisions (because of changes in the relative attractiveness of different sources of finance). The last paragraph demonstrates how investing and financing decisions may be interlinked.

(a) (i) **Procedure for FRAs**

A company can hedge its risk by entering into a forward rate agreement with a bank that **fixes the rate of interest** for borrowing at a certain time in the future. If the actual interest rate proves to be higher than the rate agreed, the bank pays the company the difference. If the actual interest rate is lower than the rate agreed, the company pays the bank the difference.

Advantages of FRAs

An **advantage** of FRAs is that, for the period of the FRA at least, they **protect the borrower** from adverse market interest rate movements to levels above the rate negotiated for the FRA. With a normal variable rate loan (for example linked to a bank's base rate or to LIBOR) the borrower is exposed to the risk of such adverse market movements. On the other hand, the borrower will similarly not benefit from the effects of favourable market interest rate movements.

The FRA required in this situation is '3-9'.

- (ii) At 6% because interest rates have fallen, Bash Co will pay the bank:

	£
FRA payment $\text{£}20 \text{ million} \times (7\% - 6\%) \times \frac{6}{12}$	(100,000)
Payment on underlying loan $6\% \times \text{£}20 \text{ million} \times \frac{6}{12}$	(600,000)
Net payment on loan	<u>(700,000)</u>
Effective interest rate on loan	7%

At 9% because interest rates have risen, the bank will pay Bash Co:

	£
FRA receipt $\text{£}20 \text{ million} \times (9\% - 7\%) \times \frac{6}{12}$	200,000
Payment on underlying loan at market rate $9\% \times \text{£}20 \text{ million} \times \frac{6}{12}$	(900,000)
Net payment on loan	<u>(700,000)</u>
Effective interest rate on loan	7%

(b) **Implications of a fall in interest rates for a typical company**

- (i) The **cost of floating rate borrowing will fall**, making it more attractive than fixed rate borrowing. For most companies with borrowings, interest charges will be reduced, resulting in higher profitability and earnings per share.
- (ii) The **value of the company's shares will rise**, both because of the higher level of company profitability and also because of the lower alternative returns that investors could earn from banks and deposits, if interest rates are expected to remain low in the longer term.
- (iii) The **higher share value results in a lower cost of equity capital**, and hence a lower overall cost of capital for the company. Investment opportunities that were previously rejected may now become viable.
- (iv) As interest rates fall, consumers have **more disposable income**. This may increase demand for the company's products. Falling returns on deposits may, however, encourage many people to save more, rather than spend.

(c) **Change in cost of capital**

As explained above, if interest rates are expected to remain low in the longer term, the company's **overall cost of capital will fall**. The discount rates used in investment appraisal will therefore be lower, making **marginal projects** more **profitable**, with a resulting increase in the company's investment opportunities.

Investment policy review

The **cash flows** from all **possible investments** should be reviewed in the light of falling interest rates and the possible effects on consumer demand and the sterling exchange rate. These cash flows should then be **appraised** at the **new lower discount rates** and the project portfolio ranked and reviewed. The company's investment plans are likely to be expanded, unless constrained by other factors such as lack of skills or management time.

Introduction of debt

When interest rates are expected to fall in the future, an ungeared company may be tempted to **introduce debt** into its capital structure. If fixed interest rates are high at the moment, **floating rate debt** may be **more attractive**, because it allows the company to take advantage of falling interest rates.

Setting gearing level

New projects may be financed entirely by borrowings until an appropriate gearing level is reached. As gearing is increased, the company's **cost of capital** is usually **reduced** because of the **tax relief** on debt interest but, if gearing is increased to too high a level, increased risks of bankruptcy arise, causing the cost of capital to rise.

Choice of projects

If the company is tempted to increase its debt financing substantially, this may affect which investment projects are undertaken, as some projects are more suitable for debt financing than others. Generally, a project with significant tangible assets and stable cash flows will be most suitable for financing by debt.

63 Preparation question: QW

Text references. Interest rate risk is covered in Chapter 20.

Top tips. This is a completely discursive question which covers a broad range of issues. Part (a) is a straightforward explanation of interest rate risk, which you should be completely happy with.

Part (b) gives you the chance to explain the purposes of derivatives in detail, showing the possible costs and the effects on risks. Your answer to (c) should concentrate on the main points of comparison (costs, flexibility, what each instrument achieves).

- (a) **Interest rate risk** is faced by companies with floating and fixed rate debt. It can arise from **gap exposure** and **basis risk**.

Interest rate risk relates to the sensitivity of profit and cash flows to changes in interest rates. An organisation will need to analyse how profits and cash flows are likely to be affected by forecast changes in interest rates and decide whether to take action.

Floating interest rate debt

The most common form of interest rate risk faced by a company is the volatility of cash flows associated with a high proportion of floating interest rate debt. Floating interest rates, of course, change according to general market conditions.

Some of the interest rate risks to which a firm is exposed may cancel each other out, where there are both assets and liabilities with which there is exposure to interest rate changes. If interest rates rise, more interest will be payable on loans and other liabilities, but this will be compensated for by higher interest received on assets such as money market deposits.

Fixed interest rate debt

A company with a high proportion of fixed interest rate debt has a commitment to fixed interest payments. If interest rates fall sharply, the company will suffer from a loss of competitive advantage compared with companies using floating rate borrowing whose interest costs and cost of capital will fall.

Gap exposure

The degree to which a firm is exposed to interest rate risk can be identified by using the method of gap analysis. Gap analysis is based on the principle of grouping together assets and liabilities which are sensitive to interest rate changes according to their maturity dates. Two different types of 'gap' may occur.

A negative gap occurs when a firm has a larger amount of interest-sensitive liabilities maturing at a certain time or in a certain period than it has interest-sensitive assets maturing at the same time. The difference between the two amounts indicates the net exposure.

There is a **positive gap** if the amount of interest-sensitive assets maturing in a particular time exceeds the amount of interest-sensitive liabilities maturing at the same time.

With a negative gap, the company faces exposure if interest rates rise by the time of maturity. With a positive gap, the company will lose out if interest rates fall by maturity.

Basis risk

It may appear that a company which has size matched assets and liabilities, and is both receiving and paying interest, may not have any interest rate exposure. However, the two floating rates may not be determined using the same basis. For example, one may be linked to LIBOR but the other is not.

LIBOR or the London Inter-Bank Offered Rate is the rate of interest applying to wholesale money market lending between London banks.

This makes it unlikely that the two floating rates will move perfectly in line with each other. As one rate increases, the other rate might change by a different amount or might change later.

(b) Financial derivatives

Financial derivatives are **traded products** that have developed from the securities and currency markets. Examples of derivative products include futures and options in currencies and interest rates.

There are two main purposes for which these products might be used:

1 Hedging against known risks

This can best be explained by means of an example. The company might have a **commitment to make a payment** in a foreign currency on a **specific date in three months' time**. It knows the amount of the sum to be paid in foreign currency, but it cannot know what the exchange rate will be at that time. It therefore faces the risk that if the home currency depreciates against the foreign currency, the size of the payment in sterling will be greater than if the payment were made now. This risk could be **hedged** by using a derivative. Such a transaction would have a **commission cost associated** with it, but it would **limit the risk** faced by the company.

2 Speculation

Derivatives can also be used to **gamble on expectations of movements** in interest and exchange rates. For example, the investor might believe that sterling would weaken against the dollar, and therefore buy dollars futures. These dollars would then be sold on the spot market once the expected movement in rates had taken place. The transactions are made purely with the **motive of making a profit**, and are not linked to any underlying business transactions. They are therefore very risky.

Since QW has diversified, international interests, derivative products offer **significant benefits** in the management of the financial risks to which the company is exposed. The board needs to determine the level of risk that it is prepared to accept in these areas so that an integrated set of guidelines can be established for the effective management of these issues.

(c) Hedging interest rate risk

The main techniques available to hedge this type of risk are as follows.

Forward rate agreements

A **forward rate agreement (FRA)** is an OTC contract to lend or borrow a given sum of money in the future at an interest rate that is agreed today. For currencies, the equivalent is the **forward contract**: an agreement to buy or sell a given amount of currency in the future at an exchange rate that is agreed today. These contracts can be used to **'fix' interest rates or exchange rates** on future transactions, thus **removing the risk of rate movements** in the intervening period.

Interest rate futures

These operate in a similar way to forward rate agreements. However, they are not negotiated directly with a bank but are **traded on the futures market**. Consequently, the terms, the amounts and the periods are **standardised**. For this reason, forward rate agreements are normally more appropriate than interest rate futures to non-financial companies such as QW.

Interest rate options

An interest rate option provides the **right to borrow or to lend a specified amount at a guaranteed rate of interest**. On the date of expiry of the option, or before, the buyer must decide whether or not to **exercise the right**. Thus in a borrowing situation, the option will only be exercised if market interest rates have risen above the option rate. Tailor made contracts can be purchased from major banks, while standardised contracts are traded in a similar way to interest rate futures. The cost of taking out an option is generally higher than for a forward rate agreement.

Interest rate swaps

These are transactions that exploit different interest rates in different markets for borrowing, to **reduce interest costs** for either fixed or floating rate loans. An interest rate swap is an arrangement whereby two companies, or a company and a bank, **swap interest rate commitments** with each other. In a sense, each simulates the other's borrowings, although each party to the swap retains its obligations to the original lenders. This means that the parties must accept counterparty risk.

The main benefits of a swap as compared with other hedging instruments are as follows.

- **Transaction costs are low**, being limited to legal fees
- They are **flexible**, since they can be arranged in any size, and they can be reversed if necessary
- Companies **with different credit ratings** can **borrow at the best cost in the market** that is most accessible to them and then swap this benefit with another company to reduce the mutual borrowing costs
- Swaps allow **capital restructuring** by changing the nature of interest commitments without the need to redeem debt or to issue new debt, thus reducing transaction costs

64 Gorwa Co

Text references. Interest rate risk is covered in Chapter 20, overtrading in Chapter 4 and factoring in Chapter 5.

Top tips. This is a time pressured question and you will need to do the necessary calculations as quickly as possible, making sure you allow sufficient time to write enough explanations and discussion. Use a logical approach and show your workings clearly to gain as many marks as possible in the time available.

Easy marks. There are plenty of easy marks available for some straightforward ratio analysis and the calculation in part (c).

Examiner's comments. Some candidates were not aware of the difference between interest rate and interest payment, and consequently discussed how the company's finance costs (interest payments) had increased from one year to the next. Analysis would have shown that the increase in the finance cost was due to the increase in the overdraft and that the interest rate applied to the overdraft was 5% in each year, ie the interest rate had not changed. The bonds were fixed-rate in nature, as they were given in the balance sheet as 8% bonds. As the question asked about hedging interest rate risk, looking at the balance between fixed rate debt (bonds) and floating rate debt (overdraft) was also relevant here, as was a consideration of gearing and interest cover. The question was, in fact, very open in nature, and a discussion of the effects of an increase in interest rates could look at an increase in financial risk, a decrease in sales due to a fall in demand, an increase in operating costs and a cutting back of investment plans.

In part (b), better answers calculated a series of accounting ratios, perhaps adding some growth rates and changes in financial statement entries, and used this analysis to look at the increasing dependence of the company on short-term sources of finance while sales were expanding at a high rate. Weaker answers often did little more than repeat in words the financial ratios that had been already calculated without explaining how or why the identified changes supported the idea that the company was overtrading.

In part (c) many candidates seemed to be unfamiliar with the relationship between credit sales, the level of trade receivables in the balance sheet, trade receivables days (the trade receivables collection period), and the cost of financing trade receivables. This unfamiliarity led to applying the revised trade receivables days to the current level of receivables instead of to credit sales: calculating the factor's advance on the current level of receivables rather than on the revised level of receivables: and calculating the factor's fee on the level of receivables rather than on credit sales.

Since marks were available for each element of the cost-benefit analysis, most candidates were able to obtain reasonable marks on this part even where answers were incomplete or contained some of the errors identified above.

Marking scheme

		Marks
(a)	Discussion of effects of interest rate increase	3-4
	Relevant financial analysis	1-2
	Interest rate hedging	<u>2-3</u>
	Maximum	7
(b)	Financial analysis	5-6
	Discussion of overtrading	4-5
	Conclusion as to overtrading	<u>1</u>
	Maximum	10
(c)	Reduction in financing cost	3
	Factor's fee	1
	Interest on advance	2
	Net cost of factoring	1
	Conclusion	<u>1</u>
		<u>8</u>
		<u>25</u>

(a)		<i>20X7</i>	<i>20X6</i>
		\$'000	\$'000
	8% bonds	2,425	2,425
	Overdraft	<u>3,225</u>	<u>1,600</u>
	Total debt	5,650	4,025
	Proportion of debt that has variable interest (1,600/4,025 × 100%)	57%	40%
	Overdraft interest payments @ 5%	161	80
	Bond interest payments @ 8%	<u>194</u>	<u>194</u>
		355	274
	Proportion of interest payments that are variable (80/274 × 100%)	45%	29%
	Interest coverage ratio (2,939/274)	8.4 times	10.7 times
	Long-term debt/equity ratio (2,425/11,325 × 100%)	20%	21%
	Total debt/equity ratio (4,025/11,325 × 100%)	45%	36%

Fixed interest debt

The 8% bonds are redeemable in ten years' time and are therefore sufficiently **long-term** to protect Gorwa Co against an increase in interest rates. In 20X6, fixed interest debt constituted 60% of total debt but this fell to 43% in 20X7. The company has therefore become **more exposed** to interest rate fluctuations.

Financial risk

The **interest coverage ratio** has fallen from 10.7 times to 8.4 times and this will be a problem if this trend continues.

Gearing has increased from 36% to 45%, if we look at the debt/equity ratio including the overdraft. Gearing has fallen slightly if we ignore the overdraft, but it is sufficiently large to justify its inclusion in the calculation.

These two ratios indicate that **financial risk** has increased and an increase in interest rates will worsen the situation further. The proportion of interest arising from variable rate debt has already risen from 29% to 45% and an increase in interest rates would further reduce profit before taxation and therefore interest coverage.

Protection against interest rate risk

Interest rate risk relates to the sensitivity of profit and cash flows to changes in interest rates. Variable rate debt increases the **volatility of cash flows**; therefore a **switch into long-term fixed rate debt** would reduce this risk. However, long-term debt tends to be **more expensive** than short-term debt, assuming a normal yield curve. If interest rates fall sharply, Gorwa Co could suffer a loss of **competitive advantage** compared with companies using floating rate borrowing whose interest rates and cost of capital will fall.

Gorwa Co could consider the use of **interest rate derivatives** such as **options** and **futures** in the short-term to limit its exposure to adverse interest rate movements. A **forward rate agreement** could also be considered which would fix the interest rate on future borrowing.

(b) Overtrading

Overtrading happens when a business tries to **do too much too quickly** with **too little long-term capital**, so that it is trying to support too large a volume of trade with the capital resources at its disposal.

Even if an overtrading business operates at a profit, it could easily run into serious trouble because it is **short of money**. Such liquidity troubles stem from the fact that it does not have enough capital to provide the cash to pay its debts as they fall due.

	20X7	20X6
Inventory days	$4,600/34,408 \times 365 = 49$ days	$2,400/23,781 \times 365 = 37$ days
Receivables days	$4,600/37,400 \times 365 = 45$ days	$2,200/26,720 \times 365 = 30$ days
Payables days	$4,750/34,408 \times 365 = 50$ days	$2,000/23,781 \times 365 = 31$ days
Current ratio	$9,200/7,975 = 1.15$ times	$4,600/3,600 = 1.28$ times
Quick ratio	$4,600/7,975 = 0.58$ times	$2,200/3,600 = 0.61$ times
Sales/net working capital	$37,400/(9,200 - 7,975) = 30.53$ times	$26,720/(4,600 - 3,600) = 26.72$ times

Increase in sales	$(37,400 - 26,720)/26,720 \times 100\% = 40\%$
Increase in non-current assets	$(13,632 - 12,750)/12,750 \times 100\% = 7\%$
Increase in inventory	$(4,600 - 2,400)/2,400 \times 100\% = 92\%$
Increase in receivables	$(4,600 - 2,200)/2,200 \times 100\% = 109\%$
Increase in payables	$(4,750 - 2,000)/2,000 \times 100\% = 138\%$
Increase in overdraft	$(3,225 - 1,600)/1,600 \times 100\% = 102\%$

Symptoms of overtrading are as follows.

A rapid increase in turnover

Gorwa Co has experienced a 40% increase in turnover from 20X6 to 20X7 and working capital has not increased in line. The sales/net working capital ratio has increased from 26.72 times to 30.53 times.

A rapid increase in the volume of current assets

Inventories have increased by 92% and receivables by 109%. **Inventory turnover** and **accounts receivable turnover** have slowed down so the rate of increase in inventories and accounts receivable has been even greater than the rate of increase in sales. Inventory may have been stockpiled in anticipation of a further

increase in turnover. The increase in sales could have partly arisen due to a relaxation of credit terms for receivables.

Most of the increase in assets is financed by credit

The payment period for **accounts payable** has lengthened from 31 days to 50 and there has been an overall increase of 138% in payables. The **bank overdraft** has also increased by 102%.

Falling liquidity ratios

Both the **current ratio** and the **quick ratio** have deteriorated.

Conclusion

There is clear evidence that Gorwa Co is overtrading. It would be helpful to have **benchmark information** such as key ratios from similar companies and more information from **prior years** to see if there is definitely a trend.

(c) **Benefits**

Current receivables = \$4,600,000

Receivables under factor = $\$37,400,000 \times 30/365 = \$3,073,973$

Reduction in receivables = $\$4,600,000 - \$3,073,973 = \$1,526,027$

Reduction in finance cost = $1,526,027 \times 5\% = \$76,301$ per year

Administration cost savings = \$100,000 per year

Bad debt savings = \$350,000 per year

Costs

Factor's annual fee = $\$37,400,000 \times 3\% = \$1,122,000$ per year

Extra interest cost on advance = $\$3,073,973 \times 80\% \times (7\% - 5\%) = \$49,184$ per year

The proposal to factor trade receivables is **not financially acceptable** as there is a net cost of \$644,883.

Mock Exams

ACCA

Paper F9

Financial Management

Mock Examination 1

Question Paper	
Time allowed	
Reading and Planning Writing	15 minutes 3 hours
ALL FOUR questions are compulsory and MUST be attempted	
During reading and planning time only the question paper may be annotated	

DO NOT OPEN THIS PAPER UNTIL YOU ARE READY TO START UNDER EXAMINATION CONDITIONS

Question 1

It is currently December 20X7. Phoenix Co, which manufactures building products, experienced a sharp increase in profits before interest and tax from the \$25m level in 20X5-6 to \$40m in 20X6-7 as the economy emerged from recession, and demand for new houses increased. The increase in profits has been entirely due to volume expansion, with margins remaining static. It still has substantial excess capacity and therefore no pressing need to invest, apart from routine replacements.

In the past, Phoenix has followed a rather conservative financial policy, with restricted dividend payouts and relatively low borrowing levels. It now faces the issue of how to utilise an unexpectedly sizeable cash surplus. Directors have made two main suggestions. One is to redeem the \$10m secured loan stock issued to finance a capacity increase several years previously, the other is to increase the dividend payment by the same amount. Phoenix's present capital structure is shown below.

	\$m
Issued share capital (25c par value)	70
Reserves	130
Payables falling due after more than one year:	
7% secured loan notes 20Y7	10

Further information

- (i) Phoenix has not used an overdraft during the two years.
- (ii) The rate of tax on company profits is 30%.
- (iii) The dividend paid by Phoenix in 20X5-6 was 1.50 cents per share.
- (iv) Sector averages currently stand as follows.

Dividend cover	2.6 times
Gearing (long-term debt/equity)	45%
Interest coverage	6.5 times

Required

- (a) Calculate the dividend payout ratios and dividend covers for *both* 20X5-6 *and* for the reporting year 20X6-7, if the dividend is raised as proposed. **(7 marks)**
- (b) You have recently been hired to work as a financial strategist for Phoenix, reporting to the finance director. Using the information provided, write a report to your superior, which identifies and discusses the relative merits of the two proposals for utilising the cash surplus. **(18 marks)**

(Total = 25 marks)

Question 2

- (a) Discuss:
- (i) The significance of trade payables in a firm's working capital cycle; and **(4 marks)**
 - (ii) The dangers of over-reliance on trade credit as a source of finance. **(4 marks)**
- (b) Keswick Co traditionally follows a highly aggressive working capital policy, with no long-term borrowing. Key details from its recently compiled accounts appear below.

	\$m
Sales (all on credit)	10.00
Earnings before interest and tax (EBIT)	2.00
Interest payments for the year	0.50
Shareholders' funds (comprising \$1m issued share capital, par value 25c, and \$1m revenue reserves)	2.00
Receivables	0.40
Inventories	0.70
Trade payables	1.50
Bank overdraft	3.00

A major supplier, which accounts for 50% of Keswick's cost of sales, is highly concerned about Keswick's policy of taking extended trade credit. The supplier offers Keswick the opportunity to pay for supplies within 15 days in return for a discount of 5% on the invoiced value.

Keswick holds no cash balances but is able to borrow on overdraft from its bank at 12%. Tax on corporate profit is paid at 30%.

Required

Determine the costs and benefits to Keswick of making this arrangement with its supplier, and recommend whether Keswick should accept the offer.

Your answer should include the effects on:

- The working capital cycle
- Interest coverage
- Profits after tax
- Earnings per share
- Return on equity
- Capital gearing **(12 marks)**

- (c) Sellmoor Co is considering a proposal to change its credit policy from allowing its receivables a credit period of 50 days, to either 40 days or 60 days, and supplied you with the following data.

<i>Period of credit allowed to receivables</i>	<i>Annual turnover (all on credit)</i>
Days	\$'000
50 (current)	420
40	350 (estimated)
60	520 (estimated)

The average profit/volume ratio for the company is 22% and the cost of financing receivables is 12%.

Required

Compute and explain briefly what the effect on profit of each proposal by Sellmoor Co would be, if adopted.

(5 marks)

(Total = 25 marks)

Question 3

- (a) Briefly explain the main features of the following.
- (i) Sale and leaseback
 - (ii) Hire purchase
 - (iii) Finance leases
- (6 marks)**

- (b) Howgill Co is the leasing subsidiary of a major commercial bank. It is approached by Clint Co, a company entirely financed by equity, which operates in the pharmaceutical industry, with a request to arrange a lease contract to acquire new computer-controlled manufacturing equipment to further automate its production line. The outlay involved is \$20m. The equipment will have only a four-year operating life due to the fast rate of technical change in this industry, and no residual worth. The basic project has a positive net present value when operating cash flows are discounted at the shareholders' required rate of return.

Howgill would finance the purchase of the machinery by borrowing at a pre-tax annual rate of 14½%. The purchase would be completed on the final day of its accounting year, when it would also require the first of the annual rental payments. Howgill currently pays tax at 30%, 12 months after its financial year end. A writing-down allowance is available based on a 25% reducing balance.

Under the terms of the lease contract, Howgill would also provide maintenance services, valued by Clint at \$750,000 pa. These would be supplied by Howgill's computer maintenance sub-division at no incremental cost as it currently has spare capacity which is expected to persist for the foreseeable future. Clint has the same financial year as Howgill, also pays tax at 30% and its own bank will lend at 17½% before tax.

Required

Calculate the minimum rental which Howgill would have to charge in order to just break even on the lease contract. You may assume that the rental is wholly tax-allowable as a business expense.

(6 marks)

- (c) Assume that Howgill does proceed with the contract and charges an annual rental of \$7m. Calculate whether, on purely financial criteria, Clint should lease the asset or borrow in order to purchase it outright:
- (i) Ignoring the benefit to Clint of the maintenance savings **(6 marks)**
 - (ii) Allowing for the maintenance savings. **(3 marks)**
- (d) Discuss the non-financial factors that may influence the decision whether to lease or buy. **(4 marks)**

(Total = 25 marks)

Question 4

- (a) KB Co has a paid-up ordinary share capital of \$1,500,000 represented by 6 million shares of 25c each. It has no loan capital. Earnings after tax in the most recent year were \$1,200,000. The P/E ratio of the company is 12.

The company is planning to make a large new investment which will cost \$5,040,000, and is considering raising the necessary finance through a rights issue at 192c.

Required

- (i) Calculate the current market price of KB Co's ordinary shares. **(2 marks)**
 - (ii) Calculate the theoretical ex-rights price, and state what factors in practice might invalidate your calculation. **(6 marks)**
 - (iii) Briefly explain what is meant by a deep-discounted rights issue, identifying the main reasons why a company might raise finance by this method. **(3 marks)**
- (b) As an alternative to a rights issue, KB Co might raise the \$5,040,000 required by means of an issue of convertible loan notes at par, with a coupon rate of 6%. The loan notes would be redeemable in seven years' time. Prior to redemption, the loan notes may be converted at a rate of 35 ordinary shares per \$100 nominal.

Required

- (i) Explain the term *conversion premium* and calculate the conversion premium at the date of issue implicit in the data given. **(4 marks)**
- (ii) Identify the advantages to KB Co of issuing convertible loan notes instead of the rights issue to raise the necessary finance. **(5 marks)**
- (iii) Explain why the market value of convertible loan notes is likely to be affected by the dividend policy of the issuing company. **(5 marks)**

(Total = 25 marks)

Answers

**DO NOT TURN THIS PAGE UNTIL YOU HAVE
COMPLETED THE MOCK EXAM**

A PLAN OF ATTACK

We've already established that you've been told to do it 101 times, so it is of course superfluous to tell you for the 102nd time to **Take a good look at the paper before diving in to answer questions.** You are going to remember aren't you; good!

Which order to do the questions

Having **looked through the paper in detail**, you need to have worked out the **order** in which to attempt the questions. You will probably have decided which question looks the easiest and started with that one. Answer plans will help you to decide how to approach each question.

The next step

You're probably thinking that you don't know where to begin or you could answer all of the questions in two hours!

Option 1 (Oh dear)

If you are challenged by this paper, do the **questions in the order of how well you think you can answer them.**

- **Question 1** is a mainly written question but there are some easy calculations to warm up with in part (a). Do a detailed answer plan for part (b) to help you get started.
- **Question 2** may look daunting but there are a number of parts where marks can be scored independent of your ability to do every section.
- **Question 3** is a leasing question which may again look daunting. You can however gain plenty of easy marks if you use a clear format, show all your workings and don't panic!
- **Question 4** requires you to be able to calculate share prices and conversion premium which may be tricky. There are some easy marks for straightforward explanations.

Option 2 (This one's definitely easier)

Are you **sure** it is? If you are then that's encouraging but don't forget to do answer plans to make sure you don't miss the point of the questions.

- Don't just concentrate on the calculations in **Question 1**. Make sure you also write full answers to the discussion parts and remember to use a report format.
- Don't just do a brain dump of everything you know in **Question 2**. Make sure you apply your discussions to the organisation in the question.
- Time management is going to be important in **Question 3** as there are a lot of calculations to get through.
- Work through **Question 4** slowly and carefully making sure you answer each part fully and accurately.

Once more for the road

You must **allocate your time** according to the marks for the question in total, and for the parts of the questions. And you must also **follow the requirements exactly.**

Finished with fifteen minutes to spare?

Looks like you slipped up on the time allocation. However if you have, make sure you don't waste the last few minutes; go back to **any parts of questions that you didn't finish** because you ran out of time.

Forget about it!

Forget about what? Excellent, you already have.

Question 1

Text references. Dividend policy is covered in Chapter 13.

Top tips. This question is mainly a narrative discussion comparing two possible uses of surplus funds: increasing the dividend or repaying loans. Because there are many other potential uses for the money, no final recommendation can be made, but the marks will go for discussing the very important principles which are involved.

This question is a typical question for this subject area; questions might also be set on financing by retained earnings or rights issues, the advantages and disadvantages of debt finance and so on. All of these questions can be answered from the same basic principles of dividend policy, use of debt financing, risk, return and taxation. They are of fundamental importance to the understanding of financial management, but candidates' solutions are usually very limited.

In (b) it is easy to throw away marks by not using the report format. In addition you need to go beyond stating the obvious, and discuss the pros and cons of each proposal in some detail.

Marking scheme

		Marks
(a)	Profit after tax calculation	3
	Payout ratio	2
	Dividend cover	<u>2</u>
		7
(b)	Report format	2
	Discussion of loan redemption proposal	8
	Discussion of dividend proposal	<u>8</u>
		<u>18</u>
		<u>25</u>

(a) Dividend payout ratios and dividend covers

Phoenix Co	20X5-6	20X6-7
	\$m	\$m
Profit before interest and tax	25.00	40.00
Less: interest: \$10m × 7%	<u>0.70</u>	<u>0.70</u>
Profit before tax	24.30	39.30
Tax	<u>7.29</u>	<u>11.79</u>
After tax profit	<u>17.01</u>	<u>27.51</u>
Total dividend: 280m shares × 1.5c	4.20	
\$4.2m + \$10m		14.20
Pay-out ratio (dividend/after-tax profit)	24.7%	51.6%
Dividend cover (after-tax profit/dividend)	4.05	1.94 times

- (b) To: Finance Director
From: Financial Strategist
Date: 15 December 20X7

Report on proposals for using cash surpluses

Under the terms of reference for this report I am required to evaluate two proposals for the use of the company's \$10 million cash surplus:

- **Redeeming** the \$10 million secured 7% loan
- **Increasing** the dividend payout by \$10 million

Before making a final decision, however, other possible uses for the cash should be considered, including:

- **Placing the money on deposit** or in liquid investments
- **Capital investment** for organic growth
- **Acquisition** of other **businesses**
- **Share buyback**

These other alternatives are not specifically discussed in this report.

(i) **Background**

The cash surplus has arisen because of a marked **expansion** in the **volume** of our business as the economy emerged from the recession. We should, however, bear in mind that ours is an industry which suffers from volatile fluctuations in demand and in future years we might suffer cash shortages.

(ii) **Proposal to redeem the \$10 million secured 7% loan**

If the loan is redeemed, eliminating future interest payments, then future **dividends** can be increased. Because share prices of quoted companies reflect expectations of future dividend payouts, the company's share price should increase.

Impact on shareholders

Thus, from the shareholders' point of view, the effect of the loan redemption can be seen as a sacrifice of a potentially large dividend now in return for an **increased 'ex div' share price**. Shareholders seeking capital gains as opposed to cash dividends (usually for tax reasons) will prefer this option.

Risk reduction

Eliminating debt also means that the shareholders will suffer less risk: the volatility of their earnings ('**financial risk**') will decrease and the chances of bankruptcy or financial distress are lessened.

Arguments against redemption of the loan

(1) **Gearing levels**

The **company's gearing is very low** compared with the sector average. This implies that the bankruptcy risk mentioned above is not significant. Gearing (debt/shareholders funds) at present is $\$10m/\$200m = 5\%$ compared with the sector average of 45%, and interest coverage is $\$25m/\$0.7m = 35.7$ times at the moment compared with the sector average of 6.5 times.

(2) **Taxation**

Loan interest is an **allowable expense** against tax on profits. The return on shareholders' investment is increased by this tax saving if loan finance is used. The benefits of this tax reduction (known as the '**tax shield**') will be lost if the loan is redeemed.

(3) **Shareholder viewpoint**

If not properly explained to the market, the **loan repayment** may be **interpreted** by shareholders as a sign that there are difficult times ahead. This may cause the share price to fall, rather than rise.

Interest rate comparisons

An important point when deciding whether to redeem a fixed interest loan is its **interest rate compared with expected future market interest rates**. For example, if the loan is redeemable now *at par* but to borrow in future would cost more than 7% then redemption would probably be unwise. However, if the loan notes are quoted with a market value, the price at which it can be purchased and cancelled will adjust to take account of this effect.

(iii) **Proposal to increase the equity dividend by \$10 million**

This proposal is the extreme alternative to the previous one: a large dividend is paid immediately but future dividends cannot be as large as if the loan were repaid; hence there will be no increase in 'ex div' share price.

Views of shareholders

This proposal will be preferred by those shareholders who want a **large immediate cash distribution** and will not suffer any adverse tax consequences if it is received as a dividend. Such shareholders are often tax-exempt institutions. However, higher rate tax payers may regard the increased dividend as very unwelcome if they were looking for share price growth rather than a taxed dividend. These shareholders may sell their shares, assuming that the company had changed its dividend policy to one of high taxable dividend payouts.

Taxation

If the loan is not repaid, the advantage of the **tax shield** from loan interest is retained.

Dividend signalling

The main problem with the proposed increase in dividend is that it is **very large** in percentage terms (a 238% increase). Unless the reasons for the increase are carefully explained to the market, the wrong signals can be picked up. Some shareholders may assume that dividends in **future years** will continue to increase at the same rate, whereas others may assume the company has run out of investment ideas and is signalling an end to growth. It is best to avoid confusion of this sort, as it can have an adverse effect on the share price. Companies wishing to pay large increases in cash to shareholders have avoided this confusion either by announcing 'one-off' **special dividends** or by making **share buy-backs**.

Dividend management

Most finance directors tend to believe that dividend policy should be **managed** in such a way that dividends show a **steady rate of increase** over time, rather than just being a residual balancing figure after investment and financing decisions have been made. This positive management of dividend policy is said to increase investor confidence, though the matter is far from proved.

(iv) **Making the choice**

As stated at the outset, the choice is not a simple alternative between paying a \$10 million dividend and repaying the \$10 million loan. There are several alternatives which must be discussed carefully, each of which could merit a report longer than this one. The end result is likely to be a combination of several applications for the money. We cannot at this stage, therefore, make any recommendations.

Question 2

Text references. Working capital management is covered in Chapters 4, 5 and 6.

Top tips. In (a)(i) it is helpful to explain the components of working capital and their inter-relationships linking working capital with cash.

In (a)(ii) you should consider not only the direct costs and dangers of reliance on trade credit, but also some of the potential dangers that it entails in terms of threat to supplies of goods and the potential to obtain credit from new suppliers in the future.

It is possible to have negative working capital, so don't get distracted in (b) and make the mistake of adding payables to the other elements of working capital. The question leads you through what you have to do, and you shouldn't assume that there will be a significant change in every figure. The twist comes at the end with the increased capital gearing. Make sure you use the right figures in the calculation, distinguishing between the **changes** in figures (the extra interest charge for example) and the new totals.

Your discussion needs to stress that the gearing deterioration outweighs significantly any potential benefits. However as the company seems to be in good shape, its chances of obtaining long-term loan finance (and thus having a better **match** of funds) appear to be good.

In (c) the key elements are contribution and cost of receivables.

Marking scheme

		Marks
(a)	Up to 2 marks for each point	8
(b)	Working capital cycle	2
	Interest cover	2
	Profits after tax	2
	Earnings per share	2
	Return on equity	2
	Capital gearing	<u>2</u>
		12
(c)	Calculation	4
	Explanation	<u>1</u>
		<u>5</u>
		<u>25</u>

(a) (i) **Working capital**

The net working capital of a business can be defined as its current assets less its current liabilities. The management of working capital is concerned with ensuring that **sufficient liquid resources** are maintained within the business. For the majority of businesses, particularly manufacturing businesses, trade payables will form the major part of the current liabilities figure, and will be a significant element in the make-up of the working capital balance.

Trade credit period

It follows that the trade credit period taken will be a major determinant of the working capital requirement of the company. This is calculated (in days) as the total value of trade payables divided by the level of credit purchases times 365. The actual length of the period will depend partly on the credit terms offered by suppliers and partly on the decisions made by the company. For example, the company may choose to negotiate longer terms with its suppliers although this may be at the expense of any available settlement discounts.

Working capital cycle

The longer the payable days, the shorter the working capital cycle. This can be defined as the receivable days plus the inventory holding days less the payable days.

(ii) For many firms, trade payables provide a very important source of short-term credit. Since very few companies currently impose interest charges on overdue accounts, taking extended credit can appear to be a very cheap form of short-term finance. However, such a policy entails some risks and costs that are not immediately apparent, as follows.

- (1) If discounts are being forgone, the **effective cost** of this should be evaluated – it may be more beneficial to shorten the credit period and take the discounts.
- (2) If the company gains a reputation for slow payment this will **damage its credit references** and it may find it difficult to obtain credit from new suppliers in the future.
- (3) Suppliers who are having to wait for their money may seek recompense in other ways, for example by raising prices or by placing a lower priority on new orders. Such actions could do **damage** to both the **efficiency and profitability** of the company.

- (4) Suppliers may place the company 'on stop' until the account is paid. This can jeopardise supplies of essential raw materials which in turn could cause production to stop: this will obviously provide the company with a high level of unwanted costs.

(b) **Working capital cycle**

Receivable days:	$\$0.4\text{m} \times 365/\10m	14.6 days
Inventory holding days:	$\$0.7\text{m} \times 365/(\$10\text{m} - \$2\text{m})$	31.9 days
Payable days:	$\$1.5\text{m} \times 365/(\$10\text{m} - \$2\text{m})$	68.4 days
Working capital cycle		(21.9 days)

This is a remarkably short working capital cycle which suggests that Keswick is unusually efficient in its management of working capital. The effect of the proposal by the supplier would be to reduce the payable period for 50% of the purchases from 68.4 days to 15 days. The new payable days figure would therefore fall to:

$$(68.4 \times 50\%) + (15 \times 50\%) = 41.7 \text{ days}$$

The working capital cycle will therefore rise to:

$$14.6 + 31.9 - 41.7 = 4.8 \text{ days}$$

Interest coverage

Interest coverage can be defined as EBIT (earnings before interest and tax) divided by annual interest payments. The current figure for Keswick is four times ($\$2.0\text{m}/\0.5m) which for the majority of companies would be quite reasonable. The effect of the proposal made by the supplier will be to reduce the cost of sales, and therefore increase EBIT, but at the same time increase the level of interest since the company will have to finance the reduction in the working capital cycle. These elements can be calculated as follows.

$$\text{Improvement in EBIT} = ((\$10\text{m} - \$2\text{m}) \times 50\%) \times 5\% = \$0.2\text{m}$$

The net advanced payment to the supplier will be:

$$((\$10\text{m} - \$2\text{m}) \times 50\%) - \text{discount } (\$0.2\text{m}) = \$3.8\text{m}.$$

This must be financed for an additional 53.4 days ($68.4 - 15$). If this is financed using the overdraft, the interest rate to be paid will be 12%, generating additional interest of $\$3.8\text{m} \times 12\% \times 53.4/365 = \$66,700$.

The interest coverage now becomes:

$$(\$2.0\text{m} + \$0.2\text{m})/(\$0.5\text{m} + \$0.0667\text{m}) = 3.88 \text{ times}$$

This represents only a very small reduction in the interest coverage.

Profits after tax

These will change as follows.

	Before	After
	\$'000	\$'000
Earnings before interest and tax	2,000	2,200
Interest	(500)	(566)
Taxable profit	1,500	1,634
Tax at 30%	450	490
Profit after tax	<u>1,050</u>	<u>1,144</u>

The proposal should give a small improvement in post-tax profit.

Earnings per share

Earnings attributable to equity have been calculated above (the profit after tax figure). The number of shares in issue is 4m ($\$1\text{m}/25\text{c}$).

Existing EPS:	$\$1.050\text{m}/4\text{m}$	=	26.3 cents
Projected EPS:	$\$1.144\text{m}/4\text{m}$	=	28.6 cents

Thus, the EPS is also likely to improve if the proposals are adopted.

Return on equity

Return on shareholders' funds is calculated as profit attributable to equity divided by shareholders' funds. (\$2m):

Existing:	\$1.050m/\$2m	=	52.5%
Projected:	\$1.144m/\$2m	=	57.2%

The return on equity will also rise if the proposals are adopted.

Capital gearing

Capital gearing is defined as prior charge capital (in this case the bank overdraft of \$3m) divided by shareholders' funds (\$2m). The existing level of gearing is therefore 150% (\$3m/\$2m).

If the proposals are adopted, the average level of the overdraft will rise by $\$3.8m \times 53.4/365 = \$556,000$. The gearing level will therefore increase to 178% (\$3.556m/\$2m).

Summary

In summary, the effect of the proposal would be to give a **slight increase** in the **profitability** of Keswick, as measured by profit after tax, earnings per share and return on equity, but this would be at the expense of a **small reduction** in the **interest coverage**, a **lengthening** of the **working capital cycle**, and a significant increase in the level of **capital gearing**. It is this final item that gives the greatest cause for concern – to have such a high gearing level based totally on overdraft finance which is repayable on demand is a very dangerous position to be in. It is suggested that Keswick should either attempt to renegotiate its terms with the supplier to give a longer credit period than that being proposed, or alternatively seek to restructure its debt and to convert at least a part of the overdraft into more secure long-term borrowings.

(c) Effect on profit levels

The calculations show that the savings in financing costs resulting from a reduction in the credit period are more than outweighed by the associated **loss of contribution**. However, extending the credit period should increase the level of profits. The calculations also do not take into account the effect of the change in policy on the level of bad debts which could be expected to increase if the credit period is extended. An evaluation of this should be undertaken before any decisions are made.

Effect on profit levels of changing the credit period

	Credit period		
	50 days	40 days	60 days
	\$	\$	\$
Turnover	420,000	350,000	520,000
Average receivables	57,534	38,356	85,479
Contribution (22%)	92,400	77,000	114,400
Cost of receivables (12%)	(6,904)	(4,603)	(10,257)
Profit	85,496	72,397	104,143
Increase/(decrease)	–	(13,099)	18,647

Question 3

Text references. Leasing is covered in Chapter 11.

Top tips. Ownership and cash flow patterns are important issues in (a). In (b) you need to read the question carefully to understand the distinction between the two parties and their roles. The clearest way to do the calculations in (c) is to lay the figures for each option out in tabular form and then calculate the NPVs of the options at the after tax cost of finance. However, since many of the figures stay constant for a number of years, a shorter approach would be to use annuity values.

Marking scheme

		Marks
(a)	Up to 2 marks for each explanation	6
(b)	Calculation of minimum rental	6
(c)	Lease or buy calculation	6
	Effect of maintenance savings	<u>3</u>
(d)	1 mark for each factor	9
		<u>4</u>
		<u>25</u>

(a) (i) **Sale and leaseback**

Sale and leaseback is an arrangement which is **similar to mortgaging**. A business which already owns an asset, for example a building or an item of equipment, agrees to sell the asset to a financial institution and then immediately to lease it back on terms specified in the agreement. The business has the **benefit of the funds from the sale** while retaining use of the asset, in return for regular payments to the financial institution.

Benefits of sale and leaseback

The principal benefit is that the company gains **immediate access to liquid funds**; however this is at the expense of the ability to profit from any capital appreciation (potentially significant in the case of property), and the capacity to borrow elsewhere may be reduced since the balance sheet value of assets will fall.

(ii) **Hire purchase**

Hire purchase (HP) is a form of **instalment credit** whereby the business purchases goods on credit and pays for them by instalments. The periodic payments include both an **interest element** on the initial price and a **capital repayment element**. The mechanics of the transaction are as follows.

- (1) The **supplier** of the asset **sells** it to a **finance house**.
- (2) The **supplier** of the asset **delivers** it to the **customer** who will be the user and the eventual owner.
- (3) The hire purchase agreement is made between the **finance house** and the **customer**.

Benefits of hire purchase

At the end of the period, ownership of the asset passes to the user, who is also able to claim capital allowances on the basic purchase cost of the asset.

(iii) **Finance leases**

Finance leases are similar to HP contracts in that the asset is sold not to the user but to an intermediary who then leases the asset to the user in return for periodic payments. However, unlike with HP, **ownership** of the asset does not transfer to the user at the end of the lease period, but is retained by the purchaser. The **purchaser** (not the user) can **claim tax depreciation**, which may be passed on to the user in the form of a reduction in the periodic payments. A further difference is that although the user does not own the asset, entries **appear** in the **user's balance sheet** and income statement to reflect the capital element of the lease, the interest element of the payments, and the remaining lease commitment. This is to ensure that all forms of long-term debt are fully reflected in the balance sheet.

Primary and secondary periods

Many finance leases are structured into a '**primary period**' which covers the major part of the economic life of the asset, and a '**secondary period**' during which the user continues to lease the asset, but at a much lower (often only nominal) rate.

(b) **Cost to Howgill**

The cost to Howgill will be the purchase cost of the asset, less the present value of the tax allowable depreciation. Since there is no incremental cost to Howgill in providing the computer maintenance, the cost of this will be excluded from the calculations. The cash flows will be discounted at the after tax cost of borrowing: $14.5\% \times (1 - 0.3) = 10\%$ approx. The present value of the net-of-tax tax depreciation can now be found.

Year	0	1	2	3	4	5
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
WDV at start of year	20,000	15,000	11,250	8,437	6,328	
WDV at end of year	15,000	11,250	8,437	6,328	—	
Depreciation	5,000	3,750	2,813	2,109	6,328	
30% tax saving on depreciation		1,500	1,125	844	633	1,898
Discount factor at 10%		0.909	0.826	0.751	0.683	0.621
PV of tax savings		1,364	929	634	432	1,178

Thus the NPV of the tax savings over the period is **\$4,537,000**, say \$4.5m approximately. Since the NPV of the tax savings amount to \$4.5m, the effective net-of-tax cost of the machinery is **\$15.5m** (\$20m – \$4.5m). Therefore for Howgill to break even, the present value of the after tax rental income must be at least \$15.5m. The structure of the cash flows to Howgill will be as follows (R = annual pre-tax rental income).

Year	0	1	2	3	4
Income	R	R	R	R	
Tax		0.3R	0.3R	0.3R	0.3R
Post tax income	R	0.7R	0.7R	0.7R	(0.3R)
10% discount factor	1.0	0.909	0.826	0.751	0.683
PV of income	R	0.636R	0.578R	0.526R	(0.205R)

NPV of after tax rental income = 2.535R

To break even: $2.535R = \$15.5m^*$

$$R = \$6.11m$$

Thus the minimum annual rental required for Howgill to break even is \$6,110,000 per annum.

(c) (i) **Lease or buy**

The approach is to calculate the net of tax present value of the two options available to Clint. The discount rate to be used will be the cost of borrowing net of tax. $17.5\% \times (1 - 0.3) =$ approximately 12%.

Purchasing outright

Year	0	1	2	3	4	5
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Initial outlay	20,000					
Tax savings on depreciation (above)		1,500	1,125	844	633	1,898
Net cash flow	(20,000)	1,500	1,125	844	633	1,898
Discount factor at 12%	1.000	0.893	0.797	0.712	0.636	0.567
PV of cash flow	(20,000)	1,340	897	601	403	1,076

Thus the NPV cost of purchasing outright is \$15,683,000.

Leasing

Year	0	1	2	3	4
	\$'000	\$'000	\$'000	\$'000	\$'000
Annual rental	(7,000)	(7,000)	(7,000)	(7,000)	
Tax savings (rental \times 30%)		2,100	2,100	2,100	2,100
Net cash flow	(7,000)	(4,900)	(4,900)	(4,900)	2,100
Discount factor at 12%	1.000	0.893	0.797	0.712	0.636
PV of cash flow	(7,000)	(4,376)	(3,905)	(3,489)	1,336

Thus the NPV cost of leasing is **\$17,434,000**. This is \$1,751,000 more than the NPV cost of direct purchase over the life of the equipment, and direct purchase therefore appears more attractive on financial grounds.

(ii) **Effect of additional maintenance costs**

The cost of purchase can be re-evaluated to take into account the additional maintenance costs that would be incurred of \$750,000 per year. These costs are assumed to start in year 1, with the associated tax saving coming through in the subsequent year.

Year	0	1	2	3	4	5
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Initial outlay	(20,000)					
Tax savings on depreciation (above)		1,500	1,125	844	633	1,898
Maintenance costs		(750)	(750)	(750)	(750)	
Tax saving			225	225	225	225
Net cash flow	(20,000)	750	600	319	108	2,123
Discount factor at 12%	1.000	0.893	0.797	0.712	0.636	0.567
PV of cash flow	(20,000)	670	478	227	69	1,204

If the maintenance costs are taken into account, the NPV cost of purchase rises to **\$17,352,000**, which is slightly less (by \$30,000) than the cost of leasing. Although the decision is not reversed, the relative costs are marginal, and other factors should also be considered, for instance the reliability and availability of the different maintenance options.

(d) **Non-financial factors influencing the decision**

- (i) The purchase option involves **three separate decisions** covering acquisition of the asset, financing and maintenance. The lease is one contract covering all three aspects and this is less risky.
- (ii) The **flexibility** of the arrangements, for example the ability to exchange the asset after one or two years if technology changes.
- (iii) The manner in which the **transactions are shown** in the company's accounts, for example whether asset on contract hire is capitalised.
- (iv) If the asset is leased, the company does **not** have to **worry** about **the risks** involved in eventually selling it.

Question 4

Text references. Sources of finance are covered in Chapter 12, business valuations in Chapter 17.

Top tips. This question tests your knowledge of the theory surrounding rights issues and convertibles.

Part (a) (i) involves a simple calculation of share price using EPS and P/E ratios.

When considering in (a)(ii) the likely price following the rights issue, you should take into account stock market factors as well as the performance of the company. Does the market view the company rationally? Is the company competing for funds?

Don't forget in (a) (iii) that shares can never be issued below their nominal value; you need to mention this as it does limit the discounts on deep discounted issues.

In (b) (i) you are after a figure for how much loan notes you will need to purchase a single share on conversion.

(b) (ii) is a very good summary of the factors you should take into account when considering any new source of finance. One thing that will concern the business is how likely it is to obtain the funds it seeks, so don't forget to look at things from the finance provider's viewpoint.

The dividend valuation model is at the heart of the answer to (b) (iii).

Marking scheme

			Marks
(a)	(i)	Calculation of market value	2
	(ii)	Calculation of TERP	3
		Explanation of factors	<u>3</u>
			6
(iii)		Explanation of deep-discounted rights issue	1
		Reasons for use	<u>2</u>
			3
(b)	(i)	Explanation	2
		Calculation	<u>2</u>
			4
	(ii)	1 mark per advantage	5
	(iii)	Explanation	<u>5</u>
			<u>25</u>

- (a) (i) The **current market price** can be found by multiplying the earnings per share (EPS) by the price/earnings (P/E) ratio.
- EPS is \$1.2m/6m = 20 cents per share
P/E ratio is 12
Market price of shares is $12 \times 20c = \mathbf{\$2.40 \text{ per share}}$
- (ii) In order to raise \$5,040,000 at a price of 192 cents, the company will need to issue an additional 2,625,000 (\$5,040,000/\$1.92) shares.

Following the investment, the total number of shares in issue will be 8,625,000 (6,000,000 + 2,625,000).

At this point, the total value of the company will be:

$$(6m \times \$2.40) + \$5,040,000 = \$19,440,000$$

The **theoretical ex-rights price** will therefore be $\$19.44m/8.625m = \mathbf{\$2.25}$.

Alternative solution

Theoretical ex-rights price

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

$$= \frac{1}{\left(\frac{6,000}{2,625}\right) + 1} + \left(\left(\frac{6,000}{2,625} \times 2.40 \right) + 1.92 \right)$$

$$= \$2.25$$

Problems with calculations

- (1) The **costs of arranging the issue** have not been included in the calculations.
- (2) The **market view** of the **quality of the new investment** will affect the actual price of the company's shares.
- (3) If the **issue** is **not fully subscribed** and a significant number of shares remain with the underwriters, this will **depress the share price**.
- (4) The effect of the new investment on the **risk profile** of the company and the expected **future dividend stream** could also cause the share price to differ from that predicted.

- (5) The price of the shares depends not only on the financial performance of the company, but also on the **overall level of demand** in the stock market. If the market moves significantly following the announcement of the issue, this will affect the actual price at which the shares are traded.

(iii) **Features of deep discounted rights issue**

In a **deep-discounted** rights issue, the new shares are priced at a **large discount** to the current market price of the shares. The purpose of this is to ensure that the issue is well subscribed and that shares are not left with the underwriters, and thus this form of issue pricing is attractive when the stock market is particularly volatile. However, the shares cannot be issued at a price which is below their nominal value.

Disadvantage of deep discounted rights issue

The main drawback to this approach is that a **larger number of shares** will need to be **issued** in order to raise the required amount of finance, and this will lead to a larger dilution of earnings per share and dividends per share.

(b) (i) **Conversion premium**

The **conversion premium** is the **difference** between the **issue value** of the **notes** and the **conversion value** as at the date of issue. In other words it is the measure of the additional expense involved in buying shares via the convertible notes as compared with buying the shares on the open market immediately.

In this case, \$100 loan notes can be converted into 35 ordinary shares. The **effective price** of these shares is therefore \$2.86 (\$100/35) per share.

The **current market price** of the shares is \$2.40. The **conversion premium** is therefore \$2.86 – \$2.40 = **46 cents**. This can also be expressed in percentage terms as **19%** (0.46/2.40).

(ii) **Advantages of issuing convertible loan notes**

- (1) **Convertibles** should be **cheaper than equity** because they offer greater security to the investor. This may make them particularly attractive in fast growing but high-risk companies.
- (2) **Issue costs** are **lower** for loan stock than for equity.
- (3) **Interest** on the **loan notes** is **tax deductible**, unlike dividends on ordinary shares.
- (4) There is **no immediate change** in the **existing structure** of control, although this will change over time as conversion rights are exercised.
- (5) There is no **immediate dilution** in **earnings and dividends per share**.

(iii) **Dividend policy**

Dividend policy is one of the major factors which determines the share price. Under the **dividend valuation model**, the share price is held to be directly related both to the current dividend and to the expected future growth in dividends:

$$p_0 = \frac{d_0(1+g)}{(k_e - g)}$$

where: p_0 = market price of shares
 d_0 = current level of dividend
 k_e = required rate of return
 g = growth in dividend

Impact of dividend growth

Thus it can be seen that dividend growth is important in determining the likely market value of the shares. As has already been discussed above, the market value of the shares is very important in determining the price of convertibles, and therefore the dividend policy of the company will have an important effect on the value of convertible notes.

ACCA

Paper F9

Financial Management

Mock Examination 2

Question Paper	
Time allowed	
Reading and Planning Writing	15 minutes 3 hours
ALL FOUR questions are compulsory and MUST be attempted	
During reading and planning time only the question paper may be annotated	

DO NOT OPEN THIS PAPER UNTIL YOU ARE READY TO START UNDER EXAMINATION CONDITIONS

Question 1

Cavic Co services custom cars and provides its clients with a courtesy car while servicing is taking place. It has a fleet of 10 courtesy cars which it plans to replace in the near future. Each new courtesy car will cost \$15,000. The trade-in value of each new car declines over time as follows:

Age of courtesy car (years)	1	2	3
Trade-in value (\$/car)	11,250	9,000	6,200

Servicing and parts will cost \$1,000 per courtesy car in the first year and this cost is expected to increase by 40% per year as each vehicle grows older. Cleaning the interior and exterior of each courtesy car to keep it up to the standard required by Cavic's clients will cost \$500 per car in the first year and this cost is expected to increase by 25% per year.

Cavic Co has a cost of capital of 10%. Ignore taxation and inflation.

Required

- (a) Using the equivalent annual cost method, calculate whether Cavic Co should replace its fleet after one year, two years, or three years. **(12 marks)**
- (b) Discuss the causes of capital rationing for investment purposes. **(4 marks)**
- (c) Explain how an organisation can determine the best way to invest available capital under capital rationing. Your answer should refer to single-period capital rationing, project divisibility and the investment of surplus funds. **(9 marks)**

(Total = 25 marks)

Question 2

Extracts from the recent financial statements of Anjo Co are as follows:

INCOME STATEMENT

	20X6	20X5
	\$000	\$000
Revenue	15,600	11,100
Cost of sales	<u>9,300</u>	<u>6,600</u>
Gross profit	6,300	4,500
Administration expenses	<u>1,000</u>	<u>750</u>
Profit before interest and tax	5,300	3,750
Interest	<u>100</u>	<u>15</u>
Profit before tax	<u><u>5,200</u></u>	<u><u>3,735</u></u>

STATEMENT OF FINANCIAL POSITION EXTRACTS

	20X6		20X5	
	\$'000	\$'000	\$'000	\$'000
Non-current assets		5,750		5,400
Current assets				
Inventories	3,000		1,300	
Receivables	3,800		1,850	
Cash	<u>120</u>		<u>900</u>	
		6,920		4,050
Current liabilities				
Trade payables	2,870		1,600	
Overdraft	<u>1,000</u>		<u>150</u>	
		<u>(3,870)</u>		<u>(1,750)</u>
Total assets less current liabilities		<u><u>8,800</u></u>		<u><u>7,700</u></u>

All sales were on credit. Anjo Co has no long-term debt. Credit purchases in each year were 95% of cost of sales. Anjo Co pays interest on its overdraft at an annual rate of 8%. Current sector averages are as follows:

Inventory days: 90 days Receivable days: 60 days Payable days: 80 days

Required

- (a) Calculate the following ratios for each year and comment on your findings.
 - (i) Inventory days
 - (ii) Receivable days
 - (iii) Payable days

(6 marks)
- (b) Calculate the length of the cash operating cycle (working capital cycle) for each year and explain its significance. **(4 marks)**
- (c) Discuss the relationship between working capital management and business solvency, and explain the factors that influence the optimum cash level for a business. **(7 marks)**
- (d) A factor has offered to take over sales ledger administration and debt collection for an annual fee of 0.5% of credit sales. A condition of the offer is that the factor will advance Anjo Co 80% of the face value of its receivables at an interest rate 1% above the current overdraft rate. The factor claims that it would reduce outstanding receivables by 30% and reduce administration expenses by 2% per year if its offer were accepted.

Required

Evaluate whether the factor's offer is financially acceptable, basing your answer on the financial information relating to 20X6. **(8 marks)**

(Total = 25 marks)

Question 3

JER Co wishes to raise finance for a major investment project by means of a rights issue, and is proposing to issue shares on the basis of 1 for 5 at a price of \$1.30 each. The following information relates to JER Co.

Current earnings: \$1.5 million
Dividend paid (cents per share)
20X5:8
20X6:9
20X7:11
20X8:11
20X9:12

JER Co has 5 million ordinary shares in issue, with a market price of \$1.60 each. JER Co has \$1 million of irredeemable 12% debentures in issue, with a market price of \$80 per \$100 nominal value. It also has 500,000 15% preference shares in issue, with a nominal value per share of \$1, and a market value of \$1.45. The tax rate is 33%.

James Brown currently owns 10,000 shares in JER Co and is seeking advice on whether to not to take up the proposed rights.

Required

- (a) Explain the difference between a rights issue and a scrip issue. Your answer should include comment on the reasons why companies make such issues and the effect of the issues on private investors. **(7 marks)**
- (b) Calculate:
- (i) The theoretical value of James Brown's shareholding if he takes up his rights
 - (ii) The theoretical value of James Brown's rights if he chooses to sell them **(4 marks)**
- (c) Using only the information given above, and applying the dividend growth model formula, calculate the weighted average cost of capital of JER Co. **(8 marks)**
- (d) Explain how a belief that the stock market operates with a strong level of efficiency might affect the behaviour of the finance directors of publicly quoted companies. **(6 marks)**

(Total = 25 marks)

Question 4

JetAWay is a 'low cost' airline providing airline services between 25 cities in the European Union. It now operates 40 aircraft and employs 7,500 people across the EU. The main areas of employment are in Aberdeen, where the company's headquarters and main aircraft service centre are located, Milan, which maintains the company's database services and most recently Selab, a new member of the EU. JetAWay recently opened a repair centre in Selab with the promise of connecting the main airport to 10 other European destinations.

Operations

JetAWay operates 275 different services every day ranging from 'commuter style' services, being cities with less than one hour flying time, to provision of holiday services. The 25 cities it serves are in 15 different countries with only 4 of these countries being in the Eurozone. JetAWay has to maintain staff in each country with salaries being paid in the local currency.

Customers make bookings using the Internet or JetAWay's call centre. All bookings are made in euros or the relevant local currency. However, tickets can be purchased from any of JetAWay's 15 national websites, and then funds are transferred via the Milan data centre to other locations as necessary. Currencies in some European countries which are not aligned to the euro still fluctuate significantly.

JetAWay has ordered 10 second-hand aircraft from an American airline which recently went into chapter 11 bankruptcy. The aircraft are only 3 years old and can seat 126 passengers each.

The aircraft will be available in three months' time at a cost of \$40 million. JetAWay does not have any surplus funds. The following additional information is available:

	US \$		UK £	
	<i>Deposit rate</i>	<i>Borrowing rate</i>	<i>Deposit rate</i>	<i>Borrowing rate</i>
	%	%	%	%
1 month	6.75	7.75	8.25	10.50
3 months	7.00	8.25	8.50	10.75

\$/£ exchange rate (\$=£1)

Spot	1.6625 – 1.6635
1 month forward	1.6565 – 1.6577
3 months forward	1.6445 – 1.6460

Required

- Explain the major types of foreign exchange risk (or currency risk) that JetAWay could be subject to regarding its European operations, noting the extent to which the company is affected by each risk. **(8 marks)**
- JetAWay would like to hedge against exchange rate movements in the next three months. Calculate whether forward exchange contracts or the money markets should be used to hedge this risk. **(6 marks)**
- Explain the four-way equivalence model. **(4 marks)**
- Discuss the characteristics and benefits of interest rate swaps compared with other forms of interest rate management, including forward rate agreements and interest rate futures. **(7 marks)**

(Total = 25 marks)

Answers

**DO NOT TURN THIS PAGE UNTIL YOU HAVE
COMPLETED THE MOCK EXAM**

A PLAN OF ATTACK

We've already established that you've been told to do it 102 times, so it is of course superfluous to tell you for the 103rd time to **Take a good look at the paper before diving in to answer questions.** You are going to remember aren't you; good!

Which order to do the questions

Having **looked through the paper in detail**, you need to have worked out the **order** in which to attempt the questions. You will probably have decided which question looks the easiest and started with that one. Answer plans will help you to decide how to approach each question.

The next step

You're probably thinking that you don't know where to begin or you could answer all of the questions in two hours!

Option 1 (Oh dear)

If you are challenged by this paper, do the **questions in the order of how well you think you can answer them.**

- **Question 1** has 13 marks for explanations which can be written even if you struggle with the calculations in part (a).
- The calculations in parts (a) and (b) of **Question 2** are not too difficult if you can remember the formulae! Part (c) can be answered if you are struggling with the calculations in the other parts of the question.
- **Question 3** is a wide ranging share issue question which may look daunting. You can however gain marks in each part even if you cannot complete all of the calculations.
- **Question 4** concerns interest rate and exchange rate risks which you may find difficult. There are however plenty of marks available for some straightforward discussions and explanations.

Option 2 (This one's definitely easier)

Are you **sure** it is? If you are then that's encouraging but don't forget to do answer plans to make sure you don't miss the point of the questions.

- Don't just concentrate on the calculations in **Question 1**. Make sure you also write full answers to the discussion parts.
- Make sure you do full written explanations in **Question 2**, there are as many marks for discussion as for calculations.
- Time management is going to be important in **Question 3** as there are a lot of calculations to get through. Make sure you leave enough time for the written parts of the question which have equal marks.
- **Question 4** answers need to be sufficiently detailed and, in part (a), applied to the organisation in the question.

Once more for the road

You must **allocate your time** according to the marks for the question in total, and for the parts of the questions. And you must also **follow the requirements exactly.**

Finished with fifteen minutes to spare?

Looks like you slipped up on the time allocation. However if you have, make sure you don't waste the last few minutes; go back to **any parts of questions that you didn't finish** because you ran out of time.

Forget about it!

Forget about what? Excellent, you already have.

Question 1

Text reference. Capital rationing is covered in Chapter 11.

Top tips. Parts (b) and (c) can be answered with no reference to the rest of the question. You might choose to do them first and to get these marks before doing the calculations in part (a).

In part (a) show your workings. This will ensure you earn good marks even if you make an arithmetic error.

Easy marks. Students are often tempted to spend more time on the numerical elements of a question.

Part (b) was straightforward and full marks should be attainable for making some obvious discussion points.

Again this is a question where a proforma approach could be used. Once you have your proforma for part (a) set out you should have been able to pick up some easy marks for costs and annuity factors.

There was a gift of a mark in part (a) for making a recommendation. Make a recommendation based on your calculations. As long as you recommend the lowest cost then the mark is yours!

For Part (c) make sure you cover all three elements covered in the question. In order to ensure this try to use separate sub-headings.

Marking scheme

		Marks
(a)	Servicing costs	1
	Cleaning costs	1
	Present values of total costs	1
	Present values of trade-in values	2
	Net present values of costs of each cycle	3
	Annuity factors	1
	Equivalent annual costs	2
	Recommendation	1
		<hr/>
		12
(b)	Causes of capital rationing	4
(c)	Single-period and capital rationing	3
	Project divisibility	3 - 4
	Investment of surplus funds	3 - 4
		<hr/>
		9
		<hr/>
		25

(a)

Replace every year

Year	0	1
Initial cost	(15,000)	
Trade-in value		11,250
Service cost		(1,000)
Cleaning cost		(500)
Net cost	(15,000)	9,750
Discount factor @ 10%	1	0.909
Present value	(15,000)	8,863
NPV	(6,137)	
Annuity factor	0.909	
Equivalent annual cost	(6,751) pa	

Replace every 2 years

Year	0	1	2
Initial cost	(15,000)		
Trade-in value			9,000
Service cost		(1,000)	(1,400)
Cleaning		(500)	(625)
Net cost	(15,000)	(1,500)	6,975
Discount factor 10%	1	0.909	0.826
Present value	(15,000)	(1,364)	5,761
NPV	(10,603)		
Annuity factor	1.735 for 2 years		
Equivalent annual cost	(6,111) pa		

Replace every 3 years

Year	0	1	2	3
Initial cost	(15,000)			
Trade-in value				6,200
Service cost		(1,000)	(1,400)	(1,960)
Cleaning cost		(500)	(625)	(781)
Net cost	(15,000)	(1,500)	(2,025)	3,459
Discount factor @ 10%	1	0.909	0.826	0.751
Present value	(15,000)	(1,364)	(1,673)	2,598
NPV	(15,439)			
Annuity factor	2.487 for 2 years			
Equivalent annual cost	(6,208) pa			

(b) In order to invest in all projects with a positive net present value a company must be able to raise funds as and when it needs them: this is only possible in a **perfect capital market**. In practice capital markets are not perfect and the capital available for investment is likely to be **limited** or **rationed**. The causes of capital rationing may be external (hard capital rationing) or internal (soft capital rationing).

Soft capital rationing is more common than hard capital rationing. When a company cannot raise external finance even though it wishes to do so, this may be because providers of debt finance see the company as being **too risky**. In terms of **financial risk**, the company's gearing may be seen as too high, or its interest cover may be seen as too low. From a **business risk** point of view, lenders may be uncertain whether a company's future profits will be sufficient to meet increased future interest payments because its trading prospects are poor, or because they are seen as too variable.

When managers **impose restrictions** on the funds they are prepared to make available for capital investment, soft capital rationing is said to occur. One reason for soft capital rationing is that managers may not want to raise new external finance.

For example, they may not wish to raise new debt finance because they believe it would be unwise to commit the company to meeting future interest payments given the current economic outlook. They may not

wish to issue new equity because the finance needed is insufficient to justify the **transaction costs** of a new issue, or because they wish to avoid **dilution of control**.

Another reason for soft capital rationing is that managers may prefer **slower organic growth**, where they can remain in control of the growth process, to the sudden growth arising from taking on one or more large investment projects.

A key reason for soft capital rationing is the desire by managers to make capital investments **compete** for funds, ie to create an internal market for investment funds. This competition for funds is likely to weed out weaker or marginal projects, thereby channelling funds to more robust investment projects with better chances of success and larger margins of safety, and reducing the risk and uncertainty associated with capital investment.

- (c) The net present value decision rule is to invest in all projects that have a **positive** net present value. By following this decision rule, managers will **maximise the value of a company** and therefore maximise the **wealth of ordinary shareholders**, which is a primary objective of financial management. Even when capital is rationed, it is still essential to be able to offer advice on which capital investment projects should be selected in order to secure the **maximum return** for the investing company, ie the maximum overall net present value.

Single-period capital rationing

The approach to solving single-period capital rationing problems depends on whether projects are divisible or not. A **divisible project** is one where a partial investment can be made in order to gain a pro rata net present value. For example, investing in a forest is a divisible project, since the amount of land purchased can be varied according to the funds available for investment (providing the seller agrees to a partial sale, of course). A non-divisible project is one where it is not possible to invest less than the full amount of capital. When building an oil refinery, for example, it is not possible to build only one part of the overall facility.

Where projects are divisible, the objective of maximising the net present value arising from invested funds can be achieved by **ranking projects** according to their profitability index and investing sequentially in order of decreasing profitability index, beginning with the highest, assuming that each project can be invested in only once, ie is non-repeatable.

The **profitability index** can be defined as net present value divided by initial investment. Ranking projects by profitability index is an example of **limiting factor analysis**. Because projects are divisible, there will be no investment funds left over: when investment funds are insufficient to for the next ranked project, part of the project can be taken on because it is divisible.

When projects are non-divisible, the objective of maximising the net present value arising from invested funds can be achieved by calculating the net present value arising from different combinations of projects. With this approach, there will usually be some surplus funds remaining from the funds initially available.

The investment of surplus funds

When investigating combinations of non-divisible projects in order to find the combination giving rise to the highest net present value, any **return from investing surplus funds is ignored**. The net present value analysis has been based on the company's average cost of capital and it is unlikely that surplus funds can be invested in order to earn a return as high as this.

Investment of surplus funds in, for example, the money markets would therefore be an investment project that would be rejected as having a negative net present value, or an internal rate of return less than the company's average cost of capital if using IRR to assess investments projects. However, it is **good working capital management** to ensure that liquid funds are invested to earn the highest available return, subject to any risk constraints, in order to increase overall profitability.

Question 2

Text reference. Working capital management is covered in Chapters 4, 5 and 6.

Top tips. Parts (c) can be answered with no reference to the rest of the question. You might choose to answer it first and to get these marks before doing the calculations in the rest of the question.

In parts (a) and (b) you were asked for calculations based on formulae you should have learnt. As a starting point for answering these types of questions write out the formula first and then slot in the numbers.

Where a question asks for a number of factors, as in part (c), then try to give as many factors as you can think of. Don't limit yourself to just a couple of points.

Note that there are two separate elements to part (b).

Easy marks. Part (a) and (b) were both very straightforward calculations followed by brief discussion parts. Note that there were as many marks for the discussion elements as the calculation.

Marking scheme

			Marks
(a)	Ratio calculations	3	
	Comment	<u>3</u>	6
(b)	Calculation of cash operating cycle	2	
	Significance of cash operating cycle	<u>2</u>	4
(c)	Working capital and business solvency	3-4	
	Factors influencing optimum cash level	<u>4-5</u>	
	Maximum		7
(d)	New level of receivables	1	
	Finance saving	1	
	Administration cost savings	1	
	Interest on advance form factor	2	
	Factor annual fee	1	
	Net benefit of factor's offer	1	
	Conclusion and discussion	<u>1</u>	
			<u>8</u>
			<u>25</u>

(a) Inventory days

$$\text{Inventory Days} = \frac{\text{Inventory level at year end}}{\text{Cost of sales}} \times 365$$

$$20X6: (3,000/9,300) \times 365 = 118 \text{ days}$$

$$20X5: (1,300/6,600) \times 365 = 72 \text{ days}$$

Sector average: 90 days

Receivable days

$$\text{Receivable Days} = \frac{\text{Receivables at year end}}{\text{Turnover}} \times 365$$

$$20X6: (3,800/15,600) \times 365 = 89 \text{ days}$$

$$20X5: (1,850/11,100) \times 365 = 61 \text{ days}$$

Sector average: 60 days

Payable days

$$\text{Payable Days} = \frac{\text{Trade payables at year end}}{\text{Cost of sales}} \times 365$$

20X6: $(2,870/9,300 \times 0.95) \times 365 = 119$ days

20X5: $(1,600/6,600 \times 0.95) \times 365 = 93$ days

Sector average: 80 days

Commentary

In each case, the ratio in 20X6 is **higher** than the ratio in 20X5, indicating that deterioration has occurred in the management of inventory, receivables and payables in 20X6.

Inventory days have increased by 46 days or 64%, moving from below the sector average to 28 days – one month – more than it. Given the rapid increase in turnover (40%) in 20X6, Anjo Co may be expecting a continuing increase in the future and may have built up inventories in preparation for this, ie inventory levels reflect future sales rather than past sales. Accounting statements from several previous years and sales forecasts for the next period would help to clarify this point.

Receivable days have increased by 28 days or 46% in 20X6 and are now 29 days above the sector average. It is possible that more generous credit terms have been offered in order to stimulate sales. The increased turnover does not appear to be due to offering lower prices, since both gross profit margin (40%) and net profit margin (34%) are unchanged.

Payable days. In 20X5, only management of payables was a cause for concern, with Anjo Co taking 13 more days on average to settle liabilities with trade payables than the sector. This has increased to 39 days more than the sector in 20X6. This could lead to difficulties between the company and its suppliers if it is exceeding the credit periods they have specified.

Anjo Co has no long-term debt and the balance sheet indicates an **increased reliance** on short-term finance, since cash has reduced by \$780,000 or 87% and the overdraft has increased by \$850,000 to \$1 million. Perhaps the company should investigate whether it is **undercapitalised** (overtrading). It is unusual for a company of this size to have no long-term debt.

- (b) Cash operating cycle = Inventory days + Receivable days – Payable days

Cash operating cycle (2005) = $72 + 61 - 93 = 40$ days

Cash operating cycle (2006) = $118 + 89 - 119 = 88$ days

Significance

The cash operating cycle or working capital cycle gives the average time it takes for the company to receive payment from receivables after it has paid its trade payables. This represents the period of time for which receivables require financing. The cash operating cycle of Anjo Co has lengthened by 48 days in 20X6 compared with 20X5. This represents an increase in working capital requirement of approximately $\$15,600,000 \times 48/365 = \2.05 million.

- (c) The objectives of working capital management are **liquidity** and **profitability**, but there is a tension between these two objectives. Liquid funds, for example cash, earn no return and so will not increase profitability. Near-liquid funds, with short investment periods, earn a lower return than funds invested for a long period. Profitability is therefore decreased to the extent that liquid funds are needed.

The main reason that companies fail, though, is because they **run out of cash** and so good cash management is an essential part of good working capital management. Business solvency cannot be maintained if working capital management in the form of cash management is of a poor standard.

In order to **balance** the twin objectives of liquidity and profitability in terms of cash management, a company needs to decide on the **optimum** amount of cash to hold at any given time. There are several factors that can aid in determining the optimum cash balance:

First, it is important to note that cash management is a forward-looking activity, in that the optimum cash balance must reflect the expected need for cash in the next budget period, for example in the next month. The cash budget will indicate expected cash receipts over the next period, expected payments that need to be made, and any shortfall that is expected to arise due to the difference between receipts and payments. This is the **transactions need** for cash, since it is based on the amount of cash needed to meet future business transactions.

However, there may be a degree of **uncertainty** as to the timing of expected receipts. Receivables, for example, may not all pay on time and some may take extended credit, whether authorised or not. In order to guard against a possible shortfall of cash to meet future transactions, companies may keep a '**buffer inventory**' of cash by holding a cash reserve greater than called for by the transactions demand. This is the **precautionary demand** for cash and the optimum cash balance will reflect management's assessment of this demand.

Beyond this, a company may decide to hold additional cash in order to take advantage of any business opportunities that may arise, for example the possibility of taking over a rival company that has fallen on hard times. This is the **speculative demand** for cash and it may contribute to the optimum cash level for a given company, depending on that company's strategic plan.

(d)

	\$000
Current receivables	3,800
Receivables under factor = $3,800 \times 0.7$	<u>2,660</u>
Reduction in receivables	<u>1,140</u>
	\$000
Finance cost saving = $1,140 \times 0.08$	91.2
Administration cost saving = $1,000 \times 0.02$	20.0
Interest on advance = $2,660 \times 0.8 \times 0.01$	(21.3)
Factor's annual fee = $15,600 \times 0.005$	<u>(78.0)</u>
Net benefit of accepting factor's offer	<u>11.9</u>

Although the terms of the factor's offer are financially acceptable, suggesting a net financial benefit of \$11,900, this benefit is small compared with annual turnover of \$15.6 million. Other benefits, such as the application of the factor's expertise to the receivable management of Anjo Co, might also be influential in the decision on whether to accept the offer.

Question 3

Text references. Sources of finance are covered in Chapter 12 and market efficiency in Chapter 18.

Top tips. A very good indication of the sort of question you might get in the exam, in terms of the calculations you may be asked to do and the balance between calculations and discussion.

Remember in (a) that on a rights issue, relative voting rights will only be unchanged if all current shareholders take up their rights, and they have to have the money to pay for the rights to do that. Also don't confuse scrip **issues** with scrip **dividends** (where shareholders are offered the choice of dividends in the form of shares or cash.)

In (b) (ii) remember you are calculating the value of the **rights**. A further adjustment $(25/5) = 5c$ would be needed to calculate the value of the rights **to each share currently held**.

In (c) two alternative methods are given to calculate the rate of dividend growth. However the first method is superior if you can calculate the fourth roots of numbers. The methods of calculating the cost of debt and the cost of preference shares are identical; if the debt was redeemable however, you would have to carry out an internal rate of return calculation.

The best approach to (d) is to define strong form market efficiency first; points from the definition can be used to support your reasons as to the possible effects of the hypothesis on managers' behaviour.

Marking scheme

		Marks
(a)	Rights issue explanation	2
	Scrip issue explanation	2
	Effect on private investors	<u>3</u>
		7
(b)	Take up rights calculation	2
	Sell rights calculation	<u>2</u>
		4
(c)	Cost of equity	3
	Cost of preference shares	1
	Cost of debt	2
	WACC	<u>2</u>
		8
(d)	Explanation of strong form efficiency	3
	Effect on behaviour	<u>3</u>
		6
		<u>25</u>

(a) Rights issue

A rights issue is a way of raising **new share capital** by means of an offer to existing shareholders enabling them to buy more shares, usually at a **price lower** than the **current market price**. Under a rights issue existing shareholders are invited to **subscribe cash** for new shares in proportion to their existing holdings.

Reasons for rights issue

A company may choose to make a rights issue for the following reasons:

- (i) Rights issues are **cheaper** than offers for sale to the general public. This is because:
 - (1) **No prospectus** is **required** (provided that the issue is for less than 10% of the class of shares concerned).
 - (2) **Administration** is **simpler**.
 - (3) The **costs of underwriting** will be **less**.

The company will however need to **explain** clearly to shareholders the purpose for which the additional funds are required, and **demonstrate** that the **return on capital** will at least be **maintained**, and ideally enhanced as a result of the issue.

- (ii) Relative **voting rights** are **unaffected** if shareholders all take up their rights.
- (iii) Funds can be raised in this way for any type of **long term investment**, or to **reduce** the level of **capital gearing**.

Impact on private investor

The effects from the point of view of the **private investor** include:

- (i) He must decide whether to **take up** or **sell** the rights. If the market is efficient, he should be **no worse off** whether he decides to take up the rights or to sell them. However, if he were to do nothing then he would **forego** the **financial benefits** of the issue.
- (ii) If he decides to take up the rights he must have **additional funds** available to invest in the company. He must therefore decide if this is the **best use** of those funds, and also consider the effect of such an investment on the **risk/return profile** of his investment portfolio.

Scrip issue

A scrip issue (or bonus issue) is an issue of new shares to existing shareholders, by **converting equity reserves** into **issued share capital**. For example, a company with issued share capital of 10m \$1 nominal value shares with a market price of \$10 and reserves of \$20m, could make a scrip issue of one for one. This would have the effect of doubling the number of shares in issue, and thus reducing the theoretical market price of the shares to \$5.

Impact on company

The advantage to the company of a scrip issue is that it makes the **shares cheaper** and therefore **more marketable** on the Stock Exchange.

Impact on private investor

From the point of view of the investor, there should be **no change** as a result of a scrip issue. He is not required to subscribe additional capital, unlike the rights issue. Once the issue has taken place, he will own a **larger number of shares** in the company, but the overall value of his holding will be the same as it was before. However, in practice the **share price** may **rise slightly** as a result of improved marketability, and therefore he may experience a small capital gain.

$$\begin{aligned} \text{(b) (i) Theoretical ex-rights price} &= \frac{1}{N+1} ((N \times \text{cum rights price}) + \text{issue price}) \\ &= \frac{1}{5+1} ((5 \times 1.60) + 1.30) \\ &= \$1.55 \text{ per share} \end{aligned}$$

After the rights issue, James Brown will own 12,000 shares (10,000 + 2,000) at a price of \$1.55. **The theoretical value of his holding** will therefore be \$18,600.

$$\begin{aligned} \text{(ii) Value of rights per share} &= \text{Theoretical ex-rights price} - \text{Cost of taking up rights} \\ &= \$1.55 - \$1.30 \\ &= 25 \text{ cents per share} \end{aligned}$$

James Brown has the right to subscribe for an additional 2,000 shares. If he sells these rights he can expect to receive $2,000 \times \$0.25 = \500 .

(c) The required return on equity using the dividend growth model:

$$k_e = \frac{d_0(1+g)}{p_0} + g$$

Where d_0 = Current level of dividends = 12c per share
 g = Rate of growth in dividends (see below)
 p_0 = Market price of shares = \$1.60 per share

'g' can be estimated over the four year period as $\left(\sqrt[4]{\frac{12}{8}}\right) - 1 = 0.1067$ ie 11%.

Alternatively, it can be approximated by finding the average annual rate of growth as follows:

Year	Div cents	Increase cents	Increase %
20X5	8		
20X6	9	1	12.5
20X7	11	2	22.2
20X8	11	0	0.0
20X9	12	1	9.1
			<u>43.8</u>

Over four years this gives an average rate of 11%.

The required rate of return can now be found:

$$\begin{aligned}k_e &= \frac{12(1+0.11)}{160} + 0.11 \\ &= 19.3\%\end{aligned}$$

Cost of preference shares (k_{pref})

This can be found by dividing the preference dividend rate by the market price of the shares:

$$\begin{aligned}k_{pref} &= \frac{15}{145} \\ &= 10.3\%\end{aligned}$$

Although preference shares are included with prior charge capital, the dividend is not allowable for tax, and therefore no adjustment needs to be made for this.

Cost of debentures (k_{dnet})

The after tax cost of the debentures can be found using the following expression:

$$k_{dnet} = \frac{i(1-T)}{p_0}$$

where: i = rate of debenture interest
 p_0 = market price of debentures
 T = rate of tax on profits

$$\begin{aligned}k_{dnet} &= \frac{12(1-0.33)}{80} \\ k_{dnet} &= 10.1\%\end{aligned}$$

Total market value of capital (\$m)

$$\begin{aligned}&= (1.60 \times 5) + (1 \times 0.8) + (0.5 \times 1.45) \\ &= \$m (8 + 0.8 + 0.725) \\ &= \$9.525 \text{ million}\end{aligned}$$

$$\begin{aligned}\text{Weighted average cost of capital} &= \frac{8(0.193) + 0.8(0.101) + 0.725(0.103)}{9.525} \\ &= 17.8\%\end{aligned}$$

(d) Stock market efficiency

An efficient stock market is one in which:

- (i) The prices of securities traded **reflect** all the **relevant information**, which is **available** to the buyers and sellers. Share prices **change quickly** to reflect all new information about future prospects.
- (ii) **No individual dominates** the market.
- (iii) **Transaction costs** of buying and selling are **not so high** as to **discourage trading** significantly.

Strong form efficiency

The efficient markets hypothesis exists in a number of forms, which relate to the nature of the information available to investors. Strong form efficiency means that share prices **reflect all information** available from:

- (i) Past price changes
- (ii) Public knowledge or anticipation
- (iii) Insider knowledge available to specialists or experts such as investment managers

Impact of strong form efficiency

If the stock market is believed to operate with strong level efficiency, this might affect the behaviour of the finance directors of publicly quoted companies in the following ways.

Managers are likely to be aware that **share prices** will **change quickly** to reflect decisions that they take. This means that all financial decisions are likely to be evaluated in the light of their **potential impact** on the **share price**. A contrary view is that management should concentrate simply on **maximising the net present value** of its investments and need not worry about the **effect on share prices** of financial results in the published accounts. **Investors** will make **allowances** for low profits or dividends in the current year if higher profits or dividends are expected in the future.

Question 4

Text reference. Foreign currency risk is covered in Chapter 19 and interest rate risk in Chapter 20.

Top tips. Make sure you apply your answer in part (a) to the specific circumstances of this company.

If you picked the wrong rate in (b), remember that the company needs to obtain dollars by buying them with pounds and the lower figures mean that it will get fewer dollars per pound (the customer always loses when it deals with the bank).

Part (c) is a textbook explanation and part (d) requires you to bring out that swaps are used for different reasons to other derivatives – as a means of borrowing on the best terms possible rather than trying to limit losses from foreign exchange dealings.

Marking scheme

		Marks
(a)	Up to 3 marks per risk discussed. To obtain high marks, must include discussion of company's circumstances	8
(b)	Forward market calculation	2
	Money market calculation	3
	Conclusion	<u>1</u>
(c)	Explanation of model	4
(d)	Swaps – must include advantages compared with other methods for maximum marks	4
	Other methods	<u>5</u>
	max	<u>7</u> <u>25</u>

(a) **Types of currency risk**

Economic risk

Economic risk refers to the effect of **exchange rate movements** on the international competitiveness of a company. For example, JetAWay provides airline services to many European countries. Movements in exchange rates will change the relative value of currencies. An appreciation of sterling against other European currencies will **erode the competitiveness** of the company where airline services are denoted in Sterling. Providing websites selling airline tickets in different currencies helps to alleviate this risk.

However, the fact that bookings can be made in any of JetAWay's web sites may cause problems. If JetAWay does not amend prices to reflect currency movements, this means that customers can '**shop around**' for the cheapest airfare from the 15 regional websites, paying in the site with the weakest currency. JetAWay needs to update its websites to **reflect currency movements** to ensure this does not happen.

Transaction risks

This is the risk of adverse exchange rate movements occurring in the **course of normal international trading transactions**. It arises when **export prices are fixed** in foreign currency terms or **imports are invoiced in other foreign currencies**.

For JetAWay, all sales are transferred to Milan and then to the regional locations for each JetAWay office. This exposes JetAWay to **currency risk** in respect of the euro against all non-euro countries. There will also be **transaction and conversion costs** for each currency movement. **Maintaining sales in local currencies** and **paying local expenditure** first before remitting surplus funds to Milan would help to limit this risk and transaction costs.

Translation risks

Translation risk arises from **differences in currencies** in which assets and liabilities are denominated. Where a company has different proportions of assets and liabilities denominated in different currencies, then exchange rate movements are likely to have varying effects on the value of those assets and liabilities.

In the case of JetAWay no information is available regarding the currencies in which assets and liabilities are denominated. It is possible that all assets are held in the UK accounts in which case the company would not be subject to translation risk.

(b) **Forward exchange market**

Cost of \$40 million in 3 months = $\$40,000,000 / 1.6445 = \text{£}24,323,503$

Money markets

US dollar deposit rate = 7%, so three month rate = $7/4 = 1.75\%$

To earn \$40,000,000 in three months need to lend now:

$40,000,000 / 1.0175 = \$39,312,039$

Purchase dollars now at spot rate of 1.6625

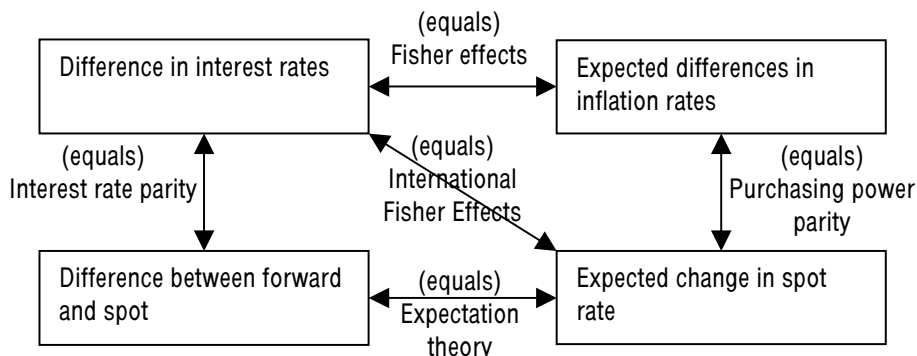
$39,312,039 / 1.6625 = \text{£}23,646,339$

Annual borrowing interest rate for 3 months = $10.75/4 = 2.6875\%$

Amount required = $23,646,339 \times 1.026875 = \text{£}24,281,834$

Conclusion – use money market to hedge risk.

- (c) The **four-way equivalence model** states that in equilibrium, differences between forward and spot rates, differences in interest rates, expected differences in inflation rates and expected changes in spot rates are **equal** to one another.



(d) **Hedging interest rate risk**

Interest rate risk can be hedged using the following techniques:

Forward rate agreements

This is an agreement that can be **purchased 'over the counter'** to lend or borrow a given sum of money in the future for an interest rate that is agreed now. In terms of currencies, this equates to a **forward contract** – that is an agreement to buy or sell a given amount of currency in the future at an exchange rate that is agreed today. Both types of contracts are used to **'fix' interest rates or exchange rates** on future transactions which removes the risk of rate movements in the intervening period.

Interest rate futures

Interest rate futures are similar to FRA's, although they are not available at a bank; they are **traded on the futures market**. The **terms, amounts and periods are standardised**. This means that forward rate agreements are more appropriate than interest rate futures for non-financial companies such as ReGen.

Interest rate options

An interest rate option gives the **right to borrow or lend a specified amount at a guaranteed rate of interest**. On or before the expiry of the option, the holder must decide whether or not to exercise the right to borrow or lend.

In a borrowing situation, the option will only be exercised if the **market interest rates** have **risen above the option rate**. Bespoke contracts can be obtained from major banks while standardised contracts are traded in a similar way to interest rate futures. Interest rate options tend to cost more than forward rate agreements.

Interest rate swaps

These are transactions which **exploit different interest** rates in different markets for borrowing, with the aim of reducing interest rate costs for fixed or floating loans. An interest rate swap is actually an agreement where two companies, or a bank and a company, swap interest rate commitments with each other. Each party effectively simulates the other's borrowings while maintaining their original obligation to their lender. Each party therefore accepts a counterparty risk.

The benefits of a swap compared to other hedging instruments include:

- **Low transaction costs** – legal fees only.
- **Flexibility** – swaps can be arranged in any size and reversed if necessary.
- **Companies with different credit ratings can borrow at the best cost** in the market that is accessible to each company, and then swap the benefit with another company with the aim of reducing mutual borrowing costs.
- Swaps can allow **capital restructuring** by changing the nature of interest commitments without the need to redeem old debt or issue new debt, which again reduces transaction costs.

ACCA

Paper F9

Financial Management

Mock Examination 3

Question Paper	
Time allowed	
Reading and Planning Writing	15 minutes 3 hours
ALL FOUR questions are compulsory and MUST be attempted	
During reading and planning time only the question paper may be annotated	

DO NOT OPEN THIS PAPER UNTIL YOU ARE READY TO START UNDER EXAMINATION CONDITIONS

ALL FOUR questions are compulsory and MUST be attempted

Question 1

ASOP Co is considering an investment in new technology that will reduce operating costs through increasing energy efficiency and decreasing pollution. The new technology will cost \$1 million and have a four-year life, at the end of which it will have a scrap value of \$100,000.

A licence fee of \$104,000 is payable at the end of the first year. This licence fee will increase by 4% per year in each subsequent year.

The new technology is expected to reduce operating costs by \$5-80 per unit in current price terms. This reduction in operating costs is before taking account of expected inflation of 5% per year.

Forecast production volumes over the life of the new technology are expected to be as follows:

Year	1	2	3	4
Production (units per year)	60,000	75,000	95,000	80,000

If ASOP Co bought the new technology, it would finance the purchase through a four-year loan paying interest at an annual before-tax rate of 8.6% per year.

Alternatively, ASOP Co could lease the new technology. The company would pay four annual lease rentals of \$380,000 per year, payable in advance at the start of each year. The annual lease rentals include the cost of the licence fee.

If ASOP Co buys the new technology it can claim capital allowances on the investment on a 25% reducing balance basis. The company pays taxation one year in arrears at an annual rate of 30%. ASOP Co has an after-tax weighted average cost of capital of 11% per year.

Required

- (a) Based on financing cash flows only, calculate and determine whether ASOP Co should lease or buy the new technology. **(11 marks)**
- (b) Using a nominal terms approach, calculate the net present value of buying the new technology and advise whether ASOP Co should undertake the proposed investment. **(6 marks)**
- (c) Discuss and illustrate how ASOP Co can use equivalent annual cost or equivalent annual benefit to choose between new technologies with different expected lives. **(3 marks)**
- (d) Discuss how an optimal investment schedule can be formulated when capital is rationed and investment projects are either:
 - (i) Divisible; or
 - (ii) Non-divisible. **(5 marks)**

(Total = 25 marks)

Question 2

DD Co has a dividend payout ratio of 40% and has maintained this payout ratio for several years. The current dividend per share of the company is 50c per share and it expects that its next dividend per share, payable in one year's time, will be 52c per share.

The capital structure of the company is as follows:

	\$m	\$m
<i>Equity</i>		
Ordinary shares (par value \$1 per share)	25	
Reserves	<u>35</u>	60
<i>Debt</i>		
Bond A (par value \$100)	20	
Bond B (par value \$100)	<u>10</u>	30
		<u>90</u>

Bond A will be redeemed at par in ten years' time and pays annual interest of 9%. The current ex interest market price of the bond is \$95.08.

Bond B will be redeemed at par in four years' time and pays annual interest of 8%. The cost of debt of this bond is 7.82% per year. The current ex interest market price of the bond is \$102.01.

Bond A and Bond B were issued at the same time.

DD Co has an equity beta of 1.2. The risk-free rate of return is 4% per year and the average return on the market of 11% per year. Ignore taxation.

Required

- (a) Calculate the cost of debt of Bond A. **(3 marks)**
- (b) Discuss the reasons why different bonds of the same company might have different costs of debt. **(6 marks)**
- (c) Calculate the following values for DD Co:
- (i) Cost of equity, using the capital asset pricing model; **(2 marks)**
 - (ii) Ex dividend share price, using the dividend growth model; **(3 marks)**
 - (iii) Capital gearing (debt divided by debt plus equity) using market values; and **(2 marks)**
 - (iv) Market value weighted average cost of capital. **(2 marks)**
- (d) Discuss whether a change in dividend policy will affect the share price of DD Co. **(7 marks)**

(Total = 25 marks)

Question 3

NG Co has exported products to Europe for several years and has an established market presence there. It now plans to increase its market share through investing in a storage, packing and distribution network. The investment will cost €13 million and is to be financed by equal amounts of equity and debt. The return in euros before interest and taxation on the total amount invested is forecast to be 20% per year.

The debt finance will be provided by a €6.5 million bond issue on a large European stock market. The interest rate on the bond issue is 8% per year, with interest being payable in euros on a six-monthly basis.

The equity finance will be raised in dollars by a rights issue in the home country of NG Co. Issue costs for the rights issue will be \$312,000. The rights issue price will be at a 17% discount to the current share price. The current share price of NG Co is \$4.00 per share and the market capitalisation of the company is \$100 million.

NG Co pays taxation in its home country at a rate of 30% per year. The currency of its home country is the dollar. The current price/earnings ratio of the company, which is not expected to change as a result of the proposed investment, is 10 times.

The spot exchange rate is 1.3000 €/\$. All European customers pay on a credit basis in euros.

Required

- (a) Calculate the theoretical ex rights price per share after the rights issue. (4 marks)
 - (b) Evaluate the effect of the European investment on:
 - (i) The earnings per share of NG Co; and
 - (ii) The wealth of the shareholders of NG Co.

Assume that the current spot rate and earnings from existing operations are both constant. (9 marks)
 - (c) Explain the difference between transaction risk and translation risk, illustrating your answer using the information provided. (4 marks)
 - (d) The six-month forward rate is 1.2876 €/€ and the twelve-month forward rate is 1.2752 €/€. NG Co can earn 2.8% per year on short-term euro deposits and can borrow short-term in dollars at 5.3% per year.
- Identify and briefly discuss exchange rate hedging methods that could be used by NG Co. Provide calculations that illustrate TWO of the hedging methods that you have identified. (8 marks)

(Total =25 marks)

Question 4

APX Co achieved a turnover of \$16 million in the year that has just ended and expects turnover growth of 8.4% in the next year. Cost of sales in the year that has just ended was \$10.88 million and other expenses were \$1.44 million.

The financial statements of APX Co for the year that has just ended contain the following statement of financial position:

	\$m	\$m
Non-current assets		22.0
Current assets		
Inventory	2.4	
Trade receivables	<u>2.2</u>	
		4.6
Total assets		<u>26.6</u>
Equity finance:	\$m	\$m
Ordinary shares	5.0	
Reserves	<u>7.5</u>	
		12.5
Long-term bank loan		<u>10.0</u>
		22.5
Current liabilities		
Trade payables	1.9	
Overdraft	<u>2.2</u>	
		4.1
Total liabilities		<u>26.6</u>

The long-term bank loan has a fixed annual interest rate of 8% per year. APX Co pays taxation at an annual rate of 30% per year.

The following accounting ratios have been forecast for the next year:

Gross profit margin:	30%
Operating profit margin:	20%
Dividend payout ratio:	50%
Inventory turnover period:	110 days
Trade receivables period:	65 days
Trade payables period:	75 days

Overdraft interest in the next year is forecast to be \$140,000. No change is expected in the level of non-current assets and depreciation should be ignored.

Required

- (a) Discuss the role of financial intermediaries in providing short-term finance for use by business organisations. **(4 marks)**
 - (b) Prepare the following forecast financial statements for APX Co using the information provided:
 - (i) An income statement for the next year; and
 - (ii) A statement of financial position at the end of the next year. **(9 marks)**
 - (c) Analyse and discuss the working capital financing policy of APX Co. **(6 marks)**
 - (d) Analyse and discuss the forecast financial performance of APX Co in terms of working capital management. **(6 marks)**
- (Total = 25 marks)**

Answers

**DO NOT TURN THIS PAGE UNTIL YOU HAVE
COMPLETED THE MOCK EXAM**

A PLAN OF ATTACK

We've already established that you've been told to do it 103 times, so it is of course superfluous to tell you for the 104th time to **Take a good look at the paper before diving in to answer questions.**

Which order to do the questions

Having **looked through** the **paper in detail**, you need to have worked out the **order** in which to attempt the questions. You will probably have decided which question looks the easiest and started with that one. Answer plans will help you to decide how to approach each question.

The next step

You're probably thinking that you don't know where to begin or you could answer all of the questions in two hours!

Option 1 (Oh dear)

If you are challenged by this paper, do the **questions in the order of how well you think you can answer them.**

- **Question 1** has some straightforward calculations if you have practised them, and you can answer parts (c) and (d) even if you haven't completed the calculations.
- You may not like this part of the syllabus but there are easy marks available in each part of **Question 2**.
- **Question 3** does cover a number of areas of the syllabus in an unusual way, but there are easy marks available in each part.
- **Question 4** may look tricky with forecast financial statements but there are plenty of marks available for straightforward discussions.

Option 2 (This one's definitely easier)

Are you **sure** it is? If you are then that's encouraging but don't forget to do answer plans to make sure you don't miss the point of the questions.

- Don't just concentrate on the calculations in **Question 1**. Make sure you also write full answers to the discussion and comment parts.
- **Question 2** requires good knowledge of these financial management techniques. Make sure your explanations are sufficiently detailed and not just a list of points.
- **Question 3** needs a clear layout and workings to make life easier for the marker.
- Again, don't just concentrate on the calculations in **Question 4**, there are more marks available for the written sections which will need to be carefully planned.

Once more for the road

You must **allocate your time** according to the marks for the question in total, and for the parts of the questions. And you must also **follow the requirements exactly.**

Finished with fifteen minutes to spare?

Looks like you slipped up on the time allocation. However if you have, make sure you don't waste the last few minutes; go back to **any parts of questions that you didn't finish** because you ran out of time.

Forget about it!

Forget about what? Excellent, you already have.

Question 1

Text references. The lease v buy decision, equivalent annual cost and capital rationing are covered in Chapter 11, investment appraisal in Chapters 8 and 9.

Top tips. You need to be very careful with which information belongs to which part of this question. Part (a) concerns a lease v buy decision and is therefore concerned only with financing cashflows. The question of whether the investment is worthwhile is in part (b). The reduction in operating costs must therefore go in part (b) not part (a), as these will happen irrespective of whether the technology is bought or leased. You also need to be careful with the discount rates.

Be careful with time management in this question and make sure you have enough time to gain the easy marks available in parts (c) and (d).

Easy marks. There are easy marks available throughout this question, in the calculations in parts (a) and (b) and in the straightforward textbook explanations in parts (c) and (d).

Marking scheme

		Marks
(a)	Present value of lease rentals	2
	Present value of lease rental tax benefits	1
	Present value of cost of leasing	1
	Investment and scrap values	1
	Licence fee	1
	Capital allowance tax benefits	2
	Licence fee tax benefits	1
	Present value of cost of borrowing to buy	1
	Appropriate decision on leasing versus buying	<u>1</u>
		11
(b)	Inflated cost savings	2
	Tax liabilities	1
	Present values of net cash flows	1
	Net present value	1
	Advice on acceptability of investment	<u>1</u>
		6
(c)	Definition of equivalent cost or benefit	1
	Relevant discussion	1
	Appropriate illustration	<u>1</u>
		3
(d)	Capital rationing	1-2
	Divisible projects and profitability index	2-3
	Indivisible projects and combinations	1-2
	Maximum	<u>5</u>
		<u>25</u>

(a) **Net present value of purchasing new technology**

Discount rate = $8.6\% \times (1 - 30\%) = 6\%$

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Capital costs	(1,000)					
Licence fee		(104)	(108)	(112)	(116)	
Disposal proceeds					100	
Tax deduction @30% for licence payments			31	32	34	35
Writing down allowances (W)			75	56	42	96
Net cash flows	(1,000)	(104)	(2)	(24)	60	131
Discount at 6%	1.000	0.943	0.890	0.840	0.792	0.747
PV of cash flow	(1,000)	(98)	(2)	(20)	48	98
NPV of cash flow	\$(974)					

Working

Writing down allowances

	\$'000	Capital allowance \$'000	Tax benefit \$'000	Year of cash flow
Initial investment	1,000			
Allowances at 25% pa on a reducing balance basis over 4 years				
Year 1	(250)	(250)	75	Y2
	750			
Year 2	(188)	(188)	56	Y3
	562			
Year 3	(141)	(141)	42	Y4
	421			
Year 4				
Proceeds on sale	(100)			
Balancing allowance	321		96	Y5

Net present value of leasing new technology

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Annual lease rentals	(380)	(380)	(380)	(380)		
Taxation deduction @ 30% for lease rentals			114	114	114	114
Net cash flows	(380)	(380)	(266)	(266)	114	114
Discount at 6%	1.000	0.943	0.890	0.840	0.792	0.747
PV of cash flow	(380)	(358)	(237)	(223)	90	85
NPV of cash flow	\$(1,023)					

Therefore the new technology should be **purchased** rather than leased.

(b) **Net present value of buying the new technology**

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Saving in operating costs (W)		365	480	638	564	
Licence fee		(104)	(108)	(112)	(116)	
Net additional cash flow		261	372	526	448	
Tax @ 30%			(78)	(112)	(158)	(134)
Capital costs	(1,000)					
Disposal proceeds					100	
Writing down allowances			75	56	42	96
Net cash flows	(1,000)	261	369	470	432	(38)
Discount at 11%	1.000	0.901	0.812	0.731	0.659	0.593
PV of cash flow	(1,000)	235	300	344	285	(23)
NPV of cash flow		\$141				

Working

Operating costs

	Year 1	Year 2	Year 3	Year 4
Production units	60	75	95	80
Cost saving @ \$5.80	348	435	551	464
Inflation	× 1.05	× 1.05 ²	× 1.05 ³	× 1.05 ⁴
Saving in operating costs cashflow	365	480	638	564

Advice on proposed investment

The net present value of the investment proposal is **positive** and is \$141,000. According to this criteria, ASOP Co should therefore undertake the proposed investment.

(c) **Equivalent annual cost or benefit**

When a choice has to be made between projects with **different expected lives**, the NPVs are **not directly comparable** because they refer to different time periods. The NPV for each project must therefore be divided by the **cumulative present value factor** for the number of years of the project.

For example, for the new technology project, the NPV of \$141,000 would be divided by the cumulative present value factor for a discount rate of 11% and four years, which is 3.102. The result could then be compared with an equivalent value from an alternative project and the project with the **highest equivalent annual benefit** chosen.

(d) **Capital rationing**

Capital rationing occurs when a company has a **limited amount of capital** to invest in potential projects, such that the different possible investments need to be **compared** with one another in order to allocate the capital available most effectively.

(i) **Divisible projects**

Projects are divisible, so that it is possible to undertake, say, half of Project X in order to earn half of the net present value (NPV) of the whole project.

The basic approach is to **rank** all investment opportunities so that the NPVs can be maximised from the use of the available funds.

Ranking is done in terms of the **profitability index**. This profitability index is a ratio that measures the PV of future cash flows per \$1 of investment, and so indicates which investments make the best use of the limited resources available.

(ii) **Non-divisible projects**

If the projects are **not divisible** then the profitability index method may not result in the optimal solution. Another complication which arises is that there is likely to be a small amount of **unused capital** with each combination of projects. The best way to deal with this situation is to use **trial and error** and test the NPV available from different combinations of projects. This can be a laborious process if there are a large number of projects available.

Question 2

Text references. Cost of debt and cost of capital are covered in Chapter 15 and dividend policy in Chapter 13.

Top tips. This question has a number of quite small parts so plenty of straightforward marks are available, even if you get stuck on one part. Use your knowledge of interest rate theory in part (b), the question is asking why interest rates differ on the bonds.

You will need to calculate the dividend growth rate in part (c) (ii) but this is just a simple percentage change calculation. If you get stuck on any part of part (c), make an assumption and move on.

Easy marks. The calculations are mostly straightforward and logical and should provide easy marks if you have practised these techniques.

Marking scheme

		Marks
(a)	Calculation of cost of debt of Bond A	3
(b)	Term structure of interest rates	1-2
	Liquidity preference theory	1-2
	Expectations theory	1-2
	Market segmentation theory	1-2
	Other relevant discussion	1-2
	Maximum	6
(c)	Cost of equity	2
	Dividend growth rate	1
	Share price using dividend growth model	2
	Capital gearing	2
	Weighted average cost of capital	<u>2</u>
		9
(d)	Dividend irrelevance	3-4
	Dividend relevance	3-4
	Maximum	<u>7</u>
		<u>25</u>

(a) **Cost of debt of bond A**

The cash flows will be as follows:

Year		Cash flow \$	10% discount factors	PV \$	8% discount factors	PV \$
0	Market value	(95.08)	1.000	(95.08)	1.000	(95.08)
1-10	Interest	9.00	6.145	55.31	6.710	60.39
10	Capital repayment	100.00	0.386	38.60	0.463	46.30
				<u>(1.17)</u>		<u>11.61</u>

Calculate the cost of debt using an IRR calculation.

$$\begin{aligned} \text{IRR} &= a\% + \left[\frac{\text{NPV}_a}{\text{NPV}_a - \text{NPV}_b} \times (b - a) \right] \% \\ &= 8\% + \frac{11.61}{11.61 + 1.17} \times (10 - 8) = 9.82\% \end{aligned}$$

The **cost of debt** is therefore **9.82%**

(b) **Different bonds and different costs of debt**

Risk

In general, the cost of a source of finance is related to its level of risk. The **higher** the risk, the **greater** the return expected by investors and therefore the higher the cost to the company. In this case, the bonds were issued at the same time by the company so business risk will not be a reason for the difference in cost of debt.

Security

Connected with the concept of risk and return is the amount of security offered. For example, a bond may be secured on a specific asset or group of assets. An unsecured bond will generally have a **higher** interest rate than a secured one. A lack of security therefore raises the cost of debt. There is no information to suggest a difference in security for Bond A and Bond B.

Time

The **yield curve** is normally upward sloping which means that long-term financial assets offer a higher yield than short-term assets. This is due to **liquidity preference** theory which states that investors prefer cash now to later and want **compensation** in the form of a **higher return** for being unable to use their cash now.

Longer dated bonds can therefore be expected to have a higher cost of debt than shorter dated bonds. Bond A has a greater time to maturity than Bond B so would therefore be expected to have a higher interest rate and cost of debt.

Size of debt

The amount of finance raised by Bond A is twice that of Bond B and that may have contributed to the higher cost of debt.

(c) (i) **Cost of equity**

$$\begin{aligned} E(r_i) &= R_f + \beta_i (E(r_m) - R_f) \\ E(r_i) &= 4\% + 1.2(11\% - 4\%) \\ &= \mathbf{12.4\%} \end{aligned}$$

(ii) **Ex-dividend share price**

Dividend growth rate (g) = $(52 - 50)/50 \times 100\% = 4\%$

$$P_0 = \frac{d_0(1+g)}{(k_e - g)}$$

$$\begin{aligned} P_0 &= \frac{50 \times 1.04}{0.124 - 0.04} \\ &= 52/0.084 \\ &= 619\text{c or } \$6.19 \end{aligned}$$

(iii) **Capital gearing**

Market value of Bond A = $(20\text{m} \times 0.9508)$
= \$19.016m

Market value of Bond B = $10\text{m} \times 1.0201$
= \$10.201m

Market value of debt = $19.016 + 10.201$
= \$29.217m

Market value of equity = $25\text{m} \times 6.19$
= \$154.75m

Market value of capital employed = $154.75 + 29.217$
= \$183.967m

Capital gearing = $29.217/183.967 \times 100\%$
= **15.9%**

(iv) **Weighted average cost of capital**

$$\text{WACC} = k_e \left[\frac{V_E}{V_E + V_{DA} + V_{DB}} \right] + k_{dA} \left[\frac{V_P}{V_E + V_{DA} + V_{DB}} \right] + k_{dB} \left[\frac{V_D}{V_E + V_{DA} + V_{DB}} \right]$$

$$= 12.4 \left[\frac{154.75}{183.967} \right] + 9.82 \left[\frac{19.016}{183.967} \right] + 7.82 \left[\frac{10.201}{183.967} \right]$$

$$= 10.43 + 1.02 + 0.43$$

$$= 11.88\%$$

(d) **Dividend policy and the share price**

Dividends as a signal to investors

The ultimate objective in any financial management decisions is to **maximise shareholders' wealth**. If shareholder wealth is increased, it can be expected that the share price will rise. Shareholder wealth and therefore the share price should largely be determined by the **cash flows arising from the investment decisions** taken by management

Shareholders will look at a number of factors when analysing investments and not just dividends. They will be particularly interested in the **business** and **financial risk** of the company and will not necessarily be impressed with a large increase in dividends.

The dividend declared can be interpreted as a **signal** from directors to shareholders about the strength of underlying project cash flows. Investors usually expect a **consistent dividend policy** from the company, with stable dividends each year or, even better, **steady dividend growth**.

Modigliani and Miller

Modigliani and Miller (MM) proposed that in a tax-free world, shareholders are indifferent between dividends and capital gains, and the value of a company is determined solely by the 'earning power' of its assets and investments.

MM argued that if a company with investment opportunities decides to pay a dividend, so that **retained earnings** are **insufficient** to finance all its investments, the shortfall in funds will be made up by **obtaining additional funds** from outside sources. If a company pursues a consistent dividend policy, 'each corporation would tend to attract to itself a **clientele** consisting of those preferring its particular payout ratio, but one clientele would be entirely as good as another in terms of the valuation it would imply for the firm'.

Conclusion

Capital markets are only **semi-strong efficient**, not perfect, so the signalling power of a dividend and the existence of clienteles can be important. This implies that a change in dividend policy could affect DD Co's share price.

Question 3

Text references. Rights issues are covered in Chapter 12 and exchange rates in Chapter 19.

Top tips. This is a time pressured question covering a wide range of topics on the syllabus. The combination of a rights issue calculation and exchange rates may be initially confusing but in part (a) you just need to first convert the € cost of investment to \$s and then carry on as normal with the TERP calculation.

In part (b), you need to be happy working with EPS and P/E ratios in order to derive profit figures and show the effect of the investment.

Part (c) should be a straightforward textbook explanation but make sure you apply your explanations to NG Co.

Part (d) gives you forward exchange rates and interest rate information so is strongly hinting that you need to illustrate your answer with a forward exchange contract and money market hedging. Explain these methods and then use the information to illustrate how they work.

Easy marks. The first half of this question is quite tricky but there are easy marks in there once you understand the scenario. Part (c) has an easy 4 marks and part (d) is straightforward if you are happy with these techniques.

Marking scheme

		Marks
(a)	Amount of equity finance to be raised in dollars	1
	Rights issue price	1
	Theoretical ex rights price	<u>2</u>
		4
(b)	Current EPS	1
	Increase in PBIT from investment	1
	Interest on bond issue	1
	Revised dollar profit after tax	2
	Revised EPS	1
	Revised share price using PER method	1
	Comment on effect on shareholder wealth	<u>1-3</u>
	Maximum	9

(c)	Transaction risk	1-2	
	Translation risk	1-2	
	Link to question	<u>1-2</u>	
	Maximum		4
(d)	Euro account	1	
	Forward market hedge	1	
	Illustration of forward market hedge	1-2	
	Money-market hedge	1	
	Illustration of money-market hedge	1-2	
	Other hedging strategies, including derivatives	<u>1-2</u>	
	Maximum		<u>8</u>
			<u>25</u>

(a) **Theoretical ex-rights price**

Amount of equity finance to be invested in €s = $13\text{m}/2 = \text{€}6.5$ million

Amount of equity to be invested in \$s = $6.5\text{m}/1.3 = \text{\$}5$ million

Issue costs = $\text{\$}0.312\text{m}$

Amount of equity finance to be raised in \$s = $5\text{m} + 0.312\text{m} = \text{\$}5.312\text{m}$

Rights issue price = $\text{\$}4.00 \times (1 - 17\%) = \text{\$}3.32$ per share

Number of new shares issued = $5.312\text{m}/3.32 = 1.6\text{m}$ shares

Current number of ordinary shares in issue = $100\text{m}/4.00 = 25\text{m}$ shares

Total number of shares after the rights issue = $25\text{m} + 1.6\text{m} = 26.6\text{m}$ shares

Theoretical ex rights price = $((25\text{m} \times 4) + (1.6\text{m} \times 3.32))/26.6$

= $105.312/26.6$

= **$\text{\$}3.96$** per share

(b) (i) **EPS**

Current P/E ratio = 10

P/E ratio = Market price of share/EPS

$10 = 4.00/\text{EPS}$

Current EPS = $4.00/10 = 40$ cents per share

Current profit after tax = $100\text{m}/10 = \text{\$}10\text{m}$

After the European investment, the increase in profit before interest and tax = $\text{€}13\text{m} \times 20\% = \text{€}2.6\text{m}$

Converted to \$s = $2.6\text{m}/1.3 = \text{\$}2$ million

	\$m
Increase in profit before interest and tax	2.00
Increase in interest ($6.5\text{m} \times 8\%/1.3$)	<u>0.40</u>
Increase in profit before tax	1.60
Taxation @ 30%	<u>0.48</u>
Increase in profit after tax	1.12
Current profit after tax	<u>10.00</u>
Revised profit after tax	<u>11.12</u>

Revised EPS = $\text{\$}11.12\text{m}/26.6\text{m} = \text{41.8}$ cents per share

EPS is therefore expected to **increase** by 4.5% ($1.8/40 \times 100\%$) as a result of the investment.

(ii) **Shareholder wealth**

Expected share price = Revised EPS × P/E ratio

= 0.418 × 10

= **\$4.18** per share

The theoretical ex-rights price per share was calculated as \$3.96. There is therefore a capital gain for shareholders of 22 cents per share (\$4.18 – \$3.96).

In the absence of any information about dividend payments, it appears that the investment will **increase the wealth** of shareholders.

(c) **Transaction risk**

This is the risk of adverse exchange rate movements occurring in the course of **normal international trading transactions**. This arises when the prices of imports or exports are fixed in foreign currency terms and there is movement in the exchange rate between the date when the price is agreed and the date when the cash is paid or received in settlement.

NG Co is exposed to transaction risk on its euro-denominated **European sales** and **interest payments**. The dollar value of its euro-denominated sales, for example, would decrease if the dollar appreciated against the euro.

Translation risk

This is the risk that the organisation will make exchange losses when the accounting results of its foreign branches or subsidiaries are **translated** into the home currency. Translation losses can result, for example, from restating the book value of a foreign subsidiary's assets at the exchange rate on the statement of financial position date.

NG Co is exposed to translation risk on its **euro-denominated non-current assets**. The dollar value of the non-current assets acquired by investing in the storage, packing and distribution network, for example, will change as the euro/dollar exchange rate changes.

(d) **Matching receipts and payments**

A company can reduce or eliminate its foreign exchange transaction exposure by **matching** receipts and payments. Wherever possible, a company that expects to make payments and have receipts in the same foreign currency should plan to **offset its payments against its receipts in the currency**.

NG Co will receive euro-denominated income and will incur euro-denominated expenses as a result of its European operations. It could therefore have a euro-denominated bank account for all euro-denominated transactions.

Forward exchange contracts

A forward contract specifies in advance the rate at which a specified quantity of currency will be bought and sold.

The six-monthly interest payment of €260,000 can be used to illustrate this. The current cost of the interest payment is \$200,000. In six months and twelve months, as the euro is expected to **strengthen** against the dollar, the **dollar cost** of the interest payment is expected to **rise**. In order to protect against unexpected adverse exchange rate movements, NG Co can lock into the six-month and twelve-month forward rates of 1.2876 €/€ and 1.2752 €/€ using forward exchange contracts. This **guarantees** the dollar cost of its euro-denominated interest payments. The dollar cost of the six-month interest payment would be \$201,926 (€260,000/1.2876) and the dollar cost of the twelve-month interest payment would be \$203,890 (€260,000/1.2752).

Money market hedging

Money market hedging involves borrowing in one currency, converting the money borrowed into another currency and putting the money on deposit until the time the transaction is completed, hoping to take advantage of favourable exchange rate movements.

NG Co could borrow now in dollars in order to make a euro deposit which, with accrued interest, will be enough to pay the euro-denominated interest in six months' time.

The six-month euro deposit rate available to NG Co is 1.39% ($(\sqrt{1+0.028} - 1) \times 100\%$) and the six-month dollar borrowing rate available to NG Co is 2.62% ($(\sqrt{1+0.053} - 1) \times 100\%$). The amount of dollars to deposit now would be €256,436 ($260,000/1.0139$) and to make this payment NG Co would need to borrow \$197,259 ($256,436/1.3000$). The six-month dollar cost of this debt would be \$202,427 ($197,259 \times 1.0262$). This is more expensive than using the six-month forward exchange contract.

Question 4

Text references. Financial intermediaries are covered in Chapter 3, forecasting and working capital financing in Chapter 6 and working capital management in Chapters 4 and 5.

Top tips. Part (a) requires a quick, relevant discussion of financial intermediaries which will be straightforward if you can remember the key terminology.

Part (b) may throw you as it requires a forecast income statement and statement of financial position rather than a cashflow forecast. However, the format for the statement of financial position is provided in the question and the workings involved require logical manipulation of the accounting ratios provided. Fill in as many figures as you can and you will gain a mark for each correct calculation.

In parts (c) and (d) plan your answers carefully and make sure you write about working capital financing in part (c) and working capital management ie ratio analysis in part (d). Calculate the ratios first in part (d) and then discuss the company's performance.

Easy marks. This question may look daunting initially but there are plenty of easy marks available if you tackle it logically and move on quickly if you get stuck.

Marking scheme

		Marks
(a)	Relevant discussion on financial intermediaries	4
(b)	Gross profit	1
	Net profit	1
	Profit before tax	1
	Retained profit	1
	Inventory	1
	Trade receivables	1
	Trade payables	1
	Reserves	1
	Overdraft	1
	Layout and format	<u>1</u>
	Maximum	9
(c)	Working capital financing policies	2-3
	Financial analysis	1-2
	Working capital financing policy of company	<u>2-3</u>
	Maximum	6
(d)	Discussion of working capital management	3-4
	Financial analysis	<u>2-4</u>
	Maximum	6
		<u>25</u>

(a) **Role of financial intermediaries**

Financial intermediaries provide a **link** between investors who have surplus cash and borrowers who have a need for finance.

Financial intermediaries **aggregate** invested funds. This means that they group together the small amounts of cash provided by individual investors, so that borrowers who need large amounts of cash have a convenient and readily accessible route to obtain necessary funds.

Financial intermediaries **reduce** the risk for individual lenders by **pooling**. They will assume the risk of loss on short-term funds borrowed by business organisations. Such losses are shared among lenders in general.

Financial intermediaries also offer **maturity transformation**, in that they bridge the gap between the wish of most lenders for **liquidity** and the desire of most borrowers for loans over longer periods.

(b) (i) **Forecast income statement**

	\$m
Turnover ($16.00m \times 1.084$)	17.344
Cost of sales ($17.344m - 5.203m$)	12.141
Gross profit ($17.344m \times 30\%$)	<u>5.203</u>
Other expenses ($5.203m - 3.469m$)	1.734
Net profit ($17.344m \times 20\%$)	3.469
Interest ($10m \times 0.08$) + 0.140m	0.940
Profit before tax	2.529
Tax ($2.529m \times 0.3$)	0.759
Profit after tax	1.770
Dividends ($1.770m \times 50\%$)	0.885
Retained profit	<u>0.885</u>

(ii) **Forecast statement of financial position**

	\$m	\$m
Non-current assets		22.00
<i>Current assets</i>		
Inventory ($12.141m \times (110/365)$)	3.66	
Trade receivables ($17.344m \times (65/365)$)	<u>3.09</u>	
		6.75
Total assets		<u>28.75</u>
<i>Equity finance</i>		
Ordinary shares	5.00	
Reserves ($7.5m + 0.885m$)	<u>8.39</u>	
		13.39
Long-term bank loan		<u>10.00</u>
		23.39
<i>Current liabilities</i>		
Trade payables ($12.141m \times (75/365)$)	2.49	
Overdraft ($28.75m - 23.39m - 2.49$ balancing figure)	<u>2.87</u>	
		5.36
Total liabilities		<u>28.75</u>

(c) **Working capital financing policy**

Working capital financing policies can be described as **conservative**, **moderate** or **aggressive**, depending on the extent to which fluctuating current assets and permanent current assets are financed by short-term sources of finance.

Permanent current assets are the amount required to meet long-term minimum needs and sustain normal trading activity, for example inventory and the average level of accounts receivable.

Fluctuating current assets are the current assets which vary according to normal business activity, for example due to seasonal variations.

A **conservative** working capital financing policy uses **long-term funds** to finance non-current assets and permanent current assets, as well as a proportion of fluctuating current assets.

An **aggressive** working capital financing policy uses **short-term funds** to finance fluctuating current assets and a proportion of permanent current assets as well. This is riskier but potentially more profitable.

A **balance** between risk and return might be best achieved by a **moderate** policy, which uses long-term funds to finance long-term assets (non-current assets and permanent current assets) and short-term funds to finance short-term assets (fluctuating current assets).

The **current** statement of financial position shows that APX Co uses **trade payables** and an **overdraft** as sources of **short-term** finance. 89% ($100 \times 4.1/4.6$) of current assets are financed from short-term sources and only 11% are financed from long-term sources. This appears to be a **very aggressive** working capital financing policy which carries significant risk. For example, if the bank called in the overdraft, APX Co might have to resort to more expensive short-term financing.

The **forecast** statement of financial position shows a **reduced** reliance on short-term finance. 79% ($100 \times 5.36/6.75$) of current assets are now financed from short-term sources and 21% are financed from long-term sources. This reduces the risk of the working financing capital policy.

Further moves away from an aggressive policy would be hampered by a lack of ability to pay interest on more long-term debt. The forecast **interest coverage ratio** is only 3.7 times ($3.469/0.94$). Alternatively, APX Co could consider an **increase in equity funding** to decrease reliance on short-term finance.

(d) **Working capital management**

Ratio calculations

Extracts from current income statement:

	\$m
Turnover	16.00
Cost of sales	<u>10.88</u>
Gross profit	5.12
Other expenses	<u>1.44</u>
Net profit	<u><u>3.68</u></u>

	<i>Current</i>	<i>Forecast</i>
Gross profit margin ($100 \times 5.12/16.00$)	32%	30%
Net profit margin ($100 \times 3.68/16.00$)	23%	20%
ROCE ($100 \times 3.68/22.5$)	16.35%	14.83% ($100 \times 3.469/23.39$)
Inventory period ($365 \times 2.4/10.88$)	81 days	110 days
Receivables period ($365 \times 2.2/16.00$)	50 days	65 days
Payables period ($365 \times 1.9/10.88$)	64 days	75 days
Current ratio ($4.6/4.1$)	1.12 times	1.26 times ($6.75/5.36$)
Quick ratio ($2.2/4.1$)	0.54 times	0.58 times ($3.09/5.36$)

Analysis

All of the key working capital management ratios are expected to worsen. The **inventory turnover period** is expected to increase from 81 days to 110 days. The **trade receivables period** is expected to increase from 50 days to 65 days. The **trade payables period** is expected to increase from 64 days to 75 days.

Because current assets are expected to increase by more than current liabilities, the **current ratio** and the **quick ratio** are both expected to increase in the next year. The current ratio will increase from 1.12 times to 1.26 times and the quick ratio from 0.54 times to 0.58 times.

It would be useful to compare all of these values with **industry averages** to see if APX Co has a particular problem.

The deterioration in the working capital position may be linked to an expected deterioration in the **overall financial performance** of APX Co. For example, the forecast **gross profit margin** of 30% and net profit margin of 20%, are both less than the current values of these ratios. Despite the increase in turnover, **return on capital employed** is expected to fall from 16.35% to 14.83%.

ACCA examiner's answers: June and December 2009 papers

1 (a) Weighted average cost of capital (WACC) calculation

Cost of equity of KFP Co = $4.0 + (1.2 \times (10.5 - 4.0)) = 4.0 + 7.8 = 11.8\%$ using the capital asset pricing model

To calculate the after-tax cost of debt, linear interpolation is needed

After-tax interest payment = $100 \times 0.07 \times (1 - 0.3) = \4.90

Year	Cash flow	\$	10% discount	PV (\$)	5% discount	PV (\$)
0	Market value	(94.74)	1.000	(94.74)	1.000	(94.74)
1 to 7	Interest	4.9	4.868	23.85	5.786	28.35
7	Redemption	100	0.513	51.30	0.711	71.10
				<u>(19.59)</u>		<u>4.71</u>

After-tax cost of debt = $5 + ((10 - 5) \times 4.71) / (4.71 + 19.59) = 5 + 1.0 = 6.0\%$

Number of shares issued by KFP Co = $\$15\text{m} / 0.5 = 30$ million shares

Market value of equity = $30\text{m} \times 4.2 = \126 million

Market value of bonds issued by KFP Co = $15\text{m} \times 94.74 / 100 = \14.211 million

Total value of company = $126 + 14.211 = \$140.211$ million

WACC = $((11.8 \times 126) + (6.0 \times 14.211)) / 140.211 = 11.2\%$

(b) (i) Price/earnings ratio method

Earnings per share of NGN = 80c per share

Price/earnings ratio of KFP Co = 8

Share price of NGN = $80 \times 8 = 640\text{c}$ or \$6.40

Number of ordinary shares of NGN = $5 / 0.5 = 10$ million shares

Value of NGN = $6.40 \times 10\text{m} = \64 million

However, it can be argued that a reduction in the applied price/earnings ratio is needed as NGN is unlisted and therefore its shares are more difficult to buy and sell than those of a listed company such as KFP Co. If we reduce the applied price/earnings ratio by 10% (other similar percentage reductions would be acceptable), it becomes 7.2 times and the value of NGN would be $(80/100) \times 7.2 \times 10\text{m} = \57.6 million

(ii) Dividend growth model

Dividend per share of NGN = $80\text{c} \times 0.45 = 36\text{c}$ per share

Since the payout ratio has been maintained for several years, recent earnings growth is the same as recent dividend growth, i.e. 4.5%. Assuming that this dividend growth continues in the future, the future dividend growth rate will be 4.5%.

Share price from dividend growth model = $(36 \times 1.045) / (0.12 - 0.045) = 502\text{c}$ or \$5.02

Value of NGN = $5.02 \times 10\text{m} = \50.2 million

(c) A discussion of capital structure could start from recognising that equity is more expensive than debt because of the relative risk of the two sources of finance. Equity is riskier than debt and so equity is more expensive than debt. This does not depend on the tax efficiency of debt, since we can assume that no taxes exist. We can also assume that as a company gears up, it replaces equity with debt. This means that the company's capital base remains constant and its weighted average cost of capital (WACC) is not affected by increasing investment.

The traditional view of capital structure assumes a non-linear relationship between the cost of equity and financial risk. As a company gears up, there is initially very little increase in the cost of equity and the WACC decreases because the cost of debt is less than the cost of equity. A point is reached, however, where the cost of equity rises at a rate that exceeds the reduction effect of cheaper debt and the WACC starts to increase. In the traditional view, therefore, a minimum WACC exists and, as a result, a maximum value of the company arises.

Modigliani and Miller assumed a perfect capital market and a linear relationship between the cost of equity and financial risk. They argued that, as a company geared up, the cost of equity increased at a rate that exactly cancelled out the reduction effect of cheaper debt. WACC was therefore constant at all levels of gearing and no optimal capital structure, where the value of the company was at a maximum, could be found.

It was argued that the no-tax assumption made by Modigliani and Miller was unrealistic, since in the real world interest payments were an allowable expense in calculating taxable profit and so the effective cost of debt was reduced by its tax efficiency. They revised their model to include this tax effect and showed that, as a result, the WACC decreased in a linear fashion as a company geared up. The value of the company increased by the value of the 'tax shield' and an optimal capital structure would result by gearing up as much as possible.

It was pointed out that market imperfections associated with high levels of gearing, such as bankruptcy risk and agency costs, would limit the extent to which a company could gear up. In practice, therefore, it appears that companies can reduce their WACC by increasing gearing, while avoiding the financial distress that can arise at high levels of gearing.

It has further been suggested that companies choose the source of finance which, for one reason or another, is easiest for them to access (pecking order theory). This results in an initial preference for retained earnings, followed by a preference for debt before turning to equity. The view suggests that companies may not in practice seek to minimise their WACC (and consequently maximise company value and shareholder wealth).

Turning to the suggestion that debt could be used to finance a cash bid for NGN, the current and post acquisition capital structures and their relative gearing levels should be considered, as well as the amount of debt finance that would be needed. Earlier calculations suggest that at least \$58m would be needed, ignoring any premium paid to persuade target company shareholders to sell their shares. The current debt/equity ratio of KFP Co is 60% (15m/25m). The debt of the company would increase by \$58m in order to finance the bid and by a further \$20m after the acquisition, due to taking on the existing debt of NGN, giving a total of \$93m. Ignoring other factors, the gearing would increase to 372% (93m/25m). KFP Co would need to consider how it could service this dangerously high level of gearing and deal with the significant risk of bankruptcy that it might create. It would also need to consider whether the benefits arising from the acquisition of NGN would compensate for the significant increase in financial risk and bankruptcy risk resulting from using debt finance.

- 2 (a) The key stages in the capital investment decision-making process are identifying investment opportunities, screening investment proposals, analysing and evaluating investment proposals, approving investment proposals, and implementing, monitoring and reviewing investments.

Identifying investment opportunities

Investment opportunities or proposals could arise from analysis of strategic choices, analysis of the business environment, research and development, or legal requirements. The key requirement is that investment proposals should support the achievement of organisational objectives.

Screening investment proposals

In the real world, capital markets are imperfect, so it is usual for companies to be restricted in the amount of finance available for capital investment. Companies therefore need to choose between competing investment proposals and select those with the best strategic fit and the most appropriate use of economic resources.

Analysing and evaluating investment proposals

Candidate investment proposals need to be analysed in depth and evaluated to determine which offer the most attractive opportunities to achieve organisational objectives, for example to increase shareholder wealth. This is the stage where investment appraisal plays a key role, indicating for example which investment proposals have the highest net present value.

Approving investment proposals

The most suitable investment proposals are passed to the relevant level of authority for consideration and approval. Very large proposals may require approval by the board of directors, while smaller proposals may be approved at divisional level, and so on. Once approval has been given, implementation can begin.

Implementing, monitoring and reviewing investments

The time required to implement the investment proposal or project will depend on its size and complexity, and is likely to be several months. Following implementation, the investment project must be monitored to ensure that the expected results are being achieved and the performance is as expected. The whole of the investment decision-making process should also be reviewed in order to facilitate organisational learning and to improve future investment decisions.

- (b) (i) Calculation of NPV

Year	0	1	2	3	4
	\$	\$	\$	\$	\$
Investment	(2,000,000)				
Income		1,236,000	1,485,400	2,622,000	1,012,950
Operating costs		676,000	789,372	1,271,227	620,076
Net cash flow	(2,000,000)	560,000	696,028	1,350,773	392,874
Discount at 10%	1·000	0·909	0·826	0·751	0·683
Present values	(2,000,000)	509,040	574,919	1,014,430	268,333
Net present value	\$366,722				

Workings

Calculation of income

Year	1	2	3	4
Inflated selling price (\$/unit)	20·60	21·22	21·85	22·51
Demand (units/year)	60,000	70,000	120,000	45,000
Income (\$/year)	1,236,000	1,485,400	2,622,000	1,012,950

Calculation of operating costs

Year	1	2	3	4
Inflated variable cost (\$/unit)	8.32	8.65	9.00	9.36
Demand (units/year)	60,000	70,000	120,000	45,000
Variable costs (\$/year)	499,200	605,500	1,080,000	421,200
Inflated fixed costs (\$/year)	176,800	183,872	191,227	198,876
Operating costs (\$/year)	676,000	789,372	1,271,227	620,076

Alternative calculation of operating costs

Year	1	2	3	4
Variable cost (\$/unit)	8	8	8	8
Demand (units/year)	60,000	70,000	120,000	45,000
Variable costs (\$/year)	480,000	560,000	960,000	360,000
Fixed costs (\$/year)	170,000	170,000	170,000	170,000
Operating costs (\$/year)	650,000	730,000	1,130,000	530,000
Inflated costs (\$/year)	676,000	789,568	1,271,096	620,025

(ii) Calculation of internal rate of return

Year	0	1	2	3	4
	\$	\$	\$	\$	\$
Net cash flow	(2,000,000)	560,000	696,028	1,350,773	392,874
Discount at 20%	1.000	0.833	0.694	0.579	0.482
Present values	(2,000,000)	466,480	483,043	782,098	189,365
Net present value		(\$79,014)			

$$\text{Internal rate of return} = 10 + ((20 - 10) \times 366,722) / (366,722 + 79,014) = 10 + 8.2 = 18.2\%$$

(iii) Calculation of return on capital employed

Total cash inflow = 560,000 + 696,028 + 1,350,773 + 392,874 = \$2,999,675
 Total depreciation and initial investment are same, as there is no scrap value
 Total accounting profit = 2,999,675 - 2,000,000 = \$999,675
 Average annual accounting profit = 999,675/4 = \$249,919
 Average investment = 2,000,000/2 = \$1,000,000
 Return on capital employed = 100 x 249,919/1,000,000 = 25%

(iv) Calculation of discounted payback

Year	0	1	2	3	4
	\$	\$	\$	\$	\$
PV of cash flows	(2,000,000)	509,040	574,919	1,014,430	268,333
Cumulative PV	(2,000,000)	(1,490,960)	(916,041)	98,389	366,722

$$\text{Discounted payback period} = 2 + (916,041/1,014,430) = 2 + 0.9 = 2.9 \text{ years}$$

- (c) The investment proposal has a positive net present value (NPV) of \$366,722 and is therefore financially acceptable. The results of the other investment appraisal methods do not alter this financial acceptability, as the NPV decision rule will always offer the correct investment advice.

The internal rate of return (IRR) method also recommends accepting the investment proposal, since the IRR of 18.2% is greater than the 10% return required by PV Co. If the advice offered by the IRR method differed from that offered by the NPV method, the advice offered by the NPV method would be preferred.

The calculated return on capital employed of 25% is less than the target return of 30%, but as indicated earlier, the investment proposal is financially acceptable as it has a positive NPV. The reason why PV Co has a target return on capital employed of 30% should be investigated. This may be an out-of-date hurdle rate that has not been updated for changed economic circumstances.

The discounted payback period of 2.9 years is a significant proportion of the forecast life of the investment proposal of four years, a time period which the information provided suggests is limited by technological change. The sensitivity of the investment proposal to changes in demand and life-cycle period should be analysed, since an earlier onset of technological obsolescence may have a significant impact on its financial acceptability.

- 3 (a) When considering the financing of working capital, it is useful to divide current assets into fluctuating current assets and permanent current assets. Fluctuating current assets represent changes in the level of current assets due to the unpredictability of business activity. Permanent current assets represent the core level of investment in current assets needed to support a given level of turnover or business activity. As turnover or level of business activity increases, the level of permanent current assets will also increase. This relationship can be measured by the ratio of turnover to net current assets.

The financing choice as far as working capital is concerned is between short-term and long-term finance. Short-term finance is more flexible than long-term finance: an overdraft, for example, is used by a business organisation as the need arises and variable interest is charged on the outstanding balance. Short-term finance is also more risky than long-term finance: an overdraft facility may be withdrawn, or a short-term loan may be renewed on less favourable terms. In terms of cost, the term structure of interest rates suggests that short-term debt finance has a lower cost than long-term debt finance.

The matching principle suggests that long-term finance should be used for long-term investment. Applying this principle to working capital financing, long-term finance should be matched with permanent current assets and non-current assets. A financing policy with this objective is called a 'matching policy'. HGR Co is not using this financing policy, since of the \$16,935,000 of current assets, \$14,000,000 or 83% is financed from short-term sources (overdraft and trade payables) and only \$2,935,000 or 17% is financed from a long-term source, in this case equity finance (shareholders' funds) or traded bonds.

The financing policy or approach taken by HGR Co towards the financing of working capital, where short-term finance is preferred, is called an aggressive policy. Reliance on short-term finance makes this riskier than a matching approach, but also more profitable due to the lower cost of short-term finance. Following an aggressive approach to financing can lead to overtrading (undercapitalisation) and the possibility of liquidity problems.

(b) Bank balance in three months' time if no action is taken:

Month	1	2	3
	\$000	\$000	\$000
Receipts	4,220	4,350	3,808
Payments	(3,950)	(4,100)	(3,750)
Interest on bonds		(200)	
Overdraft interest	(19)	(18)	(18)
Capital investment			(2,000)
Net cash flow	251	32	(1,960)
Opening balance	(3,800)	(3,549)	(3,517)
Closing balance	(3,549)	(3,517)	(5,477)

Bank balance in three months' time if the finance director's proposals are implemented:

Month	1	2	3
	\$000	\$000	\$000
Receipts	4,220	4,350	3,808
Payments	(3,950)	(4,100)	(3,750)
Interest on bonds		(200)	
Overdraft interest	(19)	(15)	(13)
Capital investment			(2,000)
Accounts receivable	270	270	270
Inventory	204	204	204
Net cash flow	725	509	(1,481)
Opening balance	(3,800)	(3,075)	(2,566)
Closing balance	(3,075)	(2,566)	(4,047)

Workings:

Reduction in accounts receivable days

Current accounts receivable days = $(8,775/49,275) \times 365 = 65$ days

Reduction in days over six months = $65 - 53 = 12$ days

Monthly reduction = $12/6 = 2$ days

Each receivables day is equivalent to $8,775,000/65 = \$135,000$

(Alternatively, each receivables day is equivalent to $49,275,000/365 = \$135,000$)

Monthly reduction in accounts receivable = $2 \times 135,000 = \$270,000$

Reduction in inventory days

Current inventory days = $(8,160/37,230) \times 365 = 80$ days

Each inventory day is equivalent to $8,160,000/80 = \$102,000$

(Alternatively, each inventory day = $37,230,000/365 = \$102,000$)

Monthly reduction in inventory = $102,000 \times 2 = \$204,000$

Overdraft interest calculations

Monthly overdraft interest rate = $1.0617^{1/12} = 1.005$ or 0.5%

If no action is taken: Period 1 interest = $3,800,000 \times 0.005 = \$19,000$

Period 2 interest = $3,549,000 \times 0.005 = \$17,745$ or \$18,000

Period 3 interest = $3,517,000 \times 0.005 = \$17,585$ or \$18,000

If action is taken: Period 1 interest = $3,800,000 \times 0.005 = \$19,000$
 Period 2 interest = $3,075,000 \times 0.005 = \$15,375$ or $\$15,000$
 Period 3 interest = $2,566,000 \times 0.005 = \$12,830$ or $\$13,000$

Discussion

If no action is taken, the cash flow forecast shows that HGR Co will exceed its overdraft limit of \$4 million by \$1.48 million in three months' time. If the finance director's proposals are implemented, there is a positive effect on the bank balance, but the overdraft limit is still exceeded in three months' time, although only by \$47,000 rather than by \$1.47 million.

In each of the three months following that, the continuing reduction in accounts receivable days will improve the bank balance by \$270,000 per month. Without further information on operating receipts and payments, it cannot be forecast whether the bank balance will return to less than the limit, or even continue to improve.

The main reason for the problem with the bank balance is the \$2 million capital expenditure. Purchase of non-current assets should not be financed by an overdraft, but a long-term source of finance such as equity or bonds. If the capital expenditure were removed from the area of working capital management, the overdraft balance at the end of three months would be \$3.48 million if no action were taken and \$2.05 million if the finance director's proposals were implemented. Given that HGR Co has almost \$50 million of non-current assets that could possibly be used as security, raising long-term debt through either a bank loan or a bond issue appears to be sensible. Assuming a bond interest rate of 10% per year, current long-term debt in the form of traded bonds is approximately $(\$200m \times 2)/0.1 = \$4m$, which is much less than the amount of non-current assets.

A suitable course of action for HGR Co to follow would therefore be, firstly, to implement the finance director's proposals and, secondly, to finance the capital expenditure from a long-term source. Consideration could also be given to using some long-term debt finance to reduce the overdraft and to reduce the level of accounts payable, currently standing at 100 days.

- (c) When credit is granted to foreign customers, two problems may become especially significant. First, the longer distances over which trade takes place and the more complex nature of trade transactions and their elements means foreign accounts receivable need more investment than their domestic counterparts. Longer transaction times increase accounts receivable balances and hence the level of financing and financing costs. Second, the risk of bad debts is higher with foreign accounts receivable than with their domestic counterparts. In order to manage and reduce credit risks, therefore, exporters seek to reduce the risk of bad debt and to reduce the level of investment in foreign accounts receivable.

Many foreign transactions are on 'open account', which is an agreement to settle the amount outstanding on a predetermined date. Open account reflects a good business relationship between importer and exporter. It also carries the highest risk of non-payment.

One way to reduce investment in foreign accounts receivable is to agree early payment with an importer, for example by payment in advance, payment on shipment, or cash on delivery. These terms of trade are unlikely to be competitive, however, and it is more likely that an exporter will seek to receive cash in advance of payment being made by the customer.

One way to accelerate cash receipts is to use bill finance. Bills of exchange with a signed agreement to pay the exporter on an agreed future date, supported by a documentary letter of credit, can be discounted by a bank to give immediate funds. This discounting is without recourse if bills of exchange have been countersigned by the importer's bank.

Documentary letters of credit are a payment guarantee backed by one or more banks. They carry almost no risk, provided the exporter complies with the terms and conditions contained in the letter of credit. The exporter must present the documents stated in the letter, such as bills of lading, shipping documents, bills of exchange, and so on, when seeking payment. As each supporting document relates to a key aspect of the overall transaction, letters of credit give security to the importer as well as the exporter.

Companies can also manage and reduce risk by gathering appropriate information with which to assess the creditworthiness of new customers, such as bank references and credit reports.

Insurance can also be used to cover some of the risks associated with giving credit to foreign customers. This would avoid the cost of seeking to recover cash due from foreign accounts receivable through a foreign legal system, where the exporter could be at a disadvantage due to a lack of local or specialist knowledge.

Export factoring can also be considered, where the exporter pays for the specialist expertise of the factor as a way of reducing investment in foreign accounts receivable and reducing the incidence of bad debts.

4 (a) *Financial Analysis*

	2008	2007	2006	2005
Turnover (\$m)	28.0	24.0	19.1	16.8
Turnover growth	17%	26%	14%	
Geometric average growth: 18.6%				
Profit before interest and tax (\$m)	9.8	8.5	7.5	6.8
PBIT growth	15%	13%	10%	
Geometric average growth: 13.0%				
Earnings (\$m)	5.5	4.7	4.1	3.6
Earnings per share (cents)	100	85	75	66
EPS growth	18%	13%	14%	
Geometric average growth: 14.9%				
Dividends (\$m)	2.2	1.9	1.6	1.6
Dividends per share (cents)	40	35	29	29
DPS growth	14%	21%	nil	
Geometric average growth: 11.3%				
Ordinary shares (\$m)	5.5	5.5	5.5	5.5
Reserves (\$m)	13.7	10.4	7.6	5.1
Shareholders' funds (\$)	19.2	15.9	13.1	10.6
8% Bonds, redeemable 2015 (\$m)	20	20	20	20
Capital employed (\$m)	39.2	35.9	33.1	30.6
Profit before interest and tax (\$m)	9.8	8.5	7.5	6.8
Return on capital employed	25%	24%	23%	22%
Earnings (\$m)	5.5	4.7	4.1	3.6
Return on shareholders' funds	29%	30%	31%	34%
8% Bonds, redeemable 2015 (\$m)	20	20	20	20
Market value of equity (\$m)	47.5	31.6	18.4	14.7
Debt/equity ratio (market value)	42%	63%	109%	136%
Share price (cents)	864	574	335	267
Dividends per share (cents)	40	35	29	
Total shareholder return	58%	82%	36%	

Achievement of corporate objectives

JJG Co has shareholder wealth maximisation as an objective. The wealth of shareholders is increased by dividends received and capital gains on shares owned. Total shareholder return compares the sum of the dividend received and the capital gain with the opening share price. The shareholders of JJG Co had a return of 58% in 2008, compared with a return predicted by the capital asset pricing model of 14%. The lowest return shareholders have received was 21% and the highest return was 82%. On this basis, the shareholders of the company have experienced a significant increase in wealth. It is debatable whether this has been as a result of the actions of the company, however. Share prices may increase irrespective of the actions and decisions of managers, or even despite them. In fact, looking at the dividend per share history of the company, there was one year (2006) where dividends were constant, even though earnings per share increased. It is also difficult to know when wealth has been maximised.

Another objective of the company was to achieve a continuous increase in earnings per share. Analysis shows that earnings per share increased every year, with an average increase of 14.9%. This objective appears to have been achieved.

Comment on financial performance

Return on capital employed (ROCE) has been growing towards the sector average of 25% on a year-by-year basis from 22% in 2005. This steady growth in the primary accounting ratio can be contrasted with irregular growth in turnover, the reasons for which are unknown.

Return on shareholders' funds has been consistently higher than the average for the sector. This may be due more to the capital structure of JJG Co than to good performance by the company, however, in the sense that shareholders' funds are smaller on a book value basis than the long-term debt capital. In every previous year but 2008 the gearing of the company was higher than the sector average.

(b) *Calculation of theoretical ex rights per share*

Current share price = \$8.64 per share

Current number of shares = 5.5 million shares

Finance to be raised = \$15m

Rights issue price = \$7.50 per share

Number of shares issued = $15m / 7.50 = 2$ million shares

Theoretical ex rights price per share = $((5.5m \times 8.64) + (2m \times 7.50)) / 7.5m = \8.34 per share

The share price would fall from \$8.64 to \$8.34 per share

However, there would be no effect on shareholder wealth

Effect of rights issue on earnings per share

Current EPS = 100 cents per share

Revised EPS = $100 \times 5.5m/7.5m = 73$ cents per share

The EPS would fall from 100 cents per share to 73 cents per share

However, as mentioned earlier, there would be no effect on shareholder wealth

Effect of rights issue on the debt/equity ratio

Current debt/equity ratio = $100 \times 20/47.5 = 42\%$

Revised market value of equity = $7.5m \times 8.34 = \$62.55$ million

Revised debt/equity ratio = $100 \times 20/62.55 = 32\%$

The debt/equity ratio would fall from 42% to 32%, which is well below the sector average value and would signal a reduction in financial risk

- (c) The current debt/equity ratio of JJG Co is 42% (20/47.5). Although this is less than the sector average value of 50%, it is more useful from a financial risk perspective to look at the extent to which interest payments are covered by profits.

	2008	2007	2006	2005
Profit before interest and tax (\$m)	9.8	8.5	7.5	6.8
Bond interest (\$m)	1.6	1.6	1.6	1.6
Interest coverage ratio (times)	6.1	5.3	4.7	4.3

The interest on the bond issue is \$1.6 million (8% of \$20m), giving an interest coverage ratio of 6.1 times. If JJG Co has overdraft finance, the interest coverage ratio will be lower than this, but there is insufficient information to determine if an overdraft exists. The interest coverage ratio is not only below the sector average, it is also low enough to be a cause for concern. While the ratio shows an upward trend over the period under consideration, it still indicates that an issue of further debt would be unwise.

A placing, or any issue of new shares such as a rights issue or a public offer, would decrease gearing. If the expansion of business results in an increase in profit before interest and tax, the interest coverage ratio will increase and financial risk will fall. Given the current financial position of JJG Co, a decrease in financial risk is certainly preferable to an increase.

A placing will dilute ownership and control, providing the new equity issue is taken up by new institutional shareholders, while a rights issue will not dilute ownership and control, providing existing shareholders take up their rights. A bond issue does not have ownership and control implications, although restrictive or negative covenants in bond issue documents can limit the actions of a company and its managers.

All three financing choices are long-term sources of finance and so are appropriate for a long-term investment such as the proposed expansion of existing business.

Equity issues such as a placing and a rights issue do not require security. No information is provided on the non-current assets of JJG Co, but it is likely that the existing bond issue is secured. If a new bond issue was being considered, JJG Co would need to consider whether it had sufficient non-current assets to offer as security, although it is likely that new non-current assets would be bought as part of the business expansion.

	<i>Marks</i>	<i>Marks</i>
1 (a) Cost of equity calculation	2	
Correct use of taxation rate	1	
Cost of debt calculation	3	
Market value of equity	1	
Market value of debt	1	
WACC calculation	<u>2</u>	
		10
(b) Price/earnings ratio value of company	2	
Current dividend per share	1	
Dividend growth model value of company	<u>3</u>	
		6
(c) Traditional view of capital structure	1–2	
Miller and Modigliani and capital structure	2–3	
Market imperfections	1–2	
Other relevant discussion	1–2	
Comment on debt finance for cash offer	<u>2–3</u>	
	Maximum	<u>9</u>
		<u>25</u>
2 (a) Identification of decision-making stages	1–2	
Explanation of decision-making stages	4–6	
Role of investment appraisal	<u>1–2</u>	
	Maximum	7
(b) Inflated income	2	
Inflated operating costs	2	
Discount factors	1	
Net present value	1	
Internal rate of return	3	
Return on capital employed	2	
Discounted payback	<u>2</u>	
		13
(c) Discussion of investment appraisal findings	4	
Advice on acceptability of project	<u>1</u>	
		<u>5</u>
		<u>25</u>

	<i>Marks</i>	<i>Marks</i>
3 (a) Analysis of current assets	1-2	
Short-term and long-term finance	2-3	
Matching principle	1-2	
Financing approach used by company	1-2	
	Maximum	7
(b) Bank balance if no action is taken	2	
Bank balance if action is taken	5	
Working capital management implications	1-2	
Advice on course of action	1-2	
	Maximum	10
(c) Relevant discussion		<u>8</u>
		<u>25</u>
4 (a) Relevant financial analysis	6-7	
Shareholder wealth discussion	2-3	
Earnings per share growth discussion	2-3	
Comment on financial performance	1-2	
	Maximum	12
(b) Share price calculation and comment	2-3	
Earnings per share calculation and comment	2-3	
Debt/equity ratio calculation and comment	1-2	
	Maximum	6
(c) Financial analysis	1-2	
Discussion of rights issue and placing	2-3	
Discussion of bond issue	2-3	
	Maximum	<u>7</u>
		<u>25</u>

- 1 (a) After-tax cost of borrowing = $8.6 \times (1 - 0.3) = 6\%$ per year

Evaluation of leasing

Year	Cash flow	Amount (\$)	6% Discount factors	Present value (\$)
0-3	Lease rentals	(380,000)	$1.000 + 2.673 = 3.673$	(1,395,740)
2-5	Tax savings	114,000	$4.212 - 0.943 = 3.269$	372,666
				<u>(1,023,074)</u>

Present value of cost of leasing = \$1,023,074

Evaluation of borrowing to buy

Year	Capital \$	Licence fee \$	Tax benefits \$	Net cash flow \$	6% discount factors	Present value \$
0	(1,000,000)			(1,000,000)	1.000	(1,000,000)
1		(104,000)		(104,000)	0.943	(98,072)
2		(108,160)	106,200	(1,960)	0.890	(1,744)
3		(112,486)	88,698	(23,788)	0.840	(19,982)
4	100,000	(116,986)	75,934	58,948	0.792	46,687
5			131,659	131,659	0.747	98,349
						<u>(974,762)</u>

Present value of cost of borrowing to buy = \$974,762

Workings

Year	Capital allowance \$	Tax benefits \$	Licence fee tax benefits \$	Total \$
2	$1,000,000 \times 0.25 = 250,000$	75,000	31,200	106,200
3	$750,000 \times 0.25 = 187,500$	56,250	32,448	88,698
4	$562,500 \times 0.25 = 140,625$	42,188	33,746	75,934
5	$421,875 - 100,000 = 321,875$	96,563	35,096	131,659

ASOP Co should buy the new technology, since the present cost of borrowing to buy is lower than the present cost of leasing.

- (b) Nominal terms net present value analysis

Year	1 \$	2 \$	3 \$	4 \$	5 \$
Cost savings	365,400	479,250	637,450	564,000	
Tax liabilities		(109,620)	(143,775)	(191,235)	(169,200)
Net cash flow	365,400	369,630	493,675	372,765	(169,200)
Discount at 11%	0.901	0.812	0.731	0.659	0.593
Present values	<u>329,225</u>	<u>300,140</u>	<u>360,876</u>	<u>245,652</u>	<u>(100,336)</u>
Present value of benefits		1,135,557			
Present cost of financing		(974,762)			
Net present value		<u>160,795</u>			

The investment in new technology is acceptable on financial grounds, as it has a positive net present value of \$160,795.

Workings

Year	1	2	3	4
Operating cost saving (\$/unit)	6.09	6.39	6.71	7.05
Production (units/year)	<u>60,000</u>	<u>75,000</u>	<u>95,000</u>	<u>80,000</u>
Operating cost savings (\$/year)	365,400	479,250	637,450	564,000
Tax liabilities at 30% (\$/year)	109,620	143,775	191,235	169,200

(Examiner's note: Including the financing cash flows in the NPV evaluation and discounting them by the WACC of 11% is also acceptable)

- (c) The equivalent annual cost or benefit method can be used to calculate the equal annual amount of cost or benefit which, when discounted at the appropriate cost of capital, produces the same present value of cost or net present value as a set of varying annual costs or benefits.

For example, the net present value (NPV) of investing in the new technology of \$160,795 in part (b) was calculated using a weighted average cost of capital (WACC) of 11% over an expected life of four years. The annuity factor for 11% and four years is 3.102. The equivalent annual benefit (EAB) is therefore $160,795/3.102 = \$51,835.9$ per year. This can be checked by multiplying the EAB by the annuity factor, i.e. $51,835.9 \times 3.102 = \$160,795$.

If an alternative investment in similar technology over five years had a lower EAB, the four-year investment would be preferred as it has the higher EAB.

- (d) When capital is rationed, the optimal investment schedule is the one that maximises the return per dollar invested. The capital rationing problem is therefore concerned with limiting factor analysis, but the approach adopted is slightly different depending on whether the investment projects being evaluated are divisible or indivisible.

With divisible projects, the assumption is made that a proportion rather than the whole investment can be undertaken, with the net present value (NPV) being proportional to the amount of capital invested. If 70% of a project is undertaken, for example, the resulting NPV is assumed to be 70% of the NPV of investing in the whole project.

For each divisible project, a profitability index can be calculated, defined either as the net present value of the project divided by its initial investment, or as the present value of the future cash flows of the project divided by its initial investment. The profitability index represents the return per dollar invested and can be used to rank the investment projects. The limited investment funds can then be invested in the projects in the order of their profitability indexes, with the final investment selection being a proportionate one if there is insufficient finance for the whole project. This represents the optimum investment schedule when capital is rationed and projects are divisible.

With indivisible projects, ranking by profitability index will not necessarily indicate the optimum investment schedule, since it will not be possible to invest in part of a project. In this situation, the NPV of possible combinations of projects must be calculated. The most likely combinations are often indicated by the profitability index ranking. The combination of projects with the highest aggregate NPV will then be the optimum investment schedule.

- 2 (a) The cost of debt of Bond A can be found by linear interpolation.

Using 11%, the difference between the present value of future cash flows and the ex interest market value = $(9 \times 5.889) + (100 \times 0.352) - 95.08 = 53.00 + 35.20 - 95.08 = (\$6.88)$

As the net present value is negative, 11% is higher than the cost of debt.

Using 9%, the difference between the present value of future cash flows and the ex interest market value = $(9 \times 6.418) + (100 \times 0.422) - 95.08 = 57.76 + 42.20 - 95.08 = \4.88

As the net present value is positive, 9% is lower than the cost of debt.

Cost of debt = $9 + ((11 - 9) \times 4.88)/(4.88 + 6.88) = 9 + 0.83 = 9.83\%$

Using estimates other than 11% and 9% will give slightly different values of the cost of debt.

- (b) A key factor here could be the duration of the bond issues, linked to the term structure of interest rates. Normally, the longer the time to maturity of a debt, the higher will be the interest rate and the cost of debt. Bond A has the greater time to maturity and therefore would be expected to have a higher interest rate and a higher cost of debt than Bond B, which is the case here.

Liquidity preference theory suggests that investors require compensation for deferring consumption, i.e. for not having access to their cash in the current period, and so providers of debt finance require higher compensation for lending for longer periods. The premium for lending for longer periods also reflects the way that default risk increases with time.

Expectations theory suggests that the shape of the yield curve depends on expectations as to future interest rates. If the expectation is that future interest rates will be higher than current interest rates, the yield curve will slope upwards. If the expectation is that future interest rates will be lower than at present, the yield curve will slope downwards.

Market segmentation theory suggests that future interest rates depend on conditions in different debt markets, e.g. the short-term market, the medium-term market and the long-term market. The shape of the yield curve therefore depends on the supply of, and demand for, funds in the market segments.

Since the two bonds were issued at the same time by the same company, the business risk of DD Co can be discounted as a reason for the difference between the two costs of debt. If the two bonds had been issued by different companies, a different business risk might have been a reason for the difference in the costs of debt.

The size of the debt could be a contributory factor, since the Bond A issue is twice the size of the Bond B issue. The greater size of the Bond A issue could be one of the reasons it has the higher cost of debt.

- (c) (i) Cost of equity = $4 + (1.2 \times (11 - 4)) = 4 + 8.4 = 12.4\%$
(ii) Dividend growth rate = $100 \times ((52/50) - 1) = 100 \times (1.04 - 1) = 4\%$ per year
Share price using DGM = $(50 \times 1.04)/(0.124 - 0.04) = 52/0.084 = 619c$ or \$6.19

- (iii) Number of ordinary shares = 25 million
 Market value of equity = $25m \times 6.19 = \$154.75$ million
 Market value of Bond A issue = $20m \times 95.08/100 = \$19.016m$
 Market value of Bond B issue = $10m \times 102.01/100 = \$10.201m$
 Market value of debt = $\$29.217m$
 Market value of capital employed = $154.75m + 29.217m = \$183.967m$
 Capital gearing = $100 \times 29.217/183.967 = 15.9\%$
- (iv) WACC = $((12.4 \times 154.75) + (9.83 \times 19.016) + (7.82 \times 10.201))/183.967 = 11.9\%$

- (d) Miller and Modigliani showed that, in a perfect capital market, the value of a company depended on its investment decision alone, and not on its dividend or financing decisions. In such a market, a change in dividend policy by DD Co would not affect its share price or its market capitalisation. They showed that the value of a company was maximised if it invested in all projects with a positive net present value (its optimal investment schedule). The company could pay any level of dividend and if it had insufficient finance, make up the shortfall by issuing new equity. Since investors had perfect information, they were indifferent between dividends and capital gains. Shareholders who were unhappy with the level of dividend declared by a company could gain a 'home-made dividend' by selling some of their shares. This was possible since there are no transaction costs in a perfect capital market.

Against this view are several arguments for a link between dividend policy and share prices. For example, it has been argued that investors prefer certain dividends now rather than uncertain capital gains in the future (the 'bird-in-the-hand' argument). It has also been argued that real-world capital markets are not perfect, but semi-strong form efficient. Since perfect information is therefore not available, it is possible for information asymmetry to exist between shareholders and the managers of a company. Dividend announcements may give new information to shareholders and as a result, in a semi-strong form efficient market, share prices may change. The size and direction of the share price change will depend on the difference between the dividend announcement and the expectations of shareholders. This is referred to as the 'signalling properties of dividends'.

It has been found that shareholders are attracted to particular companies as a result of being satisfied by their dividend policies. This is referred to as the 'clienteles effect'. A company with an established dividend policy is therefore likely to have an established dividend clientele. The existence of this dividend clientele implies that the share price may change if there is a change in the dividend policy of the company, as shareholders sell their shares in order to reinvest in another company with a more satisfactory dividend policy. In a perfect capital market, the existence of dividend clienteles is irrelevant, since substituting one company for another will not incur any transaction costs. Since real-world capital markets are not perfect, however, the existence of dividend clienteles suggests that if DD Co changes its dividend policy, its share price could be affected.

- 3 (a) Amount of equity finance to be invested in euros = $13m/2 = €6.5$ million
 Amount of equity to be invested in dollars = $6.5m/1.3000 = \$5$ million
 The amount of equity finance to be raised in dollars = $5m + 0.312m = \$5.312m$
 Rights issue price = $4.00 \times 0.83 = \$3.32$ per share
 Number of new shares issued = $5.312m/3.32 = 1.6$ million shares
 Current number of ordinary shares in issue = $\$100m/4.00 = 25$ million shares
 Total number of shares after the rights issue = $25m + 1.6m = 26.6$ million shares
 Theoretical ex rights price = $((25m \times 4) + (1.6m \times 3.32))/26.6 = 105.312/26.6 = \3.96 per share

- (b) (i) *Effect on earnings per share*
 Current EPS = $100 \times 4.00/10 = 40$ cents per share
 (Alternatively, current profit after tax = $100m/10 = \$10$ million
 Current EPS = $100 \times 10m/25m = 40$ cents per share)
 Increase in profit before interest and tax = $13m \times 0.2 = €2,600,000$
 Dollar increase in profit before interest and tax = $2,600,000/1.3000 = \$2$ million

	\$000
Increase in profit before interest and tax	2,000
Increase in interest = $6.5m \times 0.08 = 0.52m/1.3000 =$	400
Increase in profit before tax	1,600
Taxation = $1.6m \times 0.3 =$	480
Increase in profit after tax	1,120
Current profit after tax = $100m/10 =$	10,000
Revised profit after tax	11,120

Alternatively, using euros:

	€000
Increase in profit before interest and tax = $13\text{m} \times 0.2 =$	2,600
Increase in interest = $6.5\text{m} \times 0.08 =$	520
	<hr/>
Increase in profit before tax	2,080
Taxation = $2.08\text{m} \times 0.3 =$	624
	<hr/>
Increase in profit after tax	1,456
	<hr/>
	\$000
Increase in dollar profit after tax = $1.456\text{m}/1.300 =$	1,120
Current profit after tax = $100\text{m}/10 =$	10,000
	<hr/>
Revised profit after tax	11,120

Revised EPS = $100 \times 11.12\text{m}/26.6\text{m} = 41.8$ cents/share

- (ii) *Effect on shareholder wealth*
 Expected share price using PER method = $(41.8 \times 10)/100 = \$4.18$ per share
 This should be compared to the theoretical ex rights price per share in order to evaluate any change in shareholder wealth.
 The investment produces a capital gain of 22 cents per share ($\$4.18 - \3.96)
 In the absence of any information about dividend payments, it appears that the investment will increase the wealth of shareholders.
- (c) Transaction risk is exchange rate risk that arises as a result of short term transactions. Because it is short term in nature, it has a direct effect on cash flows, which can either increase or decrease, depending on the movement in exchange rates before the settlement dates of individual short-term transactions.
 NG Co is exposed to transaction risk on its euro-denominated European sales and interest payments. The dollar value of its euro-denominated sales, for example, would decrease if the dollar appreciated against the euro.
 Translation risk is exchange rate risk that arises from the need to consolidate financial performance and financial position when preparing consolidated financial statements. For this reason, it is also referred to as accounting exposure.
 NG Co is exposed to translation risk on its euro-denominated non-current assets. The dollar value of the non-current assets acquired by investing in the storage, packing and distribution network, for example, will change as the euro/dollar exchange rate changes.
- (d) NG Co will receive euro-denominated income and will incur euro-denominated expenses as a result of its European operations. One hedging method is to maintain a euro-denominated bank account for all euro-denominated transactions. This natural hedge will minimise the need for cash to be exchanged from one currency to another.
 Transactions that are deemed to have significant exchange-rate risk could be hedged using the forward market, i.e. using a forward exchange contract or FEC. This is a binding contract between a company and a bank for delivery or receipt of an agreed amount of foreign currency at an agreed exchange rate on an agreed future date.
 The six-monthly interest payment of €260,000 can be used to illustrate an FEC. The current cost of the interest payment is \$200,000. In six months and twelve months, as the euro is expected to strengthen against the dollar, the dollar cost of the interest payment is expected to rise. In order to protect against unexpected adverse exchange rate movements, NG Co can lock into the six-month and twelve-month forward rates of 1.2876 €/£ and 1.2752 €/£ using forward exchange contracts, thereby guaranteeing the dollar cost of its euro-denominated interest payments. The dollar cost of the six-month interest payment would be \$201,926 ($\text{€}260,000/1.2876$) and the dollar cost of the twelve-month interest payment would be \$203,890 ($\text{€}260,000/1.2752$).
 An alternative to an FEC is a money market hedge. NG Co could borrow now in dollars in order to make a euro deposit which, with accrued interest, will be sufficient to pay the euro-denominated interest in six months' time.
 The six-month euro deposit rate available to NG Co is 1.39% ($100 \times (1.02805 - 1)$) and the six-month dollar borrowing rate available to NG Co is 2.62% ($100 \times (1.05305 - 1)$). The amount of dollars to deposit now would be €256,436 ($260,000/1.0139$) and to make this payment NG Co would need to borrow \$197,259 ($256,436/1.3000$). The six-month dollar cost of this debt would be \$202,427 ($197,259 \times 1.0262$). This is more expensive than using the six-month forward exchange contract.
 (Examiner's note: an illustration using the interest payment due in twelve months would also be acceptable. It would also be acceptable to use six-monthly interest rates that are one half of the annual interest rates.)
 Other hedging methods that could be identified and briefly discussed are currency futures, currency options and currency swaps.

- (a) The role of financial intermediaries in providing short-term finance for use by business organisations is to provide a link between investors who have surplus cash and borrowers who have financing needs. The amounts of cash provided by individual investors may be small, whereas borrowers need large amounts of cash: one of the functions of financial intermediaries is therefore to aggregate invested funds in order to meet the needs of borrowers. In so doing, they provide a convenient and readily accessible route for business organisations to obtain necessary funds.

Small investors are likely to be averse to losing any capital value, so financial intermediaries will assume the risk of loss on short-term funds borrowed by business organisations, either individually or by pooling risks between financial intermediaries. This aspect of the role of financial intermediaries is referred to as risk transformation. Financial intermediaries also offer maturity transformation, in that investors can deposit funds for a long period of time while borrowers may require funds on a short-term basis only, and vice versa. In this way the needs of both borrowers and lenders can be satisfied.

- (b) Forecast income statement

	\$m
Turnover = $16.00m \times 1.084 =$	17.344
Cost of sales = $17.344m - 5.203m =$	12.141
Gross profit = $17.344m \times 30\% =$	5.203
Other expenses = $5.203m - 3.469m =$	1.734
Net profit = $17.344m \times 20\% =$	3.469
Interest = $(10m \times 0.08) + 0.140m =$	0.940
Profit before tax	2.529
Tax = $2.529m \times 0.3 =$	0.759
Profit after tax	1.770
Dividends = $1.770m \times 50\% =$	0.885
Retained profit	0.885

Forecast statement of financial position

	\$m	\$m
Non-current assets		22.00
Current assets		
Inventory	3.66	
Trade receivables	3.09	
		6.75
Total assets		28.75
Equity finance:	\$m	\$m
Ordinary shares	5.00	
Reserves	8.39	
		13.39
Bank loan		10.00
		23.39
Current liabilities		
Trade payables	2.49	
Overdraft	2.87	
		5.36
Total liabilities		28.75

Workings

Inventory = $12.141m \times (110/365) = \$3.66m$
 Trade receivables = $17.344m \times (65/365) = \$3.09m$
 Trade payables = $12.141m \times (75/365) = \$2.49m$
 Reserves = $7.5m + 0.885m = \$8.39m$
 Overdraft = $28.75m - 23.39m - 2.49 = \$2.87m$ (balancing figure)

- (c) Working capital financing policies can be classified into conservative, moderate (or matching) and aggressive, depending on the extent to which fluctuating current assets and permanent current assets are financed by short-term sources of finance. Permanent current assets are the core level of investment in current assets needed to support a given level of business activity or turnover, while fluctuating current assets are the changes in the levels of current assets arising from the unpredictable nature of some aspects of business activity.

A conservative working capital financing policy uses long-term funds to finance non-current assets and permanent current assets, as well as a proportion of fluctuating current assets. This policy is less risky and less profitable than an aggressive

working capital financing policy, which uses short-term funds to finance fluctuating current assets and a proportion of permanent current assets as well. Between these two extremes lies the moderate (or matching) policy, which uses long-term funds to finance long-term assets (non-current assets and permanent current assets) and short-term funds to finance short-term assets (fluctuating current assets).

The current statement of financial position shows that APX Co uses trade payables and an overdraft as sources of short-term finance. In terms of the balance between short- and long-term finance, 89% of current assets ($100 \times 4.1/4.6$) are financed from short-term sources and only 11% are financed from long-term sources. Since a high proportion of current assets are permanent in nature, this appears to be a very aggressive working capital financing policy which carries significant risk. If the overdraft were called in, for example, APX Co might have to turn to more expensive short-term financing.

The forecast statement of financial position shows a lower reliance on short-term finance, since 79% of current assets ($100 \times 5.36/6.75$) are financed from short-term sources and 21% are financed from long-term sources. This decreased reliance on an aggressive financing policy is sensible, although with a forecast interest coverage ratio of only 3.7 times ($3.469/0.94$), APX Co has little scope for taking on more long-term debt. An increase in equity funding to decrease reliance on short-term finance could be considered.

(d) *Working capital management*

Financial analysis shows deterioration in key working capital ratios. The inventory turnover period is expected to increase from 81 days to 110 days, the trade receivables period is expected to increase from 50 days to 65 days and the trade payables period is expected to increase from 64 days to 75 days. It is also a cause for concern here that the values of these working capital ratios for the next year are forecast, i.e. APX Co appears to be anticipating a worsening in its working capital position. The current and forecast values could be compared to average or sector values in order to confirm whether this is in fact the case.

Because current assets are expected to increase by more than current liabilities, the current ratio and the quick ratio are both expected to increase in the next year, the current ratio from 1.12 times to 1.26 times and the quick ratio from 0.54 times to 0.58 times. Again, comparison with sector average values for these ratios would be useful in making an assessment of the working capital management of APX Co. The balance between trade payables and overdraft finance is approximately the same in both years (trade payables are 46% of current liabilities in the current statement of financial position and 47% of current liabilities in the forecast statement of financial position), although reliance on short-term finance is expected to fall slightly in the next year.

The deteriorating working capital position may be linked to an expected deterioration in the overall financial performance of APX Co. For example, the forecast gross profit margin (30%) and net profit margin (20%) are both less than the current values of these ratios (32% and 23% respectively), and despite the increase in turnover, return on capital employed (ROCE) is expected to fall from 16.35% to 14.83%.

Analysis

Extracts from current income statement:

	\$m	
Turnover	16.00	
Cost of sales	10.88	
Gross profit	5.12	
Other expenses	1.44	
Net profit	3.68	
	Current	Forecast
Gross profit margin ($100 \times 5.12/16.00$)	32%	30%
Net profit margin ($100 \times 3.68/16.00$)	23%	20%
ROCE ($100 \times 3.68/22.5$) ($100 \times 3.469/23.39$)	16.35%	14.83%
Inventory period ($365 \times 2.4/10.88$)	81 days	110 days
Receivables period ($365 \times 2.2/16.00$)	50 days	65 days
Payables period ($365 \times 1.9/10.88$)	64 days	75 days
Current ratio ($4.6/4.1$) ($6.75/5.36$)	1.12 times	1.26 times
Quick ratio ($2.2/4.1$) ($3.09/5.36$)	0.54 times	0.58 times

	<i>Marks</i>	<i>Marks</i>
1 (a) Present value of lease rentals	2	
Present value of lease rental tax benefits	1	
Present value of cost of leasing	1	
Investment and scrap values	1	
Licence fee	1	
Capital allowance tax benefits	2	
Licence fee tax benefits	1	
Present value of cost of borrowing to buy	1	
Appropriate decision on leasing versus buying	<u>1</u>	
		11
(b) Inflated cost savings	2	
Tax liabilities	1	
Present values of net cash flows	1	
Net present value	1	
Advice on acceptability of investment	<u>1</u>	
		6
(c) Definition of equivalent cost or benefit	1	
Relevant discussion	1	
Appropriate illustration	<u>1</u>	
		3
(d) Capital rationing	1–2	
Divisible projects and profitability index	2–3	
Indivisible projects and combinations	<u>1–2</u>	
	Maximum	<u>5</u>
		25
2 (a) Calculation of cost of debt of Bond A		3
(b) Term structure of interest rates	1–2	
Liquidity preference theory	1–2	
Expectations theory	1–2	
Market segmentation theory	1–2	
Other relevant discussion	<u>1–2</u>	
	Maximum	6
(c) Cost of equity	2	
Dividend growth rate	1	
Share price using dividend growth model	2	
Capital gearing	2	
Weighted average cost of capital	<u>2</u>	
		9
(d) Dividend irrelevance	3–4	
Dividend relevance	<u>3–4</u>	
	Maximum	<u>7</u>
		25

	<i>Marks</i>	<i>Marks</i>
3 (a) Amount of equity finance to be raised in dollars	1	
Rights issue price	1	
Theoretical ex rights price	<u>2</u>	
		4
(b) Current EPS	1	
Increase in PBIT from investment	1	
Interest on bond issue	1	
Revised dollar profit after tax	2	
Revised EPS	1	
Revised share price using PER method	1	
Comment on effect on shareholder wealth	1-3	
	Maximum	9
(c) Transaction risk	1-2	
Translation risk	1-2	
Link to question	<u>1-2</u>	
	Maximum	4
(d) Euro account	1	
Forward market hedge	1	
Illustration of forward market hedge	1-2	
Money-market hedge	1	
Illustration of money-market hedge	1-2	
Other hedging strategies, including derivatives	<u>1-2</u>	
	Maximum	8
		<u>25</u>
4 (a) Relevant discussion on financial intermediaries		4
(b) Gross profit	1	
Net profit	1	
Profit before tax	1	
Retained profit	1	
Inventory	1	
Trade receivables	1	
Trade payables	1	
Reserves	1	
Overdraft	1	
Layout and format	<u>1</u>	
	Maximum	9
(c) Working capital financing policies	2-3	
Financial analysis	1-2	
Working capital financing policy of company	<u>2-3</u>	
	Maximum	6
(d) Discussion of working capital management	3-4	
Financial analysis	<u>2-4</u>	
	Maximum	6
		<u>25</u>

Mathematical tables

Present Value Table

Present value of 1 i.e. $(1 + r)^{-n}$

Where r = discount rate
 n = number of periods until payment

Periods (n)	Discount rate (r)										
	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 i.e. $\frac{1 - (1 + r)^{-n}}{r}$

Where r = discount rate
 n = number of periods

Periods (n)	Discount rate (r)										
	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	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	2
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	3
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	4
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	5
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	6
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	7
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	8
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	9
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	10
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	11
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	12
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103	13
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367	14
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606	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	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528	2
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106	3
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589	4
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991	5
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326	6
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605	7
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837	8
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031	9
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192	10
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327	11
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439	12
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533	13
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611	14
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675	15

Review Form & Free Prize Draw (continued)

TELL US WHAT YOU THINK

Please note any further comments and suggestions/errors below.

Free Prize Draw Rules

- 1 Closing date for 31 July 2010 draw is 30 June 2010. Closing date for 31 January 2011 draw is 31 December 2010.
- 2 Restricted to entries with UK and Eire addresses only. BPP employees, their families and business associates are excluded.
- 3 No purchase necessary. Entry forms are available upon request from BPP Learning Media Ltd. No more than one entry per title, per person. Draw restricted to persons aged 16 and over.
- 4 Winners will be notified by post and receive their cheques not later than 6 weeks after the relevant draw date.
- 5 The decision of the promoter in all matters is final and binding. No correspondence will be entered into.