ACCA

STUDY TEXT

Professional Paper 14 Financial Strategy



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PREFACE

Professional exams are not easy. They demand your time and commitment over a period which can feel never-ending. You want to qualify and get on with your career - but you don't want to put your life on hold. You don't want to spend a moment longer studying than you have to.

At BPP we believe strongly that the secret of success is effective study material which is focused and relevant to the exam *you* will be sitting. It needs to see you through the entire study process - from knowledge acquisition (the Study Text, your core study and reference book), through recap and practice (the Practice & Revision Kit, with exam-standard questions and plenty of revision features) to *final* exam revision (when Passcards are invaluable) - and success!

We have designed and written this Study Text on *Financial Strategy* to set you firmly on the first step - the acquisition of knowledge, skills and techniques.

- We include the actual syllabus, so you know what you're up against, and we cover it comprehensively. We continually consult with the examiner to make sure we - and you - are right on track.
- We encourage you to study thoroughly and methodically, giving you plenty of opportunity to check that the topics are sinking in, while at the same time we help you to 'dip in' if you wish (see the *How to use this Study Text* section).
- We focus your mind on the examination, with recently-examined topics highlighted.
- All topics are up-to-date as at 31 May 1996 - the cut-off date set by the ACCA for the December 1996 exam - and for any further developments up to and including 30 June 1996. (Our Practice & Revision Kit provides an update for the June 1997 exam.)

***Financial Strategy* July 1996**

Now in its fourth edition, this Study Text has been enhanced in the following ways.

- The text has been updated on recent developments, including for example the Greenbury Code on directors' pay and the establishment of the World Trade Organisation.
- To take account of how the subject is being examined, there is expanded coverage of various key topics, including dividend policy, corporate failure models, swaptions, transfer prices and the balance of payments.
- New topics covered include free cash flow and shareholder value analysis.
- Cuts in length have been made in some chapters, to make learning easier without losing depth of coverage of syllabus topics.
- Knowledge you have covered at an earlier stage is highlighted where appropriate.
- Full account is taken of the June 1996 exam.

Market leaders for nearly 20 years in targeted study material for ACCA exams, at BPP we have the experience and the commitment to produce for our customers effective study material which is smart, focused and student-friendly. The rest is up to you. Good luck!

BPP Publishing
July 1996

For details of the other BPP titles relevant to your studies for this examination and for a full list of books in the BPP ACCA range, including our innovative ACCA PASSCARDS, please turn to the end of the text. If you send us your comments on this Study Text, you will automatically be entered in our FREE PRIZE DRAW.

HOW TO USE THIS STUDY TEXT

This Study Text has been designed to help students and lecturers to get to grips as effectively as possible with the content and scope of Paper 14 *Financial Strategy*.

- The framework of this Study Text is structured so that you should find it to be the most coherent way of covering the syllabus. However we have also aimed to help those who choose to take a different path by indicating (in the *Introduction* section beginning each chapter) the areas which naturally precede the current chapter and those chapters in which topics introduced can be further explored.
- Syllabus coverage in the text is indicated on pages (viii) to (x) by chapter references set against each syllabus topic. Syllabus topics are also identified within each chapter of the text. It is thus easy to trace your path through the syllabus.
- As a further guide - and a convenient means of monitoring your progress - we have included a *Study checklist* on page (xxii) on which to chart your completion of chapters and their related illustrative questions.

Each chapter of the Study Text is divided into sections.

- An introduction places the subject of the chapter in its context.
- The text gives clear, concise topic-by-topic coverage.
- Knowledge you will have covered at an earlier stage is indicated as appropriate.
- Dates when topics have been examined are indicated against relevant section or subsection headings.
- Examples and exercises reinforce learning, confirm understanding and stimulate thought.
- A 'roundup' at the end of the chapter pulls together the key points.
- A test your knowledge quiz helps you to check that you have absorbed the material in the chapter.
- Each chapter ends with a recommendation on illustrative questions to try for practice.

Some features of the Study Text are worth looking at in more detail.

Exercises

Exercises are provided throughout the text to enable you to check your progress as you work through the text. These come in a large variety of forms: some test your ability to do a calculation just described, others see whether you have taken in the full significance of a piece of information. Some are meant to be discussed with colleagues, friends or fellow students.

A suggested solution is usually given, but often in an abbreviated form to help you avoid the temptation of merely reading the exercise rather than actively engaging your brain. We think it is preferable on the whole to give the solution immediately after the exercise rather than making you hunt for it at the end of the chapter, losing your place and your concentration. Cover up the solution with a piece of paper if you find the temptation to cheat too great!

Examples can also often be used as exercises, if not the first time you read a passage, then certainly afterwards when you come to revise.

Chapter roundup and Test your knowledge quiz

At the end of each chapter you will find two boxes. The first is the *Chapter roundup* which summarises key points and arguments and sets out what you should know or be able to do having studied the chapter. The second box is a quiz that serves a number of purposes.

(a) It is an essential part of the chapter roundup and can be glanced over quickly to remind yourself of key issues covered by the chapter.

(b) It is a quiz pure and simple. Try doing it before you arrive at work in the morning to revise what you read the night before.

(c) It is a revision tool. Shortly before your examination sit down with pen and paper and try to answer all the questions fully. Many of the questions are typical of the four- or five-mark-earning opportunities that feature so regularly in examination questions.

Illustrative questions and Class questions

Initially you might attempt the *Illustrative questions* in the bank at the end of this Study Text with reference to the chapter you have just covered. Later in your studies, it would be helpful to attempt some without support from the text. Only when you have attempted each question as fully as possible should you refer to the suggested solution to check and to correct your performance.

Additional *Class questions* are provided without suggested solutions. These are intended to be attempted under supervision. The solutions are given in a separate Lecturer's Pack, available only to bona fide lecturers.

Glossary and Index

Finally, we have included a *Glossary* to define key terms and a comprehensive *Index* to help you locate key topics.

A note on pronouns

For reasons of style, it is sometimes necessary in our study material to use 'he' instead of 'he or she', 'him' instead of 'him or her' and so on. However, no prejudice or stereotyping according to gender is intended or assumed.

SYLLABUS

		Covered in Chapter(s)
1	**Corporate governance**	
(a)	The aims and objectives of an organisation and the goals of the different interest groups involved, the significance of these for business planning.	1
(b)	The relationship between shareholders, bondholders, bankers and directors, the potential for conflicts of interest. The contribution of agency theory to the debate on governance.	1, 2
(c)	The concept of goal congruence and how it may be achieved.	2
(d)	The role of executive share option schemes (ESOPs), non-executive directors, management buy-outs and buy-ins, administrators etc.	1, 2, 3
2	**Business planning**	
(a)	Proposing, evaluating and implementing ways to meet short and medium term financial objectives (eg, budgeting, monitoring and controlling cash flow, pricing, raising finance, repaying debt).	10
(b)	Advising on the purpose and benefits of setting short-term objectives consistent with long-term strategy.	1, 10, 11
(c)	Seeking, clarifying and confirming information relevant to the determination of business objectives (eg information on current business position and past performance by ratio and other analysis, planned changes, systems and processes used).	3, 4, 12
(d)	Developing and analysing business plans to meet agreed objectives, including risk assessment of plans and all aspects of the business that they will influence, analysis to include measures of value, profit, optimisation, and utility.	4, 10
(e)	Long-term financial planning including:	4, 11, 13, 14
	(i) the issues to be considered in the decision whether to expand through organic growth or through acquisition	
	(ii) advising clients on the strategies a company might use in order to expand or maintain its current market position	
	(iii) the techniques for valuing individual shares and other securities and for valuing a business, the application of these techniques in merger and acquisition situations	
	(iv) the arguments for and against mergers and acquisitions	
	(v) methods of financing an acquisition	
	(vi) advising clients on appropriate merger and acquisition strategies and tactics	
	(vii) tactics to follow when defending against a takeover bid	
	(viii) planning for post-merger success and post merger audit	
	(ix) identifying schemes for financial restructuring and the issues involved in the decision process; methods of restructuring: buyouts, buyins, going private, share repurchases, rescheduling debts, and joint ventures.	

		Covered in Chapter(s)
3	**Further issues relating to long-term investments**	
(a)	The relationship of investment decisions to long-term financial planning.	3, 11
(b)	Portfolio theory and its relevance to decision making and financial management practice.	7
(c)	The capital asset pricing model and its uses in financial management.	8
(d)	Calculating the cost of capital, the significance of the dividend-based model and the capital asset pricing model in such calculations. The cost of various forms of debt. The use of the weighted average cost of capital approach.	5, 6, 8
(e)	The adjusted present value approach and its application in decision-making.	6
(f)	The factors to take into account in deciding upon a dividend policy. Taxation and dividends. The impact of dividends on share prices. The concept of signalling.	9
4	**Treasury management**	
(a)	Optimising the flow of financial assets for an organisation/individual.	25
(b)	Risk management and cost saving within the organisation by use of:	21, 22
	(i) options, including caps, floors and collars (ii) futures (iii) swaps (iv) the scope and benefits of financial engineering.	
(c)	Foreign exchange markets and hedging against foreign exchange risk.	19, 20
5	**Economic influences on international financial management decisions**	
(a)	International factors affecting business developments. Trends in global competition with particular reference to the role of Japan and the USA.	16
(b)	The role of multinational companies in the world economy.	16
(c)	The theory and practice of free trade and problems of protectionism.	16
(d)	Balance of payments and implications of policies to achieve equilibrium.	16
(e)	Trade agreements and areas, GATT, EFTA etc.	16
(f)	Customs Unions/common markets.	16
(g)	Exchange rate determination and alternative exchange rate regimes including Exchange Rate Mechanism (ERM).	19

		Covered in Chapter(s)
(h)	International institutions such as the World Bank and International Monetary Fund (IMF) and their role.	17
(i)	Economic relations between developed and developing countries: problems of debt and development.	17

6 International financial management decisions

(a)	Advising clients on the alternative methods of financing imports and exports.	18
(b)	Workings of the international money and capital markets and the opportunities that they offer to companies as a source of finance, and as a repository for the investment of funds.	17
(c)	The management of financial resources within a group of companies including:	23, 25
	(i) payments between companies (ii) cash management (iii) transfer pricing (iv) judging the performance of companies within a group (v) the financial control of a group of companies.	
(d)	The appraisal of international capital investments, applying the appropriate techniques, and the consideration of the major issues in the decision-making process including	23, 24
	(i) strategic objectives (ii) the principle of home country versus host country returns (iii) the form of foreign investment, branch versus subsidiary, European Economic Interest Groups (EEIGs) (iv) the effect of taxation on the foreign investment decision (basic principles only) (v) discounted cash flows (vi) adjusted present value (vii) political risk analysis (viii) an analysis of the different methods of financing the investment.	

TEACHING GUIDE

This is the current Teaching Guide for the December 1996 exam. Any changes to the Teaching Guide which relate to the June 1997 exam will be reflected in the 1997 edition of the Practice & Revision Kit.

	Syllabus reference
Session 1 Financial strategy: its nature and scope	1a

- describe what is meant by financial strategy
- identify the importance of financial strategy to the organisation
- discuss the relationship between financial strategy and overall corporate strategy

Corporate governance

- identify the aims and objectives of organisations
- describe the goals of different interest groups
- understand the significance of changing share ownership patterns for the company
- define the meaning of corporate governance from a UK perspective and briefly contrast between UK practices and those of other countries especially the USA, Continental Europe and the Far East
- understand the debate regarding corporate governance, including the Cadbury Report
- identify the role of auditors, audit committees, non-executive directors etc in corporate governance

Session 2 Conflicts of interest and their resolution	1b, 1c, 1d

- identify directors' powers and behaviour, including the significance of creative accounting, off-balance sheet finance and the influence of the threat of takeover
- understand the principles of agency theory and their contribution to the debate on governance
- understand the potential for conflict between owners, directors, managers and other interest groups
- discuss the meaning of goal congruence, and understand how it might be achieved through the use of alternative reward systems including share option schemes and profit related pay
- discuss the role of non-executive directors, administrators etc with respect to the organisation

Session 3 Translating market disciplines	2c, 3a

- explain and quantify what is meant by adequate financial return, contrasting profit based measures with net present value of expected cash flows
- understand the benefits of using net present value, and how the use of net present value can serve as a unifying long-term objective for the enterprise as a whole
- revise NPV analysis, including the identification of relevant cash flows and the impact of price level changes
- describe the efficient markets hypothesis including weak, semi-strong and strong form efficiency
- understand the meaning of market efficiency and its significance to financial decision-making based upon NPV
- explain the meaning of the term structure of interest rates, including the forms of the yield curve and the expectations, liquidity preference and market segmentation theories
- understand the significance of yield curves to financial managers

Syllabus reference

Session 4 The valuation of securities

2e

- understand models for the valuation of shares and bonds, dividend growth models, earnings growth models and use such models to estimate value from given information
- be aware of the theoretical and practical limitations of such models
- discuss the relevance of accounting information to share valuation
- be aware of practical influences on share price, including reasons why share prices differ from their theoretical values
- understand and apply models for the valuation of debt and other securities

Session 5 Portfolio theory

3b

- understand the benefits of portfolio diversification
- estimate the risk and return of portfolios
- understand the meaning of mean-variance efficiency for two asset portfolios and portfolios of many assets, efficient portfolios and the efficient frontier
- understand the concept of utility and its importance to portfolio selection
- explain portfolio selection when both risky and risk free assets are available
- discuss the nature and significance of the Capital Market Line
- discuss the relevance of portfolio theory to practical financial management
- discuss the limitations of portfolio theory

Session 6 Capital asset pricing model

3c

- understand the meaning and significance of systematic and unsystematic risk
- discuss the Security Market Line
- understand what is meant by alpha and beta factors, their interpretation and how they are calculated
- discuss the problems of using historic data as the basis for future decision-making, and the evidence of the stability of beta over time
- describe the assumptions of CAPM
- understand the uses of the model in financial management
- discuss the limitations of the model, including some of the instances when it does not perform as expected (eg low beta investments, low PE investments, day of week effects etc)

Session 7 The cost of capital

3d

- estimate the cost of equity, using the CAPM and dividend valuation models
- estimate the cost of debt, for both redeemable and irredeemable debt
- understand the weighted average cost of capital of a company, and how it is estimated
- discuss the theories of Modigliani and Miller including their assumptions, and the value and limitations of their theories and their implications for the capital structure decision
- estimate the cost of capital for individual investments and divisions, including the use of the 'pure play' method with ungearing and regearing beta
- discuss the relevance of the cost of capital for unlisted companies and public sector organisations
- explain the practical problems of estimating an appropriate discount rate, and understand the margin of error that is involved in cost of capital estimates

Session 8 The interaction of investment and financing decisions

3e

- understand the adjusted present value technique of investment appraisal including how to estimate the base case NPV and the financing side effects of an investment
- discuss the practical problems of using the APV technique
- discuss alternatives to the capital asset pricing model, including the Arbitrage Pricing Theory (n.b. detailed knowledge is not required)

	Syllabus reference
Session 9 Corporate dividend policy	3f
● describe the practical influences on dividend policy, including the possible effects of both corporate and personal taxation	
● discuss the role of dividends as signals of future prospects	
● discuss the alternative arguments with respect to the effect of dividend policy on share prices	
Case scenario	
● practise a detailed investment appraisal question or mini-case	
Session 10 Business planning	2a, 2c, 2d
● review the nature of financial control - the three levels of control: strategic, tactical and operational	
● discuss the information requirements for financial control, forecasts, decision support and monitoring	
Short-term financial planning	
● understand the information needs of short-term financial planning	
● explain how budgeting, monitoring and controlling cash flows, including pricing, raising finance, repaying debt etc may be used to meet short and medium term financial objectives	
● analyse past, current and expected future performance of the organisation through ratios and other techniques to provide relevant information for business planning	
● compare actual and expected performance, highlighting areas for further investigation	
● nature of free cash flow and its impact on financial planning and strategy	
Session 11 Long-term planning	2b, 2e, 3d
● understand the relationship between short-term and long-term financial planning, and the potential conflict between short-term and long-term objectives	
● describe top-down versus bottom-up planning systems	
● understand the use of budgets to influence the success of financial planning	
● describe the relationship of investment decisions to long-term planning	
● describe alternative strategies for long-term growth, organic growth versus external growth, and the key dimensions of strategy that need to be addressed if a business is considering organic growth	
Session 12 Mergers and acquisitions	2e
● understand the arguments for and against mergers and acquisitions	
● contrast merger and acquisition activity in the UK and USA with activity in continental Europe and Japan, and discuss the implications of the differences that exist for corporate governance	
● describe the alternative strategies and tactics of mergers and acquisitions	
● discuss how possible acquisition targets may be identified using financial or other information	
● estimate the value of potential target companies	
● distinguish between the various methods of financing mergers and acquisitions - cash, debt equity and hybrids, and assess the attractiveness of different financing alternatives to vendors	
● evaluate the various defences against takeovers, and be aware of any restrictions on their use as specified by the City Code	
● identify key issues that influence the success of acquisitions, and recommend appropriate actions for a given situation	
● understand the importance of post-audit and monitoring of post-acquisition success	

	Syllabus reference
Session 13 Financial restructuring alternatives and decisions	2e

- describe the nature of, and reasons for, divestments
- describe 'unbundling' and 'de-merging' of quoted companies

Management buy-outs

- discuss the advantages of buy-outs, and understand the issues that a management team should address when in the preparation of a buy-out proposal
- identify situations in which a management buy-out is likely to offer the best value for a disposer
- evaluate alternative sources of finance for buy-outs
- assess the viability of buy-outs from the viewpoint of both the buy-out team and the financial backers
- identify the advantages and disadvantages of management buy-ins

Capital reconstruction schemes

- identify and justify when a capital reconstruction may be required or appropriate
- be aware of the importance of taking into account the interests of the various suppliers of capital in a reconstruction situation
- formulate a feasible reconstruction from given information

Session 14 Economic influences on international financial management decisions	5a, 5b, 5c, 5d, 5e, 5f

Multinational companies and trends in global competition

- understand the nature, size and significance of multinational companies in the world economy
- discuss the influence of exchange rates, international capital markets and changes in global competition patterns on the strategies of multinational companies, with particular reference to the EC, USA and Japan

International trade and protectionism

- understand the theory and practice of free trade, and the problems of protectionism, through tariff and non-tariff barriers
- describe the major trade agreements and customs unions (the European Union, North American Free Trade Area, EFTA etc)
- understand the nature and significance of the balance of payments and the possible effects of national balance of payments problems on the financial decisions of companies
- explain the objectives and function of GATT and the World Trade Organisation (WTO), and describe the major rounds of GATT and their achievements

Self study

- most of these items, especially where descriptions of the institutional framework is concerned, could be undertaken by self study

Session 15 The international financial system	5h, 5i, 6b

- understand the role of the major international financial institutions, including the IMF, The Bank of International Settlements and the International Bank for Reconstruction and Development (The World Bank)

International banking

- understand the workings of international money markets
- outline the major factors affecting the development of international banking
- understand the role of international banks in international finance, including international bank lending through syndication and multi-option facilities and other means

	Syllabus reference
International capital markets	
• describe the nature and development of the Euromarkets, including the Eurocurrency, Eurobond and Euroequity markets	
• explain the types of financing instruments that are available to corporate treasurers on the Euromarkets, for both borrowing and financial investment	
• understand the role of domestic capital markets, especially stock exchanges, in the financing the activities of multinational companies	
Self study	
• understand the nature of the global debt problem and its effects on relations between developed and developing countries	
• be aware of the role of international financial markets and institutions in the global debt problem, and the effect of the problem on multinational companies and international banks	
• be aware of the methods that have been suggested for dealing with the problem	
Session 16 Foreign trade	6a
• advise clients on the alternative methods of exporting and importing	
• understand the risks of foreign trade, currency, credit/commercial and political	
• explain the advantages and disadvantages of using documentary letters of credit, bills of exchange, acceptances etc in foreign trade	
• describe the insurance that is available to protect against the risks of foreign trade	
• describe and evaluate the sources of finance for foreign trade, including forfaiting and international factoring	
• describe the main features of countertrade, and various alternatives that exist for foreign trade deals other than for monetary payments	
Session 17 Exchange rate systems	4c, 5g
• describe the major developments in exchange rate systems since Bretton Woods, including the European Monetary System and the ERM	
• explain the workings of the foreign exchange markets, types of quotation, spot and forward rates	
The determinants of exchange rates	
• discuss the relationship between foreign exchange rates and interest rates in different countries	
• explain the meaning and significance of the purchasing power parity theory	
• discuss whether exchange rates may be successfully forecast using modelling or other techniques	
Session 18 Currency risk	4c
• discuss the types of currency risk - transaction, translation and economic exposure, and their importance to companies	
• evaluate alternative strategies that companies might adopt with respect to currency exposure	
• discuss and evaluate traditional methods of currency risk management, including currency of invoice, leading and lagging, netting, matching, and internal asset and liability management	
• evaluate hedging strategies using forward foreign exchange contracts	
Session 19 Risk management	4b
• outline the recent volatility of interest rates and exchange rates	
• describe the main instruments that are available to help manage the volatility of such rates	

Syllabus reference

Futures markets and contracts

- explain the nature of futures contracts
- discuss the use of margin requirements and the functions of futures Clearing Houses
- explain how price movements are recognised within futures markets
- describe the major interest rate futures (short-term and long-term) and currency futures contracts
- evaluate hedging strategies with both interest rate and currency futures using given information
- contrast the use of currency futures with forward contracts

Session 20 Options 4b

- describe the main features of options including puts and calls, the exercise price, American and European options, in and out of the money
- differentiate between traded options and over-the-counter options
- discuss the determinants of options prices, including the Black-Scholes model and its limitations
- explain the advantages and disadvantages of options compared to futures
- describe the various types of interest rate options, including short-term options, caps, collars and floors, and the nature of currency options
- be aware of the nature of benefits of low cost or zero cost options
- evaluate alternative hedging scenarios using interest rate and currency options

Session 21 Swaps 4b

- describe nature of interest rate and currency swaps
- understand the value of swaps to the corporate treasurer
- understand the role of banks in swap activity
- describe the various types of risk that are associated with swaps
- describe hybrid forms of instruments such as swaptions, and the value of financial engineering
- evaluate hedging scenarios using swaps and swaptions

Session 22 Transfer pricing 6c

- explain the importance of transfer pricing to multinational companies
- understand the legal regulations affecting transfer pricing, particularly with respect to the attitude of tax authorities
- discuss the use of tax havens to try to maximise the benefits of transfer pricing
- explain the potential adverse motivational effects of transfer pricing on individual subsidiaries or divisions

Performance measurement

- describe the guidelines appropriate to the regular financial reports required from overseas operations
- evaluate the performance of all or part of the international group of companies using ratio and other forms of analysis

Session 23 The international treasury function 4a, 6c

- discuss the merits of defining the treasury as a cost centre or profit centre
- discuss the arguments for the centralisation versus decentralisation of international treasury activities
- describe the main forms of international cash transfer mechanisms
- describe the short-term investment opportunities that exist in international money markets and in international marketable securities

Session 24 International operations

- describe the forms of entity that are available for international operations, including the relative merits of branch, subsidiary, joint venture licensing and economic interest groups 6d

	Syllabus reference
Foreign direct investment	
• discuss the complexities of foreign direct investment, including the possible forms and implications of political risk and its importance to the investment decision process	
• discuss the impact of blocked funds and restrictions on the remittance of funds to the parent company, and the use of royalties, management charges etc to avoid restrictions on remittances	
Session 25 International capital budgeting	6d
• estimate the international cost of capital for an organisation, using the CAPM	
• evaluate how APV might be used in international investment appraisal	
• illustrate the effect of taxation on international investment, including the possibility of double taxation	
• discuss the advantages and disadvantages of international portfolio diversification	
Session 26 The international capital structure decision	6d
• discuss the factors that influence the type of finance used in international operations	
• describe the strategic implications of international financing, with respect both to the type of finance used, and the currency in which the financing is denominated	
• undertake a detailed appraisal of an international capital investment proposal using given information - this could be either by organic growth or acquisition	
Session 27/28 Question practice	
• As an alternative to a block of question practice at the end of the course, individual sessions could be used during the course. The emphasis during these sessions should be on detailed case scenario questions of the format that are likely to appear in the examination	

THE EXAMINATION PAPER

The ACCA provides the following further guidance on the examination paper of Paper 14 *Financial Strategy.*

The objective of the Professional Stage

The main aim of the Professional Stage is to establish evidence of competence to practise as a professional accountant in public practice, public sector or in industry and commerce. This requires candidates to demonstrate not only that they have mastered the range of required knowledge, skills and techniques, but also that they are able to apply them in a managerial context.

By this stage, knowledge has to be fully integrated in the way it is used by professionals with a recognition of how the different subjects contribute to dealing with problems. This stage will present students with problems which test their skills and sensitivity in dealing with new contexts and unforeseen circumstances. In dealing with such situations, students will be expected to tailor solutions to problems appropriately and in a way which demonstrates their grasp of managerial skills.

Although emphasis will be given to practical issues, students will also be expected to criticise current practice and express views on developments in accounting. They will also be expected to show evidence of the necessary personal qualities and interpersonal skills required of the professional accountant.

Skills to be tested in the Professional Stage

Students should be able to demonstrate the ability to:

- draw on knowledge across all earlier papers studied
- integrate that knowledge effectively and use it creatively in applying concepts and techniques
- analyse and interpret data and information and present reasoned conclusions
- diagnose and formulate appropriate solutions to problems which indicate commercial awareness
- exercise judgement drawing on technical, political and commercial awareness in developing and evaluating alternatives and in proposing solutions
- adapt to new systems and circumstances
- communicate analyses and conclusions effectively and with sensitivity for different purposes and to contrasting audiences with due emphasis on social expectations

While the skills identified above will be tested directly by the questions set, in assessing the answers weight will be given to the students' ability to demonstrate a grasp of the following personal skills and attributes:

Interpersonal skills
Tact, sensitivity to political tensions and cultural differences, awareness of social, economic and political pressure, ability to influence

Management skills
Resource management: people, material, time and money, management of the client, management of change, in particular in technology, and contingency planning

Personal qualities
Persistence to pursue inquiries and probing responses, integrity, objectivity, independence and public responsibility

Aim of Paper 14

To equip students with the underpinning knowledge and competence to make reasoned decisions in the area of financial management and to be able to adapt to changes in factors affecting those decisions.

On completion of this paper students should be able to:

- understand the concepts behind available theoretical models and assess the relevance of developments in financial management theory to an enterprise
- select the techniques most appropriate to optimise the employment of resources including the most effective method of financing
- understand the workings of the financial system and evaluate alternative sources of finance and assess investment possibilities
- understand the treasury management function, in particular the working capital aspects and international considerations
- demonstrate the skills expected at the Professional Stage

Assessment methods and format of the paper

The format of the examination paper is as follows.

		Number of marks
Section A:	2 compulsory questions (both questions at least 30 marks)	70
Section B:	3 (out of 5) questions of 10 marks each	30
		100

Time allowed: 3 hours

Section A will consist of mini case studies/scenario type questions.

Present value table, annuity table and formula sheet will be provided in the exam.

Prerequisite knowledge

Students will require a thorough understanding of the financial management section of Paper 8 *Managerial Finance*.

Paper 14 develops the introduction to financial management provided in Paper 8 by:

- considering further aspects relating to long-term investments, including the Capital Asset Pricing Model and Portfolio Theory
- examining the strategic implications of short-term and long-term financial planning
- introducing the international considerations of the treasury management function
- extending the appraisal of capital investments within an international environment
- considering the economic influences on international financial management decisions
- providing a more critical appraisal of corporate governance
- evaluating financial restructuring schemes

Extent of integration

Questions will demand an application of quantitative techniques covered in Paper 3 *Management Information* to appraise capital investment decisions.

Paper 14 develops an awareness of the international environment and considers the economic influences on international decisions - students will have made reference to this area in their study of economics in Paper 4 *The Organisational Framework*.

Students need to be aware of the links between the personal finance coverage in Paper 11 *Tax Planning* and the portfolio theory dimension of Paper 14.

Paper 14 will draw upon the strategic management and business planning issues covered in Paper 12 *Management and Strategy* in the context of financial planning.

Paper 14 examines mergers and acquisitions in the context of long-term financial planning - an area covered in Paper 13 *Financial Reporting Environment.*

Analysis of past papers

The analysis below shows the topics which have been examined in the papers which have been set for the *Financial Strategy* syllabus up to the time of publication of this Study Text and in the ACCA Pilot Paper. (Note that before a format change in 1995, papers consisted of three compulsory questions of 30 or 40 marks each.)

June 1996

Section A

1 Evaluation of takeover bid proposals (30 marks)
2 The euromarket compared with domestic bank borrowing; estimation of sterling cost of capital for an overseas investment; interest rate swap (40 marks)

Section B

3 Discussion of effects of specified measures on stakeholders and on share price
4 Collar to reduce interest rate risk
5 Centralisation of cash balances, with calculations
6 Exchange rate systems and their implications for multinationals
7 Advantages and risks of using financial futures

December 1995

Section A

1 Expansion of an overseas subsidiary: advantages and disadvantages of debt finance and alternative finance sources, with calculations (30 marks)
2 Report on alternative investments for a company, with calculations of expected net present values; discussion of use of NPV technique, CAPM and arbitrage pricing theory in strategic investment decision-making (40 marks)

Section B

3 The global debt crisis and its relevance to multinationals
4 Swaptions, and their use by a particular company
5 Modigliani and Miller's 'irrelevancy' theory and dividend policy
6 Transfer prices, including calculation of tax effects
7 Tactical and strategic decisions in corporate planning; performance analysis and controls for two divisions

June 1995

Section A

1 Report on company's proposed disposal of subsidiaries; effects of alternative partial demerger (30 marks)
2 Exchange risk management strategy; calculations on hedging exchange risk; alternative methods of finance for foreign trade (40 marks)

Section B

3 Success factors in a management buyout
4 Term structure of interest rates; calculation of expected yields on alternative investments for surplus funds
5 Discussion of how a company can comply with the Cadbury Code
6 Comparison of portfolio theory and CAPM; estimation of portfolio risk and return
7 Discussion of non-tariff trade barriers

December 1994

1 Medium-term planning and financing needs of a company; achievement of company objectives (30 marks)
2 Hedging of interest rate risk: calculations and discussion of alternative hedging techniques (30 marks)
3 Discussion of advantages and disadvantages of exporting, licensing and foreign direct investment; appraisal of a direct investment with political risks in a country with economic problems (40 marks)

June 1994

1 Discussion of growth by acquisition; company valuations; discussion of corporate governance issues affecting shareholders in a takeover (30 marks)
2 Evaluation of diversification strategy; report including investment appraisal in a diversification situation where gearing levels have changed (30 marks)
3 Relevance of country data to FDI decision; advice on hedging of translation exposure; multilateral netting; hedging of short-term foreign exchange risk exposure (40 marks)

Pilot paper

1 Non-tariff barriers and GATT; appraisal of proposed joint venture in a country with very high inflation (30 marks)
2 Appraisal of the strategic objectives and financial management of an expanding company (30 marks)
3 Report on and evaluation of methods of protecting a company from interest rate risk (40 marks)

STUDY CHECKLIST

This checklist is designed to help you chart your progress through the Study Text, including the illustrative questions at the back of it. You can tick off each topic as you study and try questions on it. Insert the dates you complete the chapters and questions in the relevant boxes. You will thus ensure that you are on track to complete your study before the exam.

		Text chapters	Illustrative questions	
		Date completed	*Question numbers*	*Date completed*
	PART A: THE NATURE AND SCOPE OF FINANCIAL STRATEGY			
1	Financial strategy and objectives		1	
2	Issues in corporate governance		2	
	PART B: INVESTMENT DECISIONS AND CAPITAL STRUCTURE			
3	Evaluating financial returns		3	
4	Valuation of securities and market efficiency		4	
5	The cost of capital		5	
6	The effect of capital structure		6	
7	Portfolio theory		7	
8	The capital asset pricing model		8	
9	Corporate dividend policy		9	
	PART C: BUSINESS PLANNING			
10	Business planning and financial planning		10	
11	Long-term financial planning		11	
12	Analysis of performance		12	
13	Amalgamations and restructuring		13	
14	The valuation of companies		14	
15	Capital reconstruction schemes		15	
	PART D: THE INTERNATIONAL ENVIRONMENT			
16	Multinationals and international trade		16	
17	International finance		17	
18	Foreign trade finance		18	
19	Exchange rates		19	
20	Currency risk		20, 21	
21	Options and option valuation		22	
22	Interest rate risk		23	
	PART E: INTERNATIONAL OPERATIONS			
23	Forms of international operation. Transfer pricing		24	
24	International investment decisions		25	
25	The treasury function		26	

Part A

The nature and scope of financial strategy

Chapter 1

FINANCIAL STRATEGY AND OBJECTIVES

This chapter covers the following topics.

		Syllabus reference
1	Corporate strategy and financial strategy	1(a), 1(b), 1(d)
2	Objectives of business enterprises	1(a), 2(b)
3	Financial objectives	1(a)
4	Non-financial objectives	1(a)
5	Objectives of publicly owned and non-commercial bodies	1(a)

Introduction

In this chapter, we introduce the subject of this Study Text - financial strategy - in the context of the objectives of organisations.

Many of the concepts introduced are relevant to the debate on corporate governance discussed in Chapter 2.

1 CORPORATE STRATEGY AND FINANCIAL STRATEGY

1.1 Strategy may be defined as 'a course of action, including the specification of the resources required, to achieve a specific objective' *(CIMA)*.

(a) Strategy can be short-term or long-term, depending on the time horizon of the objective it is intended to achieve.

(b) This definition also indicates that since strategy depends on objectives or targets, the obvious starting point for a study of corporate strategy and financial strategy is the identification and formulation of objectives.

1.2 Johnson and Scholes (*Exploring Corporate Strategy*) have summarised the characteristics of strategic decisions for an organisation as follows.

(a) Strategic decisions will be concerned with the *scope* of the organisation's activities.

(b) Strategy involves the matching of an organisation's activities to the *environment* in which it operates.

(c) Strategy also involves the matching of an organisation's activities to its *resource capability*.

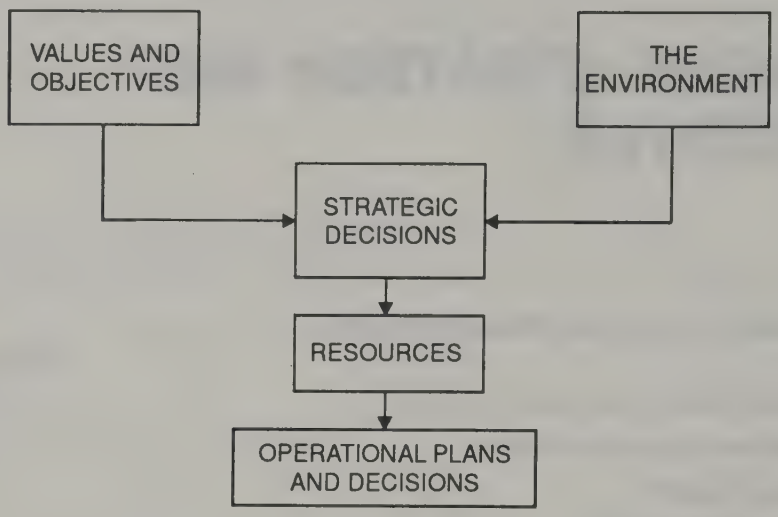
(d) Strategic decisions therefore involve major decisions about the *allocation* or *re-allocation of resources*.

(e) Strategic decisions will *affect operational decisions*, because they will set off a chain of 'lesser' decisions and operational activities, involving the use of resources.

(f) Strategic decisions will be affected not just by (1) environmental considerations and (2) resources availability, but also by (3) the *values and expectations of the people in power* within the organisation.

(g) Strategic decisions are likely to affect the *long-term direction* that the organisation takes.

(h) Strategic decisions have implications for change throughout the organisation, and so are likely to be *complex in nature*.



1.3 *Financial strategy* is the area of strategy which falls within the scope of financial management, including for example decisions relating to the sources from which funds are obtained, the amount which should be paid out by a company in dividends, financial aspects of the replacement of machines, and a company's policies on allowing and taking up discounts.

1.4 Three levels of strategy can be identified.

(a) *Corporate strategy* is concerned with broader issues, such as that of 'what business are we in?' Financial aspects of this level of strategic decision-making include the choice of method in entering a market or business. Whether entry should be accomplished through an acquisition or through organic growth, for example, is a question with financial implications.

(b) *Business strategy* or *competitive strategy* covers the question of how strategic business units compete in individual markets, and therefore of the resources which should be allocated to them. For example, what is the threat from potential entrants to the market? What is the bargaining power of buyers and of suppliers? What competition is there among existing companies? What pressure is there from substitute products? Porter (1985) identified these competitive forces as determining profitability of an industry.

(c) *Operational strategy* is to do with how different functions within the business - including the finance function - contribute to corporate and business strategies. For example, a strategy to implement a new policy on dividends formulated as a part of corporate strategy may be developed by the finance function.

What determines strategies?

1.5 The evolution of strategies can be seen as the result of the following.

(a) General and environmental influences
(b) The power and influence of stakeholder groups and internal coalitions
(c) Economic objectives
(d) Social responsibilities of the organisation

Environmental influences

1.6 General environmental influences consist of the following.

(a) *External influences*

(i) The values of society

(ii) The influence of organised groups, such as government departments, consumer groups, environmentalist groups and so on

(b) The influence of the *nature of the business* itself

(i) The market situation and market conditions it is in (eg depressed market, growth market)

(ii) The products it makes

(iii) The technology it uses (influencing its methods of operating, the skills of its employees and so on)

(c) The influence of the *organisation's culture*

(i) Its tradition (history)
(ii) Its organisation structure
(iii) Its management/leadership style

Stakeholder groups 6/96

1.7 There is a variety of different groups or individuals whose interests are directly affected by the activities of a firm. These groups or individuals are referred to as *stakeholders* in the firms.

Sharplin (*Strategic Management*) has listed the various stakeholder groups in a firm as follows.

- Common (equity) shareholders
- Preferred shareholders
- Trade creditors
- Holders of unsecured debt securities
- Holders of secured debt securities
- Intermediate (business) customers
- Final (consumer) customers
- Suppliers
- Employees
- Past employees
- Retirees
- Competitors
- Neighbours
- The immediate community
- The national society
- The world society
- Corporate management
- Organisational strategists
- The chief executive
- The board of directors
- Government
- Special interest groups

Objectives of stakeholder groups

1.8 The various groups of stakeholders in a firm will have different goals which will depend in part on the particular situation of the enterprise. Some of the more important aspects of these different goals are as follows.

(a) *Ordinary (equity) shareholders* are the providers of the risk capital of a company and usually their goal will be to maximise the wealth which they have as a result of the ownership of the shares in the company.

(b) *Trade creditors* have supplied goods or services to the firm. Trade creditors will generally be profit-maximising firms themselves and have the objective of being paid the full amount due by the date agreed. On the other hand, they usually wish to ensure that they continue their trading relationship with the firm and may sometimes be prepared to accept later payment to avoid jeopardising that relationship.

(c) *Long-term creditors*, which will often be banks, have the objective of receiving payments of interest and capital on the loan by the due date for the repayments.

Where the loan is secured on assets of the company, the creditor will be able to appoint a receiver to dispose of the company's assets if the company defaults on the repayments. To avoid the possibility that this may result in a loss to the lender if the assets are not sufficient to cover the loan, the lender will wish to minimise the risk of default and will not wish to lend more than is prudent.

(d) *Employees* will usually want to maximise their rewards paid to them in salaries and benefits, according to the particular skills and the rewards available in alternative employment. Most employees will also want continuity of employment.

(e) *Government* has objectives which can be formulated in political terms. Government agencies impinge on the firm's activities in different ways including through taxation of the firm's profits, the provision of grants, health and safety legislation, training initiatives and so on. Government policies will often be related to macroeconomic objectives such as sustained economic growth and high levels of employment.

(f) *Management* has, like other employees (and managers who are not directors will normally be employees), the objective of maximising their own rewards. It is the duty of the directors and the managers to whom they delegate responsibilities to manage the company for the benefit of shareholders. The objective of reward maximisation might conflict with the exercise of this duty, in ways which will shall examine a little later.

1.9 The situation of a company in financial distress presents the possibility that a *receiver* or an *administrator* may be appointed.

(a) Where a receiver is appointed by a secured creditor following default by the company, the receiver's primary duty is to the creditor, usually a bank, who pays his fees. The receiver may sell the business, or parts of it, as a going concern or may sell the assets of the business separately. Once sufficient money has been raised to repay the loan, the receiver has no incentive to maximise proceeds from the sale of remaining assets or to keep the business operating.

(b) Administration is a new procedure introduced under the Insolvency Act 1986 in order to help rescue companies in difficulties and to protect jobs. The administrator attempts to reorganise the finances and operating structure of the company while the company continues to trade. Appointed by the court at the request of the directors, the administrator has an equal duty to all creditors. As with the 'Chapter 11' bankruptcy provisions in the USA, the administration procedure is intended to provide a 'breathing space' during which the company is protected from legal action by its creditors and has a chance to get back on its feet again.

Stakeholder groups and strategy

1.10 The actions of stakeholder groups in pursuit of their various goals can exert influence on strategy. The greater the power of the stakeholder, the greater his influence will be. Johnson and Scholes separate power groups into 'internal coalitions' and 'external stakeholder groups'. Internal coalitions will include the marketing department, the finance department, the manufacturing department, the chairman and board of directors and so on.

1.11 Each internal coalition or external stakeholder group will have different expectations about what it wants, and the expectations of the various groups will conflict. Each group, however, will influence strategic decision-making.

As just one example, the Ferranti 'scandal' in the late 1980s brought to the public attention the disagreement a few years earlier between the chairman of Ferranti and some of the company's major institutional shareholders, who opposed (unsuccessfully) the company's strategy to take over ISC, the secretive US defence equipment manufacturer. When details of a fraud within ISC eventually emerged, the institutional shareholders were accused in the press of having failed to use their influence more powerfully to prevent the takeover in the first place.

1.12 Many managers acknowledge that the interests of some stakeholder groups - eg themselves and employees - should be recognised and provided for, even if this means that the interests of shareholders might be adversely affected. Not all stakeholder group interests can be given specific attention in the decisions of management, but those stakeholders for whom management recognises and accepts a responsibility are referred to as *constituents* of the firm.

1.13 'There can be no debate about whether corporations should acknowledge and respond to the interest of every stakeholder to the extent that the interests are embodied in law or enforced by market forces .... The debate is ongoing, however, about whether the plural stakeholders should be served as legitimate claimants in their own right rather than simply as a way of serving the primary corporate constituency, the common shareholder' (Sharplin).

(a) The *stakeholder view* of company objectives is that many groups of people have a stake in what the company does. Shareholders own the business, but there are also suppliers, managers, workers and customers. Each of these groups has its own objectives so that a compromise or balance is required. Management must balance the profit objectives with the pressures from the non-shareholder groups in deciding the strategic targets of the business.

(b) The *consensus theory* of company objectives was developed by Cyert and March. They argued that managers 'run' a business but do not own it and that 'organisations do not have objectives, only people have objectives'. Managers do not necessarily set objectives for the company but rather they look for objectives which suit their own inclinations. However, objectives emerge as a consensus of the differing views of shareholders, managers, employees, suppliers, customers and society at large, but (in contrast to the stakeholder view) they are not all selected nor controlled by management.

Financial reporting and accounting concepts

1.14 As you will be aware, limited companies and their directors are bound by the provisions of the Companies Act 1985 (CA 1985). This legislation governs the preparation and publication of the annual financial statements of companies.

1.15 The form and content of a company's accounts are regulated primarily by CA 1985, but must also comply with the accounting standards published by the Accounting Standards Board (ASB) - called FRSs (financial reporting standards) - and by the Accounting Standards Committee, which the ASB has now replaced.

2 OBJECTIVES OF BUSINESS ENTERPRISES

Mission, corporate objectives and unit objectives

2.1 Objectives of organisations will be heavily influenced by the 'coalition' or stakeholder group that has the most power. This is usually an organisation's senior management. However, this group will be influenced by the expectations of other coalitions and stakeholders. Objectives come in hierarchies, with the objectives lower down in the hierarchy contributing to the objectives higher up.

2.2 Granger identifies three types of objectives.

(a) A mission
(b) Corporate objectives
(c) Unit objectives

2.3 *Mission*. A mission is a general objective, visionary, often unwritten, and very open-ended, without any time limit for achievement. Thus, the mission of a democratic government should be to improve the well-being of its people in ways which are compatible with their wishes and have a general consensus of support. A commercial

company in the leisure industry might have a mission of improving the quality of people's lives, by providing them with all the leisure activities they want.

2.4 *Corporate objectives*. Corporate objectives are those which are concerned with the firm as a whole. Objectives should be explicit, quantifiable and capable of being achieved. The corporate objectives outline the expectations of the firm and the strategic planning process is concerned with the means of achieving the objectives.

2.5 Objectives should relate to the key factors for business success, which are typically as follows.

(a) Profitability (return on investment)
(b) Market share
(c) Growth
(d) Cash flow
(e) Customer satisfaction
(f) The quality of the firm's products
(g) Industrial relations
(h) Added value

2.6 *Unit objectives*. Unit objectives are objectives that are specific to individual units of an organisation, and are often 'operational' objectives. Examples are as follows.

(a) From the commercial sector:
    (i) increasing the number of customers by x% (an objective of a sales department);
    (ii) reducing the number of rejects by 50% (an objective of a production department);
    (iii) producing monthly reports more quickly, within 5 working days of the end of each month (an objective of the management accounting department).
(b) From the public sector:
    (i) to provide cheap subsidised bus travel (an objective of a local authority transport department);
    (ii) to introduce more nursery education (an objective of a borough education department);
    (iii) responding more quickly to calls (an objective of a local police station, fire department or hospital ambulance service).

Primary and secondary objectives

2.7 Some objectives are more important than others, and it could be argued that in the hierarchy of objectives, there is a *primary corporate objective* (restricted by certain constraints on corporate activity) and other *secondary objectives* which are strategic objectives which should combine to ensure the achievement of the overall corporate objective.

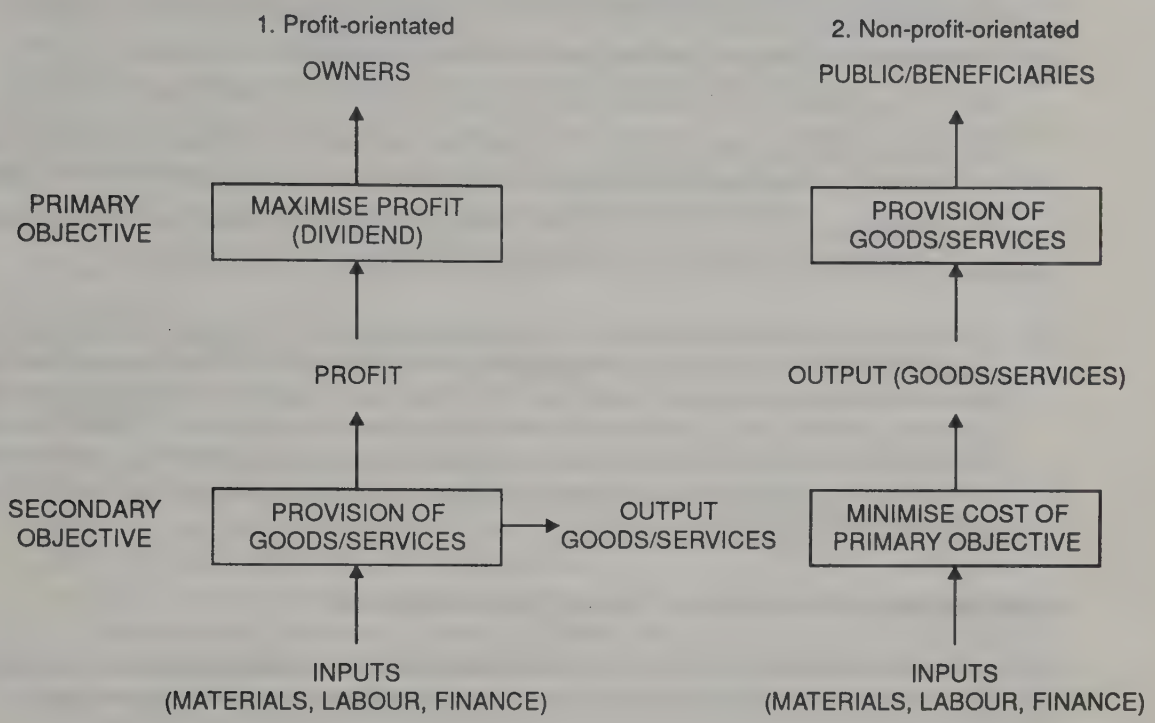
2.8 Many writers accept that profitability must be the primary objective for a profit-making commercial organisation, but there are different ways of measuring profitability, in one form or another. It is not clear, however, whether there should be a single primary objective or several objectives, nor how different aims and objectives inter-relate.

Argenti cited the creation of customers, servicing society, providing employment and maximising profits as various objectives, and concluded that an objective must be expressed as follows.

(a) It must identify the beneficiaries.
(b) It must state what the nature of the benefit is to be.
(c) It must state the size of the benefit.

For a public sector organisation, the primary objective is unlikely to be quite so simple.

2.9 Whereas the primary objective of a profit-oriented organisation is to make money, it must fulfil certain secondary objectives to do so. For example, the secondary objective of a motor company whose primary objective might be to make money for its shareholders must be to build the best cars for its market or market niche. Other secondary objectives include areas such as promoting environmentally friendly production processes, if that is what consumers indicate they require, or what the law stipulates. In the public sector, the primary objective is an output of services (for example, patient care), not the pursuit of profit.



Trade-off between objectives

2.10 When there are several key objectives, some might be achieved only at the expense of others. For example, a company's objective of achieving good profits and profit growth might have adverse consequences for the cash flow of the business, or the quality of the firm's product. Attempts to achieve a good cash flow or good product quality, or to improve market share, might call for some sacrifice of profits.

2.11 There will be a trade-off between objectives when strategies are formulated, and a choice will have to be made. For example, there might be a choice between the following two options.

Option A 15% sales growth, 10% profit growth, a £2 million negative cash flow and reduced product quality and customer satisfaction.

Option B 8% sales growth, 5% profit growth, a £500,000 surplus cash flow, and maintenance of high product quality/customer satisfaction.

If the firm chose option B in preference to option A, it would be trading off sales growth and profit growth for better cash flow, product quality and customer satisfaction.

Long-term and short-term objectives

2.12 Objectives may be long-term and short-term. A company that is suffering from a recession in its core industries and making losses in the short term might continue to have a primary objective in the long term of achieving a steady growth in earnings or profits, but in the short term, its primary objective might switch to survival.

2.13 Secondary objectives will range from short-term to long-term. Planners will formulate secondary objectives within the guidelines set by the primary objective, after selecting strategies for achieving the primary objective.

2.14 For example, a company's primary objective might be to increase its earnings per share from 30p to 50p in the next five years. Strategies for achieving the objective might be selected to include the following.

(a) Increasing profitability in the next 12 months by cutting expenditure.
(b) Increasing export sales over the next three years.
(c) Developing a successful new product for the domestic market within five years.

Secondary objectives might then be re-assessed to include the following.

(a) The objective of improving manpower productivity by 10% within 12 months.

(b) Improving customer service in export markets with the objective of doubling the number of overseas sales outlets in selected countries within the next three years.

(c) Investing more in product-market research and development, with the objective of bringing at least three new products to the market within five years.

2.15 Objectives, targets and plans are inter-related aspects of the strategic planning process. Targets cannot be set without an awareness of what is realistic. For example, setting an objective of doubling profits within the next three years might seem fine on paper, but if it is not a realistic aim, it will not be worth the paper it is written on. Quantified targets for achieving the primary objective, and targets for secondary objectives, must therefore emerge from a realistic 'situation audit' of the organisation's position and resources, and from the planning process.

Trade-offs between short-term and long-term objectives

2.16 Just as there may have to be a trade-off between different objectives, so too might there be a need to make trade-offs between short-term and long-term (S/L) objectives.

2.17 In practice, managers' performance is usually judged by short-term achievements.

(a) Middle and senior management are expected to achieve budget targets, and are criticised if they do not.

(b) The board of directors of a public company are expected by City analysts to achieve a certain growth in profits and earnings per share each year. If they do not, the share price will be marked down, and the board will be criticised for poor corporate results.

2.18 Since performance is often judged by short-term achievements, it is hardly surprising that the natural tendency for managers is to sacrifice longer term aims in order to achieve short term targets. In some situations, this might be the 'right' thing to do; in others, it might be a short-sighted and ultimately a bad decision.

2.19 Decisions which involve the sacrifice of longer term objectives include the following.

(a) Postponing or abandoning capital expenditure projects, which would eventually contribute to (longer term) growth and profits, in order to protect short-term cash flow and profits.

(b) Cutting research and development expenditure to save operating costs, and so reducing the prospects for future product development.

Exercise 1

See if you can think of other examples of how an organisation might be sacrificing longer term objectives for shorter term ones.

Solution

Here are a couple of examples you could have chosen.

(a) Reducing quality control, to save operating costs.
(b) Reducing the level of customer service, to save operating costs.

Profitability and profit measurement

2.20 The shorter term financial objectives of companies include targets for profitability. The measurement of profit under historical cost accounting follows the principles of the generally accepted fundamental accounting concepts (going concern, accruals, consistency and prudence) set out in the accounting standard SSAP 2.

Although profits do matter, they are not the best measure of a company's achievements.

(a) Accounting profits are not the same as 'economic' profits. Accounting profits can be manipulated to some extent by choices of accounting policies.

Exercise 2

Can you give three examples of how accounting profits might be so manipulated?

Solution

Here are some examples you might have chosen.

(i) Provisions, such as provisions for depreciation or anticipated losses
(ii) The capitalisation of various expenses, such as development costs
(iii) Adding overhead costs to stock valuations

(b) A company might make an accounting profit without having used its resources in the most profitable way possible. There is a difference between the accounting concept of 'historical cost' and the economic concept of 'opportunity cost', which is the value that could have been obtained by using resources in their most profitable alternative way.

(c) 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. Hence measures of financial achievement include:

(i) accounting return on capital employed;

(ii) earnings per share;

(iii) yields on investment, for example dividend yield as a percentage of stock market value.

(d) Profits are reported every year (with half-year interim results for quoted companies). They are measures of *short-term* performance, whereas a company's performance should ideally be judged over a longer term.

3 FINANCIAL OBJECTIVES

3.1 Financial management is the management of the finances of a business; that is, financial planning and financial control in order to achieve the financial objectives of the business.

The prime financial objective of a company

3.2 The theory of company finance is based on the assumption that the objective of management is to maximise the market value of the company's shares. Specifically, the main objective of a company should be to maximise the wealth of its ordinary shareholders.

3.3 A company is financed by ordinary shareholders, preference shareholders, loan stock holders and other long-term and short-term creditors. All surplus funds, however, belong to the legal owners of the company, its ordinary shareholders. Any retained profits are undistributed wealth of these equity shareholders.

How are the wealth of shareholders and the value of a company measured?

3.4 If the financial objective of a company is to maximise the value of the company, and in particular the value of its ordinary shares, we need to be able to put values on a company and its shares. How do we do it?

3.5 Three possible methods of valuation might occur to us.

(a) A *balance sheet valuation, with assets valued on a going concern basis*. Certainly, investors will look at a company's balance sheet. If retained profits rise every year, the company will be a profitable one. Balance sheet values are not a measure of 'market value', although retained profits might give some indication of what the company could pay as dividends to shareholders.

(b) The *valuation of a company's assets on a break-up basis*. This method of valuing a business is only of interest when the business is threatened with liquidation, or when its management is thinking about selling off individual assets (rather than a complete business) to raise cash.

(c) *Market values*. The market value is the price at which buyers and sellers will trade stocks and shares in a company. This is the method of valuation which is most relevant to the financial objectives of a company.

(i) When shares are traded on a recognised stock market, such as the London Stock Exchange, the market value of a company can be measured by the price at which shares are currently being traded.

(ii) When shares are in a private company, and are not traded on any stock market, there is no easy way to measure their market value. Even so, the financial objective of these companies should be to maximise the wealth of their ordinary shareholders.

3.6 The *wealth* of the shareholders in a company comes from dividends received and the market value of the shares.

A shareholder's *return* on investment is obtained in the form of dividends received and capital gains from increases in the market value of his or her shares.

3.7 Dividends are generally paid by UK public companies just twice a year at most (interim and final dividends), whereas a current market value is (for quoted shares) always known from share prices. There is also a theory, supported by much empirical evidence (and common sense) that market prices are influenced strongly by expectations of what future dividends will be. So we might conclude that the wealth of shareholders in quoted companies can be measured by the market value of the shares.

How is the value of a business increased?

3.8 If a company's shares are traded on a stock market, the wealth of shareholders is increased when the share price goes up. Ignoring day-to-day fluctuations in price caused by patterns of supply and demand, and ignoring fluctuations caused by 'environmental' factors such as changes in interest rates, the price of a company's shares will go up when the company makes attractive profits, which it pays out as dividends or re-invests in the business to achieve future profit growth and dividend growth. However, to increase the share price the company should achieve its profits without taking business risks and financial risks which worry shareholders.

3.9 If there is an increase in earnings and dividends, management can hope for an increase in the share price too, so that shareholders benefit from both higher revenue (dividends) and also capital gains (higher share prices). Management should set targets for factors

which they can influence directly, such as profits and dividend growth. And so a financial objective might be expressed as the aim of increasing profits, earnings per share and dividend per share by, say, 10% a year for each of the next five years.

3.10 Following Financial Reporting Standard No 3 (FRS 3), earnings are the profits attributable to equity (that is, to ordinary shareholders) after tax and after extraordinary gains or losses. Earnings per share (EPS) are the earnings attributable to each equity share.

3.11 Dividends are the direct reward to shareholders that a company pays out, and so dividends are evidence of a company's ability to provide a return for its shareholders. Companies might therefore set targets for growth in dividend per share.

The level of borrowings

3.12 Why do companies not borrow up to the hilt to get as much debt finance as they can? What restricts their ability or their willingness to borrow?

There are various reasons why a company might be unwilling or unable to borrow more.

(a) Interest charges have been relatively high in recent years, making debt capital quite expensive, even after tax relief. Interest yields are higher than dividend yields on equity shares.

(b) Heavy borrowing increases the financial risks for ordinary shareholders. A company must be able to pay the interest charges and eventually repay the debt from its cash resources, and at the same time maintain a healthy balance sheet which does not deter would-be creditors. There might be insufficient security for a new loan.

(c) There might be restrictions on a company's power to borrow.

3.13 The borrowing powers of a company may be restricted by several factors.

(a) The company's Articles of Association may limit borrowing. These borrowing limits cannot be altered except with the approval of the shareholders at a general meeting of the company. A typical wording of a paragraph in the Articles is as follows: 'The Directors shall restrict the borrowings ... so as to ensure that the aggregate amount of all monies borrowed by the company and/or any subsidiaries shall not at any time without the previous sanction of an ordinary resolution of the company exceed the share capital and consolidated reserves.'

(b) Trust deeds of existing loan stock may limit borrowing. These limits can only be overcome by redeeming the loan stock.

(c) Borrowing may be limited by the attitude of would-be new lenders, who expect some security for their lending, in the form of a charge on company assets, or a certain rate of interest cover, or a 'safe' debt ratio or gearing ratio for the borrowing company.

Financial targets

3.14 In addition to targets for earnings, EPS, and dividend per share, a company might set other financial targets, such as:

(a) a restriction on the company's level of gearing, or debt. For example, a company's management might decide that:

(i) the ratio of long-term debt capital to equity capital should never exceed, say, 1:1;

(ii) the cost of interest payments should never be higher than, say, 25% of total profits before interest and tax;

(b) a target for profit retentions. For example, management might set a target that dividend cover (the ratio of distributable profits to dividends actually distributed) should not be less than, say, 2.5 times;

(c) a target for operating profitability. For example, management might set a target for the profit/sales ratio (say, a minimum of 10%) or for a return on capital employed (say, a minimum ROCE of 20%). (The calculation of ROCE is explained later in the Study Text.)

3.15 These financial targets are not primary financial objectives, but they can act as subsidiary targets or constraints which should help a company to achieve its main financial objective without incurring excessive risks.

Some recently privatised companies act within regulatory financial constraints imposed by 'consumer watchdog' bodies set up by government. For example, BT (British Telecom) is overseen by the telecommunications regulator OFTEL, which restricts price rises to protect consumers.

Short-term and long-term objectives

3.16 Targets such as those mentioned in paragraph 3.16 are usually measured over a year rather than over the long term, and it is the maximisation of shareholder wealth in the long term that ought to be the corporate objective.

Short-term measures of return can encourage a company to pursue short-term objectives at the expense of long-term ones, for example by deferring new capital investments, or spending only small amounts on research and development and on training.

Multiple financial targets

3.17 A major problem with setting a number of different financial targets, either primary targets or supporting secondary targets, is that they might not all be consistent with each other, and so might not all be achievable at the same time. When this happens, some compromises will have to be accepted.

4 NON-FINANCIAL OBJECTIVES

4.1 An enterprise may have important non-financial objectives, which could limit the achievement of financial objectives.

Exercise 3

Before looking at what follows, write out your own list of the various non-financial objectives which an enterprise might have.

Examples of non-financial objectives are as follows.

(a) *The welfare of employees*
A company might try to provide good wages and salaries, comfortable and safe working conditions, good training and career development, and good pensions. If redundancies are necessary, many companies will provide generous redundancy payments, or spend money trying to find alternative employment for redundant staff.

(b) *The welfare of management*
Managers will often take decisions to improve their own circumstances, even though their decisions will incur expenditure and so reduce profits. High salaries, company cars and other perks are all examples of managers promoting their own interests.

(c) *The welfare of society as a whole*
The management of some companies are aware of the role that their company has to play in providing for the well-being of society. As an example, oil companies are aware of their role as providers of energy for society, faced with the problems of protecting the environment and preserving the Earth's dwindling energy resources.

(d) *The provision of a service*
The major objectives of some companies will include the provision of a service to the public. Examples are the recently privatised companies such as BT, British Gas and the regional electricity distribution companies. For some of these companies (including BT), the regulatory regime imposed by government specifies certain service standards.

(e) *The fulfilment of responsibilities towards customers and suppliers*

(i) Responsibilities towards customers include providing a product or service of a quality that customers expect, and dealing honestly and fairly with customers.

(ii) Responsibilities towards suppliers are expressed mainly in terms of trading relationships. A company's size could give it considerable power as a buyer. The company should not use its power unscrupulously. Suppliers might rely on getting prompt payment, in accordance with the agreed terms of trade.

The relationship between financial and non-financial objectives

4.2 Non-financial objectives do not negate financial objectives, but they do mean that the simple theory of company finance, that the objective of a firm is to maximise the wealth of ordinary shareholders, is too simplistic. Financial objectives may have to be compromised in order to satisfy non-financial objectives.

5 OBJECTIVES OF PUBLICLY OWNED AND NON-COMMERCIAL BODIES

Nationalised industries

5.1 The framework of financial management in state-owned (or nationalised) industries consists of:

(a) strategic objectives;
(b) rules about investment plans and their appraisal;
(c) corporate plans, targets and aims;
(d) external financing limits.

Following the privatisation programme of the 1980s and early 1990s, the UK's nationalised industries are much fewer in number than they were. The largest nationalised industry remaining is the Post Office. Another is the London Underground transport system. Some other countries, however, have much more extensive state ownership of industries.

Strategic objectives for the nationalised industries

5.2 Nationalised industries are financed by government loans, and some borrowing from the capital markets. They do not have equity capital, and there is no stock exchange to give a day-by-day valuation of the business.

5.3 The financial objective cannot be to maximise the wealth of its owners, the government or the general public, because this is not a concept which can be applied in practice. Nevertheless, there will be a financial objective, to contribute in a certain way to the national economy. This objective may be varied according to the political views of the government.

(a) There may be an objective to earn enough profits for the industry to provide for a certain proportion of its investment needs from its own resources.

(b) A very profitable state-owned industry may be expected to transfer surplus funds to the government.

5.4 Even so, the principal objective of a nationalised industry will in most cases not be a financial one at all. The financial objectives will therefore be subordinated to a number of political and social considerations.

(a) A nationalised industry may be expected to provide a certain standard of service to all customers, regardless of the fact that some individuals will receive a service at a charge well below its cost. For example, the postal service must deliver letters to remote locations for the price of an ordinary first or second class stamp.

(b) The need to provide a service may be of such overriding social and political importance that the government is prepared to subsidise the industry. There is a strong body of opinion, for example, which argues that public transport is a social necessity and a certain level of service must be provided, with losses made up by government subsidies.

Investment plans and investment appraisal in nationalised industries

5.5 Nationalised industries in the UK are generally expected to aim at a rate of return (before interest and tax) on their new investment programmes of 5% in real terms. This is required so that the industries do not divert resources away from those areas where they could be used to best effect.

Corporate plans, targets and aims for nationalised industries

5.6 Each nationalised industry has financial targets and a series of performance aims. These targets and performance aims are set for a period of three to five years ahead, and may be included within a broader corporate plan.

5.7 Financial targets vary from industry to industry, depending on how profitable or unprofitable it is expected to be. For profitable industries, the financial target has so far been set in terms of achieving a target rate of return. The return is measured as a current cost operating profit on the net replacement cost of assets employed.

5.8 Performance aims are intended to back up the financial targets, and may be expressed in terms of target cost reductions or efficiency improvements. Achieving cost reduction through efficiency improvements has been a prime target of nationalised industries in the UK in recent years. The Post Office, for example, has in the past had a target to reduce real unit costs in its mail business and in its counters business.

External financing limits (EFLs) for nationalised industries

5.9 External financing limits (EFLs) control the flow of finance to and from nationalised industries. They set a limit on the amount of finance the industry can obtain from the government, and in the case of very profitable industries, they set requirements for the net repayment of finance to the government.

Not-for-profit organisations

5.10 Some organisations are set up with a prime objective which is not related to making profits. Charities and government organisations are examples.

5.11 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) 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.

(b) Having obtained funds, a not-for-profit organisation should seek to use the funds:

(i) economically: not spending £2 when the same thing can be bought for £1;
(ii) efficiently: getting the best use out of what money is spent on;
(iii) effectively: spending funds so as to achieve the organisation's objectives.

5.12 The nature of financial objectives in a not-for-profit organisation can be explained in more detail, using government organisations in the UK as an illustration.

Government departments

5.13 Financial management in government departments is different from financial management in an industrial or commercial company for some fairly obvious reasons.

(a) Government departments do not operate to make a profit, and the objectives of a department or of a programme of spending cannot be expressed in terms of maximising the return on capital employed.

(b) Government services are provided without the commercial pressure of competition. There are no competitive reasons for controlling costs, being efficient or, when services are charged for (such as medical prescriptions), keeping prices down.

(c) Government departments have full-time professional civil servants as their managers, but decisions are also taken by politicians.

(d) The government gets its money for spending from taxes, other sources of income and borrowing (such as issuing gilts) and the nature of its fund-raising differs substantially from fund-raising by companies.

(i) The financial markets regard the government as a totally secure borrower, and so the government can usually borrow whatever it likes, provided it is prepared to pay a suitable rate of interest.

(ii) Central government borrowing is co-ordinated centrally by the Treasury and the Bank of England. Individual departments of government do not have to borrow funds themselves.

(iii) Local governments raise some taxes locally and can do some borrowing in the financial markets, but they also rely for some of their funds on central government.

(iv) Companies rely heavily on retained profits as a source of funds. Government departments cannot rely on any such source, because they do not make profits. Some government services must be paid for by customers, for example medical prescriptions and school meals, although the price that is charged might not cover the costs in full.

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

(a) setting objectives for each department;
(b) careful planning of public expenditure proposals;
(c) emphasis on getting value for money.

5.15 A development in recent years has been the creation of agencies to carry out specific functions (such as vehicle licensing). These *executive agencies* are answerable to the government for providing a certain level of service, but are independently managed on business principles.

Chapter roundup

- In this chapter, we have discussed financial strategy and its relationship with overall corporate strategy.
- One of the most important influences on strategy is the goals of different interest groups.
- Corporate governance is an area of current debate, and we explore some current issues in the next chapter.

Test your knowledge

1 List six types of stakeholder groups. (see para 1.7)

2 Explain what is meant by the consensus theory of corporate objectives. (1.13(b))

3 What is meant by the 'mission' of an organisation? (2.3)

4 According to the theory of company finance, what is the central financial objective of a company? (3.2)

5 What factors may restrict the borrowing powers of a company? (3.13)

6 What might be the objectives of a publicly owned industry? (5.3, 5.4)

Now try illustrative question 1 at the end of the Study Text

Chapter 2

ISSUES IN CORPORATE GOVERNANCE

This chapter covers the following topics.

		Syllabus reference
1	Patterns of share ownership	1(b)
2	Potential sources of conflict	1(b), (c), (d)
3	The Cadbury Report	1(b), (d)
4	The Greenbury Code	1(b),(d)

Introduction

Following on from Chapter 1, we discuss here:

(a) corporate governance - the system by which companies are directed and controlled; and
(b) the possible conflicts of interest which may arise in corporate governance.

In recent years, the debate on corporate governance has been intensifying, leading to a re-examination of shareholders' relationships with management.

Corporate governance should be studied as an underpinning to the study of strategic financial decisions in Paper 14.

1 PATTERNS OF SHARE OWNERSHIP

1.1 Who are the shareholders of the company? The governance of a company will depend in part on the answer to this question. The most important distinction to be made here is between private companies, which cannot offer their shares to the public, and public companies, which include all companies quoted on the Stock Exchange.

Private companies

1.2 A private company is likely to be 'owner-managed', in which case it will be run by a small group of shareholder/directors. Outside shareholders are relatively uncommon, although the UK Government's Enterprise Investment Scheme, set up in 1994, offers tax incentives to encourage individuals to hold shares in private companies.

1.3 Minority shareholders in private companies are usually in a weak position if they are not on the board, since the small group controlling more than 50% of the voting shares will be able to control the make-up of the board of directors.

Quoted companies

1.4 Under London Stock Exchange rules, at least 25% of the shares of quoted companies must be held by members of the public. Although a small group might still control the majority of voting shares, the minority shareholder of a quoted company has the advantage that there is a secondary market for the shares. If the shareholder does not like the way the company is run, it is possible simply to sell the shares - an alternative which is often not available to the private company minority shareholder.

1.5 The existence of a secondary market in existing shares of Stock Exchange quoted companies acts as an incentive to directors to manage the company effectively and in accordance with the general wishes of shareholders and potential shareholders. If demand for the company's shares falls, the share price will fall and it may become more difficult for the company to raise the finance it needs.

Types of institutional investor

1.6 Institutional investors channel funds invested by individuals making investments on their behalf which may be in government ('gilt-edged') stocks, shares of unquoted companies and other financial instruments or other assets (such as gold or works of art), as well as the predominant form of investment: shares in companies quoted on the Stock Exchange.

1.7 The institutional investors are now the biggest investors on the stock market but they might also invest venture capital, or lend directly to companies.

Exercise 1

Before looking at the following paragraph, see if you can list the major types of institutional investor in the UK.

1.8 The major institutional investors in the UK are:

(a) pension funds;
(b) insurance companies;
(c) investment trusts;
(d) unit trusts;
(e) venture capital organisations.

Of these, pension funds and insurance companies have the largest amounts of funds to invest.

Pension funds as institutional investors

1.9 Pension funds comprise funds set aside to provide for retirement pensions. They are financed from pension contributions paid into a fund by:

(a) a company and its employees;
(b) private individuals.

1.10 Pension funds are continually receiving large amounts of money from pension contributions. They are also continually paying out money for pensions, as:

(a) lump sums;
(b) regular pension payments to beneficiaries.

1.11 Money coming in can be diverted to meet payment obligations, but there will usually be an excess of contributions coming in over pensions going out, and this excess must be invested.

1.12 A fund manager is the person who makes the investment decisions, buying and selling securities. Fund managers must attempt to ensure that their investments will provide enough income to meet future pension commitments. Generally speaking, most holdings are considered to be long-term. Few fund managers would expect to make a substantial profit from short term speculation as such dealing is highly risky. Often a portion of the fund is invested in high yield securities, such as gilts which will, hopefully, give enough income to meet current commitments, and the balance is invested in growth assets such as equities or property.

Insurance companies

1.13 Insurance companies sell insurance policies (life assurance policies, car insurance, house insurance, pension policies and so on). They need cash to pay out for claims or other entitlements under the terms of their policies, but they will have substantial cash income to invest.

1.14 The investment strategy of insurance companies is similar to the investment strategy of pension fund managers.

(a) They invest in a portfolio of company stocks and shares, government securities (gilts), direct loans and mortgages and other investments.

(b) They limit investment risks, investing most of their funds in secure companies.

(c) They deal in large blocks of stocks and shares, because the potential return from small investments is often not worth the trouble.

Investment trusts

1.15 Investment trusts are companies whose business is to invest in the securities of a wide range of other companies. Their portfolios may change continually, as circumstances require.

(a) Having a capital structure like any other company, they pay dividends to shareholders from profits which arise from their investment income. An investment trust company with a Stock Exchange listing must have a clause in its Memorandum or Articles prohibiting the distribution as dividend of any surpluses arising from the sale of investments it holds.

(b) Most of the funds of investment trusts are invested directly through the Stock Exchange, and little money goes into unquoted shares. Normally they are only interested in larger unquoted companies but some investment trusts might be prepared to take a block of shares in a smaller unquoted company.

Unit trusts

1.16 Unit trusts cater for small investors who wish to spread their investment risk over a wide range of securities, but have insufficient funds to create such a portfolio by themselves.

A 'unit' is a portfolio of shares or other investments managed by a unit trust company in which individual investors are invited to take a stake (sub-unit). Since 1991, the Securities and Investments Board has sanctioned the creation of authorised unit trusts dealing in futures and options.

1.17 The unit trust is based on a trust deed. Unit holders receive their income as a proportionate share of the investment income from the securities in the unit after deducting expenses of the management company.

When a unit holder wants to realise his investment, he can sell his unit. Unit prices vary in market value according to the value of the shares or other securities which make up the unit's portfolio.

The growth of institutional investment

1.18 Over the last three decades or so, there has been a radical change in the pattern of shareholdings in the UK. The overall position can be appreciated by looking at the following table.

Percentage holdings of UK ordinary shares

Type of investor	*1957*	*1975*	*1983*	*1989*
	%	%	%	%
Insurance companies	9	16	22	25
Pension funds	3	17	29	29
Investment trusts	5	6	6	3
Unit trusts	1	4	4	6
	18	43	61	63
Persons	66	37	25	18
Others	16	20	14	19
	100	100	100	100

(Source: UBS Phillips & Drew)

1.19 The figures show that, while in 1957 over 60% of equities were held by private individuals, by 1989 it was institutions which held nearly two-thirds of all shares in UK companies. The market worth of pension funds stood at around £200 billion by 1989, over 50% of which was invested in UK equities. The decline in the proportion of shares held by individuals continued into the 1980s, a trend which also occurred in the USA, Japan and Germany.

It can be appreciated from the UK figures that institutional investors or fund managers wield great power with the potential to exert influence over the various companies in which they invest.

1.20 In some respects the existence of the institutional investor seems desirable. It is desirable that more people should be in pensionable employment or have personal pension plans and that the funds from which their pensions will be payable should be held separately from the companies by whom they are employed. Similarly, it is desirable that investors should have the opportunity to invest through the medium of insurance companies, unit trusts and investment trusts. These forms of collective investment are often best for the small investor whose knowledge of the market is limited and who has insufficient funds to build up his own balanced portfolio of investments.

1.21 However, the dominance of the equity markets by institutional investors has possibly undesirable consequences as well.

(a) For capital markets to be truly competitive there should be no investors who are on their own of such size that they can influence prices. In the UK, transactions by the largest institutions are now on such a massive scale that considerable price movements can result. For example if an insurance company decided to sell, at one time, a 5% holding in a large public company the effect on the price would, at least in the short term, be substantial. The problem will be compounded if other institutions follow and sell their holdings.

(b) Many institutions tend to avoid shares which are seen as speculative as they feel that they have a duty to their 'customers' to invest only in 'blue chip' shares (ie those of leading commercially sound companies). As a result, the shares of such companies tend to be relatively expensive.

(c) Because of their collective power the institutions have to some extent become elite investors. They are sometimes, for example, invited to meet the top management of companies. At such meetings it is almost inevitable that they will obtain information not generally available to other investors. The Stock Exchange is concerned about trends of this type, believing that all shareholders should be treated as equal. One consequence of their concern has been the Takeover Code. This is aimed, among other things, at preventing a bidder from seeking institutional support by offering better terms than those available to other shareholders.

(d) Fund managers are sometimes accused of 'short-termism' in that they will tend to seek short-term speculative gains or simply sell their shares and invest elsewhere

rather than use their collective power constructively if they feel that there are management shortcomings.

1.22 The advantages of having a wide range of shareholders include the following.

(a) There is likely to be greater activity in the market in the firm's shares, ie greater 'market liquidity'.

(b) There is less likelihood of one shareholder having a controlling interest.

(c) Since shareholdings are smaller on average, there is likely to be less effect on the share price if one shareholder sells his holding.

(d) There is a greater likelihood of the threat of a takeover bid being frustrated.

Disadvantages of a large number of shareholders include the following.

(a) Administrative costs will be high. These include the costs of sending out copies of the annual report and accounts, counting proxy votes, registering new shareholders and paying dividends.

(b) Shareholders will have varying tax rates and objectives in holding the firm's shares, which makes a dividend/retention policy more difficult for the management to decide upon.

Should managers know who the shareholders are?

1.23 A company's senior management should remain aware of who its major shareholders are, and it will often help to retain shareholders' support if the chairman or the managing director meets occasionally with the major shareholders, to exchange views.

1.24 The advantages of knowing who the company's shareholders are can be listed as follows.

(a) The company's management might learn about shareholders' preferences for either high dividends or high retained earnings for profit growth and capital gain.

(b) For public companies, changes in shareholdings might help to explain recent share price movements.

(c) The company's management should be able to learn about shareholders' attitudes to both risk and gearing. If a company is planning a new investment, its management might have to consider the relative merits of seeking equity finance or debt finance, and shareholders' attitudes would be worth knowing about before the decision is taken.

(d) Management might need to know its shareholders in the event of an unwelcome takeover bid from another company, in order to identify key shareholders whose views on the bid might be crucial to the final outcome.

2 POTENTIAL SOURCES OF CONFLICT

The role of shareholders and the role of managers

2.1 Although ordinary shareholders (equity 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. 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.

2.2 The day-to-day running of a company is the responsibility of the directors and other management staff to whom they delegate, and although the company's results are submitted for shareholders' approval at the annual general meeting (AGM), there is often apathy and acquiescence in directors' recommendations. AGMs are often very poorly attended.

2.3 For these reasons, there is the potential for conflicts of interest between management and shareholders.

Agency theory and the 'agency problem'

2.4 The relationship between management and shareholders is sometimes referred to as an agency relationship, in which managers act as agents for the shareholders, using delegated powers to run the affairs of the company in the shareholders' best interests.

2.5 *Agency theory* (Fama and Jensen) proposes that, although individual members of the business team act in their own self-interest, the well-being of each individual depends on the well-being of other team members and on the performance of the team in competition with other teams. The firm is seen as constituted by contracts among the different factors of production.

2.6 Agency theory was advanced by two American economists, Jensen and Meckling, in 1976 as a theory to explain relationships within corporations. It has been used to explain management control practices as well as relationships between management and investors: here we are concerned with the latter.

2.7 Jensen and Meckling proposed that corporations be viewed as a set of contracts between management, shareholders and creditors, with management as agents and providers of finance as principals. Financial reports and external audit are two mechanisms by which the agents demonstrate compliance with their obligations to the principals.

2.8 The agency relationship arising from the separation of ownership from management is sometimes characterised as the 'agency problem'. For example, if managers hold none or very little of the equity shares of the company they work for, what is to stop them from:

(a) working inefficiently?
(b) not bothering to look for profitable new investment opportunities?
(c) giving themselves high salaries and perks?

2.9 One power that shareholders possess is the right to remove the directors from office. But shareholders have to take the initiative to do this, and in many companies, the shareholders lack the energy and organisation to take such a step. Even so, directors will want the company's report and accounts, and the proposed final dividend, to meet with shareholders' approval at the AGM.

2.10 For management below director level, it is the responsibility of the directors to ensure that they perform well. Getting the best out of subordinates is one of the functions of management, and directors should be expected to do it as well as they can.

2.11 Another reason why managers might do their best to improve the financial performance of their company is that managers' pay is often related to the size or profitability of the company. Managers in very big companies, or in very profitable companies, will normally expect to earn higher salaries than managers in smaller or less successful companies.

2.12 As explained by G Cosserat in an article published in the ACCA *Students' Newsletter* (December 1994), agency theory is based on a number of behavioural and structural assumptions. The most important behavioural assumptions are individual welfare maximisation, individual rationality, and the assumption that individuals are risk-averse. Structural assumptions include the assumption that investments are not infinitely divisible, and that individuals vary in their access to funds and their entrepreneurial ability. Some criticisms of the theory have attacked these various assumptions. For example, are individuals satisficers rather than maximisers? And are individuals truly 'rational' or perhaps rather gullible?

2.13 The assumptions of the theory suggest that investors and entrepreneurs have incentives for sharing risks and rewards of entrepreneurial activity, for example where the entrepreneur, who may enjoy limited liability, borrows from investors at fixed rates of interest.

2.14 The key feature of an efficient agency contract, for example within a company, is that it allows full delegation of decision-making authority over the use of invested funds to management without excessive risk of abuse of that authority. In the real world, an 'agency cost' arises, being the difference between the return expected if managers truly maximised shareholder wealth and the actual return, given that managers will actually be seeking to maximise their own wealth.

2.15 'Bonding' and 'monitoring' procedures help to act as safeguards to minimise the risk of investors incurring agency costs. An example of 'bonding' is a condition attached to a loan (eg security over assets, conditions not to raise further loans). A bank lending money to a business will also expect information to be supplied to enable it to *monitor* compliance with the loan agreement.

2.16 Agency theory suggests that audited accounts of limited companies are an important source of 'post-decision' information minimising investors' agency costs, in contrast to alternative approaches which see financial reports as primarily a source of 'pre-decision' information for equity investors. The theory is advanced as an explanation for the continued use of absorption costing and historic costs in management accounts in spite of their apparent lack of relevance in decision making.

Goal congruence

2.17 Agency theory sees employees of businesses, including managers, as individuals, each with his or her own objectives. Within a department of a business, there are departmental objectives. If achieving these various objectives leads also to the achievement of the objectives of the organisation as a whole, there is said to be *goal congruence*.

2.18 Goal congruence may be better achieved and the 'agency problem' better dealt with by giving managers some profit-related pay, or by providing incentives which are related to profits or share price.

Examples of such remuneration incentives are:

(a) pay or bonuses related to the size of profits (*profit-related pay*);

(b) rewarding managers with shares. This might be done when a private company 'goes public' and managers are invited to subscribe for shares in the company at an attractive offer price. In a *management buy-out* or buy-in (the latter involving purchase of the business by new managers; the former by existing managers), managers become owner-managers;

(c) rewarding managers with *share options*. 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. For example, an employee might be given 10,000 options to subscribe for shares in the company at a price of £2.00 per share. If the share price goes up to, say, £5 per share by the time that the exercise date for the options arrives, the employee will be able to profit by £30,000 (by buying £50,000 worth of shares for £20,000).

2.19 Such measures might merely encourage management to adopt *'creative accounting'* methods which will distort the reported performance of the company in the service of the managers' own ends.

It should be noted however that creative accounting methods such as off-balance sheet finance present a temptation to management at all times given that they allow a more favourable picture of the state of the company to be presented than otherwise, to shareholders, potential investors, potential lenders and others.

2.20 An alternative approach is to attempt to monitor managers' behaviour, for example by establishing 'management audit' procedures, to introduce additional reporting requirements, or to seek assurances from managers that shareholders' interests will be foremost in their priorities.

Shareholders, managers and the company's long-term creditors

2.21 The relationship between long-term creditors of a company, the management and the shareholders of a company encompasses the following factors.

(a) Management may decide to raise finance for a company by taking out long-term or medium-term loans. They might well be taking risky investment decisions using outsiders' money to finance them.

(b) Investors who provide debt finance will rely on the company's management to generate enough net cash inflows to make interest payments on time, and eventually to repay loans.

Long-term creditors will often take *security* for their loan, perhaps in the form of a fixed charge over an asset (such as a mortgage on a building). Debentures are also often subject to certain restrictive covenants, which restrict the company's rights to borrow more money until the debentures have been repaid.

If a company is unable to pay what it owes its creditors, the creditors may decide:

(i) to exercise their security; or
(ii) to apply for the company to be wound up.

(c) The money that is provided by long-term creditors will be invested to earn profits, and the profits (in excess of what is needed to pay interest on the borrowing) will provide extra dividends or retained profits for the shareholders of the company. In other words, shareholders will expect to increase their wealth using creditors' money.

3 THE CADBURY REPORT

6/94, 6/95

3.1 Financial aspects of corporate governance in the UK have been addressed recently in the report of the Cadbury Committee, which was formed in 1991.

3.2 The terms of reference of the committee were to consider, along with any other relevant matters, the following issues:

(a) the responsibilities of executive and non-executive directors for reviewing and reporting on performance to shareholders and other financially interested parties, and the frequency, clarity and form in which information should be provided;

(b) the case for audit committees of the board, including their composition and role;

(c) the principal responsibilities of auditors and the extent and value of the audit;

(d) the links between shareholders, boards, and auditors.

Corporate governance

3.3 The Cadbury Report defines corporate governance as 'the system by which companies are directed and controlled.'

The roles of those concerned with the financial statements are described.

(a) The *directors* are responsible for the corporate governance of the company.

(b) The *shareholders* are linked to the directors via the financial reporting system.

(c) The *auditors* provide the shareholders with an external objective check on the directors' financial statements.

(d) Other concerned *users*, particularly employees (to whom the directors owe some responsibility) are indirectly addressed by the financial statements.

3.4 The Cadbury Committee was set up because of the lack of confidence which was perceived in financial reporting and in the ability of auditors to provide the assurances required by the users of financial statements. The main difficulties were considered to be in the relationship between auditors and boards of directors. In particular, the commercial pressures on both directors and auditors caused pressure to be brought to bear on auditors by the board and the auditors often capitulated. Problems were also perceived in the ability of the board of directors to control their organisations. These problems have been debated for some time, but recent company collapses, often sudden and unexpected, intensified the worries of regulating bodies, the Stock Exchange and the government. The lack of board accountability in many of these company collapses intensified the perceived need for action.

3.5 The committee aims to set out the responsibilities of each group involved in the reporting process and to make recommendations on good practice.

Code of Best Practice

3.6 The Code of Best Practice included in the Cadbury Report is aimed at the directors of all UK public companies, but the directors of all companies are encouraged to use the Code for guidance. Pressure should be brought by all the relevant parties on the directors to ensure compliance with the Code. In particular, institutional investors will have a lot of power to influence the directors. Key points in the Code are summarised in the following paragraphs.

3.7 Directors should state in the annual report and accounts whether they comply with the Code and give reasons for any non-compliance. This statement of compliance should only be published after a review by the auditors.

The board of directors

3.8 The board must meet on a regular basis, retain full control over the company and monitor the executive management. A clearly accepted division of responsibilities is necessary at the head of the company, so no one person has complete power, answerable to no-one. (Compare this to the Robert Maxwell situation.)

3.9 The report encourages the separation of the posts of chairman and chief executive. Where they are not separate, a strong independent group should be present on the board, with their own leader.

3.10 There should be a formal schedule of matters which must be referred to the board stating which decisions require a single director's signature and which require several signatures. Procedures should be in place to make sure the schedule is followed. The schedule should include:

(a) acquisitions and disposals of assets of the company, or its subsidiaries, that are material to the company; and

(b) investments, capital projects, bank borrowing facilities, loans and their repayment, foreign currency transactions, all above a certain size (to be determined by the board).

Non-executive directors

3.11 The following points are made about non-executive directors, who are those directors not running the day to day operations of the company.

(a) They should bring independent judgement to bear on important issues, including key appointments and standards of conduct.

(b) There should be no business, financial or other connection between the non-executive directors and the company, apart from fees and shareholdings.

(c) Fees should reflect the time they spend on the business of the company, so extra duties could earn extra pay.

(d) They should not take part in share option schemes and their service should not be pensionable, to maintain their independent status.

(e) Appointments should be for a specified term and reappointment should not be automatic. The board as a whole should decide on their nomination and selection.

(f) Procedures should exist whereby non-executive directors may take independent advice, at the company's expense if necessary.

Executive directors

3.12 In relation to the directors who run companies on a day to day basis, the main points in the Code relate to service contracts (contracts of employment) and pay. The length of such contracts should be three years at most, unless the shareholders approve a longer contract.

3.13 Directors' emoluments and those of the highest paid directors should be fully disclosed and analysed between salary and performance-related pay. The basis of measuring performance should also be shown. A remuneration committee of non-executive directors should decide on the level of executive pay.

The audit committee

3.14 A major recommendation in the Code is that all listed companies must establish effective audit committees if they have not already done so. The Code takes its example from countries such as Canada and the USA where audit committees for listed companies are compulsory.

3.15 The audit committees should have formal terms of reference dealing with their membership, authority and duties. They should meet at least three times every year and membership of the committee, which should be comprised of *non-executive* directors, should be shown in the annual report.

3.16 The committee must have the authority, resources and means of access to investigate anything within its terms of reference. The duties of the audit committee should include the following.

(a) Recommendations to the board on the appointment of the auditor, resignation or dismissal and the audit fee.

(b) Review of the half yearly and annual statements before they are submitted to the board.

(c) Discussion with the auditors.

(d) Review of the internal audit programme and any significant findings.

(e) Review of the external auditors' management letter and the company's statement on the internal control system.

Recent issues

3.17 Since the Cadbury Report was published, the following questions have been discussed.

(a) *Statement of compliance.* Concerns have however been expressed about whether the auditors can make an objective assessment of whether the statement of compliance is valid as required in the Code of Best Practice.

(b) *Costs of compliance.* The Confederation of British Industry (CBI) has expressed the view that the costs of compliance with the terms of the Cadbury Report may be too high.

(c) *Enforcement.* As a voluntary code, the Cadbury Report may be not fully complied with by those determined to evade its provisions. The Stock Exchange does not plan to threaten de-listing of companies which do not comply with the Cadbury Code of Practice.

(d) *Non-executive directors.* Do non-executive directors provide a strong enough safeguard? Will the relationships with the executive directors be too 'cosy'? Some non-executive directors may be relatively ineffective and they are no substitute for strong internal controls.

(e) *Audit report.* Should the auditors' report be addressed to a wider range of stakeholders than only to the shareholders? Should the scope of the report be extended?

(f) *Smaller companies.* Many smaller companies have complained that the Cadbury Code is too burdensome for them, raising fears that if its requirements are not diluted then many smaller companies will simply fail to comply with them. In response to this, a special version of the code aimed at listed companies with market capitalisation below £250 million was published in 1994 by the City Group for Smaller Companies ('Cisco'), with the endorsement of the Cadbury Committee. Differences between the Cisco code and the Cadbury code include reduction of the number of non-executives on a company board from three to two and not requiring smaller companies to split the roles of chief executive and chairman.

Comparisons with other countries

3.18 The establishment of a voluntary code of practice on corporate governance in the Cadbury Report characterises a different approach to that adopted in many other countries.

(a) In the USA, the system of corporate governance is rather more oriented to stock exchange regulation, through the Securities and Exchange Commission (SEC), which imposes stringent quarterly reporting requirements on listed US companies and requires all such companies to maintain independent audit committees.

(b) In continental Europe, reporting requirements tend to be more statutorily based in tax law. In Germany, the common two-tier board system, with a separate management board and supervisory board, may be claimed to encourage management to take shareholders' interests more closely into account than the typical one-tier UK system.

(c) Japanese companies are characterised by what is sometimes called a flexible approach to corporate governance, with a low level of regulation. This lack of regulation compared with the US, UK and European corporate environment no doubt goes some way to accounting for some of the recent reports of allegedly extensive corruption involving Japanese companies.

We examine the corporate environment in Germany and Japan in more detail below.

Germany: institutional differences

3.19 A significant difference between companies in the UK and many German companies is the distribution of power between:

(a) workers and managers; and
(b) shareholders and managers.

3.20 In the UK, ownership is something which can be easily traded on the Stock Exchange in the form of shares. Buyers of shares seek the best combination of risk and return.

While managers have most power for practical purposes, in theory they are acting in the shareholders' interests. From the company's point of view, the stock market is the principal source of investment capital, especially for large companies. Banks generally provide credit, not capital.

In Germany:

(a) the role of stock markets in company finance and management is not so important, although it is quite possible that other changes will give them an enhanced role in future, especially with financial deregulation;

(b) banks specialising in lending to industry and commercial enterprises have a relatively long-term interest in a company, and might even have an equity investment in it, as the sign of a long-term business relationship. It is argued that this makes them more sympathetic to a company's problems.

3.21 Institutional arrangements in German companies, typified by the two-tiered board, allow employees to have a formal say in the running of the company.

(a) A supervisory board has workers' representatives, and perhaps shareholders' representatives, in equal numbers. The board has no executive function, although it does review the company's direction and strategy.

(b) An executive board, composed entirely of managers, will be responsible for the running of the business.

Japan: cross shareholdings

3.22 In Japan, the stock market does have an important role to play, particularly in savings. However, the separation between investment and management is in practice drawn differently to the UK. The stock market is less 'open'.

3.23 It is sometimes believed that Japanese companies wish to set up long-term business relationships with suppliers and customers, even to the extent of buying each other's shares as a symbol of the relationship. When share prices fall, friendly companies do not sell shares in each other. If the web of interrelated companies is large enough, it may possibly include a bank which provides credit to participants in the group.

3.24 These arrangements have enabled some companies to be protected from the rigours of profit-performance, so that long-term objectives such as market share have been traditionally favoured instead. There is evidence, however, that this system is gradually coming to an end.

The effect of institutional differences

3.25 Assessing the impact of institutional arrangements on financial performance is difficult, especially as there are a multitude of factors which are responsible for commercial success or failure. It has become fashionable to talk of the failure of the 'Anglo-Saxon' model of corporate governance (ie that prevalent in the USA, the UK, Canada and Australia for example), and to compare it unfavourably with the success of German and Japanese industries since World War II. However, this probably understates the differences between the Anglo-Saxon economies (eg the USA is one of the most important markets in the world, while Australia's economy has been based on natural resources) and the significance of other economic and cultural factors. Moreover, even the most precisely defined institutional arrangements will still have little impact if other factors, such as government economic decisions, past trading patterns, culture and so on militate against commercial success.

Differences in management culture

3.26 Another factor which has an impact on multinational enterprises, or organisations competing in global markets, is the management culture. This comprises the views about managing held by managers, their shared educational experiences, and the 'way

business is done'. Obviously, this reflects wider cultural differences between countries, and conversely national cultures can sometimes be subordinated to the corporate culture of the organisation (eg the efforts to ensure that staff of Eurodisney are as enthusiastic as their American counterparts).

Exercise 2

Examine the recently published annual report of any listed public company. Bearing in mind our discussion of corporate objectives and corporate governance in Chapters 1 and 2, look for:

(a) a statement regarding the Cadbury Report Code of Best Practice;

(b) any references to the corporate objectives and financial strategy of the company (examine the Chairman's Statement especially).

4 THE GREENBURY CODE

4.1 In July 1995, the Greenbury Committee published a Code which established principles for the determination of directors' pay and detailing disclosures to be given in the annual reports and accounts. Most of the Greenbury Code principles have been adopted by The Stock Exchange in its Listing Rules.

4.2 The Greenbury Code goes beyond The Cadbury Code of Best Practice. Under the Greenbury Code, it is recommended that the remuneration committee determines, and not merely recommends, executive directors' remuneration and that this committee should be comprised solely of non-executive directors. (However, the Chairman or Chief Executive may be consulted.) Directors' service contracts, it is recommended, should be limited to one year.

4.3 The implementation of two of the most controversial recommendations of the Greenbury Committee have been deferred.

(a) The first of these is the prohibition on issuing share options at a discount. The Stock Exchange is to issue a Consultative Document to explore the possibility of exempting discounted options granted as a part of approved schemes.

(b) The second is the disclosure of pension entitlements earned by each director in the year. Guidance from the actuarial profession is awaited on this issue.

4.4 Two further recommendations have been included in the Listing Rules (Annex B), but the Stock Exchange has not yet made them mandatory by including them in the Listing Rules themselves, pending further consultation. These are recommendations that:

(a) long-term incentive schemes should be approved by shareholders;

(b) awards under share option and other incentive schemes should normally be phased rather than awarded in one block.

Chapter roundup

- In this chapter, we have explored issues in corporate governance.
- The system of corporate governance - which is the directors' responsibility - should seek to ensure congruence between the objectives of the organisation and those of its teams or departments and individual team members.
- The Cadbury Report has clarified many of the contentious issues of corporate governance and sets standards of best practice in relation to financial reporting and accountability, while the Greenbury Code has made recommendations on directors' pay.

Test your knowledge

1 What advantages are there for management in knowing who the company's shareholders are? (see para 1.24)

2 What is the relevance of agency theory to corporate governance? (2.5 - 2.7)

3 What is meant by 'goal congruence'? (2.17)

4 According to the Cadbury Report, what should be the role of the audit committee? (3.14 - 3.16)

5 What are the main current issues of debate on corporate governance since the Cadbury Report was published? (3.17)

6 Describe the main differences affecting corporate governance between companies in the UK and (i) Germany and (ii) Japan. (3.20, 3.22 - 3.24)

7 Outline the main provisions of the Greenbury Code. (4.1 - 4.4)

Now try illustrative question 2 at the end of the Study Text

Part B

Investment decisions and capital structure

Chapter 3

EVALUATING FINANCIAL RETURNS

This chapter covers the following topics.

		Syllabus reference
1	Financial returns and profit	2(c), 3(a)
2	Discounting cash flows	2(c), 3(a)
3	Net present value (NPV) analysis	2(c), 3(a)
4	NPV analysis and inflation	2(c), 3(a)
5	The NPV method and separation of ownership and control	2(c), 3(a)
6	Interest rates	2(c), 3(a)

Introduction

Having considered general aspects of financial strategy and corporate governance in Part A, we now begin to examine more specific issues in financial strategy.

In this chapter, we seek to explain and quantify what is meant by an adequate financial return. We also discuss the significance of interest rates and what is called the term structure of interest rates.

Knowledge brought forward from Papers 3 and 8

Paper 14 questions involving capital investment appraisal may demand application of quantitative techniques covered in Paper 3 *Management Information* and the investment appraisal techniques covered in Paper 8 *Managerial Finance*. We revise NPV analysis in this chapter.

1 FINANCIAL RETURNS AND PROFIT

1.1 Firms are in business to make a financial return. Firms seek to make a financial return overall, and they will also need to consider the financial return to be made from an individual project or venture when deciding whether to select it. Shareholders similarly wish to make a financial return from their investment and will select shares and other alternative investments accordingly.

1.2 What do we mean by financial return? How do we measure it? Economists assume that firms make decisions on what to supply and at what price so as to maximise profits. A central aim of accounting is to provide a way of measuring financial return in the form of 'profit' for a firm in a given accounting period. Yet accountants and economists use different concepts of profit.

1.3 *Accounting profits* consist of sales revenue minus the explicit costs of the business. Explicit costs are those which are clearly stated and recorded, such as:

(a) material costs - prices paid to suppliers;
(b) labour costs - wages paid;
(c) depreciation costs on fixed assets;

(d) other expenses, such as rates and rents on buildings.

1.4 *Economic profits* consist of sales revenue minus both the explicit and the implicit costs of the business. Implicit costs are benefits forgone by not using the factors of production (labour, capital and so on) in their next most profitable way.

1.5 For example, suppose that a business hires labour which is paid a wage of £200,000. The labour is used to provide a service A, which means that it could not be used to do an alternative task, which was to provide a service B, which would have earned a contribution to profit of £100,000. The economic cost of the labour would be the sum of its explicit and implicit costs, which is its total *opportunity cost.*

	£
Explicit cost - wages paid	200,000
Implicit cost - contribution forgone	100,000
Economic cost (opportunity cost) of labour	300,000

1.6 Using the economists' concept of profit, it can be shown that firms in a perfectly competitive market reach a long-term equilibrium in which profits are zero. In the light of what we have said above about different ways of defining profit, it is important to realise that these 'zero' profits are profits *after* the deduction of a 'risk premium' due to entrepreneurs or investors to compensate them for providing risk capital. No such deduction is made in arriving at accounting profit.

1.7 Profitability of a firm in accounting terms can be measured in different ways. For example, as you will be aware, gross profit margins and net profit margins are both widely used performance measures. The fact that opportunity costs are ignored for the purposes of measuring accounting profits means that the acceptability of a particular level of profitability for a project must be judged by comparison of that level of profitability with that available from other projects.

The accounting rate of return (ARR) method

1.8 A capital investment project may be assessed by calculating the return on investment (ROI) or accounting rate of return (ARR) and comparing it with a pre-determined target level. Unfortunately, there are several different definitions of the ARR. One of the most popular is:

$$\text{ARR} = \frac{\text{Estimated average profits}}{\text{Estimated average investment}} \times 100\%$$

Others are:

$$\text{ARR} = \frac{\text{Estimated total profits}}{\text{Estimated initial investment}} \times 100\%$$

$$\text{ARR} = \frac{\text{Estimated average profits}}{\text{Estimated initial investment}} \times 100\%$$

1.9 There are various arguments in favour of each of definitions above. The important thing is that the method selected should be used consistently. (For examination purposes we recommend the first definition unless the question clearly indicates that some other one is to be used.)

1.10 The accounting rate of return method of appraising a capital project is to estimate the accounting rate of return that the project will yield. If it exceeds a target rate of return, the project should be undertaken.

Example: accounting rate of return method

1.11 A company has a target accounting rate of return of 20% (using the first definition in Paragraph 1.8) and is now considering the following project.

Capital cost of asset	£80,000
Estimated life	4 years
Estimated profit before depreciation:	
	£
Year 1	20,000
Year 2	25,000
Year 3	35,000
Year 4	25,000

The capital asset would be depreciated by 25% of its cost each year, and would have no residual value.

Should the project be undertaken?

Solution

1.12 The annual profits after depreciation, and the mid-year net book value of the asset, would be as follows.

Year	*Profit after depreciation*	*Mid-year net book value*	*ARR in the year*
	£	£	
1	0	70,000	0
2	5,000	50,000	10%
3	15,000	30,000	50%
4	5,000	10,000	50%

1.13 As the table shows, the ARR is low in the early stages of the project, partly because of low profits in Year 1 but mainly because the net book value of the asset is much higher early on in its life.

1.14 The project does not achieve the target ARR of 20% in its first two years, but exceeds it in years 3 and 4. So should it be undertaken?

1.15 When the accounting rate of return from a project varies from year to year, it makes sense to take an overall view of the project's return. In this case, we should look at the return as a whole over the four year period.

		£
Total profit before depreciation over four years		105,000
Total profit after depreciation over four years		25,000
Average annual profit after depreciation		6,250
Original cost of investment		80,000
Average net book value over the four year period	$\frac{80,000 + 0}{2}$	40,000

1.16 $$\text{ARR} = \frac{\text{Average annual profit}}{\text{Average net book value}} \qquad \frac{£\,6,250}{£40,000} = 15.63\%$$

So the project should not be undertaken because it would fail to yield the target return of 20%.

The comparison of mutually exclusive projects

1.17 The ARR method of capital investment appraisal can also be used to compare two or more projects which are mutually exclusive, that is, only one of them can be undertaken.

The project with the highest ARR should be selected (provided that its expected ARR is higher than the company's target ARR).

The drawbacks of the ARR method

1.18 The ARR method of capital investment appraisal has the serious drawback that it does not take account of the *timing* of the profits from an investment. Whenever capital is invested in a project, money is tied up until the project begins to earn profits which pay back the investment. Money tied up in one project cannot be invested anywhere else until the profits are realised. Management should be aware of the benefits of early repayments from an investment, which will provide money for other investments.

The payback method

1.19 The payback method is another profit based measure which evaluates projects by considering how long a project would take to pay back the initial investment made in it. This is the *payback period*.

1.20 Study the returns shown below for two mutually exclusive projects, A and B.

	Project A	*Project B*
	£	£
Cost	50,000	50,000
Residual value after five years	nil	nil
Profits before depreciation:		
Year 1	10,000	40,000
Year 2	15,000	30,000
Year 3	20,000	10,000
Year 4	25,000	5,000
Year 5	30,000	5,000

1.21 The ARR of each project, measured as average annual profit after depreciation as a percentage of the average investment, would be as follows.

(a) Project A $\frac{10,000}{25,000} = 40\%$

(b) Project B $\frac{8,000}{25,000} = 32\%$

1.22 Using ARR to select the preferred investment, project A would be selected.

But the profits from project A, ignoring depreciation, would not repay the initial investment of £50,000 until year 4. By the end of the third year, it would have paid back £45,000 and so it would be about a fifth of the way through the fourth year that the investment would be paid back. This is the payback period.

In contrast, project B pays back the original investment about a third of the way through the second year.

1.23 So although project A has the higher ARR, project B pays back more quickly. If the company:

(a) has a cash shortage, and/or
(b) has other investments which it would undertake if it had the money,

then the company's management might decide to choose project B instead of project A, because of its quicker payback.

1.24 You should note that when payback is calculated, we take profit *before* depreciation, because we wish to estimate the cash returns from a project, and depreciation is not a cash outflow.

Using the payback method

1.25 Payback is often used as a first screening method. A company might have a target payback period, and it would reject a capital project unless its payback period is less than a certain number of years, perhaps five years. However, payback should not be used on its own to evaluate capital investments because projects with short payback periods might make much smaller profits overall than other projects which have longer payback periods but which make high profits at the end of their lives.

2 DISCOUNTING CASH FLOWS

6/94, 12/95

2.1 The financial manager needs an approach to measuring returns which will allow choices to be made between different investment or financing proposals, within the overall remit that the wealth of shareholders is to be maximised. Choosing only proposals which enhance the wealth of shareholders means choosing those for which the total of the benefits less the costs attributable to the decision exceeds zero.

2.2 How are these benefits and costs to be measured? To answer this question, we need a clear understanding of the importance of *cash flows* and the *time value of money.*

2.3 Any investment or financing proposal will involve cash flows, and these flows are likely to occur at various times. Evaluation of the various cash flows must take account of the time value of money.

2.4 The value of money depends on when the cash flow occurs, for a number of reasons.

(a) *Inflation.* If inflation is expected, the purchasing power of money, and therefore its 'value' or utility, falls over time.

(b) *Risk.* There is likely to be greater risk associated with future cash flows than with present ones, because of the possible consequences of intervening events.

(c) *Individuals' consumption preferences.* In general, people appear to prefer consumption now to consumption in the future. After all, in the future we may not be around to do the consuming.

(d) *Opportunity costs.* £100 now is better than £100 in a year's time because we would have the opportunity of investing £100 at, say, a 6% interest rate to produce £106 at the end of the year instead.

2.5 The ARR method of project evaluation considered earlier ignores the timing of cash flows and the opportunity cost of capital tied up. Payback considers the time it takes to recover the original investment cost, but ignores total profits over a project's life. Discounted cash flow, or DCF for short, is an investment appraisal technique which takes into account both the time value of money and also total returns over the life of the investment proposal or project.

(a) DCF looks at the *cash flows* of a project, not the accounting profits. As a decision accounting technique, DCF is concerned with *relevant costs* (discussed later in this section of the chapter).

(b) The timing of cash flows is taken into account by discounting them. The effect of discounting is to give a bigger value per £1 for cash flows that occur earlier: £1 earned after one year will be worth more than £1 earned after two years, which in turn will be worth more than £1 earned after five years, and so on.

Discounting

2.6 Discounting is compounding in reverse.

Suppose that a company has £10,000 to invest. If it could be invested at 10% compound, the value of the investment with interest would build up as follows.

(a) After one year £10,000 × 1.10 = £11,000
(b) After two years £10,000 × 1.10^2 = £12,100
(c) After three years £10,000 × 1.10^3 = £13,310

and so on.

2.7 This is compounding. The formula for the future value of an investment plus accumulated interest after n time periods is:

$$FV = PV(1 + r)^n$$

where FV is the future value of the investment with interest
PV is the present value of the investment
r is the compound rate of return per time period, expressed as a proportion (so 10% = 0.10, 5% = 0.05 and so on)
n is the number of time periods.

2.8 *Discounting* starts with the future value, and converts a future value to a present value. For example, if a company expects to earn a compound rate of return of 10% on its investments, how much would it need to invest now to have an investment of:

(a) £11,000 after 1 year?
(b) £12,100 after 2 years?
(c) £13,310 after 3 years?

2.9 The answer is £10,000 in each case, and we can calculate it by discounting, as follows.

(a) $£11{,}000 \times \frac{1}{1.10} = £10{,}000$

(b) $£12{,}100 \times \frac{1}{1.10^2} = £10{,}000$

(c) $£13{,}310 \times \frac{1}{1.10^3} = £10{,}000$

2.10 The discounting formula to calculate the present value of a future sum of money at the end of n time periods is:

$$PV = FV\frac{1}{(1 + r)^n}$$

where the symbols have the same meanings as in Paragraph 2.7.

2.11 Discounting can be applied to both money receivable and money payable. By discounting all payments and receipts from a capital investment to their present values, we can compare them on a common basis at values which take account of when the various cash flows will take place.

Exercise 1

Spender Ltd expects the cash inflow from an investment to be £40,000 after two years and another £30,000 after three years. Its target rate of return is 12%.

(a) What is the present value of these future returns?
(b) What does this present value signify?

Solution

Year	*Cash flow*	*Discount factor at 12%*	*Present value*
	£		£
2	40,000	$\frac{1}{1.12^2} = 0.797$	31,880
3	30,000	$\frac{1}{1.12^3} = 0.712$	21,360
		Total PV	53,240

The present value of the future returns, discounted at 12%, is £53,240. This means that if Spender Ltd can invest now to earn a return of 12% on its investments, it would have to invest £53,240 now to earn £40,000 after two years plus £30,000 after three years.

Non-annual cash flows

2.12 For non-annual cash flows, the period interest rate r is related to the annual interest rate R by the following formula.

$$r = \sqrt[n]{1 + R} - 1$$

where n is the number of periods per annum.

2.13 For example, if the annual interest rate is 18%, the monthly interest rate $r = \sqrt[12]{1.18} - 1 = 0.0139$, ie 1.39%

Changes in interest rate

2.14 Changes in interest rate can be reflected as in the following example.

2.15 For example, in years 1, 2 and 3, the interest rate is 10%, 12% and 14% respectively.

$$\text{Then: Year 3 discount factor} = \frac{1}{(1 + r_1)(1 + r_2)(1 + r_3)}$$

$$= \frac{1}{1.10 \times 1.12 \times 1.14} = 0.7120$$

Relevant cash flows

2.16 The cash flows to consider when making decisions are only those that are directly relevant to the decision under consideration.

2.17 Remember that a relevant cost is a future cash flow arising as a consequence of a decision. It follows that:

(a) any costs incurred in the past; and

(b) any committed costs which will be incurred regardless of whether or not an investment is undertaken;

are not relevant cash flows because they have occurred, or will occur whatever investment decision is taken.

3 NET PRESENT VALUE (NPV) ANALYSIS

6/94, 12/95

The net present value of a project

3.1 The net present value (NPV) of a project is the value obtained by discounting all cash outflows and inflows at a chosen target rate of return or 'cost of capital', and taking the net total (inflows minus outflows).

(a) *If the NPV is positive*, then the cash inflows from the investment will yield a return in excess of the cost of capital, and so the project should be undertaken.

(b) *If the NPV is negative*, then the cash inflows from the investment will yield a return below the cost of capital, and so the project should not be undertaken.

(c) *If the NPV is exactly zero*, then the cash inflows from the investment will yield a return which is exactly the same as the cost of capital, so the company should be indifferent between undertaking and not undertaking the project.

Example: net present value method (1)

3.2 Slogger Ltd has a cost of capital of 15%. The company is considering a capital investment, where the estimated cash flows are as follows.

Year	*Cash flow*
	£
0	(100,000)
1	60,000
2	80,000
3	40,000
4	30,000

What is the NPV of the project, and should it be undertaken?

Solution

3.3

Year	*Cash flow*	*Discount factor* 15%		*Present value*
	£			£
0	(100,000)		1.000	(100,000)
1	60,000	$\frac{1}{(1.15)}$	= 0.870	52,200
2	80,000	$\frac{1}{(1.15)^2}$	= 0.756	60,480
3	40,000	$\frac{1}{(1.15)^3}$	= 0.658	26,320
4	30,000	$\frac{1}{(1.15)^4}$	= 0.572	17,160
			NPV =	56,160

The discount factor for any cash flow now, that is, at year 0, is always 1.0, regardless of what the cost of capital is.

The PV of cash inflows exceeds the PV of cash outflows by £56,160, which means that the project has a yield in excess of 15%. It should therefore be undertaken.

Discount tables for the present value of £1

3.4 The discount factor that we use in discounting is $\frac{1}{(1+r)^n} = (1+r)^{-n}$

Instead of having to calculate this factor every time we can use tables.

Discount tables for the present value of £1, for different values of r and n, are shown in the Appendix to this Study Text.

Exercise 2

LCH Ltd manufactures product X which it sells for £5 a unit. Variable costs of production are currently £3 a unit, and fixed costs 50p a unit. A new machine is available which would cost £90,000 but which could be used to make product X for a variable cost of only £2.50 a unit. Fixed costs, however, would increase by £7,500 a year as a direct result of purchasing the machine. The machine would have an expected life of four years and a resale value after that time of £10,000. Sales of product X are 75,000 units a year. If LCH Ltd expects to earn at least 12% from its investments, should the machine be purchased?

Assume that all cash flows spread over a year take place at the end of the year. Ignore taxation.

Solution

Savings are 75,000 × (£3 – £2.50) = £37,500 a year.

Additional costs are £7,500 a year.

Net cash savings are therefore £30,000 a year.

All future cash flows arising as a direct consequence of the decision should be taken into account. It is assumed that the machine will be sold for £10,000 at year 4.

Year	*Cash flow*	*PV factor*	*PV of cash flow*
	£	12%	£
0	(90,000)	1.000	(90,000)
1	30,000	0.893	26,790
2	30,000	0.797	23,910
3	30,000	0.712	21,360
4	40,000	0.636	25,440
	Net present value		+7,500

The NPV is positive and so the project is acceptable.

The timing of cash flows

3.5 To use discounting, we must attach precise times to cash flows. The following guidelines may be applied.

(a) A cash outlay to be incurred at the beginning of an investment project occurs in year 0. The present value of £1 now, in year 0 is:

$$\frac{1}{(1+r)^0} = £1$$

regardless of the value of r (the cost of capital).

(b) A cash outlay, saving or inflow which occurs during the course of a year is assumed to occur all at once at the end of the year. Therefore receipts of £10,000 spread over the first year are taking to occur 'at year 1', the time one year from now.

(c) A cash outlay, saving or inflow which occurs at the beginning of a year is taken to occur at the end of the previous year. Therefore a cash outlay of £5,000 at the beginning of the second year is taken to occur at the end of the first year, that is, 'at year 1'.

Annuity tables

3.6 In Exercise 2, the calculations could have been simplified for years 1 to 3 as follows.

	30,000	×	0.893
+	30,000	×	0.797
+	30,000	×	0.712
=	30,000	×	2.402

3.7 Where there is a constant cash flow for several years (in this case £30,000 a year for years 1 to 3) we can calculate the present value by adding together the discount factors for the individual years. These total factors are 'cumulative present value' factors or 'annuity' factors. They are shown in the table of cumulative present value factors at the start of this Text. (2.402, for example, is in the column for 12% and the year 3 row).

The formula which yields the cumulative present value factors is:

$$\frac{1}{r}\left[1-\frac{1}{(1+r)^n}\right]$$

where r is the discount rate as a proportion
n is the number of years.

A table of cumulative present value factors can be found in the Appendix to this Study Text.

Exercise 3

(a) What is the present value of £1,000 earned each year from years 1 to 10, when the required return on investment is 11%?

(b) What is the present value of £100 earned each year from years 3 to 6 when the cost of capital is 5%?

Solution

(a) The PV of £1,000 earned each year from year 1 to year 10 at 11% is £1,000 × 5.889 = £5,889.

(b) The PV of £100 earned each year from year 3 to year 6 at 5% is as follows.

PV of £1 a year for years 1 to 6	= 5.076
Less PV of £1 a year for years 1 to 2	= 1.859
PV of £1 a year for years 3 to 6	= 3.217

£100 × 3.217 = £321.7, say £322

Annual cash flows in perpetuity

3.8 How do we calculate the cumulative present value of £1 a year for ever? When the cost of capital is r, the cumulative PV of £1 a year in perpetuity (starting one year from now) is £1/r.

Example: net present value method

3.9 A company with a cost of capital of 14% is considering an investment in a project costing £500,000 that would yield cash inflows of £100,000 a year in perpetuity. Should the project be undertaken?

Solution

3.10

Year	*Cash flow*	*Discount factor*	*Present value*
	£	14%	£
0	(500,000)	1.0	(500,000)
1 - ∞	100,000	1/0.14 = 7.14	714,000
		Net present value	214,000

The NPV is positive and so the project should be undertaken.

4 NPV ANALYSIS AND INFLATION

4.1 We need now to consider the effect of inflation on the net present value (NPV) analysis of investment proposals. As the inflation rate increases so will the minimum return required by an investor. You might be happy with a return of 5% in an inflation-free world, but if inflation was running at 15% you would expect a considerably greater yield.

Example: inflation (1)

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

Time	*Actual cash flows*
	£
0	(15,000)
1	9,000
2	8,000
3	7,000

The company requires a minimum return of 20% under the present and anticipated conditions. Inflation is currently running at 10% a year, and this rate of inflation is expected to continue indefinitely. Should the company go ahead with the project?

4.3 Let us first look at the company's required rate of return. Suppose that it invested £1,000 for one year on 1 January, then on 31 December it would require a minimum return of £200. With the initial investment of £1,000, the total value of the investment by 31 December must therefore increase to £1,200. During the course of the year the purchasing value of the pound would fall due to inflation. We can restate the amount received on 31 December in terms of the purchasing power of the pound at 1 January as follows.

$$\text{Amount received on 31 December in terms of the value of the pound at 1 January} = \frac{£1,200}{(1.10)^1} = £1,091$$

4.4 In terms of the value of the pound at 1 January, the company would make a profit of £91 which represents a rate of return of 9.1% in 'today's money' terms. This is known as the real rate of return. The required rate of 20% is a nominal rate of return (sometimes called a 'money' rate of return). The nominal rate measures the return in terms of the pound which is, of course, falling in value. The real rate measures the return in constant price level terms.

The two rates of return and the inflation rate are linked by the equation:

$$(1 + \text{nominal rate}) = (1 + \text{real rate}) \times (1 + \text{inflation rate})$$

where all the rates are expressed as proportions.

In our example:

$$(1 + 0.20) = (1 + 0.091) \times (1 + 0.10) = 1.20$$

Which rate is used in discounting?

4.5 We must decide which rate to use for discounting, the real rate or the nominal rate. The rule is as follows.

(a) If the cash flows are expressed in terms of the actual number of pounds that will be received or paid on the various future dates, we must use the nominal rate for discounting.

(b) If the cash flows are expressed in terms of the value of the pound at time 0 (that is, in constant price level terms), we must use the real rate.

4.6 The cash flows given in Paragraph 4.2 are expressed in terms of the actual number of pounds that will be received or paid at the relevant dates. We should, therefore, discount them using the nominal rate of return.

Time	*Cash flow*	*Discount factor*	*PV*
	£	20%	£
0	(15,000)	1.000	(15,000)
1	9,000	0.833	7,497
2	8,000	0.694	5,552
3	7,000	0.579	4,053
		NPV =	+ 2,102

The project has a positive net present value of £2,102.

4.7 The future cash flows can be re-expressed in terms of the value of the pound at time 0 as follows, given inflation at 10% a year.

Time	*Actual cash flow* £	*Cash flow at time 0 price level* £
0	(15,000)	(15,000)
1	9,000	$9{,}000 \times \frac{1}{1.10} = 8{,}182$
2	8,000	$8{,}000 \times \frac{1}{(1.10)^2} = 6{,}612$
3	7,000	$7{,}000 \times \frac{1}{(1.10)^3} = 5{,}259$

4.8 The cash flows expressed in terms of the value of the pound at time 0 can now be discounted using the real rate of 9.1%.

Time	*Cash flow* £	*Discount factor* 9.1%	*PV* £
0	(15,000)	1.00	(15,000)
1	8,182	$\frac{1}{1.091}$	7,500
2	6,612	$\frac{1}{(1.091)^2}$	5,555
3	5,259	$\frac{1}{(1.091)^3}$	4,050
		NPV	+2,105

4.9 The NPV is the same as before (and the present value of the cash flow in each year is the same as before) apart from rounding errors with a net total of £3.

Costs and benefits which inflate at different rates

4.10 Not all costs and benefits will rise in line with the general level of inflation. In such cases, we can apply the money rate to inflated values to determine a project's NPV.

Example: inflation (2)

4.11 Rice Ltd is considering a project which would cost £5,000 now. The annual benefits, for four years, would be a fixed income of £2,500 a year, plus other savings of £500 a year in year 1, rising by 5% each year because of inflation. Running costs will be £1,000 in the first year, but would increase at 10% each year because of inflating labour costs. The general rate of inflation is expected to be 7½% and the company's required money rate of return is 16%. Is the project worthwhile?

Ignore taxation.

Solution

4.12 The cash flows at inflated values are as follows.

Year	*Fixed income* £	*Other savings* £	*Running costs* £	*Net cash flow* £
1	2,500	500	1,000	2,000
2	2,500	525	1,100	1,925
3	2,500	551	1,210	1,841
4	2,500	579	1,331	1,748

The NPV of the project is as follows.

Year	Cash flow	Discount factor	PV
	£	16%	£
0	(5,000)	1.000	(5,000)
1	2,000	0.862	1,724
2	1,925	0.743	1,430
3	1,841	0.641	1,180
4	1,748	0.552	965
		NPV	+ 299

The NPV is positive and the project would seem to be worthwhile.

Example: inflation (3)

4.13 Antsnest plc is considering whether to establish a new subsidiary operation in Scotland. The cost of the fixed asset investment would be £1,000,000 in total, with £750,000 payable at once and the remainder payable after one year. A further investment of £300,000 in working capital would be required.

The management of Antsnest expect all their investments to justify themselves financially within a four year planning horizon. The net disposal value of the fixed assets after four years is expected to be zero.

The operation would incur fixed costs of £520,000 a year in the first year, including depreciation of £200,000. These costs, excluding depreciation, are expected to increase by 5% each year because of inflation. The operation would involve the manufacture and sale of a standard unit, with a unit selling price and unit variable cost of £12 and £6 respectively in the first year and expected annual increases because of inflation of 4% and 7% respectively. Annual sales are expected to be 125,000 units.

The company's money cost of capital is 14%.

Is the project viable? Ignore taxation.

Solution

4.14 *Workings*

1 *Fixed costs*

		£
Year 1	(520,000 – 200,000)	320,000
Year 2		336,000
Year 3		352,800
Year 4		370,440

2 *Contribution*

Year	Unit selling price	Unit variable cost	Unit contribution	Units	Total contribution
	£	£	£		£
1	12.00	6.00	6.00	125,000	750,000
2	12.48	6.42	6.06	125,000	757,500
3	12.98	6.87	6.11	125,000	763,750
4	13.50	7.35	6.15	125,000	768,750

4.15 *NPV calculation*

Year	Fixed assets	Working capital	Contribution less fixed costs	Net cash flow	Discount factor	Present value
	£	£	£	£	14%	£
0	(750,000)	(300,000)		(1,050,000)	1.000	(1,050,000)
1	(250,000)		430,000	180,000	0.877	157,860
2			421,500	421,500	0.769	324,134
3			410,950	410,950	0.675	277,391
4		300,000	398,310	698,310	0.592	413,400
					NPV	+122,785

The NPV is positive, and so ignoring considerations of risk, the project is viable.

Variations in the expected rate of inflation

4.16 If the rate of inflation is expected to change, the calculation of the money cost of capital is slightly more complicated.

Example: inflation (4)

4.17 Mr Gable has just received a dividend of £1,000 on his shareholding in Gonwithy Windmills plc. The market value of the shares is £8,000 ex div.

What is the (money) cost of the equity capital, if dividends are expected to rise because of inflation by 10% in years 1, 2 and 3, before levelling off at this year 3 amount?

Solution

4.18 The money cost of capital is the internal rate of return of the following cash flows.

Year	*Cash flow*	*Discount factor*	*PV at 15%*	*Discount factor*	*PV at 20%*
	£	15%	£	20%	£
0	(8,000)	1.000	(8,000)	1.000	(8,000)
1	1,100	0.870	957	0.833	916
2	1,210	0.756	915	0.694	840
3 - ∞*	1,331 pa	5.041	6,710	3.472	4,621
			582		(1,623)

* Discount factors = $\frac{1}{r}$ – 2-year annuity factor:

(a) Discount factor at 15%: 6.667 – 1.626 = 5.041

(b) Discount factor at 20%: 5.000 – 1.528 = 3.472

Interpolation gives an IRR of about 16.3%.

Expectations of inflation and the effects of inflation

4.19 When managers evaluate a particular project, or when shareholders evaluate their investments, they can only guess at what the rate of inflation is going to be. Their expectations will probably be wrong, at least to some extent, because it is extremely difficult to forecast the rate of inflation accurately. The only way in which uncertainty about inflation can be allowed for in project evaluation is by risk and uncertainty analysis.

4.20 You should note that inflation has the following effects.

(a) Since fixed assets and stocks will increase in money value, the same quantities of assets must be financed by increasing amounts of capital.

  (i) If the future rate of inflation can be predicted, management can work out how much extra finance the company will need, and take steps to obtain it (for example by increasing retentions of earnings, or borrowing).

  (ii) If the future rate of inflation cannot be predicted with accuracy, management should guess at what it will be and plan to obtain extra finance accordingly. However, plans should also be made to obtain 'contingency funds' if the rate of inflation exceeds expectations. For example, a higher bank overdraft facility might be negotiated, or a provisional arrangement made with a bank for a loan.

(b) Inflation means higher costs and higher selling prices. The effect of higher prices on demand is not necessarily easy to predict. A company that raises its prices by

10% because the general rate of inflation is running at 10% might suffer a serious fall in demand.

5 THE NPV METHOD AND SEPARATION OF OWNERSHIP AND CONTROL

5.1 The concept of net present value accords with the separation of ownership and control found in the large or medium-sized company. The reasoning for this is as follows.

5.2 Managers are assumed to act in the best interests of the shareholders, the owners of the company. This is achieved by management trying to increase shareholders' wealth by maximising the net present value of cash flows. The rate of interest reflects the market discount of future wealth in relation to current wealth.

The NPV rule as a long-term objective for the enterprise

5.3 The NPV method prescribes acceptance of all investment proposals which offer positive net present values when discounted at the market rate of interest. Thus, using this method, managers will ensure that all projects will be accepted up to the point at which the marginal rate of return on the investment equals the rate of interest prevailing on alternative investments in the capital market. This will lead to an increase in the market value of the firm and therefore of the shareholder's share in it. We can thus see that the NPV rule can serve as a unifying long-term objective for the enterprise as a whole.

5.4 In relatively liquid capital markets, shareholders are able to invest and disinvest at appropriate times in order to meet their own consumption requirements. They can also combine different investments with different degrees of risk as they require. Because of these possibilities, the manager of an individual enterprise does not need to be concerned with the consumption requirements or risk preferences of individual shareholders.

6 INTEREST RATES 6/95

6.1 Interest rates are an important element in the economic environment faced by financial managers.

(a) Interest rates measure the cost of borrowing. If a company wants to raise money, it must pay interest on its borrowing, and the rate of interest payable will be one which is 'current' at the time the borrowing takes place. When interest rates go up, companies will pay more interest on some of their borrowing (including on bank overdrafts).

(b) Interest rates in a country influence the foreign exchange value of the country's currency.

(c) Interest rates act as a guide to the sort of return that a company's shareholders might want, and changes in market interest rates will affect share prices.

The main interest rates in the financial markets

6.2 The interest rates in the UK financial markets which are most commonly quoted are as follows.

(a) The clearing banks' *base rates.* Banks will lend money to small companies and individual customers at certain margins above their base rate. The base rate is set independently by each clearing bank, although in practice, an increase in the base rate of one bank will be followed by similar changes by other banks.

(b) The inter-bank lending rate on the London inter-bank money market. This interest rate is referred to as *LIBOR*, short for the London Inter-Bank Offer Rate. For large loans to big companies, banks will set interest rates at a margin above LIBOR rather than at a margin above base rate.

(c) The *Treasury bill rate*. This is the rate at which the Bank of England sells Treasury bills to the discount market. It is an average rate, since discount houses tender for bills and tender prices vary.

(d) The yield on long-dated gilt-edged securities (20 years to maturity). Gilt-edged securities are securities issued by the government.

6.3 There are many other different interest rates you might see quoted, for example:

(a) the yield on bank deposit accounts or building society accounts;

(b) the bank overdraft rate for personal customers;

(c) various money market rates, such as the yield on deposits with discount houses, the rate of discount on bank bills or 'fine' trade bills, the yield on sterling certificates of deposit, and the yield on local authority deposits;

(d) the rate of discount offered by the Bank of England for its purchase of different types of eligible bills from the discount market.

Why are there so many different interest rates?

6.4 There are several reasons why interest rates differ in different markets and market segments.

(a) *Risk*. Higher risk borrowers must pay higher rates on their borrowing, to compensate lenders for the greater risk involved (see Paragraph 6.13 below on *default risk*).

(b) *The need to make a profit on re-lending*. Financial intermediaries make their profits from re-lending at a higher rate of interest than the cost of their borrowing.

(c) *The duration of the lending*. Normally, long-term loans will earn a higher yield than short-term loans. The reasons for this term structure of interest rates are discussed later.

(d) *The size of the loan*. Deposits above a certain amount with a bank or building society might attract higher rates of interest than smaller deposits.

(e) *International interest rates*. The level of interest rates varies from country to country. The reasons for these variations are

(i) differing rates of inflation from country to country;
(ii) government policies on interest rates and foreign currency exchange rates.

(f) *Different types of financial asset*. Different types of financial asset attract different rates of interest. This is largely because of the competition for deposits between different types of financial institution.

(i) Building societies must offer a high enough yield to depositors to attract enough deposits to meet the demand for mortgages. Since bank deposit accounts are seen as a competitor for individuals' savings, building societies might try to pay a slightly higher rate of interest than bank deposits.

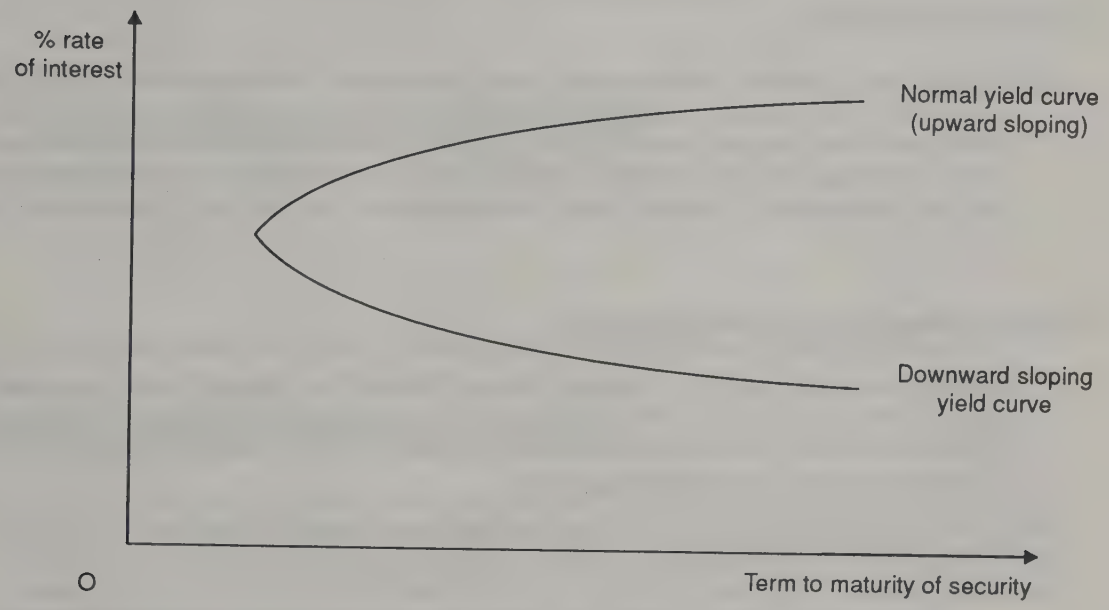
(ii) Discount houses, banks, finance houses and local authorities all compete to borrow money in the money markets. To attract funds away from the discount houses, local authority deposits will offer a slightly higher yield, and the inter-bank rate might be slightly higher again. Finance houses, to attract one-month deposits, might be obliged to offer a higher yield than the one-month inter-bank rate.

The term structure of interest rates: the yield curve

6.5 Suppose that an investor decides to buy some government securities (gilts). Since the securities represent borrowing by the government, it might seem reasonable to expect that the nominal rate of interest paid would be the same, no matter what the type of security.

6.6 Obviously, this is not the case. One reason why this is so is that the government borrows by issuing new securities from time to time, and the rate of interest offered on a new issue of securities will depend on conditions in the market at the time. This will explain why the nominal interest rate on new gilt-edged securities might be 12% on one occasion, 10% on another and 8% on another.

6.7 There is another important reason why interest rates on the same type of financial asset might vary. This is that interest rates depend on the term to maturity of the asset. For example, Treasury Stock might be short-dated, medium-dated, or long-dated. The *term structure* of interest rates refers to the way in which the yield on a security varies according to the term of the borrowing, that is the length of time until the debt will be repaid as shown by the *yield curve*. Normally, the longer the term of an asset to maturity, the higher the rate of interest paid on the asset.



Yield curves

6.8 The reasons why, in theory, the yield curve will normally be upward sloping, so that long-term financial assets offer a higher yield than short-term assets, are as follows.

(a) The investor must be compensated for tying up his money in the asset for a longer period of time. In other words, if the government were to make two issues of 9% Treasury Stock on the same date, one with a term of five years and one with a term of 20 years (and if there were no expectations of changes in interest rates in the future) then the *liquidity preference* of investors would make them prefer the five year stock.

The only way to overcome the liquidity preference of investors is to compensate them for the loss of liquidity; in other words, to offer a higher rate of interest on longer dated stock.

(b) There is a greater risk in lending long-term than in lending short-term. To compensate investors for this risk, they might require a higher yield on longer dated investments.

6.9 So why might a yield curve slope downwards, with short-term rates higher than longer-term rates?

(a) *Expectations* about the way that interest rates will move in the future affect the term structure of interest rates. When interest rates are expected to fall, short-term rates might be higher than long-term rates, and the yield curve would be downward sloping. Thus, the shape of the yield curve gives an indication to the financial manager about how interest rates are expected to move in the future.

(b) *Government policy* on interest rates might be significant too. In the UK, government influence over interest rates is directed mainly towards short-term interest rates. A

policy of keeping interest rates relatively high might therefore have the effect of forcing short-term interest rates higher than long-term rates.

(c) The *market segmentation theory* of interest rates suggests that the slope of the yield curve will reflect conditions in different segments of the market. This theory holds that the major investors are confined to a particular segment of the market and will not switch segment even if the forecast of likely future interests rates changes. For instance, banks, building societies and general insurance companies invest mainly at the 'short end' of the market (with short periods to maturity) while life assurance and pension funds invest mainly at the 'long end'. Although there may be some truth in this theory, the fact that the shape of the yield curve is used in practice to predict interest rate movements suggests that expectations of future interest rates must also have some significant influence on the slope of the yield curve.

The reverse yield gap

6.10 Because debt involves lower risk than equity investment, it is normal for yields on debt to be lower than yields on shares. Sometimes the opposite applies and the yields on shares are lower than on low-risk debt: this situation is known as a *reverse yield gap*. A reverse yield gap can occur because shareholders may be willing to accept lower returns on their investment in the short term, in anticipation that they will make capital gains in the future.

Nominal rates and real rates of interest

6.11 Nominal rates of interest or 'money' rates of interest are interest rates expressed in money terms. Real rates of interest are rates of interest adjusted for the rate of inflation. The real rate is therefore a measure of the increase in the real wealth, expressed in terms of buying power, of the investor or lender.

(a) The real rate of interest is $\dfrac{1 + \text{nominal rate of interest}}{1 + \text{rate of inflation}} - 1$

If the nominal rate of interest is 12% and the rate of inflation is 8%, the real rate of interest would be $\dfrac{1.12}{1.08} - 1 = 0.037 = 3.7\%$

(b) The real rate of interest is more commonly estimated (for arithmetical simplicity) as the difference between the nominal rate of interest and the rate of inflation. In our example, this would be 12% – 8% = 4%.

6.12 The real rate of interest will usually be positive, although when the rate of inflation is very high, the real rate of interest might become negative (the rate of inflation exceeding the nominal interest rate). Nominal rates of interest will tend to rise when the rate of inflation increases, because lenders will want to earn a real return and will therefore want nominal rates to exceed the inflation rate.

Default risk

6.13 As mentioned earlier, the relative risks of default by different borrowers is reflected in differences in the interest rates which different borrowers will have to pay. It can be appreciated that the risks of default by the Government is rather less than the risk of default by companies, and this accounts for why the government typically has to pay lower interest rates than companies on its borrowings.

Example: default risk

6.14 Drainforth plc issues 9% loan stock redeemable at par after one year, at a time when the interest rate for one-year government stocks is 8%. There is a 10% probability that Drainforth plc will default on payment, with the loan stock holders then receiving nothing.

Ignore taxation and general risks in the markets.

Required

Calculate the value of the loan stock and the yield which it offers.

Solution

6.15 If there was no default risk, the loan stock will have a value of $\frac{£109}{1.08} = £100.93$

However, given the default risk, the expected value of the loan stock after one year will be: $(0.9 \times £109) + (0.1 \times 0) = £98.10$

If we discount at the risk-free rate, we have a present value of:

$$\frac{£98.10}{1.08} = £90.83$$

This is the value at which the loan stock will now sell.

The yield is:

$$\frac{109}{90.83} - 1 = 20\%$$

6.16 It can be seen that the expected yield has risen to compensate for the default risk.

Interest rates, inflation and capital gains or losses

6.17 A positive real rate of interest adds to an investor's real wealth from the income he earns from his investments. However, when interest rates go up or down, perhaps due to a rise or fall in the rate of inflation, there will also be a potential capital loss or gain for the investor. In other words, the market value of interest-bearing securities will alter. Market values will fall when interest rates go up.

6.18 For example, when the Government issues long-term gilts at a coupon interest rate of, say, 10% and the market rate of interest is also 10%, the market value of the securities will be £100 per £100 face value of the stock (or '£100 per cent').

(a) Now if nominal interest rates in the market subsequently rise to, say, 14% the re-sale value of the gilts will fall to:

$$£100 \times \frac{10\%}{14\%} = £71.43 \text{ per £100 face value of the stock}$$

An investor in the gilts will make a capital loss of £28.57 per cent (plus selling costs) if he decides to sell the securities.

(b) If nominal interest rates subsequently fall to, say, 8%, the re-sale value of the gilts will rise to:

$$£100 \times \frac{10\%}{8\%} = £125 \text{ per cent}$$

An investor could then sell his asset for a capital gain of £25 per cent (less selling costs).

Interest rates and share prices

6.19 When interest rates change, the return expected by investors from shares will also change.

For example, if interest rates fell from 14% to 12% on government securities, and from 15% to 13% on company debentures, the return expected from shares (dividends and capital growth) would also fall.

6.20 By the fundamental theory of shares values, it is predicted that if a shareholder expects a 15% return on his investment in equities, and the annual dividend on one of his shares is 21p, then the market value of the share should be $\frac{21p}{15\%} = £1.40$ (ignoring any prospect of capital growth).

However, if interest rates fell, the shareholder would probably be satisfied with a lower return from his shares, say 14%, and the price of a share offering an annual dividend of 21p should then rise to:

$$\frac{21p}{14\%} = £1.50$$

Equally, if interest rates went up, the shareholder would probably want a higher return from his shares, and share prices would fall. If, in our example, the investor wanted a 16% return, the predicted share price would fall to:

$$\frac{21p}{16\%} = £1.31$$

Changes in interest rates and financing decisions

6.21 Interest rates are important for financial decisions by companies.

(a) When interest rates are low, it might be financially prudent:

(i) to borrow more, preferably at a fixed rate of interest, and so increase the company's gearing;

(ii) to borrow for long periods rather than for short periods;

(iii) to pay back loans which incur a high interest rate, if it is within the company's power to do so, and to take out new loans at a lower interest rate.

(b) When interest rates go up:

(i) a company might decide to reduce the amount of its debt finance, and to substitute equity finance, such as retained earnings;

(ii) a company which has a large surplus of cash and liquid funds to invest might switch some of its short-term investments out of equities and into interest-bearing securities;

(iii) a company might opt to raise new finance by borrowing short-term funds and debt at a variable interest rate (for example on overdraft) rather than long-term funds at fixed rates of interest, in the hope that interest rates will soon come down again.

Interest rates and new capital investments

6.22 When interest rates go up, and so the cost of finance to a company goes up, the minimum return that a company will require on its own new capital investments will go up too.

6.23 Some new capital projects might be in the pipeline, with purchase contracts already signed with suppliers, and so there will often be a time lag before higher interest rates result in fewer new investments.

6.24 A company's management should give close consideration, when interest rates are high, to keeping investments in assets, particularly unwanted or inefficient fixed assets, stocks and debtors, down to a minimum, in order to reduce the company's need to borrow.

Chapter roundup

- In this chapter, we have worked through some of the mathematics of investment appraisal. While it is of course important to practise calculations, do not neglect the pros and cons of different methods of investment appraisal. It is important to understand the central concept of the time value of money.
- The objective of a company should be to maximise the wealth of its shareholders. The fundamental analysis theory of share values, which we discuss in the next chapter, is based on discounted cash flow principles.
- We have also looked at the significance of interest rates to the financial manager.

Test your knowledge

1 Give a formula for the accounting rate of return. (see para 1.8)

2 What is a project's payback period? (1.19)

3 Why is £1 now worth more than £1 at a later time? (2.4)

4 A cost of £20,000 is expected to occur near the beginning of the third year. To what year should the £20,000 be allocated in DCF analysis? (3.5)

5 What are the possible effects of inflation on a project? (4.20)

6 How is the NPV method consistent with the separation of ownership and control in a company? (5.1 - 5.4)

7 Why might a yield curve for interest rates slope downwards? (6.9)

8 What is meant by the market segmentation theory of interest rates? (6.10)

9 How do interest rates affect share prices? (6.19, 6.20)

Now try illustrative question 3 at the end of the Study Text

Chapter 4

VALUATION OF SECURITIES AND MARKET EFFICIENCY

This chapter covers the following topics.

		Syllabus reference
1	Share prices and investment returns	2(d), (e)
2	The fundamental analysis theory of share values	2(e)
3	Charting or technical analysis	2(e)
4	Random walk theory	2(e)
5	The efficient market hypothesis	2(e)
6	Stock market ratios	2(c), (e)
7	Convertibles and warrants	2(e)

Introduction

In this chapter, we look at methods of valuing individual shares, and then at aspects of the efficiency of stock markets and at the ratios which might be used by stock market investors.

We also look at yardsticks by which stock market analysts generally judge company performance.

Knowledge brought forward from Paper 8

The money and capital markets

- Financial intermediation and credit creation
- Nature and functions of money markets
- Nature and functions of capital markets
  - types of share capital
  - new share issues and rights issues
  - loan capital
  - convertibles and warrants
- Introduction to international money and capital markets

1 SHARE PRICES AND INVESTMENT RETURNS

1.1 Investors will buy shares to obtain an income from dividends and/or to make a capital gain from an increase in share prices. The market price of a security will depend on the return that investors expect to get from it.

1.2 The return from an *ordinary share* consists of dividends plus any capital gain.

(a) *Dividends*. In the UK, these are paid net of the lower rate of income tax (20%).

(b) The *capital gain* (or *loss*) is the difference between the price at which the investor bought the share, and the share's current market value. Capital gains are not taxable until the shareholder sells his or her shares, and realises the capital gain.

1.3 Returns on *fixed interest* securities consist of:

(a) interest payments;

(b) either:

(i) changes in the market value of the security, if the investor sells it before maturity; or

(ii) the redemption value of the security when it eventually matures, less the price paid.

1.4 Generally speaking, investors who buy ordinary shares are taking a bigger financial risk than investors in fixed interest securities. This is because holders of debt receive interest out of pre-tax profits and have a prior claim over shareholders in the event that the company goes into liquidation. Ordinary shareholders, in contrast:

(a) can only receive dividends if the company has enough distributable profits;
(b) might suffer capital losses if the share price goes down.

1.5 If the purpose of investing is to earn dividend income, an investor will try to buy shares which are expected to provide a satisfactory dividend in relation to their market value. The movement in share prices, which occurs from day to day on the stock market, means that an investor can improve his return by *buying at the right time*. For example, if the share price is £1.50 on day 1, rising to £1.55 on day 2, falling to £1.48 on day 3 and rising to £1.50 on day 4, the investor will obtain the best return if he buys shares on day 3. However, if he predicts that the share price will fall even lower than £1.48 in one or two weeks time, he will prefer to wait until then before buying.

1.6 Similarly, the prediction of share price movements may help an investor to maximise his capital gain from buying and selling shares. Shares should be bought when prices are at their lowest and sold when they are at their highest. Since stockbrokers and investment advisers give advice to clients about when to buy and sell shares, they need a method of foretelling which way share prices will move, up or down, and when. It is therefore useful to consider the extent to which share prices and share price movements can be predicted.

Theories of share price behaviour

1.7 There are differing views about share price movements, which may be broadly classified as:

(a) the fundamental analysis theory;
(b) technical analysis (chartist theory);
(c) random walk theory.

These different theories about how share prices are reached in the market, especially fundamental analysis, have important consequences for financial management.

2 THE FUNDAMENTAL ANALYSIS THEORY OF SHARE VALUES

2.1 The fundamental theory of share values is based on the theory 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 share, discounted at the shareholders' cost of capital.

You need to learn the two formulae given below.

2.2 (a) When the company is expected to pay constant dividends every year into the future, 'in perpetuity':

$$P_o = \frac{D}{K_e}$$

where P_o is the market price of the share ex div, that is, excluding any current dividend that might be payable

D is the expected annual dividend per share in the future

K_e is the shareholders' cost of capital (the required rate of return).

(b) When the company is expected to pay a dividend which increases at a constant rate, g, every year into the future, the following *dividend growth model* may be used:

$$P_o = \frac{D_0(1+g)}{(K_e - g)} = \frac{D_1}{(r-g)}$$

where D_0 is the dividend in the current year (year 0) and so D_0 (1 + g) is the expected future dividend in year 1(D_1). Again, P_o is the market value of the share ex div.

Example: constant dividend

2.3 Hocus plc expects to pay a constant dividend of £450,000 at the end of every year for ever (in perpetuity). Assuming that a dividend has just been paid, calculate what the market value of Hocus plc's shares ought to be if its shareholders' cost of capital is 15%.

Solution

2.4 $$P_o = \frac{£450,000}{(1.15)} + \frac{£450,000}{(1.15)^2} + \frac{£450,000}{(1.15)^3} + \text{.... and so on, in perpetuity.}$$

The present value of £1 a year for ever at a rate of interest r% (r expressed as a proportion) is 1/r.

Therefore, the present value of £450,000 a year at a rate of interest of 15%

is $£450,000 \times \frac{1}{0.15} = £3,000,000.$

The value of Hocus plc's shares will be £3,000,000.

Example: dividend growth

2.5 Pocus plc paid a dividend this year of £3,000,000. The company expects the dividend to rise by 2% a year in perpetuity. This expectation is shared by the investors in the stock market. The current return expected by investors from shares in the same industry as Pocus plc is 11%.

(a) What would you expect the total market value of the shares of Pocus plc to be?

(b) If it is now rumoured in the stock market that interest rates are about to rise and so shareholders will want to earn an extra 1% on their shares. What change would you expect in the value of the shares of Pocus plc?

(c) What conclusion do you draw from this example?

Solution

2.6 $$P_o = \frac{D_0(1+g)}{K_e - g}$$

(a) Predicted share value (return of 11%) $= \frac{£3,000,000(1.02)}{(0.11-0.02)} = £34,000,000$

(b) Predicted share value (return of 12%) $= \frac{£3,000,000(1.02)}{(0.12-0.02)} = £30,600,000$

The value of the company's shares would fall by £3,400,000.

(c) When interest rates are expected to go up, there may well be a fall in share prices. Similarly, expectations of a fall in interest rates may well result in an increase in share prices. This is because the required return on shares is likely to move approximately in step with changes in rates of interest on other investments.

Exercise 1

The management of Crocus plc are trying to decide on the dividend policy of the company.

There are two options that are being considered.

(a) The company could pay a constant annual dividend of 8p per share.

(b) The company could pay a dividend of 6p per share next year, and use the retained earnings to achieve an annual growth of 3% in dividends for each year after that.

The shareholders' cost of capital is thought to be 18%. Which dividend policy would maximise the wealth of shareholders, by maximising the share price?

Solution

(a) *With a constant annual dividend*

Share price $= \frac{8p}{0.18} = 44.4p$

(b) *With dividend growth*

Share price $= \frac{6p(1.03)}{(0.18-0.03)} = \frac{6.18}{0.15} = 41.2p$

The constant annual dividend would be preferable.

Exercise 2

Lupin plc has paid a constant annual dividend of 8.4p a share for some years, and is expected to go on doing so in the future. The current dividend of 8.4p is about to be paid.

The return expected by shareholders is currently 14%.

(a) What would you expect the share price cum div for Lupin plc shares to be?

(b) What should the share price cum div move to if the return required by shareholders falls to 12%?

(c) Can you see a simplifying assumption about the payment of the annual dividend that is being made in the computations you make?

Note

The market value (MV) cum div is the market value including the value of the dividend that is soon to be paid out. The MV cum div equals the MV ex div (P_0) plus the dividend.

Solution

(a) $P_0 = \frac{8.4}{0.14} = 60p$

MV cum div $= P_0$ + current dividend

$= 60p + 8.4p$

$= 68.4p$

(b) $P_0 = \frac{8.4}{0.12} = 70p$

MV cum div = 70p + 8.4p

= 78.4p

Since the shareholders' required rate of return will go down, the share price will go up.

(c) The simplifying assumption is that the annual dividend will be paid in full all in one go. In practice, companies (especially public companies) will probably pay the dividend in two parts:

(i) an interim dividend part way through the year;

(ii) a final dividend after the end of the year.

In general, however, this simplifying assumption is accepted as giving a sufficiently accurate estimate of share values.

The value of debentures

2.7 The same valuation principle can be applied to the valuation of debentures and other loan stock. However, the future income from fixed interest debentures is predictable, which should make the process of valuation more straightforward.

(a) For irredeemable debentures or loan stock, where the company will go on paying interest every year in perpetuity, without ever having to redeem the loan:

$$P_0 = \frac{i}{K_d}$$

where P_0 the market price of the stock ex interest, that is, excluding any interest payment that might soon be due

i is the annual interest payment on the stock

K_d is the return required by the loan stock investors.

(b) For redeemable debentures or loan stock, the market value is the discounted present value of future interest receivable, up to the year of redemption, *plus* the discounted present value of the redemption payment.

Example: debentures

2.8 A company has issued some 9% debentures, which are now redeemable at par in three years time. Investors now require an interest yield of 10%. What will be the current market value of £100 of debentures?

Solution

2.9

Year		*Cash flow* £	*Discount factor* 10%	*Present value* £
1	Interest	9	0.909	8.18
2	Interest	9	0.826	7.43
3	Interest	9	0.751	6.76
3	Redemption value	100	0.751	75.10
				97.47

£100 of debentures will have a market value of £97.47.

The importance of the fundamental theory of share values

2.10 If the fundamental analysis theory of share values is correct, the price of any share will be predictable, provided that all investors have:

(a) the same information about a company's expected future profits and dividends;

(b) a known cost of capital.

So is it correct? Are share prices predictable? And if not, why not?

2.11 In general terms, fundamental analysis seems to be valid. This means that if an investment analyst can foresee before anyone else that:

(a) a company's future profits and dividends are going to be different from what is currently expected; or

(b) shareholders' cost of capital will rise or fall (for example in response to interest rate changes)

then the analyst will be able to predict a future share price movement, and so recommend clients to buy or sell the share before the price change occurs.

2.12 In practice, share price movements are affected by day to day fluctuations, reflecting supply and demand in a particular period, investor confidence, market interest rate movements, and so on. Investment analysts want to be able to predict these fluctuations in prices, but fundamental analysis might be inadequate as a technique.

Some analysts, known as chartists, therefore rely on technical analysis of share price movements.

3 CHARTING OR TECHNICAL ANALYSIS

3.1 Chartists or 'technical analysts' attempt to predict share price movements by assuming that past price patterns will be repeated.

There is no real theoretical justification for this approach, but it can at times be spectacularly successful. Studies have suggested that the degree of success is greater than could be expected merely from chance. Nevertheless not even the most extreme chartist would claim that every major price movement can be predicted accurately and sufficiently early to make correct investment decisions.

3.2 Chartists do not attempt to predict every price change. They are primarily interested in trend reversals, for example when the price of a share has been rising for several months but suddenly starts to fall. There are several features of charts that are considered important. These include:

(a) resistance levels;
(b) double tops and double bottoms;
(c) 'head and shoulders' patterns.

3.3 Consider Figure 1.

The dotted line represents the lower resistance level on a rising trend. It will be noticed that many of the troughs lie on this line, but only at the end is it breached. The chartist would claim that this breach is a good indication that the trend has been reversed.

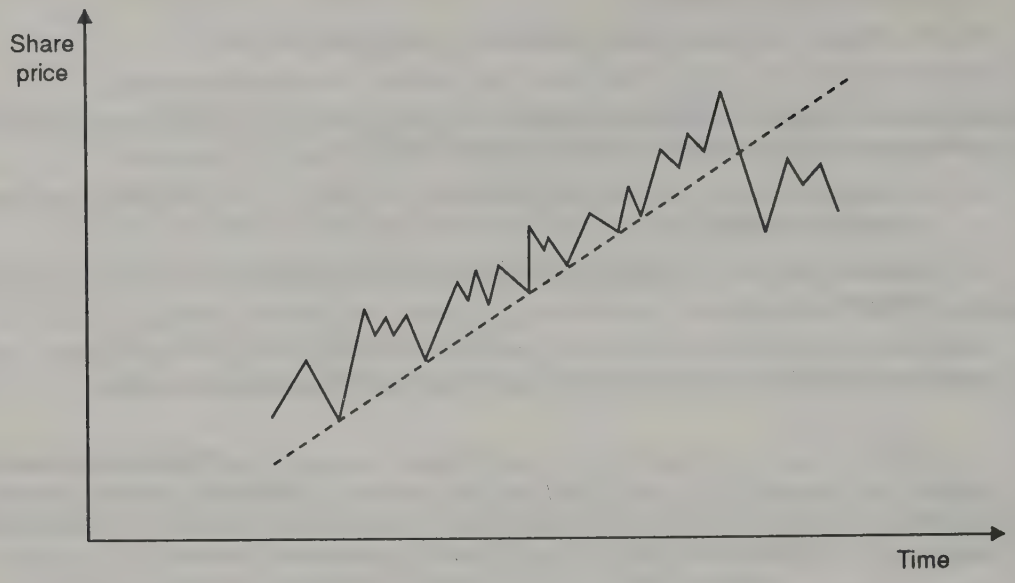


Figure 1 Resistance level

3.4 Let us now look at a resistance level on a double top. Suppose that the price of a share has been rising steadily for some time. Recently the price fell as some investors sold to realise profits and it then rose to its maximum level for a second time before starting to fall again.

This is known as a double top and based on experience the chartist would predict that the trend has reversed. A typical double top might appear as in Figure 2.

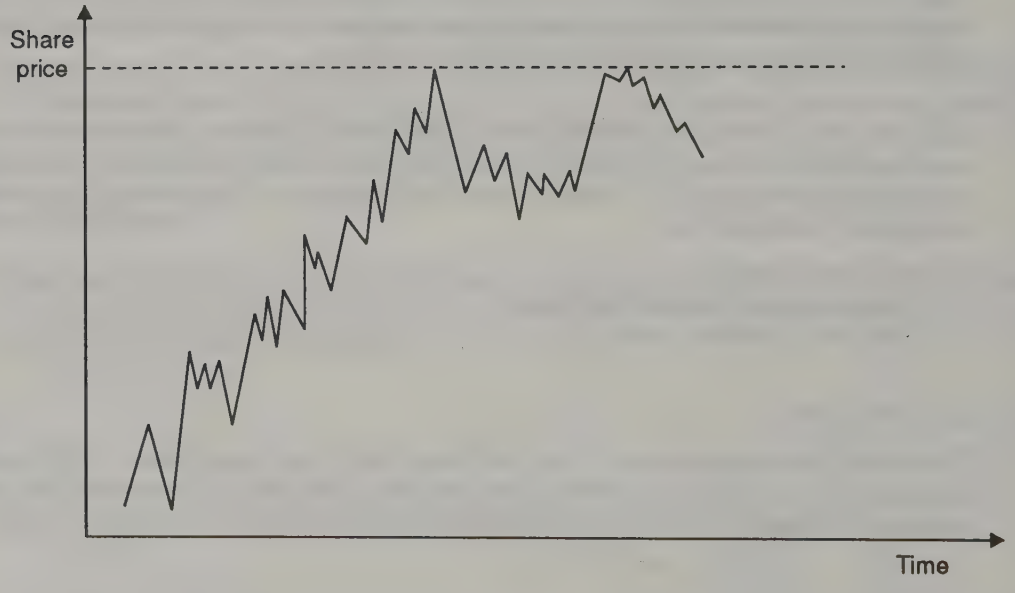


Figure 2 Double top

Double bottoms can be interpreted in a similar but opposite way.

3.5 Another indication of a trend reversal is the 'head and shoulders'. Consider Figure 3.

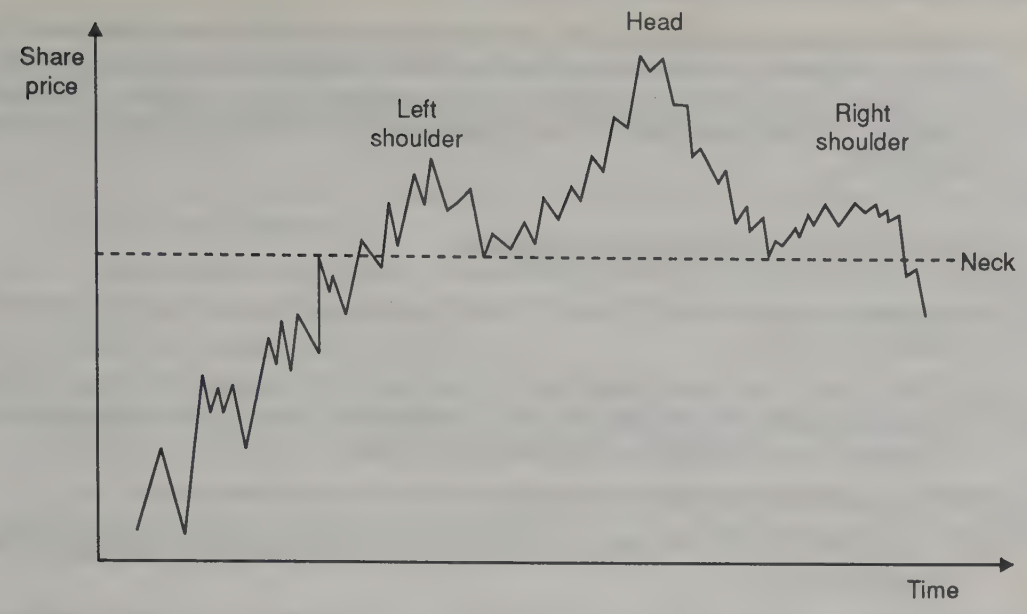


Figure 3 Head and shoulders

In Figure 3, the price has been rising for some time before, at the left shoulder, profit taking has caused the price to drop. The price has then risen steeply again to the head before more profit taking causes the price to drop to more or less the same level as before (the neck). Although the price rises again the gains are not as great as at the head. The level of the right shoulder together with the frequent dips down towards the neck would suggest to the chartist that the upward trend previously observed is over and that a fall is imminent. The breach of the neckline is the indication to sell.

An inverse head and shoulders can be interpreted in a similar manner.

3.6 Moving averages help the chartist to examine overall trends. For example, he may calculate and plot moving averages of share prices for 20 days, 60 days and 240 days. The 20 day figures will give a reasonable representation of the actual movement in share prices after eliminating day to day fluctuations. The other two moving averages give a good idea of longer term trends.

4 RANDOM WALK THEORY

4.1 Random walk theory is consistent with the fundamental theory of share values. It accepts that a share should have an intrinsic price dependent on the fortunes of the company and the expectations of investors. One of its underlying assumptions is that all relevant information about a company is available to all potential investors who will act upon the information in a rational manner.

4.2 The key feature of random walk theory, however, is that although share prices will have an intrinsic or fundamental value, this value will be altered as new information becomes available, and that the behaviour of investors is such that the actual share price will fluctuate from day to day around the intrinsic value.

4.3 Random walk theory emerged in the late 1950s as an attempt to disprove chartist theory. H V Roberts challenged the idea that share price movements were systematic, and showed how sequences of random numbers can exhibit the same pattern as actual recorded changes of share prices on the Stock Exchange. Roberts was able to duplicate the 'head and shoulders' pattern of share price movements with random numbers, and he concluded that such 'patterns' are illusory and of no value for predicting share prices.

Random walks and an efficient stock market

4.4 Research was carried out in the late 1960s to explain why share prices in the stock market display a random walk phenomenon. This research led to the development of the efficient market hypothesis.

It can be shown that random movements in share prices will occur if the stock market operates 'efficiently' and makes information about companies, earnings, dividends and so on, freely (or cheaply) available to all customers in the market. In displaying efficiency, the stock market also lends support to the fundamental analysis theory of share prices.

5 THE EFFICIENT MARKET HYPOTHESIS

5.1 It has been argued that the UK and US stock markets are efficient capital markets, that is, markets in which:

(a) the prices of securities bought and sold reflect all the relevant information which is available to the buyers and sellers. In other words, share prices change quickly to reflect all new information about future prospects;

(b) no individual dominates the market and so there is competition;

(c) transaction costs of buying and selling are not so high as to discourage trading significantly.

5.2 If the stock market is efficient, share prices should vary in a rational way.

(a) If a company makes an investment with a positive net present value (NPV), shareholders will get to know about it and the market price of its shares will rise in anticipation of future dividend increases.

(b) If a company makes a bad investment shareholders will find out and so the price of its shares will fall.

(c) If interest rates rise, shareholders will want a higher return from their investments, so market prices will fall.

The definition of efficiency

5.3 Different types of efficiency can be distinguished in the context of the operation of financial markets.

(a) If financial markets allow funds to be directed towards firms which make the most productive use of them, then there is *allocative efficiency* in these markets. Allocative efficiency will be at its maximum or 'optimum' level if there is no alternative allocation of funds, channelled from savings, which would result in higher economic prosperity.

(b) Transaction costs are incurred by participants in financial markets, for example commissions on share transactions, margins between interest rates for lending and for borrowing, and loan arrangement fees. Financial markets have *operational efficiency* if transaction costs are kept as low as possible. Transaction costs are kept low where there is open competition between brokers and other market participants.

(c) The *information processing efficiency* of a stock market means the ability of a stock market to price stocks and shares fairly and quickly. An efficient market in this sense is one in which the market prices of all the securities traded on it reflect all the available information. There is no possibility of 'speculative bubbles' in which share prices are pushed up or down, by speculative pressure, to unrealistically high or low levels.

Varying degrees of information processing efficiency

5.4 There are three degrees or 'forms' of this 'information processing' efficiency.

(a) weak form;
(b) semi-strong form;
(c) strong form.

5.5 Tests can be carried out on the workings of a stock market to establish whether the market operates with a particular form of efficiency.

(a) Weak form tests are made to assess whether a stock market shows at least weak form efficiency.

(b) Semi-strong form tests are made to assess whether a market shows at least semi-strong form efficiency.

(c) Strong form tests are made to assess whether a market shows strong form efficiency.

Weak form tests and weak form efficiency

5.6 The weak form hypothesis of market efficiency explains changes in share prices as the result of new information which becomes available to investors.

In other words, share prices only change when new information about a company and its profits have become available. Share prices do *not* change *in anticipation* of new information being announced.

5.7 Since new information arrives unexpectedly, changes in share prices should occur in a random fashion: a weak form test seeks to prove the validity of the random walk theory of share prices. In addition, since the theory states that current share prices reflect all information available from past changes in the price, if it is correct then chartist or technical analysis cannot be based on sound principles.

5.8 Research to prove that the stock market displays weak form efficiency has been based on the principle that:

(a) if share price changes are random, and

(b) if there is no connection between past price movements and new share price changes,

then it should be possible to prove statistically there is no correlation between successive changes in the price of a share, that is, that trends in prices cannot be detected.

Proofs of the absence of trends have been claimed in the work of various writers.

Semi-strong form tests and semi-strong form efficiency

5.9 Semi-strong form tests attempt to show that the stock market displays semi-strong efficiency, by which we mean that current share prices reflect both:

(a) all relevant information about past price movements and their implications; and
(b) all knowledge which is available publicly.

5.10 Tests to prove semi-strong efficiency have concentrated on the ability of the market to anticipate share price changes before new information is formally announced.

For example, if two companies plan a merger, share prices of the two companies will inevitably change once the merger plans are formally announced. The market would show semi-strong efficiency, however, if it were able to *anticipate* such an announcement, so that share prices of the companies concerned would change in advance of the merger plans being confirmed.

5.11 Research in both the UK and the USA has suggested that market prices anticipate mergers several months before they are formally announced, and the conclusion drawn is that the stock markets in these countries *do* exhibit semi-strong efficiency.

5.12 It has also been argued that the market displays sufficient efficiency for investors to see through 'creative accounting' or 'window dressing' of accounts by companies which use accounting conventions to overstate profits.

5.13 Suppose that a company is planning a rights issue of shares in order to invest in a new project. A semi-strong form efficient market hypothesis (unlike the weak form hypothesis) would predict that if there is public knowledge before the issue is formally announced, of the issue itself and of the expected returns from the project, then the market price (cum rights) will change to reflect the anticipated profits before the issue is announced.

Strong form tests and strong form efficiency

5.14 A strong form test of market efficiency attempts to prove that the stock market displays a strong form of efficiency, by which we mean that share prices reflect all information available:

(a) from past price changes;

(b) from public knowledge or anticipation; and

(c) from insider knowledge available to specialists or experts (such as investment managers).

It would then follow that in order to maximise the wealth of shareholders, management should concentrate simply on maximising the net present value of its investments and it 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.

5.15 In theory, an expert such as an investment manager should be able to use his privileged access to additional information about companies to earn a higher rate of return than an ordinary investor. Unit trusts should in theory therefore perform better than the average investor. Research has suggested, however, that this expert skill does not exist (or at least, that any higher returns earned by experts are offset by management charges).

How efficient are stock markets?

5.16 Evidence so far collected suggests that stock markets show efficiency that is at least weak form, but tending more towards a semi-strong form. In other words, current share prices reflect all or most publicly available information about companies and their securities.

However, it is very difficult to assess the market's efficiency in relation to shares which are not usually actively traded.

5.17 Fundamental analysis and technical analysis, which are carried out by analysts and investment managers, play an important role in creating an efficient stock market. This is because an efficient market depends on the widespread availability of cheap information about companies, their shares and market conditions, and this is what the firms of market makers and other financial institutions *do* provide for their clients and for the general investing public.

The implications of the efficient market hypothesis

5.18 If the strong form of the efficient market hypothesis is correct, a company's real financial position will be reflected in its share price. Its real financial position includes both its current position and its expected future profitability. Making profits from insider dealing would not be possible, since all information is available to the market.

If the management of a company attempts to maximise the net present value of their investments and to make public any relevant information about those investments then current share prices will in turn be maximised.

5.19 The semi-strong form EMH has the most supporters. If the semi-strong EMH is true, it will not be possible for investors to make a speculative gain on the basis of publicly available information. Indeed studies have shown that not even fund managers can

consistently 'beat the market'. Of course this does not preclude a 'fair' profit being made over time for the risk taken by investing.

If the semi-strong form EMH is correct, then the directors should 'manage' both the underlying projects and information made publicly available concerning the company and its projects. Such information may 'signal' important facts that might be used to predict future equity cashflows.

5.20 The implication for an investor is that if the market shows strong form or semi-strong form efficiency, he can rarely spot shares at a bargain price that will soon rise sharply in value. This is because the market will already have anticipated future developments, and will have reflected these in the share price. All the investor can do, instead of looking for share bargains, is to concentrate on building up a good spread of shares (a portfolio) in order to achieve a satisfactory balance between risk and return.

5.21 As already pointed out, the weak form EMH challenges the claim of chartists - those who claim to identify trends and pattern in share values.

Example: efficient market hypothesis

5.22 Company X has 3,000,000 shares in issue and company Y 8,000,000.

(a) On day 1 the market value per share is £3 for X and £6 for Y.

(b) On day 2 the management of Y decide, at a private meeting, to make a takeover bid for X at a price of £5 per share. The takeover will produce large operating savings with a present value of £8,000,000.

(c) On day 5 Y publicly announces an unconditional offer to purchase all shares of X at a price of £5 per share with settlement on day 20. Details of the large savings are not announced and are not public knowledge.

(d) On day 10 Y announces details of the savings which will be derived from the takeover.

Ignoring tax and the time value of money between day 1 and 20, and assuming the details given are the only factors having an impact on the share price of X and Y, determine the day 2, day 5 and day 10 share price of X and Y if the market is:

(a) semi-strong form efficient;
(b) strong form efficient;

in each of the following *separate* circumstances.

(i) The purchase consideration is cash as specified above.

(ii) The purchase consideration, decided on day 2 and publicly announced on day 5, is five newly issued shares of Y for six shares of X.

Solution

5.23 (a) *Semi-strong form efficient market (i) cash offer*

With a semi-strong form of market efficiency, shareholders know all the relevant historical data and publicly available current information.

(i) Day 1 Value of X shares: £3 each, £9,000,000 in total.
Value of Y shares: £6 each, £48,000,000 in total.

(ii) Day 2 The decision at the *private* meeting does not reach the market, and so share prices are unchanged.

(iii) Day 5 The takeover bid is announced, but no information is available yet about the savings.

(1) The value of X shares will rise to their takeover bid price of £5 each, £15,000,000 in total.

(2) The value of Y shares will be as follows.

	£
Previous value (8,000,000 × £6)	48,000,000
Add value of X shares to be acquired, at previous market worth (3,000,000 × £3)	9,000,000
	57,000,000
Less purchase consideration for X shares	15,000,000
New value of Y shares	42,000,000
Price per share	£5.25

The share price of Y shares will fall on the announcement of the takeover.

(iv) Day 10 The market learns of the potential savings of £8,000,000 (present value) and the price of Y shares will rise accordingly to:

$$\frac{£42,000,000 + £8,000,000}{8,000,000 \text{ shares}} = £6.25 \text{ per share}$$

The share price of X shares will remain the same as before, £5 per share.

Semi-strong form efficient market (ii) share exchange offer

(i) The share price will not change until the takeover is announced on day 5, when the value of the combined company will be perceived by the market to be (48 + 9) £57,000,000.

The number of shares in the enlarged company Y would be as follows.

Current	8,000,000
Shares issued to former X shareholders (3,000,000 × 5/6)	2,500,000
	10,500,000

The value per share in Y would change to reflect what the market expects the value of the enlarged company to be.

$$\frac{£57,000,000}{10,500,000} = £5.43 \text{ per share}$$

The value per share in X would reflect this same price, adjusted for the share exchange terms.

$$\frac{5}{6} \text{ of } £5.43 = £4.52$$

(ii) Day 10 The value of the enlarged company would now be seen by the market to have risen by £8,000,000 to £65,000,000 and the value of Y shares would rise to:

$$\frac{£65,000,000}{10,500,000} = £6.19 \text{ per share}$$

The value per X share would be

$$\frac{5}{6} \text{ of } £6.19 = £5.16$$

(b) *Strong form efficient market (i) cash offer*

In a strong form efficient market, the market would become aware of *all* the relevant information when the private meeting takes place. The value per share would change as early as *day 2* to:

(i) X: £5
(ii) Y: £6.25

The share prices would then remain unchanged until day 20.

Strong form efficient market (ii) share exchange offer

In the same way, for the same reason, the value per share would change *on day 2* to:

(i) X: £5.16
(ii) Y: £6.19

and remain unchanged thereafter until day 20.

5.24 The different characteristics of a semi-strong form and a strong form efficient market thus affect the timing of share price movements, in cases where the relevant information becomes available to the market eventually. The difference between the two forms of market efficiency concerns when the share prices change, not by how much prices eventually change.

You should notice, however, that in neither case would the share prices remain unchanged until day 20. In a *weak form* efficient market, the price of Y's shares would not reflect the expected savings until after the savings had been achieved and reported, so that the takeover bid would result in a fall in the value of Y's shares for a considerable time to come.

Explaining the 1987 share price crash

5.25 The crash of October 1987, in which share prices fell suddenly by 20% to 40% on the world's stock markets, raised serious questions about the validity of random walk theory, the fundamental theory of share values and the efficient market hypothesis. If these theories are correct, how can shares that were valued at one level on one day suddenly be worth 40% less the next day, without any change in expectations of corporate profits and dividends? On the other hand, a widely feared crash late in 1989 failed to happen, suggesting that stock markets may not be altogether out of touch with the underlying values of companies.

5.26 Evidence suggests that the 1987 crash in the US stock market was fuelled by conflicting uncertainties and speculation, rather than fundamental values, as pointed out in an article by R A Hill in the ACCA *Students' Newsletter* (January 1995).

5.27 Hill argues that the EMH, and therefore the market, appears to be most efficient with stable conditions, when there are limited opportunities for speculation because the rational expectation is for prices to remain constant, leaving values to be determined by a consensus of a large number of securities traders. This is usually in the middle of a 'bull' or 'bear' phase, which can only be known with the benefit of hindsight. Much of the market may be driven for much of the time by irrationality.

5.28 After more than ten years of international financial scandals, critics claim that the EMH operates only in the weakest of forms, if at all. Investors have come to believe in the use of insider information. However, the extent of use of insider information cannot be tested because its use is illegal and remains covert by its very nature.

Speculative bubble theory

5.29 Hill discusses how, according to 'speculative bubble theory', stock market behaviour is non-linear and based on inflating and bursting speculative bubbles, rather than economic forecasts. Security prices rise above their intrinsic prices reflecting expected cash returns because some investors believe that others will pay more for them in the future. This behaviour feeds upon itself and prices rise for a period, producing a bull market. However, at some point, investors will eventually react to all the information which they have previously ignored, losing confidence that prices can rise still further, and a market crash then occurs.

5.30 Recent research seems to support a rational bubble theory. When negative returns are likely, the investors tend to be risk-seeking, gambling in an attempt to minimise their losses.

Catastrophe theory

5.31 Hill's article explains how speculative bubble theory leads on to more sophisticated explanations of investor behaviour.

The theory suggests that the capital market is a dynamic non-linear system with the following properties:

(a) it is a 'feedback' system;

(b) there are 'critical levels' of activity where equilibrium prices breakdown;

(c) it is such that a slight change in current fundamentals can have an explosive impact on future events.

5.32 Such a system can be described as 'chaotic'. Forecasting and prediction then become impossible beyond a certain time scale, lending credibility to 'short-termism'.

5.33 Hill explains that catastrophe theory's concept of 'self organised criticality', where small changes in local conditions can significantly effect the system causing a rapid shift from stable to turbulent behaviour, was first applied to the capital market by Zeeman in 1974.

5.34 Zeeman divided all investors into two (non-mutually exclusive) classes:

(a) 'fundamentalists', who are guided in their investment strategies by economic analyses to construct forecasts based on rational expectations;

(b) 'speculators', whose decisions reflect adaptive behaviour in response to technical analysis of recent stock market patterns.

5.35 Instability in financial markets occurs if there is a substantial proportion of speculators, amplifying changes in market indices. If the index begins to rise/fall, there will be a rapid move into a bull/bear phase respectively.

The 'coherent market hypothesis'

5.36 A recent approach, developed by Vaga in a 1991 publication and drawing upon catastrophe theory, is that known as the coherent market hypothesis (CMH).

The CMH holds that financial markets may be in one of four states depending on the combination of economic fundamentals and group sentiment or crowd behaviour:

(a) random walks (an efficient market with neutral fundamentals);

(b) unstable transition (an inefficient market with neutral fundamentals);

(c) coherence (crowd behaviour with bullish fundamentals);

(d) chaos (crowd behaviour with mildly bearish fundamentals).

5.37 According to Vaga, the 1987 crash was pure crowd behaviour characteristic of a chaotic market and had little to do with information on economic fundamentals.

5.38 Hill argues that the CMH is a significant development in capital market theory because it provides a non-linear statistical model for assessing market risk and how it changes over time in response to fundamental and technical factors.

6 STOCK MARKET RATIOS

6.1 Investors are interested in:

(a) the value (market price) of the securities that they hold;
(b) the return that the security has obtained in the past;
(c) expected future returns;
(d) whether their investment is reasonably secure.

6.2 Information that is relevant to market prices and returns is available from published stock market information, and in particular from certain stock market ratios. The main *stock market ratios* are:

(a) the dividend yield;
(b) earnings per share;

(c) the price/earnings ratio;
(d) the dividend cover;
(e) the earnings yield.

The dividend yield

6.3 The dividend yield is given by $\frac{\text{Gross dividend per share}}{\text{Market price per share}} \times 100\%$

The gross dividend is the dividend paid plus the appropriate tax credit. The gross dividend yield is used in preference to a net dividend yield, so that investors can make a direct comparison with (gross) interest yields from loan stock and gilts.

Example: dividend yield

6.4 A company pays a dividend of 15p (net) per share. The market price is 240p. What is the dividend yield if the tax credit is at the lower rate of income tax, 20%?

Gross dividend per share $= 15\text{p} \times \frac{100}{(100-20)} = 18.75\text{p}$

Dividend yield $\frac{18.75\text{p}}{240\text{p}} \times 100\% = 7.81\%$

Interest yield

6.5 Interest yield $= \frac{\text{Gross interest}}{\text{Market value of loan stock}} \times 100\%$

Example: interest yield

6.6 An investor buys £1,000 (nominal value) of a bond with a coupon of 8% for the current market value of £750.

Interest yield $= \frac{1{,}000 \times 8\%}{750} \times 100\% = 10.67\%$

Note that the interest yield, which is the investor's rate of return, is different from the coupon rate of 8%. (Many students confuse these.)

Dividend yield and interest yield

6.7 In practice, we usually find with quoted companies that:

(a) the dividend yield on shares is less than the interest yield on debentures and loan stock (and also less than the yield paid on gilt-edged securities);

(b) the share price often rises each year, giving shareholders capital gains.

In the long run, shareholders will want the return on their shares, in terms of dividends received plus capital gains, to exceed the return that investors get from fixed interest securities.

Earnings per share (EPS)

6.8 EPS is widely used as a measure of a company's performance and is of particular importance in comparing results over a period of several years. A company must be able to sustain its earnings in order to pay dividends and re-invest in the business so as to achieve future growth. Investors also look for *growth* in the EPS from one year to the next.

6.9 Following the publication in 1992 of Financial Reporting Standard No 3 (FRS 3), EPS is defined as the profit in pence attributable to each equity (ordinary) share, based on:

(a) the profit (or in the case of a group the consolidated profit) of the period after tax, minority interests and extraordinary items, and after deducting preference dividends;

(b) divided by the number of equity shares in issue and ranking for dividend.

Extraordinary items are unusual, non-repeating items that affect profit. Under SSAP 3, which has been amended by FRS 3, extraordinary items were not taken into account in the definition of 'earnings' for the calculation of EPS.

Exercise 3

Walter Wall Carpets plc made profits before tax in 19X8 of £9,320,000. Tax amounted to £2,800,000.

The company's share capital is as follows.

	£
Ordinary shares (10,000,000 shares of £1)	10,000,000
8% preference shares	2,000,000
	12,000,000

Calculate the EPS for 19X8.

Solution

	£
Profits before tax	9,320,000
Less tax	2,800,000
Profits after tax	6,520,000
Less preference dividend (8% of £2,000,000)	160,000
Earnings	6,360,000
Number of ordinary shares	10,000,000
EPS	63.6p

Exercise 4

Calculate the earnings per share of Orson Cart plc, given the following information.

Profits before extraordinary items and taxation	£5,050,000
Interest charges	£850,000
Tax on ordinary operations	£1,370,000
Extraordinary losses (net of tax)	£460,000
Nominal value of issued shares (25p shares)	£1,000,000

Solution

Interest charges have already been deducted in arriving at the profits before tax, and so should be ignored.

		£	£
Profits before tax and extraordinary items			5,050,000
Less	Tax on ordinary operations	1,370,000	
	Extraordinary items (net of tax)	460,000	
			1,830,000
Earnings			3,220,000
Number of shares			4,000,000
EPS			80.5p

6.10 EPS on its own does not tell us anything. It must be seen in the context of several other matters.

(a) EPS is used for comparing the results of a company over time. Is its EPS growing? What is the rate of growth? Is the rate of growth increasing or decreasing?

(b) Is there likely to be a significant dilution of EPS in the future, perhaps due to the exercise of share options or warrants, or the conversion of convertible loan stock into equity?

(c) EPS should not be used blindly to compare the earnings of one company with another. For example, if A plc has an EPS of 12p for its 10,000,000 10p shares and B plc has an EPS of 24p for its 50,000,000 25p shares, we must take account of the numbers of shares. When earnings are used to compare one company's shares with another, this is done using the P/E ratio or perhaps the earnings yield.

(d) If EPS is to be a reliable basis for comparing results, it must be calculated consistently. The EPS of one company must be directly comparable with the EPS of others, and the EPS of a company in one year must be directly comparable with its published EPS figures for previous years. Changes in the share capital of a company during the course of a year cause problems of comparability.

6.11 Note that:

(a) EPS is a figure based on past data; and

(b) it is easily manipulated by changes in accounting policies and by mergers or acquisitions.

The use of the measure in calculating management bonuses makes it particularly liable to manipulation. The attention given to EPS as a performance measure by City analysts is arguably disproportionate to its true worth. Investors should be more concerned with future earnings, but of course estimates of these are more difficult to reach than the readily available figure.

6.12 A *fully diluted EPS* (FDEPS) can be measured where the company has issued securities that might be converted into ordinary shares at some future date, such as convertible loan stock, share warrants or share options.

6.13 The FDEPS measures a hypothetical EPS, based on earnings in the period under review, if the company's ordinary shares were increased to their maximum number by the exercise of all existing share options and warrants, and the conversion of existing convertible loan stock etc. The FDEPS gives investors an appreciation of by how much EPS might be affected if and when the options, warrants or conversion rights are exercised.

6.14 Total earnings are increased by:

(a) the savings in interest (net of tax) from the conversion of loan stock into shares;

(b) in the case of share options or warrants, the addition to profits (net of tax) from investing the cash obtained from their exercise (estimated on the assumption that the cash is invested in 2½% Consolidated Stock at their market price on the first day of the period).

$$\text{FDEPS} = \frac{\text{Adjusted earnings}}{\text{Maximum number of ordinary shares}}$$

Example: fully diluted earning per share

6.15 Suppose that Walter Wall Carpets plc (see Exercise 3 above) has in issue £4,000,000 8% convertible unsecured loan stock, convertible in three years' time, with a conversion ratio of 5 shares per £100 of loan stock. The company pays tax at 33%. What is the fully diluted EPS?

Solution

6.16 Undiluted EPS is 63.6 pence, as shown in Exercise 3.

If all holders of the convertible stock convert their holding to ordinary shares, an additional 200,000 (= 4,000,000/100 × 5) shares will be issued in three years' time.

The interest saving on conversion is:

£4,000,000 × 8% × 0.67 = £214,400.

Therefore:

$$\text{FDEPS} = \frac{6{,}360{,}000 + 214{,}400}{10{,}000{,}000 + 200{,}000}$$

$$= \frac{6{,}574{,}400}{10{,}200{,}000} = 64.5 \text{ pence}$$

The price earnings (P/E) ratio

6.17 The P/E ratio is the most important yardstick for assessing the relative worth of a share. It is:

$$\frac{\text{Market price in pence}}{\text{EPS in pence on the net basis}}$$

which is the same as:

$$\frac{\text{Total market value of equity}}{\text{Total earnings on the net basis}}$$

The 'net basis' means that account is taken of the tax (ACT) effects of any dividend payments.

6.18 The value of the P/E ratio reflects the market's appraisal of the shares' 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 consider that it is a less risky company or in a more 'secure' industry.

6.19 The P/E ratio is, simply, 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 considerations for investors, the market price of a share and its earnings capacity. It is however significant only as a measure of this relationship between earnings and value.

Example: price earnings ratio (1)

6.20 A company has recently declared a dividend of 12p per share. The share price is £3.72 cum div and earnings for the most recent year were 30p per share. Calculate the P/E ratio.

Solution

6.21 $$\text{P/E ratio} = \frac{\text{MV ex div}}{\text{EPS}} = \frac{£3.60}{30\text{p}} = 12$$

Changes in EPS: the P/E ratio and the share price

6.22 The dividend valuation model or fundamental theory of share values is the theory that share prices are related to expected future dividends on the shares.

6.23 Another approach to assessing what share prices ought to be, which is often used in practice, is a P/E ratio approach. It is a commonsense approach to share price assessment (although not as well founded in theory as the dividend valuation model), which is that:

(a) the relationship between the EPS and the share price is measured by the P/E ratio;

(b) there is no reason to suppose, in normal circumstances, that the P/E ratio will vary much over time;

(c) so if the EPS goes up or down, the share price should be expected to move up or down too, and the new share price will be the new EPS multiplied by the constant P/E ratio.

6.24 For example, if a company had an EPS last year of 30p and a share price of £3.60, its P/E ratio would have been 12. If the current year's EPS is 33p, we might expect that the P/E ratio would remain the same, 12, and so the share price ought to go up to 12 × 33p = £3.96.

Example: effects of a rights issue

6.25 Annette Cord Sports Goods plc has 6,000,000 ordinary shares in issue, and the company has been making regular annual profits after tax of £3,000,000 for some years. The share price is £5.

A proposal has been made to issue 2,000,000 new shares in a rights issue, at an issue price of £4.50 per share. The funds would be used to redeem £9,000,000 of 12% debenture stock.

The rate of corporation tax is 33%.

What would be the predicted effect of the rights issue on the share price, and would you recommend that the issue should take place?

Solution

6.26 If the stock market shows semi-strong form efficiency, the share price will change on announcement of the rights issue, in anticipation of the change in EPS. The current EPS is 50p per share, and so the current P/E ratio is 10.

	£	£
Current annual earnings		3,000,000
Increase in earnings after rights issue		
Interest saved (12% × £9,000,000)	1,080,000	
Less tax on extra profits (33%)	356,400	
		723,600
Anticipated annual earnings		3,723,600
Number of shares (6,000,000 + 2,000,000)		8,000,000
EPS		£0.46545
Current P/E ratio		10
The anticipated P/E ratio is assumed to be the same		
Anticipated share price		£4.6545

The proposed share issue is a one for three rights issue, and we can estimate the theoretical ex rights price.

	£
Current value of three shares (× £5)	15.00
Rights issue price of one share	4.50
Theoretical value of four shares	19.50
Theoretical ex rights price $\frac{£19.50}{4}$ = £4.875	

6.27 The anticipated share price after redeeming the debentures would be £4.6545 per share, which is less than the theoretical ex rights price. If the rights issue goes ahead and the P/E ratio remains at 10, shareholders should expect a fall in share price below the theoretical ex rights price, which indicates that there would be a capital loss on their investment. The rights issue is for this reason not recommended.

Changes in the P/E ratio over time

6.28 Changes in the P/E ratios of companies over time will depend on several factors.

(a) If interest rates go up, investors will be attracted away from shares and into debt capital. Share prices will fall, and so P/E ratios will fall.

Similarly, if interest rates go down, shares will become relatively more attractive to invest in, so share prices and P/E ratios will go up.

(b) If prospects for company profits improve, share prices will go up, and P/E ratios will rise. Share prices depend on expectations of future earnings, not historical earnings, and so a change in prospects, perhaps caused by a substantial rise in international trade, or an economic recession, will affect prices and P/E ratios.

(c) Investors' confidence might be changed by a variety of circumstances, such as:

(i) the prospect of a change in government;
(ii) the prospects for greater exchange rate stability between currencies.

The dividend cover

6.29 The dividend cover is the number of times the actual dividend could be paid out of current profits.

The dividend cover is equal to:

$$\frac{\text{Maximum possible equity dividend that could be paid out of current profits}}{\text{Actual dividend for ordinary shareholders}}$$

The figures for the maximum dividend and the actual dividend may be either:

(a) both gross; or
(b) both net.

6.30 The dividend cover indicates:

(a) the proportion of distributable profits for the year that is being retained by the company;

(b) the level of risk that the company will not be able to maintain the same dividend payments in future years, should earnings fall.

6.31 A high dividend cover means that a high proportion of profits are being retained, which might indicate that the company is investing to achieve earnings growth in the future.

Example: dividend cover

6.32 The EPS of York plc is 20p. The dividend was 20% on the 25p ordinary shares. Calculate the dividend cover.

Solution

6.33 $$\text{Dividend cover} = \frac{20\text{p}}{20\% \text{ of } 25\text{p}} = 4$$

A dividend cover of 4 means that the company is retaining 75% of its earnings for reinvestment.

The earnings yield

6.34 The most common definition of the earnings yield currently used is:

$$\frac{\text{Grossed up equivalent of EPS calculated on the net basis} \times 100\%}{\text{Market price per share}}$$

The earnings are grossed up to put the earnings yield on the same basis as the dividend yield. 'Net basis' means that earnings are calculated by deducting the actual taxation change, as required by SSAP3.

Example: earnings yield

6.35 The EPS of Cumbria plc calculated on the net basis is 25p and the market price per ordinary share is 200p. Calculate the earnings yield assuming that the rate of tax credit on dividends and the rate of ACT is 20%, the lower rate of income tax.

Solution

6.36 $$\text{Earnings yield} = \frac{25 \times 100/80}{200} \times 100\% = 15.625\%$$

7 CONVERTIBLES AND WARRANTS

Convertible loan stock

7.1 Convertible securities are fixed return securities that may be converted, on pre-determined dates and at the option of the holder, into ordinary shares of the company at a predetermined rate. Once converted they cannot be converted back into the original fixed return security.

For example, the conversion terms of convertible stock might be that on 1 April 2000, £2 of stock can be converted into one ordinary share, whereas on 1 April 2001, the conversion price will be £2.20 of stock for one ordinary share.

The conversion value and the conversion premium

7.2 The current market value of ordinary shares into which a unit of stock may be converted is known as the *conversion value*. The conversion value will be below the value of the stock at the date of issue, but will be expected to increase as the date for conversion approaches on the assumption that a company's shares ought to increase in market value over time. The difference between the issue value of the stock and the conversion value as at the date of issue is the implicit *conversion premium*.

Example: convertible loan stock

7.3 The 10% convertible loan stock of Starchwhite plc is quoted at £142 per £100 nominal. The earliest date for conversion is in four years time, at the rate of 30 ordinary shares per £100 nominal loan stock. The share price is currently £4.15. Annual interest on the stock has just been paid.

(a) What is the average annual growth rate in the share price that is required for the stockholders to achieve an overall rate of return of 12% a year compound over the next four years, including the proceeds of conversion?

(b) What is the implicit conversion premium on the stock?

Solution

7.4 (a)

Year	*Investment* £	*Interest* £	*Discount* 12%	*Present value* £
0	(142)		1.000	(142.00)
1		10	0.893	8.93
2		10	0.797	7.97
3		10	0.712	7.12
4		10	0.636	6.36
				(111.62)

The value of 30 shares on conversion at the end of year 4 must have a present value of at least £111.62, to provide investors with a 12% return.

The money value at the end of year 4 needs to be £111.62 ÷ 0.636 = £175.50.

The current market value of 30 shares is (× £4.15) £124.50.

The growth factor in the share price over four years needs to be:

$$\frac{175.50}{124.50} = 1.4096$$

If the annual rate of growth in the share price, expressed as a proportion, is g, then:

$$\begin{aligned} (1+g)^4 &= 1.4096 \\ 1+g &= 1.0896 \\ g &= 0.0896, \text{ say } 0.09 \end{aligned}$$

Conclusion. The rate of growth in the share price needs to be 9% a year (compound).

(b) The conversion premium can be expressed as an amount per share or as a percentage of the current conversion value.

(i) As an amount per share $\dfrac{£142 - £(30 \times 4.15)}{30} = £0.583$ per share

(ii) As a % of conversion value $\dfrac{£0.583}{£4.15} \times 100\% = 14\%$

The issue price and the market price of convertible loan stock

7.5 A company will aim to issue loan stock with the greatest possible conversion premium as this will mean that, for the amount of capital raised, it will, on conversion, have to issue the lowest number of new ordinary shares. The premium that will be accepted by potential investors will depend on the company's growth potential and so on prospects for a sizeable increase in the share price.

7.6 Convertible loan stock issued at par normally has a lower coupon rate of interest than straight debentures. This lower yield is the price the investor has to pay for the conversion rights. It is, of course, also one of the reasons why the issue of convertible stock is attractive to a company.

7.7 When convertible loan stock is traded on a stock market, its *minimum* market price will be the price of straight debentures with the same coupon rate of interest. If the market value falls to this minimum, it follows that the market attaches no value to the conversion rights.

7.8 The actual market price of convertible stock will depend not only on the price of straight debt but also on the current conversion value, the length of time before conversion may take place, and the market's expectation as to future equity returns and the risk associated with these returns. If the conversion value rises above the straight debt value then the price of convertible stock will normally reflect this increase.

7.9 Most companies issuing convertible stocks expect them to be converted. They view the stock as *delayed equity*. They are often used either because the company's ordinary share price is considered to be particularly depressed at the time of issue or because the issue of equity shares would result in an immediate and significant drop in earnings per share. There is no certainty, however, that the security holders will exercise their option to convert; therefore the stock may run its full term and need to be redeemed.

Warrants (or subscription rights)

7.10 A warrant is a right given by a company to an investor, allowing him to buy new shares at a future date at a fixed, pre-determined price known as the exercise price.

7.11 Warrants are usually issued as part of a package with unsecured loan stock: an investor who buys stock will also acquire a certain number of warrants. The purpose of warrants is to make the loan stock more attractive.

7.12 Once issued, warrants are detachable from the stock and can be sold and bought separately before or during the 'exercise period' (the period during which the right to use the warrants to subscribe for shares is allowed). The market value of warrants will depend on expectations of actual share prices in the future.

7.13 During the exercise period, the price of a warrant should not fall below the higher of:

(a) nil; and
(b) the 'theoretical value', which equals:

(Current share price – Exercise price) × Number of shares obtainable from each warrant

7.14 If for example, a warrant entitles the holder to purchase two ordinary shares at a price of £3 each, when the current market price of the shares is £3.40, the minimum market value ('theoretical value') of a warrant would be (£3.40 – £3) × 2 = 80p.

7.15 If the price fell below the theoretical value during the exercise period, then arbitrage would be possible. For example, suppose the share price is £2.80 and the warrant exercise price is £2.20. The warrants are priced at 50p with each entitled to one share. Ignoring transactions costs, investors could make an instant gain of 10p per share by buying the warrant, exercising it and then selling the share.

7.16 For a company with good growth prospects, the warrant will usually be quoted at a premium above the minimum prior to the exercise period. This premium is known as the warrant conversion premium. It is sometimes expressed as a percentage of the current share price.

Example: warrant conversion premium

7.17 An investor holds some warrants which can be used to subscribe for ordinary shares on a one for one basis at an exercise price of £2.50 at a specified future rate. The current share price is £2.25 and the warrants are quoted at 50p. What is the warrant conversion premium?

Solution

7.18 The easiest way of finding the premium is to deduct the current share price from the cost of acquiring a share using the warrant, treating the warrant as if it were currently exercisable:

	£
Cost of warrant	0.50
Exercise price	2.50
	3.00
Current share price	2.25
Premium	0.75

7.19 You may be wondering why an investor would prefer to buy warrants at 50p when this means that it will cost him more to get the ordinary shares than if he bought them directly. The attractions of warrants to the investor are:

(a) low initial outlay - he only has to spend 50p per share as opposed to £2.25. This means that he could buy 4½ times as many warrants as shares or, alternatively, he could invest the remaining £1.75 in other, less risky investments;

(b) lower downside potential - his maximum loss per share is 50p instead of £2.25. Of course the risk of the loss of 50p is much greater than the risk of losing £2.25. The share price of £2.25 is below the exercise price. If it remained at this level until the beginning of the exercise period, the warrants would become worthless as it would not be worthwhile exercising them; and

(c) high potential returns - see below.

The gearing effect of warrants

7.20 In a similar way to share options, warrants offer the investor the possibility of making a high profit as a percentage of initial cost. This is because the price of the warrants will tend to move more or less in line with the price of the shares. Thus, if the share price rises by 50p the increase in the value of the warrant will be similar.

Using the previous prices, a 50p increase in share price is about 22% but a 50p increase in the warrant price is 100%. This illustrates the gearing effect of warrants.

7.21 Let us now recalculate the premium, assuming a 50p rise in the share price and a 50p rise in the warrant price.

	£
Cost of warrant (50p + 50p)	1.00
Exercise price	2.50
	3.50
Current share price (£2.25 + 50p)	2.75
Premium	0.75

The premium has stayed the same.

7.22 Note also that the share price is now above the exercise price. The warrants now have an 'intrinsic' value of 25p (ie 275p – 250p).

7.23 In the short run the warrant price and share price normally move fairly closely in line with each other. In the longer term the price of the warrant and hence the premium will depend on:

(a) the length of time before the warrants may be exercised;
(b) the current price of the shares compared with the exercise price; and
(c) the future prospects of the company.

As the exercise period approaches, any premium will reduce. Towards the end of the exercise period the premium will disappear because, if there were a premium, it would be cheaper to buy the shares directly rather than via the warrant.

Chapter roundup

- In this chapter, we have seen how share values may be arrived at. We may then start to see how a financial manager should act, in order to maximise shareholders' wealth.
- In aiming to maximise the share value, and hence shareholders' wealth, the financial manager must face the need to convince the stock market of the worth of the company. It is therefore important to appreciate the meaning and importance of the various stock market ratios.
- In practice, factors affecting the market value of company shares which the financial manager should be aware of include the following.
  - Announcement of results
  - Other information about the company's prospects, products and management
  - Information about industry prospects
  - Takeover speculation
  - The state of the economy
  - Exchange rate changes
  - Interest rate changes
  - New legislation

Test your knowledge

1 What is the fundamental theory of share values? (see para 2.1) State the formulae for the valuation of shares, assuming (a) no dividend growth (b) a constant rate of dividend growth in perpetuity. (2.2)

2 What is chartism? (3.1)

3 What is random walk theory? (4.1 - 4.3) How is this theory related to the efficient market hypothesis? (4.4)

4 What does efficiency mean, in the context of the efficient market hypothesis? (5.3)

5 What is weak form efficiency? (5.6)

6 What is semi-strong form efficiency? (5.9, 5.10)

7 What is strong form efficiency? (5.14)

8 How does the difference between weak form and semi-strong form efficiency matter, in terms of by how much or when share prices change? (5.24)

9 How is dividend yield calculated? (6.3)

10 How might EPS be used to judge the returns that a company is making for its equity investors? (6.10)

11 What is the P/E ratio? (6.11) Why is it significant? (6.16)

12 What makes a share's P/E ratio change over time? (6.25)

13 What is the dividend cover? (6.29) What does it indicate? (6.30, 6.31)

14 What is the earnings yield? (6.34)

15 Distinguish between convertible loan stocks and warrants (7.1, 7.10)

Now try illustrative question 4 at the end of the Study Text

Chapter 5

THE COST OF CAPITAL

This chapter covers the following topics.

		Syllabus reference
1	Investment decisions, financing decisions and the cost of capital	3(d)
2	The costs of different sources of finance	3(d)
3	Special problems	3(d)
4	The weighted average cost of capital	3(d)
5	The cost of capital, the NPV of new projects and the value of shares	3(d)

Introduction

While in the previous chapter we looked at investments from the investor's point of view, in this Chapter we assess costs from the perspective of the company (or other business enterprise).

Knowledge brought forward from Paper 8

Sources of finance

- Nature and importance of internally generated funds
- The effect of dividend policy
- Bank finance
- Trade credit
- Government grants and tax incentives
- Venture capital
- Leasing
- International money and capital markets

1 INVESTMENT DECISIONS, FINANCING DECISIONS AND THE COST OF CAPITAL

1.1 The cost of capital has two aspects to it.

(a) It is the cost of funds that a company raises and uses, and the return that investors expect to be paid for putting funds into the company.

(b) It is therefore 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.

1.2 The cost of capital can therefore be measured by studying the returns required by investors, and then used to derive a discount rate for DCF analysis and investment appraisal.

The cost of capital as an opportunity cost of finance

1.3 The cost of capital, however it is measured, is an opportunity cost of finance, because it is the minimum return that investors require. If they do not get this return, they will transfer some or all of their investment somewhere else. Here are two examples.

(a) If a bank offers to lend money to a company, the interest rate it charges is the yield that the bank wants to receive from investing in the company, because it can get just as good a return from lending the money to someone else. In other words, the interest rate is the opportunity cost of lending for the bank.

(b) When shareholders invest in a company, the returns that they can expect must be sufficient to persuade them not to sell some or all of their shares and invest the money somewhere else. The yield on the shares is therefore the opportunity cost to the shareholders of not investing somewhere else.

The cost of capital and risk

1.4 The cost of capital has three elements.

(a) The *risk-free rate of return* is the return which would be required from an investment if it were completely free from risk. Typically, a risk-free yield would be the yield on government securities.

(b) The *premium for business risk* is an increase in the required rate of return due to the existence of uncertainty about the future and about a firm's business prospects. The actual returns from an investment may not be as high as they are expected to be. Business risk will be higher for some firms than for others, and some types of project undertaken by a firm may be more risky than other types of project that it undertakes.

(c) The *premium for financial risk* relates to the danger of high debt levels (high gearing). For ordinary shareholders, financial risk is evident in the variability of earnings after deducting payments to holders of debt capital. The higher the gearing of a company's capital structure, the greater will be the financial risk to ordinary shareholders, and this should be reflected in a higher risk premium and therefore a higher cost of capital.

1.5 Because different companies are in different types of business (varying business risk) and have different capital structures (varying financial risk) the cost of capital applied to one company may differ radically from the cost of capital of another.

2 THE COSTS OF DIFFERENT SOURCES OF FINANCE 6/96

2.1 Where a company uses a mix of equity and debt capital its overall cost of capital might be taken to be the weighted average of the cost of each type of capital, but before discussing this we must look at the cost of each source of capital: equity, preference shares, debt capital and so on.

The cost of ordinary share capital

2.2 New funds from equity shareholders are obtained:

(a) from new issues of shares;
(b) from retained earnings.

2.3 Both of these sources of funds have a cost.

(a) Shareholders will not be prepared to provide funds for a new issue of shares unless the return on their investment is sufficiently attractive.

(b) Retained earnings also have a cost. This is an opportunity cost, the dividend forgone by shareholders.

The dividend valuation model

2.4 If we begin by ignoring share issue costs, the cost of equity, both for new issues and retained earnings, could be estimated by means of a dividend valuation model, on the assumption that the market value of shares is directly related to expected future dividends on the shares.

2.5 If the future dividend per share (D_1) is expected to be *constant* in amount then the ex dividend share price (P_o) will be calculated by the formula:

$$P_o = \frac{D_1}{(1+K_e)} + \frac{D_1}{(1+K_e)^2} + \frac{D_1}{(1+K_e)^3} + \ldots = \frac{D_1}{K_e}, \text{ so } K_e = \frac{D_1}{P_o}$$

where K_e is the shareholders' cost of capital

D_1 is the annual dividend per share, starting at year 1 and then continuing annually in perpetuity

Assumptions in the dividend valuation model

2.6 The dividend valuation model is based on certain assumptions.

(a) The dividends from projects for which the funds are required will be of the same risk type or quality as dividends from existing operations.

(b) There would be no increase in the cost of capital, for any other reason besides (a) above, from a new issue of shares.

(c) All shareholders have perfect information about the company's future, there is no delay in obtaining this information and all shareholders interpret it in the same way.

(d) Taxation can be ignored.

(e) All shareholders have the same marginal cost of capital.

(f) There would be no issue expenses for new shares.

Share issue costs and the cost of equity

2.7 The issue of shares, whether to the general public or as a rights issue, costs money and these costs should be considered in investment appraisal. Two approaches have been suggested.

(a) One approach is to deduct issue costs as a year 0 cash outflow of the project or projects for which the share capital is being raised. The issue costs would not affect the cost of equity capital.

(b) An alternative approach you might come across is to calculate the cost of new equity with the formula:

$$K_e = \frac{D_1}{P_o - X}$$

where X represents the issue costs. Thus, if the issue price of a share is £2.50, issue costs are 20p per share, and new shareholders expect constant annual dividends of 46p, the cost of new equity would be:

$$\frac{46}{(250-20)} = 0.2 = 20\%$$

Approach (a) is recommended.

The dividend growth model

2.8 Shareholders will normally expect dividends to increase year by year and not to remain constant in perpetuity. The fundamental theory of share values states that the market

price of a share is the present value of the discounted future cash flows of revenues from the share, so the market value given an expected constant annual growth in dividends would be:

$$P_o = \frac{D_0(1+g)}{(1+K_e)} + \frac{D_0(1+g)^2}{(1+K_e)^2} + ...$$

where P_o is the current market price (ex div)
D_0 is the current net dividend
K_e is the shareholders' cost of capital
g is the expected annual growth in dividend payments
and both r and g are expressed as proportions.

2.9 This formula assumes a constant growth rate in dividends, but it could easily be adapted for uneven growth.

Capital growth through increases in the share price will arise from changed expectations about future dividend growth, or changes in the required return, r.

2.10 It is often convenient to assume a constant expected dividend growth rate in perpetuity. The formula in Paragraph 2.8 then simplifies to:

$$P_o = \frac{D_0(1+g)}{(r-g)}$$

2.11 Re-arranging this, we get a formula for the ordinary shareholders' cost of capital.

$$K_e = \frac{D_0(1+g)}{P_o} + g$$

2.12 This is equivalent to the following equation, which is included on the Paper 14 *Formulae Sheet* (see the Appendix to this Study Text).

$$K_e = \frac{D_1}{P_o} + g$$

where D_1 is the dividend in year 1, so that:

$$D_1 = D_0(1+g)$$

2.13 The dividend growth model is sometimes called Gordon's growth model.

Exercise 1

A share has a current market value of 96p, and the last dividend was 12p. If the expected annual growth rate of dividends is 4%, calculate the cost of equity capital.

Solution

$$\text{Cost of capital} = \frac{12(1+0.04)}{96} + 0.04$$

$$= 0.13 + 0.04$$
$$= 0.17$$
$$= 17\%$$

Estimating the growth rate

2.14 If an examination question requires you to calculate a cost of equity using the growth model, it is likely that you will be expected to predict the future growth rate from an analysis of the growth in dividends over the past few years.

Example: cost of capital (2)

2.15 The dividends and earnings of Hall Shores plc over the last five years have been as follows.

Year	*Dividends*	*Earnings*
	£	£
19X1	150,000	400,000
19X2	192,000	510,000
19X3	206,000	550,000
19X4	245,000	650,000
19X5	262,350	700,000

The company is financed entirely by equity and there are 1,000,000 shares in issue, each with a market value of £3.35 ex div.

What is the cost of equity?
What implications does dividend growth appear to have for earnings retentions?

Solution

2.16 The dividend growth model will be used.

(a) Dividends have risen from £150,000 in 19X1 to £262,350 in 19X5. The increase represents four years growth. (Check that you are aware that there are four years growth, and not five years growth, in the table.) The average growth rate, g, may be calculated as follows.

$$\text{Dividend in 19X1} \times (1+g)^4 = \text{Dividend in 19X5}$$

$$(1+g)^4 = \frac{\text{Dividend in 19X5}}{\text{Dividend in 19X1}}$$

$$= \frac{£262,350}{£150,000}$$

$$= 1.749$$

$$1+g = \sqrt[4]{1.749} = 1.15$$

$$g = 0.15 = 15\%$$

(b) The growth rate over the last four years is assumed to be expected by shareholders into the indefinite future, so the cost of equity, r, is:

$$\frac{d_0(1+g)}{P_o} + g$$

$$= \frac{0.26235(1.15)}{3.35} + 0.15$$

$$= 0.24 = 24\%$$

(c) Retained profits will earn a certain rate of return and so growth will come from the yield on the retained funds. It might be assumed that g = bR where b is the yield on new investments and R is the proportion of profits retained for reinvestment. In our example, if we applied this assumption the future annual growth rate would be 15% if bR continued to be 15%. If the rate of return on new investments averages 24% (which is the cost of equity) and if the proportion of earnings retained is 62.5% (which it has been, approximately, in the period 19X1 – 19X5) then g = bR = 24% × 62.5% = 15%.

The cost of debt capital and the cost of preference shares

2.17 Estimating the cost of fixed interest or fixed dividend capital is much easier than estimating the cost of ordinary share capital because the interest received by the holder of the security is fixed by contract and will not fluctuate. The cost of debt capital already issued is the rate of interest (the internal rate of return) which equates the current market price with the discounted future cash receipts from the security.

Ignoring taxation for the moment, in the case of *irredeemable* debt (or preference shares) the future cash flows are the interest (or dividend) payments in perpetuity so that:

$$P_0 = \frac{I}{(1+K_d)} + \frac{I}{(1+K_d)^2} + \frac{I}{(1+K_d)^3} \ldots\ldots$$

where P_0 is the current market price of debt capital after payment of the current interest (dividend)
I is the interest (dividend) received
K_d is the cost of debt (preference share) capital

$$\frac{1}{(1+K_d)} + \frac{1}{(1+K_d)^2} + \frac{1}{(1+K_d)^3} \ldots\ldots$$

simplifies to $\frac{1}{K_d}$ so:

$$P_0 = \frac{I}{K_d} \qquad \text{and} \qquad K_d = \frac{I}{P_0}$$

2.18 If the debt is *redeemable* then in the year of redemption the interest payment will be received by the holder as well as the amount payable on redemption, so:

$$P_0 = \frac{I}{(1+K_d)} + \frac{I}{(1+K_d)^2} + \ldots\ldots + \frac{I+P_n}{(1+K_d)^n}$$

where P_n = the amount payable on redemption in year n.

2.19 The above equation cannot be simplified so 'K_d' will have to be calculated by trial and error, as an IRR. The best trial and error figure to start with in calculating the cost of redeemable debt is to take the cost of debt capital as if it were irredeemable and then add the annualised capital profit that will be made from the present time to the time of redemption.

Example: cost of capital (3)

2.20 Owen Allot plc has in issue 10% debentures of a nominal value of £100. The market price is £90 ex interest. Calculate the cost of this capital if the debenture is:

(a) irredeemable;
(b) redeemable at par after 10 years.

Ignore taxation.

Solution

2.21 The cost of irredeemable debt capital is $\frac{i}{P_0} = \frac{£10}{£90} \times 100\% = 11.1\%$

2.22 *The cost of redeemable debt capital.* The cost of debt capital is 11.1% if irredeemable. The capital profit that will be made from now to the date of redemption is £10 (£100 – £90). This profit will be made over a period of ten years which gives an annualised profit of £1 which is about 1% of current market value. The best trial and error figure to try first is, therefore, 12%.

Year		*Cash flow*	*Discount factor* 12%	*PV* £	*Discount factor* 11%	*PV* £
0	Market value	(90)	1.000	(90.00)	1.000	(90.00)
1-10	Interest	10	5.650	56.50	5.889	58.89
10	Capital repayment	100	0.322	32.20	0.352	35.20
				(1.30)		4.09

The approximate cost of debt capital is, therefore, $(11 + \frac{4.09}{(4.09 - -1.30)} \times 1) = 11.76\%$

2.23 The cost of debt capital estimated above represents the cost of continuing to use the finance rather than redeem the securities at their current market price. It would also represent the cost of raising additional fixed interest capital if we assume that the cost of the additional capital would be equal to the cost of that already issued. If a company has not already issued any fixed interest capital, it may estimate the cost of doing so by making a similar calculation for another company which is judged to be similar as regards risk.

Debt capital and taxation

2.24 The interest on debt capital is an allowable deduction for purposes of taxation and so the cost of debt capital and the cost of share capital are not properly comparable costs. This tax relief on interest ought to be recognised in DCF computations. One way of doing this is to include tax savings due to interest payments in the cash flows of every project. A simpler method, and one that is normally used, is to allow for the tax relief in computing the cost of debt capital, to arrive at an 'after-tax' cost of debt.

The after-tax cost of irredeemable debt capital is:

$$K_d = \frac{I}{P_0}(1 - t)$$

where K_d is the cost of debt capital
I is the annual interest payment
P_0 is the current market price of the debt capital ex interest (that is, after payment of the current interest)
t is the rate of corporation tax.

2.25 Therefore if a company pays £10,000 a year interest on irredeemable debenture stock with a nominal value of £100,000 and a market price of £80,000, and the rate of corporation tax is 33%, the cost of the debentures would be:

$$\frac{10,000}{80,000}(1 - 0.33) = 0.08375 = 8.375\%.$$

2.26 The higher the rate of corporation tax is, the greater the tax benefits in having debt finance will be compared with equity finance. In the example above, if the rate of tax had been 50%, the cost of debt would have been, after tax:

$$\frac{10,000}{80,000}(1 - 0.50) = 0.0625 = 6.25\%$$

2.27 In the case of *redeemable* debentures, the capital repayment is not allowable for tax. To calculate the cost of the debt capital to include in the weighted average cost of capital, it is necessary to calculate an internal rate of return which takes account of tax relief on the interest.

Example: cost of capital (4)

2.28 (a) A company has outstanding £660,000 of 8% debenture stock on which the interest is payable annually on 31 December. The stock is due for redemption at par on 1 January 19X6. The market price of the stock at 28 December 19X2 was 103 cum interest.

Ignoring any question of personal taxation, what do you estimate to be the current market rate of interest?

(b) If a new expectation emerged that the market rate of interest would rise to 12% during 19X3 and 19X4 what effect might this have in theory on the market price at 28 December 19X2?

(c) If the effective rate of corporation tax was 33% what would be the percentage cost to the company of debenture stock in (a) above? Tax is paid each 31 December on profits earned in the year ended on the previous 31 December.

Solution

2.29 (a) The current market rate of interest is found by calculating the pre-tax internal rate of return of the cash flows shown in the table below. We must subtract the current interest (of 8% per £100 of stock) from the current market price, and use this 'ex interest' market value. A discount rate of 10% is chosen for a trial-and-error start to the calculation.

Item and date		*Year*	*Cash flow*	*Discount factor*	*Present value*
			£	10%	£
Market value (ex int)	28.12.X2	0	(95)	1.000	(95.0)
Interest	31.12.X3	1	8	0.909	7.3
Interest	31.12.X4	2	8	0.826	6.6
Interest	31.12.X5	3	8	0.751	6.0
Redemption	1.1.X6	3	100	0.751	75.1
				NPV	0

By coincidence, the market rate of interest is 10% since the NPV of the cash flows above is zero.

(b) If the market rate of interest is expected to rise in 19X3 and 19X4 it is probable that the market price in December 19X2 will fall to reflect the new rates obtainable. The probable market price would be the discounted value of all future cash flows up to 19X6, at a discount rate of 12%.

Item and date		*Year*	*Cash flow*	*Discount factor*	*Present value*
			£	*12%*	£
Interest	31.12.X2	0	8	1.000	8.0
Interest	31.12.X3	1	8	0.893	7.1
Interest	31.12.X4	2	8	0.797	6.4
Interest	31.12.X5	3	8	0.712	5.7
Redemption	1.1.X6	3	100	0.712	71.2
				NPV	98.4

The estimated market price would be £98.4 per cent *cum* interest.

(c) Again we must deduct the current interest payable and use ex interest figures.

At a market value of 103			*Cash flow ex int*	*PV 5%*	*PV 8%*
Item and date		*Year*	£	£	£
Market value		0	(95.0)	(95.0)	(95.0)
Interest	31.12.X3	1	8.0	7.6	7.4
Tax saved	31.12.X4	2	(2.6)	(2.4)	(2.2)
Interest	31.12.X4	2	8.0	7.3	6.9
Tax saved	31.12.X5	3	(2.6)	(2.2)	(2.1)
Interest	31.12.X5	3	8.0	6.9	6.4
Tax saved	31.12.X6	4	(2.6)	(2.1)	(1.9)
Redemption	1. 1.X6	3	100.0	86.4	79.4
NPV				6.5	(1.1)

The estimated cost of capital is:

$$5\% + \left(\frac{6.5}{(6.5 - -1.1)} \times 3\%\right) = 7.6\%$$

The cost of floating rate debt

2.30 If a firm has floating rate debt, then the cost of an equivalent fixed interest debt should be substituted. 'Equivalent' usually means fixed interest debt with a similar term to maturity in a firm of similar standing, although if the cost of capital is to be used for project appraisal purposes, there is an argument for using debt of the same duration as the project under consideration.

The cost of convertible securities

2.31 The cost of fixed interest securities which are convertible into ordinary shares is found as follows, allowing for taxation and assuming that conversion will take place.

$$P_0 = \frac{I(1-t)}{(1+r)} + \frac{I(1-t)}{(1+r)^2} + \ldots\ldots + \frac{I(1-t)}{(1+r)^n} + \frac{P_n \times R}{(1+r)^n}$$

where P_0 is the current market price of the convertible security, convertible in year n, after paying the current year's interest
I is the annual interest payment
t is the rate of corporation tax
r is the cost of capital of the convertible security holders
P_n is the market value of an ordinary share in year n
R is the conversion ratio, that is the number of shares into which the security is convertible.

The cost of capital, r, would be calculated by finding the IRR which equates P_0 with the present value of the future cash flows.

If the cost of capital found by treating the convertibles as non-convertible debentures is higher, that higher cost should be used on the basis that the debenture holders will choose not to convert, so as to secure the higher rate of return for themselves.

Example: cost of capital (5)

2.32 Some 8% convertible debentures have a current market value of £106 per cent. An interest payment was made recently.

The debentures will be convertible into equity shares in three years time, at a rate of four shares per £10 of debentures. The shares are expected to have a market value of £3.50 each at that time, and all the debenture holders are expected to convert their debentures.

What is the cost of capital to the company for the convertible debentures? Corporation tax is at 33%. Assume that tax savings occur in the same year that the interest payments arise.

Solution

2.33

			Try 12 %		*Try 15%*	
Year	*Item*	*Cash flow*	*Discount factor*	*PV*	*Discount factor*	*PV*
				£		£
0	Current MV	(106.00)	1.000	(106.00)	1.000	(106.00)
1-3	Interest less tax (I(1–t))	5.36	2.402	12.87	2.283	12.24
3	Value of shares on conversion (40 × £3.5)	140.00	0.712	99.68	0.658	92.12
				6.55		(1.64)

$$\text{Cost of capital} = 12\% + \left[\frac{6.55}{(6.55 - -1.64)} \times (15-12)\right]\%$$

= 12% + 2.4%
= 14.4%, say 14%

The cost of short-term funds

2.34 The cost of short-term funds such as bank loans and overdrafts is the current interest being charged on such funds.

Depreciation

2.35 Depreciation, being a non-cash item of expense, is ignored in our cost of capital computations, but depreciation is a means of retaining funds within a business for new investments or replacements. For our purposes, it is sufficient to say that the cost of funds retained by depreciation *is ignored*, because it is argued that they should be taken as having a cost equal to the company's weighted average cost of capital, and so are irrelevant to the calculation of the cost of capital.

3 SPECIAL PROBLEMS

Private companies and the cost of equity

3.1 The cost of capital cannot be calculated from market values for *private companies* in the way that has been described so far, because the shares in a private company do not have a quoted market price.

Since private companies do not have a cost of equity that can be readily estimated, it follows that a big problem for private companies which want to use DCF for evaluating investment projects is how to select a cost of capital for a discount rate.

3.2 Suitable approaches might be:

(a) to estimate the cost of capital for similar public companies, but then add a further premium for additional business and financial risk;

(b) to build up a cost of capital by adding estimated premiums for business risk and financial risk to the risk-free rate of return.

Government organisations and the cost of capital

3.3 The same problem faces government organisations. Government organisations do not have a market value, and most of them do not pay interest on much or all of the finance they receive. Government activities do not involve business risk, and there is no financial risk either for the investor, which is mainly the government itself. In practice, the problem is overcome in the case of nationalised industries by using a target 'real' rate of return set by the Treasury rather than a cost of capital.

The cost of equity capital: gross dividend or net dividend yield?

3.4 We have seen that the cost of equity is calculated on the basis of net dividends (perhaps with dividend growth). This selection of net dividends rather than gross dividends for the cost of equity requires some explanation.

3.5 The net dividend is the appropriate choice because the cost of capital is used as the discount rate for the evaluation of capital projects by a company, and the company must have sufficient profits from its investments to pay shareholders the net dividends they require out of after-tax profits.

3.6 The taxation on profits is allowed for in the cash flows of each project. The discount rate is therefore applied to the cash flows of the project after tax. If a company were to make

a payment of dividends out of profits, the amount available would be the net dividend, related to the after-tax profits earned.

3.7 Since the company's cost of equity is connected with the net dividends payable by the company, the company need not be concerned with the net dividends received by the shareholders after personal taxation has been deducted from the shareholders' gross dividend income. The cash return to a shareholder from his investment in the shares may well differ from the cash which the company pays out. That is, the cost of equity to the company will differ from the required net return of the shareholder.

3.8 Different shareholders have different tax positions, and may therefore have different preferences as to the amount of dividends they receive and the amount of retained earnings kept within the business for capital growth.

4 THE WEIGHTED AVERAGE COST OF CAPITAL

Computing a discount rate

4.1 We have now looked at the costs of individual sources of capital for a company. But how does this help us to work out the cost of capital as a whole, or the discount rate to apply in DCF investment appraisals?

4.2 In many cases it will be difficult to associate a particular project with a particular form of finance. A company's funds may be viewed as a pool of resources. Money is withdrawn from this pool of funds to invest in new projects and added to the pool as new finance is raised or profits are retained. Under these circumstances it might seem appropriate to use an average cost of capital as the discount rate.

4.3 The correct cost of capital to use in investment appraisal is the marginal cost of the funds raised (or earnings retained) to finance the investment.

The weighted average cost of capital (WACC) might be considered the most reliable guide to the marginal cost of capital, but only on the assumption that the company continues to invest in the future, in projects of a standard level of business risk, by raising funds in the same proportions as its existing capital structure.

General formula for the WACC

4.4 A general formula for the weighted average cost of capital is:

$$\text{WACC} = K_{eg}\left(\frac{E}{E+D}\right) + K_d\left(\frac{D}{E+D}\right)$$

where K_{eg} is the cost of equity
K_d is the cost of debt
E is the market value of equity in the firm
D is the market value of debt in the firm

4.5 The above formula ignores taxation. Bringing in corporation tax, we should calculate the cost of debt net of tax, where the tax rate is t, as follows.

$$\text{WACC} = K_{eg}\left(\frac{E}{E+D}\right) + K_d(1-t)\left(\frac{D}{E+D}\right)$$

This second formula is included on the Paper 14 *Formulae Sheet*. However, it works only for irredeemable debt. If you are given a pre-tax cost of debt, and no details about the nature of the debt, then you can assume that it is irredeemable.

If you need to calculate WACC where debt is redeemable, you should calculate the after-tax cost of debt using the techniques set out earlier in this chapter and substitute this into the formula in place of $K_d (1 - t)$.

Example: weighted average cost of capital (1)

4.6 Prudence plc is financed partly by equity and partly by debentures. The equity proportion is always kept at two thirds of the total. The cost of equity is 18% and that of debt 12%. A new project is under consideration which will cost £100,000 and will yield a return before interest of £17,500 a year in perpetuity. Should the project be accepted? Ignore taxation.

Solution

4.7 Since the company will maintain its gearing ratio unchanged, it is reasonable to assume that its marginal cost of funds equals its WACC. The weighted average cost of capital is as follows.

	Proportion	*Cost*		*Cost × proportion*
Equity	$\frac{2}{3}$	18%		12%
Debt	$\frac{1}{3}$	12%		4%
			WACC	16%

4.8 The present value of the future returns in perpetuity can be found using the WACC as the discount rate, as follows.

$$\text{Present value of future cash flows} = \frac{\text{annual cash flow}}{\text{discount rate}} = \frac{£17,500}{0.16} = £109,375$$

4.9 The NPV of the investment is £109,375 – £100,000 = £9,375.

4.10 Another way of looking at the investment shows how using the WACC as the discount rate ensures that equity shareholders' wealth is increased by undertaking projects with a positive NPV when discounted at the WACC.

The amount of finance deemed to be provided by the debenture holders will be $^1/_3 \times$ £100,000 = £33,333. The interest on this will be 12% × £33,333 = £4,000, leaving £13,500 available for the equity shareholders. The return they are receiving based on their 'investment' of £66,667 will be as follows.

$$\text{Return to equity} = \frac{£13,500}{£66,667} = 0.2025 \text{ or } 20.25\%$$

As this return exceeds the cost of equity capital, the project is acceptable.

Weighting

4.11 In the last example, we simplified the problem of weighting the different costs of capital by giving the proportions of capital. Two methods of weighting could be used.

(a) Weights could be based on market values (by this method, the cost of retained earnings is implied in the market value of equity).

(b) Weights could be based on book values.

Although the latter are often easier to obtain they are of doubtful economic significance. It is, therefore, more meaningful to use market values when data are available. For unquoted companies estimates of market values are likely to be extremely subjective and consequently book values may be used. When using market values it is not possible

to split the equity value between share capital and reserves and only one cost of equity can be used. This removes the need to estimate a separate cost of retained earnings.

Exercise 2

The management of Custer Ackers plc are trying to decide on a cost of capital to apply to the evaluation of investment projects.

The company has an issued share capital of 500,000 ordinary £1 shares, with a current market value cum div of £1.17 per share. It has also issued £200,000 of 10% debentures, which are redeemable at par in two years time and have a current market value of £105.30 per cent, and £100,000 of 6% preference shares, currently priced at 40p per share. The preference dividend has just been paid, and the ordinary dividend and debenture interest are due to be paid in the near future.

The ordinary share dividend will be £60,000 this year, and the directors have publicised their view that earnings and dividends will increase by 5% a year into the indefinite future.

The fixed assets and working capital of the company are financed by the following.

	£
Ordinary shares of £1	500,000
6% £1 Preference shares	100,000
Debentures	200,000
Reserves	380,000
	1,180,000

Required

Advise the management. Ignore inflation, and assume corporation tax of 33%. Assume also that tax savings occur in the same year as the interest payments to which they relate.

Note. The cost of capital of a security is the IRR which equates the current market value of the security with its expected future cash flows. The balance sheet (accounting) values of the securities and reserves should be ignored.

Solution

(a) *Equity.* Given a 5% annual increase in dividend in perpetuity, the cost of equity capital may be estimated as

$$\frac{60,000(1+0.05)}{585,000-60,000^{*}}+0.05=0.17=17\%$$

* MV ex div

(b) *Preference shares.* The cost of capital is $\frac{6p}{40p}\times 100\%=15\%$

(c) *Debentures.* The cost of capital is the IRR of the following cash flows.

Year	*Cost*	*Interest*	*Tax relief*	*Net cash flows*
	£	£	£	£
0	(95.30)			(95.30)
1		10	(3.30)	6.70
2	100.00	10	(3.30)	106.70

Net cash flow		*Try 10%*		*Try 8%*
		PV		*PV*
£	*Discount factor*	£	*Discount factor*	£
(95.30)	1.000	(95.30)	1.000	(95.30)
6.70	0.909	6.09	0.926	6.20
106.70	0.826	88.13	0.857	91.44
		(1.08)		2.34

$$\text{The IRR is approx } 8\%+\frac{2.34}{(2.34--1.08)}\times(10-8)\%$$

$$=9.37\%, \text{ say } 9\%$$

(d) *Weighted average cost of capital*

Item	*Market value*	*Cost of capital*	*Product*
	£		£
Ordinary shares*	525,000	17%	89,250
Preference shares	40,000	15%	6,000
Debentures*	190,600	9%	17,154
	755,600		112,404

* ex div and ex interest

$$\text{WACC} = \frac{112,404}{755,600} = 0.149 = 14.9\%, \text{ say } 15\%$$

(e) The management of Custer Ackers plc may choose to add a premium for risk on top of this 15% and apply a discount rate of, say, 18% to 20% in evaluating projects.

Arguments for using the WACC

4.12 The weighted average cost of capital can be used in investment appraisal if we make the following assumptions:

(a) new investments must be financed by new sources of funds: retained earnings, new share issues, new loans and so on;

(b) the cost of capital to be applied to project evaluation must reflect the marginal cost of new capital; and

(c) the weighted average cost of capital reflects the company's long-term future capital structure, and capital costs. If this were not so, the current weighted average cost would become irrelevant because eventually it would not relate to any actual cost of capital.

Arguments against using the WACC

4.13 The arguments against using the WACC as the cost of capital for investment appraisal (as follows) are based on criticisms of the assumptions that are used to justify use of the WACC.

(a) New investments undertaken by a company might have different *business risk* characteristics from the company's existing operations. As a consequence, the return required by investors might go up (or down) if the investments are undertaken, because their business risk is perceived to be higher (or lower).

(b) 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. Depending on whether the project is financed by equity or by debt capital, the perceived financial risk of the entire company might change. This must be taken into account when appraising investments.

(c) Many companies raise *floating rate* debt capital as well as fixed interest debt capital. With floating rate debt capital, the interest rate is variable, and is altered every three or six months or so in line with changes in current market interest rates. The cost of debt capital will therefore fluctuate as market conditions vary. Floating rate debt is difficult to incorporate into a WACC computation, and the best that can be done is to substitute an 'equivalent' fixed interest debt capital cost in place of the floating rate debt cost.

Marginal cost of capital approach

4.14 The marginal cost of capital approach involves calculating a marginal cut-off rate for acceptable investment projects by:

(a) establishing rates of return for each component of capital structure, except retained earnings, based on its value if it were to be raised under current market conditions;

(b) relating dividends or interest to these values to obtain a marginal cost for each component;

(c) applying the marginal cost to each component depending on its proportionate weight within the capital structure and adding the resultant costs to give a weighted average.

4.15 It can be been argued that the current weighted average cost of capital should be used to evaluate projects, where a company's capital structure changes only very slowly over time; then the marginal cost of new capital should be roughly equal to the weighted average cost of current capital.

If this view is correct, then by undertaking investments which offer a return in excess of the WACC, a company will increase the market value of its ordinary shares in the long run. This is because the excess returns would provide surplus profits and dividends for the shareholders.

4.16 Where gearing levels fluctuate significantly, or the finance for new project carries a significantly different level of risks to that of the existing company, there is good reason to seek an alternative marginal cost of capital.

4.17 Note that the marginal cost of capital approach outlined above only takes into account the incremental financing costs of the new project. The financing of a major project may change the risk profile of the existing capital structure, in which case the 'adjusted present value' (APV) method, discussed in the next chapter, is likely to be more appropriate.

5 THE COST OF CAPITAL, THE NPV OF NEW PROJECTS AND THE VALUE OF SHARES

5.1 Using the dividend valuation model, it can be argued that the total value of a company's shares will increase by the NPV of any project that is undertaken, provided that there is no change in the company's WACC.

We shall begin by considering this argument for companies financed entirely by equity, so that the WACC and the cost of equity are the same.

5.2 Suppose that a company relying on equity as its only source of finance wishes to invest in a new project. If the money is raised by issuing new share capital to the existing shareholders and the inflows generated by the new project are used to increase dividends, then the project will have to show a positive net present value (NPV) at the shareholders' marginal cost of capital, because otherwise the shareholders would not agree to provide the new capital.

5.3 The gain to the shareholders after acceptance of the new project will be the difference between the market value of the company before acceptance of the new project and the market value of the company after acceptance of the new project less the amount of funds raised from the shareholders to finance the project.

The market value of the shares will increase by:

$$\frac{A_1}{(1+K_e)} + \frac{A_2}{(1+K_e)^2} + \frac{A_3}{(1+K_e)^3} + \ldots\ldots - (\text{Cost of project})$$

where $A_1, A_2 \ldots\ldots$ are the additional dividends at years 1, 2 and so on
K_e is the shareholders' marginal cost of capital

This is the NPV of the project.

Investments financed by retained profits

5.4 If for some reason there is a limit to the number of new shares that a company can issue to its shareholders and a company could undertake many projects with positive net present values, then reducing its dividend payment would increase the supply of capital available. Even though in the short term dividends will be reduced, this will be more than compensated for in the long term by the fact that extra cash inflows generated by the investments will increase dividends in the future. Indeed, it can be argued that no dividends should be paid until all projects with positive net present values have been financed.

Example: increase in the market value of shares

5.5 Hubble plc, which has just paid its current dividend, expects to pay dividends of £6,000 at year 1, £6,000 at year 2 and £8,000 a year from then onwards.

A new project has just been discovered which will require an outlay of £3,000 at year 1 and will yield cash inflows of £2,000 each year for two years. If the project is accepted, dividends will be adjusted accordingly. The shareholders' marginal cost of capital is estimated at 15%.

If the shareholders were told at year 0 that the project was going to be accepted and they were given full information about the project, what should be the theoretical increase in the market value of the company's shares?

Solution

5.6 (a) The market value of company at year 0 before acceptance of the new project is:

$$\frac{£6,000}{1.15}+\frac{£6,000}{1.15^2}+\frac{£8,000}{1.15^3}+\frac{£8,000}{1.15^4}+ \text{... (£8,000 pa in perpetuity)}$$

The value at year 2 of £8,000 receivable each year from year 3 onwards is:

$$\frac{£8,000}{0.15} = £53,333$$ which means that the computation above can be simplified to:

$$\frac{£6,000}{1.15}+\frac{£6,000}{1.15^2}+\frac{£53,333}{1.15^2} = £50,080$$

(b) The market value of the company at year 0 after acceptance of the new project is:

$$\frac{£3,000}{1.15}+\frac{£8,000}{1.15^2}+\frac{£10,000}{1.15^3}+\frac{£8,000}{1.15^4}+ \text{... (£8,000 pa in perpetuity)}$$

The year 1 dividend will be £3,000 lower than before and the years 2 and 3 dividends will be £2,000 higher than before.

$$\frac{£3,000}{1.15}+\frac{£8,000}{1.15^2}+\frac{£10,000}{1.15^3}+\frac{£53,333}{1.15^3} = £50,300$$

(c) The market value of the company at year 0 would increase by £220 (£50,300 – £50,080) after acceptance of the project. The £220 can be proved as follows.

(i) NPV of the project at year 1 $= \frac{£2,000}{1.15^2}+\frac{£2,000}{1.15}-£3,000$

$= £(1,512 + 1,739 - 3,000) = £251$

(ii) NPV at year 0 of £251 receivable at the end of year 1

$$= \frac{£251}{1.15} = £218$$

This NPV of £218 is the same as the increase in the market value of £220, allowing for a rounding error of £2.

5.7 In the example above, the shareholders would in theory benefit from a sudden rise in the price equal to the net present value of the new project as soon as the project was accepted. In practice, however, this is unlikely to happen for the following reasons.

(a) It would only happen if there is a strong form efficient market, or if dividend forecasts are published and are believed.

(b) Shareholders do not necessarily make rational decisions, so market values may not in practice respond to changes in future dividend expectations.

Conclusions for ungeared companies

5.8 If an all equity company undertakes a project, and it is financed in such a way that its cost of capital remains unchanged, the total market value of ordinary shares will increase by the amount of the NPV of the project.

If the market has strong form efficiency the shares will increase in value as soon as details of the intended project become available in advance of extra profits actually being earned and extra dividends actually being received from the project.

Geared companies

5.9 The situation is the same if a company has debt capital in its capital structure.

Example: geared company

5.10 Trubshaw plc is financed 50% by equity and 50% by debt capital. The cost of equity is 20% and the cost of debt is 14%. Ignoring tax, this means that Trubshaw's WACC is 17%.

The company currently pays out all its profits as dividends, and expected dividends are £800,000 a year into the indefinite future.

A project is under consideration which would cost £1,200,000, to be financed half by a new issue of equity and half by a new loan. It would increase annual profits before interest by £340,000. The costs of equity and debt capital would be unchanged.

(a) What is the NPV of the project?
(b) By how much would the value of equity increase if the project is undertaken?

Solution

5.11 The NPV of the project is as follows.

Year	*Cash flow*	*Discount factor*		*Present value*
	£	17%		£
0	(1,200,000)	1.0		(1,200,000)
1 - ∞	340,000	1/0.17		2,000,000
			NPV	800,000

The market value of the company as a whole will increase by £2,000,000, which is the project's NPV plus the cost of the investment. Of this, £1,000,000 will be debt capital and £1,000,000 will be equity.

5.12 To maintain the 50:50 debt:equity ratio, the cost of the investment will be financed by £1,000,000 debt capital and £200,000 equity. It would not be financed by £600,000 of each. This is because the NPV of £800,000 will add to the value of equity *only*, not to the value of the debt capital. If new equity of £200,000 is issued, the NPV of £800,000 will increase the market value of equity by £1,000,000 in total, which matches the new loan capital of £1,000,000.

5.13 The increased value of equity can be proved as follows.

	£
Annual profit from project, before interest	340,000
Less interest cost (£1,000,000 × 14%)	140,000
Increase in annual profits and dividends	200,000
Cost of equity	÷20%
Increase in the market value of equity	£1,000,000

5.14 This example therefore illustrates that given an unchanged WACC, the value of equity will be increased by the NPV of any project which is undertaken (plus the extra funds invested in equity, in this case £200,000) with the NPV calculated using a discount rate equal to the WACC.

Chapter roundup

- As you will see from this chapter, every source of finance has a cost. In deciding how to finance a company, the costs of all sources must be considered.
- Financial managers need a cost of capital to use in making decisions. A weighted average might seem a reasonable cost to use, but you should appreciate the arguments against, as well as those for, using it.

Test your knowledge

1 A cost of capital can be said to consist of three elements. What are they? (1.4)

2 What are the dividend valuation model formulae for the cost of equity:
(a) with no dividend growth? (2.5)
(b) with dividend growth? (2.8 - 2.12)

3 How is the after-tax cost of debt capital calculated? (2.24 - 2.27)

4 How is the cost of convertible securities calculated? (2.31)

5 Why should a weighted average cost of capital be used as the discount rate, instead of the cost of the funds that are specifically used to finance each new investment? (4.2)

6 On what assumption is it appropriate to use the weighted average cost of capital as the discount rate for investment evaluation? (4.3)

7 In calculating the WACC, should weightings be based on the market values or the book values of the sources of capital? (4.11)

8 What are the arguments against using the WACC as the discount rate? (4.14)

Now try illustrative question 5 at the end of the Study Text

Chapter 6

THE EFFECT OF CAPITAL STRUCTURE

This chapter covers the following topics.

		Syllabus reference
1	Gearing, financial risk and the cost of capital	3(d)
2	Traditional and net operating income views of WACC	3(d)
3	Modigliani-Miller (MM) theory without taxation	3(d)
4	Modigliani-Miller theory adjusted for taxation	3(d)
5	The adjusted present value method of project evaluation	3(e)

Introduction

This chapter should be read after the topics in Chapter 3 and Chapter 5 have been covered.

As well as looking at the theories of Modigliani and Miller - an important aspect of the syllabus - we explain a rather different topic: the adjusted present value (APV) method in project appraisal. The APV method provides a way of taking into account the financing effects of a project.

1 GEARING, FINANCIAL RISK AND THE COST OF CAPITAL

1.1 A high level of debt creates financial risk. The financial risk of a company's capital structure can be measured by a gearing ratio.

The method of calculating a gearing ratio which is appropriate for investment evaluation is one based on market values. Capital gearing can be measured as:

$$\frac{\text{Market value of debt (including preference shares)}}{\text{Market value of equity + market value of debt}} \text{ or } \frac{D}{D+E}$$

1.2 Because of the financial risk associated with gearing, higher gearing will increase the rate of return required by ordinary shareholders, and may also affect the yield required by long-term creditors. It follows that a company's gearing level could have a bearing on its weighted average cost of capital.

Gearing, project appraisal and the source of funds to finance a new project

1.3 It can be suggested that a project which has a positive NPV when its cash flows are discounted at the WACC might be financially harmful to shareholders if it is financed in the wrong way. This suggestion can be taken one step further.

If a project is viable (has a positive NPV) when it is discounted at the current WACC, then it would be worthwhile provided that the new funds which are raised to finance it leave the company's WACC unchanged.

Gearing and shareholders' investment decisions

1.4 The value of equity is related, not only to the size of dividends and the cost of equity, but also to the weighted average cost of capital. This connection will now be investigated in some detail.

We will assume that a shareholder would be prepared to accept a change in the gearing of a company, and therefore a change in the required rate of return for equity, provided that the effect of this change in gearing would be to increase the value of his shares, or at the very least to leave them unchanged.

2 TRADITIONAL AND NET OPERATING INCOME VIEWS OF WACC

2.1 There are two main theories about the effect of changes in gearing on the weighted average cost of capital (WACC) and share values. These are:

(a) the 'traditional' view;

(b) the net operating income approach (Modigliani and Miller.)

2.2 The assumptions on which these theories are based are as follows.

(a) The company pays out all its earnings as dividends.

(b) The gearing of the company can be changed immediately by issuing debt to repurchase shares, or by issuing shares to repurchase debt. There are no transaction costs for issues.

(c) The earnings of the company are expected to remain constant in perpetuity and all investors share the same expectations about these future earnings.

(d) Business risk is also constant, regardless of how the company invests its funds.

(e) Taxation, for the time being, is ignored.

The traditional view of WACC

2.3 The traditional view is as follows.

(a) 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 increase.

(b) The cost of equity rises as the level of gearing increases.

(c) The weighted average cost of capital does not remain constant, but rather falls initially as the proportion of debt capital increases, and then begins to increase as the rising cost of equity (and possibly of debt) becomes more significant.

(d) The optimum level of gearing is where the company's weighted average cost of capital is minimised.

2.4 The traditional view about the cost of capital is illustrated n Figure 1. It shows that the weighted average cost of capital will be minimised at a particular level of gearing P.

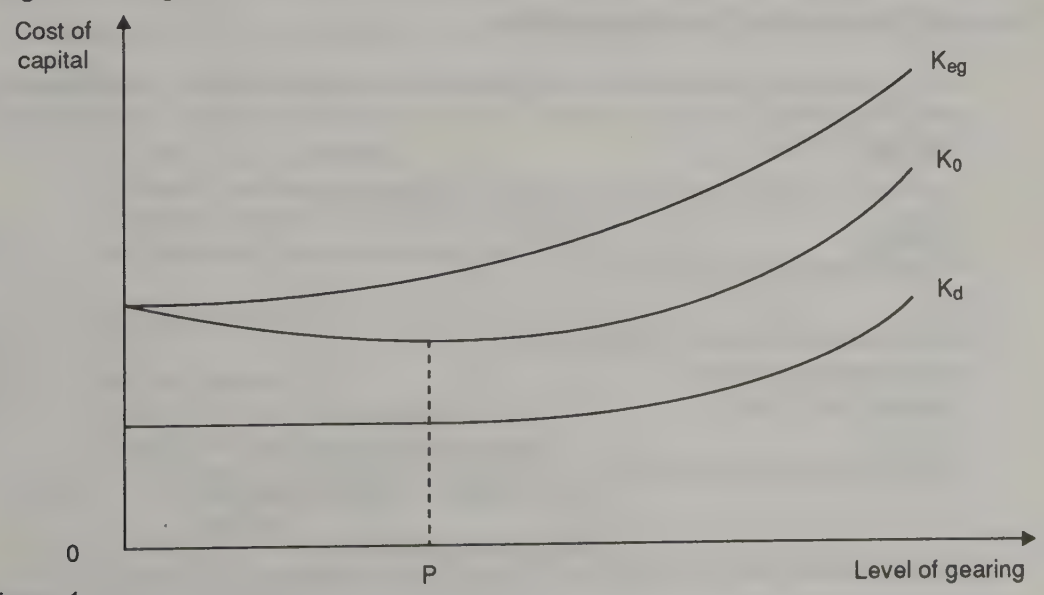


Figure 1

K_{eg} is the cost of equity in the geared company
K_d is the cost of debt
K_o is the weighted average cost of capital

2.5 The traditional view is that the weighted average cost of capital, when plotted against the level of gearing, is saucer shaped. The optimum capital structure is where the weighted average cost of capital is lowest, at point P.

The net operating income view of WACC

2.6 The net operating income approach takes a different view of the effect of gearing on WACC. It assumes that the weighted average cost of capital is unchanged, regardless of the level of gearing, because of the following two factors.

(a) The cost of debt remains unchanged as the level of gearing increases.

(b) The cost of equity rises in such a way as to keep the weighted average cost of capital constant.

This would be represented on a graph as shown in Figure 2.

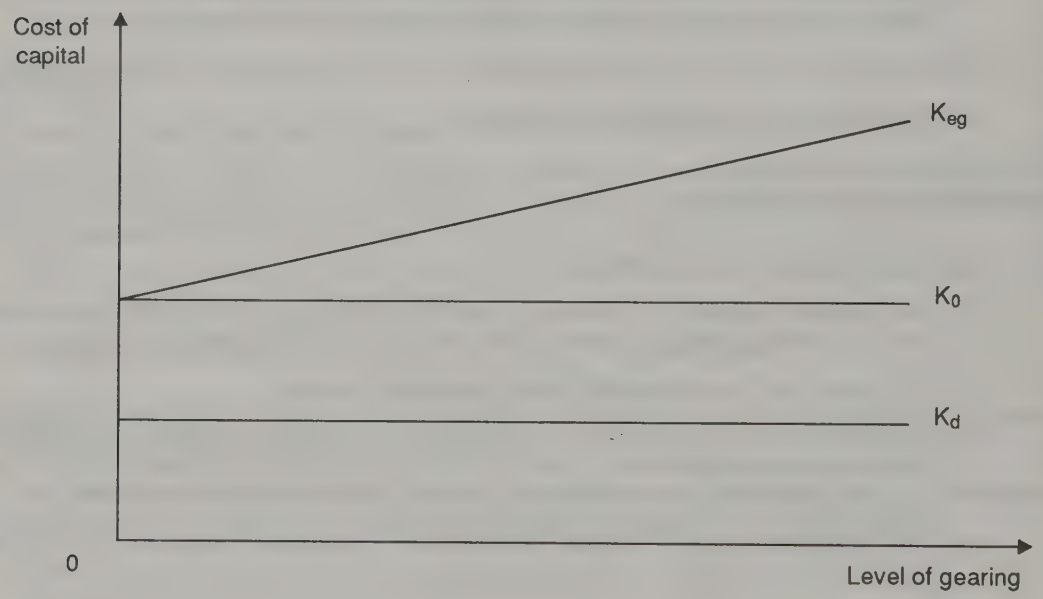


Figure 2

Example: net operating income approach

2.7 A company has £5,000 of debt at 10% interest, and earns £5,000 a year before interest is paid. There are 2,250 issued shares, and the weighted average cost of capital of the company is 20%.

The market value of the company should be as follows.

Earnings	£5,000
Weighted average cost of capital	0.2
	£
Market value of the company (£5,000 ÷ 0.2)	25,000
Less market value of debt	5,000
Market value of equity	20,000

The cost of equity is therefore $\frac{5{,}000 - 500}{20{,}000} = \frac{4{,}500}{20{,}000} = 22.5\%$

and the market value per share is $\frac{4{,}500}{2{,}250} \times \frac{1}{0.225} = £8.89$

2.8 Suppose that the level of gearing is increased by issuing £5,000 more of debt at 10% interest to repurchase 562 shares (at a market value of £8.89 per share) leaving 1,688 shares in issue.

The weighted average cost of capital will, according to the net operating income approach, remain unchanged at 20%. The market value of the company should still therefore be £25,000.

Earnings	£5,000
Weighted average cost of capital	0.2
	£
Market value of the company	25,000
Less market value of debt	10,000
Market value of equity	15,000

Annual dividends will now be £5,000 – £1,000 interest = £4,000.

The cost of equity has risen to $\frac{4,000}{15,000} = 26.667\%$ and the market value per share is still

$$\frac{4,000}{1,688} \times \frac{1}{0.2667} = £8.89$$

2.9 The conclusion of the net operating income approach is that the level of gearing is a matter of indifference to an investor, because it does not affect the market value of the company, nor of an individual share. This is because as the level of gearing rises, so does the cost of equity in such a way as to keep both the weighted average cost of capital and the market value of the shares constant.

Although, in our example, the dividend per share rises from £2 to £2.37 the increase in the cost of equity is such that the market value per share remains at £8.89.

Exercise 1

AB plc has a WACC of 16%. It is financed partly by equity (cost 18%) and partly by debt capital (cost 10%). The company is considering a new project which would cost £5,000,000 and would yield annual profits of £850,000 before interest charges. It would be financed by a loan at 10%. As a consequence of the higher gearing, the cost of equity would rise to 20%. The company pays out all profits as dividends, which are currently £2,250,000 a year.

(a) What would be the effect on the value of equity of undertaking the project?

(b) To what extent can you analyse the increase or decrease in equity value into two causes, the NPV of the project at the current WACC and the effect of the method of financing?

Ignore taxation. The traditional view of WACC and gearing is assumed in this exercise.

Solution

(a)

	£
Current profits and dividends	2,250,000
Increase in profits and dividends (£850,000 less extra interest 10% x £5,000,000)	350,000
New dividends, if project is undertaken	2,600,000
New cost of equity	20%
	£
New MV of equity	13,000,000
Current MV of equity (£2,250,000 ÷ 0.18)	12,500,000
Increase in shareholder wealth from project	500,000

(b) (i) NPV of project if financed at current WACC

$$= \frac{£850,000}{0.16} - £5,000,000 = + £312,500$$

(ii) The effect of financing on share values must be to increase the MV of equity by the remaining £187,500, which indicates that the effect of financing the project in the manner proposed will be to increase the company's gearing, but to reduce its WACC.

3 MODIGLIANI-MILLER (MM) THEORY WITHOUT TAXATION

3.1 Modigliani and Miller developed a defence of the net operating income approach to the effect of gearing on the cost of capital. Their view was that investors would use *arbitrage* to keep the weighted average cost of capital constant when changes in a company's gearing occur.

Arbitrage

3.2 Arbitrage is trading in shares and debt to profit by different prices in different companies. An example will be used to explain how it works.

Example: arbitrage

3.3 Consider two companies, Ordinary plc and Levered plc, in the same risk class, which are identical in all respects except that Ordinary plc is financed entirely by equity whereas the capital structure of Levered plc includes £40,000 of debt at 8% interest.

We will assume that the annual earnings of both companies (before interest) are the same, £20,000, and we will begin by considering the traditional view of the cost of capital, and suppose that the cost of equity in the unlevered company is 13½%, and in the levered company, it is higher at 14%.

The market valuation of each company, according to the traditional view, would be as follows.

	Ordinary plc	*Levered plc*
	£	£
Annual earnings	20,000	20,000
Less interest	-	3,200
Available for equity (earnings = dividends)	20,000	16,800
Cost of equity	0.135	0.14
	£	£
Market value of equity	148,148	120,000
Market value of debt	-	40,000
Market value of company	148,148	160,000
Weighted average cost of capital (PBIT ÷ market value)	13.5%	12.5%
Gearing ratio	0%	33.3%

3.4 The two companies, identical in every respect except their gearing, are therefore assumed by the traditional view to have different market values. MM argue that this situation could not last for long because investors in Levered plc would soon see that they could get the same return for a smaller investment by investing in Ordinary plc. Exercising arbitrage, they would sell their shares in Levered plc and buy shares in Ordinary plc.

This sale would:

(a) drive up the price of Ordinary plc shares (thereby lowering the cost of its equity capital); and

(b) force down the price of Levered plc shares (thereby raising the cost of its equity capital); until the total market value of each company is the same. Arbitrage would then cease.

3.5 Arbitrage would occur as follows. Suppose Mr Onepercent owns 1% of the equity in Levered plc. These would have a market value of (1% × £120,000) = £1,200. He would notice that Ordinary plc makes the same annual earnings as Levered plc (£20,000) but with a smaller investment (£148,148 compared to £160,000). He would therefore take the following steps.

(a) He would sell his shares in Levered plc for £1,200.

(b) He would borrow £400 at 8% interest. This amount is equivalent to 1% of the debt of Levered plc (£40,000 at 8%). In this way, Mr Onepercent would have substituted personal gearing for the corporate gearing of Levered plc. His assets would be as follows.

£	
1,200	from the sale of his shares
400	borrowed at 8%
1,600	which is 1 % of the value of Levered plc

His personal gearing ratio (400/1,200 = 33.3%) is the same as the gearing ratio of Levered plc, and so MM would argue that his financial risk is in no way changed by this process of arbitrage.

(c) He would then buy 1% of the equity of Ordinary plc for £148,148 × 1% = £1,481.48. To do this, he would use the borrowed £400 plus £1081.48 of his own money.

(d) His annual earnings from Ordinary plc would be as follows.

	£
1% of £20,000	200
Less the interest he must repay on his personal loan (8% of £400)	32
Net earnings	168

This is exactly the same as he would earn from keeping 1% of the equity of Levered plc (1% of £16,800) but he can earn this from a smaller net investment of £1,081.48 rather than £1,200.

(e) Alternatively, if he spends the entire £1,600 in purchasing shares of Ordinary plc, his annual earnings would be a dividend of:

$\frac{1,600}{148,148} \times £20,000 = £216$ less loan repayments of £32, leaving him with £184, which is £16 more than he currently earns from his Levered plc investment.

3.6 Rational investors will continue to substitute personal gearing for corporate gearing, and buy shares in Ordinary plc, until the price of these shares has risen, the price of Levered plc shares has fallen, and the market values of the two companies are the same. At this point:

(a) the cost of equity in the company with the higher gearing (Levered plc) will be higher than the cost of equity in the other company;

(b) because both the market values and the annual earnings of the companies are the same, the weighted average costs of capital must be the same, despite the difference in gearing.

The Modigliani-Miller propositions, ignoring taxes

3.7 We can now set out the propositions of Modigliani and Miller, ignoring tax relief on the interest charged on debt capital.

3.8 The following symbols will be used.

V_u = the market value of an ungeared (all equity) company

D = the market value of the debt capital in a geared company which is similar in every respect to the ungeared company (same profits before interest and same business risk) except for its capital structure. The debt capital is assumed, for simplicity, to be irredeemable

E = the market value of the equity in the geared company

K_{eu} = the cost of equity in an ungeared company

K_{eg} = the cost of equity in the geared company

K_d = the cost of debt capital

The total market value of the geared company (V_g) is then equal to ($E + D$).

Proposition 1 (ignoring taxation): the total market value of a company and the WACC

3.9 MM suggested that the total market value of any company is independent of its capital structure, and is given by discounting its expected return at the appropriate rate. The value of a geared company is therefore as follows.

$$V_g = V_u$$

$$V_g = \frac{\text{Profit before interest}}{\text{WACC}}$$

$$V_u = V_g = \frac{\text{Earnings in an ungeared company}}{K_{eu}}$$

Proposition 2 (ignoring taxation): the cost of equity in a geared company

3.10 MM went on to argue that the expected return on a share in a geared company equals the expected cost of equity in a similar but ungeared company, plus a premium related to financial risk.

3.11 The premium for financial risk can be calculated as the debt/equity ratio multiplied by the difference between the cost of equity for an ungeared company and the risk-free cost of debt capital.

$$K_{eg} = K_{eu} + [(K_{eu} - K_d) \times \frac{D}{E}]$$

Note the following points.

(a) The part of the formula to the right of the plus sign is the value of the premium for financial risk.

(b) The formula requires the debt ratio (debt : equity) to be used rather than the more common debt : (debt + equity).

(c) Market values are used - not book values.

Example: MM, ignoring taxation (1)

3.12 The cost of equity in Dunquin plc, an all equity company, is 15%. The WACC is therefore also 15%.

Another company, Bantry plc, is identical in every respect to the first, except that it is geared, with a debt:equity ratio of 1:4. The cost of debt capital is 5% and this is a risk-free cost of debt. What is Bantry plc's WACC?

Solution

3.13 $K_{eg} = 15\% + ((15 - 5)\% \times \frac{1}{4}) = 17.5\%$.

	Weighting	*Cost*		*Product*
Equity	80%	17.5%		14%
Debt	20%	5.0%		1%
			WACC =	15%

The WACC in the geared company is the same as in the ungeared company.

Example: MM, ignoring taxation (2)

3.14 Loesch plc is an all equity company and its cost of equity is 12%.

Berelco plc is similar in all respects to Loesch plc, except that it is a geared company, financed by £1,000,000 of 3% debentures (current market price £50 per cent) and 1,000,000 ordinary shares (current market price £1.50 ex div).

What is Berelco's cost of equity and weighted average cost of capital?

Solution

3.15 $$K_d = 3\% \times \frac{100}{50} = 6\%$$

$$K_{eg} = 12\% + [(12\% - 6\%) \times \frac{500}{1{,}500}] = 14\%$$

	Market value		*Cost*		
	£'000				£'000
Equity	1,500	×	0.14	=	210
Debt	500	×	0.06	=	30
	2,000				240

$$\text{WACC} = \frac{240}{2{,}000} = 0.12 = 12\%$$

This is the same as Loesch plc's WACC. As gearing is introduced, the cost of equity rises, but in such a way that the WACC does not change.

Weaknesses in MM theory

3.16 MM theory has been criticised on four main grounds.

(a) The risks for the investor may differ between personal gearing and corporate gearing. In the example in Paragraph 3.5 Mr Onepercent stands, financially, to lose no more than £1,200, which is in his stake in a company (Levered plc) with limited liability. If he practises arbitrage, he would stand to lose his personal investment in Ordinary plc (£1,481.48 – £400 = £1,081.48) plus his debt repayment (£400), a total of £1,481.48. The financial risk is consequently greater.

(b) The cost of borrowing for an individual is likely to be higher than the cost of borrowing for a company. MM assume that the cost is the same for personal and corporate borrowers.

(c) Transaction costs will restrict the arbitrage process.

(d) MM theory initially ignored tax implications (discussed below).

3.17 Further weaknesses in the MM theory are as follows.

(a) In practice, it may be impossible to identify firms with identical business risk and operating characteristics.

(b) Some earnings may be retained and so the simplifying assumption of paying out all earnings as dividends would not apply.

(c) Investors are assumed to act rationally which may not be the case in practice.

3.18 MM also acknowledge that when the level of gearing gets high, the cost of debt will rise. They argue, however, that this does not affect the weighted average cost of capital because the cost of equity falls at the same time as risk seeking investors are attracted to buying shares in the company.

3.19 When a company's gearing reaches very high levels, it may be perceived as being in danger of insolvency, and its market value will be very low (instead of being very high, as MM would predict). MM ignored the possibility of bankruptcy, and so their theory may not be valid at very high levels of gearing.

4 MODIGLIANI-MILLER THEORY ADJUSTED FOR TAXATION

4.1 Allowing for taxation reduces the cost of debt capital by multiplying it by a factor (1 – t) where t is the rate of corporation tax (assuming the debt to be irredeemable). So far, our analysis of MM theory has ignored the tax relief on debt interest, which makes debt capital cheaper to a company, and therefore reduces the weighted average cost of capital where a company has debt in its capital structure.

4.2 MM modified their theory to admit that tax relief on interest payments does lower the weighted average cost of capital. They claimed that the weighted average cost of capital will continue to fall, up to very high levels of gearing.

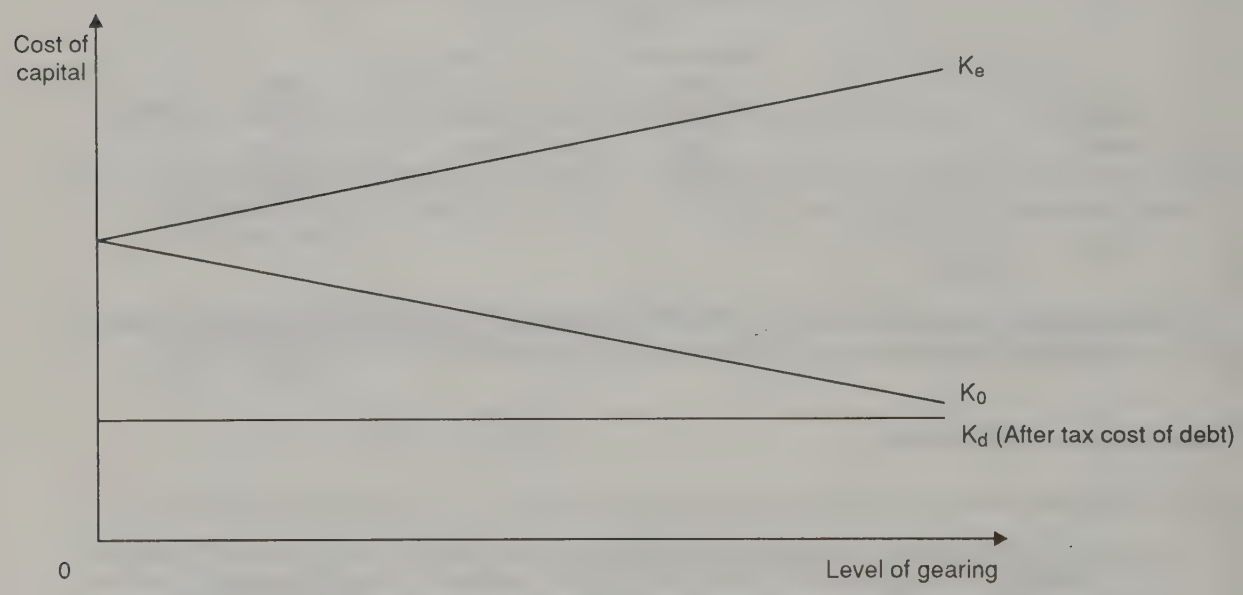


Figure 3

The adjustment to the MM cost of equity formula to allow for taxes

4.3 The formula for the cost of equity in a geared company becomes:

$$K_{eg} = K_{eu} + (1-t)[(K_{eu} - K_d) \times \frac{D}{E}]$$

where t is the corporation tax rate and K_d is the pre-tax (gross) cost of debt capital.

The financial risk premium is adjusted by a factor of (1 – t).

4.4 From this formula we can derive the following formula:

$$WACC_g = K_{eu}\left[1 - \frac{Dt}{E+D}\right]$$

where $WACC_g$ is the weighted average cost of capital of a geared company
K_{eu} is the cost of equity and the WACC of a similar ungeared company

This formula is included on the Paper 14 *Formulae Sheet.*

(You are not required to know the derivation, and so this is not given here.)

4.5 Thus assuming a corporation tax rate of 33%, Bantry plc's cost of equity in the example in Paragraphs 3.12 and 3.13 would be:

$$15\% + (1 - 0.33)[(15\% - 5\%) \times \frac{1}{4}] = 16.675\%$$

and its WACC would be:

$$15\% \left[1 - \frac{1 \times 0.33}{(1+4)}\right] = 15\% \times 0.934 = 14.01\%$$

4.6 This is below the ungeared company's WACC which is 15%. So higher gearing reduces the WACC.

Exercise 2

Apply the formula given in Paragraphs 4.3 and 4.4 to find the cost of equity and WACC for Berelco plc (using the information given in Paragraph 3.14). The corporation tax rate is 33%.

Solution

Berelco plc's cost of equity would be:

$$12\% + (1 - 0.33) \times \left[(12 - 6)\% \times \frac{500}{1{,}500}\right]$$

= 13.34%

and its WACC would be:

$$12\% \left[1 - \frac{500 \times 0.33}{1{,}500 + 500}\right] = 12\% \times 0.9175 = 11.01\%$$

This is below Loesch plc's WACC of 12%.

4.7 The WACC in a geared company will be lower than the WACC in an ungeared company ($WACC_u = K_{eu}$) by a measurable amount. WACC will fall as fearing increases.

$$WACC_g = WACC_u \times \frac{V_u}{V_g}$$

where $V_g = E + D$

Is there an optimum level of gearing?

4.8 We have now seen that MM modified their theory to say that when taxation is taken into account, the WACC will continue to fall as the level of gearing increases. The arbitrage process still operates, although the actions of investors will be influenced by their marginal rates of personal taxation.

4.9 MM argued that since WACC falls as gearing rises, and the value of a company should rise as its WACC falls, the value of a geared company will always be greater than its ungeared counterpart, but only by the amount of the debt-associated tax saving of the geared company, assuming a permanent change in gearing.

$$V_g = V_u + Dt$$

where V_g is the value of the similar geared company.

4.10 However, the positive tax effects of debt finance will be exhausted where there is insufficient tax liability to use the tax relief which is available. This is known as *tax shield exhaustion.*

Example: MM, with taxes

4.11 Notnil plc and Newbegin plc are companies in the same industry. They have the same business risk and operating characteristics, but Notnil is a geared company whereas Newbegin is all equity financed. Notnil plc earns three times as much profit before interest as Newbegin plc. Both companies pursue a policy of paying out all their earnings each year as dividends.

The market value of each company is currently as follows.

		Notnil plc		*Newbegin plc*
		£m		£m
Equity	(10m shares)	36	(20m shares)	15
Debt	(£12m of 12% loan stock)	14		
		50		15

The annual profit before interest of Notnil is £3,000,000 and that of Newbegin is £1,000,000. The rate of corporation tax is 33%.

It is thought that the current market value per ordinary share in Newbegin plc is at the equilibrium level, and that the market value of Notnil's debt capital is also at its equilibrium level. There is some doubt, however, about whether the value of Notnil's shares is at its equilibrium level.

Apply the MM formula to establish the equilibrium price of Notnil's shares.

Solution

4.12 $V_g = V_u + Dt$

V_u = the market value of an ungeared company. Since Notnil's earnings (before interest) are three times the size of Newbegin's, V_u is three times the value of Newbegin's equity:

$3 \times £15,000,000 = £45,000,000.$

$Dt = £14,000,000 \times 33\% = £4,620,000$

$V_g = £45,000,000 + £4,620,000 = £49,620,000.$

Since the market value of debt in Notnil plc is £14,000,000, it follows that the market value of Notnil's equity should be £49,620,000 – £14,000,000 = £35,620,000.

$$\text{Value per share} = \frac{£35,620,000}{10,000,000} = £3.562 \text{ per share}$$

Since the current share price is £3.60 per share, MM would argue that the shares in Notnil are currently over-valued by the market, but only by £380,000 in total or 3.8p per share.

4.13 Now let us relate the MM company valuation formula to the process of arbitrage.

Example: MM and arbitrage

4.14 Lenox plc and Groves plc are two companies operating in the same industry. They have the same business risk, and are identical in most other respects. The annual earnings before interest and tax are £40,000 for each company. The only differences between the companies are in their financial structures and their market values. Details of these are given below.

Lenox plc

	£
Ordinary shares of £1	30,000
Share premium account	10,000
Profit and loss account	110,000
Shareholders' funds	150,000
12% loan stock (newly issued)	100,000
	250,000

Lenox's ordinary shares have a market value of 600 pence, and the 12% loan stock is trading at £100.

Groves plc

	£
Ordinary shares of £1	50,000
Share premium account	16,000
Profit and loss account	100,000
Shareholders' funds	166,000

Groves' shares have a market value of 400 pence. Corporation tax is at 33%.

Suppose that you are the owner of 1% of the equity of Lenox plc. If you agreed with the propositions of Modigliani and Miller, would you retain your shares in Lenox or could you improve your financial position? Ignore personal taxes.

Solution

4.15 A difficulty with this problem is the need to allow for tax relief on corporate debt, when working out how an investor should gear himself up so as to achieve personal gearing which is the same as the geared company. Check the solution carefully on this point.

According to MM theory, where there are corporate taxes, the value of a geared company will always be greater than the value of its ungeared counterpart, but only by the amount of the debt-associated tax saving of the geared company. This is expressed by the formula:

$$V_g = V_u + Dt$$

If actual market values do not conform to this formula, it would follow that one company is incorrectly valued by the market relative to the other.

4.16 Let us assume that the shares of Groves, the ungeared company, are correctly valued by the market at 400 pence. We would then predict that the total market value of Lenox, the geared company, should be $(V_u + Dt)$.

	£
Market value of Groves shares (50,000 × £4)	200,000
Market value of Lenox debt multiplied by tax rate (100,000 × 33%)	33,000
Correct market value of Lenox plc	233,000

Actual market value of Lenox

	£
Market value of Lenox shares (30,000 × £6)	180,000
Market value of Lenox debt capital	100,000
	280,000

4.17 We can conclude that Lenox plc is over-valued by the market and so an investor in Lenox shares can improve his or her financial position by:

(a) selling all their shares in Lenox;

(b) gearing, by personal borrowing, so as to achieve the same personal gearing as Lenox;

(c) buying shares in Groves.

4.18 This action will increase the investor's income without any change in the investor's business or financial risk. This process of arbitrage should continue until the equilibrium of $V_g = V_u + Dt$ is restored.

4.19 1% of the equity of Lenox has a current market value of 1% × £180,000 = £1,800.

	£
Sell 1% holding of shares in Lenox to receive	1,800
Borrow, through personal borrowing*, an amount equal to 1% of the market value of Lenox's debt capital, adjusted to allow for the tax relief that Lenox gets on the debt interest (1% × £100,000 × 0.67)	670
	2,470

(* The rate of interest on personal borrowing is assumed to be the same as the market rate of interest on corporate debt, which is 12%).

The investor should now invest £2,470 in the equity of Groves plc, and can buy £2,470 ÷ £200,000 = 1.235% of Groves' shares.

4.20 The investor's income will now be higher than before, but because personal gearing has been substituted for corporate gearing, there is no change in the investor's financial risk. The increase in income can be illustrated as follows.

	Holding 1% shares in Lenox plc	*Holding 1.235% of shares in Groves plc with personal gearing*
	£	£
Earnings before interest and tax	40,000	40,000
Less interest charge for the company	12,000	0
	28,000	40,000
Less tax (33%)	9,240	13,200
Earnings, assumed equal to dividends	18,760	26,800
Investor's share (1% of Lenox/1.235% of Groves)	187.60	330.98
Less interest on personal debt (12% × £670)	0	80.40
Investor's net income	187.60	250.58

The investor can increase his or her annual income by £(250.58 – 187.60) = £62.98 through this arbitrage process.

Empirical testing and conclusion

4.21 It might be imagined that empirical testing should have been carried out by now either to prove or to disprove MM theory. Given, however, that MM accept that the weighted average cost of capital declines after allowing for tax, and that traditional theorists argue in favour of a flattish bottom to the weighted average cost of capital curve, it is very difficult to prove that one theory is preferable to the other.

Exercise 3

The cost of equity in an ungeared company is 18%. The cost of risk free debt capital is 8%.

(a) What is the cost of equity in a similar geared company, according to MM, which is 75% equity financed and 25% debt financed, assuming corporation tax at a rate of 33%?

(b) What is the WACC of the geared company, allowing for taxation?

Solution

(a) $K_{eg} = 18\% + (1 - 0.33)[(18 - 8)\% \times \frac{25}{75}] = 20.233\%$

(b) $WACC_g = 18\%[1 - \frac{0.33(25)}{(25+75)}]$

$= 18\% \times 0.9175 = 16.515\%$

Exercise 4

CD plc and YZ are identical in every respect except for their gearing. The market value of each company is as follows.

CD plc	£m	*YZ plc*	£m
Equity (5m shares)	?	(8m shares)	24
Debt (£20m of 5% loan stock)	10		
	?		24

According to MM theory, what is the value of CD plc shares, given a corporation tax rate of 33%?

Solution

Value of CD plc in total $V_g = V_u + Dt$ where V_u is the value of YZ plc.

V_g = £24,000,000 + £10,000,000 × 33% = £27,300,000.

CD plc's equity is valued at £27,300,000 - debt of £10,000,000 = £17,300,000, or £3.46 per share.

5 THE ADJUSTED PRESENT VALUE METHOD OF PROJECT EVALUATION 6/94

5.1 We have seen that a company's gearing level has implications for both the value of its equity shares and its WACC. The viability of an investment project will depend partly on how the investment is financed, and how the method of finance affects gearing.

5.2 The net present value method of investment appraisal is to discount the cash flows of a project at a cost of capital. This cost of capital might be the WACC, but it could also be another cost of capital, perhaps one which allows for the risk characteristics of the individual project.

5.3 An alternative method of carrying out project appraisal is to use the adjusted present value or APV method.

The APV method involves two stages.

(a) Evaluate the project first of all as if it were all equity financed, and so as if the company were an all equity company to find the 'base case NPV'.

(b) Make adjustments to allow for the effects of the method of financing that has been used.

Example: NPV method and APV method

5.4 A company is considering a project that would cost £100,000 to be financed 50% by equity (cost 21.6%) and 50% by debt (pre-tax cost 12%). The financing method would maintain the company's WACC unchanged.

The cash flows from the project would be £36,000 a year in perpetuity, before interest charges.

Corporation tax is at 33%.

Appraise the project using firstly the NPV method and secondly the APV method.

Solution

5.5 *The NPV method*

We can use the NPV method because the company's WACC will be unchanged.

	Cost	*Weighting*		*Product*
	%			%
Equity	21.60	0.5		10.80
Debt (67% of 12%)	8.04	0.5		4.02
			WACC	14.82

Annual cash flows in perpetuity from the project are as follows.

	£
Before tax	36,000
Less tax (33%)	11,880
After tax	24,120

NPV of project = −£100,000 + (£24,120 ÷ 0.1482)
= −£100,000 + £162,753 = +£62,753

5.6 Since £100,000 of new investment is being created, the value of the company will increase by £100,000 + £62,753 = £162,753, of which 50% must be debt capital.

The company must raise 50% × £162,753 = £81,376 of 12% debt capital, and (the balance) £18,624 of equity. The NPV of the project will raise the value of this equity from £18,624 to £81,377 thus leaving the gearing ratio at 50:50.

5.7 *The APV method*

The APV method is as follows.

(a) First, we need to know the cost of equity in an ungeared company. The MM formula we can use to establish this is:

$$K_{eg} = K_{eu} + (1 - t)[(K_{eu} - K_d)\frac{D}{E}]$$

$$21.6\% = K_{eu} + (0.67)[(K_{eu} - 12\%)\frac{50}{50}]$$

$$21.6\% = K_{eu} + 0.67K_{eu} - 8.04\%$$

$$16.7K_{eu} = 29.64\%$$

$$K_{eu} = 17.748503\%$$

(b) Next, we calculate the NPV of the project as if it were all equity financed. The cost of equity would be 17.748503%.

$$NPV = \frac{£24,120}{0.17748503} - £100,000$$

$$= + £35,899$$

(c) Next, we can use the MM formula for the relationship between the value of geared and ungeared companies, to establish the effect of gearing on the value of the project. £81,376 will be financed by debt.

$$V_g = V_u + Dt$$

$$= + £35,899 + (£81,376 \times 0.33)$$

$$= £62,753$$

5.8 The value Dt represents the present value of the tax shield on debt interest, that is the present value of the savings arising from tax relief on debt interest.

Annual interest charge = 12% of £81,376	=	£9,765.12
Tax saving (33% × £9,765.12)	=	£3,222.49
Cost of debt (pre-tax)	=	12%
PV of tax savings in perpetuity	=	£3,222.49 / 0.12
	=	£26,854

Dt = £81,376 × 0.33 = £26,854 is a quicker way of deriving the same value.

5.9 The APV and NPV approaches produce the same conclusion. However, the APV method can also be adapted to allow for financing which changes the gearing structure and the WACC. In this respect, it is superior to the NPV method.

5.10 Suppose, for example, that in the previous example, the entire project were to be financed by debt. The APV of the project would be calculated as follows.

(a) The NPV of project if all equity financed is:

$$\frac{£24{,}120}{0.17748503} - £100{,}000$$

= + £35,899 (as before)

(b) The adjustment to allow for the method of financing is the present value of the tax relief on debt interest in perpetuity.

Dt = £100,000 × 0.33

= £33,000

(c) APV = £35,899 + £33,000

= + £68,899

The project would increase the value of equity by £68,899.

Example: APV method

5.11 A company is considering a project with a four year life, costing £1,600,000. The project will be financed half by a 14% loan and half by a rights issue of shares.

Corporation tax is at 33%.

The costs of raising the loan will be £10,000 and the rights issue costs will be £40,000.

The project will earn cash flows after tax as follows.

Year	£
1	400,000
2	800,000
3	600,000
4	600,000

Tax is payable in the same year that the profits arise.

If the project were all equity financed, an appropriate cost of capital would be 18%.

What is the APV of the project?

Solution

5.12 (a) If the project were all equity financed, its NPV would be as follows.

Year	*Cash flow*	*Discount factor*	*PV*
	£	18%	£
0	(1,600,000)	1.000	(1,600,000)
1	400,000	0.847	338,800
2	800,000	0.718	574,400
3	600,000	0.609	365,400
4	600,000	0.516	309,600
			(11,800)

The NPV is negative.

(b) Next, make adjustments for the method of financing used.

(i) The annual interest payment on a loan of £800,000 at 14% is £112,000. The consequent annual reduction in tax is £112,000 × 33% = £36,960.

(ii) The present value of the tax shield, discounted at the pre-tax cost of debt (14%) is as follows.

Years	*Cash flow*	*Discount factor*	*PV*
	£	14%	£
1 - 4	36,960	2.914	107,701

Summary

	£	£
NPV, if all equity financed		(11,800)
PV of tax shield (years 1 – 4)		107,701
Issue costs		
Loan	(10,000)	
Rights issue	(40,000)	
		(50,000)
Adjusted present value		+45,901

Because of the method of financing chosen, the project is a worthwhile undertaking, with an APV of + £45,901.

Exercise 5

A project costing £100,000 is to be financed by £60,000 of irredeemable 12% debentures and £40,000 of new equity. The project will yield an annual cash flow of £21,000 in perpetuity. If it were all equity financed, an appropriate cost of capital would be 15%. The corporation tax rate is 33%. What is the project's APV?

Solution

	£
NPV if all equity financed: £21,000/0.15 – £100,000	40,000
PV of the tax shield: £60,000 × 12% × 33%/0.12	19,800
APV	59,800

The advantages and disadvantages of the APV method

5.13 The main advantage of the APV method is that it can be used to evaluate all the effects of the method of financing a project.

5.14 The NPV technique can allow for the financing side-effects implicitly, by adjusting the discount rate used. In contrast, the APV technique allows for the financing side-effects explicitly.

5.15 The main difficulties with the APV technique are:

(a) establishing a suitable cost of equity for the initial DCF computation as if the project were all-equity financed;

(b) identifying all the costs associated with the method of financing.

Chapter roundup

- The MM theories discussed in this chapter may seem to be far removed from the realities of day-to-day decision making. However, the directors of a company have a duty to act in the company's interests, and if there is an optimum level of gearing they should do their best to estimate and to achieve it.
- The APV method takes account of the fact that a project can change the capital structure of an enterprise.

Test your knowledge

1 Outline the traditional view of WACC. (see para 2.3)

2 Outline the net operating income view of WACC. (2.6)

3 What is the basis on which Modigliani and Miller (MM) defended the net operating income view of WACC? (3.1)

4 What weaknesses are there in MM's theory? (3.16, 3.17)

5 Taking taxation into account in MM's theory, is there an optimum level of gearing? (4.8 - 4.10)

6 Outline the adjusted present value method of project evaluation. (5.3)

Now try illustrative question 6 at the end of the Study Text

Chapter 7

PORTFOLIO THEORY

This chapter covers the following topics.

		Syllabus reference
1	Portfolios and portfolio theory	3(b)
2	Investors' preferences	3(b)
3	Portfolio theory and financial management	3(b)

Introduction

The diversification of portfolios is an important concept in financial management.

In this chapter, we explain the benefits of portfolio diversification. We explain portfolio theory, its relevance and its limitations.

1 PORTFOLIOS AND PORTFOLIO THEORY 6/95

1.1 A portfolio is the collection of different investments that make up an investor's total holding.

A portfolio might be:

(a) the investments in stocks and shares of an investor;
(b) the investments in capital projects of a company.

1.2 Portfolio theory, which originates from the work of Markowitz, is concerned with establishing guidelines for building up a portfolio of stocks and shares, or a portfolio of projects. The same theory applies to both stock market investors and to companies with capital projects to invest in.

Factors in the choice of investments

1.3 There are five major factors to be considered when an investor chooses investments, no matter whether the investor is an institutional investor, a company making an investment or a private individual investor.

(a) *Security*. Investments should at least maintain their capital value.

(b) *Liquidity*. Where the investments are made with short-term funds, they should be convertible back into cash at short notice.

(c) *Return*. The funds are invested to make money. The highest return compatible with safety should be sought.

(d) *Spreading risks*. The investor who puts all his funds into one type of security risks everything on the fortunes of that security. If it performs badly, his entire investment will make a loss. A better (and more secure) policy is to spread investments over several types of security, so that losses on some may be offset by gains on others.

(e) *Growth prospects*. The most profitable investments are likely to be in businesses with good growth prospects.

Portfolios: expected return and risk

1.4 When an investor has a portfolio of securities, he will expect the portfolio to provide a certain return on his investment.

1.5 The *expected return* of a portfolio will be a weighted average of the expected returns of the investments in the portfolio, weighted by the proportion of total funds invested in each.

The expected return $\bar{r}_p$ of a two-asset portfolio can thus be stated as the following formula:

$$\bar{r}_p = x\bar{r}_a + (1 - x)\bar{r}_b$$

where x is the proportion of investment A in the portfolio

$\bar{r}_a$, $\bar{r}_b$ are the expected returns of investments A and B

For example, if 70% of the portfolio relates to a security which is expected to yield 10% and 30% to a security expected to yield 12%, the portfolio's expected return is (70% × 10%) + (30% × 12%) = 10.6%.

1.6 The *risk* in an investment, or in a portfolio of investments, is the risk that the actual return will not be the same as the expected return. The actual return may be higher, but it may be lower. A prudent investor will want to avoid too much risk, and will hope that the actual returns from his portfolio are much the same as what he expected them to be.

1.7 The risk of a security, and the risk of a portfolio, can be measured as the standard deviation of expected returns, given estimated probabilities of actual returns.

Example: portfolios (1)

1.8 Suppose that the return from an investment has the following probability distribution.

Return x %	*Probability* p	*Expected value* px
8	0.2	1.6
10	0.2	2.0
12	0.5	6.0
14	0.1	1.4
		11.0

The expected return is 11%, and the standard deviation of the expected return is as follows. The symbol $\bar{x}$ refers to the expected value of the return, 11%.

Return x %	$x - \bar{x}$ %	p	$p(x - \bar{x})^2$
8	–3	0.2	1.8
10	–1	0.2	0.2
12	1	0.5	0.5
14	3	0.1	0.9
		Variance	3.4

Standard deviation = $\sqrt{3.4} = 1.84\%$

Thus, the expected return is 11% with a standard deviation of 1.84%.

1.9 The risk of an investment might be high or low, depending on the nature of the investment.

(a) Low risk investments usually give low returns.

(b) High risk investments might give high returns, but with more risk of disappointing results.

So how does holding a *portfolio* of investments affect expected returns and investment risk?

Diversification as a means of reducing risk

1.10 Portfolio theory states that individual investments cannot be viewed simply in terms of their risk and return. The relationship between the return from one investment and the return from other investments is just as important.

1.11 The relationship between investments can be one of three types.

(a) *Positive correlation*. When there is positive correlation between investments, if one investment does well (or badly) it is likely that the other will perform likewise. Thus if you buy shares in one company making umbrellas and in another which sells raincoats you would expect both companies to do badly in dry weather.

(b) *Negative correlation*. If one investment does well the other will do badly, and vice versa. Thus if you hold shares in one company making umbrellas and in another which sells ice cream, the weather will affect the companies differently.

(c) *No correlation*. The performance of one investment will be independent of how the other performs. If you hold shares in a mining company and in a leisure company, it is likely that there would be no relationship between the profits and returns from each.

1.12 This relationship between the returns from different investments is measured by the correlation coefficient. A figure close to +1 indicates high positive correlation, and a figure close to –1 indicates high negative correlation. A figure of 0 indicates no correlation.

1.13 If investments show high negative correlation, then by combining them in a portfolio overall risk would be reduced. Risk will also be reduced by combining in a portfolio investments which have no significant correlation.

Example: portfolios (2)

1.14 Security A and Security B have the following expected returns.

	Security A	*Security B*
Probability	*Return*	*Return*
0.1	15%	10%
0.8	25%	30%
0.1	35%	50%

1.15 The expected return from each security is as follows.

	Security A		*Security B*	
Probability	*Return*	*EV*	*Return*	*EV*
	%	%	%	%
0.1	15	1.5	10	1
0.8	25	20.0	30	24
0.1	35	3.5	50	5
	Expected return =	25.0	Expected return =	30

1.16 The variance of the expected return for each security is $\sum p(x - \bar{x})^2$

Probability	*Security A*			*Security B*		
	Return			*Return*		
p	x	$x - \bar{x}$	$p(x - \bar{x})^2$	y	$y - \bar{y}$	$p(y - \bar{y})^2$
0.1	15	(10)	10	10	(20)	40
0.8	25	0	0	30	0	0
0.1	35	10	10	50	20	40
	$\bar{x} = 25$	Variance =	20	$\bar{y}$ = 30	Variance =	80

1.17 The standard deviation is the square root of the variance.

Security A: $\sqrt{20} = 4.472\%$

Security B: $\sqrt{80} = 8.944\%$

Security B therefore offers a higher return than security A, but at a greater risk.

1.18 Let us now assume that an investor acquires a portfolio consisting of 50% A and 50% B. The *expected return* from the portfolio will be $0.5\times 25\% + 0.5\times 30\% = 27.5\%$. This is less than the expected return from security B alone, but more than that from security A. The combined portfolio should be less risky than security B alone (although in this example of just a two-security portfolio, it will be more risky than security A alone except when returns are negatively correlated).

1.19 We can work out the standard deviation of the expected return:

(a) if there is perfect positive correlation between the returns from each security, so that if A gives a return of 15%, then B will give a return of 10% and so on;

(b) if there is perfect negative correlation between the returns from each security, so that if A gives a return of 15%, B will yield 50%, if A gives a return of 35%, B will yield 10%, and if A gives a return of 25%, B will yield 30%;

(c) if there is no correlation between returns, and so the probability distribution of returns is as follows.

A	B		p
%	%		
15	10	(0.1×0.1)	0.01
15	30	(0.1×0.8)	0.08
15	50	(0.1×0.1)	0.01
25	10	(0.8×0.1)	0.08
25	30	(0.8×0.8)	0.64
25	50	(0.8×0.1)	0.08
35	10	(0.1×0.1)	0.01
35	30	(0.1×0.8)	0.08
35	50	(0.1×0.1)	0.01
			1.00

Perfect positive correlation

1.20 The standard deviation of the portfolio may be calculated as follows, given an expected return of 27.5%.

Probability	*Return from 50% A*	*Return from 50% B*	*Combined portfolio return*		
p			x	$x - \bar{x}$	$p(x - \bar{x})^2$
	%	%	%		
0.1	7.5	5	12.5	(15)	22.5
0.8	12.5	15	27.5	0	0
0.1	17.5	25	42.5	15	22.5
				Variance =	45.0

The standard deviation is $\sqrt{45} = 6.71\%$

Perfect negative correlation

1.21 The standard deviation of the portfolio, given an expected return of 27.5%, is as follows.

Probability p	*Return from 50%* A	*Return from 50%* B	*Combined portfolio return* x	$x - \bar{x}$	$p(x - \bar{x})^2$
	%	%	%		
0.1	7.5	25	32.5	5	2.5
0.8	12.5	15	27.5	0	0
0.1	17.5	5	22.5	(5)	2.5
				Variance =	5.0

The standard deviation is $\sqrt{5} = 2.24\%$

1.22 *No correlation*

The standard deviation of the portfolio, given an expected return of 27.5%, is as follows.

Probability	*Return from 50%*	*Return from 50%*	*Combined portfolio return*		
p	A	B	x	$x - \bar{x}$	$p(x - \bar{x})^2$
	%	%	%		
0.01	7.5	5	12.5	(15)	2.25
0.08	7.5	15	22.5	(5)	2.00
0.01	7.5	25	32.5	5	0.25
0.08	12.5	5	17.5	(10)	8.00
0.64	12.5	15	27.5	0	0.00
0.08	12.5	25	37.5	10	8.00
0.01	17.5	5	22.5	(5)	0.25
0.08	17.5	15	32.5	5	2.00
0.01	17.5	25	42.5	15	2.25
				Variance =	25.00

The standard deviation is $\sqrt{25} = 5\%$

Conclusion

1.23 You should notice that for the same expected return of 27.5%, the standard deviation (the risk):

(a) is highest when there is perfect positive correlation between the returns of the individual securities in the portfolio;

(b) is lower when there is no correlation;

(c) is lowest when there is perfect negative correlation. The risk is then less than for either individual security taken on its own.

Another way of calculating the standard deviation of a portfolio

1.24 The standard deviation of the returns from a portfolio of two investments can be calculated using the following formula.

$$\sigma_p = \sqrt{\sigma_a^2 x^2 + \sigma_b^2 (1-x)^2 + 2x(1-x)p_{ab}\,\sigma_a\,\sigma_b}$$

where:

σ_p is the standard deviation of a portfolio of two investments, A and B

σ_a is the standard deviation of the returns from investment A

σ_b is the standard deviation of the returns from investment B

σ_a^2, σ_b^2 are the variances of returns from investment A and B (the squares of the standard deviations)

x is the weighting or proportion of investment A in the portfolio

p_{ab} is the correlation coefficient of returns from investment A and B

$$= \frac{\text{Covariance of investments A and B}}{\sigma_a \times \sigma_b}$$

This formula is included on the Paper 14 *Formulae Sheet.*

Example: portfolios (3)

1.25 We will use the previous example of the portfolio of 50% security A and 50% security B.

(a) When there is perfect positive correlation between the returns from A and B, r = 1.

$$\sigma_p^2 = 20 \times 0.5^2 + 80 \times 0.5^2 + 2 \times 0.5 \times 0.5 \times 1 \times \sqrt{20} \times \sqrt{80}$$
$$= 5 + 20 + 0.5 \times 4.472 \times 8.944$$
$$= 45$$

The standard deviation of the portfolio is $\sqrt{45} = 6.71\%$

(b) When there is perfect negative correlation between returns from A and B, r = –1.

$$\sigma_p^2 = 20 \times 0.5^2 + 80 \times 0.5^2 + 2 \times 0.5 \times 0.5 \times -1 \times \sqrt{20} \times \sqrt{80}$$
$$= 5 + 20 - 0.5 \times 4.472 \times 8.944$$
$$= 5$$

The standard deviation of the portfolio is $\sqrt{5} = 2.24\%$

(c) When there is no correlation between returns from A and B, r = 0.

$$\sigma_p^2 = 20 \times 0.5^2 + 80 \times 0.5^2 + 2 \times 0.5 \times 0.5 \times 0 \times \sqrt{20} \times \sqrt{80}$$
$$= 5 + 20 + 0$$
$$= 25$$

The standard deviation of the portfolio is $\sqrt{25} = 5\%$

1.26 These are exactly the same figures for standard deviations that were calculated earlier.

2 INVESTORS' PREFERENCES

2.1 Investors must choose a portfolio which gives them a satisfactory balance between:

(a) the expected returns from the portfolio; and

(b) the risk that actual returns from the portfolio will be higher or lower than expected. Some portfolios will be more risky than others.

2.2 Traditional investment theory suggests that rational investors wish to maximise return and minimise risk. Thus if two portfolios have the same element of risk, the investor will choose the one yielding the higher return. Similarly, if two portfolios offer the same return the investor will select the portfolio with the lesser risk.

This can be illustrated by Figure 1.

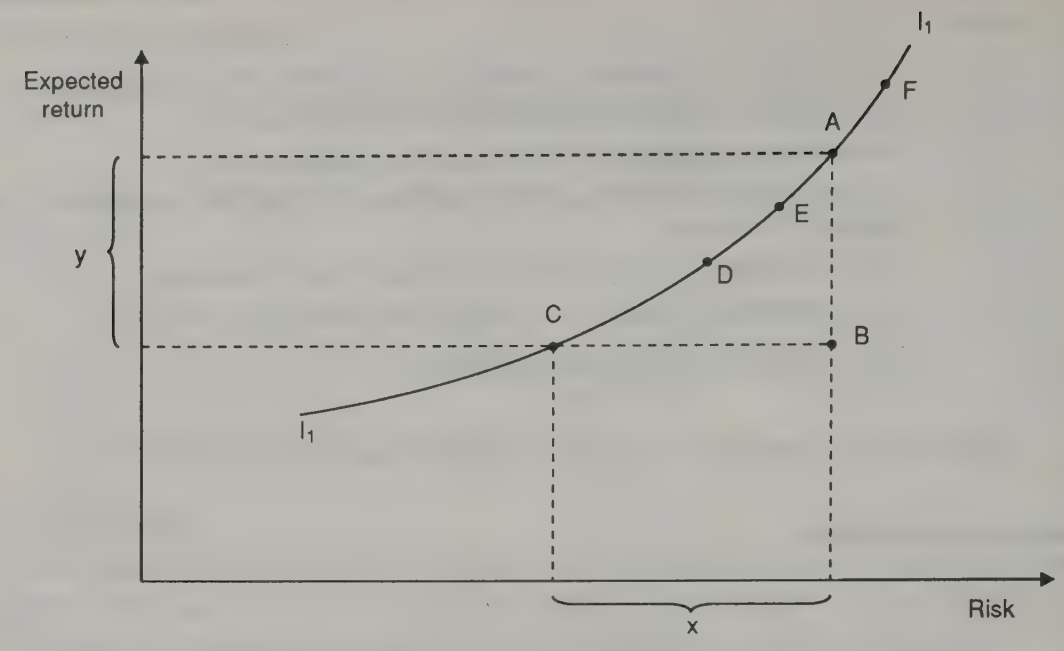


Figure 1 An investor's indifference curve

2.3 Portfolio A will be preferred to portfolio B because it offers a higher expected return for the same level of risk. Similarly, portfolio C will be preferred to portfolio B because it offers the same expected return for lower risk. (A and C are said to *dominate* portfolio B). But whether an investor chooses portfolio A or portfolio C will depend on the individual's attitude to risk, whether he wishes to accept a greater risk for a greater expected return.

2.4 The curve I_1 is an investor's indifference curve.

The investor will have no preference between any portfolios which give a mix of risk and expected return which lies on the curve, since he derives equal *utility* from each of them. Thus, to the investor the portfolios A, C, D, E and F are all just as good as each other, and all of them are better than portfolio B. Remembering that the risk of a portfolio can be measured as the standard deviation of expected returns, this may be expressed by saying that portfolio B is dispreferred on grounds of *mean-variance inefficiency*.

2.5 An investor would prefer combinations of return and risk on indifference curve A to those on curve B (Figure 2) because curve A offers higher returns for the same degree of risk (and less risk for the same expected returns). For example, for the same amount of risk x, the expected return on curve A is y_1, whereas on curve B it is only y_2.

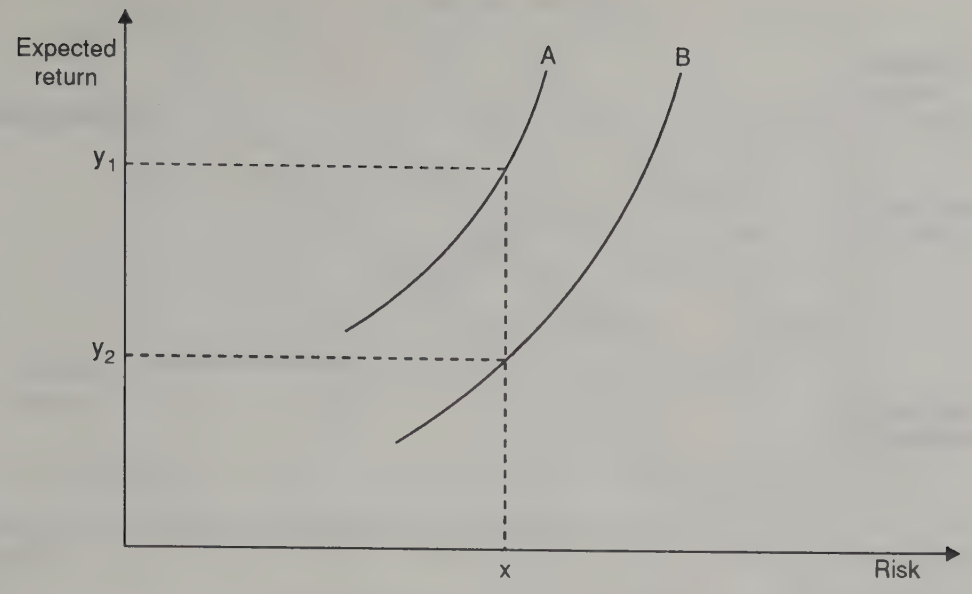


Figure 2 Indifference curves compared

Efficient portfolios

2.6 If we drew a graph (Figure 3) to show the expected return and the risk of the many possible portfolios of investments, we could (according to portfolio theory) plot an egg-shaped cluster of dots on a scattergraph as follows.

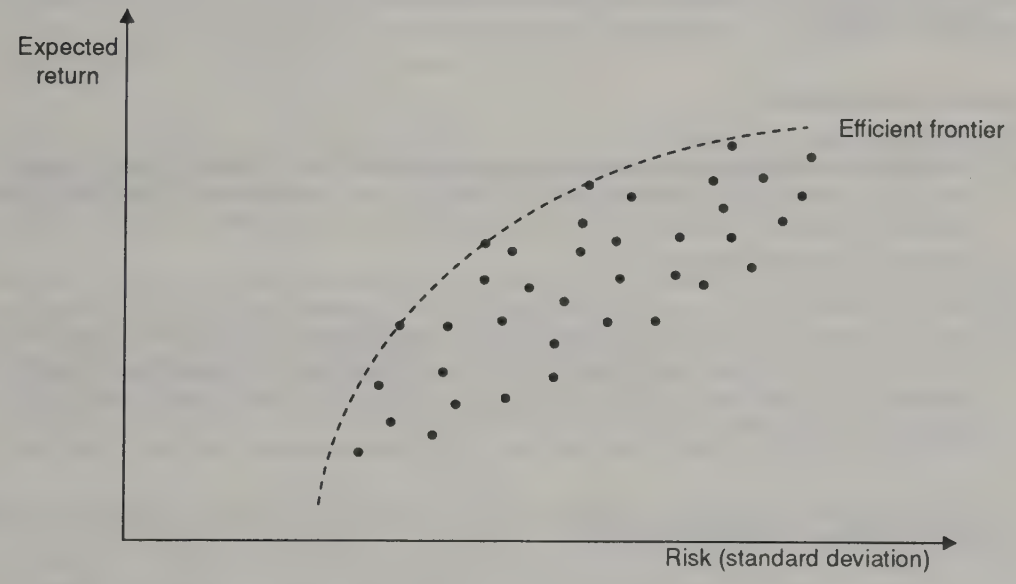


Figure 3 The efficient frontier of available investment portfolios

In this graph, there are some portfolios which would not be as good as others. However, there are other portfolios which are neither better nor worse than each other, because they have either a higher expected return but a higher risk, or a lower expected return but a lower risk. These portfolios lie along the so-called 'efficient frontier' of portfolios which is shown as a dotted line in Figure 3. Portfolios on this efficient frontier are called 'efficient' portfolios.

2.7 We can now place an investor's indifference curves on the same graph as the possible portfolios of investments (the egg-shaped scatter graph), as in Figure 4.

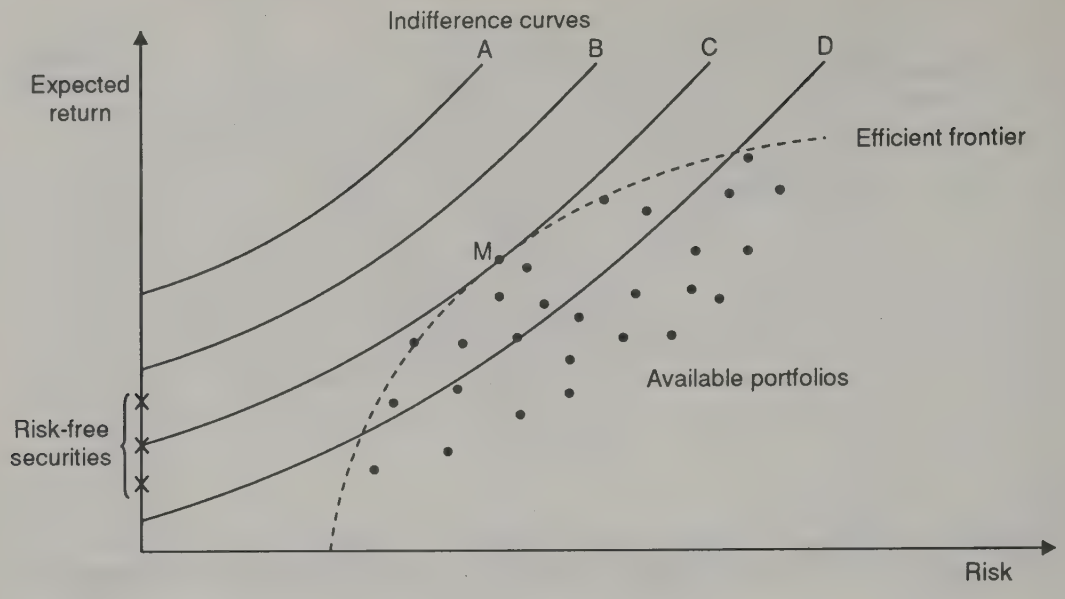


Figure 4 The optimum portfolio (ignoring risk-free securities)

An investor would prefer a portfolio of investments on indifference curve A to a portfolio on curve B, which in turn is preferable to a portfolio on curve C which in turn is preferable to curve D. No portfolio exists, however, which is on curve A or curve B.

2.8 The optimum portfolio (or portfolios) to select is one where an indifference curve touches the efficient frontier of portfolios at a tangent. In Figure 4, this is the portfolio marked M, where indifference curve C touches the efficient frontier at a tangent. Any portfolio on an indifference curve to the right of curve C, such as one on curve D, would be worse than M.

Risk-free investments

2.9 The efficient frontier is a curved line, not a straight line. This is because the additional return for accepting a greater level of risk will not be constant. The curve eventually levels off because a point will be reached where no more return can be offered to an investor for accepting more risk.

2.10 All the portfolios under consideration carry some degree of risk. But some investments are risk-free. It is extremely unlikely that the British Government would default on any payment of interest and capital on its stocks. Thus government stocks can be taken to be risk-free investments.

2.11 If we introduce a risk-free investment into the analysis we can see that the old efficient frontier is superseded (Figure 5).

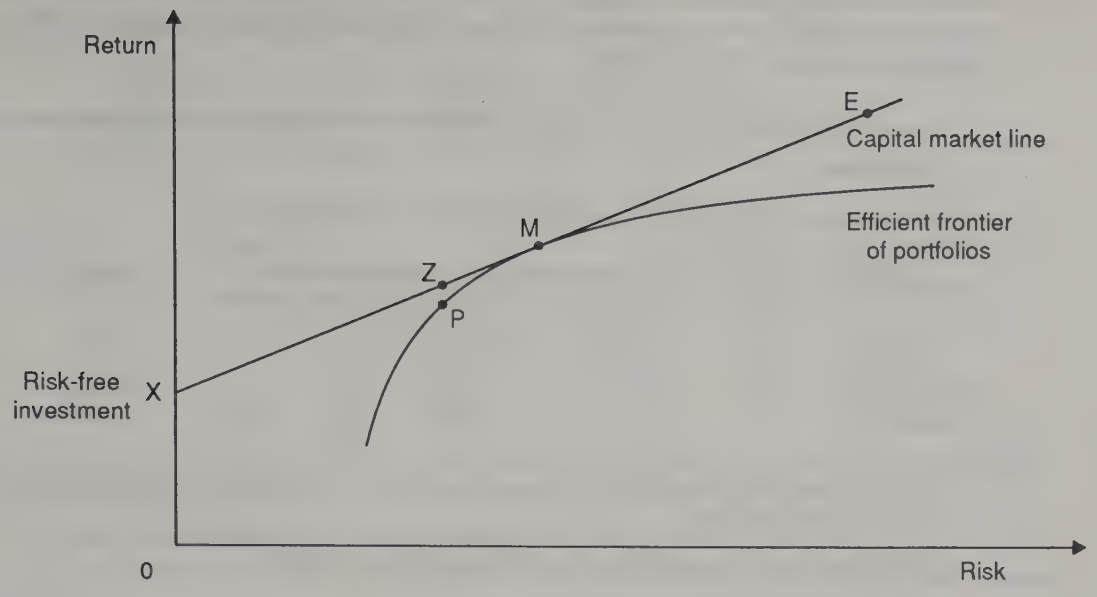


Figure 5 The capital market line

2.12 The straight line XZME is drawn at a tangent to the efficient frontier and cuts the y axis at the point of the risk-free investment's return. The line (known as the 'capital market line' (CML)) becomes the new efficient frontier.

2.13 Portfolio M is the same as in Figure 4. It is the efficient portfolio which will appeal to the investor most, ignoring risk-free investments. Portfolio Z is a mixture of the investments in portfolio M and risk-free investments. Investors will prefer portfolio Z (a mixture of risky portfolio M and the risk-free investment) to portfolio P because a higher return is obtained for the same level of risk.

2.14 The only portfolio consisting entirely of *risky* investments a rational investor should want to hold is portfolio M. All other risky portfolios are inefficient (because they are below the CML).

2.15 As with the curvilinear frontier, one portfolio on the capital market line is as attractive as another to a rational investor. One investor may wish to hold portfolio Z, which lies 2/3 of the way along the CML between risk-free investment X and portfolio M (that is, a holding comprising 2/3 portfolio M and 1/3 risk-free securities).

Another investor may wish to hold portfolio E, which entails putting all his funds in portfolio M and borrowing money at the risk-free rate to acquire more of portfolio M.

2.16 We have said that investors will only want to hold one portfolio of risky investments: portfolio M. This may be held in conjunction with a holding of the risk-free investment (as with portfolio Z). Alternatively, an investor may borrow funds to augment his holding of M (as with portfolio E).

Therefore:

(a) since all investors wish to hold portfolio M; and
(b) all shares quoted on the Stock Exchange must be held by investors; it follows that
(c) all shares quoted on the Stock Exchange must be in portfolio M.

2.17 Thus portfolio M is the 'market portfolio' and each investor's portfolio will contain a proportion of it. (Although in the real world, investors do not hold every quoted security in their portfolio, in practice a well-diversified portfolio will 'mirror' the whole market in terms of weightings given to particular sectors, high income and high capital growth securities, and so on.)

2.18 However, in practice, investors *might* be able to build up a small portfolio that 'beats the market' or might have a portfolio which performs worse than the market average. The following exercise illustrates this.

Exercise

The following data relate to four different portfolios of securities.

Portfolio	*Expected rate of return*	*Standard deviation of return on the portfolio*
	%	%
K	11	6.7
L	14	7.5
M	10	3.3
N	15	10.8

The expected rate of return on the market portfolio is 8.5% with a standard deviation of 3%. The risk-free rate is 5%.

Identify which of these portfolios could be regarded as 'efficient'.

Solution

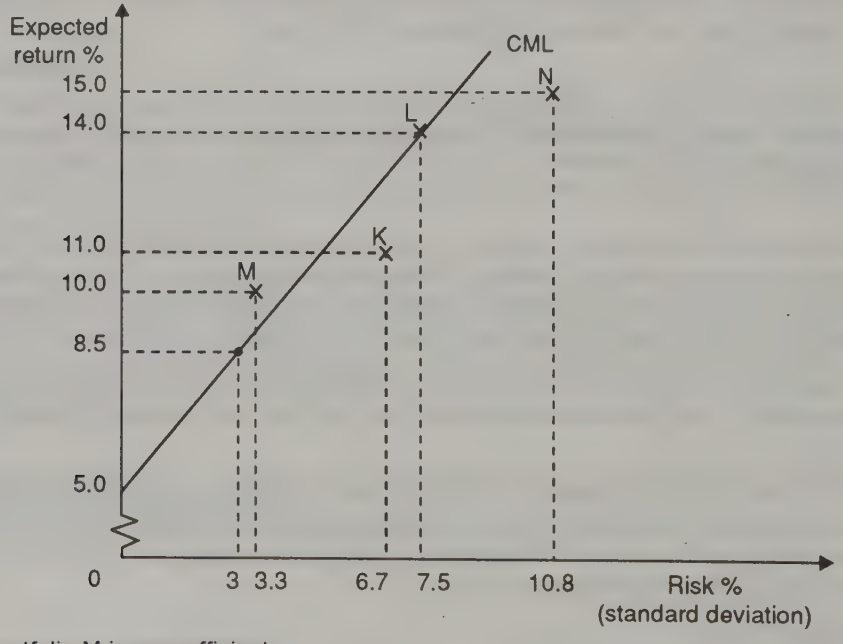
To answer this question, we can start by drawing the CML (see below).

(a) When risk = 0, return = 5.
(b) When risk = 3, return = 8.5.

These points can be plotted on a graph and joined up, and the line can be extended to produce the CML.

The individual portfolios K, L, M and N can be plotted on the same graph.

(a) Any portfolio which is above the CML is efficient.
(b) Any portfolio which is below the CML is inefficient.



(a) Portfolio M is very efficient.
(b) Portfolio L is also efficient.
(c) Portfolios K and N are inefficient.

If you prefer numbers to graphs, we can tackle the problem in a slightly different way, by calculating the equation of the CML.

Let the standard deviation of a portfolio be x.
Let the return from a portfolio be y.

The CML equation is $y = r_f + bx$.

where r_f is the risk-free rate of return. Here, this is 5.

To calculate b, we can use the high-low method.

When $x = 3, y = 8.5$

When $x = 0, y = 5$

Therefore $b = \frac{(8.5 - 5)}{(3 - 0)} = \frac{3.5}{3} = 1.16667$

The CML is $y = 5 + 1.16667x$

Portfolio	*Standard deviation x*	*CML return*	%	*Actual return* %	*Efficient or inefficient portfolio*
K	6.7	(5 + 1.16667 × 6.7)	12.8	11	Inefficient
L	7.5	(5 + 1.16667 × 7.5)	13.8	14	Efficient
M	3.3	(5 + 1.16667 × 3.3)	8.9	10	Very efficient
N	10.8	(5 + 1.16667 × 10.8)	17.6	15	Inefficient

If the actual return exceeds the CML return for the given amount of risk, the portfolio is efficient.

Here, L is efficient and M is even more efficient, but K and N are inefficient.

The return on the market portfolio M

2.19 The expected returns from portfolio M will be higher than the return from risk-free investments because the investors expect a greater return for accepting a degree of investment risk.

The size of the risk premium will increase as the risk of the market portfolio increases. We can show this with an analysis of the capital market line (CML) as in Figure 6 in which:

r_m = return from portfolio M

r_f = risk-free return

σ_m = risk of the portfolio M

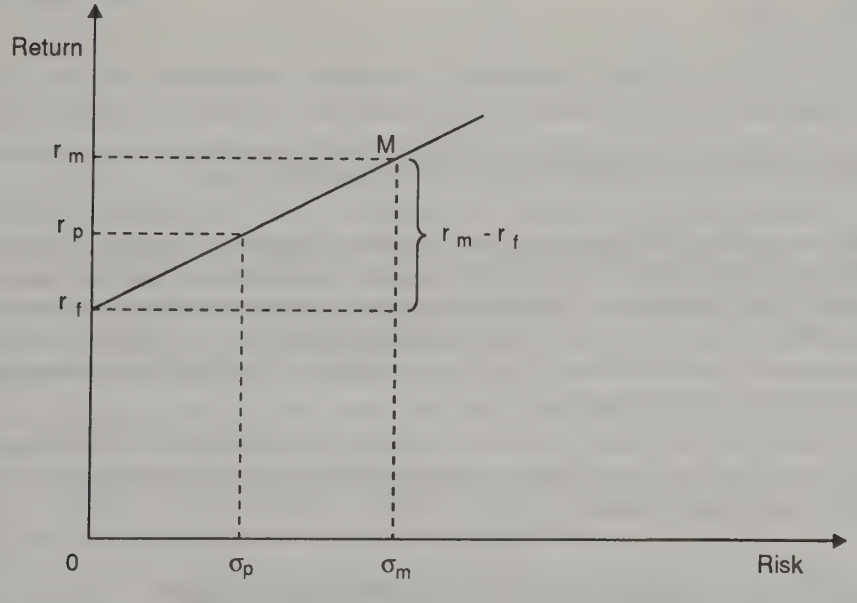


Figure 6 The risk premium in required returns from a portfolio

2.20 The formula for the CML was expressed as $y = a + bx$ in the previous exercise, where a is the risk-free rate of return and b represents the increase in the return as the risk increases.

2.21 Let r_f = the risk-free rate of return
r_m = the return on market portfolio M
r_p = the return on portfolio P, which is a mixture of investments in portfolio M and risk-free investments
σ_m = the risk (standard deviation) of returns in portfolio M
σ_p = the risk (standard deviation) of returns in portfolio P

The gradient of the CML can be expressed as $\frac{r_m - r_f}{\sigma_m}$

This represents the extent to which the required returns from a portfolio should exceed the risk-free rate of return, to compensate investors for risk.

The beta factor

2.22 The equation of the CML can be expressed as $r_p = r_f + \left(\frac{r_m - r_f}{\sigma_m}\right)\sigma_p$

where $\left(\frac{r_m - r_f}{\sigma_m}\right)\sigma_p$ is the risk premium that the investor should require as compensation for accepting portfolio risk σ_p. You can see that the risk premium is the gradient of the CML multiplied by the portfolio risk.

2.23 A high level of diversification leads to the investor holding the market portfolio, with investments reflecting the risk and return characteristics of all shares in the market. It has been shown that in practice only 10 to 12 or so diverse shares are needed to reach this position, at which:

$\sigma_p = \sigma_m$

2.24 The risk premium can be arranged into:

$\frac{\sigma_p}{\sigma_m}(r_m - r_f)$

The expression $\frac{\sigma_p}{\sigma_m}$ is referred to as a *beta factor,* so that an investor's required return from a portfolio can be stated as $r_p = r_f + (r_m - r_f)\beta$

2.25 The beta factor (β) can therefore be used to measure the extent to which a portfolio's return (or indeed an individual investment's return) should exceed the risk-free rate of return. The beta factor is multiplied by the difference between the average return on market securities (r_m) and the risk-free return (r_f) to derive the portfolio's or investment's risk premium. This risk premium will include both a business risk and a financial risk element in it.

2.26 This equation forms the basis of the capital asset pricing model (CAPM), which we shall look at in the next chapter.

3 PORTFOLIO THEORY AND FINANCIAL MANAGEMENT 6/94

3.1 Our discussion of portfolio theory has concentrated mainly on portfolios of stocks and shares. Investors can reduce their investment risk by diversifying, but what about individual companies choosing a range of businesses or projects to invest in?

3.2 Just as an investor can reduce the risk of variable returns by diversifying into a portfolio of different securities, a company can reduce its own risk and so stabilise its profitability

if it invests in a portfolio of different projects or operations, assuming that any positive correlation between returns is weak.

(a) If a company which manufactures garden tables diversifies into manufacturing umbrellas for garden tables, it is unlikely that the diversification will reduce risk, because the returns from trading in garden tables and garden table umbrellas will be positively correlated, both depending on the strength of demand for garden furniture.

(b) On the other hand, if a company which manufactures and sells computer equipment were to diversify into trading in video recorders, children's clothing, industrial paints, domestic plumbing and electrical services, it is probable that its risk of variable profits would be reduced.

Should companies try to diversify?

3.3 The answer to this question is not clear-cut, and you can probably think of examples of large companies today which concentrate mainly on a single industry or product range (for example British Telecom) and 'conglomerates' which are widely diversified (for example Hanson Trust).

3.4 Diversification may have the following advantages for shareholders.

(a) Internal cash flows will become less volatile. This makes it less risky to service the company's current level of debt and may consequently allow the company to make use of more debt without additional risk. This could reduce the cost of capital generally, increasing the wealth of shareholders.

(b) Diversification into foreign markets may enable shareholders to reduce the level of their systematic risk where exchange controls or other barriers to direct investment exist. The diversifying company can enable this to occur by investing in markets which have a combination of risk and return which shareholders would not otherwise be able to obtain.

(c) A diversified company may have a lower probability of corporate failure because of the reduced total risk for the company. This will reduce the likely impact of insolvency costs.

3.5 However, there are a number of reasons why a company should not try to diversify too far.

(a) A company may employ people with particular skills, and it will get the best out of its employees by allowing them to stick to doing what they are good at. A manager with expert knowledge of the electronics business, for example, might not be any good at managing a retailing business. Some managers can adapt successfully to running a diversified business, and a company can acquire employees with the necessary skills by taking over other companies. Even so, diversification will not necessarily succeed, because a company may lack the skills and expertise to be a successful diversified business.

(b) When companies try to grow, they will often find the best opportunities to make extra profits in industries or markets with which they are familiar. If a market opens up for say, a new electronic consumer product, the companies which are likely to exploit the market most profitably are those which already have experience in producing electronic consumer products.

(c) Conglomerates are vulnerable to takeover bids where the buyer plans to 'unbundle' the companies in the group and sell them off individually at a profit. The reason why conglomerates are vulnerable to takeover bids is that their returns will often be mediocre rather than high, and so the stock market will value the shares on a fairly low P/E ratio. Separate companies within the group would be valued according to their individual performance and prospects, often at P/E ratios that are much higher than for the conglomerate as a whole.

(d) Except where restrictions apply to direct investment, investors can probably reduce investment risk more efficiently than companies. They have a wider range of investment opportunities. Investments with uncorrelated or negatively correlated

returns will be easier to identify. Estimates of beta factors will be more reliable for quoted companies' shares than for companies' capital expenditure projects.

3.6 These arguments suggest that a company should not necessarily diversify widely into completely different products and markets. On the other hand, it would be against the interests of shareholders if a company were to be so unprofitable that it went into liquidation. Companies should try to obtain some protection against short-term profit changes, and some diversification will help to provide this protection.

Limitations of portfolio analysis for the financial manager

3.7 Portfolio analysis offers a way in which the financial manager can deal with risk by diversifying through the investment decisions which are made by the firm.

However, portfolio theory applied to the selection of investment proposals has a number of limitations.

(a) In practice, it may require guesswork to estimate probabilities of different outcomes, for example when a new product is to be developed. In other cases, such as machine replacement, sufficient information may however be available to make relatively good probability estimates.

(b) It will be difficult in practical cases to know what are shareholders' preferences between risk and return and therefore to reflect these preferences in decision-making.

(c) The agency problem in management's relationship to the company (see Chapter 2) is relevant. Portfolio theory is based on the notion of managers assessing the relevant probabilities and deciding the combination of activities which a business will be involved in. Managers have the security of their jobs to consider, while the shareholder can easily buy and sell securities. It is arguable that managers are as a result more risk-averse than shareholders, and this may distort managers' investment decisions.

(d) Projects may be of such a size that they are not easy to divide in accordance with recommended diversification principles.

(e) The theory assumes that there are constant returns to scale, in other words that the percentage returns provided by a project are the same however much is invested in it. In practice, there may be economies of scale to be gained from making a larger investment in a single project.

(f) Other aspects of risk not covered by the theory may need to be considered, eg bankruptcy costs.

Chapter roundup

- Both individuals and firms diversify their investments. Individuals have portfolios of shares and firms have portfolios of business operations.
- Portfolio theory takes account of the fact that many investors have a range of investments which are unlikely all to changes values in step. The investor should be concerned with his or her overall position, not with the performance of individual investments.
- Diversification is equally an important consideration for the financial manager in making investment decisions.
- Portfolio theory has limitations in its use by the financial manager, although it provides the basis of the more sophisticated CAPM approach to making investment decisions under risk, which we turn to in the next chapter.

Test your knowledge

1 What are the factors in choosing a portfolio of investments? (see para 1.3)

2 How is the expected return from a portfolio measured? (1.5)

3 Returns from investments might be positively correlated, negatively correlated, or uncorrelated. How does correlation of returns from individual investments affect the risk of a portfolio? (1.23)

4 What is the formula for calculating the standard deviation of returns from a two-investment portfolio? (1.24)

5 How are the expected returns and risks of portfolios on the efficient frontier related to each other? (2.6)

6 Give an example of a risk-free investment. (2.10)

7 What is the equation of the capital market line? (2.22) Use this to derive an expression for the beta factor. (2.23)

8 How is the beta factor used? (2.24, 2.25)

9 What limitations are there in using portfolio analysis in financial management decisions? (3.7)

Now try illustrative question 7 at the end of the Study Text

Chapter 8

THE CAPITAL ASSET PRICING MODEL

This chapter covers the following topics.

		Syllabus reference
1	Risk and the CAPM	3(c)
2	Calculating a beta factor	3(c)
3	CAPM and portfolios	3(c)
4	Gearing and the β values of companies' equity	3(c), (d)
5	Practical implications of the CAPM	3(c), (d)
6	The arbitrage pricing model	3(c)

Introduction

The Capital Asset Pricing Model (CAPM) brings together aspects of topics covered in earlier chapters: portfolio theory, share valuations, the cost of capital and gearing.

Towards the end of the chapter, we discuss a possible replacement for the CAPM - the arbitrage pricing model (APM). *Detailed* knowledge of the APM is not required for the Paper 14 examination.

1 RISK AND THE CAPM

6/94, 6/95, 12/95

1.1 The uses of the capital asset pricing model (CAPM) include:

(a) trying to establish the 'correct' equilibrium market value of a company's shares;

(b) trying to establish the cost of a company's equity (and the company's average cost of capital), taking account of the risk characteristics of a company's investments, both business and financial risk.

The CAPM thus provides an approach to establishing a cost of equity capital which is an alternative to the dividend valuation model.

Systematic risk and unsystematic risk

1.2 Whenever an investor invests in some shares, or a company invests in a new project, there will be some risk involved. The actual return on the investment might be better or worse than that hoped for.

To some extent, risk is unavoidable (unless the investor settles for risk-free securities such as gilts). Investors must take the rough with the smooth and for reasons outside their control, returns might be higher or lower than expected. Provided that the investor diversifies his investments in a suitably wide portfolio, the investments which perform well and those which perform badly should tend to cancel each other out, and much risk can be diversified away. In the same way, a company which invests in a number of projects will find that some do well and some do badly, but taking the whole portfolio of investments, average returns should turn out much as expected.

1.3 Risks that can be diversified away are referred to as *unsystematic risk*.

1.4 But there is another sort of risk too. Some investments are by their very nature more risky than others. This has nothing to do with chance variations up or down in actual returns compared with what an investor should expect. This inherent risk cannot be diversified away, and it is referred to as *systematic risk* or market risk (see Figure 1).

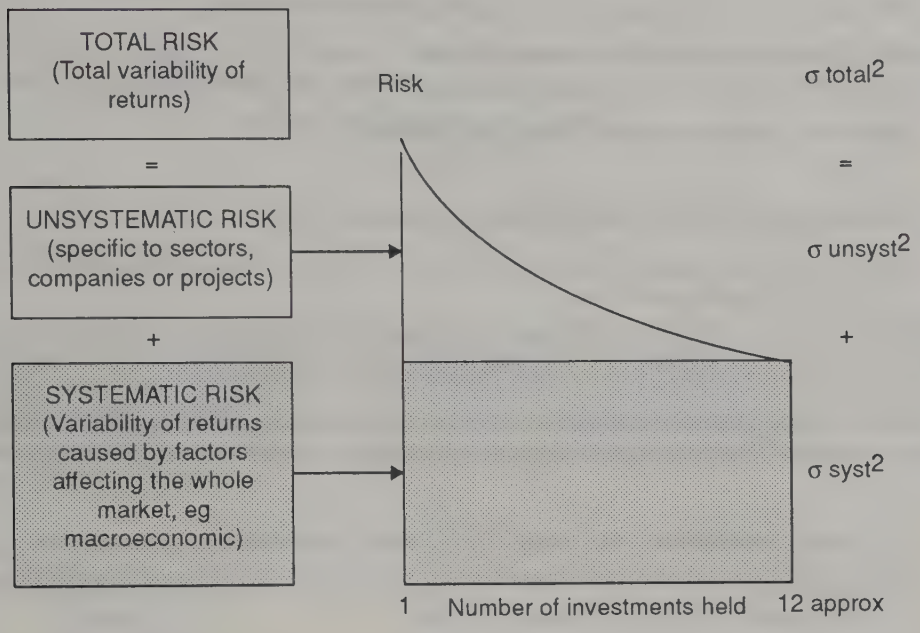


Figure 1

1.5 Systematic risk must therefore be accepted by any investor, unless he invests entirely in risk-free investments. In return for accepting systematic risk, an investor will expect to earn a return which is higher than the return on a risk-free investment.

1.6 The amount of systematic risk in an investment varies between different types of investment.

(a) Some industries by their nature are more risky than others. For example, it might be that the systematic risk in the operating cash flows of a tourism company which will be highly sensitive to consumers' spending power, is greater than the systematic risk for a company which operates a chain of supermarkets.

(b) In the same way, some individual projects will be more risky than others and so the systematic risk involved in an investment to develop a new product would be greater than the systematic risk of investing in a replacement asset.

Systematic risk and unsystematic risk: implications for investments

1.7 The implications of systematic risk and unsystematic risk are as follows.

(a) If an investor wants to avoid risk altogether, he must invest entirely in risk-free securities.

(b) If an investor holds shares in just a few companies, there will be some unsystematic risk as well as systematic risk in his portfolio, because he will not have spread his risk enough to diversify away the unsystematic risk. To eliminate unsystematic risk, he must build up a well-diversified portfolio of investments.

(c) If an investor holds a balanced portfolio of all the stocks and shares on the stock market, he will incur systematic risk which is exactly equal to the average systematic risk in the stock market as a whole.

(d) Shares in individual companies will have systematic risk characteristics which are different to this market average. Some shares will be less risky and some will be

more risky than the stock market average. Similarly, some investments will be more risky and some will be less risky than a company's 'average' investments.

Systematic risk and the CAPM

1.8 The capital asset pricing model is mainly concerned with:

(a) how systematic risk is measured; and
(b) how systematic risk affects required returns and share prices.

Systematic risk is measured using beta factors.

1.9 CAPM theory includes the following propositions.

(a) Investors in shares require a return in excess of the risk-free rate, to compensate them for systematic risk.

(b) Investors should not require a premium for unsystematic risk, because this can be diversified away by holding a wide portfolio of investments.

(c) Because systematic risk varies between companies, investors will require a higher return from shares in those companies where the systematic risk is greater.

1.10 The same propositions can be applied to capital investments by companies.

(a) Companies will want a return on a project to exceed the risk-free rate, to compensate them for systematic risk.

(b) Unsystematic risk can be diversified away, and so a premium for unsystematic risk should not be required.

(c) Companies should want a bigger return on projects where systematic risk is greater.

Market risk and returns

1.11 The CAPM was first formulated for investments in stocks and shares on the market, rather than for companies' investments in capital projects. It is based on a comparison of the systematic risk of individual investments (shares in a particular company) and the risk of all shares in the market as a whole. Market risk (systematic risk) is the average risk of the market as a whole. Taking all the shares on a stock market together, the total expected returns from the market will vary because of systematic risk. The market as a whole might do well or it might do badly.

Risk and returns from an individual security

1.12 In the same way, an individual security may offer prospects of a return of x%, but with some risk (business risk and financial risk) attached. The return (the x%) that investors will require from the individual security will be higher or lower than the market return, depending on whether the security's systematic risk is greater or less than the market average.

1.13 A major assumption in CAPM is that there is a linear relationship between the return obtained from an individual security and the average return from all securities in the market.

Example: CAPM (1)

1.14 The following information is available about the performance of an individual company's shares and the stock market as a whole.

	Individual company	*Stock market as a whole*
Price at start of period	105.0	480.0
Price at end of period	110.0	490.0
Dividend during period	7.6	39.2

1.15 The return on the company's shares (r_j) and the return on the 'market portfolio' of shares (r_m) may be calculated as

$$\frac{\text{Capital gain (or loss) + dividend}}{\text{Price at start of period}}$$

$$r_j = \frac{(110-105)+7.6}{105} = 0.12 \qquad r_m = \frac{(490-480)+39.2}{480} = 0.1025$$

1.16 A statistical analysis of 'historic' returns from a security and from the 'average' market may suggest that a linear relationship can be assumed to exist between them. A series of comparative figures could be prepared (month by month) of the return from a company's shares and the average return of the market as a whole. The results could be drawn on a scattergraph and a 'line of best fit' drawn (using linear regression techniques) as shown in Figure 2.

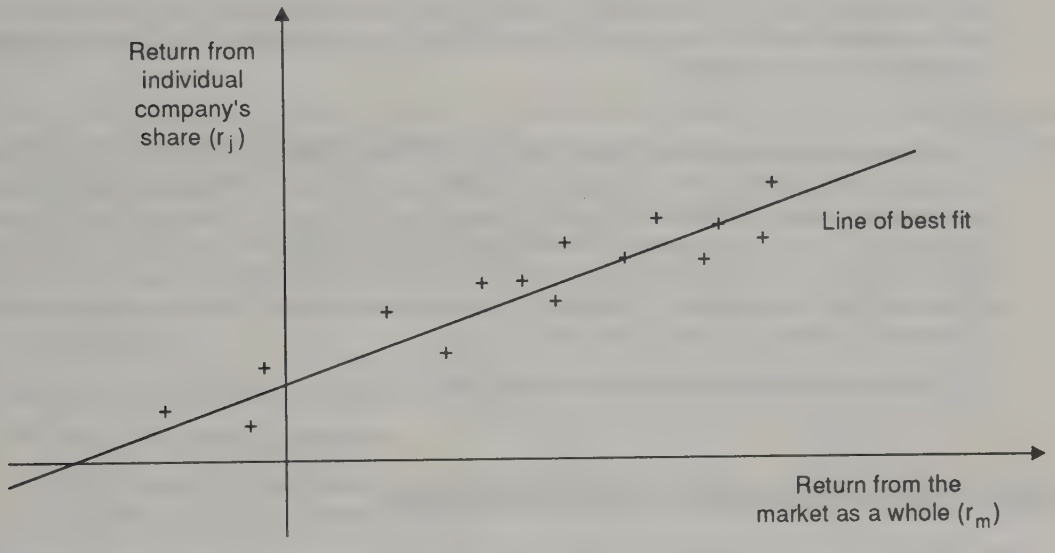


Figure 2

1.17 This analysis would show three things.

(a) The return from the security (r_j) and the return from the market as a whole will tend to rise or fall together.

(b) The return from the security may be higher or lower than the market return. This is because the systematic risk of the individual security differs from that of the market as a whole. The graph above corresponds to a security which is riskier than the market (higher returns).

(c) The scattergraph may not give a good line of best fit, unless a large number of data items are plotted, because actual returns are affected by unsystematic risk as well as by systematic risk.

Note that returns can be negative. A share price fall represents a capital loss, which is a negative return.

1.18 The conclusion from this analysis is that individual securities will be either more or less risky than the market average in a fairly predictable way. The measure of this relationship between market returns and an individual security's returns, reflecting

differences in systematic risk characteristics, can be developed into a beta factor for the individual security.

The beta factor and the market risk premium

1.19 A share's *beta factor* is the measure of its volatility in terms of market risk.

1.20 The beta factor of the market as a whole is 1.0. Market risk makes market returns volatile and the beta factor is simply a basis or yardstick against which the risk of other investments can be measured.

1.21 For example, suppose that returns on shares in XYZ plc tend to vary twice as much as returns from the market as a whole, so that if market returns went up 3%, say, returns on XYZ plc shares would be expected to go up by 6% and if market returns fell by 3%, returns on XYZ plc shares would be expected to fall by 6%. The beta factor of XYZ plc shares would be 2.0.

1.22 Thus if the average market return rises by, say, 2%, the return from a share with a beta factor of 0.8 should rise by 1.6% in response to the *same conditions* which have caused the market return to change. The *actual* return from the share might rise by, say, 2.5%, or even fall by, say, 1%, but the difference between the actual change and a change of 1.6% due to general market factors would be attributed to unsystematic risk factors unique to the company or its industry.

1.23 It is an essential principle of CAPM theory that unsystematic risk can be cancelled out by diversification. In a well-balanced portfolio, an investor's gains and losses from the unsystematic risk of individual shares will tend to cancel each other out. In other words, if shares in X plc do worse than market returns and the beta factor of X's shares would predict, shares in Y plc will do better than predicted, and the net effect will be self-cancelling elimination of the specific (unsystematic) risk from the portfolio, leaving the average portfolio return dependent only on:

(a) changes in the average market return; and
(b) the beta factors of shares in the portfolio.

Excess returns over returns on risk-free investments

1.24 The CAPM also makes use of the principle that returns on shares in the market as a whole are expected to be higher than the returns on risk-free investments. The difference between market returns and risk-free returns is called an excess return.

For example, if the return on British Government stocks is 9% and market returns are 13%, the *excess* return on the market's shares as a whole is 4%.

1.25 The difference between the risk-free return and the expected return on an individual security can be measured as the excess return for the market as a whole multiplied by the security's beta factor. Thus, if shares in DEF plc have a beta of 1.5 when the risk-free return is 9% and the expected market return is 13%, then the expected return on DEF plc shares would exceed the risk- free return by $(13 - 9) \times 1.5\% = 6\%$ and the total expected return on DEF shares would be $(9 + 6)\% = 15\%$.

1.26 If the market returns fall by 3% to 10%, say, the expected return on DEF plc shares would fall by $1.5 \times 3\% = 4.5\%$ to 10.5%, being $9\% + (10 - 9) \times 1.5\% = 10.5\%$.

The CAPM formula

6/96

1.27 The capital asset pricing model is a statement of the principles explained above. It can be stated as follows.

$$E(r_j) - r_f = (E(r_m) - r_f)\beta$$

where $E(r_j)$ is the expected return from an individual security
r_f is the risk-free rate of return
(r_m) is the expected return from the market as a whole
β_j is the beta factor of the individual security

1.28 The CAPM formula or security market line (SML) can be rearranged into:

$$E(r_j) = r_f + (E(r_m) - r_f)\,\beta_j$$

This formula is included on the Paper 14 *Formulae Sheet.*

Alpha values

1.29 A share's *alpha value* is a measure of its abnormal return, which is the amount by which the share's returns are currently above or below what would be expected, given its systematic risk.

Example: CAPM (2)

1.30 ABC plc's shares have a beta value of 1.2 and an alpha value of +2%. The market return is 10% and the risk-free rate of return is 6%.

Expected return $6\% + (10 - 6) \times 1.2\% = 10.8\%$

Current return = expected return ± alpha value
= 10.8% + 2% = 12.8%

1.31 Alpha values:

(a) are only temporary, abnormal returns;

(b) can be positive or negative;

(c) over time, will tend towards zero for any individual share, and for a well-diversified portfolio taken as a whole will be 0;

(d) if positive, might attract investors into buying the share to benefit from the abnormal return, so that the share price will temporarily go up.

The CAPM and share prices

1.32 The CAPM can be used not only to estimate expected returns from securities with differing risk characteristics, but also to predict the value of shares.

Example: CAPM (3)

1.33 Company X and company Y both pay an annual cash return to shareholders of 34.048 pence per share and this is expected to continue in perpetuity. The risk-free rate of return is 8% and the current average market rate of return is 12%. Company X's β coefficient is 1.8 and company Y's is 0.8.

What is the expected return from companies X and Y respectively, and what would be the predicted market value of each company's shares?

Solution

1.34 (a) The expected return for X is $8\% + (12\% - 8\%) \times 1.8 = 15.2\%$

(b) The expected return for Y is $8\% + (12\% - 8\%) \times 0.8 = 11.2\%$

The dividend valuation model can now be used to derive expected share prices.

(c) The predicted value of a share in X is $\frac{34.048p}{0.152} = 224$ pence

(d) The predicted value of a share in Y is $\frac{34.048p}{0.112} = 304$ pence

The actual share prices of X and Y might be higher or lower than 224p and 304p. If so, CAPM analysis would conclude that the share is currently either overpriced or underpriced.

Exercise 1

The risk-free rate of return is 7%. The average market return is 11%.

(a) What will be the return expected from a share whose β factor is 0.9?

(b) What would be the share's expected value if it is expected to earn an annual dividend of 5.3p, with no capital growth?

Solution

(a) $7\% + (11\% - 7\%) \times 0.9 = 10.6\%$

(b) $\frac{5.3p}{10.6\%} = 50$ pence

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2 CALCULATING A BETA FACTOR

2.1 The beta factor for a particular security can be calculated by plotting its return against the market return and drawing the line of best fit. The equation of this line can be derived by regression analysis.

The β factor is the gradient of the line. It can be calculated by using the following formula.

$$\beta = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - (\sum x)^2}$$

where β = the beta coefficient
x = the return from the market
y = the return from the security
n= the number of pairs of data for x and y.

2.2 Another formula for calculating the beta value of a company's shares is

$$\beta = \frac{\text{cov}(x, y)}{\text{var}(x)}$$

where cov (x, y) is the covariance of returns on the individual company's shares (y) with returns for the market as a whole (x) and var(x) is the variance of returns for the market as a whole.

Example: CAPM (4)

2.3 The risk-free rate of return is 6% and the market rate of return is 11%. The standard deviation of returns for the market as a whole is 40%. The covariance of returns for the market with returns for the shares of Peapod plc is 19.2%.

Since the variance is the square of a standard deviation, the beta value for Peapod plc is

$$\frac{0.192}{0.4^2} = \frac{0.192}{0.16} = 1.20$$

The cost of equity capital for Peapod plc would therefore be 6% +(11 – 6) × 1.2% = 12%.

2.4 Yet another formula for calculating a share's beta factor is

$$\beta = \frac{\sigma_s \rho_{sm}}{\sigma_m}$$

where σ_s is the standard deviation of returns on the shares of a company
σ_m is the standard deviation of returns on equity for the market as a whole
ρ_{sm} is the correlation coefficient between total returns on equity for the stock market as a whole and total returns on the shares of the individual company.

Example: CAPM (5)

2.5 We are given the following information.

The average stock market return on equity	= 15%
The risk-free rate of return (pre-tax)	= 8%
Company X: dividend yield	= 4%
Company X: share price rise (capital gain)	= 12%
Standard deviation of total stock market return on equity	= 9%
Standard deviation of total return on equity of Company X	= 10.8%
Correlation coefficient between Company X return on equity and average stock market return on equity	= 0.75

What is the beta factor for Company X shares, and what does this information imply for the actual returns and actual market value of Company X shares?

Solution

2.6 (a) $\beta = \frac{\sigma_s \rho_{sm}}{\sigma_m}$

$$= \frac{10.8\% \times 0.75}{9\%}$$

$$= 0.9$$

(b) The cost of Company X equity should therefore be

$E(r_j) = 8\% + (15 - 8) \times 0.9\%$
$= 14.3\%$

2.7 The actual returns on Company X equity are 4% + 12% = 16%. This implies that:

(a) the actual returns include extra returns due to unsystematic risk factors; or

(b) if there are no unsystematic risk factors, the price of Company X shares is currently lower than it should be.

Exercise 2

The standard deviation of market returns is 50%, and the expected market return ($E(r_m)$) is 12%. The risk-free rate of return is 9%. The covariance of returns for the market with returns on shares in Deancourt plc has been 20%. Calculate a beta value and a cost of capital for Deancourt plc equity.

(a) The variance of market returns is $0.50^2 = 0.25$

$$\beta = \frac{0.20}{0.25} = 0.8$$

(b) Cost of Deancourt plc equity = 9% + (12 – 9) × 0.8%
= 11.4%

3 CAPM AND PORTFOLIOS

3.1 Just as an individual security has a beta factor, so too does a portfolio of securities.

(a) A portfolio consisting of all the securities on the stock market (in the same proportions as the market as a whole), excluding risk-free securities, will have an expected return equal to the expected return for the market as a whole, and so will have a beta factor of 1.

(b) A portfolio consisting entirely of risk-free securities will have a beta factor of 0.

(c) The beta factor of an investor's portfolio is the weighted average of the beta factors of the securities in the portfolio.

Example: CAPM (6)

3.2 A portfolio consisting of five securities could have its beta factor computed as follows.

Security	*Percentage of portfolio*	*Beta factor of security*	*Weighted beta factor*
A plc	20%	0.90	0.180
B plc	10%	1.25	0.125
C plc	15%	1.10	0.165
D plc	20%	1.15	0.230
E plc	35%	0.70	0.245
	100%	Portfolio beta =	0.945

3.3 If the risk-free rate of return is 12% and the average market return is 20%, the expected return from the portfolio would be 12% + (20 – 12) × 0.945% = 19.56%

3.4 The calculation could have been made as follows.

Security	*Beta factor*	*Expected return* $E(r_i)$	*Weighting* %	*Weighted return* %
A plc	0.90	19.2	20	3.84
B plc	1.25	22.0	10	2.20
C plc	1.10	20.8	15	3.12
D plc	1.15	21.2	20	4.24
E plc	0.70	17.6	35	6.16
			100	19.56

4 GEARING AND THE β VALUES OF COMPANIES' EQUITY 6/94, 6/96

4.1 The gearing of a company will affect the risk of its equity. If a company is geared and its financial risk is therefore higher than the risk of an all-equity company, then the β value of the geared company's equity will be higher than the β value of a similar ungeared company's equity.

4.2 The CAPM is consistent with the propositions of Modigliani and Miller. MM argue that as gearing rises, the cost of equity rises to compensate shareholders for the extra financial risk of investing in a geared company. This financial risk is an aspect of systematic risk, and ought to be reflected in a company's beta factor.

Beta values and the effect of gearing: geared betas and ungeared betas

4.3 The connection between MM theory and the CAPM means that it is possible to establish a mathematical relationship between the β value of an ungeared company and the β value of a similar, but geared, company.

4.4 The β value of a geared company will be higher than the β value of a company identical in every respect except that it is all-equity financed. This is because of the extra financial risk. The mathematical relationship between the 'ungeared' and 'geared' betas is as follows.

$$\beta_a = \beta_e \frac{E}{E + D(1-t)} + \beta_d \frac{D(1-t)}{E + D(1-t)}$$

where

β_a	is the beta factor of an ungeared company: the ungeared beta
β_e	is the beta factor of equity in a similar, but geared company: the geared beta
β_d	is the beta factor of debt in the geared company
D	is the market value of the debt capital in the geared company
E	is the market value of the equity capital in the geared company
t	is the rate of corporation tax

The formula above is provided on the Paper 14 *Formulae Sheet.* It can be used to calculate the ungeared beta as a weighted average of a company's equity and debt beta factor.

4.5 Debt is often assumed to be risk-free and its beta (β_d) is then taken as zero, in which case the formula above reduces to the following form.

$$\beta_a = \beta_e \frac{E}{E + D(1-t)}$$

This assumption should be made unless the question indicates otherwise.

4.6 Re-arranging the formula in the previous paragraph, we have:

$$\beta_e = \beta_a \times \frac{E + D(1-t)}{E}$$

$$= \beta_a \left(1 + \frac{D(1-t)}{E}\right)$$

$$= \beta_a + \beta_a \left(\frac{D(1-t)}{E}\right)$$

Note that the geared beta is equal to the ungeared beta plus a premium for financial risk which equals:

$$\beta_a \left[\frac{D(1-t)}{E}\right]$$

Example: CAPM (7)

4.7 Two companies are identical in every respect except for their capital structure. Their market values are in equilibrium, as follows.

	Geared plc	*Ungeared plc*
	£'000	£'000
Annual profit before interest and tax	1,000	1,000
Less interest (4,000 × 8%)	320	0
	680	1,000
Less tax at 33%	224	330
Profit after tax = dividends	456	670
Market value of equity	3,900	6,600
Market value of debt	4,180	0
Total market value of company	8,080	6,600

The total value of Geared plc is higher than the total value of Ungeared plc, which is consistent with MM's proposition that $V_g = V_u + Dt$.

All profits after tax are paid out as dividends, and so there is no dividend growth.

The beta value of Ungeared plc has been calculated as 1.0.

The debt capital of Geared plc can be regarded as risk-free.

Calculate:

(a) the cost of equity in Geared plc;
(b) the market return r_m;
(c) the beta value of Geared plc.

Solution

4.8 (a) Since its market value is in equilibrium, the cost of equity in Geared plc can be calculated as

$$\frac{d}{MV} = \frac{456}{3,900} = 11.69\%$$

(b) The beta value of Ungeared plc is 1.0, which means that the expected returns from Ungeared plc are exactly the same as the market returns, and the $r_m = 10.15\%$.

(c) $$\beta_e = \beta_a \times \frac{E + D(1-t)}{E}$$

$$= 1.0 \times \frac{3,900 + (4,180 \times 0.67)}{3,900}$$

$$= 1.72$$

The beta of Geared plc, as we should expect, is higher than the beta of Ungeared plc.

Using the geared and ungeared beta formula to estimate a beta factor for a company

4.9 Another way of estimating a beta factor for a company's equity is to use data about the returns of other quoted companies which have similar operating characteristics: that is, to use the beta values of other companies' equity to estimate a beta value for the company under consideration.

4.10 The beta values estimated for the firm under consideration must be adjusted to allow for differences in gearing from the firms whose equity beta values are known. The formula for geared and ungeared beta values can be applied.

Example: CAPM (10)

4.11 The management of Crispy plc wish to estimate their company's equity beta value. The company, which is an all-equity company, has only recently gone public and insufficient data is available at the moment about its own equity's performance to calculate the company's equity beta. Instead, it is thought possible to estimate Crispy's equity beta

from the beta values of quoted companies operating in the same industry and with the same operating characteristics as Crispy.

Details of three similar companies are as follows.

(a) Snapp plc has an observed equity beta of 1.15. Its capital structure at market values is 70% equity and 30% debt. Snapp plc is very similar to Crispy plc except for its gearing.

(b) Crackle plc is an all-equity company. Its observed equity beta is 1.25. It has been estimated that 40% of the current market value of Crackle is caused by investment in projects which offer high growth, but which are more risky than normal operations and which therefore have a higher beta value. These investments have an estimated beta of 1.8, and are reflected in the company's overall beta value. Crackle's normal operations are identical to those of Crispy.

(c) Popper plc has an observed equity beta of 1.35. Its capital structure at market values is 60% equity and 40% debt. Popper has two divisions, X and Y. The operating characteristics of X are identical to those of Crispy but those of Y are thought to be 50% more risky than those of X. It is estimated that X accounts for 75% of the total value of Popper, and Y for 25%.

The tax rate is 33%.

(a) Assuming that all debt is virtually risk-free, calculate three estimates of the equity beta of Crispy, from the data available about Snapp, Crackle and Popper respectively.

(b) Now assume that Crispy plc is not an all-equity company, but instead is a geared company with a debt:equity ratio of 2:3 (based on market values). Estimate the equity beta of Crispy from the data available about Snapp.

Solution

4.12 (a) *Snapp plc - based estimate*

$$\beta_e = \beta_a \times \frac{E + D(1-t)}{E}$$

$$1.15 = \beta_a \times \frac{70 + 30(1-0.33)}{70}$$

$$1.15 = 1.28714\beta_a$$

$$\beta_a = 0.89$$

(b) *Crackle plc - based estimate*

If the beta value of normal operations of Crackle is β_n, and we know that the high-risk operations have a beta value of 1.8 and account for 40% of Crackle's value, we can estimate a value for β_n.

$$\text{Overall beta} = 0.4(\text{high risk beta}) + 0.6(\text{normal operations beta})$$

$$1.25 = 0.4(1.8) + 0.6\,\beta_n$$

$$\beta_n = 0.88$$

Since Crackle is an all-equity company, this provides the estimate of Crispy's equity beta.

(c) *Popper plc - based estimate*

It is easiest to arrive at an estimate of Crispy's equity beta by calculating the equity beta which Popper would have had if it had been an all-equity company instead of a geared company.

$$\beta_e = \beta_a \times \frac{E + D(1-t)}{E}$$

$$1.35 = \beta_a \times \frac{0.6 + 0.4(1-0.33)}{0.6}$$

$$\beta_a = \frac{1.35}{1.44667} = 0.93318$$

This equity beta estimate for Popper plc is a weighted average of the beta values of divisions X and Y, so that

$$0.93318 = 0.75\beta_x + 0.25\beta_y$$

where β_x and β_y are the beta values for divisions X and Y respectively. We also know that Y is 50% more risky than X, so that $\beta_y = 1.5\beta_x$.

$$0.93318 = 0.75\beta_x + 0.25(1.5\beta_x)$$

$$\beta_x = 0.83$$

Since Crispy plc is similar in characteristics to division X, the estimate of Crispy's equity beta is 0.83.

4.13 If Crispy plc is a geared company with a market-value based gearing ratio of 2:3, we can use the geared and ungeared beta formula again. The ungeared beta value, based on data about Snapp, was 0.89. The geared beta of Crispy would be estimated as

$$\beta_e = 0.89 \times \frac{3 + 2(1 - 0.33)}{3}$$

$$= 1.29$$

Weaknesses in the formula

4.14 The problems with using the geared and ungeared beta formula for calculating a firm's equity beta from data about other firms are as follows.

(a) It is difficult to identify other firms with identical operating characteristics.

(b) Estimates of beta values from share price information are not wholly accurate. They are based on statistical analysis of historical data, and as the previous example shows, estimates using one firm's data will differ from estimates using another firm's data. The beta values for Crispy estimated from Snapp, Crackle and Popper are all different.

(c) There may be differences in beta values between firms caused by:

(i) different cost structures (for example the ratio of fixed costs to variable costs);

(ii) size differences between firms;

(iii) debt capital not being risk-free;

(d) If the firm for which an equity beta is being estimated has opportunities for growth that are recognised by investors, and which will affect its equity beta, estimates of the equity beta based on other firms' data will be inaccurate, because the opportunities for growth will not be allowed for.

4.15 Perhaps the most significant simplifying assumption is that to link MM theory to the CAPM, it must be assumed that the cost of debt is a risk-free rate of return. This is obviously unrealistic. Companies may default on interest payments or capital repayments on their loans. It has been estimated that corporate debt has a beta value of 0.2 or 0.3.

4.16 The consequence of making the assumption that debt is risk free is that the formulae tend:

(a) to overstate the financial risk in a geared company;

(b) to understate the business risk in geared and ungeared companies by a compensating amount.

In other words β_a will be a bit higher and β_e will be a bit lower than the formulae suggest.

5 PRACTICAL IMPLICATIONS OF THE CAPM 12/95

5.1 The implications of CAPM theory for an investor are as follows.

(a) He should decide what beta factor he would like to have for his portfolio. He might prefer a portfolio beta factor of greater than 1, in order to expect above-average returns when market returns exceed the risk-free rate, but he would then expect to lose heavily if market returns fall. On the other hand, he might prefer a portfolio beta factor of 1 or even less.

(b) He should seek to invest in shares with low beta factors in a bear market, when average market returns are falling. He should then also sell shares with high beta factors.

(c) He should seek to invest in shares with high beta factors in a bull market, when average market returns are rising.

An investor can measure the beta factor of his portfolio by obtaining information about the beta factors of individual securities. These are obtainable from a variety of investment analysts such as the London Business School's Financial Services.

Limitations of the CAPM for the selection of a portfolio of securities

5.2 Under the CAPM, the return required from a security is related to its systematic risk rather than its total risk. If we relax some of the assumptions upon which the model is based, then the total risk may be important. In particular, the following points should be considered.

(a) The model assumes that the costs of insolvency are zero, or in other words, that all assets can be sold at going concern prices and that there are no selling, legal or other costs. In practice, the costs of insolvency cannot be ignored. Furthermore, the risk of insolvency is related to a firm's total risk rather than just its systematic risk.

(b) The model assumes that the investment market is efficient. If it is not, this will limit the extent to which investors are able to eliminate unsystematic risk from their portfolios.

(c) The model also assumes that portfolios are well diversified and so need only be concerned with systematic risk. However, this is not necessarily the case, and undiversified or partly-diversified shareholders should also be concerned with unsystematic risk and will seek a total return appropriate to the total risk that they face.

5.3 The major sources of difficulty in applying the CAPM in practice are:

(a) the need to determine the excess return $(E(r_m) - r_f)$. Expected, rather than historical, returns should be used, although historical returns are used in practice;

(b) the need to determine the risk-free rate. A risk-free investment might be a government security. However, interest rates vary with the term of the lending;

(c) errors in the statistical analysis used to calculate β values.

5.4 Beta factors based on historical data may be a poor basis for future decision-making. Evidence from a US study suggests that stocks with high or low betas tend to be fairly stable over time, but this may not always be so. Financial managers should preferably use betas for industrial sectors rather than individual company betas, as measurement errors will tend to cancel each other out. Beta values may change over time, for example if luxury items produced by a company become regarded as necessities, or if the cost structure (eg the proportion of fixed costs) of a business change.

The CAPM is also unable to forecast accurately returns for companies with low price/earnings ratios and to take account of seasonal 'month-of-the-year' or 'day-of-the-week' effects which appear to influence returns on shares.

The CAPM and project appraisal

5.5 The CAPM can be used instead of the dividend valuation model to establish an equity cost of capital to use in project appraisal.

The cost of equity is $K_{eg} = r_f + (E(r_m) - r_f) \times \beta_e$ where β_e is the beta value for the company's equity capital.

Example: CAPM (11)

5.6 A company is financed by a mixture of equity and debt capital, whose market values are in the ratio 3:1. The debt capital, which is considered risk-free, yields 10% before tax. The average stock market return on equity capital is 16%. The beta value of the company's equity capital is estimated as 0.95. The tax rate is 33%.

What would be an appropriate cost of capital to be used for investment appraisal of new projects with the same systematic risk characteristics as the company's current investment portfolio?

Solution

5.7 An appropriate cost of capital to use, assuming no change in the company's financial gearing, is its WACC. However, the CAPM can be used to estimate the cost of the company's equity.

$$K_{eg} = 10\% + (16 - 10) \times 0.95\%$$
$$= 15.7\%$$

The after tax cost of debt is $0.67 \times 10\% = 6.7\%$.

The WACC is therefore:

$$(¾ \times 15.7\%) + (¼ \times 6.7\%) = 13.45\%.$$

The cost of capital to use in project appraisal is 13.45%.

How is the WACC different using the CAPM?

5.8 You might be wondering how the weighted average cost of capital (WACC) is different when we use the CAPM compared to the method of calculating the WACC which was described in the earlier chapter on the cost of capital. The only difference, in fact, is the method used to calculate the cost of the firm's equity: the dividend valuation model or the CAPM.

5.9 Using the different techniques for measuring the cost of equity will produce two different values for these reasons.

(a) The dividend valuation model uses expectations of actual dividends and current share values. Dividends may include extra or lower returns caused by unsystematic risk variations, as well as systematic risk. Share prices might not be in equilibrium.

(b) The CAPM considers systematic risk only, and assumes equilibrium in the stock market.

5.10 If dividends reflect systematic risk only, and if stock market prices are in equilibrium, the dividend valuation model and the CAPM should produce roughly the same estimates for the cost of a firm's equity and for its WACC.

Using the CAPM to establish a discount rate for the appraisal of major diversification projects

5.11 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.

5.12 A discount rate can be found using the CAPM, although the discount rate that is calculated is not exactly correct. A method that can be used is as follows.

(a) *Step 1.* 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.

(b) *Step 2.* Adjust these beta values to allow for the company's capital gearing level. This adjustment is done in two stages.

(i) *Stage 2A.* Convert the beta values of other companies in the industry to ungeared betas, using the formula:

$$\beta_a = \frac{\beta_e}{[(1 + \frac{D(1-t)}{E}]}$$

(ii) *Stage 2B.* 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:

$$\beta_e = \beta_a (1 + \frac{D(1-t)}{E})$$

(c) *Step 3.* Having estimated a project-specific geared beta, use the CAPM to estimate:

(i) a project-specific cost of equity; and

(ii) a project-specific cost of capital, based on a weighting of this cost of equity and the cost of the company's debt capital.

Example: CAPM (12)

5.13 A company's debt:equity ratio, by market values, is 2:5. The corporate debt, which is assumed to be risk-free, yields 11% before tax. The beta value of the company's equity is currently 1.1. The average returns on stock market equity are 16%.

The company is now proposing to invest in a project which would involve diversification into a new industry, and the following information is available about this industry.

(a) Average beta coefficient of equity capital = 1.59
(b) Average debt:equity ratio in the industry = 1:2 (by market value).

The rate of corporation tax is 33%.

What would be a suitable cost of capital to apply to the project?

Solution

5.14 Convert the geared beta value for the industry to an ungeared beta for the industry.

$$\beta_a = \frac{1.59}{1 + \frac{1(1-0.33)}{2}}$$

$$= 1.19$$

Convert this ungeared industry beta back into a geared beta, which reflects the company's own gearing level of 2:5.

$$\beta_e = 1.19 [1 + \frac{2(1-0.33)}{5}]$$

$$= 1.51$$

5.15 This is a project-specific beta for the firm's equity capital, and so using the CAPM, we can estimate the project-specific cost of equity as:

$$K_{eg} = 11\% + 1.51(16\% - 11\%)$$
$$= 18.55\%$$

5.16 The project will presumably be financed in a gearing ratio of 2:5 debt to equity, and so the project-specific cost of capital ought to be:

$$[\frac{5}{7} \times 18.55\%] + [\frac{2}{7} \times 67\% \times 11\%] = 15.4\%$$

Exercise 3

Two companies are identical in every respect except for their capital structure. XY plc has a debt: equity ratio of 1:3, and its equity has a β value of 1.20. PQ plc has a debt:equity ratio of 2:3. Corporation tax is at 33%. Estimate a β value for PQ plc's equity.

Solution

Estimate an ungeared beta from XY plc data.

$$\beta_a = \frac{1.20}{1 + \frac{1(0.67)}{3}} = 0.98093$$

Estimate a geared beta for PQ plc using this ungeared beta.

$$\beta_e = 0.98093 [1 + \frac{2(0.67)}{3}] = 1.42.$$

The usefulness and the limitations of the CAPM for capital investment decisions

5.17 The CAPM produces a required return based on the expected return of the market, expected project returns, the risk-free interest rate and the variability of project returns relative to the market returns.

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. 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.

5.18 The model was developed with respect to securities; by applying it to an investment within the firm, the company is assuming that the shareholder wishes investments to be evaluated as if they were securities in the capital market and thus assumes that all shareholders will hold diversified portfolios and will not look to the company to achieve diversification for them.

5.19 The greatest practical problems with the use of the CAPM in capital investment decisions are as follows.

(a) 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.

(b) 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.

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.

(c) 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.

6 THE ARBITRAGE PRICING MODEL 12/95

6.1 The CAPM is seen as a useful analytical tool by financial managers as well as by financial analysts. However, critics suggest that the relationship between risk and return is more complex than is assumed in the CAPM. One model which could replace the CAPM in the future is the *arbitrage pricing model* (APM).

6.2 The APM assumes that the return on each security is based on a number of independent factors. The actual return r on any security is shown as:

$$r = E(r_j) + \beta_1 F_1 + \beta_2 F_2 \ldots + e$$

where $E(r_j)$ is the expected return on the security
β_1 is the sensitivity to changes in factor 1
F_1 is the difference between actual and expected values of factor 1
β_2 is the sensitivity to changes in factor 2
F_2 is the difference between actual and expected values of factor 2
e is a random term

6.3 Factor analysis is used to ascertain the factors to which security returns are sensitive. Four key factors identified by researchers have been:

(a) unanticipated inflation;
(b) changes in the expected level of industrial production;
(c) changes in the risk premium on bonds (debentures);
(d) unanticipated changes in the term structure of interest rates.

6.4 If a certain combination of securities is expected to produce higher returns than is indicated by its risk sensitivities, then traders will engage in arbitrage trading to improve the expected returns. It has been demonstrated that when no further arbitrage opportunities exist, the expected return $E(r_j)$ can be shown as:

$$E(r_j) = r_f + \beta_1(r_1 - r_f) + \beta_2(r_2 - r_f) \ldots$$

where r_f is the risk-free rate of return
r_1 is the expected return on a portfolio with unit sensitivity to factor 1 and no sensitivity to any other factor
r_2 is the expected return on a portfolio with unit sensitivity to factor 2 and no sensitivity to any other factor

6.5 This implies that the expected rate of return on a security is a function of the risk-free rate of return plus risk premiums ($(r_1 - r_f)$, $(r_2 - r_f)$ etc) depending on the sensitivity of the security to various factors such as the four factors identified in Paragraph 6.3 above.

6.6 As is the case with the CAPM, what empirical evidence is available is inconclusive and neither proves nor disproves the theory of the APM. Both the CAPM and the APM do however provide a means of analysing how risk and return may be determined in conditions of competition and uncertainty.

6.7 In an article published in the ACCA *Students' Newsletter* (January 1995), R A Hill points out that the APM has the advantage over the CAPM that it explains the pricing of securities in relation to each other, rather than relative to a market portfolio.

6.8 While the CAPM focuses upon the linear relationship between beta factors and returns, the APM breaks systematic risk into smaller components which need not be specified in advance. Any factor affecting investor returns, for example an unexpected change in the rate of inflation, can be incorporated into the APM. Research corroborates the 4-factor APM. Although the APM differs in detail from the CAPM, the model is still something

of a simplification, relying as it does on portfolio theory (originally developed by Markowitz) and its accompanying assumptions, including the questionable efficient markets hypothesis (EMH).

6.9 Hill points out that because the APM has not yet been developed fully, the CAPM remains the standard used by practitioners to explain how their active management of portfolios can profitably outperform the market by trading shares relative to measures of systematic risk.

Chapter roundup

- The capital asset pricing model has many applications, as we have seen in this chapter. However, you should not think of it as the only approach to the cost of equity, or to project appraisal. You should learn the formulae, not only to be able to use them but also to be able to criticise the CAPM.
- The risk involved in holding securities (shares) divides into risk specific to the company and risk due to variations in market activity.
- Systematic risk can be diversified away, and investors may mix a diversified market portfolio with risk-free assets to achieve a preferred mix of risk and return on the Capital Market Line (see Chapter 7).
- The required return on shares includes a risk premium in respect of systematic risk only.
- If we assume a perfect capital market, then the following equations link CAPM and Modigliani and Miller, and are all consistent with one another.

$$V_g = V_u + Dt$$

$$WACC_g = K_{eu}\left[1 - \frac{Dt}{E + D}\right] \quad *$$

$$E(r_j) = r_f + [E(r_m) - r_f]\beta_j \quad *$$

$$\beta_a + \beta_e \frac{E}{E + D(1 - t)} + \beta_d \frac{D(1 - t)}{E + D(1 - t)} \quad *$$

* These formulae are included on the Paper 14 *Formulae Sheet*.

- You should be aware of the arbitrage pricing model, which could replace the capital asset pricing model as a tool for analysing the determination of risk and return.

Test your knowledge

1 Distinguish between systematic risk and unsystematic risk. (see paras 1.3, 1.4)

2 How would we expect the returns from an individual security (shares in an individual company) to be related to the average returns from all shares in market? (1.17)

3 What is meant by a share's beta factor? (1.19)

4 State the formula for the CAPM (the security market line). (1.28)

5 What is meant by a share's alpha value? (1.29)

6 Which portfolios will have a beta factor of (a) one and (b) zero? (3.1)

7 Explain briefly how the gearing of a company affects its beta value. (4.1)

8 What is the consequence of making the assumption in CAPM analysis that corporate debt is risk free, when in reality it has a (low) beta value? (4.15, 4.16)

9 What is the difference between using the CAPM and using the dividend valuation model for calculating a cost of equity and a WACC? (5.8 - 5.10)

10 Outline the main practical problems in using the CAPM in capital investment decisions. (5.19)

11 Outline the main features of the arbitrage pricing model (APM). (6.2 - 6.5)

Now try illustrative question 8 at the end of the Study Text

Chapter 9

CORPORATE DIVIDEND POLICY

This chapter covers the following topics.

		Syllabus reference
1	Dividends and retentions	3(f)
2	Dividend growth and market value	3(f)
3	Theories of dividend policy	3(f)
4	Practical aspects of dividend policy	3(f)

Introduction

In this chapter, we deal with the question of how much should be paid out by a company to its shareholders in the form of dividends. What is the effect of dividend policy on share prices? What are the practical influences on dividend policy, including the effects of taxation?

We shall be discussing the views on dividend policy of Modigliani and Miller, whose theories were discussed in Chapter 6. Part of the chapter is based on the fundamental theory of share values, which was described in Chapter 4.

1 DIVIDENDS AND RETENTIONS

12/95

1.1 Retained earnings are the single most important source of finance for UK companies. For any company, the amount of earnings retained within the business has a direct impact on the amount of dividends. Profit re-invested as retained earnings is profit that could have been paid as a dividend.

1.2 The major reasons for using retained earnings to finance new investments, rather than to pay higher dividends and then raise new equity funds for the new investments, are as follows.

(a) The management of many companies believe that retained earnings are funds which do not cost anything, although this is not true. However, it is true that the use of retained earnings as a source of funds does not lead to a payment of cash.

(b) The dividend policy of a company is in practice determined by the directors. From their standpoint, retained earnings are an attractive source of finance because investment projects can be undertaken without involving either the shareholders or any outsiders.

(c) The use of retained earnings as opposed to new shares or debentures avoids issue costs.

(d) The use of retained earnings avoids the possibility of a change in control resulting from an issue of new shares.

1.3 Another factor that may be of importance is the financial and taxation position of the company's shareholders. If, for example, because of taxation considerations, they would rather make a capital profit (which will only be taxed when the shares are sold) than receive current income, then finance through retained earnings would be preferred to other methods.

1.4 A company must restrict its self-financing through retained profits because shareholders should be paid a reasonable dividend, in line with realistic expectations, even if the directors would rather keep the funds for re-investing.

At the same time, a company that is looking for extra funds will not be expected by investors (such as banks) to pay generous dividends, nor over-generous salaries to owner-directors.

Taxation aspects of dividends

1.5 A company declares a dividend out of its profits after taxation. This is a dividend net of any tax. The following reflects the position which has applied since 1994/95.

1.6 Suppose that a company pays a dividend of £800,000 net to shareholders. Given that there is a lower rate of income tax of 20%, the company will also have to pay advance corporation tax (ACT) of 20/80 × £800,000 = £200,000. The ACT is an advance payment of part of the company's total corporation tax for the year and will eventually be set against the tax liability of the company.

1.7 The ACT is also treated as a tax credit for shareholders with the treatment depending on the tax position of the shareholder. Suppose that shareholders A, B, C and D each receive £80 in dividends from the company.

(a) A, a non-taxpayer, is entitled to reclaim the £20 tax credit (£80 × 20/80).

(b) For both B, a lower rate (20%) taxpayer, and C, a basic rate (25%) taxpayer, there are no further tax implications. Note in particular that C has no further tax to pay even though C's marginal rate of tax is greater than the 20% rate at which tax credit is given.

(c) D, a higher rate (40%) taxpayer, is required to pay additional tax of £20, representing the difference between tax at 40% and the amount of the tax credit (£80 × 100/80 × 40% – £20).

1.8 As far as a company is concerned, the most significant taxation aspect of dividend payments is that the company must have sufficient cash to pay both the net dividend to shareholders and also the ACT to the Inland Revenue.

Legal and procedural aspects of dividend payments

1.9 Dividends are usually paid by UK public companies twice a year.

(a) An interim dividend is paid after the publication of the interim results of the company for the first half year.

(b) A final dividend is paid after the annual accounts for the year have been published, and after the proposed dividend has been agreed by shareholders at the Annual General Meeting.

1.10 It is usual for shareholders to have the power to vote to *reduce* the size of the final (proposed) dividend at the AGM, but not the power to increase the dividend. The directors of the company are therefore in a strong position, with regard to shareholders, when it comes to determining dividend policy. For practical purposes, shareholders will usually be obliged to accept the dividend policy that has been decided on by the directors.

2 DIVIDEND GROWTH AND MARKET VALUE

Dividend policy and share prices

2.1 The purpose of a dividend policy should be to maximise shareholders' wealth, which depends on both current dividends and capital gains. Capital gains can be achieved by retaining some earnings for reinvestment and dividend growth in the future.

2.2 According to what can be termed the 'residual theory', maximisation of shareholder wealth will be achieved by applying the following rules.

(a) If a company can identify projects with positive NPVs, it should invest in them.

(b) Only when these investment opportunities are exhausted should dividends be paid.

Growth in dividends

2.3 The rate of growth in dividends is sometimes expressed, theoretically, as:

$$g = bR$$

where g is the annual growth rate in dividends
R is the proportion of profits that are retained
b is the rate of return on new investments.

Example: dividend growth

2.4 (a) If a company has a payout ratio of 40%, and retains the rest for investing in projects which yield 15%, the annual rate of growth in dividends could be estimated as 15% × 60% = 9%.

(b) If a company pays out 80% of its profits as dividends, and retains the rest for reinvestment at 15%, the current dividend would be twice as big as in (a), but annual dividend growth would be only 15% × 20% = 3%.

An approach to dividend policy, based on fundamental analysis of share values

2.5 A theoretical approach to dividend and retentions policy can be based on the fundamental theory of share values. We will make the following assumptions.

(a) The market value of a company's shares depends on:

(i) the size of dividends paid;
(ii) the rate of growth in dividends;
(iii) the shareholders' required rate of return.

(b) The rate of growth in dividends depends on how much money is reinvested in the company, and so on the rate of earnings retention.

(c) Shareholders will want their company to pursue a retentions policy that maximises the value of their shares.

2.6 The basic dividend-based formula for the market value of shares P_o is:

$$P_o = \frac{D_1}{r}$$

where D_1 is a constant annual dividend, and r is the shareholders' required rate of return. This formula assumes a *constant* dividend, and no dividend growth at all, so an assumption on which this formula is based is that all earnings are paid out as dividends.

2.7 Using the dividend growth model, we have:

$$P_o = \frac{D_0(1+g)}{(r-g)}$$

where D_0 is the current year's dividend (year 0) and g is the growth rate in earnings and dividends, so $D_0(1 + g)$ is the expected dividend in one year's time. P_o is the market value excluding any dividend currently payable.

Example: dividend growth model

2.8 Tantrum plc has achieved earnings of £800,000 this year. The company intends to pursue a policy of financing all its investment opportunities out of retained earnings. There are considerable investment opportunities, which are expected to be available indefinitely. However, if Tantrum plc does not exploit any of the available opportunities, its annual earnings will remain at £800,000 in perpetuity. The following figures are available.

Proportion of earnings retained	*Growth rate in earnings*	*Required return on all investments by shareholders*
%	%	%
0	0	14
25	5	15
40	7	16

The rate of return required by shareholders would rise if earnings are retained, because of the risk associated with the new investments.

What is the optimum retentions policy for Tantrum plc? The full dividend payment for this year will be paid in the near future in any case.

Solution

2.9 Since $P_o = \frac{D_0(1+g)}{(r-g)}$

the market value cum dividend is given by:

$$\text{MV cum div} = \frac{D_0(1+g)}{(r-g)} + D_0$$

We are trying to maximise the value of shareholder wealth, which is currently represented by the *cum div* market value, since a dividend will soon be paid.

(a) If retentions are 0%, the market value cum dividend is given by:

$$\text{MV cum div} = \frac{800,000}{0.14} + 800,000$$

$$= £6,514,286$$

(b) If retentions are 25%, the current dividend will be £600,000 and:

$$\text{MV cum div} = \frac{600,000(1.05)}{(0.15-0.05)} + 600,000$$

$$= £6,900,000$$

(c) If retentions are 40%, the current dividend will be £480,000 and:

$$\text{MV cum div} = \frac{480,000(1.07)}{(0.16-0.07)} + 480,000$$

$$= £6,186,667$$

The best policy (out of the three for which figures are provided) would be to retain 25% of earnings.

Dividend policy and shareholders' personal taxation

2.10 The market value of a share has been defined as the sum of all future dividends, discounted at the shareholder's marginal cost of capital. When constant dividends are expected, we have:

$$P_o = \frac{D_0}{r}$$

2.11 The cost of capital is generally taken to be a tax-free rate, ignoring the actual rates of personal taxation paid on dividends by different shareholders. To each individual shareholder, however, the dividends are subject to income tax at a rate which depends on his own tax position, and it is possible to re-define his valuation of a share as:

$$P_o = \frac{D_g(1-t)}{r_t}$$

where D_g = gross dividend (assumed to be constant each year)
t = rate of personal tax on the dividend
r_t = the shareholder's after tax marginal cost of capital.

2.12 Presumably, a company should choose between dividend payout and earnings retention so as to maximise the wealth of its shareholders; however, if not all shareholders have the same tax rates and after tax cost of capital, there might not be an optimum policy which satisfies all shareholders. By what is referred to as the *clientele effect*, companies may attract particular types of shareholders seeking particular dividend policies.

2.13 A further problem occurs when income from dividends might be taxed either more or less heavily than capital gains. Note that in the UK, individuals have an annual capital gains exemption which is not available for setting against income, and companies are taxed on capital gains but not on dividend income. By what is referred to as the *clientele effect*, companies may attract particular types of shareholders seeking particular dividend policies.

2.14 Since the purpose of a dividend policy should be to maximise the wealth of shareholders, it is important to consider whether it would be better to pay a dividend now, subject to tax on income, or to retain earnings so as to increase the shareholders' capital gains (which will be subject to capital gains tax when the shareholders eventually sell their shares).

3 THEORIES OF DIVIDEND POLICY

Residual theory

3.1 A 'residual' theory of dividend policy can be summarised as follows.

(a) If a company can identify projects with positive NPVs, it should invest in them.
(b) Only when these investment opportunities are exhausted should dividends be paid.

Traditional view

3.2 The 'traditional' view of dividend policy, implicit in our earlier discussion, is to focus on the effects on share price.

3.3 The price of a share depends upon the mix of dividends, given shareholders' required rate of return, and growth.

$$r = \frac{d_1}{p_0} + g \qquad \therefore P_0 = \frac{d_1}{(r-g)} = \frac{d_0(1+g)}{(r-g)}$$

Accordingly, the rate at which dividends are paid does matter to shareholders.

3.4 In contrast to the traditional view, 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.

3.5 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. The consequent loss of value in the existing shares, as a result of obtaining outside finance instead of using retained earnings, is exactly equal to the amount of the dividend paid. A company should therefore be indifferent between paying a dividend (and obtaining new outside funds) and retaining earnings.

3.6 In answer to criticisms that certain shareholders will show a preference either for high dividends or for capital gains, MM argued that 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.'

The case in favour of the relevance of dividend policy (and against MM's views)

3.7 There are strong arguments against MM's view that dividend policy is irrelevant as a means of affecting shareholder's wealth.

(a) Differing rates of taxation on dividends and capital gains can create a preference for a high dividend or one for high earnings retention.

(b) Dividend retention should be preferred by companies in a period of capital rationing.

(c) Due to imperfect markets and the possible difficulties of selling shares easily at a fair price, shareholders might need high dividends in order to have funds to invest in opportunities outside the company.

(d) Markets are not perfect. Because of transaction costs on the sale of shares, investors who want some cash from their investments should prefer to receive dividends rather than to sell some of their shares to get the cash they want.

(e) Information available to shareholders is imperfect, and they are not aware of the future investment plans and expected profits of their company. Even if management were to provide them with profit forecasts, these forecasts would not necessarily be accurate or believable. As a consequence of imperfect information:

(i) companies are normally expected at least to maintain the same level of dividends from one year to the next. They are expected to pay a constant dividend or an increased dividend, but not a lower dividend than the year before. Failure to maintain the dividend level would undermine investors' confidence in the future;

(ii) in practice, undertaking a new investment project with a positive NPV will not immediately increase the market value of shares by the amount of the NPV because markets do not show strong-form efficiency. It is only gradually, as the profits from the investment begin to show up in the profits and dividends in historical financial statements, that the market value of the shares will rise.

(f) Perhaps the strongest argument against the MM view is that shareholders will tend to prefer a current dividend to future capital gains (or deferred dividends) because the future is more uncertain.

4 PRACTICAL ASPECTS OF DIVIDEND POLICY

4.1 So far, we have concentrated on theoretical approaches to establishing an optimal dividend and retentions policy. A practical approach to dividends and retentions should take various factors into consideration.

(a) The need to remain profitable. Dividends are paid out of profits, and an unprofitable company cannot for ever go on paying dividends out of retained profits made in the past.

(b) The law on distributable profits.

(c) Any dividend restraints which might be imposed by loan agreements.

(d) The effect of inflation, and the need to retain some profit within the business just to maintain its operating capability unchanged.

(e) The company's gearing level. If the company wants extra finance, the sources of funds used should strike a balance between equity and debt finance. Retained earnings are the most readily available source of growth in equity finance.

(f) The company's liquidity position. Dividends are a cash payment, and a company must have enough cash to pay the dividends it declares.

(g) The ease with which the company could raise extra finance from sources other than retained earnings. Small companies which find it hard to raise finance might have to rely more heavily on retained earnings than large companies.

4.2 If a company wants extra finance to invest, retained earnings can be obtained without incurring transaction costs. Costs of raising new share capital can be high, and even bank borrowings can be quite expensive.

Dividends as a signal to investors

4.3 You should appreciate the signalling effect of dividends.

4.4 Although the market would like to value shares on the basis of underlying cash flows on the company's projects, such information is not readily available to investors. however, the directors do have this information.

(a) The dividend declared can be interpreted as a 'signal' from directors to shareholders about the strength of underlying project cash flows.

(b) Directors can signal to the market in other ways also: the issue of debt, which commits the company to paying interest, can be interpreted as a signal of strong project cash flows, as compared with the issue of equity.

Such 'signals' are likely to be taken as more reliable than anything which the directors say, since they involve actual commitments or movements of cash.

4.5 Investors usually expect a consistent dividend policy from the company, with stable dividends each year or, even better, steady dividend growth. A large rise or fall in dividends in any year can have a marked effect on the company's share price. Stable dividends or steady dividend growth are usually needed for share price stability. A cut in dividends may be treated by investors as signalling that the future prospects of the company are weak. Thus, the dividend which is paid acts, possibly without justification, as a signal of the future prospects of the company.

4.6 The signalling effect of a company's dividend policy may also be used by management of a company which faces a possible takeover. The dividend level might be increased as a defence against the takeover: investors may take the increased dividend as a signal of improved future prospects, thus driving the share price higher and making the company more expensive for a potential bidder to take over.

Scrip dividends, scrip issues and stock splits

Scrip dividends

4.7 A *scrip dividend* is a dividend payment which takes the form of new shares instead of cash. Effectively, it converts profit reserves into issued share capital. When the directors of a company would prefer to retain funds within the business but consider that they

must pay at least a certain amount of dividend, they might offer equity shareholders the choice of:

(a) a cash dividend; or
(b) a scrip dividend of more shares in the company.

Scrip dividends have the advantage that no advance corporate tax (ACT) is payable on dividends issued in shares as there is for cash dividends.

4.8 Recently (particularly since 1993) *enhanced scrip dividends* have been offered by a number of companies. With enhanced scrip dividends, the value of the shares offered is much greater than the cash alternative, giving investors an incentive to choose the shares.

Case example: BAT Industries plc

4.9 BAT Industries plc (BAT) was the first company to offer an enhanced scrip dividend, offering a share alternative worth 50 per cent more than the cash dividend. The reduced cash dividend enabled BAT to retain funds within the business for the future benefit of shareholders and reduced payments of ACT to the government. Companies such as BAT, which earn most of their profits overseas, typically have a mainstream corporation tax liability which is insufficient to offset all of their ACT payment on cash dividends. The policy was welcomed more by individual shareholders than by institutions such as pension funds which can reclaim any tax deducted at source.

4.10 The ACT rules discriminate against overseas profits, which seems inappropriate in an increasingly internationalised financial environment. Hence, the government introduced the *foreign income dividend (FID)* scheme from 1 July 1994, which allows companies to pay a dividend out of overseas profits carrying no tax credit. BAT was the first company to take advantage of the scheme. Two weeks after declaring a dividend of 12.2 pence payable in June with no scrip alternative, the company announced that it would be postponed until July and classified as a foreign income dividend.

4.11 The tax treatment of FIDs is different to that for a normal dividend, putting non-taxpaying shareholders, including personal equity plan (PEP) holders, at a disadvantage. In the BAT case, pension fund shareholders were perturbed because they would not be able to reclaim tax deducted at source and the company responded by increasing the proposed July 1994 dividend by 3.05p. This left the pension funds receiving exactly what they would have done from a normal dividend, while taxpaying shareholders were overcompensated.

4.12 The different tax treatments are summarised below.

	Actual Dividend	*Received by taxpayers*		
		0%	*25%*	*40%*
	pence	pence	pence	pence
Normal dividend	80	100	80	60
FID	80	80	80	60
Increased FID	100	100	100	75

Scrip issues

4.13 A scrip or bonus issue (also known as a capitalisation issue) involves the issue of new shares to existing shareholders in proportion to their existing holdings.

4.14 Such an issue has the effect of reducing the retained earnings (profit and loss) account and increasing the called up share capital account. Obviously there is no net raising of cash, nor any increase in the value of shareholders' equity. Whether there is any point to the process (other than reducing the price per share and hence possibly increasing share trading liquidity) is open to debate. If there is, then it is either because:

(a) shareholders are not as clever as we think they are, or

(b) there are associated 'signals' that commonly accompany the scrip issue, eg perhaps that the dividend per share is to be maintained on the increased number of shares and hence the directors believe future company cashflows will be favourable.

Stock splits

4.15 This possible advantage of a scrip issue is also the reason for a *stock split*. A stock split occurs where, for example, each ordinary share of £1 each is split into two shares of 50p 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 50p 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.

4.16 The difference between a stock split and a scrip issue is that a scrip issue converts equity reserves into share capital, whereas a stock split leaves reserves unaffected. Both are popular with investors as they are seen as likely to lead to increased dividends. Scrip dividends can, however, lead to tax complications for individual investors.

Exercise

Ochre plc is a company that is still managed by the two individuals who set it up 12 years ago. In the current year, the company acquired plc status and was launched on the second tier Alternative Investment Market (AIM). Previously, all of the shares had been owned by its two founders and certain employees. Now, 40% of the shares are in the hands of the investing public.

The company's profit growth and dividend policy are set out below. Will a continuation of the same dividend policy as in the past be suitable now that the company is quoted on the AIM?

Year	*Profits* £'000	*Dividend* £'000	*Shares in issue*
4 years ago	176	88	800,000
3 years ago	200	104	800,000
2 years ago	240	120	1,000,000
1 year ago	290	150	1,000,000
Current year	444	222 (proposed)	1,500,000

Solution

Year	*Dividend per share*	*Dividend as % of profit*
4 years ago	11.0	50%
3 years ago	13.0	52%
2 years ago	12.0	50%
1 year ago	15.0	52%
Current year	14.8	50%

The company appears to have pursued a dividend policy of paying out half of after-tax profits in dividend.

This policy is only suitable when a company achieves a stable EPS or steady EPS growth. Investors do not like a fall in dividend from one year to the next, and the fall in dividend per share in the current year is likely to be unpopular, and to result in a fall in the share price.

The company would probably serve its shareholders better by paying a dividend of at least 15p per share, possibly more, in the current year, even though the dividend as a percentage of profit would then be higher.

Chapter roundup

- Empirical evidence suggests that investors consider dividends to be important; accordingly dividend policy should be of concern to company directors and financial managers. Companies generally smooth out dividend payments by adjusting only gradually to changes in earnings: large fluctuations might undermine public confidence.
- Modigliani and Miller's theories suggest that dividend policy is irrelevant to shareholder wealth in perfect capital markets. Given the imperfections in real-world markets and in taxation policies, the position is not so clear.

Test your knowledge

1 What reasons are there for using retained earnings to finance new investments? (see para 1.2)

2 Outline the UK tax treatment of dividends. (1.5 - 1.7)

3 Outline Modigliani and Miller's views on the irrelevance of dividend policy. (3.4 - 3.6)

4 What practical factors should be taken into consideration in deciding dividend policy? (4.1)

Now try illustrative question 9 at the end of the Study Text

Part C
Business planning

Chapter 10

BUSINESS PLANNING AND FINANCIAL PLANNING

This chapter covers the following topics.

		Syllabus reference
1	Planning and control	2(a), (b)
2	Strategic planning, management control and operational control	2(a), (b)
3	Capital structure, cash flow and pricing	2(a), (b)
4	The treatment of business risk	2(d)

Introduction

Before covering ratio analysis as a part of business financial planning (in Chapter 12), we look in Chapters 10 and 11 at aspects of business planning, financial planning and control.

Your knowledge from Paper 10 *Management and Strategy* will be relevant here.

1 PLANNING AND CONTROL

12/95

1.1 Many managers view planning and controlling as two separate activities. However, Robert N Anthony argued in his book *Planning and Control Systems: a Framework for Analysis* (1956) that 'the trouble essentially is that, although planning and control are definable abstractions and are easily understood as calling for different types of mental activity, they do not relate to separable major categories of activities actually carried on in an organisation either at different times, or by different people, or for different situations.'

1.2 Managers often plan and control at the same time. Here is an example.

In a budgetary control system, a sales manager might receive an adverse sales volume variance report at the end of May. After investigating the variance, he might do the following.

(a) Inform his superiors that sales forecasts for the rest of the year will need to be revised (planning activity).

(b) Take action in an attempt to improve the current sales effort (control activity).

1.3 Koontz (1958) wrote:

> 'Planning and control are so closely interconnected as to be singularly inseparable'.
>
> 'The fact that there seem ... to be so many fewer principles of control than principles of planning indicates the extent to which control depends upon planning and how it is largely a technique for assuring that plans are realised.'

1.4 It is also significant that in their *Official Terminology*, the CIMA describes budgetary control as involving the setting of budgets and standards (planning) as well as the appraisal of performance and control.

1.5 As an alternative analysis of planning and control systems, Anthony suggested that there are three levels or tiers within a decision-making hierarchy.

(a) *Strategic planning*: 'the process of deciding on objectives of the organisation, on changes in these objectives, on the resources used to attain these objectives, and on the policies that are to govern the acquisition, use and disposition of these resources'.

(b) *Management control*: 'the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organisation's objectives'. Management control can alternatively be called *tactical control*.

(c) *Operational control*: 'the process of assuring that specific tasks are carried out effectively and efficiently'.

1.6 In spite of the possibly misleading use of the words 'planning' and 'control' in these three titles, each level of decision-making includes elements of both planning and control (although perhaps in varying proportions).

Behavioural aspects of planning and control

1.7 An important condition of good performance is the *motivation* of management and employees. Managers and employees should *want* to set challenging targets and should be keen to achieve them.

1.8 In practice, however, there may be difficulties with the behavioural aspects of financial planning and control.

(a) Individual managers might have different, and often competing objectives, because they attach more importance to their own division or department than to the organisation as a whole.

For example, the managing directors of two subsidiary companies in a group might each want to maximise their own subsidiary's profits, even at the expense of other subsidiaries and the group as a whole. Inter-subsidiary disputes about transfer prices for the inter-company supply of goods and services can result in sub-optimal purchasing decisions (for example buying from an independent external supplier instead of from another group company).

(b) Managers might not be given clearly defined targets. Without clear targets, managers might pursue sub-optimal objectives.

(c) Managers will not take suitable control action unless they are given regular feedback, typically a report on their actual performance and a comparison of actual results against budget. Managers need to know how well or badly they are doing, and can easily be frustrated by inadequate information or inaccurate reporting.

(d) Managers must have authority to take action for directing and controlling the resources for which they are responsible. Responsibility without authority, or authority without responsibility, will result in inadequate financial control.

(e) It can be argued that managers and employees will be better motivated to achieve good results if they are well rewarded for doing so, perhaps in the form of higher salaries, but also in bonuses, commissions, share options, promotion and so on.

(f) In some circumstances, greater participation in the planning process might encourage greater commitment from staff.

Goal congruence

1.9 Goal congruence arises when the fulfilment of all individual goals will lead to the fulfilment of the company's overall goal.

1.10 Proper budgeting should promote goal congruence within an organisation, but managers will often look no further than their own division or department.

(a) A sales manager will often think that his main objective should be to win extra sales, without perhaps thinking enough about the need to make a profit on the sales.

(b) A production manager might emphasise the requirement for product quality, even though better quality could mean higher costs.

2 STRATEGIC PLANNING, MANAGEMENT CONTROL AND OPERATIONAL CONTROL

Strategic planning

2.1 We discussed objectives of organisations in the first chapter of this text. *Strategic plans* are those which set or change the objectives, or strategic targets of an organisation. They include such matters as the selection of products and markets, the required levels of company profitability, the purchase and disposal of subsidiary companies or major fixed assets, and whether employees should share in company profits.

2.2 Johnson and Scholes suggest that strategy within an organisation might be classified into three levels, as we saw in Chapter 1.

Exercise 1

Think about, and jot down notes on, aspects of the three levels of strategy identified by Johnson and Scholes in your own organisation.

Reminder: these are corporate strategy; business or competitive strategy; operational strategy.

Management control

2.3 *Management control* is at the level below strategic planning in Anthony's decision-making hierarchy. Whilst strategic planning is concerned with setting objectives and strategic targets, management control is concerned with decisions about the efficient and effective use of an organisation's resources to achieve these objectives or targets.

(a) Resources are: personnel, materials, machines and money.

(b) Efficiency in the use of resources means that optimum output is achieved from the input resources used.

(c) Effectiveness in the use of resources means that the resources are used to reach the intended objectives or targets.

2.4 Management control planning is *tactical planning* and would include activities such as the following.

(a) Preparing budgets for the next year for sales, production, stock levels, overhead cost centres, purchasing, cash etc.

(b) Establishing measures of performance (eg return on capital employed) by which profit centres or departmental results can be gauged.

(c) Developing a product for launching in the market.

(d) Planning advertising and marketing campaigns.

(e) Establishing a line-of-authority structure for the organisation.

2.5 The control features of management control include taking action as follows.

(a) Ensuring that budget targets are reached, or improved upon.

(b) Ensuring that other measures of performance are satisfactory, or even better than planned.

(c) Where appropriate, changing the budget because circumstances have altered and it is now irrelevant or out of date.

Budgets

2.6 Long-term financial plans are implemented by converting them into short-term plans or budgets.

(a) Most operating budgets cover a period of one year.

(b) Some budgets, notably capital expenditure budgets, might cover a period of several years.

2.7 Budgets will relate to a wide variety of financial planning matters, including:

(a) cash flow planning;
(b) profitability and financial returns;
(c) changes in asset structure;
(d) sources of finance and capital structure;
(e) working capital control;
(f) funding planned takeovers;
(g) tax planning;
(h) foreign currency management;
(i) banking arrangements.

2.8 The overall budgeted performance for the group will be established. The budget should include a budgeted profit and loss account, an end-of-year balance sheet and a cash flow statement.

2.9 No corporate plan has the detail or 'accuracy' that a budget has. Consequently, the tolerance limits giving 'early warning' or deviations from the plan should be wider. For example, if tolerance limits in budgetary control are variance ± 5% from standard, then corporate planning tolerance limits might be set at ± 10% or more from targets.

2.10 Whatever the tolerance limits are, the reporting of results which go outside the limits must be prompt. If sales have dropped well below target, the reasons must be established quickly and possible solutions thought about. Tolerance limits should be set on both the favourable and the adverse side of the planning targets. For example, if a company's products unexpectedly break through to win second place in the market, the questions that should be asked are as follows.

(a) How did it happen?

(b) Can profitability targets be maintained or exceeded at sales volumes which made it second in the market?

(c) Can second place be maintained, and if so, what needs to be done to secure second place?

(d) Can top place now be achieved?

Revising forecasts

2.11 Data about actual results can be used to revise forecasts about what is likely to happen in the future. Managers need information about whether actual results so far show that short-term targets have been met. They also need to know whether longer-term targets are likely to be met.

2.12 Control at a strategic level calls for the continuous revision of forecasts. A simple numerical example might help to explain this. Suppose that in 19X1, a company

forecasts its future return on capital employed, year by year for the next five years, as follows.

Year	*19X2*	*19X3*	*19X4*	*19X5*	*19X6*
Return	12%	13.5%	15%	16%	17%

In 19X2, the forecast might be revised in view of actual results in 19X2, as follows.

Year	*19X2 (actual result)*	*19X3 (forecast)*	*19X4*	*19X5*	*19X6*	*19X7*
Return	11.5%	12.5%	14%	15.5%	16.5%	17%

The revised forecast in 19X2 would show that the forecast return each year will be less than originally planned in 19X1, and that a return of 17% would not now be achieved until 19X7.

2.13 This revised forecast could be used as either to take control action to try to improve the forecast return each year, back to the levels that were originally planned in 19X1, or to revise the strategic planning targets.

2.14 Control at a strategic level, and the review of strategic plans, should therefore be an iterative process, with revised forecasts for the future being an important part of the control information.

Control and monitoring

2.15 Clear policies and targets should be set out for individual managers within the company.

A definition of control

2.16 CIMA terminology defines control and monitoring as follows.

> 'The continuous comparison of actual results with those planned, both in total and for separate sub-divisions and taking management action to correct adverse variances or to exploit favourable variances.'

2.17 This definition of control includes the three main underlying components of the control process.

(a) Setting *targets or standards* which serve as guidelines for performance.
(b) The *measurement and evaluation* of actual performance.
(c) Corrective action where it is needed in the form of a control decision.

2.18 Performance measurement, item (b) above, is therefore an essential bridge between planning (item (a)) and control (item (c)).

Setting targets or standards

2.19 Targets and standards of performance stem from a decision about what the objectives of the organisation should be. The overall corporate objectives adopted in the planning process serve as a foundation for all subsidiary quantified targets from divisional and departmental targets down to the performance standards for every echelon of manager and employee in the organisation.

2.20 Targets or standards might be for the long term or short term. Long-term targets for achievement will relate to the organisation's *objectives* and *strategic plans*. Short-term targets and standards will be for operational planning and control at a junior management level, and for medium-term planning and budgeting, and budgetary control by middle management.

Management control and strategic planning compared

2.21 The dividing line between strategic planning and management control is not a clear one. Matters such as the optimum siting of a transport depot, for example, include issues ranging from the strategic to the tactical.

2.22 Nevertheless, there is a basic distinction between the two levels of decision.

(a) The decision to launch a new brand of calorie-controlled frozen foods is a strategic plan (business strategy), but the choice of ingredients for the frozen meals involves a management control decision.

(b) A decision that the market share for a product should be 25% is a strategic plan (competitive strategy), but the selection of a sales price of £2 per unit, supported by other marketing decisions about sales promotion, direct sales effort etc to achieve the required market share, would be a series of management control decisions.

2.23 Management control tends to be carried out in a series of *regular* planning and comparison procedures (annually, monthly or weekly). For example, a budget is usually prepared annually, and control reports issued every month or four weeks. Strategic planning, in contrast, might be irregular and occur when opportunities arise or are identified.

Information requirements

2.24 The information required for management control embraces the entire organisation, just as a master budget includes all aspects of the organisation's activities. A system must exist for planning, measuring, comparing and controlling the efforts of every department or profit centre. The information is often quantitative (eg labour hours, quantities of materials consumed, volumes of sales and production) and is commonly expressed in money terms.

2.25 Management control information may by analysed in several different ways, for example an analysis may be made of production costs or departmental costs, but the total costs will be the same, whatever analysis is used. It will also be apparent that much management control information is obtained by measuring the activities and output of the organisation, as *feedback*.

2.26 In contrast, strategic planning information is obtained to some extent from internally-measured data, but to a far greater extent from 'environmental data' - external data about competitors, customers, suppliers, new technology, the state of markets and the economy, government legislation, political unrest and so on. It also tends to be more approximate and imprecise than management control information.

Conflict between management control and strategic planning activities

2.27 It is quite common for strategic plans to be in conflict with the shorter term objectives of management control. Examples are as follows.

(a) It might be in the long-term interests of a company to buy more expensive or technologically advanced machinery to make a product, in the expectation that when market demand for the product eventually declines, customers will buy from producers whose output is of a slightly better quality - ie made on better machinery. In the short run, however, new and expensive machinery will incur higher depreciation charges and therefore higher unit costs for the same volume of production. Since higher costs will reduce profit, considerations of 'management control' would suggest the existing old machinery should be worn out before replacement.

(b) Similarly, it may be in the long-term interests of a company to invest in research and development, in spite of the costs and loss of profits in the short term.

Operational control

2.28 The third and lowest tier in Anthony's hierarchy of decision-making consists of operational control decisions. As we have seen, it is the task of ensuring that *specific tasks* are carried out effectively and efficiently. Just as 'management control' plans are set within the guidelines of strategic plans, so too are 'operational control' plans set within the guidelines of both strategic planning and management control.

2.29 Here is an example.

(a) Senior management may decide that the company should increase sales by 5% per annum for at least five years - a *strategic plan*.

(b) The sales director and senior sales managers will make plans to increase sales by 5% in the next year, with some provisional planning for future years. This involves planning direct sales resources, advertising, sales promotion and so on. Sales quotas are assigned to each sales territory - a *tactical plan* (management control).

(c) The manager of a sales territory specifies the weekly sales targets for each sales representative. This is *operational planning* - individuals are given tasks which they are expected to achieve.

Operational control and management control compared

2.30 Whereas tactical information for management control is often expressed in money terms, operational information, although quantitative, is more often expressed in terms of units, hours, quantities of material and so on. Management control decisions are generally taken by managers senior in the organisation to those who take operational control decisions.

2.31 Management control reports are often prepared monthly (although sometimes annually, or weekly). Operational control is exercised during and after the completion of individual tasks - ie more frequently. In the case of automated production, control is exercised minute by minute.

3 CAPITAL STRUCTURE, CASH FLOW AND PRICING

3.1 In this section of the chapter, we look at how capital structure, cash flow and pricing can influence business planning.

Capital structure

3.2 The assets of a business must be financed somehow, and when a business is growing, the additional assets must be financed by additional capital. There are different ways in which the funding of current and fixed assets can be achieved by employing long and short-term sources of funding.

3.3 As you will by now be aware, *capital structure* refers to the way in which an organisation is financed, by a combination of long-term capital (ordinary shares and reserves, preference shares, debentures, bank loans, convertible loan stock and so on) and short-term liabilities such as a bank overdraft and trade creditors.

3.4 Figure 1 illustrates three alternative types of policy A, B and C. The dotted lines A, B and C are the cut-off levels between short-term and long-term financing for each of the policies A, B and C respectively: assets above the relevant dotted line are financed by short-term funding while assets below the dotted line are financed by long-term funding.

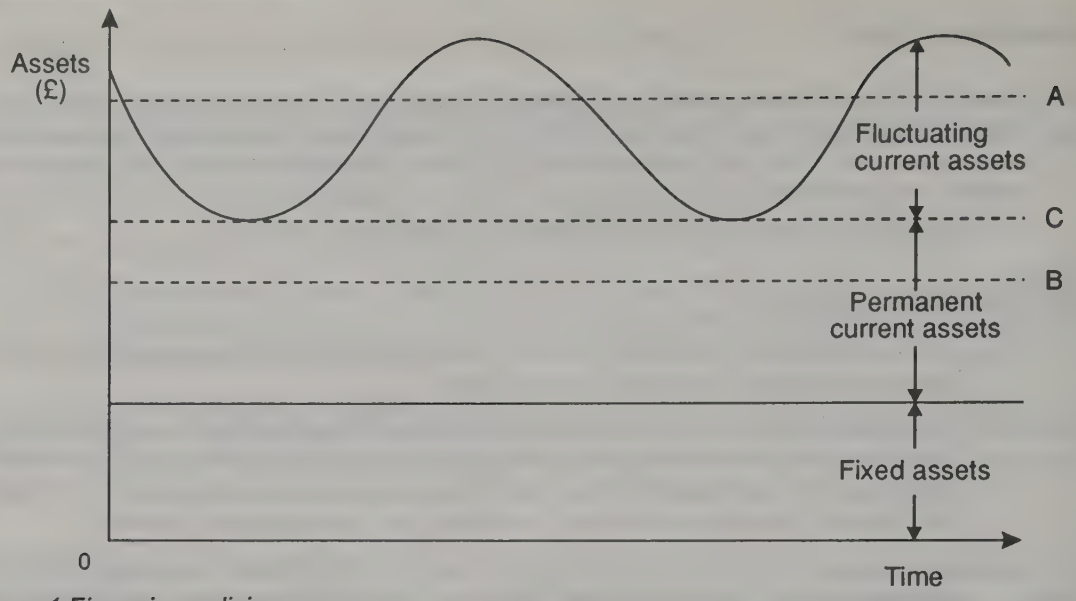


Figure 1 Financing policies

3.5 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). This can be seen in terms of policies A, B and C.

(a) Policy A can be characterised as conservative. All fixed assets and permanent current assets, as well as part of the fluctuating current assets, are financed by long-term funding. There is only a need to call upon short-term financing at times when fluctuations in current assets push total assets above the level of dotted line A. At times when fluctuating current assets are low and total assets fall below line A, there will be surplus cash which the company will be able to invest in marketable securities.

(b) Policy B is more aggressive in its 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.

(c) A balance between risk and return might be best achieved by policy C, in which long-term funds finance permanent assets while short-term funds finance non-permanent assets.

Business confidence and expectations

3.6 Business confidence and expectations of future profits are crucial factors in the determination of how much debt capital investors are prepared to lend. The level of gearing which the market will allow will therefore depend on the nature of the company wishing to borrow more funds, and the industry in which it is engaged.

(a) A company which is involved in a cyclical business, where profits are subject to periodic ups and downs, should have a relatively low gearing.

(b) A company in a business where profits are stable should be able to raise a larger amount of debt.

Free cash flow

3.7 One approach to the valuation of a business is to treat its value as the sum of future discounted free cash flows, where *free cash flow* is given by the following.

Free cash flow = Revenues – operating costs + depreciation – investment expenditure

3.8 This approach, however, presents the following problems when used in financial planning and strategy.

(a) Due to movement of working capital items, accounting information on revenues and operating costs may fail to reflect cash flows. For example, if sales increase, they may do so on longer credit terms than previously, and the cash flow effect therefore be delayed. Also, stock building may have adverse effects on cash flows while having no effects on profits.

(b) The timing of tax payments in a particular year will be based on profits earned in previous time periods. As a result, the free cash flow for the current period less this year's tax liability does not equal cash flow for the current year.

3.9 These problems mean that estimating free cash flow involves not just forecasting sales, costs and profits, but also working capital movements and taxation.

Cash flow planning

3.10 A business must maintain an adequate inflow of cash in order to survive. If a business owes money and cannot pay its debts when they fall due, it can be put into liquidation by its creditors, even if it is making profits. Since a company must have adequate cash inflows to survive, management should plan and control cash flows as well as profitability.

3.11 Cash budgeting is an important element in short-term cash flow planning. Cash budget periods might be for one year, or less (for example monthly budgets). The purpose of cash budgets is to make sure that the organisation will have enough cash inflows to meet its cash outflows. If a budget reveals that a short-term cash shortage can be expected, steps will be taken to meet the problem and avoid the cash crisis (perhaps by arranging a bigger bank overdraft facility).

3.12 Cash budgets and cash flow forecasts on their own do not give full protection against a cash shortage and enforced liquidation of the business by creditors. There may be unexpected changes in cash flow patterns. Examples of unforeseen changes include:

(a) a change in the general economic environment. An economic recession will cause a slump in trade;

(b) a new product, launched by a competitor, which takes business away from a company's traditional and established product lines;

(c) new cost-saving product technology, which forces the company to invest in the new technology to remain competitive;

(d) moves by competitors which have to be countered (for example a price reduction or a sales promotion);

(e) changes in consumer preferences, resulting in a fall in demand;

(f) government action against certain trade practices or against trade with a country that the company has dealings with;

(g) strikes or other industrial action;

(h) natural disasters, such as floods or fire damage, which curtail an organisation's activities.

3.13 When unforeseen events have an adverse effect on cash inflows, a company will only survive if it can maintain adequate cash inflows despite the setbacks.

Strategic fund management

3.14 Strategic fund management is an extension of cash flow planning, which takes into consideration the ability of a business to overcome unforeseen problems with cash flows, recognising that the assets of a business can be divided into three categories.

(a) Assets which are needed to carry out the 'core' activities of the business. A group of companies will often have one or several main activities, and in addition will carry on several peripheral activities. The group's strategy should be primarily to develop its main activities, and so there has to be enough cash to maintain those activities and to finance their growth.

(b) Assets which are not essential for carrying out the main activities of the business, and which could be sold off at fairly short notice. These assets will consist mainly of short-term marketable investments.

(c) Assets which are not essential for carrying out the main activities of the business, and which could be sold off to raise cash, although it would probably take time to arrange the sale, and the amount of cash obtainable from the sale might be uncertain. These assets would include:

(i) long-term investments (for example, substantial shareholdings in other companies);

(ii) subsidiary companies engaged in 'peripheral' activities, which might be sold off to another company or in a management buyout;

(iii) land and buildings.

3.15 If an unexpected event takes place which threatens a company's cash position, the company could meet the threat by:

(a) working capital management to improve cash flows by reducing stocks and debtors, taking more credit, or negotiating a higher bank overdraft facility;

(b) changes to dividend policy;

(c) arranging to sell off non-essential assets. The assets in category (b) above would be saleable at short notice, and arrangements could also be made to dispose of the assets in category (c), should the need arise and provided that there is enough time to arrange the sale.

Strategic cash flow planning

3.16 It is essential for the survival of any business to have an adequate inflow of cash. Cash flow planning at a strategic level is similar to normal cash budgeting, with the following exceptions.

(a) The planning horizon is longer.

(b) The *uncertainties* about future cash inflows and cash outflows are much greater.

(c) The business should be able to respond, if necessary, to an unexpected need for cash. Where could extra cash be raised, and in what amounts?

(d) A company should have planned cash flows which are consistent with:

(i) its dividend payment policy; and
(ii) its policy for financial structuring, debt and gearing.

Exercise 2

Suppose that WXY plc had the following balance sheet as at 31 December 19X8.

	£
Fixed assets	3,500,000
Current assets less current liabilities	500,000
	4,000,000
Share capital	500,000
Reserves	1,600,000
Long-term 10% debt	1,900,000
	4,000,000

The company's strategic planners have formulated the following policies.

(a) By the end of the next year (31 December 19X9), gearing should not exceed 100% - ie long term debt should not exceed the total of share capital and reserves.

(b) The company shall pay out 50% of its profits as dividend to shareholders.

The following estimates have been made.

(a) Each £10,000 of assets generates profits of £2,000 pa, before interest.
(b) The current market cost of debt capital is 10% pa.

The company would like to invest a further £500,000 but does not intend to make a share issue to raise the finance. Advise its management. Could it borrow the money and still achieve its strategic targets by the end of 19X9?

Ignore taxation and fixed asset depreciation.

Solution

The company's strategic aims *can* all be achieved, without a new share issue, even though it is already near the gearing limit it has set itself, of 100%.

A further £500,000 investment in capital would yield extra annual profits of £100,000 p.a. before interest.

Without a share issue, the £500,000 would have to be raised as a loan at 10%, raising the total company debt to £2,400,000 and total assets at the beginning of the year to £4,500,000.

		£
(1)	Profits before interest in 19X9 (£4,500,000 × 20%)	900,000
(2)	Interest (10% of £2,400,000)	240,000
(3)	Profits before dividend	660,000
(4)	Dividend (NB: taxation ignored)	330,000
(5)	Retained profits	330,000

Balance sheet at 31 December 19X9

Total assets (depreciation ignored)	£
At 31.12.X8	4,000,000
New investment	500,000
Retained profits	330,000
	4,830,000
Financed by	
Share capital	500,000
Reserves	1,930,000
Debt capital	2,400,000
	4,830,000

The company's gearing would just about remain below the maximum target limit of 100%.

New investments/product developments

3.17 Investments in new projects, such as new product developments, use up cash in the short term, and it will not be for some years perhaps that good profits and cash inflows are earned from them.

3.18 One aspect of strategic cash flow planning is to try to achieve a balance between the following.

(a) Making and selling products which are still in their early stages of development, and are still 'soaking up' cash.

(b) Making and selling products which are 'cash cows' - ie established products which are earning good profits and good cash inflows.

Cash-rich companies

3.19 A company should try to plan for adequate cash inflows, and be able to call on 'emergency' sources of cash in the event of an unforeseen need, but it might be unwise to hold too much cash.

3.20 When a company is cash-rich, it can invest the money, usually in short-term investments or deposits, such as the money market, to earn interest. However, for companies which are not in financial services or banking, the main function of money is to be spent. A cash-rich company could do one of the following.

(a) Plan to use the cash, for example for a project investment or a takeover bid for another company.

(b) Pay out the cash to shareholders as dividends, and let the shareholders decide how best to use the cash for themselves.

(c) Re-purchase its own shares.

Pricing

3.21 There are three categories of pricing decision as follows.

(a) Short-term pricing.
(b) Competitive bidding.
(c) Strategic pricing.

Short-term pricing

3.22 There is an inter-relationship between sales price and the volume of demand, expressed as a demand curve. The extent to which sales demand varies with price changes is expressed as the elasticity of demand. Marketing management should have the responsibility for estimating the price-demand inter-relationship for their organisation's products.

3.23 An aspect of pricing is the offer of *discounts* for bulk purchases, or to major customers. The scope for offering discounts is dependent on the ratio of variable cost to gross selling price. For example, if variable costs are 90% of gross sales value, a discount of 10% would wipe out all contribution, whereas if variable costs are, say, 40% of gross sales value, there is much more scope for discounts.

Sales staff might be keen to offer attractive discounts to win sales, but data about variable costs and contribution margins must be available to make sure that the discounts offered are prudent.

Competitive bidding

3.24 Competitive bidding calls for the preparation of cost data for the purpose of submitting a bid to a potential customer, in the hope of securing his order. Many sales contracts, for example local government authority contracts, are not awarded without having to resort to competitive tender.

3.25 A balance has to be drawn between putting in a bid which is too low to make an adequate profit, but keeping the bid low enough to stand a good chance of winning the contract. Consideration must be given to the following.

(a) The contribution to profit that would be obtained from the contract.

(b) The consequences for the company if it failed to win the order.

(c) The probability of winning the order, which might be assessed on the basis of past experience.

3.26 Three other factors in the competitive pricing equation might be as follows.

(a) A general price level may well exist, so that there is little likelihood of winning a contract on the basic price alone.

(b) There may be scope for a quantity discount.

(c) There may be some non-price product differentiation in favour of the supplier eg quality of service, reliable delivery times, finance facilities offered etc.

Strategic pricing

3.27 The Boston Consulting Group research (in the USA) has identified substantial empirical evidence to support the theory that costs are related to the *learning or experience curve*. The implications of the learning curve for pricing are as follows.

(a) New products often hold their price in their early stages of life, while costs are going down, creating increasing profit margins.

(b) A policy of reducing prices as costs fall can help a company to win a dominant share of the market and pursue a strategy of overall cost leadership.

3.28 Strategic pricing decisions might well depend crucially on whether the organisation achieves its estimated cost reductions from the learning curve, and close co-operation between the management accountant, marketing management and strategic planners will be necessary, to agree in advance what the size of the unit cost reductions ought to be and then to try to ensure that they are achieved in practice.

Price forecasting

3.29 In the context of strategic planning, costs can be predicted fairly reliably. Curiously though, future profit is not highly sensitive to cost estimations. However, errors in forecasting the market price will inevitably influence the profitability of a project or plan. The problem is accentuated by new technology, rendering existing investment obsolete, and making necessary the purchase of new equipment. New equipment usually means lower operating costs, but such developments have led to serious over-capacity in certain industries, and over-capacity leads to severe price-cutting and competition.

3.30 In such circumstances, when forecasting prices, the accountant needs to consider a floor price, defined as what the producer must get back in revenue to cover his costs, assuming that the largest, most efficient type of plant is used. The second component in price that has to be considered is a *profit margin* over and above the floor price and this might decline each year due to competition and the continuing life of the product. A forecast price for the product's life cycle can be developed, based on price being a function of the initial margin and floor price required at the time of the product launch, and then 'decay factors' are introduced to reduce the price as a result of the product's life, competition and experience curve cost savings.

3.31 A CIMA research report by Bromwich and Bhimani *(Management Accounting: Evolution Not Revolution)* describes the concept of *target costing* which is widely used in Japan. It begins from the principle that a product must have a *target price* that will succeed in winning a target share of the market. Market prices therefore determine product costs, and the latter have to come in line with market prices. In the *long run*, costs must come down below the target price if the product is to be worth manufacturing.

3.32 Target costing is a process of establishing what the cost of a product should be over its life cycle.

(a) In the short run, because of development costs and the learning time needed, costs are likely to exceed price.

(b) In the longer term, costs should come down because of the learning curve. In addition, value analysis and cost reduction exercises assist in attaining target costs.

4 THE TREATMENT OF BUSINESS RISK

Business risk

4.1 Risk as described here is the *business risk* of an investment. This is in contrast to financial risk which is the risk that a geared company may not make enough profit, after paying the interest on its borrowings, to finance a satisfactory dividend. Business risk can be defined as the potential volatility of profits caused by the nature and type of business operations involved.

4.2 There are three elements in business risk.

(a) *The inherent risk of the industry or market itself.* For example, the fashion industry is a higher risk industry than the food processing industry; and to a UK firm, export markets in the Third World are likely to be higher risk markets than the UK market.

(b) *The stage in the product's life cycle.* Every product has a life cycle, and the 'classical' product life cycle consists of four stages.

(i) Introduction
(ii) Growth
(iii) Maturity
(iv) Decline.

When an investment is made in a product which is in its introductory phase, there is a high risk that it will fail to win market acceptance, and will have a very short market life. When an investment is made in a declining product, the risk of a rapid decline in sales is high.

(c) *The proportion of fixed costs in total costs.* When an investment involves a high proportion of fixed costs, it will need to achieve a high sales volume just to break even, and so the business risk will be high.

4.3 In this chapter, we will consider how to allow for business risk when appraising projects as part of a business plan. Another topic, the reduction of overall risk by building up a diverse portfolio of investments, was covered in Chapter 7 above.

Methods of treating risk

4.4 Methods of treating risk when appraising projects include the following.

(a) Adjusting the discount rate to allow a premium on the cost of capital for risk
(b) Sensitivity analysis
(c) Using probability estimates of cash flows
(d) Simulation modelling

Adjusting the discount rate

4.5 In this method of allowing for risk, a premium is added to the discount rate as a safety margin. Marginally profitable projects are then less likely to have a positive NPV.

For example, if a company's true cost of capital is 10%, all capital projects might be evaluated using a discount rate of 15%. Projects which would have a positive NPV at a discount rate of 10% but a negative NPV at 15% would then be considered too risky to undertake.

4.6 This method recognises that risky investments ought to earn a higher return as reward for the risks that are taken. However, if the same increased discount rate is applied to all the proposed capital projects, no distinction would be made between more risky and less risky investments. And how is the size of the risk premium decided anyway?

Sensitivity analysis

4.7 Sensitivity analysis is applied by varying the expected cash flows of a project, to measure what would happen if the investment were to work out somewhat worse than expected. We could, for example, re-calculate the NPV if:

(a) the initial cost of the investment were 5% higher than expected;
(b) running costs were 10% higher or savings were 10% lower than expected;
(c) costs were 5% higher *and* savings 5% lower than expected.

4.8 If the NPV is negative when costs are increased a little, or benefits are reduced a little, the project would be rejected on the grounds that it is too sensitive to variations in one or more key cost or revenue items.

Measuring the margin of error

4.9 By this method of sensitivity analysis, we calculate:

(a) the percentage increases in costs above what is expected; or
(b) the percentage shortfall in benefits below what is expected;

which would have to occur before a project would only just break even.

Example: sensitivity analysis

4.10 Nevers Ure Ltd is considering a project with the following cash flows.

Year	*Purchase of plant*	*Running costs*	*Savings*
	£	£	£
0	(7,000)		
1		2,000	6,000
2		2,500	7,000

The cost of capital is 8%. Measure the sensitivity of the project to changes in the levels of expected costs and savings.

Solution

4.11 The PVs of the cash flows are as follows.

Year	*Discount factor* 8%	*PV of plant cost* £	*PV of running costs* £	*PV of savings* £	*PV of net cash flow* £
0	1.000	(7,000)			(7,000)
1	0.926		(1,852)	5,556	3,704
2	0.857		(2,143)	5,999	3,856
		(7,000)	(3,995)	11,555	560

The project has a positive NPV and would appear to be worthwhile. The changes in cash flows which would need to occur for the project to break even (NPV = 0) are as follows.

(a) Plant costs would need to increase by a PV of £560, that is by $\frac{560}{7,000} = 8\%$

(b) Running costs would need to increase by a PV of £560, that is by $\frac{560}{3,995} = 14\%$

(c) Savings would need to fall by a PV of £560, that is by $\frac{560}{11,555} = 4.8\%$

(d) The effect of changes to any combination of the cash flows could be calculated. For example, the project would only just break even if running costs were 7% higher and savings (at the same time) 2.4% lower than expected.

The weaknesses of sensitivity analysis

4.12 In spite of the possibility of checking the sensitivity of a project's NPV to changes in the cash flows from two or more items in conjunction, as suggested in Paragraph 4.11 (d) above, it is more usual for sensitivity analysis to be applied to each cost or revenue item individually. This is often unrealistic, because items are often interdependent. Furthermore, sensitivity analysis does not examine the probability that any particular variation in costs or revenues might occur. Just how likely is it that running costs will be 5% higher than expected?

The certainty-equivalent approach

4.13 With this method, the expected cash flows of the project are converted to riskless equivalent amounts. The greater the risk of an expected cash flow, the smaller the 'certainty-equivalent' value (for receipts) or the larger the certainty-equivalent value (for payments).

Example: certainty-equivalent approach

4.14 Dark Ages Ltd, whose cost of capital is 10%, is considering a project with the following expected cash flows.

Year	*Cash flow*	*Discount factor*	*Present value*
	£	10%	£
0	(9,000)	1.000	(9,000)
1	7,000	0.909	6,363
2	5,000	0.826	4,130
3	5,000	0.751	3,755
		NPV =	+ 5,248

The project would seem to be clearly worthwhile. However, because of the uncertainty about the future cash receipts, the management decides to reduce them to 'certainty-equivalents' by taking only 70%, 60% and 50% of the years 1, 2 and 3 cash flows respectively. (Note that this method of risk adjustment allows for different risk factors in each year of the project.) On this basis, is the project worthwhile?

Solution

4.15 The risk-adjusted NPV of the project is as follows.

Year	*Cash flow*	*PV factor*	*PV*
	£		£
0	(9,000)	1.000	(9,000)
1	4,900	0.909	4,454
2	3,000	0.826	2,478
3	2,500	0.751	1,878
		NPV =	–190

The project is too risky and should be rejected.

4.16 The disadvantage of the 'certainty-equivalent' approach is that the amount of the adjustment to each cash flow is decided subjectively by management.

Exercise 3

The cash flows of a project are set out below, together with PV calculations.

Yr	Discount factor 15%	Capital cost £	£	Savings £	£	Running costs £	Present value £
0	1.000	(140,000)					(140,000)
1	0.870		200,000	174,000	(150,000)	(130,500)	43,500
2	0.756		300,000	226,800	(180,000)	(136,080)	90,720
3	0.658		200,000	131,600	(160,000)	(105,280)	26,320
		(140,000)		532,400		(371,860)	20,540

How sensitive is the project to variations in costs or savings? Would you recommend that the project be undertaken? (See below)

Solution

Capital cost $\frac{20,540}{140,000} = 14.7\%$

Savings $\frac{20,540}{532,400} = 3.8\%$

Running costs $\frac{20,540}{371,860} = 5.5\%$

The project would have a negative NPV if its capital cost is more than 14.7% above estimate, or if savings are more than 3.8% below estimate, or if running costs are more than 5.5% above estimate.

The decision whether or not to undertake the project would depend on management's confidence in the accuracy of the estimated cash flows. Without further information, it might be guessed that the risk in the project is quite high.

Probability estimates of cash flows

4.17 A probability distribution of expected cash flows can often be estimated, and this may be used:

(a) to calculate an expected value of the NPV;

(b) to measure risk, for example by

(i) calculating the worst possible outcome and its probability;

(ii) calculating the probability that the project will fail to achieve a positive NPV;

(iii) calculating the standard deviation of the NPV.

Example: probability estimates of cash flows

4.18 A company is considering a project involving the outlay of £300,000 which it estimates will generate cash flows over its two year life at the probabilities shown in the following table.

Cash flows for project
Year 1

Cash flow £	*Probability*
100,000	0.25
200,000	0.50
300,000	0.25
	1.00

If cash flow in Year 1 is: £	*Year 2 there is a probability of:*	*that the cash flow in Year 2 will be:* £
100,000	0.25	Nil
	0.50	100,000
	0.25	200,000
	1.00	
200,000	0.25	100,000
	0.50	200,000
	0.25	300,000
	1.00	
300,000	0.25	200,000
	0.50	300,000
	0.25	350,000
	1.00	

The company's investment criterion for this type of project is 10% DCF.

What is the expected value (EV) of the project's NPV, and what is the probability that the NPV will be negative?

Solution

4.19 The present values of the cash flows are as follows.

Year	*Cash flow* £'000	*Discount factor* 10%	*Present value* £'000
1	100	0.909	90.9
1	200	0.909	181.8
1	300	0.909	272.7
2	100	0.826	82.6
2	200	0.826	165.2
2	300	0.826	247.8
2	350	0.826	289.1

4.20 The possible cash flows and their probabilities are as follows.

Year 1 PV of cash flow £'000 (1)	*Probability* (a)	*Year 2 PV of cash flow* £'000 (2)	*Probability* (b)	*Joint probability* (a)×(b)	*Total PV of cash inflows* £'000 (1)+(2)	*EV of PV of cash inflows* £
90.9	0.25	0	0.25	0.0625	90.9	5,681
90.9	0.25	82.6	0.50	0.1250	173.5	21,688
90.9	0.25	165.2	0.25	0.0625	256.1	16,006
181.8	0.50	82.6	0.25	0.1250	264.4	33,050
181.8	0.50	165.2	0.50	0.2500	347.0	86,750
181.8	0.50	247.8	0.25	0.1250	429.6	53,700
272.7	0.25	165.2	0.25	0.0625	437.9	27,369
272.7	0.25	247.8	0.50	0.1250	520.5	65,063
272.7	0.25	289.1	0.25	0.0625	561.8	35,113
						344,420

	£
EV of PV of cash inflows	344,420
Less project cost	300,000
EV of NPV	44,420

4.21 Since the EV of the NPV is positive, the project should go ahead unless the risk is unacceptably high.

The probability that the project will have a negative NPV is the probability that the total PV of cash inflows is less than £300,000. From the table of figures, we can establish that this probability is 0.0625 + 0.125 + 0.0625 + 0.125 = 0.375 or 37.5%. This might be considered an unacceptably high risk.

The standard deviation of the NPV

4.22 One way of measuring risk, given probabilities and an expected value, is to calculate the standard deviation of the NPV.

Example: standard deviation of the net present value

4.23 Frame plc is considering which of two mutually exclusive projects, A or B, to undertake. There is some uncertainty about the running costs with each project, and a probability distribution of the NPV for each project has been estimated, as follows.

Project A		*Project B*	
NPV	*Probability*	*NPV*	*Probability*
£'000		£'000	
– 20	0.15	+ 5	0.2
+ 10	0.20	+ 15	0.3
+ 20	0.35	+ 20	0.4
+ 40	0.30	+ 25	0.1

Which project should the company choose, if either?

Solution

4.24 We can begin by calculating the EV of the NPV for each project.

Project A			*Project B*		
NPV	*Probability*	*EV*	*NPV*	*Probability*	*EV*
£'000		£'000	£'000		£'000
- 20	0.15	(3.0)	5	0.2	1.0
10	0.20	2.0	15	0.3	4.5
20	0.35	7.0	20	0.4	8.0
40	0.30	12.0	25	0.1	2.5
		18.0			16.0

Project A has a higher EV of NPV, but what about the risk of variation in the NPV above or below the EV? This can be measured by the standard deviation of the NPV.

4.25 The standard deviation of a project's NPV, s, can be calculated as:

$$s = \sqrt{\sum p(x - \bar{x})^2}$$

where $\bar{x}$ is the EV of the NPV.

Project A, $\bar{x} = 18$

x	p	$x - \bar{x}$	$p(x-\bar{x})^2$
£'000		£'000	
–20	0.15	–38	216.6
10	0.20	–8	12.8
20	0.35	+2	1.4
40	0.30	+22	145.2
			376.0

$s = \sqrt{376} = 19.391 = £19{,}391$

Project B, $\bar{x} = 16$

x	p	$x - \bar{x}$	$p(x-\bar{x})^2$
£'000		£'000	
5	0.2	–11	24.2
15	0.3	–1	0.3
20	0.4	+4	6.4
25	0.1	+9	8.1
			39.0

$s = \sqrt{39.0} = 6.245 = £6{,}245$

Although Project A has a higher EV of NPV, it also has a higher standard deviation of NPV, and so has greater business risk associated with it.

4.26 Which project should be selected? Clearly, it depends on the attitude of the company's management to business risk.

(a) If management are prepared to take the risk of a low NPV in the hope of a high NPV, they will opt for project A.

(b) If management are risk-averse, they will opt for the less risky project B.

Exercise 4

The expected NPV from a project is £7,000,000 as follows.

NPV	*Probability*	*EV of NPV*
£m		£m
– 20	0.2	– 4
+ 10	0.5	+ 5
+ 20	0.3	+ 6
		+ 7

What is the standard deviation of the project's NPV? Would the project be undertaken if it is company policy not to undertake projects whose standard deviation of EV of NPV is greater than 100% of the EV of NPV?

Solution

$\bar{x}$ = 7 (£m)

NPV

x	*p*	$x - \bar{x}$	$p(x - \bar{x})^2$
£m			
–20	0.2	–27	145.8
+10	0.5	3	4.5
+20	0.3	13	50.7
			201.0

s = $\sqrt{201}$ = 14.2

The standard deviation (14.2) is over 200% of the EV of NPV (7) and so the company would not undertake the project.

Simulation models

4.27 When project cash flows are given in terms of probability distributions, it might be appropriate to use simulation to establish a probability distribution of the project's expected NPV, instead of simply calculating an expected value. A *Monte Carlo simulation* is a type of simulation involving the use of random numbers.

Example: simulation model

4.28 The following probability estimates have been prepared for a proposed project.

	Year	*Probability*	£
Cost of equipment	0	1.00	(40,000)
Revenue each year	1-5	0.15	40,000
		0.40	50,000
		0.30	55,000
		0.15	60,000
Running costs each year	1-5	0.10	25,000
		0.25	30,000
		0.35	35,000
		0.30	40,000

The cost of capital is 12%. How might a simulation model be used to assess the project's NPV?

Solution

4.29 A simulation model could be constructed by assigning a range of random number digits to each possible value for each of the uncertain variables, as follows.

Revenue			*Running costs*		
£	*Probability*	*Random numbers*	£	*Probability*	*Random numbers*
40,000	0.15	00 - 14	25,000	0.10	00 - 09
50,000	0.40	15 - 54	30,000	0.25	10 - 34
55,000	0.30	55 - 84	35,000	0.35	35 - 69
60,000	0.15	85 - 99	40,000	0.30	70 - 99

Random numbers would be generated, for example by a computer program, and these would be used to assign values to each of the uncertain variables.

4.30 For example, if random numbers 378420015689 were generated, the values assigned to the variables would be as follows.

	Revenue		*Costs*	
Calculation	*Random number*	*Value*	*Random number*	*Value*
		£		£
1	37	50,000	84	40,000
2	20	50,000	01	25,000
3	56	55,000	89	40,000

4.31 The NPV would be calculated many times over using the values established in this way with more random numbers, and the results would be analysed to provide:

(a) an expected NPV for the project;

(b) a statistical distribution pattern for the possible variation in the NPV above or below this average.

4.32 The decision whether to go ahead with the project would then be made on the basis of expected return and risk.

Which method of analysing risk is best?

4.33 The analytical methods for risk which we have discussed in this chapter have the following advantages and disadvantages.

(a) The problem with *adjusting the discount rate* to make it higher for more risky projects is that it is hard to decide what the size of the adjustment ought to be. Unless there is a rational basis for the size of the adjustment, this method of risk analysis will be unreliable.

(b) *Sensitivity analysis* is an important technique, and helps managers to assess the effect on a project's NPV of higher costs or lower benefits than anticipated, or delayed benefits.

The main drawback to sensitivity analysis is that it ignores the probabilities of the different outcomes.

(c) *Analysing probabilities* is a useful technique, with a project's NPV being calculated as an expected value and with risk being measured and quantifiable.

The main drawback to probability analysis, however, is the difficulty of estimating the probabilities of the different outcomes.

(d) *Simulation modelling* provides a more complex analysis of probabilities. For projects where a complex analysis of probabilities and risk will be helpful, because of the

large number of uncertainties, simulation modelling may be needed to provide a useful analysis of risk. But simulation modelling should not be used for project evaluation where a simpler method of risk analysis would be just as good.

Chapter roundup

- The hierarchical level of planning and control decisions is important to recognise, because decision-makers can only make plans or take control action within the sphere of the authority that has been delegated to them.
- The time span of decisions, and the importance of the potential consequences of individual decisions, are also important to bear in mind.
- You should understand the nature of free cash flow and its implications for financial strategy.
- There are various methods by which business risk can be allowed for in appraising projects as part of a business plan.
- Note that decision trees, covered in your earlier studies and in the next chapter of this Study Text, could be useful where more than one variable affecting the net present value is uncertain.

Test your knowledge

1 Identify three levels within a decision-making hierarchy. (see para 1.5)
2 Distinguish between strategic planning and management control. (2.21, 2.22)
3 Distinguish between operational control and management control. (2.28)
4 What is 'free cash flow'? (3.7)
5 What unforeseen circumstances could lead to a business running out of cash? (3.12)
6 Identify three categories of pricing decision. (3.21)
7 List the different methods of treating risk in appraising projects. (4.4)

Now try illustrative question 10 at the end of the Study Text

Chapter 11

LONG-TERM FINANCIAL PLANNING

This chapter covers the following topics.

		Syllabus reference
1	Financial management decisions	2(b), 3(a)
2	Financial planning	2(b), 3(a)
3	Gap analysis	2(e)
4	Strategies for long-term growth	2(e)

Introduction

This chapter follows on from topics raised in Chapter 10 to look at financial planning and strategies for long-term growth, including mergers, acquisitions and organic growth (developed further in Chapter 13).

We outline the approach to strategy known as *shareholders value analysis* in part of Section 2 of this Chapter.

1 FINANCIAL MANAGEMENT DECISIONS

1.1 Maximising the wealth of shareholders generally implies maximising profits consistent with long-term stability. It is often found that short-term gains must be sacrificed in the interests of the company's long-term prospects. In the context of this overall objective, there are three main types of decisions facing financial managers.

Exercise 1

Identify the three main types of decision facing financial managers.

Solution

(a) Investment decisions
(b) Financing decisions
(c) Dividend decisions.

In practice, these three areas are interconnected and should not be viewed in isolation.

Investment decisions

1.2 Investment decisions involve committing funds to:

(a) *internal investment* projects (and withdrawing from such projects should they turn out to be unprofitable);

(b) *external investment* decisions, involving the takeover of another company or a merger;

(c) *disinvestment decisions*, involving selling a part of the business, such as an unwanted subsidiary company.

Financing decisions

1.3 The assets of a company must be financed by a combination of share capital and reserves, long-term liabilities and short-term liabilities. When a company is growing, it will need additional finance from one or more of these sources.

1.4 The financial manager must know:

(a) where additional funds can be obtained and at what cost;

(b) the effect on a company's profitability and value of using any particular source of funds;

(c) the effect on financial risk of using any particular source of funds.

1.5 A company ought to be profitable, but it must be 'liquid' too, so that it always has access to enough cash to pay creditors and employees.

Financing decisions therefore include cash management.

The opportunity cost of finance

1.6 Financial management is concerned with obtaining funds for investment, and investing those funds profitably so as to maximise the value of the firm. It is not enough to invest at a profit; it is necessary to invest so that the profits are sufficient to pay lenders a satisfactory amount of interest. If a company cannot pay interest at the market rate demanded by lenders, the lenders will prefer to invest elsewhere on the capital market, where they can get this rate. There is a market 'opportunity cost' of funds which a company must expect to pay for new finance.

1.7 Similarly, if a company cannot make big enough profits, shareholders will be dissatisfied. The company will not be able to raise funds from new issues of shares, because investors will not be attracted. Existing shareholders who wish to sell their shares will find that buyers, who can invest in whatever securities they choose, will offer a comparatively low price, and the market price of the shares will be depressed. Since investors have a wide range of shares available to them, there is a market opportunity cost of equity.

Dividend decisions

1.8 Ordinary shareholders expect to earn dividends, and the value of a company's shares will be related to the amount of dividends that a company has been paying, and also to prospects of future dividends.

1.9 Dividend decisions, which were discussed in Chapter 9, are also directly related to financing decisions, since retained profits are the most important source of new funds for companies. What a company pays as dividends out of profits cannot be retained in the business to finance future growth, and profits retained represent a withholding of dividends.

2 FINANCIAL PLANNING 12/94

2.1 Financial objectives will not be achieved, except by luck, unless management know what they are trying to achieve, and plan how to achieve the objectives.

2.2 Quantified targets for the achievement of financial objectives should therefore be set out in a financial plan. The financial plan should cover a number of years, perhaps three to five years, or ten years, or even longer. The financial plan should be a part of the overall strategic plan of the organisation.

2.3 With good financial planning, a business can assess in advance:

(a) just how much finance it needs for:

(i) long-term investments;
(ii) short-term cash flow needs;

(b) whether it is likely to have surplus cash, and if so for how long and what can best be done with the surplus cash when it arises;

(c) how any required finance should be raised;

(d) whether the company is likely to be profitable and to achieve its main and subsidiary financial objectives, for example to carry out its policy of a 10% annual growth in dividends.

The business plan and forecasting

2.4 Financial plans will be based on forecasts.

Exercise 2

See if you can identify the different types of forecast on which financial plans may be based before looking at the remainder of this paragraph.

(a) *Environmental forecasts* are needed to assess future economic and political events which will influence an organisation's prospects. Economic factors might include the rate of growth in the economy, the rate of inflation, foreign exchange rates and the level of interest rates.

(b) *Market or industry forecasts* can be formulated within the framework of environmental forecasts. These forecasts will cover the likely rate of growth or decline in an industry or market, technological changes which might alter product design or production methods, the possible break-up of a market into separate segments and so on. An organisation ought to be aware of the likely conditions in the markets and industries where it operates, and plan accordingly.

(c) *Forecasts for the organisation itself* can then be prepared within the framework of market and industry forecasts. Forecasts can be made for:

(i) sales;
(ii) costs and profits;
(iii) new product development;
(iv) the work force;
(v) finance needs.

Further steps in the financial planning process are:

(a) establishing the financial requirements of the business plan and arranging to secure the necessary funding from the most appropriate sources;

(b) monitoring and review of the business plan against actual events.

Example: business plan

2.5 Lion Grange Ltd has recently introduced a formal scheme of long range planning. At a meeting called to discuss the first draft plans, the following estimates emerged.

(a) Sales in the current year reached £10,000,000, and forecasts for the next five years are £10,600,000, £11,400,000, £12,400,000, £13,600,000 and £15,000,000.

(b) The ratio of net profit after tax to sales is 10%, and this is expected to continue throughout the planning period.

(c) Net asset turnover, currently 0.8 times, will remain more or less constant.

2.6 It was also suggested that:

(a) if profits rise, dividends should rise by at least the same percentage;

(b) an earnings retention rate of 50% should be maintained;

(c) the ratio of long-term borrowing to long-term funds (debt plus equity) is limited (by the market) to 30%, which happens also to be the current gearing level of the company.

2.7 Prepare a financial analysis of the draft long range plan and suggest policies for dividends, retained earnings and gearing (the level of debt).

Solution

2.8 The draft financial plan, for profits, dividends, assets required and funding, can be drawn up in a table, as follows.

	Current Year £m	*Year 1* £m	*Year 2* £m	*Year 3* £m	*Year 4* £m	*Year 5* £m
Sales	10.00	10.60	11.40	12.40	13.60	15.00
Net profit after tax	1.00	1.06	1.14	1.24	1.36	1.50
Dividends (50% of profit after tax)	0.50	0.53	0.57	0.62	0.68	0.75
Net assets (125% of sales)	12.50	13.25	14.25	15.50	17.00	18.75
Equity (increased by retained earnings)	8.75*	9.28	9.85	10.47	11.15	11.90
Maximum debt (30% of assets)	3.75	3.97	4.27	4.65	5.10	5.62
Funds available	12.50	13.25	14.12	15.12	16.25	17.52
Shortfalls in funds, given maximum gearing of 30% and no new issue of shares = funds available minus net assets required	0	0	(0.13)	(0.38)	(0.75)	(1.23)

* The current year equity figure is a balancing figure, equal to the difference between net assets and long-term debt, which is currently at the maximum level of 30% of net assets.

2.9 These figures show that the financial objectives of the company are not compatible with each other, and adjustments will have to be made.

(a) Given the assumptions about sales, profits, dividends and net assets required, there will be an increasing shortfall of funds from year 2 onwards, unless new shares are issued or the gearing level rises above 30%.

(b) In years 2 and 3, the shortfall can be eliminated by retaining a greater percentage of profits, but this may have a serious adverse effect on the share price. In year 4 and year 5, the shortfall in funds cannot be removed even if dividend payments are reduced to nothing.

(c) The net asset turnover appears to be low. The situation would be eased if investments were able to generate a higher volume of sales, so that fewer fixed assets and less working capital would be required to support the projected level of sales.

(d) If asset turnover cannot be improved, it may be possible to increase the profit to sales ratio by reducing costs or increasing selling prices.

(e) If a new issue of shares is proposed to make up the shortfall in funds, the amount of funds required must be considered very carefully. Total dividends would have to be increased in order to pay dividends on the new shares. The company seems unable to offer prospects of suitable dividend payments, and so raising new equity might be difficult.

(f) It is conceivable that extra funds could be raised by issuing new debt capital, so that the level of gearing would be over 30%. It is uncertain whether investors would be prepared to lend money so as to increase gearing. If more funds were borrowed, profits after interest and tax would fall so that the share price might also be reduced.

The problem of uncertainty

2.10 The main problem with planning and forecasting, especially in the longer term, is uncertainty. Forecasts about economic events and changes in a market or an industry will be very difficult to make, and planners must accept that even the best forecasts will not be wholly accurate.

(a) A sales forecast might be for an annual growth of 10% in sales for the next five years. But how reliable are the assumptions made?

(b) Similarly, a company might forecast that on the assumption that the exchange rate of sterling against the US dollar falls by 5% next year, export sales will rise by 8%. How can exchange rate movements be forecast accurately, and so how reliable is this forecast?

2.11 Managers should make forecasts based on realistic assumptions so as to be able to compare actual and expected performance.

(a) Many large companies use the services of economic consultants to predict demand in the economy, the rate of inflation, interest rates and foreign exchange rates.

(b) Managers should be clear about what assumptions have been used in their forecasts and plans.

(c) Forecasts ought to be reviewed continually in the light of changing circumstances, and plans should be re-assessed when changes are significant.

2.12 Planners should also try to assess the consequences of forecasts being inaccurate. Three methods of assessing uncertainty are as follows.

(a) *Ask 'what if' questions.* A forecast is prepared, based on certain assumptions. The forecaster or planner can then carry out sensitivity analysis by finding the answers to questions such as:

(i) what if sales growth is only 5% a year, not 10%?

(ii) what if costs rise by 5% more than anticipated?

(iii) what if the introduction of a new project is held up by 12 months?

(iv) what if interest rates are 10% rather than 8%?

(v) what if the rate of corporation tax is put up to 40%, or what if the VAT rate is increased to 20%?

(b) *Prepare a probability distribution of possible outcomes.* An alternative technique for assessing uncertainty is to prepare a probability distribution for the range of different possible outcomes; for example:

Annual sales growth	
%	*Probability*
0	0.05
1	0.15
2	0.25
3	0.25
4	0.30

A probability distribution could be prepared for any key variable in the business plan, such as wage levels, raw material costs, productivity levels, interest rates, foreign exchange rates, sales and so on.

From the probability distributions, forecasts can be prepared of:

(i) the expected value of (for example) sales or profits;
(ii) the probability distribution of (for example) sales or profits.

(c) *Prepare pessimistic, optimistic and most likely forecasts.* A forecast can be prepared for each of three possible outcomes:

(i) the worst that might happen;
(ii) the best that might happen;
(iii) the most likely outcome.

2.13 Companies might also wish:

(a) to make *contingency plans*, for what should be done in the event that something occurs in the future that has not been allowed for in the main plan. For example, a company that exports many of its goods to an overseas country might have been warned of the possibility of import controls or exchange controls being imposed by the government of that country. The company might therefore draw up a contingency plan for what it should do if this occurs;

(b) to protect itself whenever possible against adverse change, by means of *risk management*. Companies can, at a cost, protect themselves against adverse movements in interest rates or foreign exchange rates. We shall look in some detail at risk management in later chapters.

Long-term strategic planning

2.14 Long-term strategic planning may be defined as the formulation, evaluation and selection of strategies for the purpose of preparing a long-term plan of action to attain objectives.

The planning period

2.15 A 'stumbling block' to successful strategic planning centres around the critical decision as to how far ahead the company should be preparing its plans. There is little point in planning beyond the furthest point one can reasonably foresee with any certainty. Therefore, a business which is operating in an unstable environment (eg with material shortages) or an uncertain situation (eg marketing a new product) should plan for only a few months, whilst those operating in stable conditions may plan for a decade or more ahead.

2.16 Planners must decide what the planning period ought to be. The planning period ought to be the period of time which is most suitable for planning requirements and which enables the decision making and control processes to be most effectively exercised. The most suitable length for the planning period varies with circumstances. For example, forestry requires a period of many years whereas clothing manufacture may require only a few months.

The planning horizon

2.17 The planning horizon can be defined as the furthest time ahead for which plans can be quantified. It need not be the planning period.

Thus, if there is a planning period of, say, 15 years or 20 years, the planning horizon for quantified plans might be shorter, say ten years. Planning beyond the planning horizon involves plans which cannot be properly quantified yet, but which are nevertheless useful for management decision makers, to form a picture of how the organisation should be developing in the longer term.

'Top-down' and 'bottom-up' planning

2.18 The development of corporate planning can be seen as a response to the existence of *bottom-up planning systems*. In a 'bottom-up' organisation, information is accumulated at lower levels of the enterprise and consolidated as it is passed up through the organisation, with a summary covering the overall position being prepared for top levels of management. This brings the risk that management react only on the basis of the limited options which seem to be available on the basis of the information which is presented to them.

2.19 A *top-down planning system*, in contrast, is based on the idea that directives emanating from the top management flow down through the organisational structure.

2.20 An example of a bottom-up organisation is a conglomerate in which there are many disparate subsidiaries, all having autonomy and not being linked by a synergistic relationship. Disadvantages of bottom-up planning in an organisation include the following.

(a) Overall control may become difficult.
(b) There may be a number of separate objectives which become difficult to reconcile.
(c) There may be a lack of sense of direction in the organisation as a whole.

2.21 Top-down planning recognises the position that top management has the ultimate managerial responsibility for the overall direction of the enterprise, and for providing a framework within which decision making by managers at lower levels in the organisation can operate. Nevertheless the 'top-down' principle should probably not be taken too far: planning should, where practicable, involve a wide range of people in the organisation and not just top managers or specialist planners.

The trade off between short-term and long-term for control action

2.22 It is often the case that in order to rectify short-term results, control action will be at the expense of long-term targets. Similarly, controls over longer-term achievements might call for short-term sacrifices. This conflict between controls for achieving short-term and long-term targets, and the need to keep a balance between the short-term and long-term, is sometimes referred to as the 'S/L trade-off'.

2.23 Very often managers are under pressure to produce good short-term results (eg immediate profitability) in order to get their next promotion. The successfully promoted manager then goes on to another job where again he succeeds only if he produces good short-term results. And so it goes on up the management scale, with managers being rewarded for short-term results, even if they damage long-term prospects in the process.

2.24 Examples of the need for S/L trade-offs are as follows.

(a) A company has a target of building up its market share for a new product to 30% within four years. It has decided to do this with a low-price market penetration strategy. As a short term target, it wants the product to earn a small profit (£100,000) in the current year. Actual results after three months of the year indicate that the market share has already built up to 18%, but that the product will make a £50,000 loss in the year.

The S/L trade-off involves a decision about what to do about short term profitability (raise prices? cut back on advertising? reduce the sales force?) without sacrificing altogether the long term market share target. A manager who is hoping for promotion at the end of the year would be tempted to concentrate his control actions on trying to achieve the short term profit target.

(b) *Capital expenditure*. K Bhattacharya has written (in *Accountancy*) as follows.

'This is one of the most vulnerable areas for detrimental S/L trade-offs. The horizon for returns is most certainly more than a year off, yet costs associated with

the implementation of the programme can easily reduce short-term profits. Postponements can almost always release capital and manpower resources needed to generate immediate operating profit.'

(c) *Research and development.* This is another area where short-term profitability is boosted, by cutting back on R & D expenditure, at the expense of the long-term need to continue to develop new products.

External information sources for long-term planning

2.25 Planning and decision making rely on accurate and complete information. Financial managers often rely on externally provided information systems as the source of much current information about other companies (which might be targets for takeover bids), certain markets (such as commodity and foreign exchange markets), share prices, or business and economic matters.

2.26 Some companies specialise in providing an external 'electronic reference library' or on-line information retrieval system to make this information available to subscribers. This is an externally supplied database. Subscribers can gain access to the supplier's information from a terminal in their office and pay a fee for access to the data.

2.27 A number of firms provide on-line information systems on commercial and tax matters, such as Datastream, Data-Star, Extel and Butterworths.

2.28 The value of an on-line information retrieval system (OLIRS) or external database to companies arises from the need for:

(a) comprehensive data, which the company's own information systems might not be able to provide. For example information on company accounts is available through Extel's database system;

(b) rapid access to data;

(c) up-to-date data. Some information changes so quickly (for example commodity market prices, share prices, money market interest rates and foreign exchange rates) that companies are unable to keep fully up-to-date information systems themselves, and so rely on a specialised OLIRS to do this for them.

Financial planning models

2.29 *Computer modelling* may be used to assist management in the financial planning process.

2.30 A model can be constructed (or a modelling package purchased) incorporating certain variables. These variables might include:

(a) fixed assets;
(b) current assets;
(c) liabilities;
(d) revenues from the sale of different products;
(e) payments for various items of operating cost;
(f) taxation;
(g) sources of funds (equity, loans, preference shares);
(h) dividends and interest rates.

2.31 The inter-relationships between the variables will be specified in the model. For example, an increase in sales will affect the cost of sales, debtors, creditors, cash, fixed assets, profits, taxation and dividends in a way specified by the model, according to assumptions about the contribution/sales ratio, price inflation for various cost items, asset turnover ratios, taxation rates and dividend cover.

2.32 The model may be used to plan ahead, and the future profitability of the company can be estimated. If the company needs extra funds, the amount required can be assessed, and steps can be taken at an early stage to ensure that they will be available. If the model forecasts unsatisfactory profits and dividends, management will be aware that they need to devise long-term strategies now to improve results in future years.

Financial planning illustrated by decision trees

2.33 The process of financial planning can be viewed as the process of managing a set of options or decisions.

Decision trees can be used to illustrate the choices and possible outcomes in financial planning. The two stages in preparing a decision tree are:

(a) drawing the tree itself, to show all the choices and outcomes;

(b) putting in the numbers: the probabilities, outcome values and expected values (EVs). (Expected value is calculated as probability × outcome.) For example, if you have a 1% chance of winning £100, the expected value of the winning is £1.

Example: decision tree

2.34 Beethoven Ltd has a new wonder product, the vylin, of which it expects great things. At the moment the company has two courses of action open to it, to test market the product or abandon it. If the company test markets it, the cost will be £100,000 and the market response could be positive or negative with probabilities of 0.60 and 0.40.

(a) If the response is positive the company could either abandon the product or market it full scale. If it markets the vylin full scale, the outcome might be low, medium or high demand, and the respective net payoffs would be (200), 200 or 1,000 in units of £1,000 (the result could range from a net loss of £200,000 to a gain of £1,000,000). These outcomes have probabilities of 0.20, 0.50 and 0.30 respectively.

(b) If the result of the test marketing is negative and the company goes ahead and markets the product, estimated losses would be £600,000. If, at any point, the company abandons the product, there would be a net gain of £50,000 from the sale of scrap. All the financial values have been discounted to the present.

2.35 We will now:

(a) draw a decision tree;
(b) include figures for cost, loss or profit on the appropriate branches of the tree;
(c) evaluate each option.

Solution

2.36 The starting point for the tree is to establish what decision has to be made now. What are the options? In this case, they are:

(a) to test market;
(b) to abandon.

The outcome of the 'abandon' option is known with certainty. There are two possible outcomes of the option to test market, positive response and negative response. Depending on the outcome of the test marketing, another decision will then be made, to abandon the product or to go ahead.

2.37 This is the decision tree.

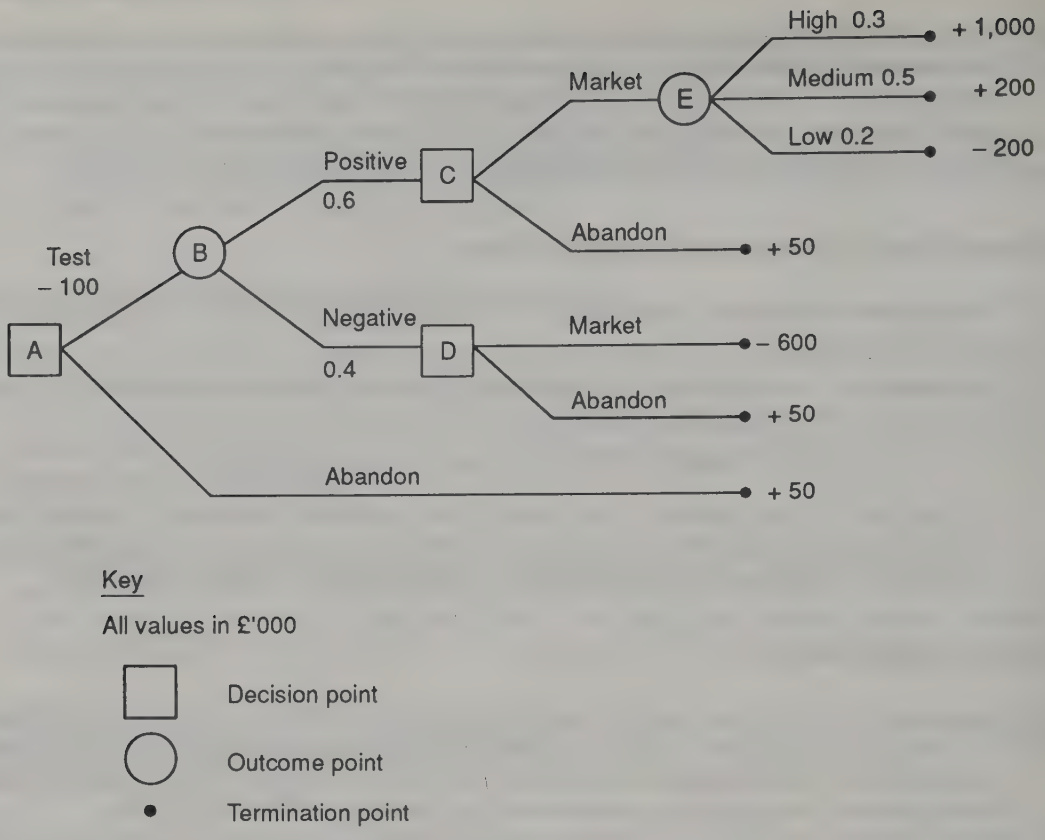


Figure 1 Evaluating the decision with a decision tree

2.38 The *expected value (EV)* of each decision option can be evaluated, using the decision tree to help with keeping the logic properly sorted out. The basic rules are as follows.

2.39 We start on the right hand side of the tree and work back towards the left hand side and the current decision under consideration. Working from *right to left*, we calculate the EV of revenue, cost, contribution or profit at each outcome point on the tree. In the above example, the right-hand-most outcome point is point E, and the EV is as follows.

	Profit (£'000)	*Probability*	
	x	p	px
High	1,000	0.3	300
Medium	200	0.5	100
Low	(200)	0.2	(40)
		EV	360

This is the EV of the decision to market the product if the test shows positive response. It may help you to write the EV on the decision tree itself, at the appropriate outcome point (point E).

2.40 We now make the second stage decisions.

(a) At decision point C, the choice is:

(i) market, EV + 360 (the EV at point E); or
(ii) abandon, value + 50.

The choice would be to market the product, and so the EV at decision point C is +360.

(b) At decision point D, the choice is:

(i) market, value – 600; or
(ii) abandon, value +50.

The choice would be to abandon, and so the EV at decision point D is +50.

If the original decision is to test market, the company will market the product if the test shows positive customer response, and will abandon the product if the test results are negative.

2.41 The evaluation of the decision tree is completed as follows.

(a) Calculate the EV at outcome point B.

	0.6 × 360 (EV at C)
+	0.4 × 50 (EV at D)
=	216 + 20 = 236.

(b) Compare the options at point A, which are:

(i) Test: EV = EV at B minus test marketing cost = 236 – 100 = 136;
(ii) Abandon: Value 50.

The choice would be to test market the product, because it has a higher EV of profit.

2.42 Decision trees can be of use in strategic planning to assess which choices are mutually exclusive, and to try and give them some quantitative value. As such they are useful in:

(a) clarifying strategic decisions when they are complex;
(b) using risk (in probability terms) as an input to quantifying the decision options;
(c) ranking the relative costs and benefits of the options.

Shareholder value analysis

2.43 *Shareholder value analysis* (SVA) was developed during the 1980s from the work of Rappaport and focuses on value creation using the net present value (NPV) approach. Thus, SVA assumes that the value of a business is the net present value of its future cash flows, discounted at the appropriate cost of capital.

2.44 Many leading companies (including, for example, Pepsi, Quaker and Disney) have used SVA as a way of linking management strategy and decisions to the creation of value for shareholders.

2.45 SVA takes the following approach.

(a) Key decisions with implications for cash flow and risk are specified. These may be strategic, operational, related to investment or financial.

(b) *Value drivers* are identified as the factors having the greatest impact on shareholder value, and management attention is focused on the decisions which influence the value drivers.

2.46 Value drivers include:

(a) sales growth and margin;
(b) working capital and fixed capital investment;
(c) the cost of capital.

2.47 SVA may help managers to concentrate on activities which create value rather than on short-term profitability. A problem with the approach is that of specifying a terminal value at the end of the planning horizon, which will extend for perhaps five or ten years.

3 GAP ANALYSIS

3.1 The purpose of *gap analysis* is to establish the following.

(a) What are the organisation's targets for achievement over the planning period?

(b) What would the organisation be expected to achieve if it 'did nothing' - in other words, did not develop any new strategies, but simply carried on in the current way with the same products and selling to the same markets.

There will be a difference between the targets in (a) and expected achievements in (b). This difference is the 'gap'. New strategies will then have to be developed which will close this gap, so that the organisation can expect to achieve its targets over the planning period.

3.2 *Gap analysis* is 'the comparison of an entity's ultimate objective with the sum of projections and already planned projects'.

A forecast or projection based on existing performance: F_O forecasts

3.3 An F_0 forecast (in Argenti's terminology) is a forecast of the company's future results assuming that it does nothing new. For example, if the company sells ten products in eight markets, produces them with a certain quantity and type of machinery in one factory, has a gearing structure of 30% etc, a forecast will be prepared, covering the corporate planning period, on the assumption that none of these items is changed. (Ansoff calls these forecasts 'reference projections').

3.4 Argenti identified four stages in the preparation of an F_0 forecast.

(a) The analysis of revenues, costs and volumes, (for example fixed, variable, unit costs and revenue).

(b) Projections into the future based on past trends, (for example using product life cycles to estimate sales volumes and examining forecasts for reasonableness).

(c) Identifying other factors affecting profits and return (for example external factors that might affect projections such as changes in government economic policy, technology, possible competitors' actions.)

(d) Finalising the forecast.

3.5 The purpose of the F_0 forecast and gap analysis is to determine the size of the task facing the company if it wishes to achieve its target profits.

Errors in the forecast

3.6 A forecast cannot be expected to guarantee accuracy and there must inevitably be some latitude for error. If possible, the error should be quantified in either of the following two ways.

(a) By predicting the profit and estimating likely variations. For example, 'in 1995 the forecast profit is £5 million with possible variations of plus or minus £2 million'.

(b) By providing a probability distribution for profits. For example, 'in 1995 there is a 20% chance that profits will exceed £7 million, a 50% chance that they will exceed £5 million and an 80% chance that they will exceed £2½ million. Minimum profits in 1995 will be £2 million'.

The profit gap

3.7 The *profit gap* is the difference between the target profits (according to the overall corporate objectives of the company) and the profits on the F_0 forecast (Figure 2).

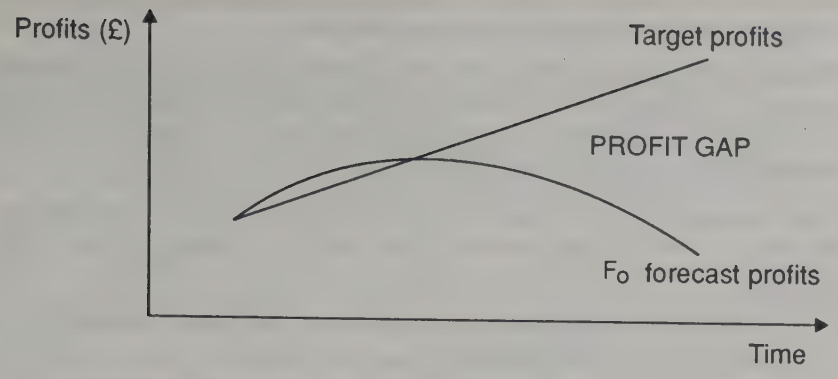


Figure 2 Profit gap

3.8 'It is at this stage of the game that the company must turn its attention to deciding what options are open to it in trying to bridge the gap. This gap represents the extra task facing the company over and above the mere continuation of the existing business - it indicates how much extra profit has to be yielded from the decisions and the commitments that will be made over the next few years' (Bishop and Griffiths). In deciding the size of the gap that must be closed, allowance must be made for errors in the forecast.

4 STRATEGIES FOR LONG-TERM GROWTH

Expansion, integration and diversification

4.1 Expansion is the growth of existing products and/or development of existing markets. It is sometimes referred to as market penetration. However, many companies actively seek new products and/or new markets.

4.2 A matrix of new product strategies and new market strategies can be set out as follows. (The analysis was first presented by Johnson and Jones in 1957.)

	PRODUCT		
	No technological change	*Improved technology*	*New technology*
Market unchanged	- - -	*Reformation* A new balance between price/quality has to be formulated	*Replacement* The new technology replaces the old
Market strengthened (ie new demand from same customers)	*Re merchandising* The product is sold in a new way - eg by re-packaging	*Improved product* Sales growth to existing customers sought on the strength of product improvements	*Product line extension* The new product is added to the existing product line to increase total demand
New market	*New use* By finding a new use for the existing product, new customers are found	*Market extension* New customers sought on the strength of product improvements	*Diversification* New product, new market

4.3 A firm should have a clear idea about what it expects to gain from dealing in products or markets with which it is unfamiliar.

(a) New products and new markets should be selected which offer prospects for growth not found in the existing product-market mix.

(b) New operations might be more profitable than keeping the surplus funds as liquid resources, deposited with a bank, say, but with comparatively low rates of return. On the other hand, there is an argument that the funds should be returned to shareholders, who can make their own investment decisions.

(c) New products and/or markets might achieve greater profitability than mere expansion even though current objectives are being realised. This may occur because:

  (i) outstanding new products have been developed by the firm's research and development department;

  (ii) the profit opportunities from these new activities are high.

(d) New activities might enable a firm to provide a more comprehensive service to customers.

4.4 Four product-market strategy options for growth are noted below.

(i) Horizontal integration.	Confusingly, these are sometimes called related diversification
(ii) Vertical integration.	
(iii) Concentric diversification.	Confusingly, these are sometimes called unrelated diversification
(iv) Conglomerate diversification.	

Integration (or 'related diversification')

4.5 *Horizontal integration* is characterised by a firm adding new products to its existing market, or new markets to its existing products (eg where a milk producer adds yoghurt to its product line or offers to deliver fruit juice with the early morning milk round). The stability of a firm is not greatly improved by horizontal integration because the firm still relies on the same markets or the same products as before.

4.6 *Vertical integration*, or vertical diversification, occurs when a company becomes either one of the following.

(a) Its own supplier of raw materials or components (ie backward vertical integration). For example, backward integration would occur where a milk producer acquires its own dairy farms rather than buying raw milk from independent farmers.

(b) Its own distributor or sales agent (ie forward vertical integration). For example, Laura Ashley not only make its goods but sells them in its own shops.

4.7 The purpose of vertical integration may be as follows.

(a) To provide a secure supply of components or raw materials with more control over quality, quantity and price.

(b) To strengthen relationships and contacts of the manufacturer with the 'final consumer' of the product.

(c) To win a share of the higher profits which might be obtainable in the raw materials market or end-user market.

4.8 The disadvantages of vertical integration are as follows.

(a) The *acquired* company loses out on the industry-wide scale economies, that might arise out of a merger with a similar firm. This might lead to higher costs or lower innovation.

(b) A company places 'more eggs in the same end-market basket' (Ansoff). Such a policy is fairly inflexible, more sensitive to instabilities and increases the firm's dependence on a particular aspect of demand.

Diversification (or 'unrelated diversification')

4.9 *Concentric diversification* occurs when a company seeks to add new products that have technological and/or marketing synergies with the existing product line. These products will normally appeal to new classes of customer. For example, Ansoff refers to a motor manufacturer who decides to make farm machinery because there is a technological similarity between the two, although the class of customer will be different.

4.10 *Conglomerate diversification* consists of making entirely new products for new classes of customers. These new products have no relationship to the company's current technology, products or markets. However the relationship comes in the *management approach.* There may be some management synergy in conglomerate diversification where the company's managers are already experienced in running a conglomerate group of companies. An example of conglomerate diversification is provided by BTR plc. BTR buys up ailing companies in mature industries and seeks to run them more efficiently than the previous management. The company has over 500 profit centres.

4.11 Advantages to an organisation in pursuing a strategy of conglomerate diversification are as follows.

(a) Risk is spread. By entering new products into new markets, the organisation can obtain protection against failure of one or more of the firm's existing range.

(b) The firm's overall profitability and flexibility might improve through acquisition in industries which have better economic characteristics than those of the acquiring firms. (But shareholders can invest in those industries directly.)

(c) Management might wish to escape from the present business into another.

(d) Greater business 'substance' or 'status' might mean better access to capital markets.

(e) A company pursuing a policy of conglomerate diversification can quickly take advantage of *high profit opportunities* which develop by acquiring a subsidiary company in the new product-market area.

(f) Conglomerate diversification and concentric diversification offer the chance of growth without creating a monopoly which would attract state regulation. This is an example of system goals overtaking mission.

(g) The firm can use surplus cash on the questionable assumption that managers are always better judges than shareholders.

(h) The firm can exploit under-utilised resources.

(i) Synergistic possibilities include:

  (i) a company which needs cash in the short term obtaining a cash-rich company or a company with large cash surpluses in the short term;

  (ii) using a company's image and reputation in one market to develop into another where corporate image and reputation could be vital ingredients for success.

4.12 The limitations of conglomerate diversification may be as follows.

(a) The dilution of shareholders' earnings if diversification is into growth industries with high P/E ratios.

(b) Profitable businesses will be milked to support ailing ones.

(c) Resource allocation will be a political rather than an economic process, as different divisions compete with each other.

(d) The organisation might suffer more in conditions of recession, if more than one activity suffers from the recession. British Aerospace suffered when its property development subsidiary hit a slump in the commercial property market.

(e) The management of the acquiring firm may interfere in the running of the acquisition, to the detriment of its operations.

(f) A conglomerate will only be successful if it has a high quality of management and financial ability at central headquarters, where the diverse operations are brought together. Otherwise it lacks a common purpose.

(g) Failure in one of the businesses will drag down the rest, as it will eat up resources.

(h) Lack of management experience in the business area can spell trouble. Japanese steel companies have diversified into areas completely unrelated to steel, such as personal computers, with limited success.

Withdrawal or abandonment

4.13 Strategies of expansion and diversification imply some logic in carrying on operations. However, it might be a better decision, although a much harder one, to cease operations or to pull out of a market completely.

4.14 There are likely to be exit barriers to so doing.

(a) Economic barriers include redundancy costs.

(b) Managers might fail to grasp the principles of opportunity costing ('we've spent all this money, so we must go on').

(c) Political barriers include government action.

(d) Marketing considerations may delay withdrawal. A product might be a 'loss-leader' for others, or might contribute to the company's reputation for its breadth of coverage.

(e) Psychology. Managers hate to admit failure, and there might be a desire to avoid a 'bloodletting'. Furthermore, people might wrongly assume that carrying on is a low risk strategy.

(f) It will be better for entities to be 'going concerns' in order to achieve the best price.

4.15 That said, firms do withdraw from products or markets, and for good reasons.

(a) The company's business may be in buying businesses, selling their assets or improving their performance, and selling them at a profit.

(b) Resource limitations mean that less profitable businesses have to be abandoned. A business will be sold to a competitor, or occasionally to management (as a buy-out).

(c) A company may be forced to quit, because of bankruptcy.

(d) The company might change its generic strategy for competitive advantage. (In the microprocessor industry, many American firms have left high-volume DRAM chips to Japanese firms so as to concentrate on high value added niche products.)

(e) Decline in purchasing power of the market segment, or indeed a fall in the market size.

Mergers and acquisitions

4.16 Companies may expand or diversify by developing their own internal resources, but they are also likely to consider growth through acquisitions or mergers. A merger is the joining of two separate companies to form a single company. On the other hand, an acquisition is the purchase of a controlling interest in another company.

In both situations the result is a sudden spurt in company growth, which can clearly cause 'corporate indigestion' typified by problems of communication, blurring of policy decisions and decline in the staff's identity with company and products.

4.17 It is important for a company to understand its reasons for acquisition and that these reasons should be valid in terms of its strategic plan. The classic reasons for acquisition as a part of the broader corporate strategy are as follows.

(a) *Marketing advantages:*

(i) to buy in a new product range;

(ii) to buy a market presence (especially true if acquiring a company with overseas offices and contracts that can be utilised by the parent company);

(iii) to unify sales departments or to rationalise distribution and advertising (eg the merger between Schweppes and Cadbury, where both companies had many common customers);

(iv) to eliminate competition or to protect an existing market.

(b) *Production advantages*:

(i) to gain a higher utilisation of production facilities and reap economies of scale by larger machine runs, less time spent on change-overs;

(ii) to 'buy in' technology and skills;

(iii) to obtain greater production capacity;

(iv) to safeguard future supplies of raw materials;

(v) to improve the purchasing position through better bulk purchase opportunities.

(c) *Finance and management*:

(i) to buy a high quality management team, which exists in the acquired company;

(ii) to obtain cash resources where the acquired company is very liquid;

(iii) to gain undervalued assets or surplus assets that can be sold off ('asset stripping');

(iv) to obtain tax advantages (eg purchase of a tax loss company).

(d) *Risk-spreading*. The diversification of tobacco companies into other businesses has already been referred to. Diversification reduced the risk of reliance on a single market, which is always threatened by further anti-smoking legislation.

(e) *To retain independence*. A company threatened by a takeover might take over another company, just to make itself bigger and so a more expensive 'target' for the predator company. Alternatively, a company under threat from a takeover could try to establish a 'Pacman defence' in which it turns round and eats (ie takes over) the predator. This was a defensive tactic by Plessey against the GEC/Siemens takeover bid in 1989, for example.

4.18 The aim of a merger or acquisition, however, should be to make profits in the long term as well as the short term. Acquisitions provide a means of entering a market, or building up a market share, more quickly and/or at a lower cost than would be incurred if the company tries to develop its own resources.

4.19 Acquisitions and mergers may not be successful in creating the anticipated profits and there is a need for corporate planners to consider the level of risk involved.

(a) The corporate planner must suggest product-market areas where acquisitions or mergers should be sought, and indicate the level of risk which would be acceptable in any particular 'deal'.

(b) It would then be the task of executive managers to find the acquisition and merger opportunities which conform to the strategic plan for products and markets and also for the level of risk which would be tolerable in view of the company's objectives.

4.20 A serious problem is the difficulty planners will have in attempting to quantify monetary (and non-monetary) advantages to be expected from acquisitions, especially where planned growth will be into areas outside the company's previous experience (ie conglomerate diversification).

4.21 It will also be necessary to attempt an evaluation of the following.

(a) The prospects of technological change in the industry.
(b) The size and strength of competitors.
(c) The reaction of competitors to an acquisition.
(d) The likelihood of government intervention and legislation.
(e) The state of the industry and its long-term prospects.
(f) The amount of synergy obtainable from the merger or acquisition.

4.22 Whatever the reason for the merger or acquisition, it is unlikely to be successful unless it offers the company opportunities that cannot be found within the company itself and unless the new subsidiary fits closely into the strategic plan outlined for future growth.

Takeovers or mergers financed by a share exchange arrangement

4.23 A business might be able to achieve accelerated growth and the cost advantages of synergy by acquiring another firm without any additional major cash investment.

4.24 Many acquisitions are paid for by issuing new shares in the acquiring company, which are then used to buy the shares of the company to be taken over in a 'share exchange' arrangement. An enlarged company might then have the financial 'muscle' and borrowing power to invest further so as to gain access to markets closed to either company previously because they could not individually afford the investment. It is interesting, for example, that in the computer technology industry, where new business opportunities are continually arising, Sinclair proved itself to be a highly innovative company, but was restricted from greater expansion by lack of financial resources and inadequate profits, until it was eventually taken over by Amstrad.

4.25 Share exchange details are more easily agreed when the buying company is a quoted company - ie with shares that can readily be sold and bought on a stock market, and which have a measurable market value. For example, if the owners of a company were approached with a takeover bid by GEC, offering a share exchange of, say, two GEC shares for every five shares in the company, the company's owners would be paid in shares that they can eventually sell for cash. In contrast, if they were approached with a similar offer by a private company, all they would get for selling up would be a part of the equity of a private company, with the only cash returns being dividends, assuming of course, that the private company did choose to pay any dividends.

Acquisitions and earnings per share

4.26 Companies seek growth through acquisitions, and their success in achieving growth can be measured by the growth in earnings per share. Growth in EPS will only occur after an acquisition if either:

(a) the company that is acquired is bought on a lower P/E ratio; or

(b) the company that is acquired is bought on a higher P/E ratio, but there is profit growth to offset this.

4.27 A *corporate raid* occurs when share prices are low, and acquisitive companies are able to buy a substantial quantity of a target company's shares at a market price which would be below the offer price in a takeover bid.

4.28 For example, suppose that shares in Wallow plc are currently trading at £1.50, on a P/E ratio of 8. Two similar companies in the industry have recently been taken over on a P/E ratio of 16. A corporate raid might then occur, in which the 007 Corporation purchases 20% of the shares of Wallow for £1.50 each. With 20% of the shares in its hands, the 007 Corporation could then go on to make a takeover bid for the remaining shares (at a price of around £3) or could wait before deciding what to do next.

4.29 Corporate raids have occurred fairly often in the UK since the October 1987 crash in share prices. For many UK companies shares have been at market prices which are well below their 'inherent value' - ie the value another company would pay in a takeover.

4.30 Another feature of much recent takeover in the USA especially, but also in the UK, is the *debt-financed takeover*. This is a takeover bid where most or all of the purchase finance is provided by a syndicate of banks for the acquisitor.

(a) The acquisitor company, if the takeover bid is successful, will then become very highly geared, with debts possibly well in excess of the company's equity.

(b) The interest costs of the borrowing will damage the acquisitor's profits and cash flows.

(c) To ease the debt burden, the acquisitor will usually sell off parts of the target company once the takeover has taken place.

4.31 A *leveraged buy-out (LBO)* is a form of debt-financed takeover where the target company is bought up by a team of managers in the company, rather than by an external acquisitor.

Organic growth or acquisition?

4.32 A company which is planning to grow must decide on whether to pursue a policy of 'organic' internal growth or a policy of taking over other established businesses, or a mix of the two.

4.33 *Organic growth* requires funding in cash, whereas acquisitions can be made by means of share exchange transactions. A company pursuing a policy of organic growth would need to take account of the following.

(a) The company must make the finance available, possibly out of retained profits. However, the company should then know how much it can afford, and with careful management, should not over-extend itself by trying to achieve too much growth too quickly.

(b) The company can use its existing staff and systems to create the growth projects, and this will open up career opportunities for the staff. In contrast, when expansion is achieved by taking over other businesses, the company usually acquires and assimilates the staff of those businesses.

(c) Overall expansion can be planned more efficiently. For example, if a company wishes to open a new factory or depot, it can site the new development in a place that helps operational efficiency (eg close to other factories, to reduce transport costs). With acquisitions, the company must take on existing sites no matter where they happen to be.

(d) Economies of scale can be achieved from more efficient use of central head office functions such as finance, purchasing, personnel and management services. With acquisitions, a company buys the head office functions of other companies and there will either be fewer economies of scale, or more redundancies.

4.34 Acquisitions are probably only desirable if organic growth alone cannot achieve the targets for growth that a company has set for itself.

Acquisitions can be made to enter new product areas, or to expand in existing markets, much more quickly. Organic growth takes time. With acquisitions, entire existing operations are assimilated into the company at one fell swoop. Acquisitions can be made without cash, if share exchange transactions are acceptable to both the buyers and sellers of any company which is to be taken over.

When an acquisition is made to diversify into new product areas, the company will be buying technical expertise, goodwill and customer contracts and so on, which it might take years to develop if it tried to enter the market by growing organically.

4.35 However, acquisitions do have their strategic problems.

(a) They might be too expensive. Some might be resisted by the directors of the target company. Others might be referred to the government under the terms of anti-monopoly legislation.

(b) Customers of the target company might resent a sudden takeover and consider going to other suppliers for their goods.

(c) In general, the problems of assimilating new products, customers, suppliers, markets, employees and different systems of operating might create 'indigestion' and management overload in the acquiring company.

(d) An example of growth which had to be pursued through diversification and acquisition is the case of Fujitsu. By acquiring the UK firm ICL, not only did it find an entry to the European market, but it also acquired ICL's experience in *open systems technologies*.

Chapter roundup

- Financial planning needs to be based on forecasts. The financial requirements of the business plan need to be established and the necessary funding arranged.
- Once in place, the business plan must be monitored and reviewed against actual events.
- Shareholder value analysis focuses on value creation using the net present value approach. Value drivers are the factors having greatest impact on shareholder value.
- Acquisitions as a strategy for long-term growth may be desirable if organic growth alone does not allow the company's long range targets to be met.

Test your knowledge

1 What is meant by the 'opportunity cost of finance'? (see para 1.6)

2 On what different types of forecast might financial plans be based? (2.4)

3 What are the advantages of 'top-down' planning? (2.18 - 2.21)

4 What is meant by 'value drivers' in the context of shareholder value analysis? (2.45, 2.46)

5 Distinguish between 'concentric diversification' and 'conglomerate diversification'. (4.9, 4.10)

6 Outline some of the strategic problems of an acquisitions strategy. (4.35)

Now try illustrative question 11 at the end of the Study Text

Chapter 12

ANALYSIS OF PERFORMANCE

This chapter covers the following topics.

		Syllabus reference
1	Ratio analysis	2(c)
2	Comparisons of accounting figures	2(c)
3	Predicting business failure	2(c)
4	Other information from companies' accounts	2(c)
5	Performance measurement in the public sector	2(c)

Introduction

The purpose of this chapter is to look at how accounting information can be interpreted so as to assess a company's financial position or the performance of business enterprises and other organisations.

This topic is covered mainly as revision, since you will have covered ratio analysis and other techniques for the interpretation of financial statements in your earlier studies.

1 RATIO ANALYSIS

12/94, 12/95

1.1 The financial situation of a company will obviously affect its share price and its ability to raise finance. Is the company profitable? Is it growing? Does it have satisfactory liquidity? Is its gearing level acceptable? What is its dividend policy? The answers to some of these questions can be obtained from accounting reports produced by the company.

1.2 Within a group of companies, subsidiary companies or divisions will be expected to report on their performance to the holding company as a part of the process of short-term financial planning.

(a) A group's performance can be measured in terms of growth in EPS or growth in dividend per share.

(b) A subsidiary's performance cannot be measured in the same way, because its financial environment is artificial (funds are obtained from the holding company, not from the market) and dividends are decided on by the holding company.

1.3 Financial reporting systems are therefore likely to be based on an analysis of financial ratios. Such ratios need to be compared over a number of periods if the analysis is to be of value.

The broad categories of ratios

1.4 Ratios can be grouped into the following four categories:

(a) profitability and return;
(b) debt and gearing;
(c) liquidity: control of cash and other working capital items;

(d) shareholders' investment ratios (or 'stock market ratios'), which were covered earlier in this Study Text.

1.5 Within each heading there are a number of standard measures or ratios that are normally calculated and generally accepted as meaningful indicators. It must be stressed however that each individual business must be considered separately, and a ratio that is meaningful for a manufacturing company may be completely meaningless for a financial institution. Try not to be too mechanical when working out ratios, and constantly think about what you are trying to achieve.

1.6 The key to obtaining meaningful information from ratio analysis is comparison: comparing ratios over time within the same business to establish whether the business is improving or declining, and comparing ratios between similar businesses to see whether the company you are analysing is better or worse than average within its own business sector.

Profitability

1.7 A company ought of course to be profitable, and obvious checks on profitability are:

(a) whether the company has made a profit or a loss on its ordinary activities;

(b) by how much this year's profit or loss is bigger or smaller than last year's profit or loss.

It is probably better to consider separately the profits or losses on extraordinary items if there are any. An extraordinary gain would obviously be a good bonus and an extraordinary loss might cause concern. However, such gains or losses should not be expected to occur again, unlike profits or losses on normal trading.

1.8 Profit on ordinary activities *before* taxation is generally thought to be a better figure to use than profit after taxation, because there might be unusual variations in the tax charge from year to year which would not affect the underlying profitability of the company's operations.

1.9 Another profit figure that can be calculated is PBIT: profit before interest and tax. This is the amount of profit which the company earned before having to pay interest to the providers of loan capital. By providers of loan capital, we usually mean *longer term* loan capital, such as debentures and medium-term bank loans, which will be shown in the balance sheet as 'Creditors: amounts falling due after more than one year'. This figure is of particular importance to bankers and lenders.

1.10 Profit before interest and tax is therefore:

(a) the profit on ordinary activities before taxation; *plus*
(b) interest charges on long term loan capital.

1.11 To calculate PBIT, in theory, all we have to do is to look at the interest payments in the relevant note to the accounts. Do not take the net interest figure in the profit and loss account itself, because this represents interest payments less interest received, and PBIT is profit including interest received but before interest payments.

1.12 The note to the accounts on interest charges, unfortunately, does not give us the exact figure we want, and we have to take the most suitable figure available. Company law requires companies to show the amount of interest in respect of:

(a) bank loans and bank overdrafts, and other loans which are repayable within five years;

(b) loans repayable by instalments (for example finance leases) beyond five years;

(c) all other loans (for example long-term debentures).

1.13 The interest cost we want is (c) plus (b) and probably a part of (a) (for interest on loans repayable within one to five years which are 'Creditors: amounts falling due after more than one year.'). Unless a company gives clear details of its interest costs, it is probably simplest to approximate the interest for PBIT as the total of (a), (b) and (c).

Profitability and return: the return on capital employed (ROCE)

1.14 It is impossible to assess profits or profit growth properly without relating them to the amount of funds (the capital) employed in making the profits.

1.15 The most important profitability ratio is therefore return on capital employed (ROCE), which states the profit as a percentage of the amount of capital employed.

1.16 Profit is usually taken as PBIT, and capital employed is shareholders' capital plus long-term liabilities and debt capital. This is the same as total assets less current liabilities. The underlying principle is that we must compare like with like, and so if capital means share capital and reserves plus long-term liabilities and debt capital, profit must mean the profit earned by all this capital together. This is PBIT, since interest is the return for loan capital.

$$\text{Thus ROCE} = \frac{\text{Profit on ordinary activities before interest and taxation (PBIT)}}{\text{Capital employed}}$$

Capital employed = Shareholders' funds plus 'creditors: amounts falling due after more than one year' plus any long-term provisions for liabilities and charges

Evaluating the ROCE

1.17 What does a company's ROCE tell us? What should we be looking for?

1.18 There are three comparisons that can be made.

(a) The change in ROCE from one year to the next.

(b) The ROCE being earned by other companies, if this information is available.

(c) A comparison of the ROCE with current market borrowing rates.

(i) What would be the cost of extra borrowing to the company if it needed more loans, and is it earning an ROCE that suggests it could make high enough profits to make such borrowing worthwhile?

(ii) Does the company have an ROCE which suggests that it is making profitable use of its current borrowing?

1.19 However, it is possible that a company's ROCE is artificially high. This is because a company's fixed assets, especially property, might be undervalued in its balance sheet, and if they are, the company would be undervaluing its capital employed. This in turn would make its ROCE higher. For example, a profit of £10,000 on capital employed of £100,000 gives an ROCE of 10%, but if capital employed is valued lower, say at £80,000, the ROCE would be 12½% for the same profit figure. What this means is that if a company's ROCE is, say 20%, you cannot assume that this is a good performance without first deciding whether the result has been due to good profits or whether it has been due to an undervaluation of capital employed.

Analysing profitability and return in more detail: the secondary ratios

1.20 We may analyse the ROCE, to find out why it is high or low, or better or worse than last year.

1.21 There are two factors that contribute towards a return on capital employed, both related to turnover.

(a) *Profit margin*. A company might make a high or a low profit margin on its sales. For example, a company that makes a profit of 25p per £1 of sales is making a bigger return on its turnover than another company making a profit of only 10p per £1 of sales.

(b) *Asset turnover*. Asset turnover is a measure of how well the assets of a business are being used to generate sales. For example, if two companies each have capital employed of £100,000, and company A makes sales of £400,000 a year whereas company B makes sales of only £200,000 a year, company A is making a higher turnover from the same amount of assets and this will help company A to make a higher return on capital employed than company B. Asset turnover is expressed as 'x times' so that assets generate x times their value in annual turnover. Here, company A's asset turnover is 4 times and company B's is 2 times.

1.22 Profit margin and asset turnover together explain the ROCE, and if the ROCE is the primary profitability ratio, these other two are the secondary ratios. The relationship between the three ratios is as follows.

$$\text{Profit margin} \times \text{Asset turnover} = \text{ROCE}$$

$$\frac{\text{PBIT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Capital employed}} = \frac{\text{PBIT}}{\text{Capital employed}}$$

A warning about comments on profit margin and asset turnover

1.23 It might be tempting to think that a high profit margin is good, and a low asset turnover means sluggish trading. In broad terms, this is so. But there is a trade-off between profit margin and asset turnover, and you cannot look at one without allowing for the other.

(a) A high profit margin means a high profit per pound of sales, but if this also means that sales prices are high, there is a strong possibility that sales turnover will be depressed, so that asset turnover will be lower.

(b) A high asset turnover means that the company is generating a lot of sales, but to do this, it might have to keep its prices down and so accept a low profit margin.

1.24 Consider the following figures.

Company A		*Company B*	
Sales	£1,000,000	Sales	£4,000,000
Capital employed	£1,000,000	Capital employed	£1,000,000
PBIT	£200,000	PBIT	£200,000

These figures would give the following ratios.

ROCE	=	200,000 / 1,000,000	= 20%	ROCE	=	200,000 / 1,000,000	= 20%
Profit margin	=	200,000 / 1,000,000	= 20%	Profit margin	=	200,000 / 4,000,000	= 5%
Asset turnover	=	1,000,000 / 1,000,000	= 1	Asset turnover	=	4,000,000 / 1,000,000	= 4

1.25 The companies have the same ROCE, but it is arrived at in very different ways. Company A operates with a low asset turnover and a comparatively high profit margin whereas company B carries out much more business, but on a lower profit margin. Company A could be operating at the luxury end of the market, whilst company B is perhaps operating at the popular end of the market. Company B may be under-capitalised.

1.26 It is wrong to over-generalise, but there will be a tendency for service industries to operate with a higher profit margin than manufacturing industries.

The gross profit margin, the net profit margin and profit analysis

1.27 Depending on the format of the profit and loss account, you may be able to calculate the gross profit margin as well as the net profit margin. Looking at the two together can be quite informative.

Exercise 1

A company has the following summarised profit and loss accounts for two consecutive years.

	Year 1	*Year 2*
	£	£
Turnover	70,000	100,000
Less cost of sales	42,000	55,000
Gross profit	28,000	45,000
Less expenses	21,000	35,000
Net profit	7,000	10,000

Required

Analyse the net profit margin and gross profit margin, indicating the implications of any changes between the two years.

Solution

Although the net profit margin is the same for both years at 10%, the gross profit margin is not.

In year 1 it is: $\frac{28,000}{70,000} = 40\%$

and in year 2 it is: $\frac{45,000}{100,000} = 45\%$

Is this good or bad for the business? An increased profit margin must be good because this indicates a wider gap between selling price and cost of sales. However, given that the net profit ratio has stayed the same in the second year, expenses must be rising. In year 1 expenses were 30% of turnover, whereas in year 2 they were 35% of turnover. This indicates that administration or selling and distribution expenses or interest costs require tight control.

A percentage analysis of profit between year 1 and year 2 is as follows.

	Year 1	*Year 2*
	%	%
Cost of sales as a % of sales	60	55
Gross profit as a % of sales	40	45
	100	100
Expenses as a % of sales	30	35
Net profit as a % of sales	10	10
Gross profit as a % of sales	40	45

Debt and gearing ratios

1.28 Debt ratios are concerned with how much the company owes in relation to its size and whether it is getting into heavier debt or improving its situation.

(a) When a company is heavily in debt, and seems to be getting even more heavily into debt, the thought that should occur to you is that this cannot continue. If the company carries on wanting to borrow more, banks and other would-be lenders are

very soon likely to refuse further borrowing and the company might well find itself in trouble.

(b) When a company is earning only a modest profit before interest and tax, and has a heavy debt burden, there will be very little profit left over for shareholders after the interest charges have been paid. And so if interest rates were to go up or the company were to borrow even more, it might soon be incurring interest charges in excess of PBIT. This might eventually lead to the liquidation of the company.

1.29 These are the two main reasons why companies should keep their debt burden under control. The four ratios that are particularly worth looking at are:

(a) the debt ratio;
(b) the gearing ratio;
(c) interest cover;
(d) the cash flow ratio.

The debt ratio

1.30 The debt ratio is the ratio of a company's total debts to its total assets.

(a) Assets consist of fixed assets at their balance sheet value, plus current assets.

(b) Debts consist of all creditors, whether amounts falling due within one year or after more than one year.

1.31 You can ignore long-term provisions and liabilities, such as deferred taxation.

1.32 There is no absolute rule on the maximum safe debt ratio, but as a very general guide, you might regard 50% as a safe limit to debt. In practice, many companies operate successfully with a higher debt ratio than this, but 50% is nonetheless a helpful benchmark. In addition, if the debt ratio is over 50% and getting worse, the company's debt position will be worth looking at more carefully.

Gearing

1.33 *Capital gearing*, defined at the beginning of Chapter 6, is concerned with a company's *long-term* capital structure.

As with the debt ratio, there is no absolute limit to what the gearing ratio ought to be. Many companies are highly geared, but if a highly geared company is increasing its gearing, it is likely to have difficulty in the future when it wants to borrow even more, unless it can also boost its shareholders' capital, either with retained profits or with a new share issue.

Operating gearing

1.34 *Operating gearing* is concerned with the relationship in a company between its variable/fixed cost operating structure and its profitability. It can be calculated as the ratio of contribution (sales minus variable costs of sales) to profit before interest and tax (PBIT).

The possibility of rises or falls in sales revenue and volume means that operating gearing has possible implications for a company's business risk.

Interest cover

1.35 The interest cover ratio shows whether a company is earning enough profits before interest and tax to pay its interest costs comfortably, or whether its interest costs are high in relation to the size of its profits, so that a fall in PBIT would then have a significant effect on profits available for ordinary shareholders.

1.36 Interest cover equals:

$$\frac{\text{PBIT}}{\text{Interest charges}}$$

1.37 An interest cover of 2 times or less would be low, and it should really exceed 3 times before the company's interest costs can be considered to be within acceptable limits.

The cash flow ratio

1.38 The cash flow ratio is the ratio of a company's net annual cash inflow to its total debts:

$$\frac{\text{Net annual cash inflow}}{\text{Total debts}}$$

(a) Net annual cash inflow is the amount of cash which the company has coming into the business each year from its operations. This will be shown in a company's cash flow statement for the year.

(b) Total debts are short-term and long-term creditors, together with provisions for liabilities and charges.

1.39 Obviously, a company needs to earn enough cash from operations to be able to meet its foreseeable debts and future commitments, and the cash flow ratio, and changes in the cash flow ratio from one year to the next, provides a useful indicator of a company's cash position.

Liquidity ratios: cash and working capital

1.40 Profitability is of course an important aspect of a company's performance, and debt or gearing is another. Neither, however, addresses directly the key issue of liquidity. A company needs liquid assets so that it can meet its debts when they fall due.

1.41 Liquidity is the amount of cash a company can obtain quickly to settle its debts (and possibly to meet other unforeseen demands for cash payments too). Liquid funds consist of:

(a) cash;

(b) short-term investments for which there is a ready market, such as investments in shares of other companies. (Short-term investments are distinct from investments in shares in subsidiaries or associated companies);

(c) fixed term deposits with a bank or building society, for example six month deposits with a bank;

(d) trade debtors. These are not cash, but ought to be expected to pay what they owe within a reasonably short time;

(e) bills of exchange receivable. Like ordinary trade debtors, these represent amounts of cash due to be received soon.

1.42 Some assets are more liquid than others. Stocks of goods are fairly liquid in some businesses. Stocks of finished production goods might be sold quickly, and a supermarket will hold consumer goods for resale that could well be sold for cash very soon.

1.43 Other stocks are not so liquid. Raw materials and components in a manufacturing company have to be used to make a finished product before they can be sold to realise cash, and so they are less liquid than finished goods. Just how liquid they are depends on the speed of stock turnover and the length of the production cycle.

1.44 Fixed assets are not liquid assets. A company can sell off fixed assets, but unless they are no longer needed, or are worn out and about to be replaced, they are necessary to continue the company's operations. Selling fixed assets is certainly not a solution to a company's cash needs, and so although there may be an occasional fixed asset item which is about to be sold off, probably because it is going to be replaced, it is safe to disregard fixed assets when measuring a company's liquidity.

1.45 In summary, liquid assets are current asset items that will or could soon be converted into cash, and cash itself. Two common definitions of liquid assets are:

(a) all current assets;
(b) all current assets with the exception of stocks.

1.46 The main source of liquid assets for a trading company is sales. A company can obtain cash from sources other than sales, such as the issue of shares for cash, a new loan or the sale of fixed assets. But a company cannot rely on these at all times, and in general, obtaining liquid funds depends on making sales and profits.

1.47 A company must be able to pay its debts when they fall due, and in the balance sheet, foreseeable creditors to be paid are represented by current liabilities, that is, amounts falling due within one year.

1.48 There are other payments that a company might want to make, such as the purchase of a new fixed asset for cash.

Why does profit not provide an indication of liquidity?

1.49 If a company makes profits, it should earn money, and if it earns money, it might seem that it should receive more cash than it pays out. In fact, profits are not always a good guide to liquidity. Two examples will show why this is so.

(a) Suppose that company X makes all its sales for cash, and pays all its running costs in cash without taking any credit. Its profit for the year just ended was as follows.

		£	£
Sales			400,000
Less costs:	running costs	200,000	
	depreciation	50,000	
			250,000
Profit			150,000
Less dividends (all paid)			80,000
Retained profits			70,000

During the year, the company purchased a fixed asset for £180,000 and paid for it in full.

Depreciation is not a cash outlay, and so the company's 'cash profits' less dividends were sales less running costs less dividends = £120,000. However, the fixed asset purchase required £180,000, and so the company's cash position worsened in the year by £60,000, in spite of the profit.

(b) Suppose that company Y buys three items for cash, each costing £5,000, and resells them for £7,000 each. The buyers of the units take credit, and by the end of the company's accounting year, they were all still debtors.

(i) The profit on the transactions is £2,000 per unit and £6,000 in total.

(ii) The company has paid £15,000 to buy the goods, but so far it has received no cash back from selling them, and so its cash position is so far £15,000 worse off from the transactions.

(iii) The effect so far of the transactions is:

Reduction in cash	£15,000
Increase in debtors	£21,000
Increase in profit	£6,000

The increase in assets is £6,000 in total, to match the £6,000 increase in profit, but the increase in assets is the net change in cash (reduced balance) and debtors (increased balance).

1.50 Both these examples show ways in which a company can be profitable but at the same time get into cash flow problems. If an analysis of a company's published accounts is to give us some idea of the company's liquidity, profitability ratios are not going to be appropriate for doing this. Instead, we look at liquidity ratios and working capital turnover ratios.

The current ratio and the quick ratio

1.51 The standard test of liquidity is the *current ratio*. It can be obtained from the balance sheet, and is:

$$\frac{\text{Current assets}}{\text{Current liabilities}}$$

A company should have enough current assets that give a promise of 'cash to come' to meet its commitments to pay its current liabilities. Obviously, a ratio in excess of 1 should be expected. Otherwise, there would be the prospect that the company might be unable to pay its debts on time. In practice, a ratio comfortably in excess of 1 should be expected, but what is 'comfortable' varies between different types of businesses.

1.52 Companies are not able to convert all their current assets into cash very quickly. In particular, some manufacturing companies might hold large quantities of raw material stocks, which must be used in production to create finished goods. Finished goods might be warehoused for a long time, or sold on lengthy credit. In such businesses, where stock turnover is slow, most stocks are not very liquid assets, because the cash cycle is so long. For these reasons, we calculate an additional liquidity ratio, known as the quick ratio or acid test ratio.

1.53 The *quick ratio*, or *acid test ratio*, is:

$$\frac{\text{Current assets less stocks}}{\text{Current liabilities}}$$

This ratio should ideally be at least 1 for companies with a slow stock turnover. For companies with a fast stock turnover, a quick ratio can be less than 1 without suggesting that the company is in cash flow difficulties.

1.54 Do not forget the other side of the coin. The current ratio and the quick ratio can be bigger than they should be. A company that has large volumes of stocks and debtors might be over-investing in working capital, and so tying up more funds in the business than it needs to. This would suggest poor management of debtors or stocks by the company.

The debtors' payment period

1.55 A rough measure of the average length of time it takes for a company's debtors to pay what they owe is the 'debtor days' ratio, or average *debtors' payment period*.

1.56 It is:

$$\frac{\text{Trade debtors}}{\text{Sales}} \times 365 \text{ days}$$

1.57 The figure for sales should be the turnover figure in the profit and loss account. The trade debtors are not the *total* figure for debtors in the balance sheet, which includes prepayments and non-trade debtors. The trade debtors figure will be itemised in an analysis of the total debtors, in a note to the accounts.

1.58 The estimate of debtor days is only approximate.

(a) The balance sheet value of debtors might be abnormally high or low compared with the normal level the company usually has.

(b) Turnover in the profit and loss account excludes VAT, but the debtors' figure in the balance sheet includes VAT. We are not strictly comparing like with like.

1.59 Sales are often made on terms of payment within 30 days, or at the end of the month following the month in which the invoice is sent out. Debtor days *significantly* in excess of this might indicate poor management of the funds of a business. However, some companies must allow generous credit terms to win customers. Exporting companies in particular may have to carry large amounts of debtors, and so their average collection period might be well in excess of 30 days.

1.60 The *trend* of the collection period (debtor days) over time is probably the best guide. If debtor days are increasing, this indicates a poorly managed credit control function.

The stock turnover period

1.61 Another ratio which can be calculated is the stock turnover period, or stock days. This is another estimated figure, obtainable from published accounts, which indicates the average number of days that items of stock are held for. As with the average debt collection period, however, it is only an approximate figure, but one which should be reliable enough for finding changes over time.

1.62 The number of *stock days* is: $\frac{\text{Stock}}{\text{Cost of sales}} \times 365$

1.63 The reciprocal of the fraction: $\frac{\text{Cost of sales}}{\text{Stock}}$

is called the *stock turnover*, and is another measure of how vigorously a business is trading. A lengthening stock turnover period indicates:

(a) a slowdown in trading; or

(b) a build-up in stock levels, perhaps suggesting that the investment in stocks is becoming excessive.

1.64 If we add together the stock days and the debtor days, this should give us an indication of how soon stock is convertible into cash. Both debtor days and stock days therefore give us a further indication of the company's liquidity.

Exercise 2

Calculate liquidity and working capital ratios from the accounts of the RMC Group, a manufacturer of products for the construction industry, and comment on the ratios.

	19X8	*19X7*
	£m	£m
Turnover	2,065.0	1,788.7
Cost of sales	1,478.6	1,304.0
Gross profit	586.4	484.7

	19X8 £m	19X7 £m
Current assets		
Stocks	119.0	109.0
Debtors (note 1)	400.9	347.4
Short-term investments	4.2	18.8
Cash at bank and in hand	48.2	48.0
	572.3	523.2
Creditors: amounts falling due within one year		
Loans and overdrafts	49.1	35.3
Corporation taxes	62.0	46.7
Dividend	19.2	14.3
Creditors (note 2)	370.7	324.0
	501.0	420.3

	19X8 £m	19X7 £m
Net current assets	71.3	102.9

Notes

		19X8 £m	19X7 £m
1	Trade debtors	329.8	285.4
2	Trade creditors	236.2	210.8

Solution

	19X8		19X7	
Current ratio	$\frac{572.3}{501.0}$	= 1.14	$\frac{523.2}{420.3}$	= 1.24
Quick ratio	$\frac{453.3}{501.0}$	= 0.90	$\frac{414.2}{420.3}$	= 0.99
Debtors' payment period	$\frac{329.8}{2,065.0}$	× 365 = 58 days	$\frac{285.4}{1,788.7}$	× 365 = 58 days
Stock turnover period	$\frac{119.0}{1,478.6}$	× 365 = 29 days	$\frac{109.0}{1,304.0}$	× 365 = 31 days
Creditors' turnover period	$\frac{236.2}{1,478.6}$	× 365 = 58 days	$\frac{210.8}{1,304.0}$	× 365 = 59 days

RMC is a manufacturing group serving the construction industry, and so would be expected to have a comparatively lengthy debtors' turnover period, because of the relatively poor cash flow in the construction industry. It is clear that RMC compensates for this by ensuring that they do not pay for raw materials and other costs before they have sold their stocks of finished goods (hence the similarity of debtors' and creditors' turnover periods).

RMC's current ratio is a little lower than average but its quick ratio is better than average and very little less than the current ratio. This suggests that stock levels are strictly controlled, which is reinforced by the low stock turnover period. It would seem that working capital is tightly managed, to avoid the poor liquidity which could be caused by a high debtors' turnover period and comparatively high creditors.

Creditors' turnover is ideally calculated by the formula:

$$\frac{\text{Average stock}}{\text{Purchases}} \times 365$$

However, it is rare to find purchases disclosed in published accounts and so cost of sales serves as an approximation. The creditors' turnover ratio often helps to assess a company's liquidity; an increase in creditor days is often a sign of lack of long-term finance or poor management of current assets, resulting in the use of extended credit from suppliers, increased bank overdraft and so on.

Shareholders' investment ratios

1.65 A further set of ratios to consider are the ratios which help equity shareholders and other investors to assess the value and quality of an investment in the ordinary shares of a company. The following shareholders' ratios were described in Chapter 4.

(a) the dividend yield;
(b) the earnings per share;
(c) the P/E ratio;
(d) the dividend cover;
(e) the earnings yield.

The value of an investment in ordinary shares in a listed company is its market value, and so investment ratios must have regard not only to information in the company's published accounts, but also to the current share price, and ratios (a), (c) and (e) all involve using the share price.

2 COMPARISONS OF ACCOUNTING FIGURES

2.1 Useful information is obtained from ratio analysis largely by means of comparisons. Comparisons that might be made are:

(a) between the company's results in the most recent year and its results in previous years;

(b) between the company's results and the results of other companies in the same industry;

(c) between the company's results and the results of other companies in other industries.

Results of the same company over successive accounting periods

2.2 Although a company might present useful information in its five year or ten year summary, it is quite likely that the only detailed comparison you will be able to make is between the current year's and the previous year's results. The comparison should give you some idea of whether the company's situation has improved, worsened or stayed much the same between one year and the next.

2.3 Useful comparisons over time include:

(a) the percentage growth in profit (before and after tax) and the percentage growth in turnover;

(b) increases or decreases in the debt ratio and the gearing ratio;

(c) changes in the current ratio, the stock turnover period and the debtors' payment period;

(d) increases in the EPS, the dividend per share, and the market price.

2.4 The principal advantage of making comparisons over time is that they give some indication of progress: are things getting better or worse? However, there are some weaknesses in such comparisons.

(a) The effect of *inflation* should not be forgotten.

(b) The progress a company has made needs to be set in the context of:

(i) what other companies have done;

(ii) whether there have been any special 'environmental' or economic influences on the company's performance.

Allowing for inflation

2.5 Ratio analysis is not usually affected by price inflation, except as follows.

(a) Return on capital employed (ROCE) can be misleading if fixed assets, especially property, are valued at historical cost net of depreciation rather than at current value. As time goes by and if property prices go up, the fixed assets would be seriously undervalued if they were still recorded at their historical cost, and so the return on capital employed would be misleadingly high.

(b) Some growth trends can be misleading, in particular:

(i) the growth in sales turnover;
(ii) the growth in profits or earnings.

2.6 For example, suppose that a company achieved the following results.

	19X8	*19X7*	*% growth*
	£m	£m	
Turnover	46	43	7.0
Profit	12	11	9.1

However, if price inflation from 19X7 to 19X8 was 10%, the performance of the company would show a drop in turnover and profit in real terms, of about 3% in turnover and of about 0.9% in profit.

Putting a company's results into context

2.7 The financial and accounting ratios of one company should be looked at in the context of what other companies have been achieving, and also any special influences on the industry or the economy as a whole. Here are two examples.

(a) If a company achieves a 10% increase in profits, this performance taken in isolation might seem commendable, but if it is then compared with the results of rival companies, which might have been achieving profit growth of 30% the performance might in comparison seem very disappointing.

(b) An improvement in ROCE and profits might be attributable to a temporary economic boom, and an increase in profits after tax might be attributable to a cut in the rate of corporation tax. When improved results are attributable to factors outside the control of the company's management, such as changes in the economic climate and tax rates other companies might be expected to benefit in the same way.

Comparisons between different companies in the same industry

2.8 Making comparisons between the results of different companies in the same industry is a way of assessing which companies are outperforming others.

(a) Even if two companies are in the same broad industry (for example retailing) they might not be direct competitors. Even so, they might still be expected to show broadly similar performance, in terms of growth, because a boom or a depression in retail markets should affect all retailers in much the same way. The results of two such companies can be compared, and the company with the better growth and accounting ratios might be considered more successful than the other.

(b) If two companies are direct competitors, a comparison between them would be particularly interesting. Which has achieved the better ROCE, sales growth, or profit growth? Does one have a better debt or gearing position, a better liquidity position or better working capital ratios? How do their P/E ratios, dividend cover and dividend yields compare? And so on.

2.9 Comparisons between companies in the same industry can help investors to rank them in order of desirability as investments, and to judge relative share prices or future prospects. It is important, however, to make comparisons with caution: a large company and a small company in the same industry might be expected to show different results, not just in terms of size, but in terms of:

(a) percentage rates of growth in sales and profits;

(b) percentages of profits re-invested. Dividend cover will be higher in a company that needs to retain profits to finance investment and growth;

(c) fixed assets. Large companies are more likely to have freehold property in their balance sheet than small companies.

Comparisons between companies in different industries

2.10 Useful information can also be obtained by comparing the financial and accounting ratios of companies in different industries. An investor ought to be aware of how companies in one industrial sector are performing in comparisons with companies in other sectors. For example, it is important to know:

(a) whether sales growth and profit growth is higher in some industries than in others. For example how does growth in the financial services industry compare with growth in heavy engineering, electronics or leisure?

(b) how the return on capital employed and return on shareholder capital compare between different industries;

(c) how the P/E ratios and dividend yields vary between industries. For example, if a publishing company has a P/E ratio of, say, 20, which is average for its industry, whereas an electronics company has a P/E ratio of, say, 14, do the better growth performance and prospects of the publishing company justify its higher P/E ratio?

3 PREDICTING BUSINESS FAILURE

3.1 The analysis of financial ratios is largely concerned with the efficiency and effectiveness of the use of resources by a company's management, and also with the financial stability of the company. Investors will wish to know:

(a) whether additional funds could be lent to the company with reasonable safety;
(b) whether the company would fail without additional funds.

3.2 One method of predicting business failure is the use of liquidity ratios (the current ratio and the quick ratio). A company with a current ratio well below 2:1 or a quick ratio well below 1:1 might be considered illiquid and in danger of failure. Research seems to indicate, however, that the current ratio and the quick ratio and trends in the variations of these ratios for a company, are poor indicators of eventual business failure.

Z scores

3.3 E I Altman researched into the simultaneous analysis of several financial ratios as a combined predictor of business failure. Altman analysed 22 accounting and non-accounting variables for a selection of failed and non-failed firms in the USA and from these, five key indicators emerged. These five indicators were then used to derive a Z score. Firms with a Z score above a certain level would be predicted to be financially sound, and firms with a Z score below a certain level would be categorised as probable failures. Altman also identified a range of Z scores in between the non-failure and failure categories in which eventual failure or non-failure was uncertain.

3.4 Altman's Z score model (derived in 1968) emerged as:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

where

X_1 = working capital/total assets
X_2 = retained earnings/total assets
X_3 = earnings before interest and tax/total assets
X_4 = market value of equity/book value of total debt (a form of gearing ratio)
X_5 = sales/total assets.

3.5 In Altman's model, a Z score of 2.7 or more indicated non-failure, and a Z score of 1.8 or less indicated failure.

3.6 Altman's sample size was small, and related to US firms. Subsequent research based on the similar principle of identifying a Z score predictor of business failure has produced different prediction models, using a variety of financial ratios and different Z score values as predictors of failure. It would be argued, for example, that different ratios and Z score values would be appropriate for conditions in the UK.

The value of Z scores

3.7 A current view of the link between financial ratios and business failure would appear to be as follows.

(a) The financial ratios of firms which fail can be seen in retrospect to have deteriorated significantly prior to failure, and to be worse than the ratios of non-failed firms. In retrospect, financial ratios can be used to suggest why a firm has failed.

(b) No fully accepted model for *predicting* future business failures has yet been established, although some form of Z score analysis would appear to be the most promising avenue for progress. In the UK, several Z score-type failure prediction models exist.

(c) Because of the use of X_4: market value of equity/book value of debt, Z score models cannot be used for unquoted companies which lack a market value of equity.

3.8 Z score models are used widely in the banking sector, in risk assessment, loan grading and corporate finance activities. They are also used by accountancy firms, fund management houses, stockbrokers and credit insurers, including Trade Indemnity.

Other corporate failure models

3.9 *Beaver* conducted a study which showed that:

(a) the worst predictor of failure is the current ratio (current assets/current liabilities); and

(b) the best predictor of failure is cash flow borrowings.

Other writers have put forward alternative models designed to predict whether a business will fail.

3.10 *Taffler's* approach is based on the following measures.

(a) earnings before tax/current liabilities
(b) current assets/total liabilities
(c) current liabilities/total assets
(d) sales/total assets

3.11 From historical data on a wide range of actual cases, *Argenti* developed a model which is intended to predict the likelihood of company failure. The model is based on calculating scores for a company based on (a) defects of the company; (b) management mistakes and (c) the symptoms of failure. For each of the scores (a), (b) and (c) there is a 'danger mark'.

3.12 Among the most important factors in the model are:

(a) defects:

(i) autocratic Chief Executive (Robert Maxwell is an example here);
(ii) passive board;
(iii) lack of budgetary control;

(b) mistakes:

(i) over-trading (expanding faster than cash funding);
(ii) gearing - high bank overdrafts/loans;
(iii) failure of large project jeopardises the company (eg Laker Airways);

(c) symptoms:

(i) deteriorating ratios;
(ii) creative accounting - signs of window-dressing;
(iii) declining morale and declining quality.

Weaknesses of corporate failure models

3.13 Weaknesses of corporate failure models include the following.

(a) In common with all correlation models, they relate to the past, without taking into account the current state of the macroeconomic environment (the level of inflation and interest rates, and so on).

(b) The models share the limitations of the accounting model (including the accounting concepts and conventions) on which they are based.

(c) The publication of accounting data by companies is subject to a delay. Failure might occur before the data becomes available.

(d) If the measures incorporated in the models become used as objectives, as some suggest, then the model is likely to become less useful as a predictive tool as the measures will be subject to manipulation.

(e) The definition of corporate failure is not clear, given that various forms of rescue or restructuring are possible, short of liquidation, for a company which is in trouble.

Other indicators of financial difficulties

3.14 You should not think that ratio analysis of published accounts and correlation models such as Z score analysis are the only ways of spotting that a company might be running into financial difficulties. There are other possible indicators too.

(a) *Other information in the published accounts*
Some information in the published accounts might not lend itself readily to ratio analysis, but still be an indicator of financial difficulties, for example:

(i) very large increases in intangible fixed assets;
(ii) a worsening net liquid funds position, as shown by the funds flow statement;
(iii) very large contingent liabilities;
(iv) important post balance sheet events.

(b) *Information in the chairman's report and the directors' report*
The report of the chairman or chief executive that accompanies the published accounts might be very revealing. Although this report is not audited, and will no doubt try to paint a rosy picture of the company's affairs, any difficulties the company has had and not yet overcome will probably be discussed in it. There might also be warnings of problems to come in the future.

The directors' report is usually restricted to the minimum information required by law, but it might be interesting to check whether there have been any changes in the composition of the board since last year. Have many of last year's directors gone? Are there many new directors, and if so, what are their qualifications?

(c) *Published information in the press*
Newspapers and financial journals are a source of information about companies, and the difficulties or successes they are having. There may be reports of strikes, redundancies and closures.

There are often articles in newspapers which focus on particular companies. If a company is in financial difficulty, adverse comments might well appear in one of these articles.

(d) *Published information about environmental or external matters*
There will also be published information about matters that will have a direct influence on a company's future, although the connection may not be obvious. Examples of external matters that may affect a company adversely are:

(i) new legislation, for example on product safety standards or pollution controls, which affect a company's main products;

(ii) international events, for example political disagreements with a foreign country, leading to a restriction on trade between the countries. The foreign country concerned might be a major importer of a company's products;

(iii) new and better products being launched on to the market by a competitor;

(iv) a big rise in interest rates, which might affect a highly-geared company seriously;

(v) a big change in foreign exchange rates, which might affect a major importer or exporter seriously.

4 OTHER INFORMATION FROM COMPANIES' ACCOUNTS

Fixed assets

4.1 Two features of a company's fixed assets which can be looked at are:

(a) how the company has accounted for the revaluation of fixed assets;
(b) the amount of intangible fixed assets in the balance sheet.

The revaluation of fixed assets

4.2 Fixed assets may be stated in the balance sheet at cost less accumulated depreciation. They may also be revalued from time to time to a current market value. When this happens:

(a) the increase in the balance sheet value of the fixed asset is matched by an increase in the *revaluation reserve*;

(b) depreciation in subsequent years is based on the revalued amount of the asset, its estimated residual value and its estimated remaining useful life.

4.3 It has been usual for companies to revalue their land and buildings periodically, but not their other fixed assets such as plant and machinery. There has been nothing to stop companies revaluing all their fixed assets regularly, but land and buildings have been an obvious example of fixed assets that can increase substantially in value. To avoid a serious understatement of their balance sheet value, companies have therefore revalued their land and buildings from time to time, typically every two or three years.

Intangible fixed assets

4.4 Intangible fixed assets are assets which do not have any physical substance, but are of use to a business over a number of years in helping to provide goods or services. Intangible assets include trademarks, patents, copyrights, development expenditure and goodwill.

4.5 Companies are allowed to include intangible fixed assets in their balance sheet, but if they do, they must depreciate them over their estimated useful lives. Instead of having intangible fixed assets, many companies write off the cost of intangible items in the year of acquisition.

4.6 An important area of current debate is the extent to which companies should be allowed to include the values of brand names in their balance sheets. Valuations of such assets are likely to be highly subjective.

Share capital and reserves

4.7 The capital and reserves section of a company's accounts contains information which appears to be mainly the concern of the various classes of shareholder. However, because the shareholders' interest in the business acts as a buffer for the creditors in the event of any financial problems, this section is also of some importance to creditors.

4.8 The nature of any increase in reserves will be of some interest. For example, if a company has increased its total share capital and reserves in the year:

(a) did it do so by issuing new shares resulting in a higher allotted share capital and share premium account?

(b) did it do so by revaluing some fixed assets, resulting in a higher revaluation reserve?

(c) did it make a substantial profit and retain a good proportion of this profit in the business resulting in a higher profit and loss account balance?

4.9 A scrip issue might also be of some interest. It will result in a fall in the market price per share. If it has been funded from a company's profit and loss account reserves, a scrip issue would indicate that the company recognised and formalised its long-term capital needs by now making some previously distributable reserves non-distributable.

4.10 If a company has issued shares in the form of a dividend, are there obvious reasons why this should be so? For example, does the company need to retain capital within the business because of poor trading in the previous year, making the directors reluctant to pay out more cash dividend than necessary?

Debentures, loans and other liabilities

4.11 Two points of interest about debentures, loans and other liabilities are:

(a) whether or not loans are secured;
(b) the redemption dates of loans.

Secured loans

4.12 For debentures and loan stock which are *secured*, the details of the security are usually included in the terms of a trust deed.

Details of any fixed or floating charges against any assets must be disclosed in a note to the accounts.

Redemptions of debentures and loan stock

4.13 In analysing a set of accounts, particular attention should be paid to some significant features concerning debenture or loan stock redemption. These are:

(a) the closeness of the redemption date which would indicate how much finance the company has to find in the immediate future to repay its loans. It is not unusual, however, to repay one loan by taking out another, and so a company does not necessarily have to find the money to repay a loan from its own resources;

(b) the percentage interest rate on the loans being redeemed, compared with the current market rate of interest. This would give some idea, if a company decides to replace loans by taking out new loans, of the likely increase (or reduction) in interest costs that it might face, and how easily it might accommodate any interest cost increase.

4.14 There are classes of debentures which do not have a redemption date attached. This does not mean that they will never be redeemed because a company can always buy back its own debentures in the market. The holder of an irredeemable debenture does not,

however, have a date by which redemption must take place, so he cannot demand repayment. Consequently, not being very attractive to investors, this is a rare form of finance.

A geographical analysis of trading

4.15 When you study a company's published accounts, a useful item of information to look for might be the analysis of the company's turnover in each part of the world. It could show in which markets the company is making good progress, and where it is losing ground to competitors.

Post balance sheet events

4.16 Post balance sheet events are those events both favourable and unfavourable which occur between the balance sheet date and the date on which the financial statements are approved by the board of directors.

4.17 The following are examples of post balance sheet events which should normally be disclosed.

(a) Mergers and acquisitions.
(b) The issue of new shares and debentures.
(c) The purchase and sales of major fixed assets and investments.
(d) Losses of fixed assets or stocks as a result of a catastrophe such as fire or flood.
(e) The opening of new trading activities.
(f) The closure of a significant part of the trading activities.
(g) A decline in the value of property and investments held as fixed assets.
(h) Changes in exchange rates where the company has significant overseas interests.
(i) Government action, such as nationalisation.
(j) Strikes and other labour disputes.
(k) The augmentation of pension benefits to employees.

Contingencies

4.18 Contingencies are conditions which exist at the balance sheet date where the outcome will be confirmed only on the occurrence or non-occurrence of one or more uncertain future events.

4.19 Contingencies can result in contingent gains or contingent losses. The fact that the condition exists at the balance sheet date distinguishes a contingency from a post balance sheet event, which arises between the balance sheet date and the date of the formal approval of the financial statements by the board of directors.

The usual types of reported contingencies

4.20 Some of the principal types of contingencies disclosed by companies are as follows.

(a) Guarantees given by the company:
    (i) for other group companies;
    (ii) for associated companies;
    (iii) for staff pension schemes;
    (iv) for the completion of contracts.
(b) Discounted bills of exchange.
(c) Uncalled liabilities on shares or loan stock.
(d) Lawsuits or claims pending.
(e) Tax on profits where the basis on which the tax should be computed is unclear.

Cash flow accounting

4.21 It can be argued, with justification, that the profit figure does not always give a useful picture of a company's operations. Readers of a company's financial statements might even be misled by a reported profit figure. Here are some examples.

(a) Shareholders might believe that if a company makes a profit after tax, of say, £100,000 then this is the amount which it could afford to pay as a dividend. Unless the company has sufficient cash available to stay in business and also to pay a dividend, the shareholders' expectations would be wrong.

(b) Employees might believe that if a company makes profits, it can afford to pay higher wages next year. This opinion may not be correct: the ability to pay wages depends on the availability of cash.

(c) Creditors might consider that a profitable company is a going concern. However:

(i) if a company builds up large amounts of unsold stocks of goods, their cost would not be chargeable against profits, but cash would have been used up in making them, thus weakening the company's liquid resources;

(ii) a company might capitalise large development costs, having spent considerable amounts of money on research and development, but only charge small amounts against current profits. As a result, the company might show reasonable profits, but get into severe difficulties with its liquidity position.

(d) The survival of a business entity depends not so much on profits as on its ability to pay its debts when they fall due. Such payments might include revenue items such as material purchases, wages, interest and taxation, but also capital payments for new fixed assets and the repayment of loan capital when this falls due.

4.22 Cash flow accounting seeks to address these issues. The purpose of a cash flow statement is to show the sources and uses of cash over a period of time.

4.23 FRS 1 *Cash flow statements* requires companies above a specified size to prepare a cash flow statement.

The cash flow statement should list the inflows and outflows of cash and cash equivalents for the period under the following standard headings:

(a) operating activities;
(b) returns on investments and servicing of finance;
(c) taxation;
(d) investing activities; and
(e) financing.

4.24 FRS 1 includes the following illustrative example.

XYZ LIMITED
CASH FLOW STATEMENT FOR THE YEAR ENDED 31 MARCH 19X2

	£'000	£'000
Net cash inflow from operating activities		6,889
Returns on investments and servicing of finance		
Interest received	3,011	
Interest paid	(12)	
Dividends paid	(2,417)	
Net cash inflow from returns on investments and servicing of finance		582
Taxation		
Corporation tax paid (including advance corporation tax)	(2,922)	
Tax paid		(2,992)
Investing activities		
Payments to acquire intangible fixed assets	(71)	
Payments to acquire tangible fixed assets	(1,496)	
Receipts from sales of tangible fixed assets	42	
Net cash outflow from investing activities		(1,525)
New cash inflow before financing		3,024
Financing		
Issue of ordinary capital	211	
Repurchase of debenture loan	(149)	
Expenses paid in connection with share issues	(5)	
Net cash inflow from financing		57
Increase in cash and cash equivalents		3,081

Cash flow per share

4.25 The cash flow statement could be used to calculate a figure for cash flow per share. Suppose in this example that XYZ plc had 10,000,000 shares in issue. The cash flow in the year would be as follows.

	£
Net cash movement	3,081,000
Add back dividends paid	2,417,000
	5,498,000

The cash flow per share would be 55p, suggesting perhaps that this is the maximum dividend that could safely have been paid out. Cash flow per share, rather than EPS (which is based on profits and so not necessarily related to cash flows) arguably gives a better indication of what dividends shareholders might expect and so might be regarded as a shareholders' investment ratio.

5 PERFORMANCE MEASUREMENT IN THE PUBLIC SECTOR

5.1 In public sector organisations, an increasing volume of information on performance and 'value for money' is produced for internal and external use.

5.2 Targets are likely to fall under the following broad headings.

(a) Financial performance targets.
(b) Volume of output targets.
(c) Quality of service targets.
(d) Efficiency targets.

Performance measurement in central government

5.3 Over recent years, much of the work of central government has been reorganised into semi-autonomous 'executive agencies'.

Financial performance targets

5.4 The following are examples of targets related to financial performance in executive agencies.

(a) Full cost recovery (Civil Service College, Central Office of Information and others), plus unit cost targets.

(b) Commercial revenue to offset costs (Met Office).

(c) Non-Exchequer income as a percentage of total income (National Engineering Laboratory).

Volume of output targets

5.5 Targets related to output can be difficult to set. While the output of the Vehicle Inspectorate can be measured on the number of tests performed, and the output of the Hydrographic Office consists of charts for navigators, in many other cases the output of executive agencies is less tangible. For example, the Historic Royal Palaces Agency not only deals with visitors, whose numbers can be counted, but is also responsible for maintaining the fabric of royal palaces - an output which is more difficult to measure. In such cases, performance will be best measured by appraising the progress of the project as a whole.

Quality of service targets

5.6 Example of quality targets set for executive agencies include the following.

(a) *Timeliness*

(i) time to handle applications (Passport Office, Vehicle Certification Agency and many others);

(ii) car driving tests to be reduced to 6 weeks nationally and 10 weeks in London (Driving Standards Agency);

(iii) all cheques to be banked within 35 hours (Accounts Services Agency).

(b) *Quality of product*

(i) number of print orders delivered without fault (HMSO);

(ii) error rate in the value of benefit payments (Employment Service);

(iii) 95% business complaints handled within 5 days (Radio Communications Agency);

(iv) 85% overall customer satisfaction rating (Recruitment and Assessment Services Agency);

(v) meetings of creditors held within 12 weeks in 90% of cases (Insolvency Service).

Efficiency targets

5.7 Efficiency improvements may come through reducing the cost of inputs without reducing the quality of outputs. Alternatively, areas of activity affecting total costs may be reduced. Targets related to efficiency include the following.

(a) Percentage reduction in price paid for purchases of stationery and paper (HMSO).

(b) Reduction in the ratio of cost of support services to total cost (Laboratory of the Government Chemist).

(c) 8.7% efficiency increase in the use of accommodation (Recruitment and Assessment Services Agency).

Performance measurement in local government

5.8 The performance measures chosen by local authorities usually consist of comparative statistics and unit costs. These measures do two things.

(a) They give details, statistics and unit costs of an authority's own activities.

(b) They show statistical and cost comparisons with other authorities or clusters of authorities.

5.9 Reporting on comparative statistics was recommended by the Department of the Environment in its code of practice *Local authority annual reports* (1982). The following list illustrates the types of comparative statistics suggested in the code of practice.

For the authority's total expenditure and for each function	Net cost per 1,000 population Manpower per 1,000 population
Primary education, secondary education	Pupil/teacher ratio Cost per pupil
School meals	Revenue/cost ratio Pupils receiving free meals as a proportion of school roll
Children in care	As a proportion of total under-18 population Cost per child in care
Care of elderly	Residents of council homes as a proportion of total over-75 population Cost per resident week
Home helps	Contract hours per 1,000 population over 65
Police	Population per police officer Serious offences per 1,000 population
Fire	Proportion of area at high risk
Public transport	Passenger journeys per week per 1,000 population
Highways	Maintenance cost per kilometre
Housing	Rents as a proportion of total cost Management cost per dwelling per week Rent arrears as a percentage of year's rent income Construction cost per dwelling completed
Trading services	Revenue/gross cost ratio

Chapter roundup

- The ratios covered in this chapter should give you plenty of tools with which to analyse performance.
- Comments on a company based on such ratios are far more likely to be right than comments based on a casual read through a set of accounts. However, you should always make use of whatever other information can be gleaned from a company's accounts.
- You should be aware of the use of corporate failure models such as those of Altman and Taffler, but numerical questions will not be set on them. Although they are used in practice, such models have a number of weaknesses.

Test your knowledge

1 Define return on capital employed. (see para 1.16)
2 What is the debt ratio? (1.30)
3 How can a profitable company run out of cash? (1.49)
4 What is the quick ratio? (1.53)
5 What is the stock turnover? (1.63)
6 Does inflation affect ratio analysis? (2.5)
7 What is a Z score? (3.3)
8 Outline the weaknesses of corporate failure models. (3.13)
9 Why should creditors be interested in a company's share capital and reserves? (4.7)
10 What contingencies might be disclosed in a company's accounts? (4.20)
11 Under what broad headings do individual targets for public sector organisations fall? (5.2)

Now try illustrative question 12 at the end of the Study Text

Chapter 13

AMALGAMATIONS AND RESTRUCTURING

This chapter covers the following topics.

		Syllabus reference
1	Amalgamations and takeovers	2(e)
2	Trends in takeover activity	2(e)
3	The conduct and financing of a takeover	2(e)
4	The position of shareholders	2(e)
5	Other matters in takeovers	2(e)
6	Post-acquisition integration	2(e)
7	Demergers	2(e)
8	Management buyouts	2(e)
9	Repurchase of shares	2(e)

Introduction

The forms of business reorganisations undertaken in the modern industrialised economy are various, as companies seek the optimal form of enterprise. In this and the following chapter, we are concerned with the issues of business combinations and restructuring from the point of view of financial management and financial strategy.

Mergers and acquisitions in the context of long-term financial planning are also covered, from a slightly different perspective, in Paper 13 *Financial Reporting Environment*.

1 AMALGAMATIONS AND TAKEOVERS

6/94, 6/96

1.1 A takeover is the purchase of a controlling interest in one company by another company. Takeovers are also called acquisitions, and are a form of 'external' investment.

An amalgamation is a *merger* between two separate companies to form a single company.

1.2 The distinction between amalgamations and takeovers is not always clear, for example when a large company 'merges' with another smaller company. The methods used for mergers are often the same as the methods used to make takeovers. In practice, the number of genuine mergers is small relative to the number of takeovers.

The reasons for an amalgamation or a takeover

1.3 When two or more companies join together, there should be a 'synergistic' effect. Synergy can be described as the 2 + 2 = 5 effect, whereby a group after a takeover achieves combined results that reflect a better rate of return than was being achieved by the same resources used in two separate operations before the takeover. If company A, which makes annual profits of £200,000 merges with company B, which also makes annual profits of £200,000, the combined annual profits of the merged companies should be more than £400,000.

1.4 The main reasons why one company may wish to acquire the shares or the business of another may be categorised as follows.

(a) *Operating economies*. There are many ways in which operating economies can be realised through a combination of companies. Duplicate (and competing) facilities can be eliminated.

(b) *Management acquisition*. It is sometimes recognised that a company neither has, nor is likely to obtain in the immediate future, a management team of sufficient quality to ensure continued growth. In these circumstances it may be best to seek an amalgamation with another company which has aggressive and competent management.

(c) *Diversification*. The management of many companies may feel that the long term interest of the shareholders will be best served by spreading risk through diversification.

(d) *Asset backing*. A company in a risky industry with a high level of earnings relative to the net assets may attempt to reduce its overall risk by acquiring a company with substantial assets.

(e) *The quality of earnings*. A company may reduce its risk by acquiring another with less risky earnings.

(f) *Finance and liquidity*. A company may be able to improve its liquidity and its ability to raise new finance through the acquisition of another more financially stable company.

(g) *Growth*. A company may achieve growth through acquisition more cheaply than through internal expansion.

(h) *Tax factors*. In exceptional cases, a cash-financed takeover may be a tax-efficient method of transferring cash out of the corporate sector. In the USA until recently, amalgamation provided a way of utilising tax losses by setting them against profits of another company: UK tax law precludes this possibility.

(i) *Defensive merger*. Companies may merge in order to prevent competitors from obtaining an advantage in some way.

1.5 The aim of a merger or acquisition should be to make profits in the long term as well as in the short term.

(a) Acquisitions may provide:

(i) a means of entering a market at a lower cost than would be incurred if the company tried to develop its own resources;

(ii) a means of acquiring the business of a competitor. Acquisitions or mergers which might reduce or eliminate competition in a market may be prohibited by the Monopolies and Mergers Commission.

(b) Mergers, especially in Britain, have tended to be more common in industries with a history of little growth and low returns. Highly profitable companies tend to seek acquisitions rather than mergers.

Factors in a takeover decision

1.6 Several factors will influence a decision to try to take over a target business. These include the following.

Price factors

(a) What would the cost of acquisition be?

(b) Would the acquisition be worth the price?

(c) Alternatively, factors (a) and (b) above could be expressed in terms of:
What is the highest price that it would be worth paying to acquire the business?

The value of a business could be assessed in terms of:

(i) its earnings;

(ii) its assets;

(iii) its prospects for sales and earnings growth;

(iv) how it would contribute to the short-term and long-term strategy of the 'predator' company.

Different methods for the valuation of companies are covered in Chapter 14 of this Study Text.

Other factors

(a) Would the takeover be regarded as desirable by the predator company's shareholders and (in the case of quoted companies) the stock market in general?

(b) Are the owners of the target company amenable to a takeover bid? Or would they be likely to adopt defensive tactics to resist a bid?

(c) What form would the purchase consideration take? An acquisition is accomplished by buying the shares of a target company. The purchase consideration might be cash, but the purchasing company might issue new shares (or loan stock) and exchange them for shares in the company taken over. If purchase is by means of a share exchange, the former shareholders in the company taken over will acquire an interest in the new, enlarged company.

(d) How would the takeover be reflected in the published accounts of the predator company?

(e) Would there be any other potential problems arising from the proposed takeover, such as:

(i) future dividend policy;
(ii) service contracts for key personnel?

Exercise

Flycatcher Ltd wishes to make a takeover bid for the shares of an unquoted company, Mayfly Ltd. The earnings of Mayfly Ltd over the past five years have been as follows.

19X0	£50,000	19X3	£71,000
19X1	£72,000	19X4	£75,000
19X2	£68,000		

The average P/E ratio of quoted companies in the industry in which Mayfly Ltd operates is 10. Quoted companies which are similar in many respects to Mayfly Ltd are:

(a) Bumblebee plc, which has a P/E ratio of 15, but is a company with very good growth prospects;

(b) Wasp plc, which has had a poor profit record for several years, and has a P/E ratio of 7.

What would be a suitable range of valuations for the shares of Mayfly Ltd?

Solution

(a) *Earnings.* Average earnings over the last five years have been £67,200, and over the last four years £71,500. There might appear to be some growth prospects, but estimates of future earnings are uncertain.

A low estimate of earnings in 19X5 would be, perhaps, £71,500.

A high estimate of earnings might be £75,000 or more. This solution will use the most recent earnings figure of £75,000 as the high estimate.

(b) *P/E ratio.* A P/E ratio of 15 (Bumblebee's) would be much too high for Mayfly Ltd, because the growth of Mayfly Ltd earnings is not as certain, and Mayfly Ltd is an unquoted company.

On the other hand, Mayfly Ltd's expectations of earnings are probably better than those of Wasp plc. A suitable P/E ratio might be based on the industry's average, 10; but since Mayfly is an unquoted company and therefore more risky, a lower P/E ratio might be more appropriate: perhaps 60% to 70% of 10 = 6 or 7, or conceivably even as low as 50% of 10 = 5.

The valuation of Mayfly Ltd's shares might therefore range between:

high P/E ratio and high earnings: 7 × £75,000 = £525,000; and

low P/E ratio and low earnings: 5 × £71,500 = £357,500.

A strategic approach to takeovers

1.7 A strategic approach to takeovers would imply that acquisitions are only made after a full analysis of the underlying strengths of the acquiror company, and identification of candidates' 'strategic fit' with its existing activities.

1.8 Possible strategic reasons for a takeover are matched with suggested ways of achieving the aim in the following list from a publication of 3i (Investors in Industry), which specialises in offering advice on takeovers.

Strategic opportunities

Where you are	*How to get to where you want to be*
Growing steadily but in a mature market with limited growth prospects	Acquire a company in a younger market with a higher growth rate
Marketing an incomplete product range, or having the potential to sell other products or services to your existing customers	Acquire a company with a complementary product range
Operating at maximum productive capacity	Acquire a company making similar products operating substantially below capacity
Under-utilising management resources	Acquire a company into which your talents can extend
Needing more control of suppliers or customers	Acquire a company which is, or gives access to, a significant customer or supplier
Lacking key clients in a targeted sector	Acquire a company with the right customer profile
Preparing for flotation but needing to improve your balance sheet	Acquire a suitable company which will enhance earnings per share
Needing to increase market share	Acquire an important competitor
Needing to widen your capability	Acquire a company with the key talents and/or technology

Are takeovers good for business?

1.9 Stuart Manson, Andrew Stark and Hardy Thomas addressed this question in an article published in *Certified Accountant* (October 1994), making the following points.

(a) Because of the volume of takeover, acquisition and merger activity, there is concern about the effect that takeover activity has on industrial structure, monopoly power and economic performance. Most previous research focuses on whether gains or losses arise from acquisitions: that is, the effect of acquisitions on economic performance.

(b) In contrast to previous accounting profit-based studies, the analysis presented in the article concludes that the average takeover does produce improvements in operating performance. This conclusion conflicts with the commonly held view that changes in corporate control result from managers pursuing their own self-interest at the expense of shareholders. If that were so, the authors argue, then the only gains would be gains to management. The authors found some support for the proposition that the takeover market provides a disciplinary mechanism over management, helping to ensure that managers act in the interests of shareholders. Recent studies in the USA have produced some similar conclusions.

(c) A key problem in analysing the effect of a takeover is that of how to choose a yardstick for revaluating post-takeover performance when investigating improvements in operating performance or any other type of performance.

2 TRENDS IN TAKEOVER ACTIVITY

UK takeover activity

2.1 There was a boom in takeover activity in the UK in the second half of the 1980s. As the increased level of expenditure on acquisitions took place at the same time as a surge in capital expenditure by industrial and commercial companies (ICCs), it appears that the increase in takeover activity must partly have reflected a desire of companies to expand.

2.2 The annual expenditure on UK takeovers peaked at £27.3 billion in 1989, following by a fall to £8.2 billion in 1990 which reflected diminished business confidence with the onset of higher interest rates and the subsequent economic recession. A new surge in takeover activity in the mid 1990s included the £8.9 billion takeover of Wellcome by Glaxo, Europe's largest ever takeover.

Some major UK takeovers

Acquiror	*Acquiree*
Guinness	Arthur Bell
Guinness	Distillers
Burton Group	Debenhams
Hanson Trust	Imperial Group
Hanson Trust	Consolidated Goldfields
Nestlé	Rowntree Mackintosh
British Petroleum	Britoil
HSBC	Midland Bank
Glaxo	Wellcome

2.3 Among the more important factors behind the 1980s takeover boom in the UK are the following.

(a) The liquidity of companies reached high levels in the period up to 1987, accompanying real growth in the profitability of companies. Interest rates became relatively low following the recession years of the early 1980s. It became relatively easy for companies to finance takeovers.

(b) The equity market was buoyant, making it easier to raise cash for rights issues and to finance takeovers by share exchanges.

(c) In a rising equity market, larger firms have sometimes tended to be valued higher than smaller companies, making it relatively easy for a large company to acquire a smaller company. (You may note that this conflicts with theories of market efficiency.)

(d) First year capital allowances of 100% were abolished in 1984, reducing the attraction of investing in new plant rather than expanding through acquisition.

(e) Deregulation of the capital markets made debt capital easier to obtain.

(f) The environment of UK competition policy was seen as more relaxed following the Government's declaration in 1984 that mergers would be judged *primarily* on competition grounds rather than on the grounds of the wider public interest. The Department of Trade and Industry document *Mergers policy* (1988) confirmed this emphasis and also indicated a desire to keep intervention at a minimum.

(g) The Single European Act introduced the prospect of a single European market in the late 1980s. This brought the prospect of new economies of scale and, by enhancing the prospect of future competition, reduced the need for authorities to concern themselves with the anti-competitive effects of merger activity.

International aspects of UK takeovers

2.4 Acquisition is one of the chief ways of carrying out *foreign direct investment* (FDI). Over the past fifteen years or so, approximately half of the UK's FDI was in the form of acquisition of share and loan capital overseas, of which a substantial proportion was related to takeovers.

2.5 The volume of acquisitions overseas by UK companies grew rapidly in the 1980s, from around £2 billion to £3 billion annually in the early 1980s to a peak of over £10 billion in 1987 (figures at 1985 prices). Since 1980, this outward investment has been concentrated in North America, where the larger transactions have tended to occur. Over half of the expenditure on inward acquisitions of UK companies during the 1980s was from countries outside the EU and North America such as Australia and Switzerland.

2.6 After the stock market crash in October 1987, there was a switch to 'leveraged' takeovers, with the cost of acquisitions being paid for by loan finance. With the recession, highly developed takeovers are having a severe impact on firms which borrowed heavily. The US, where leveraged financing was made fashionable, has a large number of indebted firms which have fallen on hard times.

2.7 A number of reasons for the expansion of UK companies in the USA, which occurred particularly during the late 1980s, can be identified.

(a) The same factors which led to the expansion in takeovers at home can be cited, especially the strong financial position of companies in this period.

(b) US capital markets are open and large bids, often hostile, can be made relatively easily.

(c) The US product markets are large and diverse.

(d) There is no language barrier.

(e) The depreciation of the dollar during the mid to late 1980s made acquisition targets more attractive.

2.8 Takeover transactions conducted by UK companies in the EU have on average been much smaller (at around £10 million on average) than for takeovers in the USA in past recent years. However, the Single European Act and financial deregulation are factors contributing to a growth in importance of UK takeovers in the rest of the EU.

International comparisons of takeover activity

2.9 Official statistics for acquisitions are not available on a fully comparable basis internationally. However, it is clear that takeover activity was buoyant in the major OECD economies generally in the latter half of the 1980s, especially in the USA, Germany, France and Canada. However, distinctive features of the UK takeover boom have been the frequency of hostile bids (relative to other EU countries) and the greater emphasis on equity finance than in the USA. Hostile bids involve payment of a substantial premium over the pre-bid share price of the target firm and are therefore only feasible if the profitability of the joint assets can be improved to compensate for this premium.

EU takeover activity

2.10 Statistics on acquisitions and mergers in the European Union are collected by the Directorate General for Competition. Only statistics covering the top 1,000 European firms are collected for the EU's purposes. A distinction is made between:

(a) *National* takeovers - between firms in the same EU country;
(b) *EU* takeovers - between firms in different EU countries; and
(c) *International* takeovers - between EU and non-EU firms.

2.11 The latter half of the 1980s saw a pronounced surge in *EU* and *international* takeovers, and the number of EU takeovers exceeded the number of national takeovers and the number of international takeovers for the first time in 1989-1990.

Takeovers in the UK compared with other European countries

2.12 It has been suggested that UK companies are more vulnerable to takeover than their counterparts in other European countries.

There are a number of reasons why this should be so, and these reasons may be considered in three groups:

(a) capital market structure;
(b) government attitudes;
(c) reporting requirements.

2.13 The equity markets in Britain are more highly developed than in other European countries and a greater proportion of companies are either quoted or are subsidiaries of quoted firms with publicly traded shares. In the rest of Europe by contrast there is a much greater proportion of firms which are still in private hands; this is especially true in Germany. Thus access to ownership in Britain is easier.

2.14 In addition the capital structure of British firms is generally different to their European counterparts. In European firms there is frequently a large class of shares that do not have voting rights, unlike the ordinary shares that make up the major part of the equity for most UK companies. Thus in Europe there is a greater division between ownership and control, and access to the controlling shares is harder to obtain.

2.15 It has also been argued that it is easier to build a stake in a UK firm due to the '3% rule' whereby a shareholder does not have to declare an interest until he holds 3% of the shares or 10% of any particular class of share. This is enhanced by the rule that a full bid need not be triggered until he owns 30%. It is difficult for a firm to mount a defence until a bid is declared, by which time the bidder already has a strong hand.

2.16 Government attitudes to the issues of ownership and control are also different to those in many other European countries. The prevalent non-interventionist policies mean that the government holds much fewer stakes and controlling interests in companies than say in France, and the 'national interest' lobby in the UK is also weaker.

2.17 Reporting requirements in the UK have been generally more rigorous than in Continental Europe. Annual reports contain more information and are more transparent than those of comparable European firms, and thus it is easier for a predator to obtain a meaningful preliminary valuation of a potential target. Although reporting rules in Europe have become stricter, enforcement is relatively weak, and annual accounts do not provide as full a picture of the company's position as in the UK.

Friendly and hostile takeovers: the UK, USA, Japan, Europe

2.18 In contrast to the UK and the USA, takeovers in Continental Europe and Japan are nearly always friendly. It has been argued that this difference results from different approaches to corporate governance in the Anglo-US markets compared with others.

2.19 In Continental Europe and Japan, the prevailing philosophy is that the objective of the organisation should be the maximisation of corporate wealth. In contrast to the Anglo-American emphasis on maximisation of shareholder wealth, this objective gives much more emphasis to the interests of other interest groups such as management, trade unions and suppliers. There are more often dual classes of voting shares, and strategic alliances (eg exchanges of shares between firms) and networks of close personal relationships play an important role. These factors mean that there are many more defences against unfriendly takeovers.

Competition policy differences in the USA and the UK

2.20 In the USA, the term 'trust' is used for a monopoly. The USA has a long history of legislation aimed at outlawing monopolies, starting with the Sherman Anti-Trust Act of 1890. From 1968, US guidelines on mergers and takeovers involved analysing the power held by the four largest companies in a market.

2.21 More recently (since 1982), guidelines on which mergers should receive detailed scrutiny have been based on the 'Herfindahl-Hirschman Index' which sums the squares of the percentage market shares of all the companies in the market. Thus a pure monopoly will have a value of 10,000 (100^2) while a perfectly competitive market will have a value close to zero. A duopoly in which the two companies each have a 50% share will have a value of 5,000 ($= 50^2 + 50^2$). The guidelines are based on the zone of index values within which a market lies, and the change in index value which an amalgamation would cause. For example, in highly concentrated markets (1,800 to 10,000), amalgamations increasing the index by more than 100 points are likely to be prohibited, while the central zone (1,000 to 1,800) is a 'grey' area, necessitating greater scrutiny of the proposed amalgamation.

2.22 The US guidelines leave an area of uncertainty about the US Justice Department's reaction relating to 'non-horizontal' amalgamations between companies in different industries or market sectors. This uncertainty is serious for the greater majority of US takeovers which are of a 'conglomerate' type (ie involving companies in different industries).

2.23 The approach to legislation on takeovers and mergers has been more tentative in the UK than in the US. (UK policy on takeovers and mergers is discussed later in this chapter.) In overview, the current regulatory regime in the UK is designed neither to inhibit nor to encourage takeovers, but to encourage competition and to ensure fair treatment of shareholders.

3 THE CONDUCT AND FINANCING OF A TAKEOVER 6/94, 6/96

Takeover tactics

3.1 It is common for a company to build up a holding of the shares of a takeover target company by buying the shares in the marketplace. Such buying may be undertaken over a very short space of time, in an effort to avoid an upward move in share prices which may occur if the buying company's tactics become known in the market. Such a tactic gives rise to the phrase 'dawn raid'. Once a holding of 3% is reached, the shareholding company is obliged to notify the company. When a holding of 30% or more is reached, the company becomes obliged under the City Code (discussed later in this chapter) to make an offer to the other remaining shareholders.

3.2 The offer price decided at this point should be set below the maximum worth of the takeover target but above the current market price of the shares. An offer addressed to the board of the target company, which may be communicated either through a merchant bank or directly, will establish the board's reaction as hostile or not.

3.3 Although secrecy should be sought for this stage in negotiations, it may in fact be in the target company's interests to 'leak' information to the market in the hope of either raising the market perception of an acceptable price or inducing the acquiror company to abandon its bid. Secrecy is relaxed when a formal offer document is sent to all shareholders.

Will the bidding company's shareholders approve of a takeover?

3.4 When a company is planning a takeover bid for another company, its board of directors should give thought to how its own shareholders might react to the bid.

3.5 A company does not have to ask its shareholders for their approval of every takeover, but:

(a) when a large takeover is planned by a listed company involving the issue of a substantial number of new shares by the predator company (to pay for the takeover), Stock Exchange rules may require the company to obtain the formal approval of its shareholders to the takeover bid at a general meeting (probably an extraordinary general meeting, called specifically to approve the takeover bid);

(b) if shareholders, and the stock market in general, think the takeover is not a good one, then the market value of the company's shares is likely to fall. The company's directors have a responsibility to protect their shareholders' interests, and are accountable to them at the annual general meeting of the company.

3.6 A takeover bid might seem unattractive to shareholders of the bidding company for the following reasons.

(a) It might reduce the EPS of their company.

(b) The target company is in a risky industry, or is in danger of going into liquidation.

(c) It might reduce the net asset backing per share of the company, because the target company will probably be bought at a price which is well in excess of its net asset value.

Will a takeover bid be resisted by the target company?

3.7 Quite often, a takeover bid will be resisted. Resistance comes from:

(a) the target company's board of directors, who adopt defensive tactics;

(b) eventually, the target company's shareholders, who can refuse to sell their shares to the bidding company.

3.8 Resistance can be overcome by offering a higher price. In cases where an *unquoted* company is the target company, if resistance to a takeover cannot be overcome, the takeover will not take place, and negotiations would simply break down.

3.9 In cases where the target company is a *quoted* company, the situation is different. The target company will have many shareholders, some of whom will want to accept the offer for their shares, and some of whom will not. In addition, the target company's board of directors might resist a takeover, even though their shareholders might want to accept the offer.

3.10 Because there are likely to be major differences of opinion about whether to accept a takeover bid or not, the Stock Exchange has issued formal rules for the conduct of takeover bids, in the City Code on Takeovers and Mergers.

Contesting an offer: defensive tactics

3.11 The directors of a target company must act in the interests of their shareholders, employees and creditors. They may decide to contest an offer on several grounds.

(a) The offer may be unacceptable because the terms are poor. Rejection of the offer may lead to an improved bid.

(b) The merger or takeover may have no obvious advantage.

(c) Employees may be strongly opposed to the bid.

(d) The founder members of the business may oppose the bid, and appeal to the loyalty of other shareholders.

3.12 When a company receives a takeover bid which the board of directors considers unwelcome, the directors must act quickly to fight off the bid. It should be borne in

mind that the tactics that can be used in fighting off a takeover bid are restricted by the City Code (discussed later).

The steps that might be taken to thwart a bid or make it seem less attractive include:

(a) issuing a forecast of attractive future profits and dividends to persuade shareholders that to sell their shares would be unwise, that the offer price is too low, and that it would be better for them to retain their shares to benefit from future profits, dividends and capital growth. Such profit and dividend forecasts can be included in 'defence documents' circulated to shareholders, and in press releases;

(b) lobbying the Office of Fair Trading and/or the Department of Trade and Industry to have the offer referred to the Monopolies and Mergers Commission;

(c) launching an advertising campaign against the takeover bid. One technique is to attack the accounts of the predator company;

(d) finding a 'white knight', a company which will make a welcome takeover bid;

(e) making a counter-bid for the predator company. This can only be done if the companies are of reasonably similar size;

(f) arranging a management buyout;

(g) introducing a 'poison-pill' anti-takeover device (see below).

Example: poison pill defence

3.13 An example of a *poison pill* anti-takeover device was that used by Time Warner, the US media group in which Canada's Seagram drinks company had built up an 11 per cent stake, early in 1994. Seagram had announced plans to buy up to 15 per cent of Time Warner shares for investment purposes.

The Time Warner device was formally known as a 'shareholder rights plan' and is triggered if one investor buys more than 15 per cent of the company's stock. If that occurs, all other shareholders are given the right to buy stock at a large discount, thus diluting the 15 per cent shareholding. Time Warner pointed out that the device would not preclude a *bona fide* all-cash offer for the company which treated all shareholders equally; the 'poison pill' was designed to protect against 'abusive takeover tactics'. Seagram, on the other hand, questioned whether poison pills were in the best interests of shareholders, since they could interfere with choice and adversely affect share values.

Costs of contested takeover bids

3.14 Takeover bids, when contested, can be very expensive, involving:

(a) costs of professional services, such as a merchant bank and a public relations agency;

(b) advertising costs;

(c) underwriting costs;

(d) interest costs;

(e) possibly also a capital loss on the sale and then re-purchase of some of the target company's shares, although a capital gain is equally likely.

Gaining the consent of the target company shareholders

3.15 A takeover bid will only succeed if the predator company can persuade enough shareholders in the target company to sell their shares. Shareholders will only do this if:

(a) they are dissatisfied with the performance of their company and its shares; or
(b) they are attracted by a high offer and the chance to make a good capital gain.

The Monopolies and Mergers Commission

3.16 A company may have to consider whether its proposed takeover would be drawn to the attention of the Monopolies and Mergers Commission. Under the terms of the Monopolies and Mergers Act, the Office of Fair Trading (the OFT) is entitled to scrutinise all mergers and takeovers above a certain size. If the OFT thinks that a merger or takeover might be against the public interest, it can refer it to the Monopolies and Mergers Commission.

Proposed mergers can be notified to the OFT in advance. If no referral is made to the Monopolies and Mergers Commission within (normally) 20 days, the merger can proceed without fear of a referral.

3.17 The function of the Commission is to advise the government. The Commission can make recommendations to the Department of Trade and Industry (or to any other body, including the companies involved in the bid).

3.18 The result of an investigation by the Commission might be:

(a) a withdrawal of the proposal for the merger or takeover, in anticipation of its rejection by the Commission;

(b) acceptance or rejection of the proposal by the Commission;

(c) acceptance of the proposal by the Commission subject to the new company agreeing to certain conditions laid down by the Commission, for example on prices, employment or arrangements for the sale of the group's products.

European Union regulations on mergers

3.19 In the past, EU competition policy was criticised for its limited scope. However, under a regulation introduced during 1990, the European Commission gained, for the first time, the power to intervene and to either block or authorise larger mergers.

3.20 The regulation provides that mergers with a world wide aggregate turnover of over 5 billion ecu (approximately £3.5 billion) between undertakings with EU-wide turnover of over 250 million ecu (approximately £175 million) now require prior clearance from the European Commission.

3.21 If the Commission finds that the merger raises serious doubts as to its compatibility with the European common market, it will initiate proceedings to block the merger.

Cases dealt with under these regulations include the £1.5 billion bid by Tetra Pak (packaging) for Alfa Laval (food processing equipment) in 1991, which was approved on the grounds that no substantial advantage was gained over competitors. Also in 1991, the merger of Varta and Bosch (both German car battery manufacturers) was approved, but only after Magneti Marelli of Italy had acquired Sonnenschein, another Germany car battery manufacturer. This EU acquisition and the French company CEAC provided powerful competitors to Bosch and Varta.

The purchase consideration

3.22 The terms of a takeover will involve a purchase of the shares of the target company for cash or for 'paper' (shares, or possibly loan stock). A purchase of a target company's shares with shares of the predator company is referred to as a *share exchange*.

Cash purchases

3.23 If the purchase consideration is in cash, the shareholders of the target company will simply be bought out. For example, suppose that the following information applies to two companies.

	Big Ltd	*Small Ltd*
Net assets (book value)	£1,500,000	£200,000
Number of shares	100,000	10,000
Earnings	£2,000,000	£40,000

Big Ltd negotiates a takeover of Small Ltd for £400,000 in cash.

3.24 As a result, Big Ltd will end up with:

(a) net assets (book value) of

£1,500,000 + £200,000 – £400,000 cash = £1,300,000;

(b) 100,000 shares (no change);

(c) expected earnings of £2,040,000, minus the loss of interest (net of tax) which would have been obtained from the investment of the £400,000 in cash which was given up to acquire Small Ltd.

Purchases with paper

3.25 One company can acquire another company by issuing shares to pay for the acquisition. The new shares might be issued:

(a) in exchange for shares in the target company. Thus, if A plc acquires B Ltd, A plc might issue shares which it gives to B Ltd's shareholders in exchange for their shares. The B Ltd shareholders therefore become new shareholders of A plc. This is a takeover for a 'paper' consideration. Paper offers will often be accompanied by a cash alternative;

(b) to raise cash on the stock market, which will then be used to buy the target company's shares. To the target company shareholders, this is a cash bid.

3.26 Sometimes, a company might acquire another in a share exchange, but the shares are then sold immediately on a stock market to raise cash for the seller. For example, A plc might acquire B Ltd by issuing shares which it gives to B's shareholders; however A plc's stockbrokers arrange to 'place' these shares with other buyers, and so sell the newly-issued shares for cash on behalf of the ex-shareholders of B Ltd. This sort of arrangement, which is a mixture of (a) and (b), is called a 'vendor placing.'

3.27 Whatever the detailed arrangements of a takeover with paper, the end result will be an increase in the issued share capital of the company making the takeover.

The choice between a cash offer and a paper offer

3.28 The choice between cash and paper offers (or a combination of both) will depend on how the different methods are viewed by the company and its existing shareholders, and on the attitudes of the shareholders of the target company.

The factors that the directors of the bidding company must consider include the following.

(a) *The company and its existing shareholders*

(i) *Dilution of earnings per share*. A fall in the EPS attributable to the existing shareholders is undesirable but it might occur when the purchase consideration is in equity shares.

(ii) *The cost to the company*. The use of loan stock (or of cash borrowed elsewhere) will be cheaper to the acquiring company than equity as the interest will be allowable for tax purposes. A direct consequence of this is that dilution of earnings may be avoided. If convertible loan stock is used, the coupon rate could probably be slightly lower than with ordinary loan stock.

(iii) *Gearing*. A highly geared company may find that the issue of additional loan stock either as consideration or to raise cash for the consideration may be unacceptable to some or all of the parties involved.

(iv) *Control.* In takeovers involving a relatively large new issue of ordinary shares the effective control of the company can change considerably. This could be unpopular with the existing shareholders.

(v) *An increase in authorised share capital.* If the consideration is in the form of shares, it may be necessary to increase the company's authorised capital. This would involve calling a general meeting to pass the necessary resolution.

(vi) *Increases in borrowing limits.* A similar problem arises if a proposed issue of loan stock will require a change in the company's borrowing limit as specified in the Articles.

(b) *The shareholders in the target company*

(i) *Taxation.* If the consideration is in cash many investors may find that they face an immediate liability to tax on a realised capital gain, whereas the liability would be postponed if the consideration consisted of shares.

(ii) *Income.* Where the consideration is other than cash, it is normally necessary to ensure that existing income is at least maintained. A drop may, however, be accepted if it is compensated for by a suitable capital gain or by reasonable expectations of future growth.

(iii) *Future investments.* Shareholders in the target company might want to retain a stake in the business after the takeover, and so would prefer the offer of shares in the bidding company, rather than a cash offer.

(iv) *Share price.* If shareholders in the target company are to receive shares, they will want to consider whether the shares are likely to retain their value.

Mezzanine finance and takeover bids

3.29 When the purchase consideration in a takeover bid is cash, the cash must be obtained somehow by the bidding company, in order to pay for the shares that it buys.

(a) Occasionally, the company will have sufficient cash in hand to pay for the target company's shares.

(b) More frequently, the cash will have to be raised:

(i) possibly from existing shareholders, by means of a rights issue;
(ii) more probably, by borrowing from banks or other financial institutions.

3.30 When cash for a takeover is raised by borrowing, the loans would normally be medium-term and secured.

3.31 However, there have been several takeover bids, with a cash purchase option for the target company's shareholders, where the bidding company has arranged loans that:

(a) are short-to-medium term;

(b) are unsecured (that is, 'junior' debt, low in the priority list for repayment in the event of liquidation of the borrower);

(c) because they are unsecured, attract a much higher rate of interest than secured debt (typically 4% or 5% above LIBOR);

(d) often, give the lender the option to exchange the loan for shares after the takeover.

This type of borrowing has been called *mezzanine finance* (because it lies between equity and debt financing).

4 THE POSITION OF SHAREHOLDERS 6/96

The market values of the companies' shares during a takeover bid

4.1 Market share prices can be very important during a takeover bid. Suppose that Velvet plc decides to make a takeover bid for the shares of Noggin plc. Noggin plc shares are currently quoted on the market at £2 each. Velvet shares are quoted at £4.50 and Velvet

offers one of its shares for every two shares in Noggin, thus making an offer at current market values worth £2.25 per share in Noggin. This is only the value of the bid so long as Velvet's shares remain valued at £4.50. If their value falls, the bid will become less attractive.

This is why companies that make takeover bids with a share exchange offer are always concerned that the market value of their shares should not fall during the takeover negotiations, before the target company's shareholders have decided whether to accept the bid.

4.2 If the market price of the target company's shares rises above the offer price during the course of a takeover bid, the bid price will seem too low, and the takeover is then likely to fail, with shareholders in the target company refusing to sell their shares to the bidder.

EPS before and after a takeover

4.3 If one company acquires another by issuing shares, its EPS will go up or down according to the P/E ratio at which the target company has been bought.

(a) If the target company's shares are bought at a higher P/E ratio than the predator company's shares, the predator company's shareholders will suffer a fall in EPS.

(b) If the target company's shares are valued at a lower P/E ratio, the predator company's shareholders will benefit from a rise in EPS.

Example: amalgamations and takeovers (1)

4.4 Giant plc takes over Tiddler Ltd by offering two shares in Giant for one share in Tiddler. Details about each company are as follows.

	Giant plc	*Tiddler Ltd*
Number of shares	2,800,000	100,000
Market value per share	£4	-
Annual earnings	£560,000	£50,000
EPS	20p	50p
P/E ratio	20	

By offering two shares in Giant worth £4 each for one share in Tiddler, the valuation placed on each Tiddler share is £8, and with Tiddler's EPS of 50p, this implies that Tiddler would be acquired on a P/E ratio of 16. This is lower than the P/E ratio of Giant, which is 20.

4.5 If the acquisition produces no synergy, and there is no growth in the earnings of either Giant or its new subsidiary Tiddler, then the EPS of Giant would still be higher than before, because Tiddler was bought on a lower P/E ratio. The combined group's results would be as follows.

	Giant group
Number of shares (2,800,000 + 200,000)	3,000,000
Annual earnings (560,000 + 50,000)	610,000
EPS	20.33p

If the P/E ratio is still 20, the market value per share would be £4.07, which is 7p more than the pre-takeover price.

Example: amalgamations and takeovers (2)

4.6 Redwood plc agrees to acquire the shares of Green Ltd in a share exchange arrangement. The agreed P/E ratio for Green's shares is 15.

	Redwood plc	*Green Ltd*
Number of shares	3,000,000	100,000
Market price per share	£2	-
Earnings	£600,000	£120,000
P/E ratio	10	

4.7 The EPS of Green Ltd is £1.20, and so the agreed price per share will be £1.20 × 15 = £18. In a share exchange agreement, Redwood would have to issue nine new shares (valued at £2 each) to acquire each share in Green, and so a total of 900,000 new shares must be issued to complete the takeover.

4.8 After the takeover, the enlarged company would have 3,900,000 shares in issue and, assuming no earnings growth, total earnings of £720,000. This would give an EPS of

$$\frac{£720,000}{3,900,000} = 18.5p$$

The pre-takeover EPS of Redwood was 20p, and so the EPS would fall. This is because Green has been bought on a higher P/E ratio (15 compared with Redwood's 10).

Buying companies on a higher P/E ratio, but with profit growth

4.9 Buying companies on a higher P/E ratio will result in a fall in EPS unless there is profit growth to offset this fall. For example, suppose that Starving plc acquires Bigmeal plc, by offering two shares in Starving for three shares in Bigmeal. Details of each company are as follows.

	Starving plc	*Bigmeal plc*
Number of shares	5,000,000	3,000,000
Value per share	£6	£4
Annual earnings		
Current	£2,000,000	£600,000
Next year	£2,200,000	£950,000
EPS	40p	20p
P/E ratio	15	20

4.10 Starving plc is acquiring Bigmeal plc on a higher P/E ratio, and it is only the profit growth in the acquired subsidiary that gives the enlarged Starving group its growth in EPS.

	Starving group
Number of shares (5,000,000 + 2,000,000)	7,000,000
Earnings	
If no profit growth (2,000,000 + 600,000) £2,600,000	EPS would have been 37.24p
With profit growth (2,200,000 + 950,000) £3,150,000	EPS will be 45p

If an acquisition strategy involves buying companies on a higher P/E ratio, it is therefore essential for continuing EPS growth that the acquired companies offer prospects of strong profit growth.

Reverse takeovers

4.11 A reverse takeover occurs when the smaller company takes over the larger one, so that the 'predator' company has to increase its voting equity by over 100% to complete the takeover.

Further points to consider: net assets per share and the quality of earnings

4.12 It might be concluded from what has been said above that dilution of earnings must be avoided at all cost. However, there are three cases where a dilution of earnings might be accepted on an acquisition if there were other advantages to be gained.

(a) Earnings growth may hide the dilution in EPS as above.

(b) A company might be willing to accept earnings dilution if the quality of the acquired company's earnings is superior to that of the acquiring company.

(c) A trading company with high earnings, but with few assets, may want to increase its assets base by acquiring a company which is strong in assets but weak in earnings so that assets and earnings get more into line with each other. In this case, dilution in earnings is compensated for by an increase in net asset backing.

Example: amalgamations and takeovers (3)

4.13 Intangible plc has an issued capital of 2,000,000 £1 ordinary shares. Net assets (excluding goodwill) are £2,500,000 and annual earnings average £1,500,000. The company is valued by the stock market on a P/E ratio of 8. Tangible Ltd has an issued capital of 1,000,000 ordinary shares. Net assets (excluding goodwill) are £3,500,000 and annual earnings average £400,000. The shareholders of Tangible Ltd accept an all-equity offer from Intangible plc valuing each share in Tangible Ltd at £4. Calculate Intangible plc's earnings and assets per share before and after the acquisition of Tangible Ltd.

Solution

4.14 (a) Before the acquisition of Tangible Ltd, the position is as follows.

$$\text{Earnings per share (EPS)} = \frac{£1,500,000}{2,000,000} = 75p$$

$$\text{Assets per share (APS)} = \frac{£2,500,000}{2,000,000} = £1.25$$

(b) Tangible Ltd's EPS figure is 40p (£400,000 ÷ 1,000,000), and the company is being bought on a multiple of 10 at £4 per share. As the takeover consideration is being satisfied by shares, Intangible plc's earnings will be diluted because Intangible plc is valuing Tangible Ltd on a higher multiple of earnings than itself. Intangible plc will have to issue 666,667 shares valued at £6 each (earnings of 75p per share at a multiple of 8) to satisfy the £4,000,000 consideration. The results for Intangible plc will be as follows.

$$\text{EPS} = \frac{£1,900,000}{2,666,667} = 71.25p \text{ (3.75p lower than the previous 75p)}$$

$$\text{APS} = \frac{£6,000,000}{2,666,667} = £2.25 \text{ (£1 higher than the previous £1.25)}$$

If Intangible plc is still valued on the stock market on a P/E ratio of 8, the share price should fall by approximately 30p (8 × 3.75p, the fall in EPS) but because the asset backing has been increased substantially the company will probably now be valued on a higher P/E ratio than 8.

4.15 The shareholders in Tangible Ltd would receive 666,667 shares in Intangible plc in exchange for their current 1,000,000 shares, that is, two shares in Intangible for every three shares currently held.

(a)

Earnings	£
Three shares in Tangible earn (3 × 40p)	1.200
Two shares in Intangible will earn (2 × 71.25p)	1.425
Increase in earnings, per three shares held in Tangible	0.225

(b) Assets

	£
Three shares in Tangible have an asset backing of (3 × £3.5)	10.50
Two shares in Intangible will have an asset backing of (2 × £2.25)	4.50
Loss in asset backing, per three shares held in Tangible	6.00

The shareholders in Tangible Ltd would be trading asset backing for an increase in earnings.

Dividends and dividend cover

4.16 A further issue which may create some difficulties before a merger or takeover can be agreed is the level of dividends and dividend cover expected by shareholders in each of the companies concerned. Once the companies merge, a single dividend policy will be applied.

5 OTHER MATTERS IN TAKEOVERS 6/94, 6/96

Service contracts for key personnel

5.1 When the target company employs certain key personnel, on whom the success of the company has been based, the predator company might want to ensure that these key people do not leave as soon as the takeover occurs. To do this, it might be necessary to insist as a condition of the offer that the key people should agree to sign service contracts, tying them to the company for a certain time (perhaps three years). Service contracts would have to be attractive to the employees concerned, perhaps through offering a high salary or other benefits such as share options in the predator company.

Where key personnel are shareholders, they might be bound not to sell shares for a period.

The Takeover Panel and the City Code on Takeovers and Mergers

5.2 The City Code is a code of behaviour which companies are expected to follow during a takeover or merger, as a measure of self-discipline. The code has no statutory backing, although it is administered and enforced by the Takeover Panel. Once adopted, the 13th Company Law Directive of the EU will have statutory power in EU member states, bringing an end to the non-statutory approach to the regulation of bids and takeover deals currently used in the UK.

5.3 The nature and purpose of the City Code is described within the code itself as follows.

> 'The code represents the collective opinion of those professionally involved in the field of takeovers on a range of business standards. It is not concerned with the financial or commercial advantages or disadvantages of a takeover, which are matters for the company and its shareholders, or with those wider questions which are the responsibility of the government, advised by the Monopolies and Mergers Commission.
>
> The code has not, and does not seek to have, the force of law, but those who wish to take advantage of the facilities of the securities markets in the United Kingdom should conduct themselves in matters relating to takeovers according to the Code. Those who do not so conduct themselves cannot expect to enjoy those facilities and may find that they are withheld.'

5.4 Companies subject to the code include all public companies (listed or unlisted) and also some classes of private company.

The City Code: general principles

5.5 The City Code is divided into general principles and detailed rules which must be observed by persons involved in a merger or takeover transaction. The general principles include the following.

(a) 'All shareholders of the same class of an offeree company must be treated similarly by an offeror.' In other words, a company making a takeover bid cannot offer one set of purchase terms to some shareholders in the target company, and a different set of terms to other shareholders holding shares of the same class in that company.

(b) 'During the course of a takeover, or when such is in contemplation, neither the offeror nor the offeree company ... may furnish information to some shareholders which is not made available to all shareholders.'

(c) 'Shareholders must be given sufficient information and advice to enable them to reach a properly informed decision and must have sufficient time to do so. No relevant information should be withheld from them.'

(d) 'At no time after a *bona fide* offer has been communicated to the board of an offeree company ... may any action be taken by the board of the offeree company in relation to the affairs of the company, without the approval of the shareholders in general meeting, which could effectively result in any *bona fide* offer being frustrated or in the shareholders being denied an opportunity to decide on its merits.'

In other words, directors of a target company are not permitted to frustrate a takeover bid, nor to prevent the shareholders from having a chance to decide for themselves.

(e) 'Rights of control must be exercised in good faith and the oppression of a minority is wholly unacceptable.'

For example, a holding company cannot take decisions about a takeover bid for one of its subsidiaries in such a way that minority shareholders would be unfairly treated.

(f) 'Where control of a company is acquired ... a general offer to all other shareholders is normally required.'

Control is defined as a 'holding, or aggregate holdings, of shares carrying 30% of the voting rights of a company, irrespective of whether that holding or holdings gives *de facto* control.'

The City Code: rules

5.6 In addition to its general principles, the City Code also contains a number of detailed rules, which are intended to govern the conduct of the parties in a takeover bid. These rules relate to matters such as:

(a) how the approach to the target company should be made by the predator company;

(b) the announcement of a takeover bid;

(c) the obligation of the board of a target company to seek independent advice (for example from a merchant bank);

(d) conduct during the offer;

(e) a time barrier to re-bidding if an offer fails.

Other legislative requirements

5.7 Legislative requirements potentially affecting takeovers and mergers include the following.

(a) Sections 428 to 430 of the Companies Act 1985 allow a company which has acquired over 90% of the shares of another company to purchase compulsorily the

remaining shares on the same terms, and gives the minority shareholders similar rights to require the company to buy their shares.

(b) Financial assistance given by a company for the purchase of its own shares is prohibited by section 151 of the Companies Act 1985. This outlaws the tactics of offering such financial assistance so as to inflate share values prior to a share-for-share exchange offer or to arrange for blocks of the target company's shares to be held by 'friendly' parties.

(c) Dealing in shares by various individuals who possess unpublished price-sensitive information ('insider dealing') is prohibited by law (Criminal Justice Act 1993). It is also an offence to *receive* price sensitive information with a view to making again by the use of that knowledge.

6 POST-ACQUISITION INTEGRATION

6.1 Failures of takeovers often result from inadequate integration of the companies after the takeover has taken place. There is a tendency for senior management to devote their energies to the next acquisition rather than to the newly-acquired firm. The particular approach adopted will depend upon the culture of the organisation as well as the nature of the company acquired and how it fits into the amalgamated organisation (eg horizontally, vertically, or as part of a diversified conglomerate).

6.2 P F Drucker has suggested Five Golden Rules for the process of post-acquisition integration.

Rule 1. There should be a 'common core of unity' shared by the acquiror and acquiree. The ties should involve overlapping characteristics such as shared technology and markets, and not just financial links.

Rule 2. The acquiror should ask 'What can we offer them?' as well as 'What's in it for us?'

Rule 3. The acquiror should treat the products, markets and customers of the acquired company with respect, and not disparagingly.

Rule 4. The acquiring company should provide top management with relevant skills for the acquired company within a year.

Rule 5. Cross-company promotions of staff should occur within one year.

6.3 C S Jones has proposed a five-step 'integration sequence'.

Step 1 is to decide on and to communicate initial reporting relationships. This will reduce uncertainty. The issue of whether to impose relationships at the beginning, although these may be subject to change, or to wait for the organisation structure to become more established (see Step 5 below) needs to be addressed.

Step 2 is to achieve rapid control of key factors, which will require access to the right accurate information. Control of information channels needs to be gained without dampening motivation. Note that it may have been poor financial controls which led to the demise of the acquiree company.

Step 3 is the resource audit. Both physical and human assets are examined in order to get a clear picture.

Step 4 is to re-define corporate objectives and to develop strategic plans, to harmonise with those of the acquiror company as appropriate, depending on the degree of autonomy managers are to have to develop their own systems of management control.

Step 5 is to revise the organisational structure.

6.4 Successful post-acquisition integration requires careful management of the 'human factor' to avoid loss of motivation. Employees in the acquired company will want to know how they and their company are to fit into the structure and strategy of the amalgamated enterprise. Morale can, hopefully, be preserved by reducing uncertainty and by providing appropriate performance incentives, staff benefits and career prospects.

7 DEMERGERS 6/95

7.1 Mergers and takeovers are not inevitably good strategy for a business. In some circumstances, strategies of internal growth, no growth or even a *demerger* might be preferable. ICI plc is one well known example of an enterprise which has undergone demerger in recent years, splitting itself into two separate companies (as ICI and the pharmaceuticals company, Zeneca).

7.2 A demerger is the opposite of a merger. It is the splitting up of a corporate body into two or more separate and independent bodies. For example, the ABC Group plc might demerge by selling its 100% shareholding in a subsidiary, C plc, to an outside buyer, who will then run C plc as an independent company. This would be a case of *disinvestment* by the group, withdrawing from its investment in C plc. Alternatively, shareholders may be offered a package of shares in the demerged parts of the business in exchange for their old shares in the merged company.

7.3 The reasons for demergers could be any of the following.

(a) An unprofitable subsidiary could be sold. The buyer might perhaps be a group of the subsidiary's managers, with the management buyout team being backed by venture capital finance.

(b) Subsidiaries which are not 'core businesses' and do not fit in with the group's strategic plans could be sold. This was the case when Royal Doulton, the china producer, was demerged from its parent company Pearson, which also owns the Financial Times, in 1993. Pearson said at the time that the demerger was part of its decision to focus on the media.

(c) A subsidiary with high risk in its operating cash flows could be sold, so as to reduce the business risk of the group as a whole.

(d) A subsidiary could be sold at a profit. Some companies have specialised in taking over large groups of companies, and then selling off parts of the newly-acquired groups, so that the proceeds of sales more than pay for the original takeovers.

7.4 The potential disadvantages with demergers are as follows.

(a) Economies of scale may be lost, where the demerged parts of the business had operations in common to which economies of scale applied.

(b) The smaller companies which result from the demerger will have lower turnover, profits and status than the group before the demerger.

(c) There may be higher overhead costs as a percentage of turnover, resulting from (b).

(d) The ability to raise extra finance, especially debt finance, to support new investments and expansion may be reduced.

(e) Vulnerability to takeover may be increased.

8 MANAGEMENT BUYOUTS 6/95

8.1 A *management buyout* (MBO) is the purchase of all or part of a business from its owners by its managers. For example, the directors of a subsidiary company in a group might buy the company from the holding company, with the intention of running it as proprietors of a separate business entity.

By 1990 the annual number of MBOs in the UK had risen to 500, with a total value of £2,830 million, compared with 100 MBOs valued at £40 million ten years earlier.

8.2 To the managers, the buyout would be a method of setting up in business for themselves. To the group, the buyout would be a method of *disinvestment*, selling off the subsidiary as a going concern.

8.3 When a firm decides to divest itself of a part of its operations, it will try to get what it can by selling off the business as a unit, or by selling individual assets. Usually, a better price can be obtained by selling the business as a unit, and there might well be many other firms interested in buying it. In recent years, however, there have been a large number of management buyouts, whereby the subsidiary is sold off to its managers. The managers put in some of their own capital, but obtain the rest from venture capital organisations, and hope to make a bigger success of the business than the company which is selling it.

8.4 Management buyouts might easily be thought of as attempts by a company to sell loss-making subsidiaries. In fact, management buyouts more commonly involve the sale of *profitable* subsidiaries, which are being sold off simply because they do not fit in well with the group's strategic plans.

The parties to a buyout

8.5 There are usually three parties to a management buyout.

(a) There is a management team wanting to make a buyout. This team ought to have the skills and ability to convince financial backers that it is worth supporting.

(b) There are the directors of a group of companies, who make the disinvestment decision.

(c) There are financial backers of the buyout team, who will usually want an equity stake in the bought-out business, because of the venture capital risk they are taking. Often, several financial backers provide the venture capital for a single buyout.

8.6 The management team making the buyout would probably have the aims of:

(a) setting up in business themselves, being owners rather than mere employees; or
(b) avoiding redundancy, when the subsidiary is threatened with closure.

8.7 A large organisation's board of directors may agree to a management buyout of a subsidiary for any of a number of different reasons.

(a) The subsidiary may be peripheral to the group's mainstream activities, and no longer fit in with the group's overall strategy.

(b) The group may wish to sell off a loss-making subsidiary, and a management team may think that it can restore the subsidiary's fortunes.

(c) The parent company may need to raise cash quickly.

(d) The subsidiary may be part of a group that has just been taken over and the new parent company may wish to sell off parts of the group it has just acquired.

(e) The best offer price might come from a small management group wanting to arrange a buyout.

(f) When a group has taken the decision to sell a subsidiary, it will probably get better co-operation from the management and employees of the subsidiary if the sale is a management buyout.

8.8 A private company's shareholders might agree to sell out to a management team because:

(a) they need cash;
(b) they want to retire;
(c) the business is not profitable enough for them.

8.9 The buyout team will have to find willing financial backers, and so it must convince them that it can run the business successfully. To help with the task of convincing the bank or other institution, the management team should prepare:

(a) a business plan;
(b) estimates of sales, costs, profits and cash flows, in reasonable detail.

8.10 If the parent company's existing shareholders have already indicated their willingness to sell, the management team should have reasonably free access to the sort of figures they need about revenues, costs, areas for improved efficiency and cost savings, and so on.

The appraisal of proposed buyouts

How likely is a management buyout to succeed?

8.11 So far, management-owned companies seem to get better performance out of their company, probably because of:

(a) a favourable buyout price having been achieved;

(b) personal motivation and determination;

(c) quicker decision making and so more flexibility;

(d) keener decisions and action on pricing and debt collection;

(e) savings in overheads, for example avoiding the need to make contributions to a large head office.

However, many management buyouts, once they occur, begin with some redundancies to cut running costs.

8.12 The prospects of success for a management buyout ought to be evaluated:

(a) by the managers who are thinking of making the buyout;

(b) by the institutional investors who are being asked to put in venture capital to finance the buyout;

(c) by the vendor, where the vendor continues to have a trading interest.

How should an institutional investor evaluate a buyout?

8.13 An institutional investor should evaluate a buyout before deciding whether or not to finance. Aspects of any buyout that ought to be checked are as follows.

(a) Does the management team have the full range of management skills that are needed (for example a technical expert and a finance director)? Does it have the right blend of experience? Does it have the commitment?

(b) Why is the company for sale? The possible reasons for buyouts have already been listed. If the reason is that the parent company wants to get rid of a loss-making subsidiary, what evidence is there to suggest that the company can be made profitable after a buyout?

(c) What are the projected profits and cash flows of the business? The prospective returns must justify the risks involved.

(d) What is being bought? The buyout team might be buying:

(i) the shares of the company; or
(ii) only selected assets of the company.

Are the assets that are being acquired sufficient for the task? Will more assets have to be bought? When will the existing assets need replacing? How much extra finance would be needed for these asset purchases? Can the company be operated profitably?

(e) What is the price? Is the price right or is it too high?

(f) What financial contribution can be made by members of the management team themselves?

The financial arrangements in a typical buyout

8.14 Typically, the buyout team will have a minority of the equity in the bought-out company, with the financial backers holding a majority of the shares between them. A buyout might have several financial backers, each providing finance in exchange for some equity.

8.15 The financial institutions will regard their investment as a fairly long-term one, but they might hope that if the company is successful, it will eventually be floated on a stock market, perhaps the second tier Alternative Investment Market (AIM), thus giving a market value to their equity, and the option to sell their shares if they wish to realise their investment.

8.16 Investors of venture capital usually want the managers to be financially committed. Individual managers could borrow personally from a bank, say £20,000 to £50,000. This should be enough to commit them without hurting them too much.

8.17 The suppliers of equity finance might insist on investing part of their capital in the form of redeemable convertible preference shares. These often have voting rights should the preference dividend fall in arrears, giving increased influence over the company's affairs. They are issued in a redeemable form to give some hope of taking out part of the investment if it does not develop satisfactorily, and in convertible form for the opposite reason: to allow an increased stake in the equity of a successful company.

Management buyout: case example

8.18 You have probably read about some management buyouts in the financial press. The details of an MBO as reported by *The Independent* in August 1993 included the following.

> *TSB sells EuroDollar to its management*
>
> 'TSB group has sold EuroDollar, its loss-making car rental business, to its management for about £60m.
>
> The management buyout is headed by Freddie Aldous, who 20 years ago founded Swan National for UDT, the credit finance firm that TSB bought in 1981.
>
> EuroDollar's management owns 40 per cent of the company. The rest is held by venture capitalists, led by Prudential Venture Managers, which has invested £20m. Charterhouse Development Capital, Electra Private Equity Partners and Morgan Grenfell Development Capital each put up £13m.
>
> Martin Clarke, a Prudential Venture Managers director, said EuroDollar could proceed to a flotation within two or three years. [A pathfinder prospectus for this was in fact published in June 1994.] The company has good management and a very profitable UK business, he said.
>
> However, start-up problems in France and Italy caused EuroDollar to suffer a pre-tax loss of £7.9m in the six months to end March. This was in spite of UK profits of more than £10m a year.
>
> Mr Aldous said he expected to sell the French company next week, the new owner becoming a EuroDollar franchisee. He intends to eliminate the Italian losses in a similar way within the next few months.
>
> Lombard North Central, a National Westminster Bank company, has provided vehicle finance and working capital facilities, along with Forward Trust and UDT. Including the equity investment, Eurodollar said the buyout involved finance of £192m.
>
> Mr Aldous and Ian Mosley, his chief executive, have given undertakings not to enter the fleet leasing market in the next 18 months. This remains a possibility for EuroDollar in the medium term. The EuroDollar deal also releases TSB from guaranteeing £58.1m of car finance loans.

TSB will receive cash of £22m and £37.9m in repayment of inter-company debt. At 31 March [1993], EuroDollar had net assets of £20.4m.

A bank spokesman said TSB was selling for strategic reasons rather than because of the price offered.'

Possible problems with buyouts

8.19 A common problem with management buyouts is that the managers may lack sufficient experience in financial management or financial accounting.

Other problems are:

(a) tax and legal complications;

(b) difficulties in deciding on a fair price to be paid;

(c) convincing employees of the need to change working practices;

(d) inadequate cash flow to finance the maintenance and replacement of tangible fixed assets;

(e) the maintenance of previous employees' pension rights;

(f) accepting the board representation requirement that many sources of funds will insist upon;

(g) the loss of key employees if the company moves geographically, or wage rates are decreased too far, or employment conditions are unacceptable in other ways;

(h) maintaining continuity of relationships with suppliers and customers.

Buy-ins

8.20 'Buy-in' is a term used when a team of *outside* managers, as opposed to managers who are already running the business, mount a takeover bid and then run the business themselves.

8.21 A management buy-in might occur when a business venture is running into trouble, and a group of outside managers see an opportunity to take over the business and restore its profitability.

Sell-offs

8.22 A sell-off is a form of divestment involving the sale of part of a company to a third party, usually another company. Generally, cash will be received in exchange.

8.23 A company may carry out a sell-off for one of the following reasons.

(a) As part of its strategic planning, it has decided to restructure, concentrating management effort on particular parts of the business. Control problems may be reduced if peripheral activities are sold off.

(b) It wishes to sell off a part of its business which makes losses, and so to improve the company's future reported consolidated profit performance.

(c) In order to protect the rest of the business from takeover, it may choose to sell a part of the business which is particularly attractive to a buyer.

(d) The company may be short of cash.

Liquidations

8.24 The extreme form of a sell-off is where the entire business is sold off in a liquidation. In a voluntary dissolution, the shareholders might decide to close the whole business, sell off all the assets and distribute net funds raised.

Spin-offs

8.25 In a spin-off, a new company is created whose shares are owned by the shareholders of the original company which is making the distribution of assets. There is no change in the ownership of assets, as the shareholders own the same proportion of shares in the new company as they did in the old company. Assets of the part of the business to be separated off are transferred into the new company, which will usually have different management from the old company. In more complex cases, a spin-off may involve the original company being split into a number of separate companies.

8.26 For a number of possible reasons such as those set out below, a spin-off appears generally to meet with favour from stock market investors.

(a) The change may make a merger or takeover of some part of the business easier in the future, or may protect parts of the business from predators.

(b) There may be improved efficiency and more streamlined management within the new structure.

(c) It may be easier to see the value of the separated parts of the business now that they are no longer hidden within a conglomerate.

(d) The requirements of regulatory agencies might be met more easily within the new structure, for example if the agency is able to exercise price control over a particular part of the business which was previously hidden within the conglomerate structure.

(e) After the spin-off, shareholders have the opportunity to adjust the proportions of their holdings between the different companies created.

Going private

8.27 A public company 'goes private' when a small group of individuals, possibly including existing shareholders and/or managers and with or without support from a financial institution, buys all of the company's shares. This form of restructuring is relatively common in the USA and may involve the shares in the company ceasing to be listed on a stock exchange. In some cases, a small group of shareholders who prefer private company status buy the shares in a company from all the other shareholders.

8.28 Advantages in going private could include the following.

(a) The costs of meeting listing requirements can be saved.

(b) The company is protected from volatility in share prices which financial problems may create.

(c) The company will be less vulnerable to hostile takeover bids.

(d) Management can concentrate on the long-term needs of the business rather than the short-term expectations of shareholders.

(e) Shareholders are likely to be closer to management in a private company, reducing costs arising from the separation of ownership and control (the 'agency problem').

8.29 A recent example of going private was Richard Branson's repurchase of shares in the Virgin Company from the public and financial institutions.

8.30 Another example was SAGA the tour operator which changed status from public to private in 1990. While public, 63% of the company was owned by one family. The family raised finance to buy all of the shares, to avoid the possibility of hostile takeover bids and to avoid conflicts between the long-term needs of the business and the short-term expectations which institutional shareholders in particular are often claimed to have.

9 REPURCHASE OF SHARES

Why buy back the company's shares?

9.1 Until relatively recently, it was illegal for a UK company to repurchase its issued shares. The Companies Act 1981, and now the Companies Act 1985, have given companies rights to buy back shares from shareholders who are willing to sell them, subject to certain conditions.

9.2 For a smaller private company with few shareholders, the reason for buying back the company's own shares may be that there is no immediate willing purchaser at a time when a shareholder wishes to sell shares.

9.3 Larger public companies also sometimes repurchase their own shares. Recently, for instance, a number of the privatised UK electricity companies have made significant share repurchases having gained shareholder approval to do so at the companies' annual meetings. For example, on 5 October 1994 it was reported that Midlands Electricity plc had purchased 21.16 million of its own shares. In making such a large repurchase, it had to pay a price of 725 pence, compared with a general market price on the day of 713 pence, up 25 pence on the previous day. There have been many other examples of share repurchase by major companies, such as PowerGen in 1996.

9.4 Repurchase of own shares is common among US companies and is gaining popularity in the UK. However, the practice remains rare in the rest of Europe. Share buybacks are indeed illegal in a number of European countries including Germany and in Scandinavia, although in some countries, including Sweden, Switzerland, and Ireland, there are (in 1996) moves towards legalisation.

9.5 Among the possible benefits of a share repurchase scheme are the following.

(a) Finding a use for surplus cash, which may be a 'dead asset'.

(b) Increase in earnings per share through a reduction in the number of shares in issue. This should lead to a higher share price than would otherwise be the case, and the company should be able to increase dividend payments on the remaining shares in issue.

(c) Increase in gearing. Repurchase of a company's own shares allows debt to be substituted for equity, so raising gearing. This will be of interest to a company wanting to increase its gearing without increasing its total long-term funding.

(d) Readjustment of the company's equity base to more appropriate levels, for a company whose business is in decline.

(e) If certain conditions are met, share repurchase may avoid the payment of advance corporation tax which might prove to be irrecoverable.

(f) Share repurchase may also fulfil special purposes, such as preventing a takeover or enabling a quoted company to withdraw from the stock market.

There are also possible disadvantages.

(a) It can be hard to arrive at a price which will be fair both to the vendors and to any shareholders who are not selling shares to the company.

(b) A purchase of shares could be seen as an admission that the company cannot make better use of the funds than the shareholders.

(c) Some shareholders may suffer from being taxed on a capital gain following the purchase of their shares rather than receiving dividend income.

9.6 For Midlands Electricity in 1994, the example cited above, the objectives of the buy-back were to boost earnings per share and to help create a 'progressive' dividend policy at a time when the company had cash available for the repurchase. An investment analyst was quoted in the press as approving of the move. Given what he saw as the

utilities companies' poor record on diversification, he said that he would prefer seeing the company do this with its money than investing it abroad.

Chapter roundup

- Buying another company is a substantial undertaking for a company. The target company's shareholders must be persuaded of the benefits of the takeover.
- Takeover bids are relatively common, and it is worth following one or two in the financial press, so as to see how the considerations set out in this chapter translate into practice.
- Management buyouts are a special sort of transaction, involving several parties. A buyout cannot go ahead unless all the parties are satisfied with the arrangements.
- Repurchase by a company of its own shares is a procedure which has become increasingly common in recent years.

Test your knowledge

1 What might be the reasons for an amalgamation or takeover? (1.4)

2 What were the main reasons for the boom in takeover activity in the UK during the latter half of the 1980s? (2.1)

3 Why might the shareholders of the bidding company disapprove of a bid for a target company by their board of directors? (3.6)

4 What factors might affect the choice between a cash offer and a paper offer in a takeover bid? (3.28)

5 What is mezzanine finance? (3.31)

6 If a bidding company issues shares to buy a target company on a *lower* P/E ratio than the bidding company shares are valued at, what will happen to the bidding company's own EPS after the takeover? (4.3)

7 What are the steps which should be followed in ensuring that an acquired company is successfully integrated into the enterprise? (6.3)

8 What are the reasons for demergers? (7.3)

9 How should an institutional investor evaluate a management buyout? (8.13)

10 Why might an investor in a management buyout ask for redeemable convertible preference shares in return for his investment? (8.17)

11 What advantages are there in a public company 'going private'? (8.28)

Now try illustrative question 13 at the end of the Study Text

Chapter 14

THE VALUATION OF COMPANIES

This chapter covers the following topics.

		Syllabus reference
1	Reasons for share valuations	2(e)
2	Methods of valuing shares	2(e)

Introduction

In the previous chapter, we explored various issues which should be addressed in business amalgamations.

We have mentioned different possible methods which could be used to value a company to be acquired. In this chapter, we explain different valuation methods in more detail.

1 REASONS FOR SHARE VALUATIONS

1.1 It may be wondered why, given quoted share prices on the Stock Exchange, there is any need to devise techniques for estimating the value of a share. A share valuation will be necessary:

(a) *for quoted companies*, when there is a takeover bid and the offer price is an estimated 'fair value' in excess of the current market price of the shares;

(b) *for unquoted companies*, when:

(i) the company wishes to 'go public' and must fix an issue price for its shares;

(ii) there is a scheme of merger, and a value of shares for each company involved in the merger must be assessed;

(iii) shares are sold;

(iv) shares need to be valued for the purposes of taxation;

(v) shares are pledged as collateral for a loan;

(c) *for subsidiary companies*, when the group's holding company is negotiating the sale of the subsidiary to a management buyout team or to an external buyer.

1.2 Valuing unquoted companies presents some special considerations.

(a) It may not be sensible to use P/E ratios of a quoted company for comparative purposes because the market value of a quoted company is likely to include a premium to reflect the marketability of its shares.

(b) A small unquoted company may be highly sensitive to the loss of key employees which may follow a merger or buyout. An arrangement to tie key employees in to the enterprise could be very costly.

1.3 Our main interest in this chapter is with methods of valuing the entire equity in a company, perhaps for the purpose of making a takeover bid, rather than with the value of small blocks of shares which an investor might choose to buy or sell on the stock market.

2 METHODS OF VALUING SHARES

6/94, 6/95, 6/96

2.1 Common methods of valuing shares for the reasons listed in Paragraph 1.1 are:

(a) the earnings method (P/E ratio method);
(b) the accounting rate of return method;
(c) the net assets method;
(d) the dividend yield method;
(e) use of the CAPM;
(f) the super-profits method;
(g) DCF-based valuations.

Each method will give a different share valuation.

2.2 It is unlikely that one method would be used in isolation. Several valuations might be made, each using a different technique or different assumptions. The valuations could then be compared, and a final price reached as a compromise between the different values.

The P/E ratio (earnings) method of valuation

2.3 This is a common method of valuing a controlling interest in a company, where the owner can decide on dividend and retention's policy. The P/E ratio relates earnings per share to a share's value.

$$\text{Since P/E ratio} = \frac{\text{Market value}}{\text{EPS}}$$

$$\text{Market value per share} = \text{EPS} \times \text{P/E ratio}$$

2.4 The concept of the P/E ratio can be used to make an earnings-based valuation of shares. This is done by deciding a suitable P/E ratio and multiplying this by the EPS for the shares which are being valued. The EPS could be a historical EPS or a prospective future EPS.

2.5 For a given EPS figure, a higher P/E ratio will result in a higher price. A high P/E ratio may indicate:

(a) *expectations* that the EPS will grow rapidly in the years to come, so that a high price is being paid for future profit prospects. Many small but successful and fast-growing companies are valued on the stock market on a high P/E ratio;

(b) *security of earnings.* A well-established low-risk company would be valued on a higher P/E ratio than a similar company whose earnings are subject to greater uncertainty;

(c) *status.* If a quoted company made a share-for-share takeover bid for an unquoted company, it would normally expect its own shares to be valued on a higher P/E ratio than the target company's shares. This is because a quoted company ought to be a lower-risk company; but in addition, there is a clear advantage in having shares which are quoted on a stock market: the shares can be readily sold. As a general guideline, the P/E ratio of an unquoted company's shares might be around 50% to 60% of the P/E ratio of a similar public company with a full Stock Exchange listing (and perhaps 70% of that of a company whose shares are traded on the AIM).

Example: earnings method of valuation

2.6 Spider plc is considering the takeover of an unquoted company, Fly Ltd. Spider's shares are quoted on the Stock Exchange at a price of £3.20 and since the most recent published EPS of the company is 20p, the company's P/E ratio is 16. Fly Ltd is a company with 100,000 shares and current earnings of £50,000, 50p per share. How might Spider plc decide on an offer price?

Solution

2.7 The decision about the offer price is likely to be based on deciding first of all what a reasonable P/E ratio would be.

(a) If Fly Ltd is in the same industry as Spider plc, its P/E ratio ought to be lower, because of its lower status as an unquoted company.

(b) If Fly Ltd is in a different industry, a suitable P/E ratio might be based on the P/E ratio that is typical for quoted companies in that industry.

(c) If Fly Ltd is thought to be growing fast, so that its EPS will rise rapidly in the years to come, the P/E ratio that should be used for the share valuation will be higher than if only small EPS growth is expected.

(d) If the acquisition of Fly Ltd would contribute substantially to Spider's own profitability and growth, or to any other strategic objective that Spider has, then Spider should be willing to offer a higher P/E ratio valuation, in order to secure acceptance of the offer by Fly's shareholders.

Of course, the P/E ratio on which Spider bases its offer will probably be lower than the P/E ratio that Fly's shareholders think their shares ought to be valued on. Some haggling over the price might be necessary.

Spider might decide that Fly's shares ought to be valued on a P/E ratio of 60% × 16 = 9.6, that is, at 9.6 × 50p = £4.80 each.

Fly's shareholders might reject this offer, and suggest a valuation based on a P/E ratio of, say, 12.5, that is, 12.5 × 50p = £6.25.

Spider's management might then come back with a revised offer, say valuation on a P/E ratio of 10.5, that is, 10.5 × 50p = £5.25.

The haggling will go on until the negotiations either break down or succeed in arriving at an agreed price.

General guidelines for a P/E ratio-based valuation

2.8 When a company is thinking of acquiring an *unquoted* company in a takeover, the final offer price will be agreed by negotiation, but a list of some of the factors affecting the valuer's choice of P/E ratio is given below.

(a) General economic and financial conditions.

(b) The type of industry and the prospects of that industry.

(c) The size of the undertaking and its status within its industry. If an unquoted company's earnings are growing annually and are currently around £300,000 or so, then it could probably get a quote in its own right on the USM and a higher P/E ratio should therefore be used when valuing its shares.

(d) Marketability. The market in shares which do not have a Stock Exchange quotation is always a restricted one and a higher yield is therefore required. Because of restrictions on transfer given in their Articles, any 'private' market in the shares of private companies is likely to be particularly small. It is not uncommon for a quoted company to have a P/E ratio twice the size of that attributed to a private company in the same industry. For examination purposes, you should normally take a figure around one half to two thirds of the industry average when valuing an unquoted company.

(e) The diversity of shareholdings and the financial status of any principal shareholders.

(f) The reliability of profit estimates and the past profit record.

(g) Asset backing and liquidity.

(h) The nature of the assets, for example whether some of the fixed assets are of a highly specialised nature, and so have only a small break-up value.

(i) Gearing. A relatively high gearing ratio will generally mean greater financial risk for ordinary shareholders and call for a higher rate of return on equity.

(j) The extent to which the business is dependent on the technical skills of one or more individuals.

2.9 A predator company may sometimes use their higher P/E ratio to value a target company. This assumes that the predator can improve the target's business, which is a dangerous assumption to make. It would be better to use an adjusted industry P/E ratio, or some other method.

Forecast growth in earnings

2.10 When one company is thinking about taking over another, it should look at the target company's forecast earnings, not just its historical results.

Forecasts of the future earnings of a target company might be attempted by managers in the company which is planning to make the takeover bid. Quite commonly, however, the management of the predator company will make an initial approach to the board of directors of the target company, to sound them out about a possible takeover bid. If the target company's directors are amenable to a bid, they might agree to produce forecasts of their company's future earnings and growth. These forecasts (for the next year and possibly even further ahead) might then be used by the predator company in choosing an offer price.

2.11 Forecasts of earnings growth should only be used if:

(a) there are good reasons to believe that earnings growth will be achieved;

(b) a reasonable estimate of growth can be made;

(c) any forecasts supplied by the target company's board of directors are made in good faith.

The accounting rate of return (ARR) method of share valuation

2.12 This method considers the accounting rate of return which will be required from the company whose shares are to be valued. It is therefore distinct from the P/E ratio method, which is concerned with the market rate of return required.

The following formula should be used.

$$\text{Value} = \frac{\text{Estimated future profits}}{\text{Required return on capital employed}}$$

2.13 For a takeover bid valuation, it will often be necessary to adjust the profits figure to allow for expected changes after the takeover. Those arising in an examination question might include:

(a) new levels of directors' remuneration;

(b) new levels of interest charges (perhaps because the predator company will be able to replace existing loans with new loans at a lower rate of interest, or because the previous owners had lent the company money at non-commercial rates);

(c) a charge for notional rent where it is intended to sell existing properties or where the rate of return used is based on the results of similar companies that do not own their own properties;

(d) the effects of product rationalisation and improved management.

Example: ARR method of share valuation

2.14 Chambers Ltd is considering acquiring Hall Ltd. At present Hall Ltd is earning, on average, £480,000 after tax. The directors of Chambers Ltd feel that after reorganisation, this figure could be increased to £600,000. All the companies in the Chambers group are expected to yield a post-tax accounting return of 15% on capital employed. What should Hall Ltd be valued at?

Solution

2.15 $$\text{Valuation} = \frac{£600,000}{15\%} = £4,000,000$$

This figure is the maximum that Chambers should be prepared to pay. The first offer would probably be much lower.

2.16 An ARR valuation might be used in a takeover when the acquiring company is trying to assess the maximum amount it can afford to pay. This is because it is a measure of management efficiency and the rate used can be selected to reflect (among other things) the return which the acquiring company thinks should be obtainable after any post-acquisition reorganisation has been completed. A valuation on this basis should then be compared with the stock market price (for quoted companies) or a price arrived at using the P/E ratio of similar quoted companies.

The net assets method of share valuation

2.17 Using this method of valuation, the value of a share in a particular class is equal to the net tangible assets attributable to that class, divided by the number of shares in the class. Intangible assets (including goodwill) should be excluded, unless they have a market value (for example patents and copyrights, which could be sold).

(a) Goodwill, if shown in the accounts, is unlikely to be shown at a true figure for purposes of valuation, and the value of goodwill should be reflected in another method of valuation (for example the earnings basis, the dividend yield basis or the super-profits method).

(b) Development expenditure, if shown in the accounts, would also have a value which is related to future profits rather than to the worth of the company's physical assets.

Example: net assets method of share valuation

2.18 The summary balance sheet of Cactus Ltd is as follows.

	£	£	£
Fixed assets			
Land and buildings			160,000
Plant and machinery			80,000
Motor vehicles			20,000
			260,000
Goodwill			20,000
Current assets			
Stocks		80,000	
Debtors		60,000	
Short-term investments		15,000	
Cash		5,000	
		160,000	
Current liabilities			
Creditors	60,000		
Taxation	20,000		
Proposed ordinary dividend	20,000		
		(100,000)	
			60,000
			340,000
12% debentures			(60,000)
Deferred taxation			(10,000)
			270,000
			£
Ordinary shares of £1			80,000
Reserves			140,000
			220,000
4.9% preference shares of £1			50,000
			270,000

What is the value of an ordinary share using the net assets basis of valuation?

Solution

2.19 If the figures given for asset values are not questioned, the valuation would be as follows.

		£	£
Total value of net assets			340,000
Less intangible asset (goodwill)			20,000
Total value of tangible assets(net)			320,000
Less:	Preference shares	50,000	
	Debentures	60,000	
	Deferred taxation	10,000	
			120,000
Net asset value of equity			200,000
Number of ordinary shares			80,000
Value per share			£2.50

2.20 The difficulty in an asset valuation method is establishing the asset values to use. Values ought to be realistic. The figure attached to an individual asset may vary considerably depending on whether it is valued on a going concern or a break-up basis.

2.21 The following list should give you some idea of the factors that must be considered.

(a) Do the assets need professional valuation? If so, how much will this cost?

(b) Have the liabilities been accurately quantified, for example deferred taxation? Are there any contingent liabilities? Will any balancing tax charges arise on disposal?

(c) How have the current assets been valued?

(i) Are all debtors collectable?
(ii) Is all stock realisable?

Can all the assets be physically located and brought into a saleable condition? This may be difficult in certain circumstances where the assets are situated abroad.

(d) Can any hidden liabilities be accurately assessed? Would there be redundancy payments and closure costs?

(e) Is there an available market in which the assets can be realised (on a break-up basis)? If so, do the balance sheet values truly reflect these break-up values?

(f) Are there any prior charges on the assets?

When is the net assets basis of valuation used?

2.22 The net assets basis of valuation should be used:

(a) *as a measure of the 'security' in a share value.* A share might be valued using the earnings basis, and this valuation might be:

(i) higher than the net asset value per share. If the company went into liquidation, the investor could not expect to receive the full value of his shares when the underlying assets were realised;

(ii) lower than the net asset value per share. If the company went into liquidation, the investor might expect to receive the full value of his shares (perhaps much more) when the underlying assets were realised.

The asset backing for shares thus provides a measure of the possible loss if the company fails to make the expected earnings or dividend payments. It is often thought to be a good thing to acquire a company with valuable tangible assets, especially freehold property which might be expected to increase in value over time;

(b) *as a measure of comparison in a scheme of merger.* For example, if company A, which has a low asset backing, is planning a merger with company B, which has a high asset backing, the shareholders of B might consider that their shares' value ought to reflect this. It might therefore be agreed that a something should be added to the value of the company B shares to allow for this difference in asset backing.

For these reasons, it is always advisable to calculate the net assets per share.

The Berliner method

2.23 You may come across reference to the *Berliner method* of share valuation. This involves taking the average of the prices calculated using the earnings method and the net assets method.

The dividend yield method of share valuation

2.24 The dividend yield method of share valuation is suitable for the valuation of small shareholdings in unquoted companies. It is based on the principle that small shareholders are mainly interested in dividends, since they cannot control decisions affecting the company's profits and earnings. A suitable offer price would therefore be one which compensates them for the future dividends they will be giving up if they sell their shares.

2.25 The simplest dividend capitalisation technique is based on the assumption that the level of dividends in the future will be *constant*. A dividend yield valuation would be:

$$\text{Value} = \frac{\text{Dividend in pence}}{\text{Expected dividend yield \%}}$$

2.26 It may be possible to use expected *future* dividends for a share valuation and to predict dividend growth. For this purpose, it is first necessary to predict future earnings and then to decide how changes in earnings will be reflected in the company's dividend policy.

2.27 The dividend growth model for share valuation, you may recall, is as follows.

$$P_o = \frac{D_0(1+g)}{(r-g)}$$

where P_o is the current market value ex dividend
D_0 is the current dividend
g is the expected annual growth in dividend, so $D_0(1+g)$ is the expected dividend next year
r is the return required.

Exercise

A company expects to pay no dividends in years 1, 2 or 3, but a dividend of 7.8p per share each year from year 4 in perpetuity. Value its shares on a dividend yield basis, assuming a required yield of 12%.

Solution

$$\frac{7.8p}{(1.12)^4} + \frac{7.8p}{(1.12)^5} + \ldots\ldots$$

$$= \frac{7.8p}{0.12} \times \frac{1}{(1.12)^3}$$

$$= \frac{65p}{(1.12)^3} = 46.26p, \text{ say } 46p$$

The CAPM and share price valuations

2.28 The capital asset pricing model (CAPM) might be used to value shares, particularly when pricing shares for a stock market listing. The CAPM would be used to establish a required equity yield.

Example: CAPM and share price valuations

2.29 Suppose that Mackerel plc is planning to obtain a Stock Exchange listing by offering 40% of its existing shares to the public. No new shares will be issued. Its most recent summarised results are as follows.

	£
Turnover	120,000,000
Earnings	1,500,000
Number of shares	3,000,000

The company has low gearing.

It regularly pays 50% of earnings as dividends, and with reinvested earnings is expected to achieve 5% dividend growth each year.

Summarised details of two listed companies in the same industry as Mackerel plc are as follows.

	Salmon plc	*Trout plc*
Gearing (total debt/total equity)	45%	10%
Equity beta	1.50	1.05

The current Treasury bill yield is 7% a year. The average market return is estimated to be 12%.

The new shares will be issued at a discount of 15% to the estimated post-issue market price, in order to increase the prospects of success for the share issue.

What will the issue price be?

Solution

2.30 Using the CAPM, we begin by deciding on a suitable β value for Mackerel's equity. We shall assume that since Mackerel's gearing is close to Trout's, a β of 1.05 is appropriate.

The cost of Mackerel equity is $7\% + (12 - 7) \times 1.05\% = 12.25\%$

2.31 This can now be used in the dividend growth model. The dividend this year is 50% of £1,500,000 = £750,000.

The total value of Mackerel's equity is $\dfrac{£750,000\ (1.05)}{(0.1225 - 0.05)} = £10,862,068$

There are 3,000,000 shares, giving a market value per share of £3.62.

2.32 Since the shares that are offered to the public will be offered at a discount of about 15% to this value, the share price for the market launch should be about 85% of £3.62 = £3.08.

The super-profits method of share valuation

2.33 This method, which is rather out-of-fashion now, starts by applying a 'fair return' to the net tangible assets and comparing the result with the expected profits. Any excess of profits (the super-profits) is used to calculate goodwill.

The goodwill is normally taken as a fixed number of years super-profits. The goodwill is then added to the value of the target company's tangible assets to arrive at a value for the business.

Example: super-profits method of share valuation

2.34 Light Ltd has net tangible assets of £120,000 and present earnings of £20,000. Doppler Ltd wants to take over Light Ltd and considers that a fair return for this type of industry is 12%, and decides to value Light Ltd taking goodwill at three years super-profits.

	£
Actual profits	20,000
Less fair return on net tangible assets: 12% × £120,000	14,400
Super-profits	5,600
Goodwill: 3 × £5,600	£16,800
Value of Light Ltd: £120,000 + £16,800	£136,800

2.35 The principal drawbacks to this valuation method are as follows.

(a) The rate of return required is chosen subjectively.

(b) The number of years purchase of super-profits is arbitrary. In the example above, goodwill was valued at three years of super-profits, but it could have been, for example, two years or four years of super-profits.

The discounted future profits method of share valuation

2.36 This method of share valuation may be appropriate when one company intends to buy the assets of another company and to make further investments in order to improve profits in the future.

Example: discounted future profits method of share valuation

2.37 Diversification Ltd wishes to make a bid for Tadpole Ltd. Tadpole Ltd makes after-tax profits of £40,000 a year. Diversification Ltd believes that if further money is spent on additional investments, the after-tax cash flows (ignoring the purchase consideration) could be as follows.

Year	*Cash flow (net of tax)*
	£
0	(100,000)
1	(80,000)
2	60,000
3	100,000
4	150,000
5	150,000

The after-tax cost of capital of Diversification Ltd is 15% and the company expects all its investments to pay back, in discounted terms, within five years.

What is the maximum price that the company should be willing to pay for the shares of Tadpole Ltd?

Solution

2.38 The maximum price is one which would make the return from the total investment exactly 15% over five years, so that the NPV at 15% would be 0.

Year	*Cash flows ignoring purchase consideration* £	*Discount factor* 15%	*Present value* £
0	(100,000)	1.000	(100,000)
1	(80,000)	0.870	(69,600)
2	60,000	0.756	45,360
3	100,000	0.658	65,800
4	150,000	0.572	85,800
5	150,000	0.497	74,550
	Maximum purchase price		101,910

Chapter roundup

- There are a number of different ways of putting a value on a business, or on shares in an unquoted company. It makes sense to use several methods of valuation, and to compare the values they produce. At the end of the day, however, what really matters is the final price that the buyer and the seller agree. The purchase price for a company will usually be discussed mainly in terms of:
  - P/E ratios, when a large block of shares, or a whole business is being valued;
  - alternatively, a DCF valuation;
  - to a lesser extent, the net assets per share.
- The dividend yield method is more relevant to small shareholdings.

Test your knowledge

1 Why are valuations of companies sometimes necessary? (see para 1.1)

2 What guidelines should help to determine the P/E ratio on which to base an offer price for shares in a target company? (2.8)

3 How should the net assets of a company be valued, for a net assets method valuation? (2.17 - 2.21) Why is the net assets method of valuation used as a reference value? (2.22)

Now try illustrative question 14 at the end of the Study Text

Chapter 15

CAPITAL RECONSTRUCTION SCHEMES

This chapter covers the following topics.

		Syllabus reference
1	Business failures	2(e)
2	Capital reconstruction schemes	2(e)

Introduction

In Chapter 13, we concentrated mainly on acquisitions but also mentioned some other forms of restructuring such as demergers and disinvestment.

In this chapter, we look at situations in which a restructuring of capital is to be carried out.

1 BUSINESS FAILURES

1.1 Not all businesses are profitable. Some incur losses in one or more years, but eventually achieve profitability. Others remain unprofitable, or earn only very small and unsatisfactory profits. Other companies are profitable, but run out of cash. (We looked at indicators of business failure in Chapter 12.)

(a) A poorly performing company which is unprofitable, but has enough cash to keep going, might eventually decide to go into liquidation, because it is not worth carrying on in business. Alternatively, it might become the target of a successful takeover bid.

(b) A company which runs out of cash, even if it is profitable, might be forced into liquidation by unpaid creditors, who want payment and think that applying to the court to wind up the company is the best way of getting some or all of their money.

1.2 However, a company might be on the brink of going into liquidation, but hold out good promise of profits in the future. In such a situation, the company might be able:

(a) to attract fresh capital;
(b) to persuade its creditors to accept some securities in the company as 'payment',

and achieve a *capital reconstruction* which allows the company to carry on in business. Companies which plan a reconstruction usually face liquidation if the reconstruction is not made.

1.3 In the event of a liquidation, the assets of the business are sold off and distributed, in the following order or 'priority list'.

(a) Secured creditors with a fixed charge on certain assets, insofar as the secured assets realise enough money to cover the debt

(b) Liquidation expenses

(c) Preferential creditors (eg up to a given time limit, unpaid income tax, VAT and national insurance, some arrears of unpaid wages and salaries)

(d) Secured creditors with a floating charge on certain assets

(e) Unsecured creditors

(f) Preference shareholders

(g) Ordinary shareholders

Fixed and floating charges

1.4 A creditor or lender may hold a *fixed charge* on certain assets of the business as security for a loan. An example would be a mortgage on a factory. When a company goes into liquidation the creditor is 'secured' and is entitled to first claim on the proceeds from the sale of the assets.

(a) If a bank is owed £60,000 by a company and holds as security a fixed charge on property which is later sold for £75,000, the bank will receive £60,000 out of the proceeds. The remaining £15,000 will be given to the liquidator, to go towards the payment of other debts of the company.

(b) If a bank is owed £60,000 by a company and its security is a fixed charge on an asset which only realises £35,000 on sale, the bank will receive the £35,000, but will become an *unsecured creditor* for the remaining £25,000 of the total debt.

1.5 A *second charge* on an asset means that the lender has a prior claim on any surplus receipts from the sale of the asset once payment has been made *in full* to another lender who holds a first charge on the asset. For example, suppose that a debenture loan of £60,000 is secured by a fixed charge on freehold property, and a bank overdraft of £20,000 is secured by a second charge on the same property. If the property is sold in a liquidation for £75,000, the debenture holders would be paid back in full (£60,000) and the bank would be paid the balance (£15,000) leaving £5,000 of the overdraft as an unsecured creditor.

1.6 A lender may hold a *floating charge* on certain assets of the business. A floating charge applies to assets such as stocks, which are continually being bought and sold in the course of normal trading operations. When a liquidation occurs, the floating charge 'crystallises' and becomes a fixed charge on the relevant assets which are in the business at that time. For example, if a creditor holds a floating charge on the stocks of a company as security for a debt, and the company goes into liquidation on, say, 31 December 19X4, then the creditor will have as his security for the debt the stocks of the business as at 31 December 19X4.

1.7 The two forms of charge may be combined in one security document. This is known by bankers as 'a fixed and floater'.

2 CAPITAL RECONSTRUCTION SCHEMES

2.1 A capital reconstruction scheme is a scheme whereby a company reorganises its capital structure. A reconstruction scheme might be agreed when a company is in danger of being put into liquidation, owing debts that it cannot repay, and so the creditors of the company agree to accept securities in the company, perhaps including equity shares, in settlement of their debts.

General principles in a scheme of reconstruction

2.2 There are certain general principles that you should observe in designing a scheme of reconstruction.

(a) If a company is in difficulties, it will probably need more finance to keep going. A scheme of reconstruction will therefore usually involve the injection of extra capital into the company. This extra finance might be forthcoming from:

(i) the existing shareholders;
(ii) another source, such as a bank.

(b) Anyone providing extra finance for an ailing company must be persuaded that the expected return from the extra finance is attractive, and that the company will have

a reasonably bright future after the reconstruction has taken place. A profit forecast and a cash forecast or a funds flow forecast will be needed to provide such a reassurance about the future, to creditors and to any financial institution that is asked to put new capital into the company.

(c) Extra finance will almost certainly include more equity capital, although some finance might be invested in the form of loan stock, possibly convertible loan stock, or even preference shares.

(d) A scheme of reconstruction might involve:

(i) the creation of new share capital of a different nominal value than existing share capital;

(ii) the cancellation of existing share capital.

(e) For a scheme of reconstruction to be acceptable it must:

(i) treat all parties fairly (for example, preference shareholders must not be treated with disproportionate favour in comparison with equity shareholders);

(ii) offer creditors a better deal than if the company went into liquidation. If it did not, the creditors would press for a winding up of the company. A scheme of reconstruction might therefore include an arrangement to pay off the company's existing debts in full.

Example: capital reconstruction schemes

2.3 Crosby and Dawson Ltd is a private company that has for many years been making mechanical timing mechanisms for washing machines. The management, like many others, was slow to appreciate the impact that the new silicon chip technology would have and the company is now faced with rapidly falling sales as its customers switch to suppliers of electronic control systems.

In July 19X1, the directors decided that the best way to exploit their company's expertise in the future was to diversify into the high precision field of control linkages for aircraft, rockets, satellites and space probes. By January 19X2, some sales had been made to European companies and sufficient progress had been made to arouse considerable interest from the major aircraft manufacturers and from NASA in the USA. The cost, however, had been heavy. The company had borrowed £2,500,000 from the Vencap Merchant Bank plc and a further £500,000 from other sources. Its bank overdraft was at its limit of £750,000 and the dividend on its cumulative preference shares, which was due in December, had been unpaid for the fourth year in succession.

On 1 February 19X2, the chairman informs the board of directors that the company has just lost another two major customers for its washing machine timers. The financial director presents the following information and suggests that the board should consider the possibility of a scheme of reconstruction.

CROSBY AND DAWSON LIMITED
BALANCE SHEETS

	31.12.X0	*31.12.X1*	*31.3.X2 Projected*
	£'000	£'000	£'000
Assets employed			
Fixed assets			
Freehold property	2,780	2,770	2,760
Plant and machinery	3,070	1,810	1,920
Motor vehicles	250	205	200
Deferred development expenditure	-	700	790
Current assets			
Stock	890	970	1,015
Debtors	780	795	725
	1,670	1,765	1,740
Current liabilities			
Trade creditors	1,220	1,100	1,960
Bank overdraft (unsecured)	650	750	750
	1,870	1,850	2,710
	(200)	(85)	(970)
	5,900	5,400	4,700
Long-term liabilities			
10% debentures 19X8 (secured on freehold property)	(1,000)	(1,000)	(1,000)
Other loans (floating charges)	-	(3,000)	(3,000)
	4,900	1,400	700

	31.12.X0	*31.12.X1*	*31.3.X2 Projected*
	£'000	£'000	£'000
Ordinary shares of £1	3,500	3,500	3,500
8% Cumulative preference shares	1,000	1,000	1,000
Accumulated reserves/(accumulated deficit)	400	(3,100)	(3,800)
	4,900	1,400	700

Other information

1 The freehold property was revalued on 31 December 19X0. It is believed that its net disposal value at 31 March 19X2 will be about £3,000,000.

2 A substantial quantity of old plant was sold during the second six months of 19X1 to help pay for the new machinery needed. It is estimated that the break up value of the plant at 31 March 19X2 will be about £1,400,000.

3 The motor vehicles owned at 31 March 19X2 could be sold for £120,000.

4 Much of the work done on the new control linkages has been patented. It is believed that these patents could be sold for about £800,000, which can be considered as the break-up value of development expenditure incurred to 31 March 19X2.

5 On liquidation, it is expected that the current assets at 31 March 19X2 would realise £1,050,000.

6 It is estimated that costs in the event of the company going into liquidation would be approximately £300,000.

7 If the company remains in operation, the expected cash flows for the next five periods are as follows.

	9 months to 31.12.X2	*19X3*	*Years ending 31 December 19X4*	*19X5*	*19X6*
	£'000	£'000	£'000	£'000	£'000
Receipts from sales	8,000	12,000	15,000	20,000	30,000
Payments to suppliers	6,000	6,700	7,500	10,800	18,000
Purchase of equipment	1,000	800	1,600	2,700	2,500
Other expenses	1,800	4,100	4,200	4,600	6,400
Interest charges	800	900	700	400	100
	9,600	12,500	14,000	18,500	27,000
Net	(1,600)	(500)	1,000	1,500	3,000

The above figures are based on the assumption that the present capital structure is maintained by further borrowings as necessary.

Required

Suggest a scheme that is likely to be acceptable to all the parties involved.

You may assume that the ordinary shareholders would be prepared to invest a further £1,200,000 if the scheme were considered by them to be reasonable.

A full solution follows. You are invited to complete the first step yourself as a short exercise.

Exercise

Ascertain the likely result of Crosby & Dawson Limited (see above) going into liquidation as at 31 March 19X2.

Solution

Break-up values of assets at 31 March 19X2	£'000
Freehold	3,000
Plant and machinery	1,400
Motor vehicles	120
Patents	800
Current assets	1,050
	6,370

Total liabilities at 31 March 19X2	£'000
Debentures	1,000
Other loans	3,000
Bank overdraft	750
Trade creditors	1,960
	6,710

Solution to remainder of the example

2.4 From the above, it can be seen that if the company was forced into liquidation, the debentures and other loans would be met in full but that after allowing for the expenses of liquidation (£300,000) the bank and trade creditors would receive a total of £2,070,000 or 76p per pound. The ordinary and preference shareholders would receive nothing.

If the company remains in operation, the cash position will at first deteriorate but will show steady improvement from 19X4 onwards. By the end of 19X6 the net assets of the company will have increased by a total of £11,800,000 before depreciation (Plant £8,600,000 and cash £3,400,000). If the figures can be relied on and the trend of results continues after 19X6 the company will, it appears, become reasonably profitable and well worth saving.

In the immediate future, however, after taking into account the additional amounts raised from the existing ordinary shareholders, the company will require finance of £400,000 in 19X2 and £500,000 in 19X3.

Perhaps the most likely source of new finance is Vencap who might be persuaded to subscribe cash for ordinary shares. It is unlikely that the company's clearing bank would be prepared to accept any shares, but as they would only receive 76p per pound on a liquidation they may be prepared to transfer part of the overdraft into a (say) five year loan whilst maintaining the current overdraft limit. It is unlikely that a suitable arrangement can be reached with the trade creditors as many would be prepared to accept 76p per pound, rather than agree to a moratorium on the debts or take an equity interest in the company.

A possible scheme might be as follows.

1 The existing ordinary shares to be cancelled and ordinary shareholders to be issued with £1,200,000 new £1 ordinary shares for cash.

2 The existing preference shares to be cancelled and the holders to be issued with £320,000 new £1 ordinary shares at par.

3 The existing debentures to be cancelled and replaced by £800,000 15% secured Debentures with a 15 year term and the holders to be issued with £400,000 of new £1 ordinary shares at par.

4 The loan 'from other sources' to be repaid.

5 The Vencap Bank to receive £2,000,000 15% secured debentures with a 15 year term in part settlement of the existing loan, to be issued £680,000 new ordinary shares in settlement of the balance and to subscribe cash for £800,000 of new ordinary shares.

6 The clearing bank to transfer the existing overdraft to a loan account repayable over five years and to keep the overdraft limit at £750,000. Both the loan and overdraft to be secured by a floating charge.

Comments

1 *Debenture holders*

The debentures currently have more than adequate asset backing, and their current nominal yield is 10%. If the reconstruction is to be acceptable to them, they must have either the same asset backing or some compensation in terms of increased nominal value and higher nominal yield. Under the scheme they will receive securities with a total nominal value of £1,200,000 (an increase of £200,000) and an increase in total yield before any ordinary dividends of £20,000. The new debentures issued to Vencap can be secured on the freehold property (see below).

2 *'Loans from other sources'*

It has been suggested that the 'loans from other sources' should be repaid as, in general, it is easier to arrange a successful reconstruction that involves fewer parties.

3 *Vencap*

Vencap's existing loan of £2,500,000 will, under the proposed scheme, be changed into £2,000,000 of 15% debentures secured on the property and £680,000 of ordinary shares. This gives total loans of £2,800,000 secured on property with a net disposal value of £3,000,000. This is low asset cover but hopefully the cover would increase if property values were to rise. As regards Vencap's present involvement in the company, it can be seen that the scheme will increase the nominal value of their interest by £180,000 with an improvement in security on the first £2,000,000 to compensate for the risk involved in holding ordinary shares. It has also been suggested that Vencap should be asked to subscribe £800,000 for new ordinary shares. The money is required to repay the 'loans from other sources' and provide additional working capital. The issue of share capital would give the bank a total of 1,480,000 ordinary shares or 43.5% of the equity. From the company's point of view issuing new equity is to be preferred to loan stock as it will improve the gearing position.

4 *The clearing bank*

In the event of a liquidation at the present time, the clearing bank would receive approximately £573,000. In return for the possibility of receiving the full amount owed to them they are being asked under the scheme to be prepared to advance a further £750,000. By way of compensation, they are receiving the security of a floating charge.

5 *Preference shares*

In a liquidation at the present time, the preference shareholders would receive nothing. The issue of 320,000 £1 ordinary shares should be acceptable as it is equivalent to their current arrears of dividend and gives them an asset which hopefully will increase in value. If the preference shares were left unaffected by the scheme, the full arrears of dividend would become payable on the company's return to profitability. This would clearly give the preference shareholders an undue advantage.

6 *Ordinary shareholders*

In a liquidation at the present time the ordinary shareholders would also receive nothing. Under the scheme, they will lose control of the company but, in exchange for their additional investment, will still hold about 35.3% of the equity in a company which will have sufficient funds to finance the expected future capital requirements.

7 *Cash flow forecast, on reconstruction*

	£'000
Cash for new shares from equity shareholders	1,200
Cash for new shares from Vencap	800
	2,000
Repayment of loan from other sources	(500)
Cash available	1,500

The overdraft of £750,000 is converted into a long-term loan, leaving the company with a further £750,000 of overdraft facility to use.

8 *Adequacy of funds*

The balance sheet below shows the company's position after the implementation of the scheme but before any repayments to creditors.

	£'000	£'000
Fixed assets		
Freehold property		2,760
Plant and machinery		1,920
Motor vehicles		200
Deferred development expenditure		790
		5,670
Current assets		
Stocks	1,015	
Debtors	725	
Cash	1,500	
	3,240	
Less current liabilities		
Trade creditors	1,960	
		1,280
		6,950
Less long-term liabilities		
15% debentures		(2,800)
Loan from clearing bank		(750)
		3,400
Ordinary shares of £1		3,400

It would seem likely that the company will have to make a bigger investment in working capital (ignoring cash) for the following reasons.

(a) Presumably a substantial proportion of the sales will be exports which generally have a longer collection period than domestic sales.

(b) It is unlikely that the trade creditors will accept the current payment position (average credit takes over two months) in the long term.

9 *Will the reconstructed company be financially viable?*

Assuming that net current assets excluding cash and any overdraft will, by the end of 19X2, rise from –£220,000 to £500,000 and increase in proportion to sales receipts thereafter, that the equipment required in 19X2 and 19X3 will be leased on five year terms and that the interest charges (including the finance elements in the lease rentals) will be approximately the same as those given in the question, then the expected cash flows on implementation could be as shown below.

	9 months to 31.12.X2	*19X3*	*19X4*	*19X5*	*19X6*
	£'000	£'000	£'000	£'000	£'000
Receipts from sales	8,000	12,000	15,000	20,000	30,000
Purchase of equipment	-	-	1,600	2,700	2,500
Payments to suppliers	6,000	6,700	7,500	10,800	18,000
Other expenses	1,800	4,100	4,200	4,600	6,400
Interest charges	800	900	700	400	100
Lease rentals (excluding finance element) (say)	200	360	360	360	360
Bank loan repayment (say)	150	150	150	150	150
Investment in working capital	720	250	190	310	630
	9,670	12,460	14,700	19,320	28,140
Net movement	(1,670)	(460)	300	680	1,860
Cash balance b/f	1,500	(170)	(630)	(330)	350
Cash balance c/f	(170)	(630)	(330)	350	2,210

These figures suggest that with an agreed overdraft limit of £750,000 the company will have sufficient funds to carry it through the next five years, assuming that the figures are reliable and that no dividends are paid until perhaps 19X4 at the earliest.

This scheme of reconstruction might not be acceptable to all parties, if the future profits of the company seem unattractive. In particular, Vencap and the clearing bank might be reluctant to agree to the scheme. In such an event, an alternative scheme of reconstruction must be designed, perhaps involving another provider of funds (such as another venture capitalist). Otherwise, the company will be forced into liquidation.

Chapter roundup

- Any capital reconstruction scheme must be carefully designed. Such schemes are only required when companies have already got into difficulties. Some parties will already stand to lose money, and they will only be persuaded to risk more money if they can see really good prospects of eventual success.

Test your knowledge

1 Why might a company go into liquidation? (see para 1.1)

2 What is a fixed charge? (1.4)

3 What is a floating charge? (1.6)

4 What is a capital reconstruction scheme? (2.1)

5 What are the general principles to be observed in designing a scheme of reconstruction? (2.2)

Now try illustrative question 15 at the end of the Study Text

Part D

The international environment

Chapter 16

MULTINATIONALS AND INTERNATIONAL TRADE

This chapter covers the following topics.

		Syllabus reference
1	Multinational enterprises and global trends	5(a), (b)
2	Advantages of international trade	5(c)
3	Protectionism and free trade agreements	5(e), (f)
4	The balance of payments	5(d)

Introduction

In this part of the Study Text, we look at aspects of the international environment faced by enterprises.

In this first chapter of Part D, we look at some trends in global competition and at the theory and practice of international trade. What are the economic arguments in favour of free trade and what international agreements exist to try to ensure that free trade takes place?

Knowledge brought forward from Paper 4

For Paper 14, you need to develop an awareness of the international environment and the economic influences on international decisions. Paper 4 *The Organisational Framework* provided an introduction to these topics.

1 MULTINATIONAL ENTERPRISES AND GLOBAL TRENDS

The nature of multinational enterprises

1.1 A multinational company or enterprise is one which owns or controls production facilities or subsidiaries or service facilities outside the country in which it is based. Thus, a company does not become 'multinational' simply by virtue of exporting or importing products: ownership and control of facilities abroad is involved.

The size and significance of multinationals

1.2 Multinational enterprises range from medium-sized companies having only a few facilities (or 'affiliates') abroad to giant companies having an annual turnover larger than the gross national product (GNP) of some smaller countries of the world. Indeed, the largest - the US multinationals Ford, General Motors and Exxon - each have a turnover larger than the GNPs of all but 14 countries of the world.

1.3 The size and significance of multinationals is increasing. Many companies in 'middle-income' countries such as Singapore are now becoming multinationals, and the annual growth in output of existing multinationals is in the range 10-15%.

1.4 The extensive activities of multinational enterprises, particularly the larger ones, raises questions about the problems of controlling them. Individual governments may be largely powerless if multinationals are able to exploit the tax regimes of 'tax haven' countries through transfer pricing policies or if the multinationals' production is switched from one country to another.

1.5 Most of the two-way traffic in investment by multinational companies ('foreign direct investment' or FDI) is between the developed countries of the world. While the present pattern of FDI can be traced back to the initial wave of investment in Europe by the USA following the Second World War, more recently Europe and Japan have become substantial overseas investors, as shown by the table below.

Foreign direct investment (1980-1989)

	$ billion	
	Inward	*Outward*
USA	251.7	157.3
UK	64.7	133.2
Japan	2.9	96.0
Germany	9.1	52.5
France	27.9	43.3

(Source: Eurobusiness, 1990)

Changes in the pattern of FDI

1.6 There have been significant changes affecting the pattern of multinationals' activities over the last twenty years or so.

(a) The *destination countries* have changed. The focus has shifted from Canada and Latin America in the days when the USA was the major source of FDI to other areas, including the countries of South East Asia which receive significant direct investment from Japanese companies in particular. The group of 'newly industrialised countries' (NICs) - Taiwan, South Korea, the Philippines, Brazil and Mexico - have become significant recipients of FDI. For example, Taiwan's five largest electronic exporters are all US-owned companies.

(b) The *reasons* for foreign direct investment have changed. Previously the rationale may have been to supply local markets abroad or to exploit natural resources situated in the foreign country. Now FDI is likely to take place in the context of a worldwide corporate strategy which takes account of relative costs and revenues, tax considerations and *process specialisation.* Process specialisation refers to the specialisation of processes within particular production facilities. For example, companies may locate labour-intensive processes in lower wage countries, leaving the final stage of the production process to be located nearer the intended market. This form of specialisation is characteristic of motor vehicle manufacture.

(c) *Centralised control* of production activities within multinationals has increased, prompted partly by the need for strategic management of production planning and worldwide resource allocation. This process of centralisation has been facilitated by the development of sophisticated worldwide computer and telecommunications links.

Globalisation

1.7 Developments in international capital markets have provided an environment conducive to FDI. Globalisation describes the process by which the capital markets of each country have become internationally integrated. The process of integration is facilitated by improved telecommunications and the deregulation of markets in many countries (for example, the UK stock market's so-called Big Bang of 1986).

1.8 Securities issued in one country can now be traded in capital markets around the world. For example, shares in UK companies are traded in the USA. The shares are bought by US banks, which then issue ADRs (American depository receipts) which are a form in which foreign shares can be traded in US markets without a local listing.

1.9 For companies planning international investment activities, easy access to large amounts of funds denominated in foreign currencies can be very useful. Such funds are available in the eurocurrency markets (see Chapter 17), whose continued expansion during the 1980s, although slower than during the 1970s, encouraged FDI. The eurocurrency markets can also help to bypass official constraints on international business activities.

Why do multinationals make direct foreign investments?

Strategic reasons

1.10 Eiteman, Stonehill and Moffett (*Multinational Business Finance*) set out five main strategic reasons for engaging in FDI, as follows.

(a) *Market seeking*. 'Market seeking' firms engage in FDI either to meet local demand or as a way of exporting to markets other than the home market. Examples of this are the manufacturing operations of US and Japanese car producers in Europe or the presence of Honda and Volkswagen in the USA.

(b) *Raw material seeking*. Firms in industries such as oil, mining, plantation and forestry will extract raw materials in the places where they can be found, whether for export or for further processing and sale in the host country.

(c) *Production efficiency seeking*. The labour-intensive manufacture of electronic components in Taiwan, Malaysia and Mexico is an example of locating production where one or more factors of production are cheap relative to their productivity.

(d) *Knowledge seeking*. Knowledge seeking firms choose to set up operations in countries in which they can gain access to technology or management expertise. For example, German, Japanese and Dutch companies have acquired technology by buying US-based electronics companies.

(e) *Political safety seekers*. Firms which are seeking 'political safety' will acquire or set up new operations in those countries which are thought to be unlikely to expropriate or interfere with private enterprise. An example of this strategy is the heavy investment by Hong Kong firms in manufacturing, service industries and property in the USA, Canada and Australia, in anticipation of the possible consequences of the takeover of Hong Kong by China in 1997.

1.11 Of course, the five strategic reasons identified above are not mutually exclusive. For example firms which locate electronics factories in Taiwan, Malaysia and Mexico will also find a market for their products in those countries.

Strategic considerations versus financial considerations

1.12 Strategic reasons seem to weigh more heavily than financial considerations in the FDI decision. Empirical studies support this conclusion, including one carried out by Stonehill and Nathanson (1968), which showed the following.

> 'Financial investment criteria were used most often in evaluating relatively small cost-saving projects, replacement projects, and other projects which would fall under the purview of local managers. For relatively large or strategic investments, however, financial investment criteria were used only as a rough screening device to prevent obviously unprofitable projects from wasting the time of the board of directors.'

1.13 The business of determining an appropriate risk-adjusted required rate of return for a foreign project is often complicated by the perceived political and foreign exchange risks. The range of possible expected outcomes may become so wide that it becomes difficult to produce a credible discounted cash flow analysis which produces a single expected net present value. Thus, although discounted cash flow techniques are still used to analyse specific projects, they do not usually become the deciding factor.

Behavioural considerations

1.14 A study by Aharoni of strategic aspects of the FDI decision revealed two sets of behavioural motive.

(a) *External stimuli*. Stimuli from the external environment include the following.

(i) An outside proposal, coming from a source which cannot easily be ignored, which may include foreign governments, distributors of the company's products or the company's clients.

(ii) Fear of losing a market.

(iii) The belief that investment in a particular area is 'a must' or the success of a competitor abroad in the same line of business (the 'bandwagon' effect).

(iv) Strong foreign competition in the home market.

(b) *Internal stimuli*. These are stimuli arising from within the organisation and are based on personal bias and the needs and commitment of individuals and groups.

1.15 Aharoni's study is an application of the behavioural theory of the firm first proposed by Herbert Simon (1947) and developed by Cyert and March (1963). Rather than there being a programme involving a search of all possible foreign investment opportunities, gathering of all the data relevant to each, and comparison and ranking of them, the behavioural approach to the foreign investment decision is typically a specific decision on a specific opportunity which is evaluated in response to a specific motivation.

Economic theories

1.16 Strategic and 'behavioural' considerations are emphasised in many case studies and surveys on FDI. Even so, it may be that these considerations are not inconsistent with modern extensions of international economic theory which view the executives of multinationals as operating under conditions of worldwide oligopolistic competition, in ways which are consistent with the rational economic motive of profit maximisation.

1.17 The traditional economic theory of international trade (examined later in this chapter) assumes that markets are perfectly competitive and that products are homogeneous in quality. These assumptions do not apply generally to multinational enterprises, in which two-way trade within the firm among the parent company and its subsidiaries forms a major element. Therefore, to explain FDI and the growth of multinational enterprises, we need a theory which recognises the imperfections of markets.

Hymer-Kindleberger theory of FDI

1.18 The modern economic theory of FDI stems from the work of Stephen Hymer (1960), subsequently developed by Charles Kindeberger (1969).

1.19 The Hymer-Kindleberger theory sees imperfections in product and factor markets as opening the way to FDI. Market imperfections may be natural, but more usually they are the result of the policies of:

(a) *firms*, as for example when oligopolists seek competitive advantage through product differentiation, for instance by creating a multiplicity of brands; and

(b) *governments*, which create market imperfections through tariffs, non-tariff barriers to trade, preferential procurement policies, tax incentives, exchange controls and so on.

1.20 An example of market imperfections created by governments is the formation of trade blocs such as the European Economic Community (now called the European Union or EU) in 1957 and the European Free Trade Area (EFTA) in 1958. The establishment of these trading blocs involved the removal of barriers to trade among member countries together with the imposition of a common external tariff on trade with non-member

countries, and these changes led to a major influx of foreign direct investment by multinationals seeking to take advantage of the removal of barriers within the blocs.

1.21 Eiteman *et al.* (1992) point out that although government policies, the actions of firms themselves or natural factors may lead to large protected markets being established, foreign firms with operations in such markets must have some competitive advantages over local firms to compensate for disadvantages such as their relative lack of knowledge of local customs and unfamiliar laws, as well as greater costs of communication and control. These competitive advantages must be such as to earn for the firm a higher rate of return from direct foreign investment than it would earn from comparable projects with a similar level of risk in the home market. Otherwise, the firm would prefer to enter foreign markets through other means such as exporting or licensing.

1.22 The most significant competitive advantages which multinationals enjoy are as follows.

(a) *Size economies of scale*. There are advantages to be gained in production, marketing, finance, research and development, transport and purchasing by virtue of firms being large. Production economies can arise from use of large-scale plant or from the possibility of rationalising production by adopting worldwide specialisation. Multinational car manufacturers produce engines in one country, transmissions in another, bodies in another, and assemble cars in yet another country, often selecting the location on the basis of the comparative advantage of having each type of production in a particular location.

(b) *Managerial and marketing expertise*. Although there is little empirical evidence to show whether managerial expertise enhances firms' success in worldwide oligopolistic markets, intuitively it would seem reasonable to assume that this is the case. Managerial expertise may be fostered in the environment of the larger multinational enterprise, and can be developed from previous knowledge of foreign markets. Empirical studies show that multinationals tend to export to markets before establishing production operations there, thus partly overcoming the possibly superior local knowledge of firms based in the host country.

(c) *Technology*. Empirical studies suggest a link between research and development (R & D) work, which enhances technological, scientific and engineering skills and the larger multinationals engaged in FDI. Vernon's *product cycle theory* is based on the idea that multinational firms originate much new technology as a result of R&D activities on new products initially launched in their home markets. Host nations are often interested in FDI for the reason that technology transfer may result from it.

(d) *Financial economies*. Multinationals enjoy considerable cost advantages in relation to finance. They have the advantage of access to the full range of financial instruments such as eurocurrency and eurobonds, which reduces their borrowing costs. Multinationals' financial strength is also achieved through their ability to reduce risk by diversifying their operations and their sources of borrowing. Although government exchange controls will often forbid it, where possible multinational enterprises can reduce their borrowing costs by borrowing funds where costs are lowest for use in the locations where funds are needed.

(e) *Differentiated products*. Firms create their own firm-specific advantages by producing and marketing differentiated products, which are similar products differentiated mainly by branding. Once the firm has developed differentiated products for the home market, it can maximise return on the heavy marketing costs by marketing them worldwide. Competitors will find it expensive and possibly difficult to imitate such products.

The theory of internalisation

1.23 Buckley and Casson's theory of internalisation is an extension of the theories of FDI based on market imperfections. These theorists argue that the existence of imperfect markets and competitive advantage for oligopolistic firms is not alone sufficient to ensure FDI.

1.24 For FDI to occur, according to this theory, the competitive advantage must be internal to the firms. In other words it must be:

(a) specific to the firm;
(b) not easily imitated;
(c) transferable to foreign subsidiaries.

1.25 The theory of internalisation claims that the most important aspects of retaining competitive advantage are:

(a) possession of proprietary information; and

(b) control of the human capital generating new information through skills in research, management, marketing and technology.

It is larger firms which devote substantial resources to research that are likely to conform to this model.

1.26 Although there is a lack of support for the theory of internalisation, it does have an intuitive attraction as a fairly sophisticated synthesis of market imperfections theories.

2 ADVANTAGES OF INTERNATIONAL TRADE

Theory of international trade

2.1 In the modern economy, production is based on a high degree of specialisation. Within a country individuals specialise, factories specialise and whole regions specialise. Specialisation increases productivity and raises the standard of living. International trade extends the principle of the division of labour and specialisation to countries. International trade originated on the basis of nations exchanging their products for others which they could not produce for themselves. Britain for example imports tea and coffee and exports oil to non-oil producing countries (although there is also plenty of trade in different types of oil between oil-producing countries themselves).

2.2 International trade arises for a number of reasons.

(a) Different goods require different proportions of factor inputs in their production.
(b) Economic resources are unevenly distributed throughout the world.
(c) The international mobility of resources is extremely limited.

2.3 Since it is difficult to move resources between nations, the goods which 'embody' the resources must move. Hence nations which have an abundance of land relative to labour will concentrate on land intensive commodities such as agricultural products. These will be exchanged for labour-intensive products such as manufactured goods made by countries which have an abundance of labour and capital relative to land. The main reason for trade therefore is that there are differences in the relative efficiency with which different countries can produce different goods and services.

2.4 In the theory of international trade, economists distinguish the concepts of comparative advantage and absolute advantage. To explain this distinction we make the following assumptions in what follows.

(a) There are only two countries, country X and country Y.
(b) Only two goods are produced, lorries and wheat.
(c) There are no transport costs and no barriers to trade.
(d) Resources within each country are easily transferred from one industry to another.

Absolute advantage

2.5 A country is said to have an *absolute advantage* in the production of a good when it is more efficient than another country in the production of that good, ie when it can produce more of a particular good with a given amount of resources than another

country. It is a fairly common situation for one country to be more efficient than another in the production of a particular good.

2.6 Assuming that Y produces wheat more efficiently than country X, while country X has an absolute advantage in producing lorries, a simple arithmetical example can illustrate the potential gains from trade. The table below shows the amounts of lorries and wheat that each country can produce, assuming that each country has an equal quantity of resources and devotes half of its resources to lorry production and half to wheat production.

	Lorries	*Wheat (tons)*
Country X	20	100
Country Y	10	150
World total	30	250

2.7 The relative or comparative cost of lorry production is lower in country X than country Y, but the situation is reversed in the case of wheat production. Country X has an absolute advantage in lorry production and country Y has an absolute advantage in wheat production.

2.8 Greater specialisation will, however, increase total output. If each country specialises in the production of the good in which it is most efficient, ie possesses absolute advantage, then total output would be as shown below.

	Lorries	*Wheat (tons)*
Country X	40	0
Country Y	0	300
World total	40	300

2.9 By specialising, total world output is now greater with ten more lorries and 50 tons more wheat now available for consumption. In order to obtain the benefits of specialisation these countries must exchange some part of their individual outputs. It is not possible to specify the exact rate of exchange but the limits of the exchange rate must be somewhere between the domestic opportunity cost ratios of the two countries. One country will not benefit from international trade if the exchange rate is not between these ratios.

Comparative advantage

2.10 When two countries produce the same two goods, as in the example above, and each has an absolute advantage in the production of one good, then it is easy to show that specialisation will lead to an increase in their combined output. Specialisation and trade can still be mutually advantageous, however, even if one country has an absolute advantage in the production of both goods. This will be the case if each country has a comparative advantage in the production of one good. This is summed up in the law of *comparative advantage* (or comparative costs) which states that two countries can gain from trade when each concentrates on the production of that good in which it has greatest comparative advantage. Comparative cost relates to the opportunity costs of producing the goods and not the absolute costs.

2.11 The principle of comparative costs can be shown by an arithmetical example. It is now assumed that country X is more efficient in the production of both lorries and wheat. If each country devotes half its resources to each industry the assumed production totals are shown below.

	Lorries	*Wheat (tons)*
Country X	20	200
Country Y	10	150
World total	30	350

2.12 In terms of resources used, the costs of production in both industries are lower in country X. If we consider the opportunity costs, however, the picture is rather different.

In country X the 'cost' of one lorry is ten tons of wheat, ie in devoting resources to the production of one lorry in country X there is a sacrifice in terms of ten tons of wheat forgone. The opportunity cost of one lorry in country Y is fifteen tons of wheat. Country X therefore has a comparative advantage in the production of lorries.

2.13 In country X the cost of a ton of wheat is 1/10 of a lorry, while in country Y the cost is 1/15 of a lorry. In terms of the output of lorries forgone, wheat is cheaper in country Y than in country X. Country Y has a comparative advantage in wheat. If each country completely specialises in the production of the good where it has a comparative advantage, the figures below show that total output of lorries increases, but the total output of wheat falls.

	Lorries	*Wheat (tons)*
Country X	40	0
Country Y	0	300
World total	40	300

2.14 The figures above show that the world total of lorry production has risen by ten lorries but that the world production of wheat has fallen by fifty tons. It is possible to show that the increase in the output of lorries, in value terms, more than offsets the fall in the output of wheat. This is not necessary, however, because by only partially specialising in the more efficient country - country X - it is possible to have more of both commodities. If country X devotes 80% of its resources to lorry production and 20% of its resources to wheat production, while country Y specialises completely in wheat, the total output will be as shown below.

	Lorries	*Wheat (tons)*
Country X	32	80
Country Y	0	300
World total	32	380

2.15 These figures show that total output of both goods is greater than that which was obtained when both countries were producing only for domestic consumption. Since the opportunity cost ratios are different in the two countries, beneficial trade is possible. If the opportunity cost ratios were the same in the two countries, the countries will not benefit from specialisation and international trade.

2.16 Generalising from this example, we can state the law of comparative advantage:

Each country should export goods in which it has a comparative cost advantage.

(By 'cost' we mean opportunity cost of resources).

2.17 In the examples so far, we have assumed that transport costs for international trade are negligible. High transport costs, however, can negate the advantages of specialisation and international trade.

The significance of the law of comparative advantage

2.18 The significance of the law of comparative advantage is that it provides a justification for the belief that:

(a) countries should specialise in what they produce, even when they are less efficient (in absolute terms) in producing every type of good. They should specialise in the goods where they have a comparative advantage;

(b) international trade should be allowed to take place without restrictions on imports or exports - ie there should be free trade. Free trade plus specialisation will result in an increase in the world's output, and all countries will share in the benefits (admittedly, however, the more efficient countries benefiting more than the less efficient ones).

Does the law apply in practice?

2.19 The law of comparative advantage does apply in practice, and countries do specialise in the production of certain goods. However, there are certain limitations or restrictions on how it operates.

(a) Free trade does not always exist. Some countries take action to protect domestic industries and discourage imports. This means that a country might produce goods in which it does not have a comparative advantage.

(b) Transport costs can be very high in international trade so that it is cheaper to produce goods in the home country rather than to import them.

The advantages of free international trade

2.20 The law of comparative advantage states perhaps the major advantage of encouraging international trade. However, there are other advantages to the countries of the world from encouraging international trade. These are as follows.

(a) Some countries have a surplus of raw materials to their needs, and others have a deficit. A country with a surplus (eg of oil) can take advantage of its resources to export them. A country with a deficit of a raw material must either import it, or accept restrictions on its economic prosperity and standard of living.

(b) International trade increases competition amongst suppliers in the world's markets. Greater competition reduces the likelihood of a market for a good in a country being dominated by a monopolist. The greater competition will force firms to be competitive and so will increase the pressures on them to be efficient, and also perhaps to produce goods of a high quality.

(c) International trade creates larger markets for a firm's output, and so some firms can benefit from *economies of scale* by engaging in export activities. Economies of scale improve the efficiency of the use of resources, reduce the output costs and also increase the likelihood of output being sold to the consumer at lower prices than if international trade did not exist.

(d) There may be political advantages to international trade, because the development of trading links provides a foundation for closer political links. An example of the development of political links based on trade is the European Union.

3 PROTECTIONISM AND FREE TRADE AGREEMENTS 6/95

Free trade and protection

3.1 Free trade exists where there is no restriction on imports from other countries or exports to other countries. The *European Union* (EU) is a free trade area for the member countries. In practice, however, there exist many barriers to free trade because governments wish to protect home industries against foreign competition. Protectionism would in effect be intended to hinder the operation of the law of comparative advantage.

3.2 Protectionist measures may be implemented by a government, but popular demand for protection commonly exceeds what governments are prepared to allow. In the UK, for example, some protectionist measures have been taken against Japanese imports (eg a voluntary restriction on car imports by Japanese manufacturers) although more severe measures are called from time to time by popular demand or lobbying interests. For example, in recent years, a strong protectionist lobby built up in Congress in the USA, with pressure being applied in particular for measures against Japanese imports.

Protectionist measures

3.3 Protection can be applied in several ways, including the following. Items (b), (c), (d) and (e) below are sometimes called *non-tariff barriers to trade*.

(a) Tariffs or customs duties
(b) Import quotas
(c) Embargoes
(d) Hidden subsidies for exporters and domestic producers
(e) Import restrictions
(f) Government action to devalue the domestic currency

Tariffs or customs duties

3.4 Tariffs or customs duties are taxes on imported goods. The effect of a tariff is to raise the price paid for the imported goods by domestic consumers, while leaving the price paid to foreign producers the same, or even lower. The difference is transferred to the government sector.

For example, if goods imported to the UK are bought for £100 per unit, which is paid to the foreign supplier, and a tariff of £20 is imposed, the full cost to the UK buyer will be £120, with £20 going to the government.

An *ad valorem* tariff is one which is applied as a percentage of the value of goods imported. A *specific* tariff is a fixed tax per unit of goods.

Import quotas

3.5 Import quotas are restrictions on the *quantity* of a product that is allowed to be imported into the country. The quota has a similar effect on consumer welfare to that of import tariffs, but the overall effects are more complicated.

(a) Both domestic and foreign suppliers enjoy a higher price, while consumers buy less at the higher price.

(b) Domestic producers supply more.

(c) There are fewer imports (in volume).

(d) The government collects no revenue.

3.6 An *embargo* on imports from one particular country is a total ban, ie effectively a zero quota.

Hidden export subsidies and import restrictions

3.7 An enormous range of government subsidies and assistance for exports and deterrents against imports have been practised, such as:

(a) *for exports* - export credit guarantees (government-backed insurance against bad debts for overseas sales), financial help (such as government grants to the aircraft or shipbuilding industry) and state assistance via the Foreign Office;

(b) *for imports* - complex import regulations and documentation, or special safety standards demanded from imported goods and so on.

3.8 When a government gives grants to its domestic producers, for example regional development grants for new investments in certain areas of the country, or grants to investments in new industries, the effect of these grants is to make unit production costs lower. These give the domestic producer a cost advantage over foreign producers in export markets as well as domestic markets.

Government action to devalue the currency

3.9 If a government allows its currency to fall in value, imports will become more expensive to buy. This will reduce imports by means of the price mechanism, especially if the demand and supply curves for the products are elastic. For example, if the exchange rate between sterling and the US dollar is £1 = $1.60, a good imported from

the USA to the UK at a cost of $8,000 would cost the UK buyer £5,000. Now if the government takes action to reduce interest rates, say, which has the effect of weakening the value of sterling, the exchange rate might change to £1 = $1.50. The same good costing $8,000 will now cost a UK buyer £5,333 - ie £333 more than before. At this higher price, the total UK demand for the US good will probably fall.

The extent of the fall in imports will thus depend on the price elasticity of demand in the UK for the US good, in other words on the degree to which demand changes when a change in price occurs.

Arguments in favour of protection

3.10 The arguments for protection are as follows.

(a) Protectionist measures can be taken against imports of cheap goods that compete with higher priced domestically produced goods, and so preserve output and employment in domestic industries.

In the UK, advocates of protection have argued that UK industries are declining because of competition from overseas, especially the Far East, and the advantages of more employment at a reasonably high wage for UK labour are greater than the disadvantages that protectionist measures would bring.

(b) Measures might be necessary to counter 'dumping' of surplus production by other countries at an uneconomically low price.

For example, if the European Union (EU) were to over-produce quantities of steel, wine, beef or butter, it might decide to dump the surpluses on other countries. The 'losses' from overproduction would in effect be subsidised by the EU governments, and so the domestic industries of countries receiving dumped goods would be facing unfair competition from abroad. Although dumping has short-term benefits for the countries receiving the cheap goods, the longer term consequences would be a reduction in domestic output and employment, even when domestic industries in the longer term might be more efficient.

(c) Protectionist measures by one country are often implemented in retaliation against measures taken by another country that are thought to be unfair.

This is why protection tends to spiral once it has begun. Any country that does not take protectionist measures when other countries are doing so is likely to find that it suffers all of the disadvantages and none of the advantages of protection.

(d) There is an argument that protectionism is necessary, at least in the short term, to protect a country's *'infant industries'* that have not yet developed to the size where they can compete in international markets.

Less developed countries in particular might need to protect industries against competition from advanced or developing countries.

(e) Protection might also help a country in the short term to deal with the problems of a declining industry.

Without protection, the industry might quickly collapse and there would be severe problems of sudden mass unemployment amongst workers in the industry - workers who must somehow be channelled into other industries. By imposing some protectionist measures, the decline in the industry might be slowed down, and so the task of switching resources to new industries could be undertaken over a longer period of time.

(f) Protection is often seen as a means for a country to reduce its balance of trade deficit, by imposing tariffs or quotas on imports.

However, because of retaliation by other countries, the success of such measures by one country would depend on the demand by other countries for its exports being inelastic with regard to price and its demand for imports being fairly elastic.

The 'optimal tariff' argument

3.11 In each of the above cases, tariffs and other protectionist measures are being advocated instead of alternative policies specifically targeted on the objectives sought. For example, alternative policies addressing the problem of labour immobility in industries affected by low-cost foreign competition could include retraining grants or relocation incentives. As an indirect method of attaining objectives in these cases, a tariffs policy has the disadvantage of imposing a 'deadweight burden' of welfare loss, which we shall explain below.

3.12 Another argument in favour of tariffs targets directly the problem of a divergence between social and private marginal costs arising from trade itself. This 'optimal tariff argument' provides a clearer demonstration of the possibility of gains in welfare from a tariff than the earlier arguments cited.

3.13 If a country's imports make up a significant share of the world market for a particular good, an increase in imports is likely to result in the world price of the good rising. In demanding an additional unit of imports, the country raises the price it has to pay for what is already imported. The economic agents in the country collectively 'bid up' the price of imports. In a free market, each individual will buy imports up to the point at which the benefit to the individual equals the world price. Because of the price-raising effect referred to above, the cost to the economy as a whole of the last import exceeds the world price, and therefore exceeds its benefit.

3.14 In such a case, society can gain by restricting imports up to the point at which the benefit of the last import equals its cost to society as a whole. A tariff set to achieve this result is called an 'optimal tariff'.

3.15 Tariffs would decrease the welfare of a country in circumstances in which the optimal tariff is zero and there is no longer a need to discourage imports. This is when a country does not 'bid up' the world price of imports, as with a relatively small country in a large world market for a good. This is the basis of the free trade argument, which is illustrated in Figure 1 below.

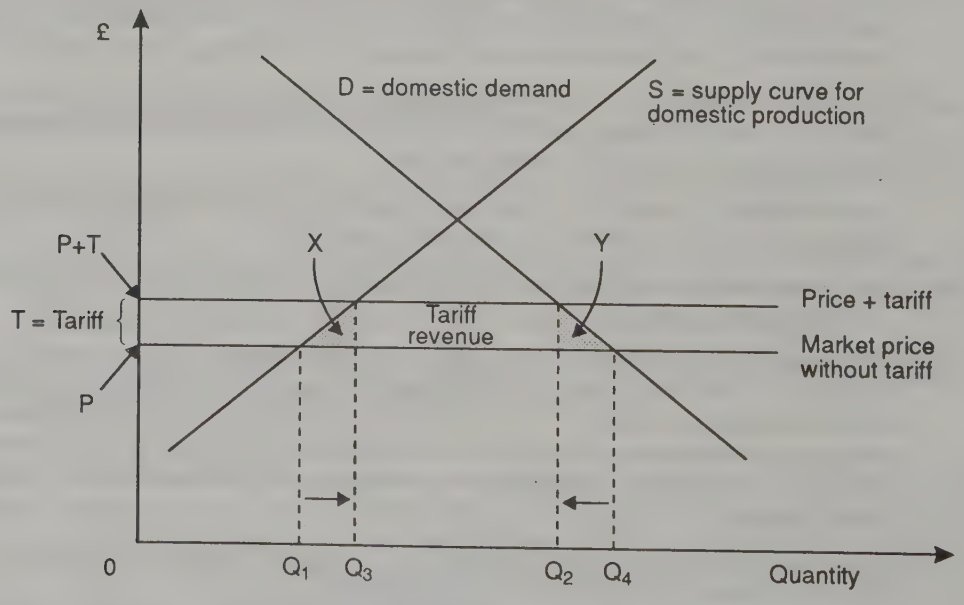


Figure 1 Effects of a tariff on prices and output

3.16 The world market purchase price of the good is initially P. At that price, domestic suppliers are willing to supply Q_1 but consumers are willing to buy Q_4. The difference $(Q_4 - Q_1)$ is then the amount of imports. An import tariff will raise the price to the consumer to (P + T). The domestic suppliers need not, of course, raise their prices, but at the higher price, consumers demand Q_2. If the domestic producers were to raise their

prices to (P + T) then they would expand their output to Q_3. Imports would fall from $(Q_4 - Q_1)$ to $(Q_2 - Q_3)$.

3.17 The result of imposing the tariff is to benefit the domestic producers and the government, but to harm the consumer. Domestic producers supply more to the market, while domestic consumers buy fewer units. The government earns some tax revenue $(Q_2 - Q_3) \times T$, but foreign suppliers provide less to the market.

3.18 The areas of triangles X and Y represent waste and net loss to society. Triangle X is the additional amount that is spent by producing the commodity domestically rather than importing it at the world price; area Y is the excess of consumer benefits over social marginal cost which the economy loses by reducing its consumption from Q_4 to Q_2.

Arguments against protection

3.19 Arguments against protection are as follows.

(a) Because protectionist measures taken by one country will almost inevitably provoke retaliation by others, protection will reduce the volume of international trade. This means that the benefits of international trade will be reduced. These benefits are:

(i) *specialisation*: the principle of comparative advantage shows that countries will specialise in the production of goods which they can make with greater efficiency than other countries, and specialisation will increase total output and increase the economic wealth of the countries of the world;

(ii) *greater competition*, and so greater efficiency amongst producers;

(iii) the advantages of *economies of scale* amongst producers who need world markets to achieve their economies and so produce at lower costs.

(b) Obviously it is to a nation's advantage if it can apply protectionist measures while other nations do not. But because of retaliation by other countries, protectionist measures to reverse a balance of trade deficit are unlikely to succeed. Imports might be reduced, but so too would exports.

(c) It is generally argued that widespread protection will damage the prospects for economic growth amongst the countries of the world, and protectionist measures ought to be restricted to 'special cases' which might be discussed and negotiated with other countries.

(d) Although from a nation's own point of view, protection may improve its position, protectionism leads to a worse outcome for all. Protection also creates political ill-will amongst countries of the world and so there are political disadvantages in a policy of protection.

3.20 As an alternative to protection, a country can try to stimulate its export competitiveness by making efforts to improve the productivity and lower the costs of domestic industries, thus making them more competitive against foreign producers.

Hidden subsidies and exchange rate devaluation or depreciation are examples of indirect protectionist measures, but other measures, such as funding industrial training schemes and educational policies, might in the longer term result in improvements in domestic productivity.

The World Trade Organisation (WTO)

3.21 The WTO was formed in 1995 as successor to the General Agreement on Tariffs and Trade (GATT). The GATT was originally signed by 23 countries in 1947 to promote free trade. The aims of GATT were:

(a) to reduce existing barriers to free trade;

(b) to eliminate discrimination in international trade;

(c) to prevent the growth of protection by getting member countries to consult with others before taking any protectionist measures.

3.22 The 'most favoured nation' principle applies whereby one country (which is a member of GATT) which offers a reduction in tariffs to another country must offer the same reduction to all other member countries of GATT.

3.23 GATT membership reached 128, including many newly industrialising countries.

GATT has succeeded in reducing world tariffs, which averaged around 40% in 1947 compared with below 5% in the 1990s. However there are serious problems which can arise.

(a) A country wishing to join GATT must consider the effect of reducing tariffs on its balance of payments and domestic economy.

(b) Special circumstances (for example economic crises, the protection of an infant industry, the rules of the EU) may be admitted whereby protection or special low tariffs between a group of countries are allowed.

(c) A country in GATT may prefer not to offer a tariff reduction to another country because it would have to offer the same reduction to all other GATT members.

(d) In spite of much success in reducing tariffs, the GATT agreements have had less effect in dealing with many non-tariff barriers to trade which countries may set up. Such non-tariff barriers include excessively lengthy customs procedures and licensing agreements which must be met before trading. Some such barriers, for example those in the guise of health and safety requirements, can be very difficult to identify.

3.24 The GATT talks have taken place over the years in a series of 'rounds' of negotiation, each dealing with different areas of trade.

(a) The 'Kennedy round' of the 1960s was particularly successful and led to tariff cuts of about 30%, bringing the average duty on manufactured goods down to about 10% by 1972.

(b) The 'Tokyo round' of the late 1970s led to further tariff reductions of approximately 30%. Trade between advanced industrialised nations in particular was favoured, with tariff cuts of 38%. The cut was a lower 25% in the case of trade between advanced industrialised and newly industrialised countries.

(c) The talks in the 'Uruguay round' which were concluded in December 1993 represented seven years of work on a very ambitious programme for the liberalisation of world trade. There were various problems in reaching agreement.

(i) A major sticking point was in the area of agriculture. The European Union's Common Agricultural Policy has been seen by other GATT members as providing excessive trade protection to EU farmers.

(ii) Another problem was in the textiles sector which has been subject to tariffs of over 15% and the quota levels imposed by the Multi-Fibre Arrangement.

(iii) A further issue to be resolved has been the opening up of markets in Japan and South Korea to rice imports.

3.25 The December 1993 conclusion of the 'Uruguay round' has revised, improved and updated many of the GATT rules which were originally drafted in the 1940s. It also brings the following changes, some of which are to be phased in over a period of time.

(a) *Industrial tariffs*. Before the 1993 deal, tariffs on manufactures averaged 5% in richer countries (down from around 40% in the late 1940s). There is now the prospect of richer countries' tariffs on industrial goods being cut by more than one third. Over 40% of imports of specific types will be duty-free. These changes will bring easier access to world markets and lower prices for consumers.

(b) *Agriculture*. Subsidies and import barriers which distort trade will be cut over the next six years. For example, domestic farm support, including that in Europe and

the USA, will be reduced by 20%. These changes should bring better market opportunities for efficient producers, reduced overproduction and lower food prices for consumers in currently protected countries.

(c) *Services*. A framework of rules on basic fair trading principles such as non-discrimination has been established, with further talks on telecommunications and financial services planned. Previously, there were no rules governing international trade in most services.

(d) *Intellectual property*. Agreements were reached on patents, copyright, trademarks, designs and so on. This should facilitate technology transfer and reduce trade in counterfeit goods.

(e) *Textiles and clothing*. The quotas imposed by richer countries since 1974 under the Multi-Fibre Arrangement are to be progressively dismantled over ten years and tariffs are to be reduced. Normal GATT rules will apply at the end of the ten year period. These changes will allow less developed countries to sell more textiles and clothing abroad and are likely to reduce prices for consumers worldwide.

(f) *Anti-dumping measures*. Clearer rules will make it more difficult for countries to introduce anti-dumping measures which have often been seen as a disguised form of protectionism.

(g) *Subsidies*. Tighter rules have been introduced on the use of subsidies, with some types of subsidy being prohibited.

(h) *Technical barriers*. Better rules have been introduced to establish international norms for product regulations and standards, which up to now have been fairly extensively used as a disguised form of competition.

(i) *Government procurement*. The coverage of the agreement on government procurement among 12 signatories (including the EU as one) in the Tokyo Round has been enlarged to cover more areas.

3.26 It has been estimated that the opening up of markets for agricultural and industrial goods following the 1993 GATT accord could add around US$200-300 billion to world income by 2002. Some commentators have however argued that poorer countries stand to lose. Against this, the GATT secretariat notes that less developed countries will have much lower tariff cuts on their exports than other countries (25 per cent compared with 37 per cent). However, if textiles and clothing, and fish and fish products, are removed from the calculation then tariff concessions of the poorest countries average 59 per cent compared with 44 per cent for industrialised nations.

3.27 Ratification of the agreement by member governments followed during 1994. The new 'World Trade Organisation' (WTO) was set up in 1995 as a successor body to GATT. GATT itself officially ceased to exist at the end of 1995.

3.28 In an article published in the *Students' Newsletter* (October 1994), Len Ross makes the following points about GATT and trade liberalisation.

(a) In spite of the benefits of free trade, virtually all governments intervene to protect their domestic industries from foreign competition, often for political reasons as governments perceive electoral as well as financial advantage from protection of domestic interests.

(b) GATT's important success in reducing industrial tariffs has been dimmed by its failure to curb other forms of protection, especially non-tariff barriers to trade (NTBs) not directly covered by GATT, and by its inability to prevent countries from bypassing GATT rules. GATT has also generally turned a blind eye to the widespread and heavy protection of agriculture; national support for farmers has been viewed as politically sensitive, allowing agricultural protection to rise to very high levels.

(c) The Uruguay Round was the first GATT negotiating round fully to address agricultural protection, NTBs to trade in goods *and* services and issues relating to intellectual property, as well as the main issue in earlier rounds: import tariffs.

(d) In contrast to the previous GATT arrangements, the new WTO will be a permanent body with comprehensive responsibility for trade in goods and services and for intellectual property rights. WTO member countries must accept all of the provisions of the Uruguay agreement.

(e) The new WTO has a procedure for settling disputes and will be able to impose sanctions on countries breaking the rules, for example by authorising multilateral reprisals against them.

(f) A danger of the new world trade order is that of 'regionalism', with the rich industrial countries organised into inward-looking regional trading blocs centred in North America, Europe and Japan. Such regional blocs might continue to pursue increasingly protectionist policies in their own self-interest, leaving the rest of the world, especially the poorest countries, to 'pick up the crumbs from the negotiating table'.

The European Union

3.29 The European Union (EU) is one of several international economic associations. It dates back to 1957 (the Treaty of Rome) and now consists of France, Germany, Italy, Belgium, the Netherlands, Luxembourg, the UK, Denmark, Eire, Greece, Spain, Portugal, Austria, Finland, and Sweden. Over the coming years, it can be expected that more nations will apply for membership, possibly including Eastern European countries which were formerly operated as centrally planned economies under Communist regimes.

3.30 The EU incorporates a *common market* combining different aspects, including a *free trade area* and a *customs union.*

(a) A free trade area exists when there is no restriction on the movement of goods and services between countries. This may be extended into a customs union when there is a free trade area between all member countries of the union, and in addition, there are common external tariffs applying to imports from non-member countries into any part of the union. In other words, the union promotes free trade among its members but acts as a protectionist bloc against the rest of the world.

(b) A common market encompasses the idea of a customs union but has a number of additional features. In addition to free trade among member countries there is also complete mobility of the factors of production. A British citizen has the freedom to work in any other country of the European community, for example. A common market will also aim to achieve stronger links between member countries, for example by harmonising government economic policies and by establishing a closer political confederation.

The customs union

3.31 The customs union of the EU:

(a) establishes a free trade area between member states; and
(b) erects common external tariffs to charge on imports from non-member countries.

The EU thus promotes free trade among member states, while acting as a protectionist bloc against the rest of the world. It is accordingly consistent that the EU negotiates in GATT talks as a single body.

The Common Agricultural Policy (CAP)

3.32 Because demand for agricultural produce tends to be inelastic, farmers tend to lose revenue with bumper harvests. Most countries provide some financial support for farmers; in the past, Britain offered a guaranteed price to its farmers, but no customs duty on food imports, and made up the difference between the market price and the (higher) guaranteed price as a 'deficiency payment' to British farmers.

3.33 The CAP on the other hand has protected farming by forcing up prices in the home market:

(a) a target price is set for agricultural prices in the following year;

(b) a threshold price is used to set customs duties on imported foods (so that imports cannot reach the EU market below this price);

(c) an intervention price is the price at which various agencies will buy up surplus stocks of agricultural produce, usually after a bumper harvest, to prevent the price falling. The surplus would be stored, disposed of, or 'dumped' abroad - producing the often publicised 'butter mountains', 'wine lakes', or 'beef mountains'.

Measures introduced to reform the CAP in 1992 aim to control surplus production. For example, cereal farmers will be required to put 15% of their land into 'set aside' (ie take it out of production) and price guarantees for cereals will be reduced by 29% between 1992 and 1995/96.

The single European market

3.34 The EU set the end of 1992 as the target date for the removal of all existing physical, technical and fiscal barriers among member states, thus creating a large multinational European 'Single Market'. This objective was embodied in the Single European Act of 1985. In practice, these changes have not occurred 'overnight', and many of them are still in progress.

3.35 Elimination of trade restrictions covers the following areas.

(a) Physical barriers (eg customs inspection) on good and services have been removed for most products. Companies have had to adjust to a new VAT regime as a consequence.

(b) Technical standards (eg for quality and safety) should be harmonised.

(c) Governments should not discriminate between EU companies in awarding public works contracts.

(d) Telecommunications should be subject to greater competition.

(e) It should be possible to provide financial services in any country.

(f) There should be free movement of capital within the community.

(g) Professional qualifications awarded in one member state should be recognised in the others.

(h) The EU is taking a co-ordinated stand on matters related to consumer protection.

3.36 At the same time, you should not assume that there will be a completely 'level playing field'. There are many areas where harmonisation is a long way from being achieved. Here are some examples.

(a) *Company taxation.* Tax rates, which can affect the viability of investment plans, vary from country to country within the EU.

(b) *Indirect taxation (VAT).* Whilst there have been moves to harmonisation, there are still differences between rates imposed by member states.

(c) *Differences in prosperity.* There are considerable differences in prosperity between the wealthiest EU economy (eg Germany), and the poorest (eg Greece). The UK comes somewhere in the middle. This has meant:

  (i) grants are sometimes available to depressed regions, which might affect investment decisions;

  (ii) different marketing strategies are appropriate for different markets.

(d) *Differences in workforce skills.* Again, this can have a significant effect on investment decisions. The workforce in Germany is perhaps the most highly trained, but also the most highly paid, and so might be suitable for products of a high added value.

(e) *Infrastructure.* Some countries are better provided with road and rail than others. Where accessibility to a market is an important issue, infrastructure can mean significant variations in distribution costs.

The European Free Trade Area (EFTA)

3.37 The European Free Trade Area (EFTA) was established in 1959, with seven member countries, one of which was the UK. The UK, Denmark and Portugal have since transferred to the EU, while Finland and Iceland joined the other original member states, Sweden, Norway, Austria and Switzerland. More recently, Finland, Sweden and Austria have also joined the EU. There is free trade between EFTA member countries but there is no harmonisation of tariffs with non-EFTA countries.

The European Economic Area (EEA)

3.38 On 1 January 1993, EFTA forged a link with the EU to create a European Economic Area (EEA) with a population of 380 million, so extending the benefits of the EU single market to the EFTA member countries (excluding Switzerland, which stayed out of the EEA).

The membership of the EEA comprises the EU countries plus Norway and Iceland.

North American Free Trade Association (NAFTA)

3.39 Canada, the USA and Mexico formed the North American Free Trade Association (NAFTA) which came into force in 1994. This free trade area covering a population of 360 million and accounting for economic output of US$6,000 billion annually is almost as large as the European Economic Area, and is thus the second largest free trade area after the EEA.

3.40 Under the NAFTA agreement, virtually all tariff and other (non-tariff) barriers to trade and investment between the NAFTA members are to be eliminated over a 15-year period. In the case of trade with non-NAFTA members, each NAFTA member will continue to set its own external tariffs, subject to obligations under GATT.

3.41 The NAFTA agreement covers most business sectors, with special rules applying to especially sensitive sectors, including agriculture, the automotive industry, financial services and textiles and clothing.

3.42 NAFTA is likely to have two possible contrasting effects.

(a) The agreement should, it is claimed, have a liberalising effect on world trade, which could be to the benefit of all companies doing business in the free trade area. However, the rapidly growing Mexican economy is likely to benefit the most.

(b) As a free trade agreement, NAFTA will create a preference for its members in each other's markets. This is likely to lead to some trade and investment being directed away from other countries outside NAFTA to within the NAFTA area.

3.43 From the point of view of non-NAFTA members, such as the UK, it is hoped that the latter trade division effect will be outweighed by the potential of NAFTA for trade expansion. Since the Mexican currency crisis of 1994/95, the glowing predictions of benefits for the NAFTA countries have been rather muted.

4 THE BALANCE OF PAYMENTS

The nature of the balance of payments

4.1 The balance of payments is a statistical 'accounting' record of a country's international trade transactions (the purchase and sale of goods and services) and capital transactions

(the acquisition and disposal of assets and liabilities) with other countries during a period of time.

4.2 Under the current method of presentation used for the UK balance of payments statistics, the broad classifications of transactions are:

(a) *current account* transactions sub-divided into:

(i) transactions in 'visibles' (goods);
(ii) transactions in 'invisibles' (services);

The current account is therefore the record of a country's trading in exports and imports of goods and services.

(b) changes in the UK's external assets and liabilities (or the capital account), sub-divided into:

(i) changes in the UK's external assets. External assets include:

(1) holdings of foreign currency by anyone resident in the UK;

(2) holdings of shares or other investments in overseas companies by anyone resident in the UK (including UK firms);

(3) loans to anyone overseas by UK banks;

(ii) changes in the UK's external liabilities. External liabilities include:

(1) investments in the UK, eg in UK government stocks or shares of UK firms, by overseas residents (such as overseas firms);

(2) borrowing from abroad by anyone in the UK.

The sum of the balance of payments accounts is zero

4.3 The sum of the balance of payments accounts must always be zero (ignoring statistical errors in collecting the figures).

This is because every transaction in international trade has a double aspect (in much the same way that accountants regard all business transactions as having matching 'debit' and 'credit' items). In the balance of payments, every 'plus' item should have a matching 'minus' item.

4.4 If the balance of payments in principle sums to zero, you may wonder what is meant by a surplus or deficit on the balance of payments. When journalists or economists speak of the balance of payments they are usually referring to the deficit or surplus on the current account, or possibly to the surplus or deficit on visibles only (this is also known as the 'balance of trade'). To appreciate these terms, it is helpful to look at the balance of payments in some more detail. Below, we use UK statistics to illustrate principles which apply equally to the balance of payments of every other country too.

The UK balance of payments accounts

4.5 The UK balance of payments for a recent year is summarised below.

UK balance of payments, 1994

	£bn	£bn
Current account		
Visible trade		
Exports (credits)	134.6	
Imports (debits)	(145.3)	
Visible balance		(10.7)
Invisibles balances		
Services	3.8	
Interest, profits, dividends	10.5	
Transfers	(5.4)	
Overall invisibles balance		8.9
Current account balance		(1.8)
Capital account		
Long-term capital account (investments)		
Overseas investment in UK	38.5	
UK investment overseas	2.1	
Long-term capital balance		40.6
Short-term capital balance (Overseas deposits in UK and borrowing from overseas residents (credits), *less* deposits overseas by UK residents and lending to overseas residents (debits))		(43.2)
Reserves (drawing on + adding to –)		(1.0)
Net transactions in external assets and liabilities (capital balance)		(3.6)
Balancing item		5.4
		-

(Source: Annual Abstract of Statistics)

Current account

4.6 *Visibles* are goods, which includes foods, beverages and tobacco, raw materials, fuels and manufactured goods. Exports of visibles less imports gives the visibles balance.

Invisibles include three main categories, which we explain below:

(a) services;
(b) interest, profits and dividends;
(c) transfers.

Services

4.7 Services consist of:

(a) transport (by sea and air, both passenger and cargo);
(b) tourism;
(c) financial (banking, insurance, brokerage, etc);
(d) government (chiefly due to military and diplomatic presence overseas).

These are important ingredients in the invisibles section of the account and have grown in importance in recent years, particularly inward tourism and earnings from financial services.

Interest, profits and dividends

4.8 Interest, profits and dividends consist of items such as:

(a) direct investment earnings. These are the share of profits in overseas branches, overseas subsidiary companies and overseas associated companies. Direct investment earnings might bring income into the country (for example, the profits of UK

firms operating overseas) or cause outflows (profits of overseas firms investing in the UK);

(b) portfolio investment earnings (interest and dividends on stocks and shares held in overseas securities by UK residents, or held in UK securities by overseas residents);

(c) interest on borrowing and lending abroad by UK banks.

Transfers

4.9 *General government transfers* are grants to overseas countries, subscriptions and contributions to international organisations and other transfers by the UK government overseas or to the UK government from overseas. Examples of these transfers are:

(a) payments by the UK into the EU budget;
(b) foreign aid;
(c) payments into UN budgets.

Private transfers include gifts of goods, payments by UK residents to dependants overseas and transfers of sums by relief organisations.

Capital account

4.10 The capital account section of the balance of payments is officially called *Transactions in external assets and liabilities* and records investment and other financial flows. The balance of payments records only 'new' transactions in assets and liabilities during the course of the period. It is not a record of the grand total of external assets or liabilities that have built up over time.

4.11 The capital account comprises the following sections.

(a) *Long-term capital account*, recording long-term capital investments. Investment by foreigners (for example, a new UK factory for a Japanese car manufacturer) comprises a credit item (inflow of money). UK investment abroad is an outflow of money, representing a debit item. When UK overseas investment exceeds foreign investment in the UK, as it often has in recent years (although not in 1994) this section of the balance of payments is in substantial deficit.

(b) *Short-term capital flows*. These flows represent short-term flows between the UK and the rest of the world. Foreign deposits in UK banks and loans from abroad to the UK are inflows on money (a credit item). Deposits by UK residents in overseas banks and loans by UK banks to overseas residents are outflows of money (debit items).

(c) *Flows to and from reserves.* The official reserves consist mainly of gold and convertible foreign currencies, held in the government's Exchange Equalisation Account with the Bank of England. (Other countries similarly have official reserves, which are kept and managed on behalf of the government by the central bank.) Governments use these reserves to balance the overseas accounts and also to deal in the foreign exchange markets. Drawing on reserves represents a credit item in the balance of payments accounts, as it is an inflow to the balance of payments but an outflow from the reserve account; an addition to reserves is a debit item. Official reserves may be used to support a deficit in another part of the balance of payments account. If there is, on the other hand, a surplus elsewhere in the balance of payments accounts, the Bank of England may use it to allow the reserves to build up.

Transactions in official reserves

4.12 An item in the balance of payments under the heading of transactions in assets is 'drawings on or additions to the official reserves'. The official reserves consist of mainly gold and convertible foreign currencies, held in the government's exchange equalisation account with the Bank of England. (Other countries similarly have official reserves,

which are kept and managed on behalf of the government by the central bank.) Governments use these reserves to balance the overseas accounts and also to deal in the foreign exchange markets.

4.13 In past years, movements on the official reserves were given greater prominence in the UK balance of payments statistics, but other international capital transactions are so large that they now 'dwarf' any changes in official reserves, and so changes in the official reserves are no longer given the same prominence as before. Instead, they are included as just another item in the assets section of the balance of payments account.

Balancing item

4.14 There is one final figure in the balance of payments account. This is a balancing item, which arises because of errors and omissions in collecting statistics for the accounts (eg sampling errors for items such as foreign investment and tourist expenditure and omission in the data gathered about exports or imports).

4.15 Try writing an answer to the following exercise before moving on.

Exercise

If the balance of payments always balances why do we hear about deficits and surpluses?

Solution

The sum of the three balance of payments accounts must always be zero because every transaction in international trade has a double aspect. Just as accounting transactions are recorded by matching debit and credit entries, so too are international trade and financing transactions recorded by means of matching plus and minus transactions

If a UK exporter sells goods to a foreign buyer:

(a) the value of the export is a plus in the current account of the balance of payments;

(b) the payment for the export results in a reduction in the deposits held by foreigners in UK banks. (A minus in the assets and liabilities section.)

When we use the phrase deficit or surplus on the balance of payments what we actually mean is a deficit or surplus on the current account. If there is a surplus (+) on the current account we would expect this to be matched by a similar negative amount on the assets and liabilities section. This will take the form of:

(a) additional claims on non-residents (eg overseas loans);

(b) decreased liabilities to non-residents (paying off our loans abroad).

This will involve not only banks and other firms but it may also involve the government too, since it is responsible for the 'reserves'.

If there is a deficit (-) on the current account the result will be a similar positive account on the assets and liabilities section. This will consist of inward investment and/or increased overseas indebtedness. This means that banks and other firms will owe more money abroad and the government may also be borrowing from abroad. Increased indebtedness cannot go on forever.

A country's balance of payments position

4.16 A country's balance of payments position is perhaps best analysed by a consideration of its long-term surplus or deficit on its current account.

4.17 If a country has a surplus on its current account year after year, it might invest the surplus abroad or add it to official reserves. The balance of payments position would be strong. There is the problem, however, that if one country which is a major trading nation (eg Japan) has a continual surplus on its balance of payments current account, other countries must be in a continual deficit. These other countries can run down their

official reserves, perhaps to nothing, and borrow as much as they can to meet the payments overseas, but eventually, they will run out of money entirely and be unable even to pay their debts. Every country must have a reasonably sound balance of payments position if international trade is to prosper. It might therefore be argued that a country has a good balance of payments position, if in the long run, it has neither surplus nor deficit on its current account.

4.18 Deficits on the current account must be financed by a run down of official reserves, or borrowing. A country cannot finance deficits in this way indefinitely. Its official reserves will run out completely one day! Clearly, if a country has a long-term deficit, its balance of payments position will be very weak, and it must eventually take action to improve the position.

Rectifying a balance of payments deficit or surplus

4.19 A country with a balance of payments deficit cannot tolerate, or even afford, to continue the deficit indefinitely.

(a) A continual deficit on current account must be financed by a surplus on the assets and liabilities section of the accounts.

(i) The official reserves are not an inexhaustible source of wealth. There is a limit to how far they can be used.

(ii) Borrowing from overseas depends on finding willing lenders, and overseas investors will probably want a good prospect of a high return, perhaps in the form of high interest rates.

This has been a recent problem for the USA, which has had a massive balance of payments deficit on current account in recent years, financed by overseas borrowing.

(b) A continual surplus on current account might seem less of a problem. However, there can be problems with a surplus, and in the case of Japan, the US authorities have in recent years made veiled threats of a trade war if Japan did nothing about the imbalance of trade between Japan and the USA.

Which solution to a balance of payments problem is best may well depend on the cause of the problem on the balance of payments itself.

Causes of a change in the balance of payments

4.20 A change in the balance of payments might be caused by, or made to happen by means of:

(a) a change in the current account balance; or

(b) a change in the assets and liabilities section - for example, changes in assets held abroad, or debts to firms, individuals or governments abroad.

A change in the assets and liabilities section

4.21 A change in the 'transactions in external assets and liabilities' section might be caused by any of the following items:

(a) *a change in interest rates*. Higher real interest rates in one country relative to another will attract more capital into that country and vice versa;

(b) *an expected change in the exchange rate*. For example, if overseas investors holding sterling assets expected sterling to fall in value, they would sell sterling assets in order to prevent a loss;

(c) *prospects for economic growth and stability*. If overseas firms consider that a country has economic stability and the potential for growth, they might be persuaded to make a direct investment. The government's economic policies will help foreign investors to assess the country's prospects. Direct investment might also be

attracted by the offer of government grants, subsidies or other assistance in setting up operations in that country.

(d) *exchange control regulations*. In the UK exchange control regulations were removed in 1979, and this left UK residents free to invest abroad. As a consequence, there has been a substantial outflow of capital in subsequent years in the form of private investments overseas.

(e) *changes occurring in the current account*. If we are selling more goods abroad we would expect an increase in the debts owed to UK exporters by non-residents.

A change in the current account balance

4.22 The UK's current account balance is determined by:

(a) the price of exports;

(b) the volume of demand for goods in overseas markets, which in turn is dependent on:

(i) the price of goods (in the domestic currency); and
(ii) general economic conditions in those markets;

(c) the price of imports;

(d) the volume of demand for imported goods, which in turn is dependent on:

(i) the price of goods (in sterling);

(ii) general economic conditions in the UK (eg manufacturing industry's output, since manufacturers purchase imported raw materials, and also the level of incomes and unemployment);

(e) the quality and lengths of delivery periods of UK goods and services in comparison with foreign goods competing in the same markets.

Of these items, (a) - (d) are perhaps the more significant. They are certainly the factors which the authorities are most able to influence.

Practical ways of rectifying a current account deficit

4.23 We now consider the following three measures aimed at rectifying a deficit on current account:

(a) a depreciation or devaluation of the currency;

(b) direct measures to restrict imports, such as tariffs or import quotas or exchange control regulations;

(c) domestic deflation.

A depreciation (or devaluation) of the currency

4.24 Assuming that changes in exchange rates are translated into changes in the prices of goods and services, devaluation of the currency would make exports relatively cheaper to foreign buyers, and so the demand for exports would probably rise. The extent of the increase in export revenue would depend on:

(a) the elasticity of demand for the goods in export markets (ie the extent of change in demand following a change in price); and

(b) the extent to which industry is able to respond to the export opportunities by either producing more goods, or switching from domestic to export markets.

4.25 The cost of imports would probably rise because more domestic currency would be needed to obtain the foreign currency to pay for imported goods. Whether or not the total value of imports would fall too would depend on the elasticity of demand for imports.

4.26 Because the effect of depreciation or devaluation depends on price elasticities of demand in this way, it might be the case that depreciation of the currency on its own would be insufficient to rectify the balance of payments deficit, unless an extremely large depreciation took place.

4.27 After a time lag, production of exports and import substitutes will rise, so that:

(a) the volume of exports will rise, thereby increasing the sterling value of exports (regardless of sterling's lower exchange rate);

(b) the volume of imports will fall further. This will improve the current account balance.

4.28 The improvement in the balance of payments will thus have some limit, and the current balance should eventually level off. The effect of the falling exchange rate on the current balance might therefore be described by a 'J' curve as illustrated in Figure 2.

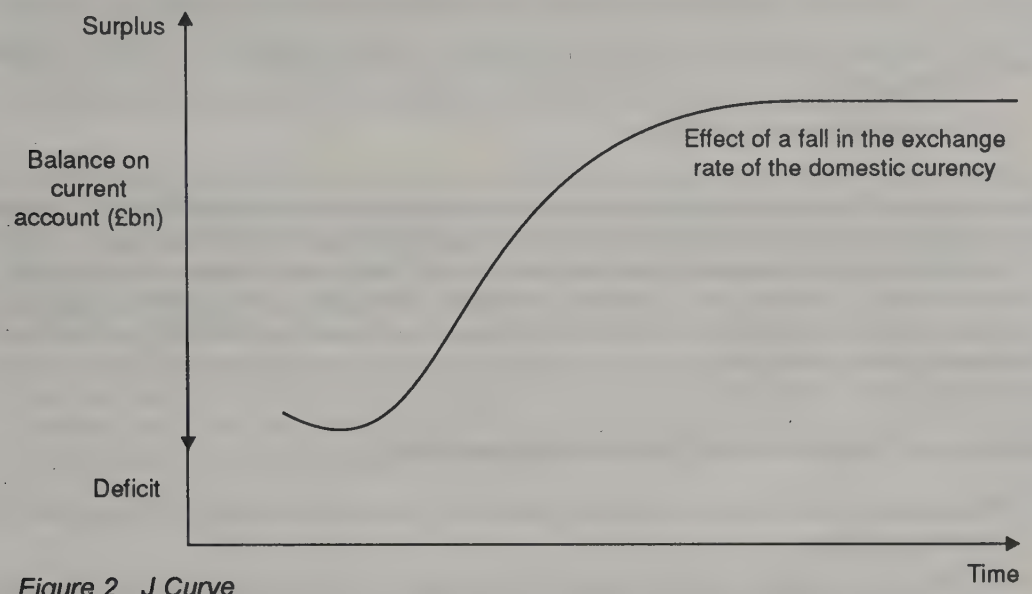


Figure 2 J Curve

Direct measures to restrict the volume of imports or to encourage exports

4.29 Direct measures might consist of:

(a) import tariffs - that is, taxes or 'duties' on goods, to raise their cost in domestic markets so as to reduce demand;

(b) import quotas - that is, restrictions on the quantities of certain goods allowed into the country;

(c) a total ban or embargo on imports from a certain country;

(d) placing administrative burdens on importers (for example increasing the documentation required or safety standards that imported goods must comply with);

(e) exchange control regulations which make it difficult for importers to obtain foreign currency to buy goods from abroad;

(f) providing export subsidies to encourage exports, and other measures of financial support to exporters.

Import restrictions and export subsidies give rise to counter-measures by other countries. They are therefore dangerous measures for a country whose economy relies heavily on external trade.

Domestic deflation

4.30 The most common method for dealing with balance of payments problems and probably the only successful long term measure is to deflate the economy. The term 'deflation' might make you think of falling prices - ie the opposite of inflation. It means, however, more than this. When the total volume of expenditure and demand for goods in a county's economy is too high, the government can take steps to reduce it, by reducing its own expenditure, raising interest rates to deter borrowing, and cutting private consumption by raising taxes. This fall in demand should lead to a fall in prices or at least to a reduction in the rate of domestic inflation. Unfortunately, it might also lead, in the short term at least, to a reduction in industrial output and a loss of jobs in the country's economy.

4.31 Deflationary measures include cutting government spending, increasing taxation and raising interest rates. The purpose of deflationary measures would be:

(a) to reduce the demand for goods and services at home, and so to reduce imports;

(b) to encourage industry to switch to export markets, because of the fall in domestic demand;

(c) to tackle domestic inflation.

4.32 Sometimes, a government's domestic economic policies are not deflationary, despite a balance of payments deficit, and on the contrary, the government's economic policies might encourage increasing demand, which will both boost demand for imports, and cause more inflation and a falling exchange rate. Economic policies which boost demand in the economy in spite of a balance of payments deficit will worsen, rather than improve, the deficit.

The balance of payments and the domestic economy

4.33 You should try to view any country's balance of payments position in the context of its domestic economy.

(a) When a country's exports exceed its imports, or vice versa, there may be a lack of equilibrium between:

(i) withdrawals from the circular flow of income in the domestic economy (remember that these withdrawals include imports); and

(ii) injections into the circular flow of income (which include exports).

Equilibrium in the balance of payments ('external equilibrium') will also help a country to achieve equilibrium in its circular flow of income ('internal equilibrium').

(b) If a country's international trade is only small in size compared with its domestic economy, problems with any balance of payments deficit will be much less than for a country which relies heavily on international trade.

Interest rates and the balance of payments

4.34 Comparative interest rates between one country and another, and changes in interest rates, affect the balance of payments both:

(a) directly, by stimulating or discouraging foreign investment, and so inflows and outflows of capital; and

(b) indirectly, through the exchange rate. High interest rates attract foreign investors, thus creating a demand for the currency and keeping the exchange rate at a high level.

4.35 Is a high interest rate policy a good solution to the problem of a deficit on the balance of payments current account?

(a) If a country relies on inflows of capital to finance a continuing balance of trade deficit, the country's balance of payments will never get into equilibrium. High interest rates will keep the exchange rate high for the country's currency, and this will make it more difficult to export (high export prices to foreign buyers) and encourage imports (cheaper prices). The country might therefore be unable to rectify its balance of trade deficit.

(b) If there is a continuing balance of trade deficit, there will always be a threat that the country's currency will eventually depreciate in value. This will deter investors.

4.36 Investors will only put money into capital investments abroad if they have satisfactory expectations about what the exchange rate for the foreign currency will be. Interest rates alone are not the only factor on which to base an investment decision. After all, what is the value to an investor of high interest rates from investments in a foreign currency when the exchange value of the currency is falling?

4.37 Since sterling's suspension in 1992 from the European exchange rate mechanism (ERM), the pound sterling has been allowed to 'float' on the foreign exchange markets, finding its own level without the government trying to fix its value. This policy led to an effective devaluation of sterling by around 15% against the deutschmark.

4.38 Devaluation of the currency acts as a stimulus to domestic economic activity since it makes the UK's exports more competitive (lower-priced) abroad, while making imports more expensive. On sterling's suspension from the ERM, some feared that a further decline in sterling's value could lead to new inflationary pressures which might be only partially offset by tougher government spending limits (fiscal policy). Others argued for reflationary measures, including interest rate cuts, to try to lift the economy out of recession. Sterling's departure from the ERM does undoubtedly allow the government to use the level of interest rates with more flexibility to stimulate or dampen domestic economic activity, and indeed paved the way for cuts in bank base interest rates from 10% to 6% between September 1992 and early 1993.

Chapter roundup

- We have examined the significance of multinational enterprises. We have looked at reasons why a firm would engage in foreign direct investment (FDI) and at economic theories taking into account the imperfect markets within which multinational companies typically operate.
- We have seen how world output of goods and services will increase if countries specialise in the production of goods/services in which they have a comparative advantage. Business enterprises are now also becoming increasingly 'internationalised' by the development of multinational activities beyond pure import and export trade.
- There are various arguments in favour of both protection and free trade, although the balance of opinion favours free trade. Even so until very recently there has been a growing threat of protection.
  - In the USA, which has a very large balance of trade deficit, there is a body of opinion which favours protectionist measures against other countries, such as Japan, which supply goods in large volumes to the USA.
  - Free trade areas which are developing, such as the EU, threaten to 'lock out' other countries from their free trade union, making it more difficult to export goods to them. Countries such as the USA and Japan, for example, have been concerned that the new rules on trade within the EU 'single market' could act as protectionist measures against them.
- Dismantling protectionism is a matter of cooperation to secure a better outcome for world nations as a whole. Although individual nations may gain from self-interested protectionism, this will lead to retaliation and a worse outcome for all than if nations cooperate to lower barriers to trade.
- We have examined the nature of the balance of payments of a country and have seen that a country can rectify a balance of payments deficit by:
  - allowing its currency to depreciate or devalue in foreign exchange value;
  - imposing protectionist measures or exchange control regulations;
  - deflationary economic measures in the domestic economy. (Such measures are usually a precondition of any IMF financial assistance to countries in balance of payments difficulties.)

Test your knowledge

1 Outline the main changes in the pattern of multinationals' activities over the past twenty years or so. (see paras 1.6, 1.7)

2 What are the five main strategic reasons why a firm might engage in FDI? (1.10)

3 Explain how the establishment of the EEC and EFTA created market imperfections influencing the pattern of foreign direct investment. (1.20)

4 Outline the main competitive advantages which multinational enterprises enjoy. (1.22)

5 What is meant by the law of comparative advantage? (2.16)

6 List the various methods of protection against foreign imports. (3.3)

7 Outline the arguments for protection. (3.10)

8 Outline the arguments against protection. (3.19)

9 List the elements of the UK balance of payments. (4.2)

10 Why might a current account deficit matter? (4.16 - 4.18)

11 By which methods may a government try to reduce or eliminate a current account deficit? (4.23)

Now try illustrative question 16 at the end of the Study Text

Chapter 17

INTERNATIONAL FINANCE

This chapter covers the following topics.

		Syllabus reference
1	International borrowing and investment	6(b)
2	International monetary institutions	5(h)
3	The eurocurrency markets and sovereign debt	5(i)

Introduction

In this chapter, we are mainly concerned with financial markets and financial institutions. The various 'euromarkets' are of increasing importance to larger companies.

You are expected to be aware of the so-called global debt problem. There has been less about this in the media than there used to be, but the problem has not gone away.

1 INTERNATIONAL BORROWING AND INVESTMENT

12/95, 6/96

Global financial markets

1.1 Small and medium-sized companies and other enterprises are usually limited in their sources of finance to their domestic markets. Larger companies are able to seek funds in international financial markets. Funds are not only sought on these global markets by multinationals: funds from overseas might be used by larger companies to finance fixed asset acquisitions or working capital in domestic business operations.

International banks

1.2 The period since World War II has seen the development of international financial centres as well as growth in international trade and multinational business activities. The most important such centres are London, New York and Tokyo.

1.3 International banks, most of whom are themselves large multinational enterprises, are the most important financial intermediaries in these financial centres.

Exercise

List the ways in which international banks assist multinational enterprises.

Solution

Banks assist in the following ways, with some specialising in particular areas:

(a) the financing of foreign trade;
(b) the financing of capital projects;
(c) international cash management services;
(d) providing full local banking services in different countries;
(e) trading in foreign exchange and currency options;
(f) lending and borrowing in the eurocurrency market;
(g) participating in syndicated loan facilities;

(h) underwriting of eurobonds;
(i) provision of advice and information.

Developments in international financial markets

1.4 Among the more important developments affecting international financial markets in recent years are the following.

(a) *Globalisation.* Globalisation describes the process by which the capital markets of each country have become internationally integrated. Securities issued in one country can now be traded in capital markets around the world.

(b) *Securitisation of debt.* Securitisation of debt refers to international borrowing by large companies, not from a bank, but by issuing securities instead. This has been possible because of the deregulation of capital markets, and in the UK because of the opening of overseas markets to borrowers since the abolition of exchange controls in 1979. Securitisation of debt has been popular with borrowers because this form of borrowing is cheaper - no intermediaries' fees - and more flexible than a bank loan. Examples of securitised debt are eurobonds and eurocommercial paper.

(c) *Risk management (and risk assessment).* Various techniques have been developed for companies to manage their financial risk. Such techniques are discussed later in this text. The existence of such transactions, which are harder to monitor where they are off balance sheet, make it difficult for banks and other would-be lenders to assess the financial risk of a company that is asking to borrow more money.

(d) *Competition.* There is much fiercer competition between financial institutions for business. Building societies are emerging as potential competitors to the banks. Foreign banks have competed successfully in the UK with the big clearing banks. The 1986 'Big Bang' deregulation measures in the City of London brought greater competition between stockbroking firms, with the abolition of fixed commissions for broking/market-making services.

International money markets

1.5 The international money markets or 'international banking market' are markets for short and medium-term funds, as distinct from the international capital markets. The international money markets include the *eurocurrency market,* one of the 'euromarkets'.

1.6 A company or other organisation might invest surplus funds on the market by placing the money on deposit with a bank for a period ranging from overnight to five years. Borrowers of funds on the international money markets will generally wish to borrow for shorter periods of time, although loans for three years or more are possible.

Eurocurrency markets

1.7 A UK company might borrow money from a bank or from the investing public, in sterling. But it might also borrow in a foreign currency, especially if it trades abroad, or if it already has assets or liabilities abroad denominated in a foreign currency.

1.8 When a UK company borrows in a foreign currency from a UK bank, the loan is known as a *eurocurrency loan*.

1.9 For example, if a UK company borrows US $50,000 from its bank, the loan will be a 'eurodollar' loan. London is a centre for eurocurrency lending and companies with foreign trade interests might choose to borrow from their bank in another currency.

1.10 The eurocurrency markets involve the deposit of funds with a bank outside the country of origin of the funds and re-lending these funds for a fairly short term, typically three months, normally at a floating rate of interest. *Eurocredits* are medium to long-term international bank loans which may be arranged by individual banks or by syndicates of banks. Much eurocurrency lending in fact takes place between banks of different countries, and takes the form of negotiable certificates of deposit.

International capital markets

1.11 Larger companies may arrange borrowing facilities from their bank, in the form of bank loans or bank overdrafts. Instead, however, they might prefer to borrow from private investors. In other words, instead of obtaining a £10,000,000 bank loan, a company might issue 'bonds', or 'paper' in order to borrow directly from investors, with:

(a) the bank merely acting as a go-between, finding investors who will take up the bonds or paper that the borrowing company issues;

(b) interest being payable to the investors themselves, not to a bank.

In recent years, a strong international market has built up which allows very large companies to borrow in this way, long-term or short-term.

Eurobonds

1.12 A eurobond is a bond issued in a capital market (another of the 'euromarkets'), denominated in a currency which often differs from that of the country of issue and sold internationally. Eurobonds are long-term loans raised by international companies or other institutions in several countries at the same time. Such bonds can be sold by one holder to another. The term of a eurobond issue is typically ten to 15 years.

1.13 Although eurobond funds may be raised at a lower cost than direct borrowing from banks, issue costs are generally higher than the costs of using the eurocurrency markets. Eurobonds would only be used by a company to raise fairly large sums of money (normally in excess of £1 million).

1.14 Eurobonds may be the most suitable source of finance for a large organisation with an excellent credit rating, such as a large successful multinational company, which:

(a) requires a long-term loan to finance a big capital expansion programme (with a loan for at least five years and up to 20 years);

(b) requires borrowing which is not subject to the national exchange controls of any government (a company in country X could raise funds in the currency of country Y by means of a eurobond issue, and thereby avoid any exchange control restrictions which might exist in country X). In addition, domestic capital issues may be regulated by the government or central bank, with an orderly queue for issues. In contrast, eurobond issues can be made whenever market conditions seem favourable.

1.15 The interest rate on a bond issue may be fixed or variable ('floating rate notes'). Many variable rate issues have a minimum interest rate which the bond holders are guaranteed, even if market rates fall even lower. These bonds convert to a fixed rate of interest when market rates do fall to this level. For this reason, they are called 'drop lock' floating rate bonds.

1.16 Other variants from conventional ('straight' or 'vanilla') bonds are zero coupon (deep discount) bonds, convertible bonds and multi-currency bonds (for example, ecu bonds), used to reduce risks of, or hedge against, currency movements.

Eurobond issues and currency risk

1.17 A borrower contemplating a eurobond issue must consider the exchange risk of a long-term foreign currency loan.

(a) If the money is to be used to purchase assets which will earn revenue in a currency different to that of the bond issue, the borrower will run the risk of exchange losses. These losses would be due to adverse movements in exchange rates, if the currency of the loan strengthens against the currency of the revenues out of which the bond (and interest) must be repaid. Borrowers cannot obtain long-term forward cover in the forward exchange market, and would have to accept the risks of foreign exchange exposure.

(b) If the money is to be used to purchase assets which will earn revenue in the same currency, the borrower can match these revenues with payments on the bond, and so remove or reduce the exchange risk.

Eurobonds and the investor

1.18 An investor subscribing to a bond issue will be concerned about the following factors.

(a) *Security*. The borrower must be of high quality. A standard condition of a bond issue is a 'negative pledge clause' in which the borrower undertakes not to give any prior charge over its assets, during the life of the bond issue, that would rank ahead of the rights of the investors in the event of a liquidation;

(b) *Marketability*. Investors will wish to have a ready market in which bonds can be bought and sold. If the borrower is of high quality the bonds or notes will be readily negotiable;

(c) *Anonymity*. Investors in eurobonds tend to be attracted by the anonymity of this type of issue, as the bonds are generally issued to bearer;

(d) *The return on the investment*. This is paid tax-free.

Euro-equity issues

1.19 A euro-equity issue may be defined as an issue of equity in a market outside the company's own domestic market. The euro-equity market has not developed to such an extent as the comparable eurobond market. The market started in 1965 when bonds were issued with the option to convert them into equity. Later, bonds were issued with warrants attached, meaning that the bond does not have to be surrendered if the warrant is used to obtain shares. Furthermore, the warrant can be traded separately from the bond.

1.20 Conventional share issues have also been made on the euro-equity markets, as for example when there were attempts to place large numbers of shares of US corporations and of Japanese companies in Europe. These attempts were largely unsuccessful: the absence of a sufficiently liquid after-market or secondary market in such shares is the main limitation on such euro-equity issues.

1.21 'Sweeteners' are often added to the shares issued on the market, to make the issue more attractive to investors. For example, a 'rolling put option' might be added to a convertible preference share, giving the purchaser the right to sell the convertible preference share back to the company at any time between, say, five and ten years after the issue.

1.22 A company may find it appropriate to raise funds by selling shares outside its domestic capital market if this is too small for its needs. Another reason why a company may seek a euro-equity issue is to attract shareholders based in the markets in which it trades overseas. The liquidity of the company's shares and the international standing of the firm can be improved. The wider spread of shareholdings which might be achieved could act as a defence against hostile takeovers. An issue overseas may also be

convenient if compliance with domestic capital market listing requirements is a complex or lengthy process.

1.23 Examples can be cited of the sale of shares in overseas markets. In 1982, the American firm International Signal and Control went public by issuing shares on the UK stock market but not in the USA. In 1986, Fiat issued $2 billion worth of shares on the euromarkets. The flotation of British Telecom involved an international issue alongside the main issue of shares on the UK stock market.

Commercial paper

1.24 A large company can raise short-term finance by issuing commercial paper. Businesses were first allowed to issue sterling commercial [aper (SCP) in 1986, following the success of euro-commercial paper (ECP) in the early 1980s.

Commercial paper (CP) is a short-term financial instrument:

(a) issued in the form of unsecured promissory notes with a fixed maturity of up to one year, typically between seven days and three months. (A promissory note is a written promise to pay);

(b) issued in bearer form;

(c) issued on a discount basis (so the rate of interest on the CP is implicit in its sale value).

The term *eurocommercial paper* refers to CP issued in any currency (often US dollars or ecus). Similar instruments issued with a maturity of over one and up to five years, at a rate of interest rather than a discount, are known as medium term notes ('MTNs') or medium term 'euronotes'. The market is most active among multinationals and other very large companies, frequently involving very large sums on a revolving or standby basis.

1.25 Commercial paper is an example of 'securitisation' - the raising of loans in the form of debt securities. Banks raise finance for their customers by packaging and selling the customers' securities, such as commercial paper, rather than by lending them money.

1.26 The following organisations are entitled to issue CP and medium term notes.

(a) Companies with net assets of at least £25 million

(b) Overseas public sector bodies (as long as the relevant government's debt securities are traded on a Stock Exchange or equivalent exchange)

(c) Certain UK local authorities

Qualifying companies can now issue CP and MTNs in any currency. The minimum amount is £100,000 or currency equivalent, although a minimum of £1,000,000 is more usual. The market is most active among multinationals and very large domestic companies, frequently involving very large sums on a revolving or standby basis.

Issues are 'investor-driven' in that CP is only issued to meet demand from specific investors.

1.27 The flexibility of CP arises because the borrower is able to choose the period to maturity (in practice, between 7 and 364 days). For example, a company might decide that it wants to issue some new paper at the end of November, with maturity in the middle of March. However, if the interest rates that would be payable are not attractive enough at the time for this term of borrowing, the borrower can decide instead to issue paper with a maturity in (say) mid-February. Corporate borrowers are therefore able to schedule borrowing for when they expect interest rates to be most favourable to themselves.

1.28 Other advantages of CP include the following.

(a) Interest rates are determined by market conditions but companies which issue commercial paper can hope to obtain slightly lower interest rates on their borrowing than if they borrowed direct from a bank.

(b) A company that issues CP does not have to be formally 'rated'. However, companies that are rated will be able to issue paper at finer rates.

(c) If a company has surplus cash, it can invest it in commercial paper rather than in a bank deposit, and hope to earn a slightly higher interest rate on its short-term investment.

(*Note*. These are among the advantages of dispensing with financial intermediaries, ie financial disintermediation, of which CP is an example.)

Syndicated credits

1.29 A 'credit' in this context is a facility whereby a borrower can borrow funds when required, but might in fact not take up the full amount of the facility. This differs from a loan, which involves an actual transaction for a specified sum for a particular period of time.

1.30 The syndicated credit market provides credit facilities at relatively high rates of interest, typically at a substantial margin above LIBOR. The market is frequently used by highly geared companies.

(a) Such a company might need such a facility if it is involved in a takeover bid, in which case it will use the standby credit to fund the acquisition if the bid is successful.

(b) The market is used in the re-financing of debts incurred in past takeovers in cases where the company has been unable to obtain alternative funds to pay off the debt.

(c) The market is also used for local and overseas government borrowings and for project financing (eg Eurotunnel).

1.31 Because much of the takeover activity of the late 1980s was of US corporations, the majority of syndicated credits relating to mergers was denominated in US dollars.

Multiple option facilities

1.32 *Multiple option facilities* (MOFs) comprise a variety of instruments through which companies can raise funds. Such instruments gained popularity in the late 1980s, and include Note Issuance Facilities (NIFs) and Revolving Underwriting Facilities (RUFs). In a typical MOF arrangement, the company may get a bank to put together a panel of banks who agree to provide an amount of 'standby' loans over a period of, say, five years, perhaps at an interest rate set to vary by reference to LIBOR. Another 'tender panel' of banks is set up and is invited to bid to provide loans when the company requires cash. The company is able to choose the lowest bid, or alternatively use the standby facility.

1.33 MOFs allow short-term loans (say, for three months) to be arranged in succession, effectively enabling medium-term finance to be obtained, if required, at competitive rates of interest. As implied by their name, MOFs allow the money required to be raised in various different forms, including foreign currency loans and bills of exchange.

Should a company borrow on the euromarkets or in domestic markets?

1.34 The factors which are relevant to choosing between borrowing on the euromarkets or through the domestic banking system are as follows.

(a) Spreads between borrowing and lending are likely to be closer on the euromarket, because domestic banking systems are generally subject to tighter regulation and more stringent reserve requirements.

(b) Euromarket loans generally require no security, while borrowing on domestic markets is quite likely to involve fixed or floating charges on assets as security.

(c) Availability of euromarket funds is enhanced by the fact that euromarkets are attractive to investors as interest is paid gross without the deduction of withholding tax which occurs in many domestic markets.

(d) With interest normally at floating rates on euromarkets, draw-down dates can be flexible, although there may be early redemption penalties, and commitment fees to pay if the full amount of the loan is not drawn down.

(e) It is often easier for a large multinational to raise very large sums on the euromarkets than in a domestic financial market.

2 INTERNATIONAL MONETARY INSTITUTIONS

The International Monetary Fund

2.1 The IMF was established in 1944. Most countries of the world have membership of the IMF. The three broad aims of the IMF are:

(a) to promote international monetary co-operation, and to establish a code of conduct for making international payments;

(b) to provide financial support to countries with temporary balance of payments deficits;

(c) to provide for the orderly growth of international liquidity, through its SDR scheme (launched in 1970). SDRs are a form of international currency, whose use is restricted.

The IMF and financial support for countries with balance of payment difficulties

2.2 If a country has a balance of payments deficit on current account, it must either:

(a) borrow capital; or
(b) use up official reserves

to offset this deficit. Since a country's official reserves will be insufficient to support a balance of payments deficit on current account for very long, it must borrow to offset the deficit.

2.3 Until the eurocurrency markets emerged in the 1970s, international lending was mainly carried out by means of lending to governments by the IMF and World Bank, and the problem was seen mainly as one of providing governments with funds to top up their official reserves, to help them to overcome a short-term balance of payments problem.

2.4 The IMF can provide financial support to member countries with *temporary* balance of payments difficulties. Most IMF loans are repayable in 3 to 5 years.

Of course, to lend money, the IMF must also have funds. Funds are made available from subscriptions or 'quotas' of member countries. The IMF uses these subscriptions to lend foreign currencies to countries with a balance of payments deficit which apply to the IMF for help.

IMF loan conditions

2.5 The pre-conditions that the IMF places on its loans to debtor countries vary according to the individual situation of each country, but the general position is as follows.

(a) The IMF regards its lending as fairly short-term in nature; this means that countries which borrow from the IMF should get into a position to start repaying the loans fairly quickly.

(b) To do this, the countries must take effective action to improve their balance of payments position.

(c) To make this improvement, the IMF generally believes that a country should take action to reduce the demand for goods and services in the economy (eg by increasing taxes and cutting government spending). This will reduce imports and help to put a brake on any price rises. The country's industries should then also be able to divert more resources into export markets.

(d) With 'deflationary' measures along these lines, standards of living will fall (at least in the short term) and unemployment may rise. The IMF regards these short term hardships to be necessary if a country is to succeed in sorting out its balance of payments and international debt problems.

Borrowing to supplement liquidity

2.6 Countries which have balance of payments deficits can borrow their way out of trouble, at least temporarily. There are various sources of borrowing:

(a) the IMF (IMF lending has already been described);

(b) other institutions, such as the World Bank, the International Development Association (IDA), and the Bank for International Settlements (BIS);

(c) borrowing from private banks (in the eurocurrency markets).

The World Bank (IBRD)

2.7 The World Bank (more properly called the International Bank for Reconstruction and Development or IBRD) began operations in 1946, with the reconstruction of war-damaged economies as one of its objectives. Its chief aim now is to supplement private finance and lend money on a commercial basis for capital projects. Loans are usually direct to governments or government agencies, for a long-term period of over 10 years (typically 20 years). Lending is usually tied to specific projects, although the Bank's lending policy has been more flexible in recent years.

2.8 During 1995, to take an example, the World Bank provided large loans to Mexico as part of a programme to support that country after the Mexican financial crisis occurring late in 1994. The support programme was assisted by the IMF and by a multi-billion dollar economic assistance package from the USA.

2.9 The World Bank's funds are obtained from capital subscriptions by member countries of the IMF, its profits, and borrowing. The major source of funds is borrowing, and the World Bank makes bond issues on the world's capital markets (eg New York).

The IDA

2.10 World Bank lending is for projects concerned with the development of agriculture, electricity, transport and so on. The cost of World Bank loans was (and still is) high to developing countries, and in 1960, the International Development Association was set up to provide 'soft' loans - ie loans at a low cost with easy repayment terms - to lesser developed countries, for similar types of projects financed by the World Bank.

2.11 The International Development Association is a subsidiary of the World Bank and member countries of the IDA are also members of the World Bank. All member countries make subscriptions to provide funds, but the main source of funds is a once-every-three-years 'replenishment' from the developed countries. The IDA's funding programme is therefore dependent on the attitudes of the governments of the developed countries, especially the USA.

2.12 Because the IDA acts a concessionary arm of the World Bank, lending money on easy terms, it is a potentially valuable source of finance for developing countries.

The IDA makes loans for 50 years without interest and charges only a service fee.

Capital repayments are:

(a) nothing for 10 years;
(b) 1% per annum in each of the next 10 years;
(c) 3% per annum in each of the next 30 years.

2.13 Many of the IDA's most needy members in Africa have seen their economies contract over the past 10 years and the World Bank has given a warning that they will continue to shrink for much of the next decade. The appeal of IDA loans to these countries, and the need for such loans to help development, should therefore be readily apparent to you.

The BIS

2.14 The Bank for International Settlements (BIS) is the banker for the central banks of other countries. It is situated in Basle, where it was founded in 1930. Most of its deposits are from the central banks of various countries and some are shareholders and represented on its board. The Bank of England, for example, has a 10% stake in the BIS.

2.15 The main functions of the BIS are:

(a) to promote co-operation between central banks;

(b) to provide facilities for international co-operation (eg the BIS organised a 'safety net' for sterling in 1977 and provided temporary finance for Brazil in 1983 whilst Brazil negotiated loan conditions with the IMF. The BIS co-operates with the IMF in international monetary matters.)

It is a profit making institution, and lends money at commercial rates.

2.16 From about 1982, the BIS took on a crucial role of providing *bridging finance* to troubled countries - ie short-term loans repayable when longer term loans (for example from the IMF) have been negotiated. These BIS loans to central banks of troubled countries (in 1983 for example, to Hungary, Mexico, Brazil and Yugoslavia) are underwritten by other central banks, such as the Bank of England. Even so the Bank of England currently opposes the idea that the BIS should become a *lender of last resort* to the central banks of other countries.

3 THE EUROCURRENCY MARKETS AND SOVEREIGN DEBT 12/95

The eurocurrency markets

3.1 In comparison to official lending institutions, the eurocurrency markets have been a much larger provider of funds to countries in need for foreign currencies. The eurocurrency markets provide funds for private borrowers as well as countries. The 'euro' prefix is something of a misnomer, since the eurocurrency markets provide funds in various currencies, not just European ones.

3.2 As already indicated, a eurocurrency is a bank deposit of currency which is deposited with a bank outside the currency's country of origin. A eurocurrency loan is a wholesale loan of eurocurrency.

3.3 The eurocurrency markets are the international markets for bank deposits and lending, in which eurocurrency loans take place. In other words:

(a) banks obtain deposits of foreign currencies and re-lend them, often to other banks;
(b) banks borrow eurocurrencies from other banks, and re-lend them.

3.4 A distinction might be made between the eurocurrency markets for different currencies (eg the eurodollar market, the euroyen market).

The IMF and lending by the commercial banks

3.5 Since the 1970s, countries with balance of payments difficulties have borrowed large sums of money from international banks and by 1982 it became clear that many countries were unable to repay these debts on schedule. The problem of rescheduling debts therefore arose - ie giving debtor countries more time to pay.

3.6 The international debt crisis forged an 'alliance' between the IMF and the international commercial banks. The role of the IMF was important because banks were now relying on the IMF to impose economic policies on the borrowing country which would enable the country concerned to repay its loans. From 1982, however, in spite of this alliance, the international debt crisis developed and is still a long way from being resolved.

The sovereign debt crisis

3.7 Sovereign debt refers to debt owed to non-residents (for example, overseas banks) by governments, government agencies or autonomous public bodies (for example, public corporations) and also any debt which is guaranteed by a government.

3.8 The sovereign debt crisis has arisen as governments in less developed countries (LDCs) have taken on levels of debt to fund their development programmes which are beyond their ability to finance. As a result the level of debt has risen and their ability to repay has decreased, as increasing amounts of GDP are absorbed in servicing the debt rather in financing development. A further factor is that, in some countries with substantial oil reserves, banks were keen to lend against the fact of these reserves combined with high world oil prices. Examples of such countries include Nigeria and Venezuela. As the oil price has fallen, the fall in oil revenues to the LDCs has precipitated a debt crisis.

3.9 Various approaches have been taken in attempts to overcome these problems. Where the situation has arisen due to a sudden (and hopefully temporary) fall in commodity prices, one solution may be for the country to take on additional short-term debt to cover the temporary shortfall. Where the problem is of a longer term nature, approaches include the following.

(a) The debt may be restructured and/or rescheduled in order to allow the government longer in which to repay the loan.

(b) Restructuring is often linked to a package of economic reforms which are aimed at improving the balance of trade and stimulating growth. Some countries may initiate such reforms themselves as a way out of their problem - in other cases, reforms are linked to the rescheduling package and are approved and monitored by the IMF.

(c) Some of the debt may be written off by the lending governments and banks thereby reducing the interest burden and enhancing the prospects of eventual payment.

(d) Some of the debt may be converted to equity, giving foreign companies a stake in local industries and reducing the level of interest payments.

Effects of the sovereign debt crisis on multinational firms

3.10 The debt crisis has a number of adverse consequences for multinational firms which undertake FDI in less developed countries. Many of these adverse consequences result from the policies of 'economic adjustment' which are imposed on debtor countries by the IMF.

(a) *Effects of deflationary policies*. Deflationary policies imposed on LDCs by the IMF are likely to damage the profitability of multinationals' subsidiaries by reducing their sales in the local market. These deflationary policies are designed to improve the balance of payments position of the debtor countries by reducing their imports and boosting exports. Higher interest rates are likely to be introduced to suppress domestic consumer's demand for imports. However, higher interest rates will tend

to dampen domestic investment and could result in increased unemployment and loss of business confidence.

(b) *Effects of devaluation*. Devaluation of the domestic currency is a policy which the debtor country may adopt to try to boost exports. The country will be able to sell its exports more cheaply in foreign currency terms - while imports to the country will become more expensive. This will adversely affect the level of operating costs for multinational firms which make use of imported inputs to their production process.

(c) *Sourcing of imports*. Debtor countries' lack of foreign currency (arising from the need to service their debt) means that less can be imported. Host countries may require that multinationals increase their use of local inputs which may be of higher cost or lower quality than the same goods obtained from elsewhere.

(d) *Lack of capital inflows*. Measures such as the Baker Plan were intended to increase the level of lending available to debtor countries. Nevertheless, as already indicated, the international banks have not been willing to provide these increased capital inflows to the less developed countries. As a result, multinational firms operating in these countries have been forced to rely more heavily on host country funding for their activities in those countries, which they may have preferred not to do.

3.11 As well as there being adverse consequences of the debt crisis on multinationals, some positive effects can also be identified.

(a) *Deregulation*. The debtor countries have been encouraged to become more oriented to free market policies by the interventions of the IMF and the World Bank having the objective of improving the countries' export cost efficiency through the increased competition. Apart from the increased freedom of action for multinationals arising from the IMFs encouragement of fewer government restrictions, the freeing up of markets also allows multinationals to take advantage of lower real labour costs in the less developed countries.

(b) *Increased incentives*. Given the lack of lending to the debt ridden countries, many of their governments have sought to encourage multinationals to engage in FDI. This encouragement may be in the form of production subsidies or tax incentives for foreign investment. The need to encourage FDI as a means of compensating for the lack of inflows of funds has also encouraged the debtor governments to minimise regulatory interference with the activities of the multinationals.

(c) *Expanded markets*. Improved economic performance in the LDCs should increase the size of the local market available to the multinationals. As well as improving their operating performance, an increased ability to match local payments with local revenues should reduce their foreign exchange exposure and simplify their foreign exchange management.

Chapter roundup

- The international money and capital markets provide various possibilities in the form of financial instruments which the treasurer of large companies may use for borrowing or for financial investment.
- The IMF was set up partly with the role of providing finance for any countries with temporary balance of payments deficits.
- The World Bank and the IDA have tried to provide long-term finance for developing countries, to help them to continue developing.
- The funds of the IMF, World Bank and IDA have been insufficient to meet the finance needs of developing countries.
- The 'sovereign debt crisis' of South American countries has attracted much attention, but similar problems have been suffered by other countries - eg in Africa and Asia.

Test your knowledge

1 What are eurobonds? (see para 1.12)

2 What is eurocommercial paper? (1.25)

3 What are multiple option facilities? (1.32, 1.33)

4 What are the factors to consider for a company choosing between borrowing in a foreign currency or in the domestic currency? (1.34)

5 What are the broad aims of the International Monetary Fund? (2.1)

6 What is the purpose of the World Bank? (2.7)

7 What are the eurocurrency markets? (3.1 - 3.4)

8 What are the effects (both positive and negative) of the sovereign debt crisis on multinational firms engaging in foreign direct investment? (3.10, 3.11)

Now try illustrative question 17 at the end of the Study Text

Chapter 18

FOREIGN TRADE FINANCE

This chapter covers the following topics.

		Syllabus reference
1	Methods of international finance	6(a)
2	Export credit insurance	6(a)
3	Countertrade	6(a)

Introduction

In this chapter, we look at different methods of financing foreign trade and at methods of insuring against the risk of non-payment by enterprises overseas.

Trading with enterprises in other countries is sometimes transacted by barter or countertrade, which is discussed in the final section of the chapter.

1 METHODS OF INTERNATIONAL FINANCE

Finance for foreign trade

1.1 Foreign trade raises special financing problems, including the following.

(a) When goods are sold abroad, the customer might ask for credit. The period of credit might be 30 days or 60 days, say, after receipt of the goods; or perhaps 90 days after shipment.

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 stocks and debtors. These working capital investments have to be financed somehow.

(b) The risk of bad debts can be greater with foreign trade than with domestic trade. If a foreign debtor 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.

There are various measures available to exporters to overcome these problems.

1.2 Apart from credit risks, there are other risks, including the risk of currency (exchange rate) fluctuations (see Chapter 20) and political risks (see Chapter 23).

Reducing the investment in foreign debtors

1.3 A company can reduce its investment in foreign debtors by insisting on earlier payment for goods.

1.4 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.

(a) *Advances against collections*. 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. The bank will expect repayment of the advance from the proceeds of the bill or the cheque.

Advances against collections would be arranged where the bill or cheque is payable in the exporter's own country.

(b) *Documentary credits*. These are described later.

(c) *Negotiation of bills or cheques*. This 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).

The advantages of using bills of exchange in international trade

1.5 The advantages of payment by means of a bill of exchange are as follows.

(a) They provide a convenient method of collecting payments from foreign buyers.

(b) The exporter can seek immediate finance, using term bills of exchange, instead of having to wait until the period of credit expires (ie until the maturity of the bill). At the same time, the foreign buyer is allowed the full period of credit before payment is made.

(c) On payment, the foreign buyer keeps the bill as evidence of payment, so that a bill of exchange also serves as a receipt.

(d) If a bill of exchange is dishonoured, it may be used by the drawer to pursue payment by means of legal action in the drawee's country.

(e) The buyer's bank might add its name to a term bill, to indicate that it *guarantees* payment at maturity. On the continent of Europe, this procedure is known as '*avalising*' bills of exchange or providing a guarantee '*par aval*' (French) or '*por aval*' (Spanish).

Reducing the bad debt risk

1.6 Methods of minimising bad debt risks are broadly similar to those for domestic trade. An exporting company should vet the creditworthiness of each customer, and grant credit terms accordingly.

1.7 Methods of reducing the risks of bad debts in foreign trade include:

(a) export factoring;
(b) forfaiting;
(c) documentary credits; and
(d) international credit unions.

Export credit insurance is also a very important mechanism which we shall examine in Section 2 of this chapter.

Export factoring

1.8 Export factoring is essentially the same as factoring domestic trade debts, a topic covered in Paper 8.

1.9 The main aspects of factoring are:

(a) administration of the client's invoicing, sales accounting and debt collection services;

(b) 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 service is also referred to as 'debt underwriting' or the 'purchase of a client's debts'. The factor

usually purchases these debts 'without recourse' to the client, which means that if the client's debtors do not pay what they owe, the factor will not ask for his money back from the client;

(c) making payments to the client in advance of collecting the debts. This is sometimes referred to as 'factor finance' because the factor is providing cash to the client against outstanding debts.

1.10 The benefits of factoring for a business customer include the following.

(a) The business can pay its suppliers promptly, and so be able to take advantage of any early payment discounts that are available.

(b) Optimum stock levels can be maintained, because the business will have enough cash to pay for the stocks it needs.

(c) Growth can be financed through sales rather than by injecting fresh capital.

(d) The business gets finance linked to its volume of sales. In contrast, overdraft limits tend to be determined by historical balance sheets.

(e) The managers of the business do not have to spend their time on the problems of slow paying debtors.

(f) The business does not incur the costs of running its own sales ledger department.

1.11 Factoring, as compared with forfaiting which we discuss below, is widely regarded as an appropriate mechanism for trade finance and collection of receivables for small to medium-sized exporters, especially where there is a flow of small-scale contracts.

1.12 A factoring service typically offers prepayment of up to 80% against approved invoices. Service charges vary between around 0.75% and 3% of total invoice value, plus finance charges at levels comparable to bank overdraft rates for those taking advantage of prepayment arrangements.

Forfaiting

1.13 Forfaiting is a method of providing medium-term (say, three to five years) export finance, which originated in Switzerland and Germany where it is still very common. It has normally been used for export sales involving capital goods (machinery etc), where payments will be made over a number of years. Forfaiting is also used as a short-term financing tool.

1.14 Forfaiting works as follows.

(a) An exporter of capital goods finds an overseas buyer who wants medium-term credit to finance the purchase. The buyer must be willing:

(i) to pay some of the cost (perhaps 15%) at once;

(ii) to pay the balance in *regular instalments* (perhaps every six months) normally for the next five years.

(b) The buyer will either:

(i) issue a series of promissory notes; or
(ii) accept a series of drafts

with a final maturity date, say, five years ahead but providing for regular payments over this time: in other words, a series of promissory notes maturing every six months, usually each for the same amount.

(c) If the buyer has a very good credit standing, the exporter might not ask for the promissory notes (or drafts) to be guaranteed. In most cases, however, the buyer will be required to find a bank which is willing to guarantee *(avalise)* the notes or drafts.

(d) At the same time, the exporter must find a bank that is willing to be a 'forfaiter'. Some banks specialise in this type of finance.

(e) Forfaiting is the business of *discounting (negotiating)* medium-term promissory drafts or bills. Discounting is normally at a fixed rate, notified by the bank (forfaiter) to the exporter when the financing arrangement is made. If the exporter arranges forfaiting with a bank before the export contract is signed with the buyer, the exporter will be able to incorporate the cost of discounting into the contract price.

(f) The exporter will deliver the goods and receive the avalised promissory notes or accepted bills. He will then sell them to the forfaiter, who will purchase them *without recourse to the exporter.* The forfaiter must now bear the risk, ie:

(i) risks of non-payment;

(ii) political risks in the buyer's country;

(iii) the transfer risk that the buyer's country might be unable to meet its foreign exchange obligations;

(iv) the foreign exchange risk. The forfaiter holds the promissory notes and has paid cash to the exporter, and therefore it is the forfaiter who accepts the exchange risk;

(v) The collection of payment from the avalising bank.

1.15 Figure 1 should help to clarify the procedures.

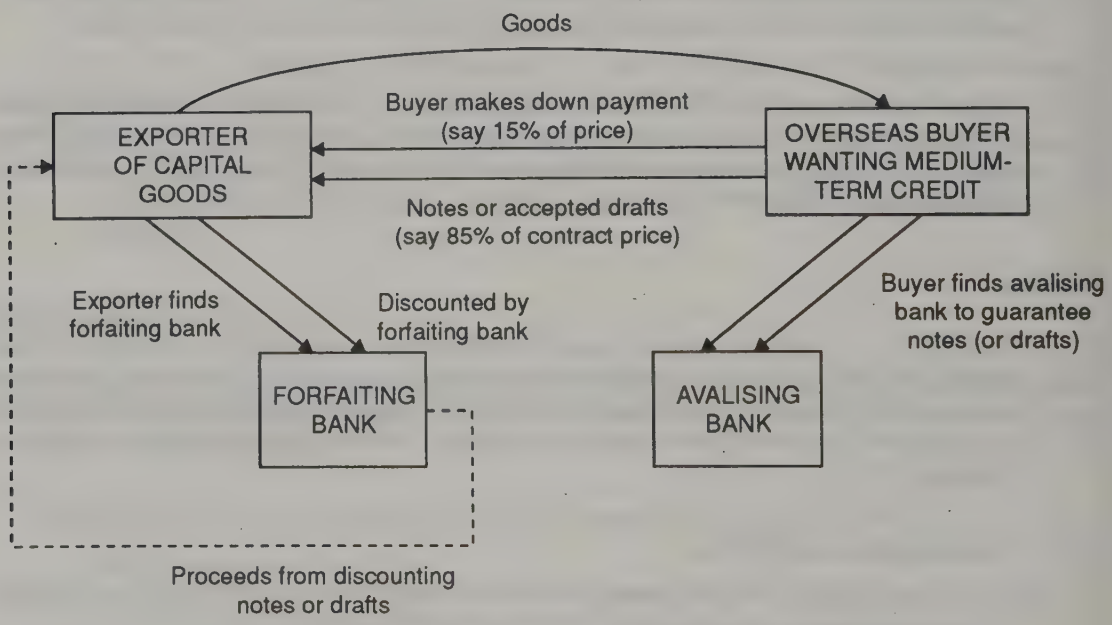


Figure 1

1.16 Forfaiting can be an expensive choice, and arranging it takes time. However, it can be a useful way of enabling trade to occur in cases where other methods of ensuring payment and smooth cash flow are not certain, and in cases where trade may not be possible by other means.

Documentary credits

1.17 Documentary credits ('letters of credit') provide a method of payment in international trade which gives the exporter a risk-free method of obtaining payment.

1.18 At the same time, documentary credits are a method of obtaining short-term finance from a bank, for working capital. This is because a bank might agree to discount or negotiate a bill of exchange, and so:

(a) the exporter receives immediate payment of the amount due to him, less the discount, instead of having to wait for payment until the end of the credit period allowed to the buyer;

(b) the buyer is able to get a period of credit before having to pay for the imports.

Banks may advance pre-shipment finance to help with manufacture.

1.19 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. This bank which issues the letter of credit is known as the *issuing bank*. The buyer is known as the *applicant* for the credit and the exporter is known as the *beneficiary* (because he receives the benefits).

1.20 The issuing bank, by issuing its letter of credit, guarantees payment to the beneficiary. Banks are involved in the credits, not in the underlying contracts.

1.21 The issuing bank asks a bank in the exporter's country to advise the credit to the exporter. This bank is known as the *advising bank*. The advising bank agrees to handle the credit (on terms arranged with the issuing bank) but does not normally make any commitment itself to guarantee payment to the exporter.

1.22 The advising bank (in the exporter's country) might be required by the issuing bank to add its own 'confirmation' to the credit. The advising bank would then be adding its own guarantee of payment to the guarantee already provided by the issuing bank. If it does confirm the credit, it is then known and the *confirming bank*. Thus, a *confirmed* letter of credit carries the guarantees of two banks, usually one in the exporter's country (the confirming bank) and one in the buyer's country (the issuing bank).

The cost of issuing a letter of credit is usually borne by the buyer.

1.23 A documentary credit arrangement must be made between the exporter, the buyer and participating banks *before the export sale takes place*. Documentary credits are slow to arrange, and administratively cumbersome; however, they might be considered essential where the risk of non-payment is high, or when dealing for the first time with an unknown buyer.

International credit unions

1.24 International credit unions are organisations or associations of finance houses or banks in different countries (in Europe). The finance houses or banks have reciprocal arrangements for providing instalment credit finance. When a buyer in one country wants to pay for imported goods by instalments the exporter can approach a member of the credit union in his own country which will then arrange for the finance to be provided through a credit union member in the importer's country. The exporter receives immediate payment without recourse to himself. The buyer obtains instalment credit finance. Without the existence of international co-operation between members of a credit union, importers would have more difficulty in obtaining instalment credit finance.

1.25 Suppose, for example, that an exporter in the UK wishes to sell some capital goods to a customer in Germany and the customer wants to pay for the goods by instalment. The exporter can approach a member of an international credit union in the UK, and ask for the necessary instalment finance to be arranged through a German member of the credit union. Details of the proposed sale will be given to the German finance house or bank,

which will then decide on the terms of instalment credit it will offer to the German buyer (in accordance with the German laws and practice). The UK finance house will receive full payment for the goods from the German finance house and pay the exporter. The German finance house is then left with a normal hire purchase agreement with the German buyer.

1.26 This type of scheme has advantages for small exporters who cannot afford to allow lengthy credit periods to its overseas customers. Examples of international credit unions are the European Credit Union and Eurocredit.

Leasing

Sale and leaseback arrangements

1.27 A company which owns its own premises can obtain finance by selling the property to an insurance company for immediate cash and renting it back, usually for at least 50 years with rent reviews every few years. The property itself will probably need to be non-specialised, modern, and situated in a geographical area with good long-term prospects for increases in property value, otherwise it would offer a poor investment to the insurance company, in the event that the tenant went out of business, or stopped renting the property for some other reason.

1.28 A company would raise more cash from a sale and leaseback agreement than from a mortgage, but it should only make such an agreement if it cannot raise sufficient funds any other way. The main disadvantages of sale and leaseback are as follows.

(a) The company loses ownership of a valuable asset which is almost certain to appreciate over time.

(b) The future borrowing capacity of the firm will be reduced, since the property if owned could be used to provide security for a loan.

(c) The company is contractually committed to occupying the property for many years ahead, and this can be restricting.

(d) The real cost is likely to be high, particularly as there will be frequent rent reviews.

Leasing

1.29 You will already be familiar with leasing and SSAP 21 from your accounting studies. Leasing in the UK is historically associated with leasehold property, but our concern here is with leasing arrangements for equipment. A lease is an agreement between two parties, the lessor and the lessee.

(a) The lessor owns a capital asset, but grants the lessee use of it. *Finance houses* (often subsidiaries of banks) act as the lessor in such arrangements;

(b) The lessee does not own the asset, but has the use of it, and in return makes payments under the terms of the lease to the lessor, for a specified period of time.

1.30 Leasing is therefore a form of rental. Leased assets have usually been plant and machinery, and cars and commercial vehicles, but might also be computers, ships, aeroplanes, oil production equipment and office equipment.

There are two basic forms of lease, operating leases and finance leases.

Operating leases

1.31 Operating leases are rental agreements between a lessor and a lessee whereby:

(a) the lessor supplies the equipment to the lessee;

(b) the lessor is responsible for servicing and maintenance of the leased equipment;

(c) the period of the lease is fairly short, less than the economic life of the asset, so that at the end of one lease agreement, the lessor can lease the same equipment to someone else.

1.32 Much of the growth in the UK leasing business in recent years has been in operating leases. With an operating lease, the lessor, often a finance house, purchases the equipment from the manufacturer and then leases it to the user (the lessee) for the agreed period.

Finance leases

1.33 Finance leases are lease agreements between the user of the leased asset (the lessee) and a provider of finance (the lessor) for most or all of the asset's expected useful life.

1.34 Suppose that a company decides to obtain a car and finance the acquisition by means of a finance lease. A car dealer will supply the car. A finance house will agree to act as lessor in a finance leasing arrangement, and so will purchase the car from the dealer and lease it to the company. The company will take possession of the car from the car dealer, and make regular payments to the finance house under the terms of the lease.

1.35 There are other important distinguishing characteristics of a finance lease.

(a) The lessee is responsible for the upkeep, servicing and maintenance of the asset. The lessor is not involved in this at all.

(b) The lease has a primary period, which covers all or most of the useful economic life of the asset. At the end of this primary period, the lessor would not be able to lease the asset again because it would be worn out or obsolete. The lessor must therefore ensure that the lease payments during the primary period pay for the full cost of the asset as well as providing the lessor with a suitable return on his investment.

(c) It is usual at the end of the primary period to allow the lessee the option to continue to lease the asset for an indefinite secondary period, in return for a very low rent, sometimes called a 'peppercorn rent'. Alternatively, the lessee might be allowed to sell the asset on a lessor's behalf (since the lessor is the legal owner) and to keep most of the sale proceeds, paying only a small percentage (perhaps 10%) to the lessor.

1.36 Under some schemes, a lessor leases equipment to the lessee for most of the equipment's life, and at the end of the lease period sells the equipment himself, with none of the sale proceeds going to the lessee.

1.37 Returning to the example of the car lease, the primary period of the lease might be three years, with an agreement by the lessee to make three annual payments of £6,000 each. The lessee will be responsible for repairs and servicing, road tax and insurance. At the end of the primary period of the lease, the lessee might be given the option either to continue leasing the car at a nominal rent (perhaps £250 a year) or to sell the car and pay the lessor 10% of the proceeds.

Why might leasing be popular?

1.38 What are the attractions of leases to the supplier of the equipment, the lessee and the lessor?

(a) The supplier of the equipment is paid in full at the beginning. The equipment is sold to the lessor, and apart from obligations under guarantees or warranties, the supplier is free from all further financial concern about the asset.

(b) The lessor invests finance by purchasing assets from suppliers and makes a return out of the lease payments received from the lessee. Provided that a lessor can find lessees willing to pay the amounts he wants to make his return, the lessor will make

good profits on his deals. He will also get capital allowances on his purchase of the equipment.

(c) Leasing might be attractive to the lessee:

(i) if the lessee does not have enough cash to pay for the asset, and may be having difficulty obtaining a bank loan to buy it, and so has to rent it in one way or another if he is to have use of the asset at all;

(ii) if finance leasing is cheaper than a bank loan. The cost of payments under a loan might exceed the cost of a lease;

(iii) because of the tax relief available.

1.39 Operating leases have further advantages.

(a) The leased equipment does not have to be shown in the lessee company's published balance sheet, and so the lessee's balance sheet shows no increase in the gearing ratio.

(b) 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, and it is the lessor who must bear the risk of being unable to sell out-of-date equipment.

1.40 Not surprisingly perhaps, a major growth area in operating leasing in the UK has been in computers and office equipment (photocopiers, fax machines and so on) where technology is continually improving.

1.41 Another form of credit finance with which leasing can be compared is hire purchase.

Hire purchase

1.42 Hire purchase (HP) is a form of instalment credit. There are two basic forms of instalment credit, whereby an individual or business purchases goods on credit and pays for them by instalments.

(a) *Lender credit* is when the buyer borrows money from a lender and uses the money to purchase goods outright.

(b) *Vendor credit* is when the buyer obtains goods on credit from a seller (vendor) and agrees to pay the vendor by instalments. Hire purchase is an example of vendor credit.

Hire purchase is similar to leasing, with the exception that ownership of the goods passes to the hire purchase customer on payment of the final credit instalment, whereas a lessee never becomes the legal owner of the goods. The HP payments consist partly of 'capital' payments towards the purchase of the asset, and partly of interest charges.

1.43 Hire purchase agreements nowadays usually involve a finance house, or finance company.

(a) The supplier sells the goods to the finance house.
(b) The supplier delivers the goods to the customer who will eventually purchase them.
(c) The hire purchase arrangement exists between the finance house and the customer.

1.44 The finance house will nearly always insist that the hirer should pay a deposit towards the purchase price, perhaps as low as 10% or even less, or as high as 33%. The size of the deposit will depend on the finance company's policy and its assessment of the hirer. This is in contrast to a finance lease, where the lessee might not be required to make any initial payment.

1.45 For example, if a company buys a car costing £10,000 under an HP agreement, the car supplier might provide HP finance over a three year period at an interest cost of 10%, and the HP payments might be, say, as follows.

	Capital element £	*Interest element* £	*Total HP payment* £
Year 0: down payment	2,540	0	2,540
Year 1	2,254	746	3,000
Year 2	2,479	521	3,000
Year 3	2,727	273	3,000
Total	10,000	1,540	11,540

1.46 The tax position on hire purchase arrangement is as follows.

(a) The buyer obtains whatever capital allowances are available, based on the capital element of the cost. Capital allowances on the full capital element of the cost can be used from the time the asset is acquired.

(b) In addition, interest payments within the HP payments are an allowable expense against tax, spread over the term of the HP agreement.

(c) Capital payments within the HP payments, however, are not allowable against tax.

1.47 In the example of the arrangement for the car given above, the car buyer would obtain whatever capital allowances are obtainable on motor vehicles, from the time of obtaining the car, plus allowances for the interest costs of £746 in year 1, £521 in year 2 and £273 in year 3.

1.48 An industrial or commercial business can use hire purchase as one alternative source of finance.

Goods bought by businesses on hire purchase include company vehicles, plant and machinery, office equipment and farming machinery. Hire purchase arrangements for fleets of motor cars are quite common, and most car manufacturers have a link with a leading finance house for point-of-sale hire purchase credit

2 EXPORT CREDIT INSURANCE

The purpose of export credit insurance

2.1 Export credit insurance is insurance against the risk of non-payment by foreign customers for export debts.

Not all exporters take out export credit insurance because premiums are very high and the benefits are sometimes not fully appreciated; but, if they do, they will obtain an insurance policy from a private insurance company that deals in export credit insurance.

2.2 Although a few private sector companies in the UK (such as Trade Indemnity) offer export credit insurance, the bulk of export credit insurance has until now been provided by ECGD and so NCM UK can be expected to have the lion's share of the market in the short term.

The government's Export Credit Guarantee Department (ECGD) also exists, providing long-term guarantees to banks on behalf of exporters.

2.3 You might be wondering why export credit insurance should be necessary, when exporters can pursue non-paying customers through the courts in order to obtain payment. The answer is that:

(a) 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;

(b) there are various reasons why non-payment might happen. Export credit insurance provides insurance against non-payment for a variety of risks in addition to the buyer's failure to pay on time. The types of risk covered are described later.

2.4 Export credit insurance is not essential, especially when exporters are reasonably confident that all their customers are trustworthy.

(We should, of course, distinguish between export credit insurance, which is insurance against the risk of non-payment by customers for goods exported and sold abroad on credit, and the insurance of the 'physical' goods themselves in transit between exporter and customer, insurance against loss or damage of the goods and so on.)

The short-term guarantee

2.5 As already mentioned, NCM UK provides of credit insurance for short-term export credit business.

A credit insurance policy for export trade on short-term credit (up to 180 days) or on cash terms is known as a short-term guarantee.

2.6 Exporters can choose to obtain credit insurance:

(a) for all their export business on a regular basis;
(b) for selected parts of their export business;
(c) for occasional, high-value export sales.

2.7 However, NCM UK prefers to provide comprehensive insurance for an exporter's entire export business.

2.8 Cover is also available for UK manufacturers and merchants (but not confirming houses) dealing in *foreign* goods, under an *endorsement* to the short-term guarantee, which was introduced in 1987. This is referred to as a multi-sourcing endorsement.

2.9 The risks covered by the short-term guarantee are non-payment by an overseas customer under any of the following circumstances:

(a) insolvency of the buyer;

(b) the buyer's failure to pay within six months of the due date, in cases where the buyer has accepted the goods sent to him by the exporter;

(c) the buyer's failure to accept the goods sent to him (*provided* non-acceptance of the goods has not been caused or excused by the exporter's own actions, and ECGD decides it would serve no useful purpose for the exporter to take up or pursue legal proceedings against the buyer);

(d) a general moratorium on debts to overseas suppliers which might be decreed by the government of the buyer's country;

(e) any other action by the government of the buyer's country which prevents performance of the contract;

(f) political events, economic difficulties, legislative measures or administrative measures arising outside the UK which prevent or delay payments under the contract;

(g) a 'shortfall' in revenue to the exporter caused by foreign exchange losses when the exporter has to accept payment in a local currency for a debt which should be paid in sterling;

(h) war, and similar disturbances outside the UK, which prevent performance of the contract;

(i) the cancellation or non-renewal of the UK export licence or a prohibition by law on the export of goods from the UK. (This risk, however, is only covered for insurance policies with a *pre-credit* risk section);

(j) in the case of 'public buyers' in the overseas country ('government' departments), the short-term guarantee also covers the risk of failure or refusal of the buyer to perform the contract, through no fault of the exporter.

2.10 These risks fall into two broad categories:

(a) the creditworthiness of the foreign buyer (buyer risks); and
(b) economic and political risks in the overseas country (country risks).

2.11 The following risks are *not* covered by the short-term guarantee:

(a) non-payment because of the exporter's failure to comply with the provisions of the insurance policy;

(b) non-payment due to causes within the exporter's control;

(c) losses due to a breach of the sale contract by the exporter;

(d) losses covered by a normal commercial insurance policy (eg damage to the exported goods, or theft of the goods);

(e) losses due to illegal activities by the exporter in either the UK or an overseas country;

(f) insolvency or default over payment by either the collecting bank or the exporter's agent;

(g) exchange risks normally covered by forward exchange contracts;

(h) any loss due to a breach of existing exchange control regulations in the buyer's country;

(i) failure on the part of the buyer to obtain the required *authority* to import the goods or make payment for them;

(j) losses incurred on the contract itself (due to the exporter's own costs in the UK).

2.12 Unless the exporter has additional pre-credit risk cover, this policy does not protect him from cancellation of the contract by the buyer before the goods are dispatched from the UK.

The percentage of cover

2.13 The percentage of the loss incurred by the exporter that this policy covers varies according to the cause of the loss.

(a) The short-term guarantee covers 90% of the loss arising from the insolvency of the buyer, or the buyer's failure to pay within six months of the due date, that is losses due to poor creditworthiness of the buyer.

(b) When the buyer fails to take up the goods dispatched to him the exporter must bear a 'first loss' of 20% of the full original invoiced price of the goods, and NCM UK will then bear 90% of the balance.

(c) For the other risks, the short-term guarantee covers 95% of the loss; there are losses due to economic and political risks in the overseas country.

Premiums

2.14 As a general guide, the premiums payable by the exporter for a comprehensive short-term guarantee are:

(a) a fixed basic premium at the start of the year;

(b) additional monthly premiums that vary with the amount of exports declared by the exporter during the month.

3 COUNTERTRADE

3.1 Countertrade involving exchange of petroleum and manufacturing goods became popular in the early 1980s as such deals provided a way of avoiding OPEC export quotas for oil-producing countries. It is also common in deals with East European countries

which are short of foreign exchange. The huge debts of many Third World and Eastern European countries have also contributed to the growth of countertrade as the only way of arranging international trade in the absence of cash or credit facilities to finance imports. It is now estimated that around 10% to 15% of international trade is conducted by some means of countertrade.

3.2 The following notes are based on the booklet *Countertrade: some guidance for exporters* issued by the Department of Trade and Industry. The quotations in these notes are all taken from this booklet.

What is countertrade?

3.3 Countertrade is a general term used to describe a variety of commercial arrangements for reciprocal international trade or barter between companies or other organisations (for example state controlled organisations) in two or more countries.

'The common characteristic of countertrade arrangements is that export sales to a particular market are made conditional upon undertakings to accept imports from that market. For example, a British exporter may sell machinery to country X on condition that he accepts agricultural products from X in payment. Simple barter deals like this are unusual and most countertrade deals are much more involved... Even at its simplest, countertrade can be a complex, expensive and uncertain mode of trading. It is fraught with pitfalls. In an ideal market it would not arise. It is, however, growing, fast becoming a fact of international trade and cannot be ignored.'

3.4 Countertrade can be costly for the exporter: it creates lengthy and cumbersome administrative problems just to set up a countertrade arrangement. It is fraught with uncertainty, and deals can easily collapse or go wrong. Small and medium-sized firms might be unable and unwilling to accept the costs and administrative burdens of exporting by means of countertrade arrangements. However, in some situations, countertrade might be the only way of securing export orders.

To give one example, the furnishings retailer Ikea engages in numerous countertrade deals in order to overcome the difficult trading conditions which still prevail in Eastern Europe.

Forms of countertrade

3.5 The mechanics of countertrade arrangements vary according to circumstances, but the most common forms of countertrade are the following.

(a) *Counterpurchase*
As a condition for obtaining an export order, the exporter undertakes to purchase goods or services from the country concerned. There are two parallel and concurrent contracts, but they are separate contracts nonetheless:

(i) the principal (export) order is paid for on normal cash or credit terms;

(ii) the counterpurchase order, which may be for goods or services ranging in value from 10% to 100% or even more of the principal order.

The counterpurchase order might be a binding contract for specific goods, or it might just be a declaration of intent. The goods in the counterpurchase order might be totally unrelated to the goods in the principal export order, and might involve parties unrelated to this sales contract.

Counterpurchase in the most common form of countertrade, especially with the former Communist bloc countries of Eastern Europe and also Indonesia.

(b) *Barter*
This is the direct exchange of goods for goods, in a single sales contract. The export goods are therefore paid for with goods (or services) from the importing country, and in the simplest cases of barter deals, no cash payments at all are made. 'In practice, supply of the principal exports is held up until sufficient revenue has been earned from selling the bartered goods.' Barter has been sought in the past by some

countries of Latin America and Africa with extensive foreign currency restrictions, but barter deals are rare.

(c) *Buyback (or compensation deals)*
This is a form of barter whereby the exporter of *capital plant or equipment* agrees to repayment from the proceeds of the output that the plant or equipment eventually produces. 'For example, exporters of equipment for a chemical works may be repaid with part of the resulting output from that works. Most common in connection with exports of process plant, mining equipment and similar orders, buyback arrangements tend to be much longer term and for much larger amounts than counterpurchase or simple barter deals.'

(d) *Offset*
This is a form of countertrade used especially with the export of products that embody advanced technology. The principle behind offset arrangements is that the importing country seeks to develop its own industrial capabilities, especially in advanced technology. An offset agreement involves the export of goods whereby the exporter agrees to incorporate into the final goods 'specified materials, components or sub-assemblies procured within the importing country'.

Offset arrangements have long been a feature of international trade in defence systems and aircraft, but it is now becoming more common with other types of product. A variant of offset occurs with large export contracts which are awarded on condition that the exporter establishes local production facilities or some other form of long-term industrial co- operation.

(e) *Switch trading*
This is perhaps best explained by quoting the DTI booklet in full.

'Imbalance in long-term bilateral trading agreements, usually between Comecon countries and developing nations, sometimes leads to the accumulation of uncleared credit surpluses in one or other country: for example, Brazil at one time had a large credit surplus with Poland. The surpluses can sometimes be tapped by third parties, so that (for example) UK exports to Brazil might be financed from the sale of Polish goods to the UK or elsewhere. Such transactions are known as 'switch' or 'swap' deals, because they typically involve switching the documentation (and destination) of goods on the high seas. Switch deals can be very complex, involving a chain of buyers, sellers and brokers in different markets.'

(f) *Evidence accounts*
Companies that conduct a large amount of continuing business in a country may be required to arrange counterpurchases at least equal in value to their exports to the country. 'For example, a multinational firm with a local manufacturing subsidiary in a developing country may be required to ensure counterpurchased exports of equivalent value to their subsidiary's imports of material and equipment.' Since the company will be continuously trading with the country concerned, it would be impractical to arrange counterpurchases for each individual import consignment into the country, and so the company may maintain an 'evidence account':

(i) debiting its imports into the country;
(ii) crediting the exports it has arranged.

The evidence account must be kept more or less in balance year by year.

Why do countries wish to use countertrade?

3.6 Some countries have insisted on imposing countertrade requirements for some of their international trade. The reasons for countertrade are chiefly that as follows.

(a) Some countries lack commercial credit or convertible foreign currency to pay for imports, and so countertrade is needed to finance imports.

(b) Some developing countries (such as Brazil and India) use countertrade to boost their developing manufacturing industries, which can export more goods by means of countertrade arrangements than they would otherwise be able to.

(c) Some communist countries have in the past used countertrade as an instrument of their political and economic policies (to achieve a balance of trade, or long-term commercial and industrial relationships with other countries).

(d) In a buyer's market, to obtain more trade or obtain new technology from another country (offset arrangements, especially for defence equipment).

Which countries have countertrade requirements?

3.7 Countertrade is unusual between industrial countries, with the exception of defence, aviation and big advanced technology deals. However, Australia and New Zealand have mandatory countertrade requirements (offset arrangements) for public sector purchases. Eastern European countries have used countertrade since 1945, and in 1989 this affected about 20% of their trade with the West.

3.8 Some oil exporting countries (Libya, Iran and Iraq) have sometimes required exporters bidding for large public sector contracts to accept payment in oil. The exporter will then have to find an oil distributor willing to buy the oil (at a discount on market prices) and much depends on the current market prices, whether there is a large surplus of oil and the size of the discount asked for by the oil distributor.

3.9 The main growth in countertrade has been among the less developed and developing countries of Latin America (such as Brazil), Africa and Asia. 'Although many LDCs have on occasion sought countertrade arrangements... the number of deals actually transacted has been constrained by the lack of effective organisational arrangements in the LDCs and by their inability to provide sufficient marketable goods for the counterpurchase.'

Exercise

Countertrade can involve problems for the exporter, in addition to 'normal' export risks. See if you can think what problems might arise, before looking at the next paragraph.

Problems with countertrade

3.10 The problems which may arise in countertrade include the following.

(a) The *costs* of countertrade (see below) might exceed the exporter's expectations. The exporter might increase the export price to cover the extra costs, or he might try to absorb the extra costs himself.

(b) The exporter might be pushed into agreeing to accept large quantities of unmarketable goods without any means of disposing of them.

(c) The importer's country might place an unrealistically high value on the goods they wish to countertrade (for example if British Steel were offered surgical instruments by India in a countertrade deal to export steel, the Indian government might place too high a value on what the Indian surgical instruments can really be sold for on the market).

(d) Several parties are likely to be involved in a countertrade arrangement, and this increases the risks of cancellation of the export order, due to one party failing to fulfil its contractual obligations.

What are the extra costs of countertrade?

3.11 The costs of countertrade include:

(a) fees of specialist consultants who advise on countertrade negotiations;

(b) the discount or 'disagio' necessary to dispose of the goods in countertrade. The size of the discount varies from 2-3% for high grade materials and commodities to 25-30% (and sometimes as much as 40-50%) for low-quality manufactured goods;

(c) counterpurchase undertakings can be dealt with by assigning the counterpurchase obligations for a fee, to a third party trading house or broker;

(d) insurance costs;

(e) bank fees, where a bank provides advice and help on countertrade matters (eg negotiations, disposal of countertraded goods).

Chapter roundup

- The various methods of providing export and import finance should be understood. Export factoring provides all the advantages of factoring generally and is especially useful in assessing credit risk. International credit unions and forfaiting provide medium term finance for importers of capital goods.
- It is worth remembering that the exporter can obtain finance from the foreign buyer (by insisting on cash with order) and the importer can obtain finance from the foreign supplier (by means of normal trade credit, perhaps evidenced by a term bill of exchange).
- Various forms of credit insurance are available to exporters.
- Countertrade is a complex and possibly expensive means of trading with poor and less developed countries. It can take several forms.

Test your knowledge

1 What services do factors provide? (see para 1.9)

2 In what type of situation might forfaiting be used? (1.13)

3 How are documentary credits used? (1.17 - 1.19)

4 What is an international credit union? (1.24)

5 What is the purpose of export credit insurance, and when is it needed? (2.1 - 2.4)

6 Outline the various forms of countertrade. (3.5)

Now try illustrative question 18 at the end of the Study Text

Chapter 19

EXCHANGE RATES

This chapter covers the following topics.

		Syllabus reference
1	Exchange rates	4(c), 5(g)
2	Influences on exchange rates	5(g)
3	Exchange rate systems	5(g)
4	European monetary cooperation	5(g)

Introduction

In this chapter, we discuss exchange rates, the factors influencing them, and the various attempts which have been made to coordinate and stabilise exchange rates.

An understanding of exchange rates is important for financial managers.

(a) Financial managers working in businesses engaged in foreign trade need to understand how exchange rates influence foreign trade transactions. Chapters 17 and 18 covered aspects of foreign trade, while in Chapters 20 to 22 we go on to look at the related area of risk management.

(b) All financial managers and accountants should have an appreciation of the importance of exchange rates in macroeconomic developments which affect their firms, such as inflation and economic recession.

1 EXCHANGE RATES

12/94, 6/95

Exchange rates

1.1 An exchange rate is the rate at which one country's currency can be traded in exchange for another country's currency.

1.2 Although it is convenient to refer to the 'exchange rate' for currency - eg the exchange rate for sterling - every traded currency in fact has many exchange rates. There is an exchange rate with every other traded currency on the foreign exchange markets, so that there is an exchange rate for sterling with the US dollar, the Canadian dollar, the yen, the deutschmark, the French franc, and so on.

1.3 Foreign exchange dealers make their profit by buying currency for less than they pay for it, and so there are really two exchange rates, a selling rate and a buying rate; eg:

	Bank's selling rate	*Bank's buying rate*
£/US dollar exchange rate	$1.5020	$1.5080

Spot rates and forward rates

1.4 Broadly speaking, there are two ways in which foreign currency is bought and sold:

(a) *spot* - for immediate 'delivery';
(b) *forward* - for delivery at a date in the future.

1.5 Thus, a UK firm might receive US$100,000 from a US customer, and sell it 'spot' to a bank, to receive sterling immediately (in practice normally two business days after the contract is made). If the exchange rate is $1.8000 to £1, the UK firm would receive £55,555.56.

1.6 If a firm knows that it is going to receive some foreign currency in the near future, which it will want to sell in exchange for domestic currency, it can make a forward exchange contract with a bank, at an exchange rate that is specified in the contract. Thus, if a firm knows that it is going to receive US$100,000 in three months' time, it can make a forward exchange contract 'now' to sell the US dollars in three months' time at a specified exchange rate. If the 'spot' rate is $1.8000 to £1, the 'forward' rate may be higher or lower than $1.8000 depending on comparative interest rates in the USA and the UK.

The foreign exchange (FX) markets

1.7 The foreign exchange (or 'forex') markets are worldwide, and are continuing to expand. The main dealers are banks. By far the largest currency dealing centre in the world is London, with a huge *daily* turnover of US$464 billion according to a 1995 survey (60% up on three years earlier). Around 350 banks deal regularly in the London forex market. The next largest centre is New York, with around half of the level of business in London, followed by Tokyo, Singapore, Hong Kong, Zurich and Frankfurt.

(a) Banks buy currency from customers and sell currency to customers - typically, exporting and importing firms.

(b) Banks may buy currency from the government or sell currency to the government - this is how a government builds up its official reserves.

(c) Banks also buy and sell currency between themselves.

Consider what is actually happening when currencies are bought and sold: essentially, bank deposits denominated in one currency are being exchanged for bank deposits denominated in another currency.

1.8 International trade involves foreign currency, for either the buyer, the seller, or both (for example, a Saudi Arabian firm might sell goods to a UK buyer and invoice for the goods in US dollars). As a consequence, it is quite likely that exporters might want to sell foreign currency earnings to a bank in exchange for domestic currency, and that importers might want to buy foreign currency from a bank in order to pay a foreign supplier.

1.9 Although demand to buy and sell foreign currencies arises from the demand of individuals (for example, tourists going abroad) and firms (for example, importers, exporters, firms investing overseas and governments) the bulk buying and selling of foreign currencies is done mainly by banks in the foreign exchange markets of the world, such as London.

1.10 Since most foreign exchange rates are not fixed but are allowed to vary, rates are continually changing and each bank will offer new rates for new customer enquiries according to how its dealers judge the market situation. Dealers are kept continually informed of rates at which deals are currently being made, by means of computerised information services.

1.11 Although exchange rates in the market are influenced by the forces of supply and demand, a government's policy on the exchange rate for its currency can have an important effect on how the exchange rate is determined.

Foreign currency quotations

1.12 The price of foreign currency (the exchange rate) is normally quoted in terms of the local currency. The exchange rates between pounds sterling and various foreign currencies are shown in the Financial Times for each day as below.

POUND SPOT - FORWARD AGAINST THE POUND

May 10	Day's spread	Close	One month	% p.a.	Three months	% p.a.
US	1.5310 - 1.5660	1.5345 - 1.5355	0.39-0.37cpm	2.97	1.09-1.06pm	2.80
Canada	1.9430 - 1.9895	1.9460 - 1.9470	0.19-0.11cpm	0.92	0.50-0.36pm	0.88
Netherlands	2.7600 - 2.7900	2.7600 - 2.7700	$\frac{3}{8}$-$1\frac{1}{2}$cdis	-1.90	$\frac{3}{4}$-$1\frac{1}{8}$dis	-1.36
Belgium	50.55 - 51.10	50.75 - 50.85	4-8cdis	-1.42	14-21dis	-1.38
Denmark	9.5010 - 9.5760	9.5200 - 9.5300	$2\frac{7}{8}$-$4\frac{3}{8}$oredis	-4.57	8-$9\frac{3}{4}$dis	-3.73
Ireland	1.0075 - 1.0165	1.0145 - 1.0155	0.17-0.20cdis	-2.19	0.46-0.52dis	-1.93
Germany	2.4600 - 2.4865	2.4600 - 2.4650	$\frac{3}{8}$-$1\frac{1}{2}$pfdis	-2.13	$\frac{7}{8}$-$1\frac{1}{8}$dis	-1.62
Portugal	227.95 - 230.30	228.40 - 229.40	225-429cdis	-17.14	429-644dis	-9.38
Spain	180.20 - 181.85	180.40 - 180.70	158-176cdis	-11.10	399-426dis	-9.14
Italy	2263.10 - 2284.10	2269.75 - 2270.75	9-12liredis	-5.55	27-29dis	-4.93
Norway	10.3840 - 10.4920	10.3875 - 10.3975	$1\frac{1}{8}$-$2\frac{5}{8}$oredis	-2.17	$2\frac{3}{4}$-$4\frac{1}{2}$dis	-1.40
France	8.2875 - 8.3735	8.2875 - 8.2975	$1\frac{1}{2}$-$1\frac{7}{8}$cdis	-2.44	$3\frac{3}{8}$-4dis	-1.78
Sweden	11.3390 - 11.4580	11.3575 - 11.3675	$2\frac{7}{8}$-$4\frac{1}{4}$oredis	-3.76	$7\frac{3}{4}$-$9\frac{1}{4}$dis	-2.99
Japan	171.00 - 173.00	171.00 - 172.00	$\frac{1}{2}$-$\frac{3}{8}$ypm	3.06	$1\frac{1}{4}$-$1\frac{1}{8}$pm	2.77
Austria	17.29 - 17.48	17.30 - 17.33	$1\frac{3}{8}$-$2\frac{1}{2}$grodis	-1.34	$4\frac{3}{8}$-$6\frac{3}{8}$dis	-1.24
Switzerland	2.2215 - 2.2430	2.2275 - 2.2375	$\frac{1}{4}$-parcpm	0.67	$\frac{5}{8}$-$\frac{3}{8}$pm	0.90
Ecu	1.2575 - 1.2645	1.2600 - 1.2610	0.26-0.31cdis	-2.71	0.46-0.51dis	-1.54

Commercial rates taken towards the end of London trading. Six-month forward dollar 2.11-2.06pm . 12 Month 3.98-3.88pm.

1.13 We can see from the above table that the closing spot rate between sterling and the US dollar was £1 = $1.5345 - 1.5355 on the day in question.

(a) The lower price is the *offer price*. The dealer is willing to offer $1.5345 in exchange for £1.

(b) The higher price $1.5355 is the *bid price*. The dealer is willing to give £1 for every $1.5355 received.

1.14 The difference between the offer price and the bid price, covering dealers' costs and profit, is called the *spread*. The size of the spread will depend upon the dealer and the type of transaction involved. For example, the spread faced by tourists seeking foreign exchange in the form of banknotes will be much larger than for substantial transactions of large companies.

1.15 As we have seen, forward exchange transactions will be at prices agreed now. The table shows that the one month forward price is at a premium of 0.39 - 0.37 cents on the spot price. This premium (or discount) is called the *swap rate*. The premium reflects the expectation of the markets that a deposit in pounds sterling will decline against a deposit in US dollars over the next month. For a one month forward transaction, less dollars will be paid per pound than the spot price.

(a) The one month forward offer price will be $(1.5345 – 0.0039) = $1.5306.
(b) The one month forward bid price is $(1.5355 – 0.0037) = $1.5318.

If the forward rate was at a discount ('dis') to the spot rate, then we would add the swap rate to the spot rate to arrive at the forward rate.

1.16 The three month forward rates can be calculated in a similar way.

(a) The three month forward offer price is $(1.5345 – 0.0109) = $1.5236.
(b) The three month forward bid price is $(1.5355 – 0.0106) = $1.5249.

1.17 We should bear in mind that the forward rate may be higher or lower than the spot rate turns out to be at the relevant date, because it is not possible for the markets to forecast exchange rates perfectly.

Exercise

Using the table above, set out the following rates (offer and bid prices) for the German deutschmark against the pound sterling as they were toward the end of the day's trading.

(a) Spot rate
(b) One month forward rate
(c) Three month forward rate

Solution

(a) DM2.4600 - DM2.4650

(b) DM(2.4600 + 0.00375) - DM(2.4650 + 0.0050)
ie DM2.46375 - DM2.47000

(c) DM(2.4600 + 0.00875) - DM(2.4650 + 0.01125)
ie DM2.46875 - DM2.47625

Measuring changes in a currency's exchange rates

1.18 When exchange rates fluctuate all the time, day by day, on the forex markets, it is obviously not possible to measure the exchange rate for any individual currency against a fixed standard. Sterling for example, changes in value continually against the US dollar, the deutschmark, the yen, the French franc, the Swiss franc, the Belgian franc, the lira, the Canadian dollar and so on.

1.19 How, then, can a currency's exchange rate trend be reported?

For any currency, there are two common methods of reporting exchange rates (assuming that exchange rates are not 'fixed' by international agreement):

(a) reporting the exchange rate for a currency against the foreign currency in which most foreign exchange deals are made;

(b) reporting the exchange rate against a 'basket' of other currencies on a trade-weighted basis.

1.20 In the case of sterling, the exchange rate is commonly reported:

(a) against the US dollar, because most foreign exchange deals in sterling are made in US dollars;

(b) against the deutschmark, largely because of the deutschmark's importance in the European Monetary System;

(c) against a basket of other currencies on a trade-weighted basis, as with the Exchange Rate Index (ERI).

2 INFLUENCES ON EXCHANGE RATES 6/95

Factors influencing the exchange rate for a currency

2.1 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.

2.2 Supply and demand in turn are influenced by:

(a) the rate of inflation, compared with the rate of inflation in other countries;
(b) interest rates, compared with interest rates in other countries;
(c) the balance of payments;
(d) sentiment of foreign exchange market participants regarding economic prospects;
(e) speculation;
(f) government policy on intervention to influence the exchange rate.

2.3 Other factors influence the exchange rate through their relationship with the items identified above. For example:

(a) total income and expenditure (demand) in the domestic economy determines the demand for goods, including:

(i) imported goods;

(ii) goods produced in the country which would otherwise be exported if demand for them did not exist in the home markets;

(b) output capacity and the level of employment in the domestic economy might influence the balance of payments, because if the domestic economy has full employment already, it will be unable to increase its volume of production for exports;

(c) the growth in the money supply influences interest rates and domestic inflation.

Purchasing power parity theory

2.4 If the rate of inflation is higher in one country than in another country, the value of its currency will tend to weaken against the other country's currency.

2.5 *Purchasing power parity theory,* which developed in the 1920s, attempted to explain changes in the exchange rate exclusively by the rate of inflation in different countries. The theory predicts that the exchange value of a 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. This is sometimes referred to as the 'law of one price'.

2.6 Formally, purchasing power parity is expressed in the following equation.

$$\frac{S_t - S_o}{S_o} = \frac{i_f - i_{uk}}{1 + i_{uk}} \quad \text{or} \quad S_t = S_o \times \frac{1 + i_f}{1 + i_{uk}}$$

where

S_o is the current spot exchange rate (at time 0)
S_t is the expected spot rate at time t
i_f is the expected inflation in the foreign country to time t (expressed as a decimal)
i_{uk} is the expected inflation in the home country to time t (expressed as a decimal)

2.7 The formula $\frac{i_f - i_{uk}}{1 + i_{uk}}$ is included on the Paper 14 *Formulae Sheet.*

Example: Purchasing power parity

2.8 The exchange rate between UK sterling and the French franc is £1 = 8.00 francs. Assuming that there is now purchasing parity, an amount of a commodity costing £110 in the UK will cost 880 French francs. Over the next year, price inflation in France is expected to be 5% while inflation in the UK is expected to be 8%. What is the expected spot exchange rate at the end of the year?

Using the formula above:

$$\frac{S_t - 8.00}{8.00} = \frac{0.05 - 0.08}{1 + 0.08}$$

$$S_t - 8.00 = 8.00 \times \frac{-0.03}{1.08}$$

$$S_t = 8.00 - 0.22 = 7.78$$

or, using the second formula:

$$S_t = 8.00 \times \frac{1.05}{1.08} = 7.78$$

2.9 This is the same figure as we get if we compare the inflated prices for the commodity. At the end of the year:

UK price = £110 × 1.08 = £118.80

France price = FF880 × 1.05 = FF924

S_t = 924 ÷ 118.80 = 7.78

Alternative formula

2.10 Purchasing power parity can also be expressed as:

$$\frac{S_t}{S_o} = \frac{1+i_f}{1+i_{uk}}$$

2.11 In the example above, we can see using this formula that:

$$\frac{7.78}{8.00} = \frac{1.05}{1.08}$$

2.12 In the real world, exchange rates move towards purchasing power parity only over the long term. However, the theory is sometimes used to predict future exchange rates in investment appraisal problems where forecasts of relative inflation rates are available.

Interest rates and the exchange rate

2.13 It would seem logical to assume that if one country raises its interest rates, it will become more profitable to invest in that country, and so an increase in (mainly short-term) investment from overseas will push up the exchange rate because of the extra demand for the currency from overseas investors.

2.14 This is true, but there is a limit to the amount of investment capital that will flow into a country because of higher interest rates. A major reason this is that investors may expect a 'risk premium' for investing in a high interest rate currency if they fear that the currency will depreciate in value.

The Fisher effect

2.15 The term *Fisher effect* is sometimes used in looking at the relationship between interest rates and expected rates of inflation.

2.16 The rate of interest can be seen as made up of two parts: the real required rate of return plus a premium for inflation. Then:

(1+ nominal rate of interest) = (1 + real rate of interest) × (1 + expected rate of inflation)

2.17 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.

2.18 According to the *international Fisher effect*, the currency of countries with relatively high interest rates is expected to depreciate against currency's 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.

2.19 This can be expressed as:

$$\frac{1 + r_f}{1 + r_{uk}} = \frac{1 + i_f}{1 + i_{uk}}$$

where

r_f is the nominal interest rate in the foreign country

r_{uk} is the nominal interest rate in the home country

The balance of payments and the exchange rate

2.20 Although the influence of flows of money within the balance of payments is obvious, it is not predominant. This is apparent from the fact that if exchange rates did respond to demand and supply for current account items, then the balance of payments on the current account of all countries would tend towards equilibrium. This is not so, and in practice other factors influence exchange rates more strongly.

2.21 Demand for currency to invest in overseas capital investments and supply of currency from firms disinvesting in an overseas currency have more influence on the exchange rate, in the short term at least, than the demand and supply of goods and services.

2.22 However, if a country has a continual deficit in its balance of payments current account, international confidence in that country's currency will eventually be eroded, and in the long term, its exchange rate will fall as capital inflows are no longer sufficient to counterbalance the country's trade deficit.

Speculation and the exchange rate

2.23 Speculators in foreign exchange are investors who buy or sell assets in a foreign currency, in the expectation of a rise of fall in the exchange rate, from which they seek to make a profit.

(a) Speculation could be a stabilising influence. For example, if a country has a deficit on its current account in the balance of payments, there will be pressure on its currency to weaken. However, if speculators take the view that the deficit is only temporary, they might purchase assets in the currency when there is a balance of payments deficit and sell them, perhaps at a small profit, when the balance returns to surplus later.

(b) However, speculation is more likely to be destabilising by creating such a high volume of demand to buy or sell a particular currency that the exchange rate moves to a level where it is overvalued or under-valued in terms of what 'hard economic facts' suggest it should be.

If a currency does become undervalued by heavy speculative selling, investors can make a further profit by purchasing it at the undervalued price and selling it later when its price rises.

2.24 In an article published in the *Bank of England Quarterly Bulletin* (August 1995), Professor Alan Kirkman argues that the large fluctuations in exchange rates which are commonplace are based not on the arrival of new information about fundamental economic changes, but rather on a kind of 'herd instinct' as dealers seek to follow each other's moves ever more closely. Speculative dealers will often do better by following the movements of the 'herd', even if these are based on a false reading of the fundamentals.

Speculation, when it is destabilising, could damage a country's economy because the uncertainty about exchange rates disrupts trade in goods and services.

Other factors influencing the exchange rate

2.25 Before we consider government *intervention* as an influence on exchange rates, there are a number of other factors to note which influence the exchange rate of a currency because they affect the trade in goods and services and capital investments. These are as follows.

(a) The *natural resources of the country*. A country which is rich in natural resources should benefit not only from a net surplus on its current account (exports less payments of interest and dividends) but also from long term capital investment from overseas investors wanting to invest in the future exploitation of the resources. The country's currency should therefore be strong in the foreign exchange market.

(b) The *political stability of the country*. A country with an uncertain political or economic future is likely to suffer from disinvestment and speculation against its currency.

(c) Government intervention taking the form of *exchange controls, import controls or import tariffs*. If there is no retaliation by other countries against such measures, their effect should be to strengthen the exchange rate.

(d) Some currencies (especially the US dollar but also the yen and deutschmark, for example) being held as *reserve currencies* by other countries. (A reserve currency is a currency used as part of the official reserves of another country). Trading in a reserve currency by the governments of these other countries will influence the exchange rate of the currency.

(e) *Speculation*. Speculation in a currency might be carried out by traders as well as investors of capital. When a currency is expected to devalue or depreciate, debtors who owe money in that currency will pay their debts more slowly, hoping that the currency will become cheaper by the time they have to pay. Debtors owing money in a currency which is expected to appreciate will pay more quickly, before the currency becomes more expensive. Quicker payments temporarily increase the demand for the currency in the foreign exchange market and slower payments temporarily reduce demand for a currency. These leads and lags add to the speculative pressure on currencies by altering supply and demand.

Forecasting exchange rates

2.26 A variety of foreign exchange forecasting services are offered by banks and independent consultants. Long-term forecasts of exchange rates provided by such services are likely to be based on fundamental economic analysis, for example of the balance of payments, relative rates of inflation and interest rates and purchasing power parities. Short-term forecasts could be based on technical analyses of a type similar to that used in technical analysis of share prices. Some multinational enterprises carry out their own foreign exchange forecasting in-house.

2.27 Can exchange rates be successfully forecast? As with equity markets, the success of the forecasts depends on the forecaster being able to 'beat the market'. The more efficient the foreign exchange market is, the more likely it is that changes in exchange rates are instances of 'random walks', in which case past price changes provide no guide to the future. If markets are less efficient, it is more likely that a forecaster is able to discover some relationship which holds and makes for successful forecasts.

Government intervention

2.28 The government can intervene in the foreign exchange markets:

(a) to sell its own domestic currency in exchange for foreign currencies, when it wants to keep down the exchange rate of its domestic currency. The foreign currencies it buys can be added to the official reserves;

(b) to buy its own domestic currency and pay for it with the foreign currencies in its official reserves. It will do this when it wants to keep up the exchange rate when market forces are pushing it down.

2.29 The government can also intervene indirectly, by changing domestic interest rates, and so either attracting or discouraging investors in financial investments which are denominated in the domestic currency. Purchases and sales of foreign investments create a demand and supply of the currency in the FX markets, and so changes in domestic interest rates are likely to cause a change in the exchange rate.

2.30 By managing the exchange rate for its currency, a government does not stop all fluctuations in the exchange rate, but it tries to keep the fluctuations within certain limits. These limits might be:

(a) 'unofficial' - a government might intervene in the foreign exchange markets and sell foreign currency from its official reserves to buy the domestic currency, and so support its exchange rate, even though there is no officially declared exchange rate that it is trying to support;

(b) official - for example countries in the European Exchange Rate Mechanism (ERM) allow their domestic currency to fluctuate against each other's currency only within specified limits. (Devaluation or revaluation beyond those limits is only permitted following a 'realignment' of ERM currencies.)

Consequences of an exchange rate policy

2.31 Reasons for a policy of controlling the exchange rate may be:

(a) to rectify a balance of trade deficit, by trying to bring about a fall in the exchange rate;

(b) to prevent a balance of trade surplus from getting too large, by trying to bring about a limited rise in the exchange rate. Japan has been under international pressure to do this in recent years, and the Japanese government has attempted to 'manage' an appreciation of the yen to a level consistent with its general economic policy;

(c) to emulate economic conditions in other countries. The UK's membership of the ERM (discussed later) had as one of its aims that of emulating the conditions of lower inflation which exist in other ERM member countries.

Stabilising the exchange rate

2.32 A country's government might have a policy of wanting to stabilise the exchange rate of its currency. A stable currency increases confidence in the currency and promotes international trade.

(a) Exporters do not want their profit on trading to be wiped out by an adverse movement in exchange rates, which means that their foreign currency earnings are worth less in domestic currency than they anticipated when the export sale was made.

(b) Similarly, importers do not want to find that the cost of imported goods rises unexpectedly because of an adverse exchange rate movement, which means that they must spend more domestic currency to buy the foreign currency to pay their overseas suppliers.

Exchange rate policy and inflation

2.33 Suppose sterling is devalued. What would happen?

(a) *Exports*, priced mainly in pounds, would become cheaper to foreign buyers. The volume and value of exports would rise.

(b) *Imports*, priced mainly in foreign currencies, would become more expensive to UK buyers. However, since demand for imports is price inelastic, UK buyers continue

to buy imports in large quantities, even at higher prices. For a country such as the UK, which depends heavily on imports, these higher import prices could add to the rate of inflation.

(c) *Inflation*. There could be an increase in the rate of inflation, because of:

(i) higher import prices;
(ii) higher wage settlements by UK firms.

If UK firms export goods abroad, a depreciation in sterling would help to boost their export sales and profits. This could encourage them to agree to higher wage settlements for employees, which could also be inflationary.

(d) *Balance of trade*. As a result of a depreciation in sterling, exports would rise, but so too would imports (due to inelastic demand). The balance of trade *might* improve, but not necessarily by much.

(e) *Capital transactions*. As a result of a depreciation in sterling, or a threatened depreciation, investors would switch capital out of sterling and into other currencies. These capital movements would result in sales of sterling on the FX markets, and create pressures for further depreciation.

3 EXCHANGE RATE SYSTEMS 6/96

3.1 We shall now go on to consider in more detail the different exchange rate policies which are open to governments. These may be categorised as:

(a) fixed exchange rates;
(b) free floating exchange rates;
(c) margins around a moveable peg;
(d) managed floating.

Fixed exchange rates

3.2 A policy of rigidly fixed exchange rates means that the government of every country in the international monetary system must use its official reserves to create an exact match between supply and demand for its currency in the FX markets, in order to keep the exchange rate unchanged. Using the official reserves will therefore cancel out a surplus or deficit on the current account and non-official capital transactions in their balance of payments. A balance of payments surplus would call for an addition to the official reserves, and a deficit calls for drawings on official reserves.

3.3 The official reserves could in theory consist of any foreign currency (or gold) within the fixed exchange rate agreement. The exchange rates of the various currencies in the system might all be fixed against each other. However, for simplicity and convenience, it is more appropriate to fix the exchange rate for every currency against a standard. The standard might be:

(a) gold. If every currency is valued in terms of gold, official reserves would consist mainly, or even entirely, of gold;

(b) a major currency, such as the US dollar. If every currency is valued in terms of the dollar, the fixed exchange rate between currencies is easily calculated. The dollars would then be the major reserve currency;

(c) a basket of major trading currencies. For example, as explained below, the ecu (European Currency Unit) is an 'international currency' which is based on a 'basket' of currencies of EU countries. The exchange rates of currencies in the exchange rate mechanism of the European Monetary System (EMS) are thus linked (but not rigidly fixed) to the value of the ecu.

3.4 A fixed exchange rate system removes exchange rate uncertainty and so encourages international trade. It also imposes economic disciplines on countries in deficit (or surplus). However, this restricts independence of domestic economic policies. A government might be forced to keep interest rates high or to reduce demand in the

domestic economy (for example by raising taxes and so cutting the demand for imports) in order to maintain a currency's exchange rate and avoid a devaluation.

3.5 If levels of inflation differ widely in countries subscribing to a fixed exchange rate regime, the regime may not survive for long. The high inflation countries will be forced to devalue in order to keep their exports competitive and to reduce imports.

3.6 There is inevitably some loss of flexibility in economic policy making once a country joins a fixed exchange rate regime. The UK is a case in point: Norman Lamont, the (then) Chancellor of the Exchequer, acknowledged in his 1992 Budget speech that within the semi-fixed ERM system 'monetary policy is primarily directed at the maintenance of sterling's parity' within the system.

Floating exchange rates

3.7 Free floating exchange rates are at the opposite end of the spectrum to rigidly fixed rates. Exchange rates are left to the free play of market forces and there is no official financing at all. There is no need for the government to hold any official reserves, because it will not want to use them.

3.8 Floating exchange rate systems (free floating and managed floating) have been criticised in the past because they allow wide fluctuations in exchange rates. Certainly, in the foreign exchange markets today, there are large fluctuations which are unsettling for international trade. However, the (then) Governor of the Bank of England said in a speech (September 1981) that: 'Wide fluctuations in exchange rates are not a reason for criticising floating rate policies, since the underlying economic turbulence would have made a fixed rate system difficult, if not impossible, to work.'

3.9 Floating exchange rates (whether free floating or managed floating) are the only option available to governments when other systems break down and fail. Professor Friedman remarked (1967) 'Floating exchange rates have often been adopted by countries experiencing financial crises when all other devices have failed. That is a major reason why they have such a bad reputation.' In practice, countries would operate 'managed floating' of their currency and a policy of allowing a currency to float freely is rare.

A moveable peg or adjustable peg system

3.10 A moveable or adjustable peg system is a system of fixed exchange rates, but with a provision for:

(a) the devaluation of a currency, for example when the country has a persistent balance of payments deficit;

(b) the revaluation of a currency, for example when the country has a persistent balance of payments surplus.

Margins around a moveable peg

3.11 A moveable peg system provides some flexibility. Exchange rates, although fixed, are not rigidly fixed, because adjustments are permitted. Even so, it is still fairly inflexible, because governments only have the choice between a revaluation/devaluation or holding the exchange rate steady. A more flexible system would allow some minor variations in exchange rates. For example, the exchange rate between sterling and the US dollar might be fixed at $2 to £1, but governments might only be required to maintain the exchange rate within a margin of, say, 2% on either side of this rate. If this were the case, the UK government would undertake to keep the exchange rate for sterling between $1.96 and $2.04 to £1. However, if the UK were to run into a fundamental balance of payments disequilibrium, a devaluation (or revaluation) of sterling would occur and the UK government would then undertake to maintain exchange rates within the required margins of the new exchange rate.

3.12 The European ERM is an adjustable peg system. The advantages and disadvantages of an adjustable peg system will be discussed firstly below within the context of the Bretton Woods agreement.

The Bretton Woods agreement 1944-1971

3.13 The Bretton Woods agreement was formulated in 1944 near the end of the Second World War but it was adopted only gradually as national economies recovered from the devastations of war. The terms of the international monetary system created by the agreement, which was eventually adopted by most advanced Western countries, were as follows.

(a) There was agreement on fixed exchange rates, but with:

(i) an adjustable peg. Countries were permitted to devalue or revalue their currency when their balance of payments was in 'fundamental disequilibrium'. The exchange rates were fixed ('pegged') against gold, but it became common practice to express exchange rates against the US dollar. Sterling, for example, was pegged at a rate of $2.80 to £1 between 1949 and 1967;

(ii) a margin on either side of the pegged rate was permitted. The monetary authorities of each country undertook to use their official reserves to keep their currency's exchange value within plus or minus 1% of the par value. (The margins for fluctuation were quite narrow, at only 1%).

(b) The US dollar was pegged to gold at the rate of $35 per ounce. The US authorities were prepared to buy and sell dollars for gold at this rate, with any other central bank in the system. All currencies in the system were therefore convertible into gold via the US dollar (Initially, this was perfectly workable, because the USA's official reserves contained more gold than other countries had dollars in their official reserves).

3.14 The system succeeded for a while in achieving its main aim. Exchange rate stability did appear to improve business confidence, and in the 1960s, international trade expanded at an unprecedented rate. Most national economies had high rates of growth, output and employment.

3.15 Eventually, however, problems crept into the system and it collapsed in 1971. Why?

(a) The system depended on exchange rates remaining fixed for long periods of time, but for a devaluation or revaluation to be made as soon as a fundamental disequilibrium in a country's balance of payments became apparent.

(i) Countries with a balance of payments surplus did not want to revalue their currency and pursue inflationary policies. Their governments took the view that there was no problem with a surplus, only with a balance of payments deficit. (Revaluations were infrequent and made reluctantly). The entire burden of 'correcting' imbalances in international payments was therefore put on to the backs of deficit countries.

(ii) Deficit countries were reluctant to recognise a fundamental disequilibrium in their balance of payments, because a devaluation of the currency was considered a 'failure'. The UK, for example, resisted pressures against a devaluation of sterling in the 1960s, until the government was forced to concede the issue in 1967.

In other words, the problem with the scheme was that for many years a country's exchange rate was defended at all costs because it became a political symbol.

(b) Fixing the nominal value of exchange rates did not protect real values, because the rate of inflation differed from one country to another. The problem of inflation meant that exchange rates would need to be adjusted more frequently, thereby removing a major reason for having a fixed exchange rate/adjustable peg system.

(c) Speculation could put excessive pressure on a currency, and force a devaluation. Speculation, when successful, always involved capital gains for private investors

and losses for the government of the country concerned, because the gains of speculators were paid for out of the official reserves.

(d) The amount of capital which was invested overseas expanded in volume during the 1960s, with the early development of the eurocurrency market. Banks and large international firms became aware of the advantages of switching funds between currencies to make a speculative gain or avoid a loss. Speculative capital therefore came to exceed the volume of official reserves, and so governments were unable to prevent successful, co-ordinated speculation.

(e) International liquidity also became a problem because of loss of confidence in the US dollar.

Managed floating

3.16 By 1973, most major currencies had abandoned official par rates and were allowed to float. Floating was adopted because the alternatives had failed, and not for any more positive reason. However, floating has always been 'dirty' or 'managed'.

3.17 A major problem with floating exchange rates in the 1980s was the wide fluctuations in foreign exchange rates for the leading international currencies.

3.18 Short-term variability is inconvenient to traders and travellers abroad, but traders can protect themselves by using the forward exchange markets. Long-term volatility is more of a problem for the following reasons.

(a) A long-term under-valuation of a currency affects the competitiveness of its exports and makes the country more receptive to imports.

(b) A long-term under-valuation of a currency makes some investments seem worthwhile that might later turn out to be unprofitable if more 'realistic' exchange rates are re-established.

(c) It discourages long-term investment.

3.19 Concern about the volatility of exchange rates led to some efforts of the authorities of the major Western countries to give the markets a lead, and make a more conscious attempt at managed floating of exchange rates.

3.20 Two international agreements were reached:

(a) the Plaza agreement in September 1985;
(b) the Louvre accord (or Paris agreement) in February 1987.

The Plaza agreement 1985

3.21 The Plaza agreement was an agreement by the authorities of five major countries (the Group of Five: the USA, Japan, West Germany, France and the UK) to co-operate in securing an orderly fall in the value of the US dollar, which they thought had become seriously over-valued. The outcome of the Plaza agreement was a steady fall in the value of the US dollar over the next fifteen months, encouraged by a policy of managed floating from the governments of all five countries concerned.

The Louvre accord 1987

3.22 By early 1987, the authorities of the countries involved believed that the US dollar had fallen far enough. However, it was agreed that international co-operation on exchange rates should continue, with managed floating of exchange rates, but that current exchange rates were more or less 'correct'. The Louvre accord between the 'Group of Seven' (G7) countries, (the USA, West Germany, Japan, the UK, France, Canada and Italy) was a further agreement at international co-operation on managing exchange rates with the aim of securing greater stability in exchange rates.

3.23 Apart from statements that the Louvre accord was very flexible, there were no public details on just what the accord was!

It involved two main ingredients however:

(a) a willingness by the central banks of the countries involved to intervene directly in the foreign exchange markets on a large scale;

(b) an apparent willingness for the countries involved to co-ordinate their monetary and fiscal policies, so as to achieve the essential requirements for exchange rate stability.

Recent examples

3.24 There were some subsequent instances of concerted intervention by the G7 group, for example in February 1991, indicating that international monetary cooperation was not yet dead. By the mid-1990s however, it came to be accepted that international cooperation on exchange rates is hindered by the limited powers of governments to influence prevailing rates in the foreign exchange markets, where flows of funds are very large in relation to governments' foreign exchange reserves.

3.25 Within the European Union, monetary and economic convergence is fostered within the European Monetary System. This is discussed in the next section of this chapter.

4 EUROPEAN MONETARY COOPERATION 6/96

The European Monetary System (EMS)

4.1 The European Union opted for a 'local' international agreement on exchange rates, derived from that originally known as the European Snake but amended in 1979 to the EMS system. In the EMS there is:

(a) a scheme of margins around a central peg for exchange rates between the currencies of the countries in the EMS (the exchange rate mechanism or ERM); but

(b) a policy of managed floating between their currencies and the currencies of countries outside the system.

4.2 The European Monetary System was formed in March 1979. The UK has been a member of the EMS since then, but did not join the exchange rate mechanism of the EMS until October 1990; its membership of the ERM was suspended in September 1992. The remaining ERM member nations were Belgium, Denmark, Eire, Germany, France, Luxembourg, Netherlands, Portugal and Spain; Austria, a more recent EU member, has also since joined the ERM.

4.3 The purposes of the EMS are:

(a) in the long term, to develop European Economic and Monetary Union (EMU), which we discuss further below;

(b) in the shorter term, to promote economic convergence in Europe, pushing inflation rates down by forcing economic policies on partner governments similar to the policies of the more successful members;

(c) in the immediate term, to stabilise exchange rates between the currencies of the member countries.

4.4 The EMS provides for the system of exchange rates for member currencies known as the exchange rate mechanism.

(a) Each currency has a 'central' rate in the system, expressed in ecus.

(b) The exchange rate of the currency of each member country is permitted to vary within a margin on either side of its central rate. Each currency must also keep within the same limit of each other currency within the system. Up to the

beginning of August 1993, the margins for most ERM currencies were plus or minus 2¼%, with wider margins of 6% for Spain and Portugal. At the beginning of August 1993, the margins for all currencies except those of Germany and the Netherlands were increased to a very wide band of plus or minus 15%. Each currency must also keep within the same limit of each other currency within the system.

(c) The exchange rate of each currency is thus pegged against the ecu and also against every other ERM member currency.

(d) In addition, there are limits on the ecu equivalents of currencies' values, narrower than the full margins, which act as an early warning system. When these limits (or *divergence thresholds*) are reached it is presumed that the central bank of the countries concerned will intervene, using its official reserves and acting to buy or sell its currency in the foreign exchange markets. If central bank intervention in the foreign exchange markets is not sufficient, a government might have to change interest rates in order to make its currency more or less attractive to hold.

(e) Revaluations or devaluations of the central parity rates can occur, but only as a 'last resort' measure. These are called *realignments*.

(f) To finance interventions in ERM currencies there are mutual credit lines among the participating central banks (*the very short-term credit facility*). There are also facilities for mutual assistance through 'short term monetary support' or 'medium-term financial assistance' from the central fund.

Sterling's membership of the ERM

4.5 In October 1990, the Chancellor of the Exchequer at the time, John Major, announced the long awaited decision that sterling was to join the ERM. On sterling's entry into the ERM, a central rate equivalent to DM 2.95 per pound was set and sterling was allocated 6% margins within the system. The Chancellor indicated that he anticipated that sterling would later move to 2¼% margins.

4.6 The central parity rate of DM 2.95 was seen by some as being too high. A high exchange rate for sterling has the effect of 'squeezing' exporters who have to cut costs in order to remain competitive: it is argued by some that this encourages wage restraint because these exporters are encouraged to resist large wage increases.

4.7 Exchange rate stability within an exchange rate regime such as the ERM prevents a government from allowing the currency to drift downwards in value to compensate for inflation. At the same time, it means that interest rate policy must be consistent with keeping the currency stable. If interest rates are too high, foreign investors will buy sterling, leading to capital inflows, much of which may be of short term 'hot money', and there will be upward pressure on the currency. If interest rates are too low, there will conversely be downward pressure on the currency.

4.8 Another possible consequence of stabilisation within an exchange rate system is that there may be effects on people's expectations and on the perceived risk of exchange rate movements between member currencies. As well as allowing firms to plan and forecast with greater certainty, exchange rate stability ought to make a currency less risky to hold.

4.9 The wider margins adopted for sterling reduced the possibility that the need to keep sterling within its ERM limits will conflict with other aspects of economic policy. The UK had a little more freedom to reduce interest rates without having problems keeping the pound within its ERM bands.

Sterling's suspension from the ERM - September 1992

4.10 During September 1992, the UK government was forced to leave the ERM following a relatively short period of turmoil on the European foreign exchange markets. The

possibility that the UK will rejoin the ERM at some stage remains: indeed, the Maastricht Treaty of 1991, which the UK government supports, presupposes membership of the ERM as a precursor to European Economic and Monetary Union (EMU). So what were the events which led to the departure of sterling from the ERM?

4.11 Interest rates in Germany remained relatively high, largely because of the need to finance economic development in the Eastern half of that country. There was also growing uncertainty about the political climate surrounding moves towards European Economic and Monetary Union (see below). Turbulence in the foreign exchange markets followed, leading to the devaluation of the Italian lira and its departure from the ERM, and the devaluation of the Spanish peseta.

4.12 Huge flows of speculative money switched out of sterling into other currencies (eg the US dollar and the deutschmark) and the Bank of England was forced to intervene heavily, spending around £10 billion in foreign exchange reserves to buy sterling. Sterling's value continued to fall in spite of this, and in spite of a final move by the UK government to raise base interest rates from 10% to 15% in a single day. Hours later, the suspension of sterling from the ERM was announced; base interest rates were brought back to 10% and sterling was floated on the foreign exchange market.

4.13 Since sterling's suspension of the ERM, the currency has been allowed to 'float'. This policy led to an effective devaluation of sterling by around 15% against the deutschmark.

4.14 Devaluation of the currency acts as a stimulus to domestic economic activity since it makes the UK's exports more competitive (lower-priced) abroad, while making imports more expensive. On sterling's suspension from the ERM, some feared that a further decline in sterling's value could lead to new inflationary pressures which might be only partially offset by tougher government spending limits (fiscal policy). Others argued for reflationary measures, including interest rate cuts, to try to lift the economy out of recession. Sterling's departure from the ERM does undoubtedly allow the government to use the level of interest rates with more flexibility to stimulate or dampen domestic economic activity, and indeed paved the way for cuts in bank base rates from 10% to 6% between September 1992 and early 1993.

Has the EMS been successful?

4.15 The shorter term aims of consistent economic policies and exchange rate stability have had mixed success.

4.16 The successes of the EMS have been:

(a) the relative stability of the value of the ecu against other world currencies, and the slowly developing use of the ecu in international commerce;

(b) member countries' gradual acceptance of the need for broadly similar economic policies;

(c) it has survived for some time since 1979, although with its new wide bands of 15% it is now a very flexible system.

4.17 The failures of the EMS have been:

(a) the lack of progress towards European economic and monetary union (discussed further below);

(b) fairly frequent realignment of currency values and the widening of the bands to 15% in August 1993, which have undermined the stability of exchange rates that was being sought;

(c) the fact that the government of an individual member state might refuse to adapt its economic policies to the needs of a stable EMS. For example in the early years

of the presidency of M Mitterrand, France adopted an independent (but eventually unsuccessful) economic policy.

The European Currency Unit (ecu)

4.18 The European Currency Unit or ecu is the central currency of the EMS. It is a composite currency, made up - as already mentioned - from a weighted 'basket' of EU currencies (including sterling), with the weightings given to each currency depending on the relative importance of that currency in trade within the EU.

4.19 The composition of the ecu is revised from time to time (every five years) to reflect changes in the constituent currencies and the relative weightings for each. A review of the composition of the ecu was carried out in September 1989, when the Spanish peseta and Portuguese escudo were included for the first time, thus making the ecu a composite of all twelve EU currencies.

4.20 It has been suggested that the ecu should become an important reserve currency (ie a currency used by all countries of the world as part of their official reserves). The reasons behind this suggestion were that:

(a) the burden on the US dollar as the leading reserve currency was too great. A EU currency would help central banks to diversify their currency reserves;

(b) the EU would then be in a stronger position to urge Japan to promote the yen as another major reserve currency, and also to persuade the USA to introduce the 'internal discipline' which would encourage relative stability in foreign exchange values.

4.21 The use of the ecu in commercial dealings has been expanding, although slowly. (Private ecus are created by private banks as opposed to the EU central banks.)

(a) A number of organisations (including Thomas Cook in the UK) now issue ecu-denominated travellers' cheques.

(b) There is a certain amount of lending and borrowing on the eurocurrency markets in loans denominated in ecus. (However, ecu eurocurrency lending is still a very small proportion of total eurocurrency lending.) Some private bond issues are also denominated in ecus.

(c) In 1988, the Bank of England made its first issue of Treasury bills denominated in ecus (with the aims of increasing the official reserves and also to maintain the City of London's leading role as a financial centre for Europe in the run-up to 1992). Ecu Treasury bills have maturities of one, three and six months.

European Economic and Monetary Union

4.22 One of the aims behind the European Monetary System is European Economic and Monetary Union (EMU). This is a long-standing objective of the EU, reaffirmed in the Single European Act of 1985 and in the Maastricht agreement of 1991.

(a) *Monetary union* can be defined as a single currency area, which would require a monetary policy for the area as a whole.

(b) *Economic union* can be described as an unrestricted common market for trade, with some economic policy co-ordination between different regions in the union.

4.23 Although the whole package of measures included in European EMU is not paralleled anywhere else in the world, there have been many international monetary unions. For example, Belgium and Luxembourg are in a monetary union, and the UK and the Republic of Ireland (Eire) were in currency union until the 1970s. There are three main aspects to the European monetary union, should it ever take place.

(a) A *common currency*. By this, we mean that instead of using sterling in the UK, deutschmarks in Germany and francs in France, a common currency would be used for normal everyday money transactions by everyone in the monetary union.

(b) A *European central bank*. A European central bank would have the role of:

(i) issuing the common currency;
(ii) conducting monetary policy on behalf of the central government authorities;
(iii) acting as lender of last resort to all European banks;
(iv) managing the exchange rate for the common currency.

(c) A *centralised monetary policy* would apply across all the countries within the union. This would involve the surrender of control over aspects of economic policy and therefore surrender of some political sovereignty by the government of each member state to the central government body of the union.

4.24 Advantages of having a single European currency are as follows.

(a) For organisations trading within the single currency area, uncertainty about exchange rate movements would be eliminated. Business confidence should be improved. The need to 'hedge' against foreign exchange risks would be removed. There would also be savings in the transaction costs (bank commission etc) involved in exchanging currencies (although this means less foreign exchange business for banks, of course!)

(b) Without transaction costs and the costs of hedging against foreign exchange risks (eg having to arrange forward exchange contracts) trade between countries in the currency area would become easier and the volume of trade should increase.

(c) Interest rates might be lower for a country like the UK, which suffers from higher interest rates as a result of doubts about the government's long-term commitment to anti-inflation policies.

4.25 The disadvantages of a single European currency are a bit more difficult to assess.

(a) The main problem is that each member state's government loses it autonomy over its domestic monetary policy. In particular, a government cannot use changes in the exchange rate for its currency as a policy weapon to influence the national economy.

(b) Another problem is that there would be pressure on countries with stronger currencies to help weaker economies that borrow too much.

4.26 Problems such as national political wranglings over federalism and the collapse of the narrow bands of the ERM may have made some people assume that EMU is off the political agenda, at least until the next millennium. However, the EU heads of government are soon to reassess the conditions which must be met before EMU can proceed.

4.27 The existing conditions are that no EU country can participate in EMU unless the following economic 'convergence criteria' are met.

(a) Consumer price inflation must, over the previous year, have been no more than 1.5 per cent higher than the average of the three best performing EU countries.

(b) Long-term interest rates must, over the previous year, have averaged no more than 2 per cent more than the average of three countries with the best consumer price inflation performance.

(c) A government's deficit should not exceed 5 per cent of GDP (gross domestic product) unless it has declined substantially or continuously or unless it is only temporarily above 3 per cent; additionally, the ratio of government debt to GDP should be no more than 60 per cent (unless it is approaching 60% at a satisfactory rate).

(d) The currency of the country should have remained within the normal bands of the ERM for a minimum of two years, without any devaluation.

4.28 Since the widening of the ERM bands to 15% in mid-1993, it is unclear whether these bands will be treated as 'normal' for the purposes of the last criterion. Another point to note is that, on the basis of current forecasts, there are actually few EU countries which would meet the criteria. It has been suggested be that only a few countries may satisfy the criteria by the end of 1996, with fiscal deficits being the main problem.

Chapter roundup

- The traditional view that exchange rates will depend on the country's balance of trade (more exactly, on its current account surplus or deficit) is still valid, but the experience of the US dollar during the 1980s shows that this view does not apply all of the time, even though it must be true in the longer term.
- Factors influencing the exchange rate include the comparative rates of inflation in different countries, comparative interest rates in different countries, the underlying balance of payments, speculation and government policy on managing or fixing exchange rates. *Capital transactions* can influence the exchange rate significantly, especially in the short term.
- Exchange rates are essentially determined by supply and demand, but governments can intervene to influence the exchange rate. Government policies on exchange rates might be fixed exchange rates or free floating exchange rates as two extreme policies. In practice, 'in-between' schemes have been:
  - fixed rates, but with provision for devaluations or revaluations of currencies from time to time ('adjustable pegs') and also some fluctuations ('margins') around the fixed exchange value permitted - eg Bretton Woods, the EMS;
  - managed floating - eg sterling, the US dollar, the yen.
- The weaknesses and strengths of each of these systems, and the aims and problems of the EMS, should be understood.
- European EMU is an ambitious project. Recent instability in the ERM, and the political difficulties of all EU members reaching agreement, indicate that significant obstacles to EMU remain.

Test your knowledge

1 Distinguish 'spot' and 'forward' exchange rates. (see para 1.5)

2 What does purchasing power parity theory say? (2.5, 2.6)

3 How may the government intervene in the foreign exchange markets? (2.28 - 2.30)

4 What are the advantages and disadvantages of fixed exchange rates? (3.2 - 3.6)

5 What are the advantages and disadvantages of floating exchanged rates? (3.7 - 3.9)

6 What are the purposes of the European Monetary System? (4.3)

7 What is the European Currency Unit? (4.16)

Now try illustrative question 19 at the end of the Study Text

Chapter 20

CURRENCY RISK

This chapter covers the following topics.

		Syllabus reference
1	Risk and foreign exchange	4(b), 4(c)
2	Direct risk management methods	4(c)
3	Forward exchange contracts	4(c)
4	Choosing a hedging method	4(c)
5	Futures and currency risk	4(b)
6	Currency swaps	4(b)

Introduction

In Chapters 20, 21 and 22 we look at various techniques for the management of risk, in particular foreign exchange (currency) risk and interest rate risk - important topics in Paper 14. In this chapter, we are particularly concerned with risks related to exchange rate fluctuations.

1 RISK AND FOREIGN EXCHANGE 6/95

Risk and risk management

1.1 *Risk management* describes the policies which a firm may adopt and the techniques it may use to manage the risks it faces. *Exposure* means being open to or vulnerable to risk.

1.2 If entrepreneurship is about risk, why should businesses want to 'manage' risk? Broadly, there are two reasons why risk management makes good business sense.

(a) Firstly, a business may wish to reduce *risks* to which it is exposed to acceptable levels. What is an acceptable level of risk may depend upon various factors, including the scale of operations of the business and the degree to which its proprietors or shareholders are risk-averse.

(b) Secondly, a business may wish to avoid particular *kinds* of risks. For example, a business may be averse to taking risks with exchange rates, for good reasons. The good reasons may include the fact that the risks are simply too great for the business to bear, for example if exchange rate movements could easily bankrupt the business. Or the business, lacking any real expertise in foreign exchange dealings, may wish to minimise its exposure to risks such as foreign exchange risk which derive from conditions external to its business.

1.3 For any particular kind of risk faced by a business, it is in general possible to say that someone somewhere will probably be prepared to accept that risk. Some may be happy to bear the risk because they already bear an opposing risk which would cancel out its effect. Others may be prepared to take on the risk if there is the prospect of them making a profit. For example, insurance companies are prepared to accept the pooled risks of fire damage which householders or businesses are unwilling to take individually. Foreign exchange dealers take risks with exchange rates in the anticipation of making profits if exchange rate movements are favourable.

1.4 There are basically two ways in which exposure to risk may be reduced.

(a) *Pooling* of risks. This method underlies insurance, in which risks which may be unacceptable to individual policyholders are aggregated or 'pooled' by being taken on by the insurance company. Pooling of risk also underlies the diversification of a portfolio of investments.

(b) *Hedging* of risks. In the case of hedging, different parties come to an agreement which cancels one of the parties' risks against the other's. The different parties may be subject to similar but opposite risks which they wish to hedge. Alternatively, one party may wish to hedge a risk while the other party may be a speculator.

1.5 Two types of risk with which corporate risk management is often concerned are *currency risk* (or *exchange rate risk)* - the risk of exchange rate movements - and *interest rate risk* - the risk of adverse interest rate movements. The inherent risks of the trade or business can be managed within the company. Other risks, including currency risk and interest rate risk, are due to factors beyond the control of the enterprise and hedging ought therefore to be considered.

Choosing not to hedge

1.6 Risk minimisation is not the only possible strategy. A company may, instead of hedging, choose to remain exposed to risks, hoping to profit from its risk-taking positions. A company's shareholders may prefer a higher risk strategy in the hope of achieving higher returns.

Currency risk

1.7 A company may become exposed to currency risk in a number of ways, including the following:

(a) as an exporter of goods or services;
(b) as an importer of goods or services;
(c) through having an overseas subsidiary;
(d) through being the subsidiary of an overseas company;
(e) through transactions in overseas capital markets.

1.8 The variability of exchange rates can be appreciated by examining the following table.

Sterling exchange rates

	US dollar	*Japanese yen*	*Swiss franc*	*European currency unit*	*Deutsch-mark*	*French franc*	*Italian lira*
1985	1.2976	307.08	3.155	1.6998	3.784	11.5495	2,463
1986	1.4672	246.80	2.635	1.4948	3.183	10.1569	2,186
1987	1.6392	236.50	2.439	1.4200	2.941	9.8369	2,123
1988	1.7796	227.98	2.603	1.5060	3.124	10.5969	2,315
1989	1.6383	225.66	2.678	1.4886	3.079	10.4476	2,247
1990	1.7864	257.38	2.469	1.4000	2.876	9.6891	2,133
1991	1.7685	237.56	2.529	1.4284	2.925	9.9473	2,187
1992	1.7665	223.72	2.476	1.3620	2.751	9.3248	2,163
1993	1.5015	166.73	2.218	1.2845	2.483	8.5073	2,360

(Source: Economic Trends)

1.9 Note, for example, that between 1985 and 1993, the pound depreciated by (3.784 – 2.483)/3.784 = 34% against the deutschmark, while it appreciated by (1.5015 – 1.2976)/1.2976 = 16% against the US dollar over the same period.

1.10 The following different types of currency risk may be distinguished.

(a) *Transaction risk* is the risk of adverse exchange rate movements occurring in the course of normal international trading transactions. This arises when export prices are fixed in foreign currency terms, or imports are invoiced in foreign currencies. Below, we discuss various methods for reducing this type of exposure to risk.

(b) *Translation risk* arises from differences in the currencies in which assets and liabilities are denominated. If a company has different proportions of its assets and liabilities denominated in particular currencies, then exchange rate movements are likely to have varying effects on the value of these assets and liabilities. This could influence investors' and lenders' attitudes to the financial worth and creditworthiness of the company. Such risk can be reduced if assets and liabilities denominated in particular currencies can be held in balanced amounts.

(c) *Economic risk* 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 may reduce this kind of exposure to risk.

(d) *Political risk* is the risk of political actions by governments which limit a company's freedom of action, such as the introduction of exchange controls affecting the operation of multinational companies.

Selling and buying currency

1.11 If an importer has to pay a foreign supplier in a foreign currency, he might ask his bank to sell him the required amount of the currency. For example, suppose that a bank's customer, a trading company, has imported goods for which it must now pay US$10,000.

(a) The company will ask the bank to sell it $10,000. If the company is buying currency, the bank is selling it.

(b) When the bank agrees to sell US$10,000 to the company, it will tell the company what the range of exchange will be for the transaction. If the bank's selling rate is, say $1.7935, the bank will charge the company:

$$\frac{\$10,000}{\$1.7935 \text{ per } £1} = £5,575.69 \text{ for the currency}$$

1.12 Similarly, if an exporter is paid, say, US$10,000 by a customer in the USA, he may wish to exchange the dollars to obtain sterling. He will therefore ask his bank to buy the dollars from him. Since the exporter is selling currency to the bank, the bank is buying the currency.

If the bank quotes a buying rate of, say $1.8075, the bank will pay the exporter:

$$\frac{\$10,000}{\$1.8075 \text{ per } £1} = £5,532 \text{ for the currency}$$

1.13 A bank expects to make a profit from selling and buying currency, and it does so by offering a rate for selling a currency which is different from the rate for buying the currency.

1.14 If a bank were to buy a quantity of foreign currency from a customer, and then were to re-sell it to another customer, it would charge the second customer more (in sterling) for the currency than it would pay the first customer. The difference would be profit. For example, the figures used for illustration in the previous paragraphs show a bank selling some US dollars for £5,575.69 and buying the same quantity of dollars for £5,532.50, at selling and buying rates that might be in use at the same time. The bank would make a profit of £43.19.

Spot rates

1.15 A spot rate is the rate of exchange which is used for currency dealing without any advance arrangement for the purchase or sale having been made. A spot rate is a rate quoted immediately, for delivery of the currency to the buyer two working days later. The 'spot date' is when the currency is delivered and settlement is made. All the rates so far mentioned in this chapter have been spot rates.

Exercise 1

Calculate how much sterling exporters would receive or how much sterling importers would pay, ignoring the bank's commission, in each of the following situations, if they were to exchange currency and sterling at the spot rate.

(a) A UK exporter receives a payment from a French customer of FF 150,000.
(b) A UK importer buys goods from a Japanese supplier and pays 1 million yen.
(c) A UK exporter receives a payment of 80,000 guilders from a Dutch customer.
(d) A UK importer pays a German consultancy firm DM 120,000 for services provided by the firm.

Spot rates are as follows.

France	10.73 - 10.76
Japan	233½ - 235½
Netherlands	3.55 - 3.57
Germany	3.1725 - 3.1775

Solution

(a) The bank is being asked to buy the French francs and will give the exporter

$$\frac{150{,}000}{10.76} = £13{,}940.52 \text{ in exchange.}$$

(b) The bank is being asked to sell the yen to the importer and will charge

$$\frac{1{,}000{,}000}{233½} = £4{,}282.66$$

(c) The bank is being asked to buy the guilders from the exporter and will pay

$$\frac{80{,}000}{3.57} = £22{,}408.96$$

(d) The bank is being asked to sell the DM, and will charge

$$\frac{120{,}000}{3.1725} = £37{,}825.06$$

Foreknowledge of foreign currency receipts and payments: exposure and foreign exchange risk

1.16 Much international trade involves credit. An importer will take credit often for several months and sometimes longer, and an exporter will grant credit. One consequence of taking and granting credit is that international traders will know in advance about the receipts and payments arising from their trade. They will know:

(a) what foreign currency they will receive or pay;
(b) when the receipt or payment will occur;
(c) how much of the currency will be received or paid.

1.17 Importers and exporters alike will be concerned about the profit they can expect to make from trade. An exporter who invoices a foreign buyer in the buyer's currency will expect to be able to exchange his foreign currency proceeds from the buyer for his domestic currency and earn enough domestic currency to cover his costs and make a profit. Similarly, an importer might buy goods from abroad for which he is invoiced in foreign currency. If he plans to sell the imports, he will produce a price list for his

customers, or agree prices with his customers, so as to earn enough domestic currency from selling the goods to pay the foreign supplier in foreign currency, and make a profit.

1.18 The great danger to profit margins is the movement in exchange rates. The risk faces (i) exporters who invoice in a foreign currency and (ii) importers who pay in a foreign currency. This risk arises even between currencies in the European exchange rate mechanism, as currencies can still move either side of their central values within the mechanism.

Exercise 2

Bulldog Ltd, a UK company, buys goods from Redland which cost 100,000 Reds (the local currency). The goods are re-sold in the UK for £32,000. At the time of the import purchase the exchange rate for Reds against sterling is 3.5650 - 3.5800.

Required

(a) What is the expected profit on the re-sale?

(b) What would the actual profit be if the spot rate at the time when the currency is received has moved to:

(i) 3.0800 - 3.0950
(ii) 4.0650 - 4.0800?

Ignore bank commission charges.

Solution

(a) Bulldog must buy Reds to pay the supplier, and so the bank is selling Reds. The expected profit is as follows.

	£
Revenue from re-sale of goods	32,000.00
Less cost of 100,000 Reds in sterling (÷ 3.5650)	28,050.49
Expected profit	3,949.51

(b) (i) If the actual spot rate for Bulldog to buy and the bank to sell the Reds is 3.0800, the result is as follows.

	£
Revenue from re-sale	32,000.00
Less cost (100,000 ÷ 3.0800)	32,467.53
Loss	(467.53)

(ii) If the actual spot rate for Bulldog to buy and the bank to sell the Reds is 4.0650, the result is as follows.

	£
Revenue from re-sale	32,000.00
Less cost (100,000 ÷ 4.0650)	24,600.25
Profit	7,399.75

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2 DIRECT RISK MANAGEMENT METHODS 6/94, 6/95

2.1 The forward exchange contract is perhaps the most important method of obtaining cover against risks, where a firm decides that it does not wish to speculate on foreign exchange. This is discussed later in the chapter. However, there are other methods of reducing risks which we shall look at first.

Currency of invoice

2.2 One way of avoiding exchange risk is for an exporter to invoice his foreign customer in his domestic currency, or for an importer to arrange with his foreign supplier to be invoiced in his domestic currency. However, although either the exporter or the importer can avoid any exchange risk in this way, only one of them can deal in his domestic currency. The other must accept the exchange risk, since there will be a period

of time elapsing between agreeing a contract and paying for the goods (unless payment is made with the order).

2.3 If a UK exporter is able to quote and invoice an overseas buyer in sterling, then the foreign exchange risk is in effect transferred to the overseas buyer. Similarly, a UK-based importer may be able to persuade the overseas supplier to invoice in sterling rather than in a foreign currency.

2.4 An alternative method of achieving the same result is to negotiate contracts expressed in the foreign currency but specifying a fixed rate of exchange as a condition of the contract.

2.5 There are certain advantages to be obtained by invoicing in a foreign currency which might persuade an exporter to take on the exchange risk. One of the most important is that there is a possible marketing advantage to be obtained by proposing to invoice in the buyer's own currency, when there is competition for the sales contract.

(a) The foreign buyer, invoiced in his own currency, will not have the problem of deciding whether to protect himself against exchange risks. The risks are borne by the exporter.

(b) If the exporter believes that he is in danger of not winning the contract, owing to competition from other sellers overseas, and if the buyer's own currency is weak and likely to depreciate against sterling, the exporter might offer to invoice the buyer in his own (weak) currency in order to win the contract. The exporter would in effect be offering the buyer a price discount due to the probability of a movement in exchange rates favourable to the buyer and therefore unfavourable to the exporter.

(c) In some export markets, foreign currency (often the US dollar) is the normal trading currency, and so UK exporters might have to quote prices in that currency for customers to consider buying from them.

(d) The exporter may be able to offset payments to his own suppliers in a particular foreign currency against receipts in that currency. For example, if a UK company regularly imports goods which it pays for in US$, and it then exports those goods and invoices its own customer in US$, it will be able to offset payments against receipts in US$ and thereby eliminate exchange risks in both directions.

(e) By arranging to sell goods to customers in a foreign currency, a UK exporter might be able to obtain a loan in that currency at a lower rate of interest than in the UK, and at the same time obtain cover against exchange risks by arranging to repay the loan out of the proceeds from the sales in that currency. 'One way of minimising exchange risk is to borrow the currency in which the contract is invoiced. Here the exporter's asset (the money due from the overseas buyer) will always match his liability (his foreign currency borrowing) whatever happens to the exchange rate....' (Bank of England, *Money for Exports*).

2.6 There are certain other aspects to invoicing in foreign currency that an exporter might wish to consider.

(a) *Pricing and price lists*. If the exporter issues price lists in foreign currency, he should be able to (and aware of the need to) make frequent revisions to the price lists as the value of his domestic currency fluctuates against the value of the foreign currency. For example, if a UK exporter issues a price list in US dollars, and sterling strengthens against the US dollar, the exporter will earn less sterling when he sells his US dollar receipts, and so his profit margins will be cut. He might therefore need to raise his prices to maintain profit margins. On the other hand, if the US dollar strengthened against sterling, the UK exporter could cut his prices whilst still maintaining his sterling profit margins. Whether an exporter has price lists or not, invoicing in a foreign currency should certainly focus his attention on pricing policy and the reaction of the overseas market to price changes.

(b) *Customer relations*. A switch from invoicing in sterling to invoicing in a foreign currency might not be easy to achieve, at least not without giving adequate warning

to the customer. The ability of an exporter to make a change might be thwarted by the resistance of a customer who is in a position of some bargaining strength (who can stop buying the exporter's goods).

(c) *Accounting systems*. Accounting procedures for invoicing in foreign currency, or borrowing in a foreign currency, are a little more complex than for invoicing and borrowing in sterling.

(d) *Pricing policy*. Pricing in a foreign currency should focus the exporter's attention on market prices in the buyer's country, and so create greater market awareness.

(e) *Credit control*. When a foreign customer is late with a payment, the exporter would suffer extra costs. It is therefore essential that credit control systems should be effective, to ensure that customers do pay on time.

(f) The customer might wish to consider taking out credit insurance cover for foreign currency risks.

Matching receipts and payments

2.7 A company can reduce or eliminate its foreign exchange transaction exposure by matching receipts and payments. Wherever possible, a UK 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.

2.8 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.

2.9 The process of matching is made simpler by having *foreign currency accounts* with a bank. UK residents are allowed to have bank accounts in any foreign currency. Receipts of foreign currency can be credited to the account pending subsequent payments in the currency. (Alternatively, a company might invest its foreign currency income in the country of the currency - for example it might have a bank deposit account abroad - and make payments with these overseas assets/deposits).

2.10 Since a company is unlikely to have exactly the same amount of receipts in a currency as it makes payments, it will still be exposed to the extent of the surplus of income, and so the company may wish to avoid exposure on this surplus by arranging forward exchange cover.

2.11 Offsetting (matching payments against receipts) will be cheaper than arranging a forward contract to buy currency and another forward contract to sell the currency, provided that:

(a) receipts occur before payments; and
(b) the time difference between receipts and payments in the currency is not too long.

Any differences between the amounts receivable and the amounts payable in a given currency should be covered by a forward exchange contract to buy/sell the amount of the difference.

Leads and lags

2.12 Companies might try to use:

(a) lead payments: payments in advance; or
(b) lagged payments: delaying payments beyond their due date

in order to take advantage of foreign exchange rate movements.

With a lead payment, paying in advance of the due date, there is a finance cost to consider. This is the interest cost on the money used to make the payment.

Example: leads and lags

2.13 A company owes $30,000 to a US supplier, payable in 90 days. It might suspect that the US dollar will strengthen against sterling over the next three months, because the US dollar is quoted forward at a premium against sterling on the foreign exchange market. The spot exchange rate is $1.50 = £1.

(a) The company could pay the $30,000 now, instead of in 90 days time. This would cost £20,000 now, which is a payment that could have been delayed by 90 days.

(b) The cost of this lead payment would be interest on £20,000 for 90 days, at the company's borrowing rate or its opportunity cost of capital.

Netting

2.14 Many multinational groups of companies engage in intra-group trading. Where related companies located in different countries trade with one another, there is likely to be inter-company indebtedness denominated in different currencies. *Netting* is a process in which credit balances are netted off against debit balances so that only the reduced net amounts remain due to be paid by actual currency flows.

Bilateral netting

2.15 In the case of *bilateral netting*, only two companies are involved. The lower balance is netted off against the higher balance and the difference is the amount remaining to be paid.

Example: bilateral netting

2.16 A and B, are respectively, UK and US based subsidiaries of a German based holding company. At 31 March 19X5, A owed B DM300,000 and B owed A DM220,000.

Required

Show how bilateral netting can reduce the value of the intercompany debts.

Solution

2.17 The two intercompany balances are set against each other, leaving a net debt of DM 80,000 (DM300,000 – 220,000) owed by A and B.

Multilateral netting

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2.18 As you had probably guessed, *multilateral netting* is a more complex procedure in which the debts of more than two group companies are netted off against each other.

2.19 There are different ways of arranging multilateral netting. The arrangement might be co-ordinated by the company's own central treasury or alternatively by the company's bankers.

2.20 The common currency in which netting is to be effected needs to be decided upon, as does the method of establishing the exchange rates to use for netting purposes. So that it is possible to agree the outstanding amounts in time but with minimum risk of exchange rate fluctuations in the meantime, this may involve using the exchange rates applying a few days before the date at which payment is to be made.

2.21 Netting has the following advantages.

(a) Foreign exchange purchase costs, including commission and the spread between selling and buying rates, and money transmission costs are reduced.

(b) There is less loss in interest from having money in transit.

2.22 Local laws and regulations need to be considered before netting is used, as netting is restricted by some countries. In some countries, bilateral netting is permitted but multinational netting is prohibited; in other cases, all payments can be combined into a single payment which is made on a 'gross settlements' basis.

Example: multilateral netting

2.23 A group of companies controlled from the USA has subsidiaries in the UK, Italy and France. Below, these subsidiaries are referred to as UK, IT and FR respectively.

At 30 June 19X5, inter-company indebtedness is as follows.

Debtor	*Creditor*	*Amount*
UK	IT	240,000,000 Italian lire (L)
UK	FR	480,000 French francs (FFr)
FR	IT	180,000,000 Italian lire
IT	UK	£74,000 sterling
IT	FR	375,000 French francs

It is the company's policy to net off inter-company balances to the greatest extent possible. The central treasury department is to use the following exchange rates for this purpose.

US$1 equals

L 1,680
£0.6800
FFr 5.880

Required

Calculate the net payments to be made between the subsidiaries after netting off of inter-company balances.

Solution

2.24 The first step is to convert the balances into US dollars as a common currency.

Debtor	*Creditor*	*Amount in US dollars*
UK	IT	240,000,000 ÷ 1,680 = $142,857
UK	FR	480,000 ÷ 5.880 = $81,633
FR	IT	180,000,000 ÷ 1,680 = $107,143
IT	UK	£74,000 ÷ 0.6800 = $108,824
IT	FR	375,000 ÷ 5.880 = $63,776

	Paying subsidiaries			
Receiving subsidiaries	*UK*	*IT*	*FR*	*Total*
	$	$	$	$
UK	-	108,824	-	108,824
IT	142,857	-	107,143	250,000
FR	81,633	63,776	-	145,409
Total payments	(224,490)	(172,600)	(107,143)	504,233
Total receipts	108,824	250,000	145,409	
Net receipt/(payment)	(115,666)	77,400	38,266	

The UK subsidiary should pay $77,400 to the Italian subsidiary and $38,266 to the French subsidiary.

Matching long-term assets and liabilities

2.25 When an international company has an operating subsidiary abroad, it may try to finance the subsidiary's long-term assets with a matching long-term loan in the same currency. For example, suppose that a UK company with a French subsidiary decides to

purchase extra premises in France which must be paid for in francs. The company may try to finance the purchase by raising a loan in francs, which it would then repay out of the operating profits (in francs) from the use of the French premises.

Money market hedges

2.26 An exporter who invoices foreign customers in a foreign currency can hedge against the exchange risk by:

(a) borrowing an amount in the foreign currency now;

(b) converting the foreign currency lent to it into domestic currency at the 'spot' rate;

(c) repaying the loan with interest out of the eventual foreign currency receipts from debtors.

2.27 For example, if an exporter knows that he will receive DM70,000 from a German customer in one year's time, he can cover the foreign exchange risk by borrowing DM70,000 now for one year and repaying the loan with the eventual receipts. (For simplicity, the interest charges are ignored in this example.) The DM70,000 can be converted into sterling at the spot rate, and so the exchange risk is avoided.

2.28 Similarly, if a company has to make a foreign currency payment in the future, it can buy the currency now at the spot rate and put it on deposit, using the principal and the interest earned to make the foreign currency payment when it falls due.

These forms of 'money market hedge' are an alternative method of covering foreign exchange risk to using forward exchange contracts (considered next).

2.29 Is one of these methods of cover likely to be cheaper than the other? The answer is perhaps, but not by much. There will be very little difference between borrowing in foreign currency and repaying the loan with currency receivables and borrowing in sterling and selling forward the currency receivables. This is because the premium or discount on the forward exchange rate reflects the interest differential between the two countries, as explained in the next section.

3 FORWARD EXCHANGE CONTRACTS 6/94

3.1 Foreign exchange transaction exposure may be overcome by means of a forward exchange contract, whereby the importer or exporter arranges for a bank to sell or buy a quantity of foreign currency at a future date, at a rate of exchange that is determined when the forward contract is made.

3.2 Forward exchange contracts allow a trader who knows that he will have to buy or sell foreign currency at a date in the future, to make the purchase or sale at a predetermined rate of exchange. The trader will therefore know in advance either how much local currency he will receive (if he is selling foreign currency to the bank) or how much local currency he must pay (if he is buying foreign currency from the bank).

Forward exchange contracts: definition

3.3 A forward exchange contract is:

(a) an immediately firm and binding contract, for example between a bank and its customer;

(b) for the purchase or sale of a specified quantity of a stated foreign currency;

(c) at a rate of exchange fixed at the time the contract is made;

(d) for performance (delivery of the currency and payment for it) at a future time which is agreed upon when making the contract. This future time will be either a specified date, or any time between two specified dates.

Forward rates and future exchange rate movements

3.4 A forward price is the spot price ruling on the day a forward exchange contract is made plus or minus the interest differential for the period of the contract. It is wrong to think of a forward rate as a forecast of what the spot rate will be on a given date in the future, and it will be a coincidence if the forward rate turns out to be the same as the spot rate on that future date.

3.5 It is however likely that the spot rate will move in the direction indicated by the forward rate. Currencies with high interest rates are likely to depreciate in value against currencies with lower interest rates: the attraction of higher interest persuades investors to hold amounts of a currency that is expected to depreciate.

For example, suppose that a spot rate on 1 June is US$1.7430 - 1.7440 to £1, and the three months forward rate (for 1 September) is US$1.7380 - 1.7395 to £1. It is likely that between 1 June and 1 September, sterling will weaken slightly against the dollar. In this example, interest rates in the UK on 1 June would be higher than interest rates in the USA, which accounts for the forward rates for dollars against sterling being lower than the spot rates on 1 June.

Interest rate parity

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3.6 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.

3.7 The principle of *interest rate parity* (not to be confused with purchasing power parity, which we explained earlier) links the foreign exchange markets and the international money markets. The principle can be stated as follows.

$$\frac{1 + r_{\$}}{1 + r_{£}} = \frac{f_{\$/£}}{s_{\$/£}}$$

This equation, based here on dollar/pound exchange and interest rates but of course generalisable to other cases, shows that:

Difference in interest rates = Difference between forward and spot rates

where $r_{\$}$ is the dollar ($) interest rate on a deposit for a certain time period

$r_{£}$ is the dollar interest rate on a deposit for the same time period

$f_{\$/£}$ is the forward exchange rate $/£ for the same time period

$s_{\$/£}$ is the spot exchange rate $/£

Example: interest rate parity

3.8 Exchange rates between two currencies, the Northland florin (NF) and the Southland dollar (S$) are listed in the financial press as follows.

Spot rates	4.7250	NF/$S
	0.21164	$S/NF
90 day rates	4.7506	NF/$S
	0.21050	$S/NF

The money market interest rate for 90 day deposits in Northland florins is 7.5% annualised. What is implied about interest rates in Southland?

Assume a 365 day year. (*Note*. In practice, foreign currency interest rates are often calculated on an alternative *360-day* basis, one month being treated as 30 days.)

Solution

3.9 Today, $S1.000 buys NF4.7250.

NF4.7250 could be placed on deposit for 90 days to earn interest of NF(4.7250 × 0.075 × 90/365) = NF0.0874, thus growing to NF(4.7250 + 0.0874) = NF4.8124.

This is then worth $S 1.0130 at the 90 day exchange rate.

This tells us that the annualised expected interest rate on 90-day deposits in Southland is 0.013 × 365/90 = 5.3%.

3.10 Alternatively, applying the formula given earlier, we have the following.

Northland interest rate on 90 day deposit = r_n = 0.0874 + 4.7250 = 1.85%

Southland interest rate on 90 day deposit = r_s

90-day forward exchange rate = $f_{s/n}$ = 0.21050

Spot exchange rate = $s_{s/n}$ = 0.21164

$$\frac{1+r_s}{1+0.0185} = \frac{0.21050}{0.21164}$$

$$1 + r_s = 1.0185 \times 0.21050 \div 0.21164$$

$$= 1.013$$

$$r_s = 0.013, \text{ or } 1.3\%$$

Annualised, this is 0.013 × 365/90 = 5.3%

Fixed and option contracts

3.11 A forward exchange contract may be either *fixed* or *option*.

(a) 'Fixed' means that performance of the contract will take place on a specified date in the future. For example, a two months forward *fixed* contract taken out on 1 September will require performance on 1 November.

(b) 'Option' means that performance of the contract may take place, at the option of the customer, either:

(i) at any date from the contract being made up to and including a specified final date for performance; or

(ii) at any date between two specified dates.

Option forward exchange contracts (or 'forward option contracts') are different from *currency options*, which are explained in Chapter 22.

Premiums and discounts: quoting a forward rate

3.12 Let us recap on premiums and discounts in quoting forward rates. As you will already appreciate, a forward exchange rate might be higher or lower than the spot rate. If it is higher, the quoted currency will be cheaper forward than spot. For example, if in the case of Italian lire against sterling (i) the spot rate is 2,156 - 2,166 and (ii) the three months forward rate is 2,207 - 2,222:

(a) a bank would sell 2,000,000 lire:

(i) at the spot rate, now, for £927.64 $\left(\frac{2,000,000}{2,156}\right)$

(ii) in three months time, under a forward contract, for £906.21 $\left(\frac{2,000,000}{2,207}\right)$

(b) a bank would buy 2,000,000 lire:

(i) at the spot rate, now, for £923.36 $(\frac{2,000,000}{2,166})$

(ii) in three months time, under a forward contract, for £900.09 $(\frac{2,000,000}{2,222})$

3.13 In both cases, the quoted currency (lire) would be worth less against sterling in a forward contract than at the current spot rate. This is because it is quoted forward cheaper, or 'at a discount', against sterling.

3.14 If the forward exchange rate is lower than the spot rate, the quoted currency will be more expensive forward than spot. For example:

(a) if the spot rate for DM against sterling is 3.05 - 3.06; and
(b) the one month forward rate is 3.03 - 3.04½,

then DM are more expensive (quoted 'at a premium') forward than spot.

3.15 Forward rates are not quoted independently, but are quoted as adjustments to the spot rates.

(a) If the forward rate for a currency is cheaper than the spot rate, it is quoted as a *discount* to the spot rate. The forward rate will be higher than the spot rate by the amount of the discount.

(b) If the forward rate for a currency is more expensive than the spot rate, it is quoted as a *premium* to the spot rate. The forward rate will be lower than the spot rate by the amount of the premium.

The rule for adding or subtracting discounts and premiums

3.16 A *discount* is therefore *added* to the spot rate, and a *premium* is therefore *subtracted* from the spot rate.

3.17 The mnemonic 'ADDIS' may help you to remember that we ADD DIScounts and so subtract premiums.

3.18 The longer the duration of a forward contract, the larger will be the quoted premium or discount. Thus premiums or discounts will be larger three months forward than one month forward.

Exercise 3

You are given the following information about currency rates for sterling spot and forward.

	Spot	*One month forward*	*Three months forward*
US (dollar)	1.5200 - 1.5210	0.32 - 0.27c pm	0.89 - 0.84 pm
Canada (dollar)	1.8630 - 1.8640	0.30 - 0.20c pm	0.90 - 0.80 pm
Netherlands (guilder)	4.05¼ - 4.06¼	2⅜ - 1⅞c pm	6¾ - 6¼ pm
Belgium (franc)	72.20 - 72.30	10 - 20c dis	45 - 55 dis
Denmark (krone)	13.01 - 13.02	44 - 5⅝ ore dis	18⅜ - 19¾ dis
Germany (DM)	3.06½ - 3.07½	2 - 1½pf pm	5½ - 5 pm

Calculate the cost or value in sterling to a customer who wishes to:

(a) buy US$14,000 one month forward from his bank;
(b) buy Canadian $25,000 spot;
(c) buy Belgian francs 75,000 three months forward;
(d) sell guilders 28,000 one month forward;
(e) sell Danish kroner 20,000 three months forward;
(f) sell DM 6,000 one month forward.

Solution

(a), (b) and (c). When the customer buys, the bank sells.

	US$ 1 month forward	*Can $ spot*	*Belg Fr 3 months forward*
Spot rate	1.5200	1.8630	72.20
Subtract premium (1 month)	0.0032		
Add discount (3 months)			0.45
Bank's selling rate	1.5168	1.8630	72.65
Currency required by customer	US$14,000	Can$25,000	BelgFr75,000
Cost in sterling	£9,229.96	£13,419.22	£1,032.35

(d), (e) and (f). When the customer sells, the bank buys.

	Guilder 1 month forward	*Kroner 3 months forward*	*DM 1 month forward*
Spot rate	4.06¼	13.02	3.07½
Subtract premium	0.01 7/8		0.01½
Add discount		0.19¾	
Bank's buying rate	4.04 3/8	13.21¾	3.06
Currency for sale by customer	Guilders28,000	Kroner20,000	DM6,000
Value in sterling	£6,924.27	£1,513.15	£1,960.78

Example: forward exchange contracts (1)

3.19 A UK importer knows on 1 April that he must pay a foreign seller 26,500 Swiss francs in one month's time, on 1 May. He can arrange a forward exchange contract with his bank on 1 April, whereby the bank undertakes to sell the importer 26,500 Swiss francs on 1 May, at a fixed rate of say 2.64.

The UK importer can be certain that whatever the spot rate is between Swiss francs and sterling on 1 May, he will have to pay on that date, at this forward rate:

$$\frac{26{,}500}{2.64} = £10{,}037.88$$

(a) If the spot rate is lower than 2.64, the importer would have successfully protected himself against a weakening of sterling, and would have avoided paying more sterling to obtain the Swiss francs.

(b) If the spot rate is higher than 2.64, sterling's value against the Swiss franc would mean that the importer would pay more under the forward exchange contract than he would have had to pay if he had obtained the francs at the spot rate on 1 May. He cannot avoid this extra cost, because a forward contract is binding.

Option forward exchange contracts

3.20 As we saw above, option contracts are forward exchange contracts where the customer has the option to call for performance of the contract:

(a) at any date from the contract being made up to a specified date in the future; or
(b) at any date between two dates both in the future.

Performance must take place at some time: it cannot be avoided altogether.

3.21 Option contracts are normally used to cover whole months straddling the likely payment date, where the customer is not sure of the exact date on which he will want to buy or sell currency. (The purpose of an option contract is to avoid having to renew a

forward exchange contract and extend it by a few days, because extending a forward contract can be expensive.)

3.22 Option contracts can also be used bit by bit. For example, if a customer makes an option forward contract to sell DM 100,000 at any time between 3 July and 3 August, he might sell DM 20,000 on 5 July, DM 50,000 on 15 July and DM 30,000 on 1 August.

3.23 When a customer makes an option forward exchange contract with his bank, the bank will quote the rate which is most favourable to itself out of the forward rates for all dates within the option period. This is because the customer has the option to call for performance of the contract on any date within the period, and the bank will try to ensure that the customer does not obtain a favourable rate at the bank's expense.

What happens if a customer cannot satisfy a forward contract?

3.24 A customer might be unable to satisfy a forward contract for any one of a number of reasons.

(a) An importer might find that:

(i) his supplier fails to deliver the goods as specified, so the importer will not accept the goods delivered and will not agree to pay for them;

(ii) the supplier sends fewer goods than expected, perhaps because of supply shortages, and so the importer has less to pay for;

(iii) the supplier is late with the delivery, and so the importer does not have to pay for the goods until later than expected.

(b) An exporter might find the same types of situation, but in reverse, so that he does not receive any payment at all, or he receives more or less than originally expected, or he receives the expected amount, but only after some delay.

Close-out of forward contracts

3.25 If a customer cannot satisfy a forward exchange contract, the bank will make the customer fulfil the contract.

(a) If the customer has arranged for the bank to buy currency but then cannot deliver the currency for the bank to buy, the bank will:

(i) sell currency to the customer at the spot rate (when the contract falls due for performance);

(ii) buy the currency back, under the terms of the forward exchange contract.

(b) If the customer has contracted for the bank to sell him currency, the bank will:

(i) sell the customer the specified amount of currency at the forward exchange rate;

(ii) buy back the unwanted currency at the spot rate.

3.26 Thus, the bank arranges for the customer to perform his part of the forward exchange contract by either selling or buying the 'missing' currency at the spot rate.

These arrangements are known as *closing out* a forward exchange contract.

Example: forward exchange contracts (2)

3.27 Shutter Ltd arranges on 1 January with a US supplier for the delivery of a consignment of goods costing US$96,000. Shutter Ltd will have to pay for the goods in six months time, on 1 July. The company therefore arranges a forward exchange contract for its bank to sell it US$96,000 six months hence.

In the event, the size of the consignment is reduced, and on 1 July, Shutter Ltd only needs US$50,000 to pay its supplier. The bank will therefore arrange to close out the

forward exchange contract for the US$46,000 which Shutter Ltd does not need. This is called a partial close-out.

Exchange rates between the US dollar and sterling are as follows.

1 January:	
Spot	$1.5145 - 1.5155
6 months forward	0.95 - 0.85c pm
1 July:	
Spot	$1.5100 - 1.5110

Compute the cost to Shutter Ltd of the whole transaction, ignoring commission.

Solution

3.28 (a) The bank will sell Shutter Ltd US$96,000, to fulfil the original forward contract. The six months forward rate on 1 January was as follows.

Spot rate	1.5145
Less premium	0.0095
Forward rate	1.5050

(b) The bank will buy back the unwanted US$46,000 at the spot rate on 1 July, thus closing out the contract.

	£
Sale of US$96,000 at $1.5050	63,787.38
Purchase of US$46,000 at $1.5110	30,443.41
Cost to Shutter Ltd	33,343.97

Extensions of forward contracts

3.29 When a forward exchange contract reaches the end of its period, a customer might find that he has not yet received the expected currency from an overseas buyer, or does not yet have to pay an overseas seller. The customer still wants to buy or sell the agreed amount of currency in the forward exchange contract, but he wants to defer the delivery date for the currency under the contract.

3.30 The customer can then ask the bank to close out the old contract at the appropriate spot rate, and ask for a new contract for the extra period, with the rate being calculated in the usual way.

3.31 An alternative would be for the bank to extend the contract, by changing the bank's selling or buying rate in the contract. The bank would then arrange a new forward exchange contract with the customer at a rate that is slightly more favourable to the customer than for an ordinary forward exchange contract. This type of arrangement is, however, frowned upon by the Bank of England as it might encourage companies to conceal losses, and banks will only permit it in the rarest of cases.

The cost of forward exchange cover

3.32 There is an implied interest rate in the cost of forward cover. The approximate cost (as an interest percentage) of forward exchange cover is:

$$\frac{\text{Premium or discount} \times 12 \text{ months} \times 100}{\text{Number of months forward cover taken} \times \text{the forward rate}}$$

Example: forward exchange contracts (3)

3.33 The bank's quoted prices for US dollars against sterling are as follows.

Spot	1.6365 - 1.6385
One month forward	0.50 - 0.47 cents pm

What is the approximate cost of forward cover?

Solution

3.34 (a) For a customer buying dollars one month forward:

$$\frac{0.005 \times 12 \text{ months} \times 100\%}{1 \text{ month} \times (1.6365 - 0.0050)} = 3.68\%$$

(b) For a customer selling dollars one month forward:

$$\frac{0.0047 \times 12 \text{ months} \times 100\%}{1 \text{ month} \times (1.6385 - 0.0047)} = 3.45\%$$

The average of these two rates is 3.57%, which is the rate that would be shown in the financial press.

3.35 The relevance of implied interest rates in forward exchange rates is that the cost of forward cover can be compared with the cost of foreign currency borrowing, as an alternative method of obtaining cover against foreign exchange risk.

4 CHOOSING A HEDGING METHOD

4.1 When a company expects to receive or pay a sum of foreign currency in the next few months, it can choose between using the forward exchange market and the money market to hedge against the foreign exchange risk. Other methods may also be possible, such as making lead payments. The cheapest method available is the one that ought to be chosen.

Example: choosing the cheapest method

4.2 Trumpton plc has bought goods from a US supplier, and must pay $4,000,000 for them in three months time. The company's finance director wishes to hedge against the foreign exchange risk, and the three methods which the company usually considers are:

(a) using forward exchange contracts;
(b) using money market borrowing or lending;
(c) making lead payments.

The following annual interest rates and exchange rates are currently available.

	US dollar		*Sterling*	
	Deposit rate	*Borrowing rate*	*Deposit rate*	*Borrowing rate*
	%	%	%	%
1 month	7	10.25	10.75	14.00
3 months	7	10.75	11.00	14.25

	$/£ exchange rate ($ = £1)
Spot	1.8625 - 1.8635
1 month forward	0.60c - 0.58c pm
3 months forward	1.80c - 1.75c pm

Which is the cheapest method for Trumpton plc? Ignore commission costs (the bank charges for arranging a forward contract or a loan).

Solution

4.3 The three choices must be compared on a similar basis, which means working out the cost of each to Trumpton either now or in three months time. Here the cost to Trumpton now will be determined.

Choice 1: the forward exchange market

4.4 Trumpton must buy dollars in order to pay the US supplier. The exchange rate in a forward exchange contract to buy $4,000,000 in three months time (bank sells) is:

	$
Spot rate	1.8625
Less 3 months premium	0.0180
Forward rate	1.8445

The cost of the $4,000,000 to Trumpton in three months time will be:

$$\frac{\$4,000,000}{1.8445} = £2,168,609.38$$

4.5 This is the cost in three months. To work out the cost now, we could say that by deferring payment for three months, the company is:

(a) saving having to borrow money now at 14.25% a year to make the payment now; or
(b) avoiding the loss of interest on cash on deposit, earning 11% a year.

The choice between (a) and (b) depends on whether Trumpton plc needs to borrow to make any current payment (a) or is cash rich (b). Here, assumption (a) is selected, but (b) might in fact apply.

4.6 At an annual interest rate of 14.25% the rate for three months is approximately 14.25/4 = 3.5625%. The 'present cost' of £2,168,609.38 in three months time is:

$$\frac{£2,168,609.38}{1.035625} = £2,094,010.27$$

Choice 2: the money markets

4.7 Using the money markets involves:

(a) borrowing in the foreign currency, if the company will eventually receive the currency;

(b) lending in the foreign currency, if the company will eventually pay the currency.

Here, Trumpton will pay $4,000,000 and so it would lend US dollars.

4.8 It would lend enough US dollars for three months, so that the principal repaid in three months time plus interest will amount to the payment due of $4,000,000.

(a) Since the US dollar deposit rate is 7%, the rate for three months is approximately 7/4 = 1.75%.

(b) To earn $4,000,000 in three months time at 1.75% interest, Trumpton would have to lend now:

$$\frac{\$4,000,000}{1.0175} = \$3,931,203.93$$

4.9 These dollars would have to be purchased now at the spot rate of (bank sells) $1.8625. The cost would be:

$$\frac{\$3,931,203.93}{1.8625} = £2,110,713.52$$

By lending US dollars for three months, Trumpton is matching eventual receipts and payments in US dollars, and so has hedged against foreign exchange risk.

Choice 3: lead payments

4.10 Lead payments should be considered when the currency of payment is expected to strengthen over time, and is quoted forward at a premium on the foreign exchange market.

Here, the cost of a lead payment (paying $4,000,000 now) would be $4,000,000 ÷ 1.8625 = £2,147,651.01.

4.11 In this example, the costs are as follows.

	£
Forward exchange contract	2,094,010.27 (cheapest)
Currency lending	2,110,713.52
Lead payment	2,147,651.01

5 FUTURES AND CURRENCY RISK

6/94, 6/96

The nature of futures

5.1 Futures are a form of forward contract, which give a fixed rate for a financial instrument, such as security prices, exchange rates or interest rates, at a future date. A futures contract can be defined as 'a standardised contract covering the sale or purchase at a future date of a set quantity of a commodity, financial investment or cash'. A buyer of a futures contract is said to take a *long position*, while the seller is said to take a *short position*.

5.2 Futures markets exist for various commodities, including sugar, gold, silver, wool and coffee, and serve the useful function of permitting suppliers and consumers to plan on the basis of known future prices. A *financial future* is a futures contract which is based on a financial instrument, rather than a physical commodity.

5.3 Unlike with forward exchange contracts, a futures position can be (and most often is) 'closed out' by selling the futures contract in the market to realise any profit or loss without actually taking delivery of the underlying commodity or financial instrument. (For some types of future, eg stock index futures, delivery is not possible in practice.) It may help to think of a futures contract as being like a 'bet' on how exchange rates or other prices will move: however, like other derivatives, futures are of use to those who wish to hedge (reduce risk) as well as those who seek speculative risk-taking opportunities.

5.4 The purchaser of a futures contract must deposit a sum as collateral for the contract, known as the *margin*, which might be in the form of a bank letter of credit, Treasury bills or cash. Changes in value of the contract must also be paid for daily by means of a 'variation margin'. The minimum amount by which the quoted price of a futures contract may change is called a *tick*.

5.5 *Marking to market* in the context of futures trading refers to a procedure whereby the customer's account is adjusted on a daily basis by the broker, and a clearing member's account is adjusted by the clearing house of a futures exchange, so as to revalue the accounts holder's position in futures to the daily settlement price (the current market value). Profits and losses arising from movements in the futures price during the day are respectively added to or subtracted from the account balance.

5.6 If there are losses on an account holder's position, there may be a demand for an additional margin payment. Such a demand is referred to as a 'margin call', and as already mentioned such payments are described as *variation margin*.

Currency futures

5.7 Financial futures in currency exchange rates are traded on some formal futures exchanges, such as the Chicago Mercantile Exchange (CME), which has offices in Chicago, New York, Washington, London and Tokyo, with a trading partner in the Singapore International Monetary Exchange (SIMEX). The specialist division of the CME for trading in currency and interest rate futures is called the International Monetary Market division (IMM). The London International Financial Futures and Options Exchange (LIFFE) does not trade in currency futures, and so a UK company wishing to buy or sell currency futures would need to use a foreign exchange such as the CME. Traders in currency futures (often banks) are dealers in large sums of money, often seeking a way of hedging against exchange risks.

5.8 Currency futures are contracts to buy or sell a quantity of a foreign currency at a future date, and so in this respect they are similar to forward exchange contracts. Unlike forward contracts, however:

(a) they can be reversed quite simply;

(b) they are for fixed amounts of currency (eg £25,000 for a future against the US dollar, DM 125,000 against the US dollar, Swiss francs SF 125,000 against US dollars etc);

(c) they are traded on a formal exchange;

(d) traders in futures have to put up 'margin money' - pay money 'up front' - to the clearers of the exchange, to ensure that they meet their future obligations.

5.9 *Basis risk* is a term used to describe the risk that the futures price may move differently from the spot market price.

5.10 Currency futures contracts are for standard quantities of currency, mainly against the US dollar. The standard value of each *tick* or minimum change in market price varies according to the contract.

5.11 Currency futures can be used to 'lock in' exchange rates by offsetting any losses on the spot market when foreign currency is actually purchased or sold with gains on the futures market.

5.12 Eight currencies are traded as futures on the CME, as follows.

Future	*Quantity per contract*	*Amount of one tick in price*	*Value of each one point price change*
Sterling	£62,500	$0.0001	$6.25
Australian dollar	A$100,000	$0.0001	$10.00
Canadian dollar	C$100,000	$0.0001	$10.00
Deutschmark	DM125,000	$0.0001	$12.50
French franc	FFr250,000	$0.00001	$2.50
Yen	Y12,500,000	$0.000001	$12.50
Swiss franc	SFr125,000	$0.0001	$12.50
Ecu	125,000 ecus	$0.0001	$12.50

5.13 Currency futures contracts can be used in a similar way to the non-standardised forward exchange contract to hedge currency risks, although it may not be possible to match the total value of contracts entered into with the amount involved in an actual transaction. We can consider currency futures by looking at an example.

Example: currency futures (1)

5.14 A UK importer buys goods from a US supplier for US$320,000. The purchase takes place on 21 March but the goods do not have to be paid for until 21 April. The spot rate of exchange on 21 March between sterling and the US dollar is £1 = $1.60.

5.15 The UK importer can hedge against the currency risk (the risk of a fall in the value of sterling against the dollar in the credit period) with currency futures. The expected cost of the purchase in sterling on 21 March is 320,000/1.60 = £200,000.

5.16 Assume for this example that sterling futures must be bought and sold in blocks of £25,000 and so the UK importer could sell eight sterling futures contracts at the current rate of US$1.60 = £1. To do this, the importer must deposit £1,000 per contract, or £8,000 in total.

5.17 Suppose that on 21 April, when the UK importer must pay the $320,000:

(a) the spot rate of exchange is £1 = $1.50;
(b) the rate at which sterling futures can be closed out is £1 = $1.51.

5.18 On 21 April, the importer will:

(a) buy US$320,000 spot for $1.5000, at a cost of $\frac{320,000}{1.50}$ = £213,333.33.

This is £13,333.33 more than was expected on 21 March;

(b) close out the futures contract at £1 = $1.5100. The value is £211,920.52 giving a realised profit of £11,920.52.

5.19 The importer's net position is as follows.

	£
Loss on fall in value of sterling from $1.60 to $1.50	(13,333.33)
Profit on futures	11,920.52
Net loss	(1,412.81)

The importer has therefore been able to hedge his position with futures for only a small net cost, which might be less than the cost of hedging with a forward exchange contract.

Example: currency futures (2)

5.20 Stark plc expects to receive US $6 million in September (six months' time). Ignore taxation and margin requirements.

Exchange rates and futures market rates are as follows.

Exchange rate	*Spot*	*6 months forward*
US $/£	1.4850 - 1.4900	1.4450 - 1.4500

Sterling £62,500 futures contracts - September US $/£ are priced at 1.4800.

Minimum price movement: 0.01 of one per cent.

Solution

5.21 On the forward market, we could 'lock in' at $1.45 per £1, thus receiving £4,137,931. What about with futures?

How many futures contracts should we buy?

$6 million ÷ 1.48 = £4,054,054, approximately 65 contracts.

Therefore, buy 65 September contracts at 1.4800.

Assuming that the spot rate in September is $1.45 and that the futures price moves by the same as the spot rate (ie no basis risk), in September we will sell 65 September contracts at 1.44 (4 cents less than 1.48).

The spot market gain compared with March is:

($6 million ÷ 1.45) – (£6 million ÷ 1.49) = £111,085

The futures market loss is:

(400 ticks × $6.25 × 65) ÷ 1.45 = £112,069

(Value of a tick = 0.0001 × 62,500 = $6.25)

Total expected receipts using futures are:

($6 million ÷ 1.49) – £112,069 + £111,085 = £4,025,862

5.22 If the spot rate had *risen* instead, there would be a spot market *loss* and a futures market *gain.*

6 CURRENCY SWAPS

6.1 In a currency swap, the parties agree to swap equivalent amounts of currency for a period. This effectively involves the exchange of debt from one currency to another. As with interest rate swaps (discussed later), liability on the principal is not transferred and the parties are liable to counterparty risk: if the other party defaults on the agreement to pay interest, the original borrower remains liable to the lender. This can present complicated legal problems, and some borrowers are unwilling to get involved in swap transactions for this reason.

6.2 Swaps 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.

(a) With a currency swap, a company could benefit from gaining access to debt finance in another country and currency where it is little known, and consequently has a poorer credit rating, than in its home country. It can therefore take advantage of lower interest rates than it could obtain if it arranged the loan itself.

(b) A further purpose of currency swaps is to restructure the currency base of the company's liabilities. This may be important where the company is trading overseas and receiving revenues in foreign currencies, but its borrowings are denominated in the currency of its home country. Currency swaps therefore provide a means of reducing exchange rate exposure.

(c) A third benefit of currency swaps is that at the same time as exchanging currency, the company may also be able to convert fixed rate debt to floating rate or vice versa. Thus it may obtain some of the benefits of an interest rate swap in addition to achieving the other purposes of a currency swap.

(d) A currency swap could be used to absorb excess liquidity in one currency which is not needed immediately, to create funds in another where there is a need.

6.3 A simple example would be one in which a UK company agrees with a US company to swap capital amounts at an agreed rate of exchange. Suppose a UK company is selling satellite equipment to NASA in the USA but will not be paid (in US dollars) for two years. The UK company could agree with another company to swap capital at an agreed rate of exchange in two years' time. The UK company will give the counterparty US dollars and receive sterling in return.

6.4 Consider a UK company X with a subsidiary in France which owns vineyards. Assume a spot rate of £1 = 10 French francs. Suppose the parent company wishes to raise a loan of 10 million French francs for the purpose of buying another French wine company. At the same time, the French subsidiary Y wishes to raise £1 million to pay for new up-to-date capital equipment imported from the UK. The UK parent company X could

borrow the £1 million sterling and the French subsidiary Y could borrow the 10 million francs, each effectively borrowing on the other's behalf. This last example is known as a back-to-back loan.

6.5 A variation on currency swaps is *international interest arbitrage financing* or *arbiloans*. This can be of value for an enterprise which operates in a country where interest rates are high and credit is hard to obtain. A subsidiary in a low-interest country borrows the amount required, converting it into the domestic currency of the parent company at the spot rate. The UK parent signs an agreement to repay the amount in the foreign currency at the end of the term, and purchases a forward contract for repayment at the same date.

6.6 A term which you may come across in relation to swaps is *warehousing* which refers to the activity of an intermediary who enters into contracts for one side of a swap even though it does not yet have a client firm to enter into the other side of the swap.

In practice, many currency swaps are conducted between banks and their customers. An agreement may only be necessary if the swap were for longer than, say, one year.

Example: hedging strategy using a swap

6.7 Adventurer Ltd, a UK company, is considering a contract to supply a telephone system to Blueland Telecom. All operating cash flows would be in the local currency, the Blue, as follows.

Time from start	*Cash flow*
	Blues
0	(700,000)
6 months	(400,000)
12 months	1,800,000

Because of high inflation in Blueland, the directors of Adventurer Ltd are very concerned about the foreign exchange risk. However, the only available form of cover is a currency swap at a fixed rate of 9 Blues to the pound, for 1,100,000 Blues, to take effect in full at the start of the project and to last for a full year. The interest rate chargeable on the Blues would be 18% a year. This compares to a UK opportunity cost of capital for Adventurer Ltd of 22%.

The alternative to the swap is to convert between sterling and Blues at the spot rate, currently 10 Blues to the pound. The Blue floats freely on world currency markets. Inflation in Blueland and the UK over the year for which the project will last is forecast to be as follows.

UK	*Blueland*	*Probability*
%	%	
2	10	0.2
3	30	0.3
4	70	0.5

Required

Show whether or not Adventurer Ltd should use the available swap. Do not discount receipts and payments to a single time.

Solution

6.8 The first step is to calculate the exchange rate in each of the different inflation scenarios. The rates can be found if we assume purchasing power parity between the two countries.

Then, with inflation rate expressed as decimals:

$$\text{Exchange rate after a year} = \text{current spot rate} \times \frac{1 + \text{Blueland inflation rate}}{1 + \text{UK inflation rate}}$$

$$\text{Exchange rate after six months} = \text{current spot rate} \times \sqrt{\frac{1 + \text{Blueland inflation rate}}{1 + \text{UK inflation rate}}}$$

Month	Inflation Blueland	Inflation UK	Exchange rate B/£
0			10.00
6	0.10	0.02	10.38
12	0.10	0.02	10.78
0			10.00
6	0.30	0.03	11.23
12	0.30	0.03	12.62
0			10.00
6	0.70	0.04	12.79
12	0.70	0.04	16.35

6.9 The expected values will not be calculated since these have little real meaning. Instead, the swap will be evaluated using the currency markets for each of the three scenarios.

6.10 The effects of the exchange rate on the investments and returns can now be calculated. It is assumed that Adventurer Ltd will have to borrow funds in the UK to finance the deal, and therefore interest will be calculated at the opportunity cost of funds, 22%. The interest rate for six months will be $\sqrt{1.22} - 1 = 0.1045 = 10.45\%$.

(a) *Using the currency markets*

(i) Inflation rates 2% and 10%:

	Blues	£	*Interest* £
Investment - month 0	(700,000)	(70,000)	(15,400)
Investment - month 6	(400,000)	(38,536)	(4,027)
		(108,536)	(19,427)
Interest		(19,427)	
Total cost		(127,963)	
Price received	1,800,000	166,976	
Net profit/(loss)		39,013	

(ii) Inflation rates 3% and 30%:

Investment - month 0	(700,000)	(70,000)	(15,400)
Investment - month 6	(400,000)	(35,619)	(3,722)
		(105,619)	(19,122)
Interest		(19,122)	
Total cost		(124,741)	
Price received	1,800,000	142,631	
Net profit/(loss)		17,890	

(iii) Inflation rates 4% and 70%:

	Blues	£	*Interest* £
Investment - month 0	(700,000)	(70,000)	(15,400)
Investment - month 6	(400,000)	(31,274)	(3,268)
		(101,274)	(18,668)
Interest		(18,668)	
Total cost		(119,942)	
Price received	1,800,000	110,092	
Net profit/(loss)		(9,850)	

(b) *Using the currency swap*

Adventurer Ltd will have to borrow sterling funds in the UK to finance the swap. The cost of funds in the UK is 22%. However, swaps involve the transfer of interest rate liabilities as well as of principal, and therefore the interest cost will be calculated at the swap rate of 18%.

It is assumed that no interest will be earned on the 400,000 Blues which will be lying idle until month 6.

The sterling investment required before interest is £1,100,000/9 = £122,222.

The price received will depend on the inflation rates. 1,100,000 Blues will be at the swap rate of 9 Blues to the pound, yielding £122,222, equal to the initial sterling outlay; the balance (700,000 Blues) will be at the prevailing year end rate. The sterling value of interest payments (198,000 Blues) will also depend on the exchange rate. It is assumed that no interest will be paid until the end of the year.

Inflation rates	*Spot rate receipts*	*Interest*	*Profit*	*Profit/(loss) without swap*
	£'000	£'000	£'000	£'000
2% and 10%	64,935	18,367	46,568	39,013
3% and 30%	55,468	15,689	39,779	17,890
4% and 70%	42,813	12,110	30,703	(9,850)

6.11 Whatever the inflation rates, Adventurer Ltd will make a bigger profit with the swap than without it. It should therefore use the swap.

Chapter roundup

- The majority of foreign exchange trading in London, the world's largest forex centre, is in swaps and other forms of forward exchange contracts.
- Exchange rates can be volatile. There are a number of techniques for exchange rate risk management, particularly when the risk is over a period of less than a year (as, for example, with foreign trade debtors and creditors).
- Examination questions may focus on the selection of the cheapest *appropriate* technique, so it is important to grasp not only the mathematics of these techniques but also what financial commitments are necessary to use each one.
- Foreign currency options, another possible form of hedging instrument, are discussed in the next chapter.

Test your knowledge

1 Distinguish and briefly explain the three types of currency risk. (see para 1.10)
2 What does the term 'matching' refer to? (2.7)
3 What are the main advantages of netting? (2.21)
4 Define a forward exchange contract. (3.3)
5 What is the meant by the principle of interest rate parity? (3.7)
6 Is a forward rate premium added to the spot rate, or subtracted? (3.16)
7 What happens if a company cannot satisfy a forward exchange contract? (3.25)
8 What are futures? (5.1)
9 What is meant by 'basis risk'? (5.9)
10 What are the main benefits of a currency swap? (6.2)

Now try illustrative questions 20 and 21 at the end of the Study Text

Chapter 21

OPTIONS AND OPTION VALUATION

This chapter covers the following topics.

		Syllabus reference
1	The nature of options	4(b)
2	Currency options	4(b)
3	A graphical approach to options	4(b)
4	Theory of the valuation of options	4(b)
5	Applications of options theory	4(b)

Introduction

Options can take various forms and are important as a form of hedging instrument. Your syllabus requires a working knowledge of options, including interest rate and currency options, and also an understanding of how options can be valued.

1 THE NATURE OF OPTIONS

Share option schemes

1.1 You are probably aware that share options may be issued by a company, giving their holders the right to subscribe for new ordinary shares at a predetermined price, at a certain date in the future. When options are eventually exercised, the company will issue new shares for cash. Companies which are 'floated' on the Stock Exchange main market or the second tier Alternative Investment Market might use the flotation as an opportunity to set up a share option scheme for employees.

1.2 Share options can be issued by a company as a way of rewarding employees. The feature of share options is that they give the right to apply for shares at a date in the future, at a specified price that will probably be favourable to the applicant. For example, a public company whose shares are currently traded at £2 on the stock market might award share options to some of its employees, giving them the right to apply for a quantity of shares at a date in the future at a price of, say, £2. Provided that the market price of the shares rises above £2 by the time the options can be exercised, the employees would then be able:

(a) to obtain some shares, and so get an equity interest in their company; or

(b) to obtain some shares and then sell them at a profit. The share options would then give, in effect, a cash bonus.

1.3 Share option schemes are an example of options, which can take various forms, as we shall see below.

The nature of an option

1.4 An option is an agreement giving the right to buy or to sell a specific quantity of something (eg shares in a company) at a known or determinable price within a stated period.

Pure options are options such as share options which are created by exchanges rather than (as in the case of share option schemes) by the company.

As with other types of option, share options can be used either as a means of speculation or as a means of risk reduction (hedging). The financial manager seeking to hedge exchange rate risk or interest rate risk is however more likely to come across currency options or interest rate options, and we look at these in more detail later in this Study Text.

Negotiated share options

1.5 A company or an investor can arrange a tailor-made option for their specific needs with a financial institution, and this is called a *negotiated option.* Negotiated may be for any number of shares or other stocks (except gilts). In practice, negotiated options are often for either 16 days or 3 months, the latter being more common.

1.6 An investor may acquire a *call option*, which means he is entitled to acquire the shares at the stated price within the specified period, or a *put option* which means he has the right to sell the shares at the stated price within the specified period, or he may take a two-way option or a *double option* (also called a *straddle*) which gives the right to buy or sell (and costs about twice as much).

Other terms for different option combinations include the *short butterfly*, the *long straddle* and the *bull spread.* A *naked option* is one that is held on its own, and not as a hedge against loss.

1.7 The price written into the option (called the *striking price*) will be slightly lower than the current bid price (the price at which a market maker will buy the share) for a put option and slightly higher than the current offer price for a call option. For example, if the current quotation were 393-397 for shares in ABC the striking price for a call option might be 400 and for a put option, 390.

Traded options in shares

1.8 One of the disadvantages of negotiated options is that because they are all different, there is no ready market for them. This problem is overcome by *traded options*, which are traded on the London International Financial Futures and Options Exchange (LIFFE) and similar exchanges.

1.9 Share option contracts are created by The Stock Exchange and are normally for 1,000 shares. Where there has been a change which affects the number of the underlying shares in issue, such as a share split or a bonus issue, the option contract may be for a different amount. The call options for a particular company are known as a *class*; the put options form another class. Traded options are available only in about 60 financially strong companies, and in the FT-SE 100 index. (Index options are explained further below).

1.10 An *American-style option* is an option that can be exercised on any day between two dates (the option period). A *European-style option* is one which can only be exercised on a particular date. This terminology is however potentially misleading, since most options traded in the UK and Europe are in fact American options.

Dealing mechanisms

1.11 There are two parties to each traded option contract: the person who receives the option money in exchange for granting an option (the seller) and the person who buys the option. Someone who sells an option he does not already own is known as a 'writer'. Anybody who can satisfy the Stock Exchange of his creditworthiness can write traded options but, as with negotiated options, it is usually done by institutions. Unlike negotiated options, a traded option position can be closed at any time by either party. The writer simply buys an option of the same series and the original buyer simply sells one. Positions may also be closed by matching call and put options with the same exercise price and the same expiry date. In practice, only a few traded options are ever actually exercised, and so no actual shares are involved in the transaction.

1.12 Dealing in traded options takes place on a special trading floor. Stock Exchange firms with option business to transact gather round the 'pitch' to form what is known as the 'crowd'. The crowd comprises board dealers (appointed by the Stock Exchange to deal in one or more classes), market makers, and public order members (brokers who are there to execute orders on behalf of their clients). In executing an order, the public order member will check the price with the board dealer and market makers who deal in the class and then complete the transaction with whichever is offering the best price. One of the duties of board dealers is to ensure that, as far as possible, orders from members of the public will be completed fairly. The clearance of completed orders is handled by the London Options Clearing House (LOCH).

Prices of traded options

1.13 The following discussion concentrates on call options. The same principles in general apply to put options.

The price (the option *premium*) will depend in general on:

(a) the time to the expiry date;
(b) the relationship of the exercise price to the current market price;
(c) the inherent volatility of the underlying shares; and
(d) future prospects.

1.14 For share call options, those with exercise prices below the current share price are said to be *in the money*; those with exercise prices above the current share price are *out of the money*; those where the exercise price equals the current price are *at the money*. For put options the meaning of these terms is reversed.

1.15 The value of an option may be divided into two parts:

(a) *intrinsic value* - this is the difference between the exercise price and the current share price. Only 'in the money' series will have any intrinsic value;

(b) *time value* - this reflects prevailing interest rates, the company's dividend record and the degree of risk associated with it. The time value always falls as the expiry date approaches.

Exercise and assignment

1.16 An investor may choose to exercise a share option which he holds rather than to sell it back into the market for a number of reasons.

(a) If he had been expecting a bid for the company to emerge or if he was expecting funds to become available which he wanted to invest in a popular company, he might exercise the appropriate call option in order to claim the shares once either of these events had occurred.

(b) If he had been holding shares in order to receive the dividend or to vote in a shareholders' meeting or if bad news had been announced affecting the company's prospects, he might exercise a put option to rid himself of the shares.

1.17 When an option is exercised, all writers (those who have sold options they do not own) stand an equal chance of being selected on any one of the options they have written. This process is known as *assignment*. Once notice of assignment has been received (by means of computer), the writer cannot trade the option but must buy or sell shares in order to complete his side of the bargain.

(a) Someone who has written call options against shares which he already owns has written a 'covered' call. He simply sells his shares through the market at the exercise price.

(b) Writers of 'naked' calls hold no shares. They must buy shares in the market at whatever price they can in order to satisfy their side of the bargain.

(c) Writers of 'naked' puts must buy shares at the exercise price whether they want them or not. If they do not wish to hold the shares, they can close their position by selling them into the market at whatever price they can obtain.

(d) A writer who had sold shares which he did not own could write a 'covered' put, though this would normally only be possible within the same two week account. On assignment he would simply buy the shares at the exercise price. Both bargains would then have been satisfied.

Straddles

1.18 An investor can write covered puts or calls not only by using his share position but also against other options which he holds in the same stock.

A 'straddle' position results when an investor buys a put and a call with the same exercise price and expiry date in the same stock or where he sells a put and a call with identical expiry dates and exercise prices. These are not covered positions. Indeed to write a naked straddle is a very high risk strategy indeed.

Attractions of traded options

1.19 Traded options can be very speculative investments. However, they may also be used in many other ways. The majority of traded options are dealt in by institutional investors who:

(a) write call options or buy put options to protect the portfolios which they manage;

(b) buy call options as part of their overall portfolio management. Call options allow them to control their cashflows very effectively while leaving them free to take advantage of stockmarket changes;

(c) take 'covered' option positions which allow them the chance to make profits for a known amount of risk.

1.20 The private investor who favours traded options is likely to be wealthy. He may:

(a) buy puts or calls as a pure gamble;

(b) sell call options against shares which he owns in the hope of increasing his gain on those shares;

(c) buy put options to protect the value of shares which he owns.

Index options

1.21 As already mentioned, traded options are available on the FT-SE 100 share index. This class was introduced following the popularity of similar investment instruments in the US.

1.22 Each *contract* is for a notional value of the Index value multiplied by £10. Thus, if the index stands at 1,100, the notional value of a contract is £11,000. Exercise prices are set at intervals of 25 index points (eg 1,100, 1,125, 1,150 etc) up to an index level of 1,700, and thereafter at intervals of 50 points. Prices (or *premiums*) are quoted in pence as the

price of 1/1,000th of the contract. Thus, if an option is bought at 35p, the price per contract will be £350 (1,000 × 35p). The procedure for creation and valuation of the options is the same as for other traded options. However, there are different expiry dates. There are also four series, set one month apart.

1.23 Index options can be useful to an investor in a number of ways, either for speculative purposes or as a 'hedge' against risk of adverse movements in market prices generally. For example, an investor may be convinced that the market is set to rise but he is not completely confident of any individual stock nor does he have sufficient funds to acquire a well-diversified equity portfolio. He may then buy index call options which he hopes will rise in value with the market. Suppose he bought one 2,100 call contract at 36p. He would have paid £360 before expenses (see above). If the index rises to 2,190, he may be able to sell his contract at (say) 96p or £960 in total, giving a profit before expenses of £600. When the index stands at 2,190 a 2,100 call option will have an intrinsic value of £10 × (2,190 – 2,100) = £900, or, in terms of the quoted price, £900 ÷ 1,000 = 90p. In other words, of the 96p price 90p is intrinsic value and 6p is time value. This reflects the fact that the market expects the index to rise further before the expiry of the option. If the investor exercised his option instead of selling it, he would realise only the intrinsic value.

1.24 Consider the position of another investor who acquires 10,000 shares in Superprofit plc (a company in which traded options are not available) when the share price is standing at 250p and the index is 2,200. The investor is convinced that Superprofit will outperform the market but is worried that share prices in general will fall. He decides to buy three 2,200 put contracts at a price of 40p, giving a total cost of £1,200 (3 × 1,000 × 40p). Some time later his fears have been justified. The index has fallen to 1,760 (a 20% fall) and the price of Superprofit plc to 225p (a 10% fall). Superprofit has done better than the index but without the options the investor would still have lost £2,500. Suppose that he sells the options for 450p; his overall position will be as follows.

	£
Gain on options 3 × 1,000 × (450p – 40p)	12,300
Loss on shares	2,500
Overall gain	9,800

The intrinsic value of the option is $\frac{(2,200 - 1,760) \times £10}{1,000} = 440p$

It follows that the price the investor obtains includes 10p time value, reflecting the fact that the market anticipates a further small drop in the index before the option expires.

Options compared with futures

1.25 Note the following differences between futures and options.

(a) In the case of futures, both parties to the contract have an obligation to complete the transaction. This is different from options, which will simply lapse and not be exercised if they are 'out of the money'.

(b) Buyers of options pay at the outset of the contract (in the premium) for the advantage that they can avoid sustaining a loss on the option. With futures, in contrast, the buyer might win or lose.

2 CURRENCY OPTIONS

6/94, 6/95

2.1 A forward exchange contract is a contract to buy or sell a given quantity of foreign exchange, which must be carried out because it is a binding contract. Some exporters might be uncertain about the amount of currency they will earn in several months time, and so would be unable to enter forward exchange contracts without the risk of contracting to sell more or less currency to their bank than they will actually earn when the time comes. An alternative method of obtaining foreign exchange cover which overcomes much of the problem is the *foreign currency option*.

2.2 A currency option is an agreement involving an option, but not an obligation, to buy or to sell a certain amount of currency at a stated rate of exchange (the *exercise price*) at some time in the future.

Note that as with other types of option, *buying* a currency option involves paying a premium, which is the most the buyer of the option can lose. *Selling* (or 'writing') options, unless covered by other transactions, is extremely risky because the seller ('writer') bears the whole of the cost of the variation and can face potentially unlimited losses. Such risks received much publicity with the Barings Bank failure in 1995.

2.3 Currency options are not the same as forward exchange option contracts, although the similarity in names might seem confusing to you. An option can be purchased by an importer or an exporter, giving him the right to buy or sell a given quantity of currency at a stated rate of exchange at a future date, typically after three months. Unlike a forward exchange contract, an option does not have to be exercised. Instead, when the date for exercising the option arrives, the importer or exporter can either exercise the option or let the option lapse.

2.4 Some terminology relating to traded options was explained in the previous section of the chapter in the context of options to buy and sell shares. Much of the same terminology applies to currency options.

(a) There are two basic types of currency option, both of which can be bought and sold.

  (i) *Call options* give the buyer of the option the right to buy the underlying currency at a fixed rate of exchange (and the seller of the option would be required to sell the underlying currency at that rate).

  (ii) *Put options* give the buyer of the option the right to sell the underlying currency at a fixed rate of exchange (and the seller of the option would be required to buy the underlying currency at that rate).

(b) The exercise price may be the same as the current spot rate, or it may be more favourable or less favourable to the option holder than the current spot rate. Options are *at the money*, *in the money* or *out of the money* accordingly.

(c) Companies can choose whether to buy:

  (i) a tailor-made currency option from a bank, suited to the company's specific needs. These are *over the counter* (OTC) or *negotiated* options;

  (ii) a standard option, in certain currencies only, from an options exchange. Such options are *traded* or *exchange-traded* options.

2.5 The currency options traded on the important Philadelphia Stock Exchange are listed below.

Philadelphia SE currency options

Currency	*Contract size**
Australian $	A$50,000
£ Sterling	£31,250
Canadian $	C$50,000
Deutschmark	DM62,500
French franc	FF250,000
Japanese yen	Y6.25m
Swiss franc	SF62,500
ECU	ECU62,500

* quoted against US $

2.6 A company wishing to purchase an option to buy or sell sterling can use currency options traded on the Philadelphia Stock Exchange.

The schedule of prices published in the *Financial Times* for £/$ options (as at 8 August 1995) is set out below.

Philadelphia SE £/$ options £31,250 (cents per pound)

Strike price	*Calls*			*Puts*		
	Aug	*Sep*	*Oct*	*Aug*	*Sep*	*Oct*
1.575	2.58	3.13	-	-	0.67	-
1.580	2.14	2.77	3.24	-	0.81	1.32
1.590	1.23	2.17	2.64	0.05	1.06	1.71
1.600	0.50	1.61	2.16	0.32	1.50	2.18
1.610	0.15	1.16	1.71	0.93	2.05	2.69
1.620	-	0.81	1.33	1.79	2.65	3.30

2.7 Note the following points.

(a) The contract size is £31,250.

(b) If a firm wished to have the option to buy pounds (selling dollars) in September, it can buy a call option on sterling. To have the option to buy pounds at an exchange rate of $1.580/£, it would need to pay a premium of 2.77 cents per pound (check for yourself in the table). For a higher exchange rate, the premium is lower, since the higher exchange rate is less favourable to the buyer of the option: more dollars are needed to buy the same number of pounds.

(c) A put option here is the option to sell sterling in exchange for dollars. Note that a put option with a strike price of 1.600 $/£ exercisable in September is, at 1.50 cents per pound, cheaper than a September put option exercisable at 1.610 $/£, which is available at a premium of 2.05 cents per pound. The premium on put options is higher for the higher exchange rate since the purchase will receive more dollars for each pound sold than with the lower exchange rate.

(d) The sizes and differentials in premiums on the option contracts for any particular month reflect also the markets' view of the likely movement in the £/$ exchange rate between now and that month.

(e) Note that a call option with a strike price of 1.600 $/£ exercisable in September will cost more than an option with the same strike price which is exercisable in August. This difference reflects the fact that for the September option there is a longer period until the exercise date and consequently the likelihood of it being beneficial to exercise the option is increased (ie it is more likely to be 'in the money' at the exercise date). The difference also reflects the market's view of the direction in which the exchange rate is likely to move between the two dates.

The purpose of currency options

2.8 The main purpose of currency options is to reduce or eliminate exposure to currency risks, and they are particularly useful for companies in the following situations:

(a) where there is uncertainty about foreign currency receipts or payments, either in timing or amount. Should the foreign exchange transaction not materialise, the option can be sold on the market (if it has any value) or exercised if this would make a profit;

(b) to support the tender for an overseas contract, priced in a foreign currency;

(c) to allow the publication of price lists for its goods in a foreign currency;

(d) to protect the import or export of price-sensitive goods. If there is a favourable movement in exchange rates, options allow the importer/exporter to profit from the favourable change (unlike forward exchange contracts, when the importer/exporter is tied to a fixed rate of exchange by the binding contract). This means that the gains can be passed on in the prices to the importer's or exporter's customers.

In both situations (b) and (c), the company would not know whether it had won any export sales or would have any foreign currency income at the time that it announces its selling prices. It cannot make a forward exchange contract to sell foreign currency without becoming exposed in the currency.

Example: currency options (1)

2.9 Tartan plc has been invited to tender for a contract in Blueland with the bid priced in Blues (the local currency). Tartan thinks that the contract would cost £1,850,000. Because of the fierce competition for the bid, Tartan is prepared to price the contract at £2,000,000, and since the exchange rate is currently B2.80 = £1, it puts in a bid of B5,600,000.

The contract will not be awarded until after six months.

2.10 What can happen to Tartan with the contract? There are two 'worst possible' outcomes.

(a) Tartan plc decides to hedge against the currency risk, and on the assumption that it will be awarded the contract in six months time, it enters into a forward exchange contract to sell B5,600,000 in six months time at a rate of B2.8 = £1.

As it turns out, the company fails to win the contract and so it must buy B5,600,000 spot to meet its obligation under the forward contract. The exchange rate has changed, say, to B2.5 = £1.

	£
At the outset:	
Tartan sells B5,600,000 forward at B2.8 to £1	2,000,000
Six months later:	
Tartan buys B5,600,000 spot to cover the hedge, at B2.5 to £1	(2,240,000)
Loss	(240,000)

(b) Alternatively, Tartan plc might decide not to make a forward exchange contract at all, but to wait and see what happens. As it turns out, Tartan is awarded the contract six months later, but by this time, the value of the Blue has fallen, say, to B3.2 = £1.

	£
Tartan wins the contract for B5,600,000, which has a sterling value of (B3.2 = £1)	1,750,000
Cost of the contract	(1,850,000)
Loss	(100,000)

A currency option would, for a fixed cost, eliminate these risks for Tartan plc. When it makes its tender for the contract, Tartan might purchase a currency option to sell B5,600,000 in six months time at B2.8 to £1, at a cost of £40,000.

2.11 The worst possible outcome for Tartan plc is now a loss of £40,000.

(a) If the company fails to win the contract, Tartan will abandon the option (unless the exchange rate has moved in Tartan's favour and the Blue has weakened against sterling so that the company can make a profit by buying B5,600,000 at the spot rate and selling it at B2.8 = £1).

(b) If the company wins the contract and the exchange rate of the Blue has weakened against sterling, Tartan will exercise the option and sell the Blues at 2.80.

	£	£
Proceeds from selling B5,600,000		2,000,000
Cost of contract	1,850,000	
Cost of currency option	40,000	
		1,890,000
Net profit		110,000

(c) If the Blue has strengthened against sterling, Tartan will abandon the option. For example, if Tartan wins the contract and the exchange rate has moved to B2.5 = £1, Tartan will sell the B5,600,000 at this rate to earn £2,240,000, and will incur costs, including the abandoned currency option, of £1,890,000.

	£	£
Proceeds from selling B5,600,000		2,240,000
Cost of contract	1,850,000	
Cost of currency option	40,000	
		1,890,000
Net profit		350,000

Example: currency options (2)

2.12 Stark plc (the company in an earlier example) expects to receive US $6 million in September (six months' time). The company could 'lock in ' at a six months' forward rate of $1.45 per £1 on the forward exchange market; the current spot rate US $/£ is 1.4850 - 1.4900. It might buy September *call* options (because the company will need to buy sterling using dollars) which have prices as follows on the Philadelphia Stock Exchange.

Sterling £31,250 contracts - September calls

Exercise price	*Cents per £*
$1.450/£	5.70
$1.500/£	1.45

A $1.500 exercise price will protect the current $1.49 spot rate at relatively low premium cost.

2.13 To provide more protection at the same rate as a forward contract in this case, an exercise price of $1.45 could be chosen, but at higher premium cost. The following calculations are for $1.45 options.

At $1.450, we would buy $6 million ÷ 1.45 = £4,137,931, approximately 133 contracts.

Premium cost: £31,250 × 133 × 5.70 cents = £236,906 or $351,805 at the spot rate of 1.485.

2.14 If the spot rate in September is $1.45 or above, the net outcome is approximately ($6 million ÷ 1.45) less the £352,000 premium cost, ie £3,786,000.

If the September spot rate were less than $1.45, say, $1.35, the options would not be exercised. The net outcome is then approximately ($6 million ÷ 1.35) less £352,000, ie £4,092,000.

(If the options are exercised, extra dollars need to be purchased at the spot rate to fulfil the contract, but this would not materially affect the solution.)

The drawbacks of currency options

2.15 The major drawbacks of currency options are as follows.

(a) The cost is about 5% of the total amount of foreign exchange covered, although the exact amount depends on the expected volatility of the exchange rate.

(b) Options must be paid for as soon as they are bought.

(c) Tailor-made options lack negotiability.

(d) Traded options are not available in every currency.

3 A GRAPHICAL APPROACH TO OPTIONS

3.1 A graphical approach to options may help you to understand options more fully and may provide a means of illustrating options in answers to exam questions.

3.2 The examples illustrated below generally refer to share prices. In the case of other types of option (eg index options or currency options), then it will be the value or price of the particular underlying investment (eg the stock index or the currency) which is relevant.

3.3 Figure 1 shows the position of a call option holder.

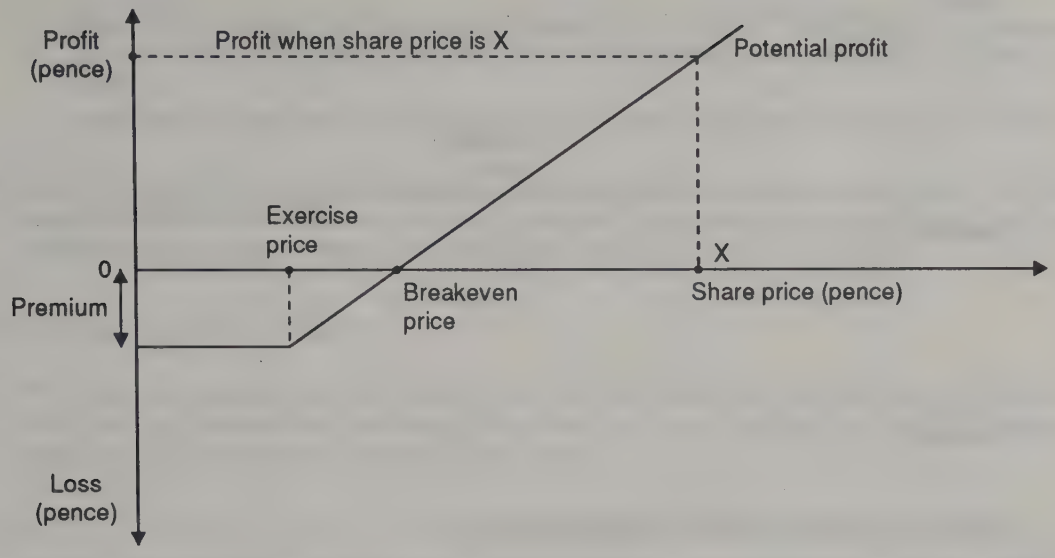


Figure 1 Call option holder ('long call position')

3.4 The holder of the call option will not exercise the option unless the share price is at least equal to the *exercise price* (or *strike price*) at the exercise date. If the share price is above that level, he can cut his losses (up to the break-even price) or make profits (if the share price is above the break-even price). Holding a call option is called having a *long position* in the option.

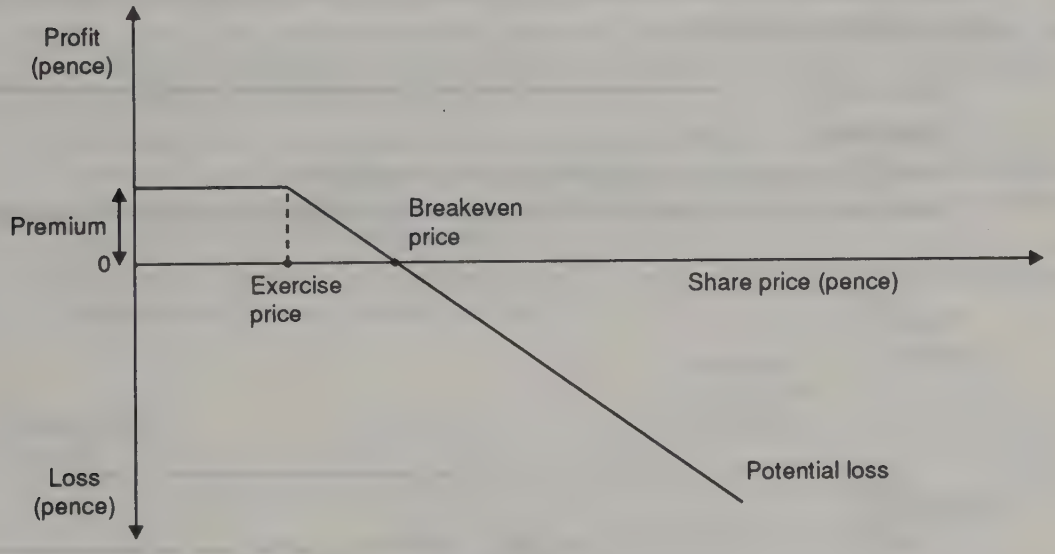


Figure 2 Call option writer ('short call position')

3.5 Any profit made by the holder of the option is reflected by the loss of the other party to the transaction - the writer of the option. Accordingly, Figure 2, illustrating the potential outcomes for the writer of the option, looks like a 'mirror image' of Figure 1. Selling or writing a call option is called taking a *short call position*. It can be seen from Figure 2 that the writer of the call option is exposed to potentially unlimited losses.

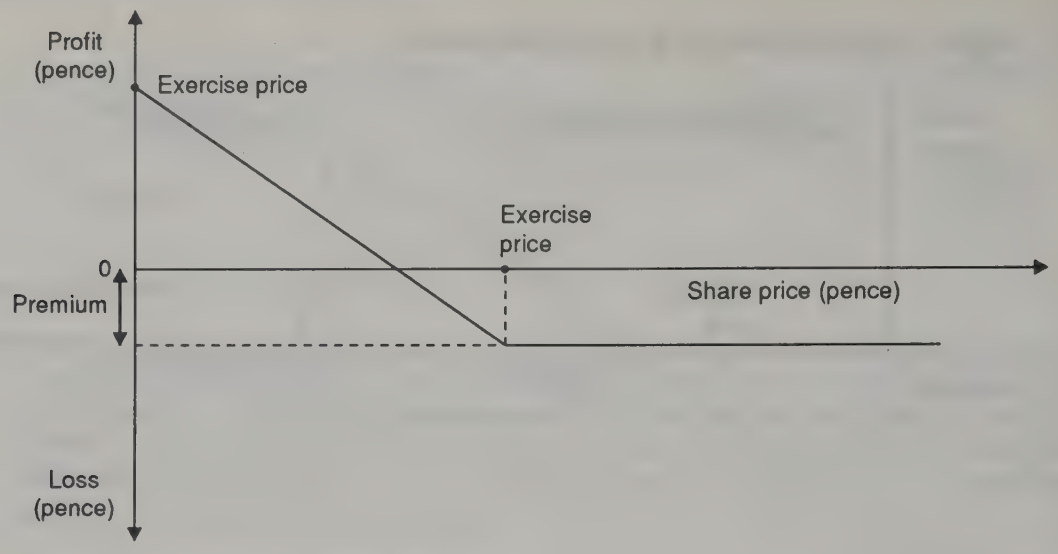


Figure 3 Put option holder ('long put position')

3.6 The position of the buyer of a put option is illustrated in Figure 3. The maximum potential profit is equal to the exercise price, which is the position if the share price falls to zero. Then, the put option holder has the option to sell worthless shares at the exercise price. You should be able to appreciate that the put option can be used to protect a holder of shares against a fall in their value. As Figure 3 shows, the loss on the option is limited to the size of the premium.

3.7 You will probably by now be able to guess what a graph illustrating the position of a put option writer will look like.

Exercise 1

See if you can sketch such a graph and then look at Figure 4.

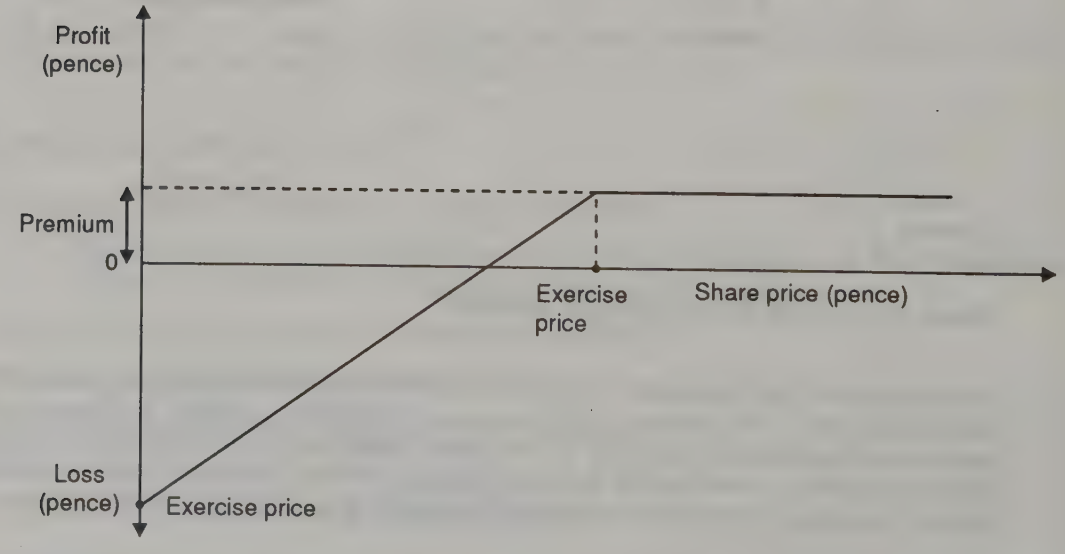


Figure 4 Put option writer ('short put position')

Exercise 2

Reasoning from what you have already learned about options, check that you can explain Figure 4. Note that the maximum loss for the writer or seller of the put option is the exercise price.

3.8 Figures 1 to 4 illustrate the basic positions which can be taken in options. It is also possible to combine different option positions in various ways, depending on the combination of risks and returns which are sought from different outcomes.

Time value and valuation of options

3.9 We need to consider the *time value* of an option. Holding a call option can be seen effectively as the deferred purchase of the underlying asset (eg shares), since the exercise price does not have to be paid until a later date.

3.10 The time value of an option will be affected by the level of interest rates. The higher the level of interest rates, the higher will be the value of the option as the present value of the exercise price of the option will be correspondingly lower. The longer the time to expiration, the higher will the value of the option be, as its present value will be lower. Furthermore, the longer is the period to expiration, the more opportunity there is for volatility in the markets to lead to higher share values. These determinants of the value of an option are recognised in the Black-Scholes model, which is outlined later in this chapter.

3.11 We can illustrate the limits of valuation of options graphically (Figure 5).

(a) An upper limit to the value of an option is the value of the underlying share (or other asset). It will never be worthwhile to pay more for an option than the price of the asset which the option enables you to buy.

(b) The lower limit to the value of an option shown on Figure 5 represents the intrinsic value of the option - ie the extent to which it is 'in the money'. This lower limit is zero up to the exercise price and at higher share prices is the difference between the share price and the exercise price.

(c) In practice, the value of most options will lie somewhere between these limits, as illustrated by lines A, B and C in Figure 5.

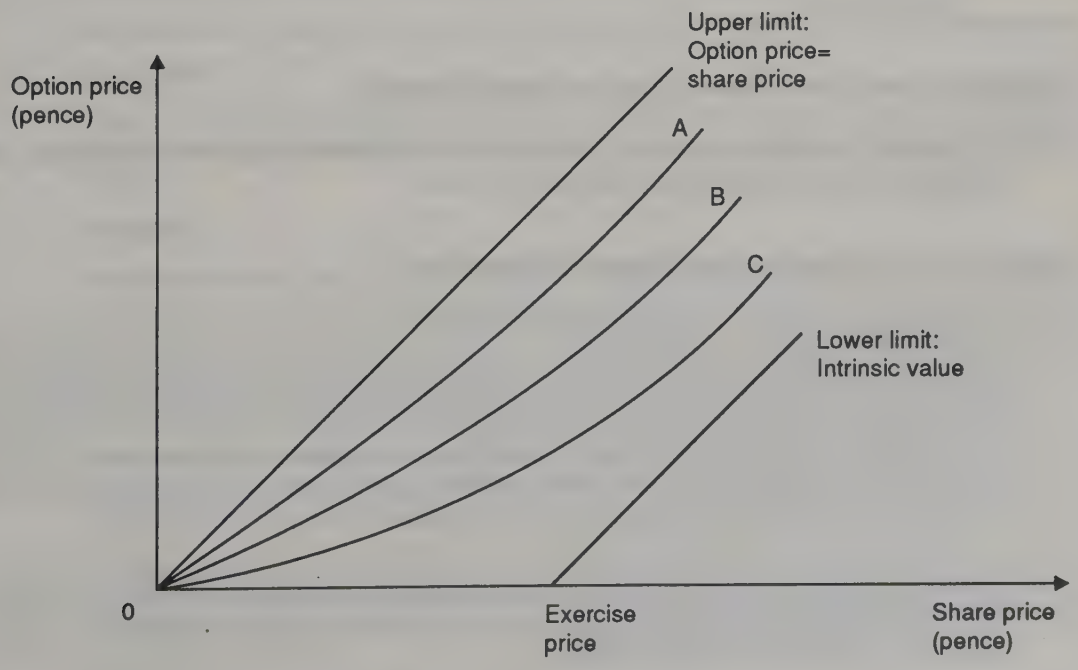


Figure 5 Limits to call option values

Graphical illustration of currency options

3.12 Above, we have used options on shares as the main type of example, but a similar graphical approach can be used to illustrate other kinds of options, for example currency options.

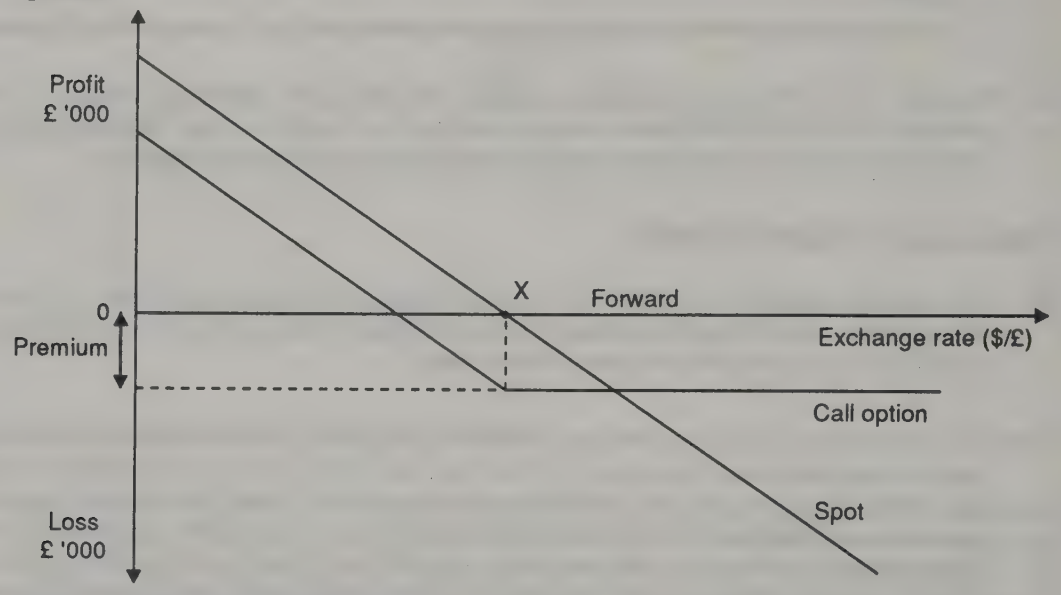


Figure 6 Currency call option, forward and spot markets: profit/loss profile

3.13 Suppose that a UK-based company expects to receive an amount of export income in dollars ($) in three months' time. Figure 6 illustrates the profit/loss profile of different strategies.

(a) Selling dollars and buying sterling in the forward market eliminates all uncertainty. The outcome is represented by a horizontal line.

(b) Relying on the spot market results in a net gain or loss compared with the forward market if the spot exchange rate in three months' time turns out to be below or above $X per pound respectively.

(c) If a call option is used, it will not be exercised if the exchange rate is less than $X per pound. A currency call option reduces the potential gain compared with the spot market strategy (b) by the amount of the premium on the option, but has the advantage that potential losses are contained as they will not exceed the value of the premium.

Graphical approach to a more complex option strategy

3.14 A graphical approach can also be helpful in understanding and illustrating more complex option strategies, such as a *zero cost collar*.

Example: zero cost collar for currency risk hedging

3.15 Blackberry plc is due to receive US$ 400,000 in three months' time. The spot exchange rate is currently, say, 1.41 $/£. Blackberry plc chooses to purchase an OTC put option to sell dollars with an exercise price of $1.45 and a premium of 6 cents, exercisable in three months' time. At the same time, the company has the opportunity to *write* a put option to sell dollars to its bank at the lower rate of 1.40. If we assume that the premium on this latter option is also 6 cents, then the premium payable exactly matches the premium receivable, making the arrangement one of 'zero cost'.

3.16 The profit and loss profile for such an arrangement, illustrated in Figure 7, is called in option dealing jargon a *vertical bull spread* (one of the various terms for a variety of possible options dealing combinations).

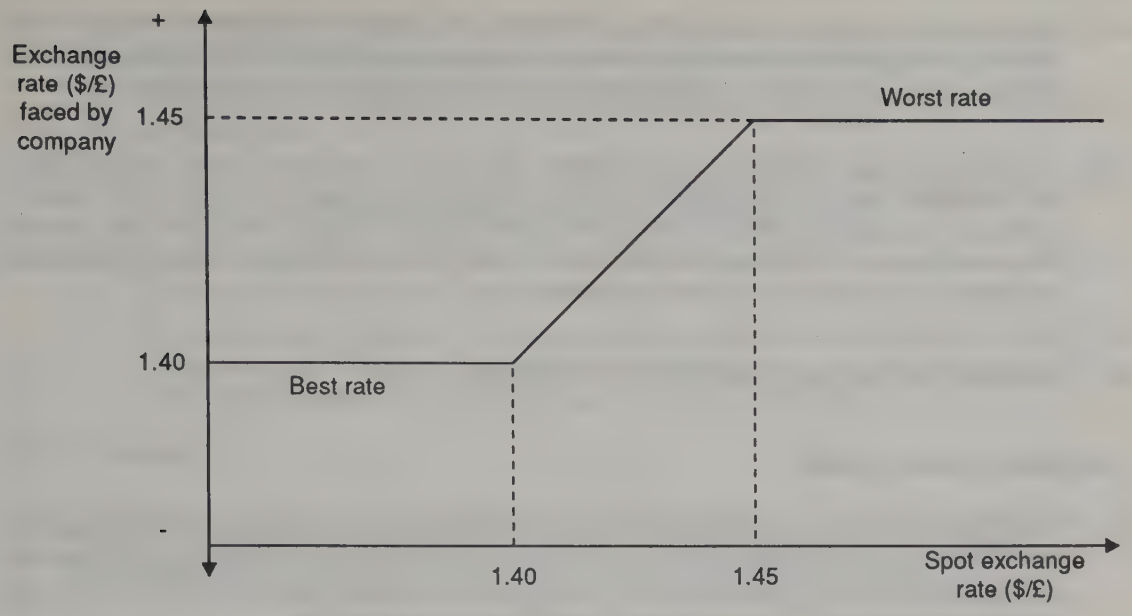


Figure 7 Vertical bull spread

3.17 Figure 7 illustrates the following points.

(a) If the spot exchange rate on expiry turns out to be between $1.40 and $1.45 to the pound, then the company will benefit from the favourable spot rate.

(b) The best rate which the company can receive from the arrangement is $1.40 while the worst it can receive is $1.45.

3.18 If the spot exchange rate is below $1.40 after the three month period has elapsed, then the bank will exercise its option to buy dollars from Blackberry plc at a rate of $1.40. Blackberry plc will thus have been prevented from taking advantage of the extent to which the $/£ exchange rate has fallen below $1.40. The company would allow its put option to lapse, since its exercise price of $1.45 is less favourable than the spot rate.

3.19 If the spot exchange rate is above $1.45, then the bank will allow its option to lapse since it could buy dollars at a more favourable rate in the spot market if it chooses to. Blackberry plc will choose to exercise its option and sell dollars at $1.45.

Exercise 3

Explain what the outcome will be if the spot exchange rate on expiry is between $1.40 and $1.45 to the pound. Consider whether each of Blackberry plc and the bank will exercise their options.

Solution

See the explanation below.

3.20 We have already noted that the company will benefit from the favourable spot rate if it falls between $1.40 and $1.45 to the pound. How is this so?

(a) The bank faces the choice between buying dollars at $1.40 to the pound by exercising the option or at a higher rate on the spot market. Therefore, the bank will allow the option to lapse.

(b) Blackberry plc faces the choice of exercising the option and selling dollars at $1.45 or selling dollars on the spot market at a lower rate. The company will therefore allow the option to lapse, preferring the choice of selling the dollar on the spot market.

3.21 Given that both options are allowed to lapse in the range for the spot exchange rate of \$1.40 to \$1.45, Blackberry plc then faces the exchange rate which would apply had there been no options contracts, as indicated by the 45° line for this range in Figure 7.

3.22 The *zero cost collar* employed by Blackberry plc may be contrasted with the outcome if the company had instead used a forward foreign exchange contract. With such a contract, the company would have faced a fixed single exchange rate, probably close to the 'worst' rate of \$1.45 and would not be able to take advantage of any favourable movement in the spot rate below the forward rate.

4 THEORY OF THE VALUATION OF OPTIONS

The Black-Scholes model

4.1 The Black-Scholes model for the valuation of European-style options was developed in 1973. The basic model makes the assumption that shares pay no dividends, although the model can be varied to take dividends into account. It is also assumed that there are no transaction costs, while in practice of course there always will be.

4.2 Another problem is that the model requires an estimate to be made of the variation in return on the shares. A simple way of making such an estimate is to measure the variation in the share price in the recent past and to make the assumption that this variability will apply during the life of the option.

4.3 Variants of the model are applied by practitioners in the field, who often make use of programmed electronic calculators or computers to determine option prices. Alternatively, option tables based on the model can be used.

4.4 Although *application* of the Black-Scholes option valuation model is beyond the scope of the Paper 14 *Financial Strategy* syllabus, it will be useful to be aware of the variables on which it is based. Your understanding of these may be enhanced by looking at the model in the form of mathematical notation, as we do below.

4.5 The Black-Scholes model states that the current value (P_0) of a European call option is given by the following formula:

$$P_0 = P_s N(d_1) - \frac{E}{e^{rt}} N(d_2)$$

where:

$$d_1 = \frac{\log_n(P_s / E) + (r + \frac{1}{2}\sigma^2)t}{\sigma\sqrt{t}}$$

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

P_s = the current price of the share
E = the exercise price of the option
r = the compound risk-free rate of return (as a decimal)
σ = the standard deviation of the rate of return on the share
e = the exponential constant 2.7183
t = the time in years to expiration of the option
$\log_n(P_s/E)$ = the natural logarithm of P_s/E
$N(d)$ = the probability that a deviation of less than d will occur in a normal distribution with a mean of zero and a standard deviation of 1

4.6 The formula may well seem daunting, but fortunately you do not need to learn it! As already mentioned, what is important is to be aware of the variables which it includes.

4.7 The Black-Scholes model demonstrates that the value of a share option depends upon:

(a) *the current share price* (P_s): if the share price rises, the value of a call option will increase. (For *currency options,* the relevant 'price' is the exchange rate.)

(b) *the exercise price of the option* (E): the higher the exercise price, the lower is the value of a call option.

(c) *the standard deviation of the return on the underlying share* (σ): the higher the standard deviation of the return, the higher is the value of a call option;

(d) *the time to expiration of the option* (t): the longer the period to expiration, the higher is the value of a call option;

(e) *the risk-free rate of interest* (r): the higher the risk-free rate of interest, the higher is the value of a call option. (In the case of *currency options,* the risk-free interest rate differential between the currencies involved is a relevant factor).

The delta value

4.8 If we accept the Black-Scholes model, the value of $N(d_1)$ can be used to indicate the amount of the underlying shares (or other instrument) which the writer of an option should hold in order to hedge (eliminate the risk of) the option position.

4.9 The appropriate 'hedge ratio' $N(d_1)$ is referred to as the *delta value*: hence the term *delta hedge*. The delta value is valid if the price changes are small.

Delta = change in call option price ÷ change in the price of the underlying share

4.10 For example, if a change in share price of 3 pence results in a change in the option price of 1 pence, then:

Delta = 1p ÷ 3p = $^1/_3$

4.11 The writer of the option needs to hold one-third of the number of shares on which there are options in order to achieve a delta hedge. If the writer loses 1 pence per share on the option, this will be offset by 1 pence gain on the share held.

4.12 The delta value is liable to change during the period of the option, and so the option writer may need to change his holding of the underlying share from time to time in order to maintain a delta hedge position.

Example: Delta hedge

4.13 How can the writer of a 3 month call option on 10,000 shares in R plc with an exercise price of 384 pence achieve a delta hedge?

The delta value is given by $N(d_1)$, whose value is 0.745.

Solution

4.14 A delta hedge would be achieved by holding the following number of shares:

$10{,}000 \times 0.745 = 7{,}450$ shares.

4.15 Note also the following points about delta values.

(a) If an option is 'at the money' (ie if the share price equals the exercise price) then the delta value is approximately 0.5.

(b) As an option moves 'out of the money' (ie the share price moves below the exercise price), the delta value falls towards zero. Delta will be zero when the share price is zero: the shares are then worthless.

(c) As an option moves further 'into the money', the delta hedge ratio increase towards a value of 1.

4.16 The factors influencing delta when the option is either in the money or out of the money can be appreciated by looking at the variables in the $N(d_1)$ formula given earlier. These factors are:

(a) the exercise price of the option relative to the share price (ie its intrinsic value);
(b) the time to expiration;
(c) the risk-free rate of return;
(d) the volatility of returns on the share.

The gamma value

4.17 The gamma value measures the amount by which the delta value changes as the share price changes:

Gamma = Change in delta value ÷ Change in the price of the underlying share

4.18 The higher the gamma value, the more difficult it is for the option writer to maintain a delta hedge. As a result, a higher gamma value will mean that the option will carry a higher premium.

4.19 Gamma values will be highest for a share which is close to expiry and is 'at the money'.

For example, suppose that an option has an exercise price of 340 pence and is due to expire in a few minutes' time.

(a) If the share price is 338 pence, there is a very low chance of the option being exercised. The delta hedge ratio will be approximately zero: in other words, no hedge is necessary.

(b) If the share price rises suddenly to 342 pence, it becomes highly probable that the option will be exercised and the delta hedge ratio will approximate to 1, suggesting the need to hedge through holding the underlying shares.

4.20 This example illustrates how a small change in the share price can result in a large change in the delta value

Example: option pricing

4.21 The following example illustrates how the Black-Scholes model can be applied to option pricing using the table on the following page (provided in Pike & Neale, *Corporate Finance and Investment).*

Shares in Trumpeter plc are currently trading at 450p. The standard deviation of the share price is 25%. The risk-free rate of interest is 6%.

What is the value of a two-year call option on shares in Trumpeter plc at an exercise price of 500p?

Solution

4.22 (a) Estimate the degree of risk, as the standard deviation of the percentage change in share price multiplied by the square root of the number of years to expiry of the option.

$$\text{Standard deviation} \times \sqrt{t} = 0.25 \times \sqrt{2} = 0.35$$

(b) Calculate the ratio of the share price to the present value of the exercise price for the option.

$$\frac{\text{Share price}}{\text{PV of exercise price}} \times \frac{450}{500 \div (1.06)^2} = \frac{450}{445} = 1.01$$

(c) Look up in the table the value corresponding with the results obtained in (a) and (b).

Black-Scholes option pricing model: call option values as a percentage of share price

Share price ÷ present value of exercise price

Standard deviation x square root of time	0.50	0.60	0.70	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.40	1.50	2.00
0.10	0.0	0.0	0.0	0.0	0.2	0.8	2.0	4.0	6.5	10.0	13.4	16.8	20.0	23.1	28.4	33.3	60.0
0.15	0.0	0.0	0.1	0.5	1.1	2.2	3.8	6.6	8.5	11.4	14.4	17.4	20.4	23.3	28.4	33.3	60.0
0.20	0.0	0.0	0.4	1.5	2.5	4.0	5.7	8.0	10.4	13.0	15.7	18.5	21.2	23.9	28.9	35.5	60.0
0.25	0.0	0.2	1.0	2.8	4.2	5.9	7.8	9.9	12.3	14.7	17.2	19.8	22.3	24.7	29.4	33.8	60.0
0.30	0.1	0.7	2.0	4.4	6.0	7.8	9.8	11.9	14.1	16.5	18.8	21.2	23.5	25.8	30.2	34.3	60.0
0.35	0.4	1.4	3.3	6.2	9.8	9.8	11.8	13.9	16.0	18.3	20.5	22.7	24.9	2.1	31.2	35.1	60.0
0.40	0.9	2.4	4.8	8.0	9.4	11.7	13.8	15.9	17.9	20.1	22.2	24.3	25.4	28.4	32.3	36.0	60.1
0.45	1.7	3.7	6.5	9.9	11.8	13.7	15.7	17.8	19.8	21.9	23.9	25.9	27.9	29.8	33.5	37.0	60.2
0.50	2.6	5.1	8.2	11.8	13.8	15.7	17.7	19.7	21.7	23.7	25.7	27.6	29.5	31.3	34.8	38.1	60.4
0.55	3.8	6.6	10.0	13.8	15.7	17.7	19.7	21.7	23.6	25.5	27.4	29.2	31.0	32.8	36.1	39.2	60.7
0.60	5.1	8.3	11.9	15.8	17.7	19.7	21.6	23.6	23.4	27.3	29.1	30.9	32.6	34.3	37.5	40.4	61.0
0.65	6.5	10.0	13.8	17.8	19.7	21.7	23.6	25.5	27.3	29.1	30.8	32.6	34.2	34.8	38.9	41.7	61.4
0.70	8.1	11.9	15.8	19.8	21.7	23.6	25.5	27.4	29.1	30.9	32.6	34.2	34.8	37.3	40.3	43.0	61.9
0.75	9.8	13.7	17.8	21.8	23.7	25.6	27.4	29.2	30.9	32.7	34.4	35.9	37.4	38.9	41.7	44.3	62.4
0.80	11.5	15.7	19.8	23.8	25.7	27.5	29.3	31.1	32.7	34.4	36.0	37.5	39.0	40.4	43.1	45.6	63.0
0.85	13.3	17.6	21.8	25.7	27.6	29.4	31.2	32.9	34.5	36.2	37.7	39.2	40.6	41.9	44.5	46.9	63.6
0.90	15.2	19.6	23.8	27.7	29.5	31.3	33.0	34.7	36.3	37.9	39.3	40.8	42.1	43.5	46.0	48.3	64.3
0.95	17.1	21.6	25.7	29.6	31.4	33.2	34.9	36.5	38.1	39.3	41.0	42.4	43.7	45.0	47.4	49.6	65.0
1.00	19.1	23.6	27.7	31.6	33.3	34.1	36.7	38.3	39.8	41.2	42.6	44.0	45.2	46.5	48.8	50.9	65.7
1.10	23.0	27.5	31.6	35.4	37.0	38.7	40.3	41.8	43.1	44.5	45.8	47.1	483.3	49.4	51.6	53.5	67.2
1.20	27.0	31.5	36.6	39.1	10.7	42.3	43.7	45.1	46.5	47.8	48.9	50.1	51.3	52.3	54.3	56.1	68.8
1.30	31.0	35.4	39.3	42.7	44.2	45.7	47.1	48.4	49.6	50.9	52.0	53.0	54.1	55.1	57.0	58.7	70.4
1.40	34.9	39.2	42.9	46.2	47.6	49.0	50.3	51.6	52.8	53.9	55.0	56.1	56.9	57.9	59.6	61.2	71.9
1.50	38.8	42.9	46.5	49.6	50.9	52.3	53.5	54.7	55.8	56.8	57.8	58.8	59.7	60.5	62.1	63.6	73.5
1.60	42.6	46.5	49.9	52.8	54.1	55.4	56.1	57.6	58.8	59.6	60.5	61.4	62.3	63.1	64.5	65.9	75.1

The nearest figure is 13.9. This indicates that a two-year call option on Trumpeter shares with an exercise price of 500p is worth approximately 13.9% of the current share price.

$$13.9\% \times 450p = 62.55p$$

4.23 The value of a put option on Trumpeter plc shares with the same exercise of 500p can be calculated as:

Call option value + PV of exercise price – Share price

$= 62.55p + 445p - 450p = 57.55p$

5 APPLICATIONS OF OPTIONS THEORY

5.1 Options theory is relevant to financial decisions beyond the areas of financial instruments such as traded options, currency options and interest rate options. The following examples should give some idea of the range of possible applications.

(a) *Convertible loan stock* provides a combination of a conventional loan with a call option. If the option is exercised, the loan is exchanged for a specified number of shares in the company.

(b) *Share warrants* provide the holder with an option to purchase shares from the company at a specified exercise price during a specified time period.

(c) *Government loan guarantees* effectively provide a put option to holders of risky loans, giving the holders an opportunity to exercise an option of obtaining reimbursement from the government if a borrower defaults.

(d) *Insurance* more generally is a form of put option which is exercised when an insurance claim is made.

(e) *Share purchase* at the prevailing market price can be seen as equivalent to the purchase of a call option combined with the sale of a put option, while putting the remaining amount on deposit at a risk-free rate of return over the option period.

(f) Option valuation theory which is used in valuing share options can be extended to various options which financial managers may meet in making *capital investment decision*, such as:

(i) the option to make further 'follow-on' investments if an initial project is successful, which is equivalent to a call option;

(ii) the option to abandon a project, which is equivalent to a put option;

(iii) the option to delay the start of a project (and gain knowledge in the meantime), which is equivalent to a call option.

5.2 Most practical option problems require the use of a computer model; using such a model effectively demands informed judgement. The *binomial model for option valuation*, for example, provides a basis for such a task and is basically a method of solving decision trees. The model involves starting at a future date and working back through the tree to the present time, determining the best future action at each decision point. Eventually, the various possible cash flows generated by future events are related back to establish a present value. In practice, such decision trees tend to be extremely complex: hence the need for computer power to solve them.

5.3 The application of option pricing theory such as the binomial model allows discounting to be carried out within decision trees. Standard discounted cash flow methods do not work within decision trees: there can be no single constant discount rate for options because the risk of the option changes as time progresses and the price of underlying assets change. Therefore, the market value of the future cash flows described by the decision tree needs to be calculated by option pricing methods.

5.4 These examples suggest the wider scope there is for financial managers and strategists to use options theory in a variety of situations which an enterprise may face. However,

where there is no market for the option concerned, such as there is with traded options, the exercise is likely to be a more subjective one involving a greater level of estimation to be made of the different factors affecting the value of the option.

Exercise 4

The value of a call option will increase as:

A the underlying share price falls
B the volatility of the underlying share price increases
C the time to maturity decreases
D interest rates increase

Required

Choose one option: A, B, C or D. Explain your choice.

Solution

B Suppose, for example, that the exercise price for a call option equals the current market price of the share, and there is a 50% probability that the share price will rise before the expiration date of the option and a 50% probability that it will fall.

The pay-offs for the holder of the call option will be as follows. (Let the share price at expiration = S and the exercise price of the option be E.)

Outcome	*Payoff*	*Probability*	*EV of option*
Share price rises: option is exercised	E-S	0.5	0.5 (E – S)
Share price falls: option is worthless and *not* exercised	0	0.5	0
			0.5 (E – S)

The greater the difference between E and S (that is to say, the greater the potential volatility of the share price) the greater will be the market value of the call option.

Chapter roundup

- The markets for hedging instruments such as options, futures and swaps have undergone huge growth in recent years.
- Currency options provide an alternative to forward exchange contracts.
- Interest rate options are discussed in the next chapter.
- Share options and index options are also available.
- The Black-Scholes model shows that the value of an option depends on:
  - the current price of the share (or other underlying instrument)
  - the exercise price
  - the standard deviation of the return on the share
  - the time to expiry
  - the risk-free rate of interest
- Options theory has applications beyond the various financial instruments known as options.

Test your knowledge

1 Distinguish between a 'call option' and a 'put option'. (see para 1.6)

2 What is the 'intrinsic value' of a share option? (1.15)

3 What differences in effect are there between options and futures? (1.25)

4 Sketch a graph showing the position of a call option writer ('short call position'). (3.3)

5 According to the Black-Scholes model, on what factors does the equilibrium value of an option depend? (4.7)

6 What is the 'delta value'? (4.8, 4.9)

Now try illustrative question 22 at the end of the Study Text

Chapter 22

INTEREST RATE RISK

This chapter covers the following topics.

		Syllabus reference
1	Interest rate risk	4(b)
2	Interest rate futures	4(b)
3	Interest rate swaps	4(b)
4	Interest rate options	4(b)
5	Hedging strategy alternatives: example	4(b)

Introduction

Here we extend our discussion of risk and its management to consider interest rate risk and some more of the financial instruments which are now available for managing financial risks.

The risk of interest rate changes is however less significant in most cases than the risk of currency fluctuations which, in some circumstances, can fairly easily wipe out profits entirely if it is not hedged.

1 INTEREST RATE RISK

12/94

Managing a debt portfolio

1.1 We should bear in mind that there are three important considerations for corporate treasurers in managing a debt portfolio, that is, in deciding how a company should obtain its short-term funds so as to be able to repay debts as they mature and to minimise any inherent risks, notably foreign exchange risk, in the debts the company owes and is owed. These three considerations are as follows.

(a) *Maturity mix*. The treasurer must avoid having too much debt becoming repayable within a short period.

(b) *Currency mix*. Foreign currency debts create a risk of losses through adverse movements in foreign exchange rates before the debt falls due for payment. Foreign currency management involves hedging against foreign currency risks, for example by means of forward exchange contracts, or having debts in several currencies, some of which will strengthen and some of which will weaken over time.

(c) *The mix of fixed interest and floating rate debts*

(i) Too much fixed interest rate debt creates an unnecessary cost when market interest rates fall. A company might find itself committed to high interest costs that it could have avoided.

(ii) Too much borrowing at a variable rate of interest (such as bank overdrafts and medium-term bank lending) leads to high costs when interest rates go up.

Interest rate exposure and hedging

1.2 The variability of interest rates over time can be appreciated from the table below.

Selected UK interest rates

	Treasury bill yield	*Selected retail bank base rates*	*Inter-bank 3 month offer rate*	*Sterling certificates of deposit 3 months offer rate*	*Euro-dollar 3 month rate*	*Long dated (20 years) UK gilts yields*
1990	13.50	14.00	14.00	13.88	7.50	11.08
1991	10.45	10.50	11.00	10.88	4.19	9.92
1992	6.44	7.00	7.19	6.91	3.32	9.13
1993	4.95	5.50	5.31	5.25	3.28	7.87

1.3 There are a number of situations in which a company might be exposed to risk from interest rate movements.

(a) *Fixed rate versus floating rate debt.* A company can get caught paying higher interest rates by having fixed rather than floating rate debt, or floating rather than fixed rate debt, as market interest rates change.

(b) *Currency of debt.* This is also a foreign currency exposure. A company can face higher costs if it borrows in a currency for which exchange rates move adversely against the company's domestic currency. The treasurer should seek to match the currency of the loan with the currency of the underlying operations/assets that generate revenue to pay interest/repay the loans.

(c) *Term of loan.* A company can be exposed by having to repay a loan earlier than it can afford to, resulting in a need to re-borrow, perhaps at a higher rate of interest.

(d) *Term loan or overdraft facility?* A company might prefer to pay for borrowings only when it needs the money as with an overdraft facility: the bank will charge a commitment fee for such a facility. Alternatively, a term loan might be preferred, but this will cost interest even if it is not needed in full for the whole term.

1.4 Where the magnitude of the risk is immaterial in comparison with the company's overall cash flows, one option is to do nothing and to accept the effects of any movement in interest rates which occur.

Hedge efficiency

1.5 *Hedging* means taking action to reduce or 'cover' an exposure: hedging is the process of financial risk management. Hedging has a cost, either a fee to a financial institution or a reduction in profit, but companies might well consider the costs to be justified by the reduction in financial risks that the hedging achieves. The degree to which the exposure is covered is termed the *hedge efficiency*: a perfect hedge has 100% efficiency.

Interest rate risk management

1.6 Methods of reducing interest rate risk include forward rate interest agreements (FRAs), interest rate futures, interest rate options (or interest rate guarantees), interest rate swaps and options on interest rate swaps ('swaptions'). In the remainder of this section, we look at FRAs, before considering interest rate futures, options and swaps.

Forward interest rate agreements (FRAs)

1.7 *FRAs* are agreements, typically between a company and a bank, about the interest rate on future borrowing or bank deposits.

For example, a company can enter into a FRA 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.

1.8 One limitation on FRAs is that they are usually only available on loans of at least £500,000. They are also likely to be difficult to obtain for periods of over one year.

1.9 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.

1.10 The interest rates which banks will be willing to set for FRAs will reflect their current expectations of interest rate movements. If it is expected that interest rates are going to rise during the term for which the FRA is being negotiated, the bank is likely to seek a higher fixed rate of interest than the variable rate of interest which is current at the time of negotiating the FRA.

Exercise 1

Explain what is meant by hedging in the context of interest rate risk.

Outline solution

Hedging is a means of reducing risk. Hedging involves coming to an agreement with another party who is prepared to take on the risk that you would otherwise bear. The other party may be willing to take on that risk because he would otherwise bear an opposing risk which may be 'matched' with your risk; alternatively, the other party may be a speculator who is willing to bear the risk in return for the prospect of making a profit. In the case of interest rates, a company with a variable rate loan clearly faces the risk that the rate of interest will increase in the future as the result of changing market conditions which cannot now be predicted.

Many financial instruments have been introduced in recent years to help corporate treasurers to hedge the risks of interest rate movements. These instruments include forward rate agreements, financial futures, interest rate swaps, options, and options on interest rate swaps ('swaptions').

Gap analysis of interest rate risk

1.11 The degree to which a firm is exposed to interest rate risk can be identified by using the method of *gap analysis*.

1.12 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.

1.13 The effect of interest rate changes depends upon whether interest rates for the assets and liabilities are floating or fixed. Floating interest rates, of course, move up and down according to general market conditions. With fixed interest rates, the interest on the asset or liability will only be repriced at the date of maturity in the light of prevailing market conditions. If a fixed interest rate liability matures at the same time as a fixed rate asset, then the interest rate risks arising from the repricing of the two instruments will cancel each other out.

1.14 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) *A negative gap*. 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.

(b) *A positive gap.* 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.

1.15 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. The company's interest rate hedge should be based on the size of the gap.

Duration analysis

1.16 In the case of bonds, the return is comprised of both interest and a capital gain or loss accruing during the bond's life. Therefore, it is not possible simply to match bonds on the basis of a period to maturity.

1.17 What can be done is to base the analysis on the 'notional' time to maturity or the *duration* of the bond. The calculations necessary for duration analysis are beyond the scope of the ACCA Paper 14 *Financial Strategy* syllabus, and so here we deal only with the general principles.

1.18 The duration of the bond is calculated as the weighted average period to maturity of the cashflows of a bond, the weights being the present value of the cashflows arising from the bond.

Note that:

(a) for a zero coupon bond, the duration is the same as the period to actual maturity;
(b) for coupon bearing bonds, the duration is less than the period to maturity.

1.19 The duration of a portfolio of bonds can be calculated to indicate the sensitivity of the market price of a bond to a change in the level of interest rates. The duration of the bond portfolio is the weighted average of the durations of the bonds within the portfolio, the weights being the market prices of the bonds. The duration can be used to find the hedge ratio for the portfolio, representing the size of the hedge needed to hedge the interest rate risk of the portfolio. Calculating a hedge ratio based on the duration is beyond the scope of your syllabus.

2 INTEREST RATE FUTURES

12/94, 6/96

2.1 Most LIFFE futures contracts involve interest rates (interest rate futures), and these offer a means of hedging against the risk of interest rate movements. Such contracts are effectively a gamble on whether interest rates will rise or fall. Like other futures contracts, interest rate futures offer a way in which speculators can 'bet' on market movements just as they offer others who are more risk-averse a way of hedging risks.

2.2 Recall that a futures contract is an agreement to buy or sell a standard quantity of a particular financial instrument at a specified future date at an agreed price - the price being determined by trading on the floor of a futures exchange.

2.3 For example, a company can contract to buy (or sell) £100,000 of a notional 30-year Treasury bond bearing an 8% coupon, in say, 6 months time, at an agreed price.

(a) The futures price is likely to vary with changes in interest rates, and this acts as a hedge against adverse interest rate movements.

(b) The outlay to buy futures is much less than for buying the financial instrument itself, and so a company can hedge large exposures of cash with a relatively small initial employment of cash.

2.4 LIFFE provides a market for futures contracts in long-dated, medium-dated and short-dated gilt-edged stocks, American, German and Japanese government bonds, short-term

sterling and euro interest rates. The Chicago Mercantile Exchange (CME) and the Chicago Board of Trade (CBOT) are other important exchanges for the trading of interest rate futures.

2.5 Interest rate futures are similar in effect to FRAs, except that the terms, the amounts and the periods are standardised.

2.6 The pricing of an interest rate futures contract is determined by prevailing interest rates. For example, if three month eurodollar time deposit interest rates are 8%, a three month eurodollar futures contract will be priced at 92 (100 – 8). If interest rates are 11%, the contract price will be 89 (100 – 11). As with currency futures, the minimum amount by which the price of a interest rate futures contract can move is called a *tick*.

The effects of price movements

2.7 A tick or point of price has a known, measurable value. Here are some examples.

(a) In the case of 3-month eurodollar futures, the amount of the underlying instrument is a 3-month deposit of $1,000,000. As a tick is 0.01 (or one-hundredth of one per cent), the value of a tick is $25 (0.01% × $1,000,000 × 3/12).

(b) In the case of long gilt futures, the underlying instrument is £50,000 of notional gilts. Given that a tick is 1/32 of one per cent, the value of one tick is £15.625 (1/32 × 1% × £50,000).

Values per tick for various short-term and long-term interest rate futures are set out in the table below.

Interest rate futures: tick values

	Notional amount of deposit	*Tick size*	*Tick value*
Short-term interest rate futures		%	
90-day US Treasury bills	TB$1 million	0.01	$25
3-month eurodollar	$1 million	0.01	$25
3-month sterling (short sterling)	£500,000	0.01	£12.50
3-month euromark	DM1 million	0.01	DM25
3-month euroswiss	SFr 1 million	0.01	SFr25
3-month ecu	1 million ecus	0.01	25 ecus
Long-term interest rate futures			
US Treasury bonds	$100,000	1/32 of 1	$31.25
Long gilts (sterling)	£50,000	1/32 of 1	£15.625
Ecu bond	200,000 ecus	0.01	20 ecus
German bond	DM250,000	0.01	DM25
Japanese government bond	Y100,000	0.01	Y10,000
Italian government bond	L200 million	0.01	L20,000

2.8 Interest rate futures are not all priced in the same way.

(a) Prices of short-term interest rate futures, which, as already indicated, reflect the interest rates on the underlying financial instrument, are quoted at a discount to a par value of 100. For example, a price of 93.40 indicates that the underlying money market deposit is being traded at a rate of 6.6% (100 – 93.40).

(b) Pricing for long-term bond futures is as a percentage of par value, similarly to the pricing of bonds themselves.

(i) In the case of US Treasury bond futures, prices are quoted in 32nds of each full percentage point of price. The number of 32nds is shown as a number following a hyphen. For example, 91-23 denotes a price of $91^{23}/_{32}$ per 100 nominal value and 91-16 denotes a price of $91^{1}/_{2}$ per 100 nominal value.

(ii) For other types of bond future, decimal pricing is used, so that if Italian government bond futures are quoted at 92.75, this indicates a price of $92^{3}/_{4}$ per 100 nominal value.

Example: futures price movements (1)

2.9 June 3-month ecu futures fell in price on a particular day from 96.84 to 96.76. Privet plc has purchased June futures, having a long position on five contracts.

Required

Calculate the change in value of the contracts on the day concerned.

Solution

2.10 The fall in price represents 8 ticks (96.84 – 96.76 = 0.08 and the tick size is 0.01%). The value of one tick is 25 ecus. Each contract has fallen in value by 25 × 8 = 200 ecus. Privet plc has bought five contracts and so the day's price movement represents for the company a loss on the contracts of 200 × 5 = 1,000 ecus.

Example: futures price movements (2)

2.11 September long gilts sterling futures fell in price on a particular day from 99-9 to 98-27. Privet plc has sold September futures, having a short position of 10 contracts.

Required

Calculate the change in value of the contract on the day concerned.

Solution

2.12 The fall in price represents 15 ticks ($99^{9}/_{32} - 98^{27}/_{32} = {}^{14}/_{32}$ and the tick size is $^{1}/_{32}$ of 1%). The value of one tick for long gilts sterling futures is £15.625. Each contract has fallen in value by £15.625 × 14 = £218.75. For Privet plc, which has sold 10 contracts, the day's price movement represents a profit of £218.75 × 10 = £2,187.50.

Exercise 2

The following futures price movements were observed during a week in October.

Contract	*Price at start of week*	*Price at end of week*
December short sterling	90.40	91.02
December US Treasury bonds	92-16	92-06
December Japanese government bond	93.80	94.25

Hawthorn plc has the following positions in these contracts:

(a) a short position (seller) of ten December short sterling contracts;
(b) a long position (buyer) of six December US Treasury bonds contracts;
(c) a long position of eight December Japanese government bonds contracts.

See the table earlier in this section giving notional deposit amounts and tick sizes and values.

Required

Calculate the profit or loss to the company on the futures contracts.

Solution

Short sterling

Increase in price (91.02 – 90.40 = 0.62)	62 ticks
Value per tick	£12.50
Increase in value of one contract (62 × £12.50)	£775

The company is a seller of ten contracts and would lose £7,750 (£775 × 10)

US Treasury bond futures

Fall in price ($92^{16}/_{32} - 92^{6}/_{32}$ = 10/32)	10 ticks
Value per tick	$31.25
Fall in value of one contract (10 × $31.25)	$312.50

The company is a buyer of six contracts and would lose $1,875 ($312.50 × 6)

Japanese government bonds

Increase in price (94.25 – 93.80 = 0.45)	45 ticks
Value per tick	Y10,000
Increase in value of one contract (45 × Y10,000)	Y450,000

The company is a buyer of eight contracts and would gain Y3,600,000 (Y450,000 × 8)

Example: interest rate hedge using futures (1)

2.13 Yew plc has taken a 3 month $1,000,000 eurodollar deposit with interest payable of 8%, the loan being due for rollover on 31 March. At 1 January, the company treasurer considers that interest rates are likely to rise in the near future. The futures price is 91 representing a yield of 9%. Given a standard contract size of $1,000,000 the company sells a eurodollar three month contract to hedge against interest on the three month loan required at 31 March (to sell a contract is to commit the seller to take a deposit). At 31 March the spot interest rate is 11%.

(a) What is the cost saving to Yew plc?
(b) Calculate the hedge efficiency.

Solution

2.14 (a) The company can buy back the future at 89 (100 – 11). The cost saving is the profit on the futures contract.

$$\$1,000,000 \times (91 - 89) \times {}^{3}/_{12} = \$5,000$$

(b) The additional interest cost resulting from the increase in interest rates is $1,000,000 × 3% × 3/12 = $7,500. Hedge efficiency = $5,000 ÷ 7,500 = 66.7%.

The hedge has effectively reduced the new interest cost by 2%. Instead of a cost of 11% at 31 March ($27,500) for a three month deposit, the net cost is $22,500 ($27,500 – 5,000).

Example: interest rate hedge using futures (2)

2.15 In three months' time (June), Hawthorn plc will need to borrow £10 million for a six month period. Current interest rates for such a loan are 8% per annum. The company treasurer expects interest rates to rise by 2% over the next three months.

LIFFE *Three months sterling futures £500,000 points of 100%* are available, with June futures priced at 92.50. Tax, margin requirements and the time value of money can be ignored.

Solution

2.16 'Points of 100%' indicates that the tick size on a three month contract is £500,000 × 0.01% × 3/12 = £12.50.

The company's anticipated additional interest costs, which need to be matched by the expected gain on the futures, are:

£10 million × 2% × 6/12 = £100,000

A 2% movement in the futures price would represent 200 ticks. The gain on a single contract would be 200 × £12.50 = £2,500. The company needs 40 futures contracts to make the gain of £100,000 required, assuming that the futures price moves in line with interest rates.

2.17 What is the effect of using the futures market if the interest rate rises by 2% and the futures price moves by, say, 1.8%?

The futures market gain will be 40 × 180 ticks × £12.50 = £90,000, not quite enough to offset fully the £100,000 additional interest costs. The *hedge efficiency* is 90,000/100,000 = 90%.

2.18 If interest rates and futures prices both actually *fall*, there will be an interest *saving* offset by a futures market *loss*.

Use of interest rate futures

2.19 The standardised nature of interest rate futures is a limitation on their use by the corporate treasurer as a means of hedging, because they cannot always be matched with specific interest rate exposures. However, their use if growing. Global trading in interest rate futures rose from around 20,000 contracts in 1975 to 156 million contracts by 1988, and by 1988 interest rate futures made up of 42% of the total volume of futures trading. Futures contracts are frequently used by banks and other financial institutions as a means of hedging their portfolios: such institutions are often not concerned with achieving an exact match with their underlying exposure.

2.20 The seller of a futures contract does not have to own the underlying instrument, but may need to deliver it on the contract's delivery date if the buyer requires it. Many, but not all, interest rate contracts are settled for cash rather than by delivery of the underlying instrument.

2.21 Interest rate futures offer an attractive means of speculation for some investors, because there is no requirement that buyers and sellers should actually be lenders and borrowers (respectively) of the nominal amounts of the contracts. A relatively small investment can lead to substantial gains, or alternatively to substantial losses. The speculator is in effect 'betting' on future interest rate movements.

Basis risk

2.22 The concept of hedge efficiency was introduced earlier. There are two reasons why it is often not possible to achieve a perfect (100%) hedge with currency futures or interest rate futures as follows.

(a) The fact that futures are available only in certain standard sizes means that the contracts may not fit exactly the company's needs.

(b) There is also *basis risk*, which we mentioned earlier in the context of currency futures, arising from the fact that the price of the futures contract may not move as expected in relation to the value of the instrument which is being hedged. There are two main reasons for basis risk.

(i) Cashflow requirements may differ, altering the relative values of the underlying financial instrument and the derivative futures contract. This is because usually no payment is required when a forward contract is entered into, while an initial margin must be deposited for a futures contract.

(ii) The financial instrument which the firm is seeking to hedge may be different from the financial instrument which underlies the futures contract. For example, a firm may wish to hedge interest rates which are linked to bank base interest rates using a futures contract which is based on the London Inter-Bank Offer Rate (LIBOR). This type of hedge is called cross hedging, and there will be basis risk because LIBOR will not always move exactly in line with bank base interest rates.

Hedge ratio

2.23 The *hedge ratio* is the ratio of the amount of the futures contracts bought or sold to the amount of the underlying financial instrument being hedged.

2.24 For example, if a company is exposed to interest rate risk on a loan of £210,000 and it takes a position in futures contracts for £200,000, the hedge ratio is:

$$\frac{200,000}{210,000} = 95.2\%$$

Optimal hedge ratio

2.25 The *optimal hedge ratio* is given by the formula:

$$p\frac{\sigma_i}{\sigma_f}$$

where p = the coefficient of correlation between the change in price of the underlying instrument and the change in price of the futures contract, each measured over the period of the hedge

σ_i = the standard deviation of the change in the price of the underlying instrument

σ_f = the standard deviation of the change in the price of the futures contract

2.26 As you can probably appreciate, establishing values for the variables p, σ_i and σ_f is more of a problem than calculating the optimal hedge ratio using the formula.

Example: Optimal hedge ratio

2.27 Melbury plc wishes to hedge the interest rate risk on a 1 year floating rate loan of £2,000,000.

The futures price is more volatile than the price of the debt, such that $\sigma_i = 0.08$ and $\sigma_f = 0.10$. $p = 0.6$.

Required

What is the optimal hedge ratio?

Solution

2.28 Optimal hedge ratio $= p\frac{\sigma_i}{\sigma_f} = 0.6 \times \frac{0.08}{0.10} = 0.48$

It follows that Melbury plc should take a position in interest rate futures for:

$$2,000,000 \times 0.48 = £960,000$$

3 INTEREST RATE SWAPS

12/94, 12/95, 6/96

3.1 *Interest rate swaps* are transactions that exploit different interest rates in different markets for borrowing, to reduce interest costs for either fixed or floating rate loans.

3.2 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, with the following effects.

(a) A company which has debt at a fixed rate of interest can make a swap so that it ends up paying interest at a variable rate.

(b) A company which has debt at a variable rate of interest (floating rate debt) ends up paying a fixed rate of interest.

3.3 Note that the parties to a swap retain their obligations to the original lenders. This means that the parties must accept *counterparty risk*.

3.4 An example is illustrated in Figure 1.

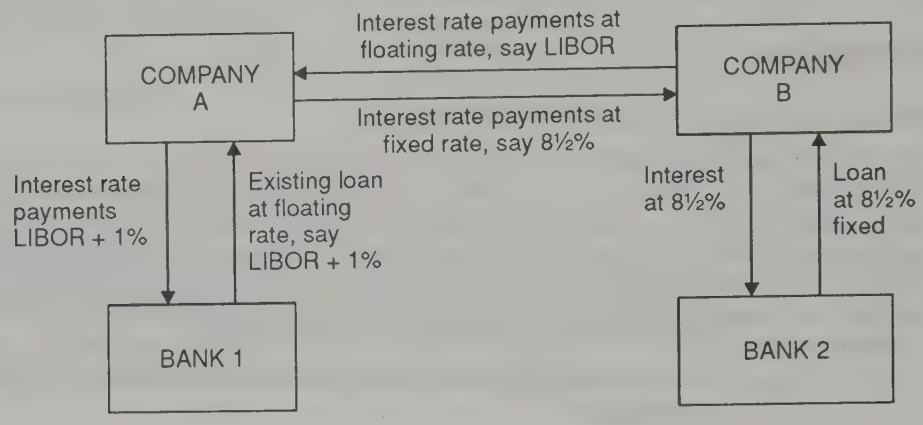


Figure 1 Interest rate swap

3.5 In this example, company A can use a swap to change from paying interest at a floating rate of LIBOR + 1% to one of paying fixed interest of (8½% + 1%) = 9½%.

3.6 A swap may be arranged with a bank, or a counterparty may be found through a bank or other financial intermediary.

3.7 We discussed currency swaps earlier. Interest rate swaps could be arranged in different currencies, for example, between a fixed rate in US dollars and a floating rate in sterling. Where this happens, the swaps are normally reversed with the principal eventually swapped back at the original exchange rate. For example, a UK company and a US company can arrange a back-to-back loan and currency swap (Figure 2).

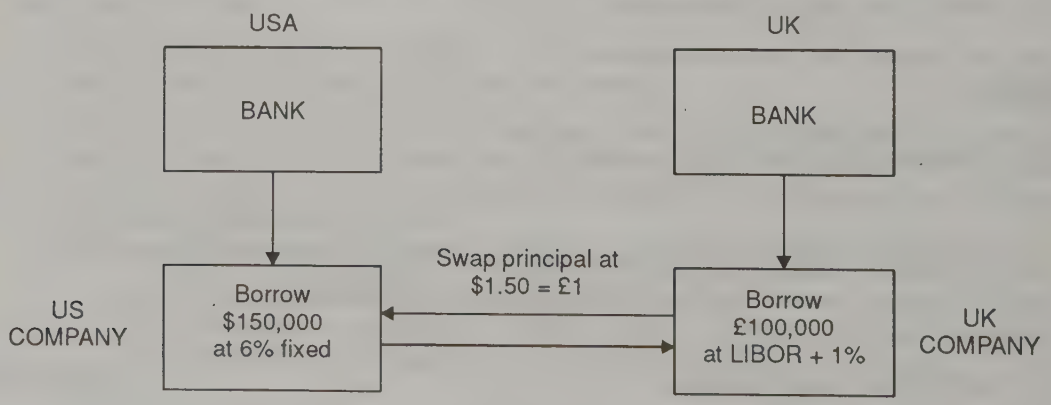


Figure 2 Back-to-back loan and currency swap

3.8 The companies can service each other's debt (interest rate swap) and also exchange the principal, with the UK company taking $150,000 and the US company taking £100,000 (currency swap). Each company will eventually repay the principal on each other's loans at a rate of $1.50 = £1.

Example: interest rate swaps

3.9 Goodcredit plc has been given a high credit rating. It can borrow at a fixed rate of 11%, or at a variable interest rate equal to LIBOR, which also happens to be 11% at the moment. It would like to borrow at a variable rate.

Secondtier plc is a company with a lower credit rating, which can borrow at a fixed rate of 12½% or at a variable rate of LIBOR plus ½%. It would like to borrow at a fixed rate.

(a) Without a swap, Goodcredit would borrow at LIBOR which is currently 11%, and Secondtier would borrow at 12½% fixed.

(b) With a swap,

  (i) Goodcredit would borrow at a fixed rate (11%);

  (ii) Secondtier would borrow at a variable rate (LIBOR plus ½%), currently 11½%.

  (iii) They would then agree a rate for swapping interest, perhaps with:

    (1) Goodcredit paying Secondtier variable rate interest, at LIBOR;
    (2) Secondtier paying Goodcredit fixed rate interest, say at 11½%.

3.10 The net result is as follows.

Goodcredit plc		*Secondtier plc*	
Pays		Pays	
to bank	(11%)	to bank	(LIBOR plus ½%)
in swap	(LIBOR)	in swap	(11½%)
Receives		Receives	
in swap	11½%	in swap	LIBOR
Net interest cost	LIBOR less ½%	Net interest cost	12%

The results of the swap are that Goodcredit ends up paying variable rate interest, but at a lower cost than it could get from a bank, and Secondtier ends up paying fixed rate interest, also at a lower cost than it could get from investors or a bank.

Other advantages of swaps

3.11 Interest rate swaps have several further attractions.

(a) They are easy to arrange.
(b) They are flexible. They can be arranged in any size and, if required, reversed.
(c) The transaction costs are low, limited to legal fees.

As with all hedging methods, interest rate swaps can alternatively be used as a means of financial speculation. In cases receiving much publicity, local authority treasurers in the UK have engaged in such speculation with disastrous results.

Swaptions

3.12 Among the various 'hybrid' hedging instruments available which combine the features of different financial instruments is the *swaption.* A swaption is an instrument which is traded on a market in the writing/purchasing of *options* to buy an interest rate swap. For example, A Ltd might buy a swaption from a bank, giving A Ltd the right, but not the obligation, to enter into an interest rate swap arrangement with the bank at or before a specified time in the future.

3.13 A swaption offers a borrower protection against rises in interest rates and at the same time allows it to take advantage of falls in rates.

A 'European-style' swaption is exercisable only on the maturity date while an 'American-style' swaption is exercisable on any business day during the exercise period.

Example: swaptions

3.14 It is now 1 January 19X6. Towyn plc pays a variable rate of interest on a $1,000,000 eurodollar loan which is due to mature on 30 June 19X9. The interest rate currently payable on this loan is 6.75% per annum. The company treasurer is now concerned about the possibility of interest rates rises over the near future.

The company's bank has indicated that an American-style dollar swaption is available with the following features.

Interest rate 7.5%
Exercise period 1 July 19X6 to 31 December 19X6
Maturity date 30 June 19X9
Premium $20,000

Required

Assess under what circumstances Towyn plc will gain from exercising the swaption.

Ignore the time value of money.

Solution

3.15 The swaption would be likely to be exercised if interest rates rose above 7.5% during the next nine months.

To evaluate the benefit of the swaption, ignoring the time value of money, it is first necessary to evaluate its cost over the remaining three year period of the loan.

	$
Interest: $1,000,000 × 7.5% × 3	225,000
Premium	20,000
Total cost	245,000

This represents an effective annual rate of interest of 8.17% ($245,000/($1,000,000 × 3)). The average rate of interest payable by the company without the swap would therefore have to exceed 8.17% for the swaption to be beneficial.

If interest rates fall, the swaption will not be exercised and the company will be able to advantage of the lower interest payments.

The company should also take into account the fact that if it does not enter into the agreement the premium will be payable whether or not the swaption was exercised. The premium is effectively the price paid for the possibility of taking advantage of lower interest rates.

4 INTEREST RATE OPTIONS 12/94, 6/96

4.1 An *interest rate option* grants the buyer of it the right, but not the obligation, to deal at an agreed interest rate (strike rate) at a future maturity date.

On the date of expiry of the option, the buyer must decide whether or not to exercise the right. Clearly, a buyer of an option to borrow will not wish to exercise it if the market interest rate is now below that specified in the option agreement. Conversely, an option to lend will not be worth exercising if market rates have risen above the rate specified in the option by the time the option has expired.

The term *interest rate guarantee* (IRG) refers to an interest rate option which hedges the interest rate for a single period of up to one year.

4.2 Tailor-made interest rate options can be purchased from major banks, with specific values, periods of maturity, denominated currencies and rates of agreed interest. The cost of the option is the 'premium'. Interest rate options offer more flexibility than and are more expensive than FRAs.

Caps, floors and collars

4.3 Various *cap* and *collar* agreements are possible. An interest rate cap is an option which sets an interest rate ceiling. A *caption* is an option to buy a cap. A *floor* is an option which sets a lower limit to interest rates. Using a 'collar' arrangement, the borrower can buy an interest rate cap and at the same time sell an interest rate floor which fixes a minimum cost for the company. The cost is lower than for a cap alone. However, the borrowing company forgoes the benefit of movements in interest rates below the floor limit in exchange for this cost reduction.

4.4 A *zero cost collar* can even be negotiated sometimes, if the premium paid for buying the cap equals the premium received for selling the floor.

Example: cap and collar

4.5 Suppose the prevailing interest rate for a company's borrowing is 10%. The company treasurer considers that a rise in rates above 12% will cause serious financial difficulties for the company. How can the treasurer make use of a 'cap and collar' arrangement?

Solution

4.6 The company can buy an interest rate cap from the bank. The bank will reimburse the company for the effects of a rise in rates above 12%. As part of the arrangements with the bank, the company can agree that it will pay at least 9%, say, as a 'floor' rate. The bank will pay the company for agreeing this. In other words, the company has sold the floor to the bank, which partly offsets the costs of the cap. The bank benefits if rates fall below the floor level.

Options on interest rate futures

4.7 Exchange-traded interest rate options are available as *options on interest rate futures*, which give the holder the right to buy (call option) or sell (put option) one futures contract on or before the expiry of the option at a specified price.

4.8 The best way to understand the pricing of interest rate options is to look at a schedule of prices. The schedule below (from the *Financial Times*) is for 8 August 1995.

Long gilt futures options (LIFFE) £50,000 64th of 100%

Strike	*Calls*				*Puts*			
price	*Sep*	*Oct*	*Nov*	*Dec*	*Sep*	*Oct*	*Nov*	*Dec*
106	0-61	1-09	1-34	1-54	0-31	1-13	1-38	1-58
107	0-29	0-46	1-05	1-25	0-63	1-50	2-09	2-29
108	0-11	0-26	0-47	1-01	1-45	2-30	2-51	3-05

4.9 The tick size (minimum price movement) is $^1/_{64}\%$ and the tick value is thus $^1/_{64}\% \times 50{,}000 = £7.8125$.

4.10 The price of an October call contract at a strike price of 106 is $1^9/_{64}\% \times 50{,}000 = £570.31$.

This means that an investor could pay £570.31 and buy one long gilt futures option which would allow him to purchase a notional 9% UK gilt in October 1995 at a price of £106 per £100 stock.

4.11 Here is another schedule of prices for options on interest rate futures (for 8 August 1995).

Short sterling options (LIFFE) £500,000 points of 100%

Strike		*Calls*			*Puts*	
Price	*Sep*	*Dec*	*Mar*	*Sep*	*Dec*	*Mar*
9300	0.19	0.31	0.38	0.05	0.21	0.40
9325	0.05	0.17	0.26	0.16	0.32	0.53
9350	0.01	0.09	0.17	0.37	0.49	0.69

4.12 This schedule shows that an investor could pay $0.19 \times £500{,}000 = £950$ to purchase the right to buy a three-month sterling futures contract in September 1995 at a price of 93.00.

Example: interest rate options (1)

4.13 Suppose that Hawthorn plc (see previous example, paragraph 2.15) is able to purchase interest rate guarantees at the current interest rate of 8% for a premium of 0.2% of the size of the loan.

4.14 The premium on the IRG is, then, £10,000,000 × 0.2% = £20,000.

4.15 With the outcome considered earlier (interest rates rise by 2%; futures rate moves by 1.8%), the futures hedge (cost £100,000 – £90,000 = £10,000) is better than the IRG (cost £20,000).

Example: interest rate options (2)

4.16 The following traded option on interest rate futures is available: LIFFE *Short sterling options £500,000 points of 100%.*

On a day in April, a September put option with a strike price of 9300 was quoted at a premium of 0.69.

4.17 This shows that the purchaser of the option has the right to sell one £500,000 3-month sterling futures contract in September at a price of 93.00 on the futures market for a premium of 0.69%.

The total premium on one contract would be £500,000 × 0.69/100 = £3,450.

If, say, in June, September 3-month sterling futures are priced *below* 93.00 (reflecting an interest rate *rise*), the option will be exercised. In calculating any gain from the option, the premium cost must also be taken into account.

The profit for each contract is:

(93 – current futures price – 0.69) × 100 ticks

To evaluate a hedge, this profit will be set against extra interest costs incurred due to the interest rate increase.

4.18 If the futures price moves *higher,* as it is likely to if interest rates *fall,* the option will not be exercised. To evaluate a hedge, there is only the option premium to set against the interest saving from the lower interest rates.

5 HEDGING STRATEGY ALTERNATIVES: EXAMPLE

5.1 Different hedging instruments often offer alternative ways of managing risk in a specific situation. In this section, we work through an example in which different ways in which a company can hedge interest rate risk are evaluated, covering both interest rate futures and interest rate options (interest rate guarantees).

Example: hedging strategy (1)

5.2 It is 31 December. Octavo plc needs to borrow £6 million in three months' time for a period of six months. For the type of loan finance which Octavo would use, the rate of interest is currently 13% per year and the Corporate Treasurer is unwilling to pay a higher rate.

The treasurer is concerned about possible future fluctuations in interest rates, and is considering the following possibilities:

(a) forward rate agreements (FRAs);
(b) interest rate futures;
(c) interest rate guarantees or short-term interest rate caps.

5.3 The Corporate Treasurer of Octavo decides to hedge the interest rate risk by using interest rate futures. Her expectation is that interest rates will increase by 2% over the next three months.

The current price of March sterling three months time deposit futures is 87.25. The standard contract size is £500,000, while the minimum price movement is one tick, the value of which is 0.01% per year of the contract size.

Set out calculations of the effect of using the futures market to hedge against movements in the interest rate and estimate the hedge efficiency:

(a) if interest rates increase by 2% and the futures market price moves by 2%;
(b) if interest rates increase by 2% and the futures market price moves by 1.75%;
(c) if interest rates fall by 1.5% and the futures market price moves by 1.25%.

The time value of money, taxation and margin requirements can be ignored.

Solution

5.4 (a) One tick has a value of:

$$0.0001 \times 500{,}000 \times {}^{3}/_{12} = £12.50$$

2% ≡ 200 ticks.

If interest rates rise by 2%, the extra interest over 6 months is:

$$£6{,}000{,}000 \times 2\% \times {}^{6}/_{12} = £60{,}000$$

Therefore a £60,000 gain from the futures contracts is required.

2% (200 ticks) movement on one contract would produce a gain of:

$$200 \times £12.50 = £2{,}500.$$

Therefore, to hedge £60,000, 24 contracts are required for the hedge.

£500,000 March sterling time deposit contracts to be sold at 87.25 (effectively 12.75% interest) on 31 December.

24 to be bought in March or when interest rates change at 85.25 (effectively 14.75% interest), closing out the position.

Gain: 24 × 200 ticks @ £12.50 = £60,000

There is 100% hedge efficiency (the perfect hedge).

(b) In this case, the futures gain will be:

$$24 \times 175 \text{ ticks} @ £12.50 = £52{,}500$$

The hedge efficiency is £52,500 ÷ £60,000 = 87.5%

(c) In this case, there is a gain on the cash market arising from the fall in interest rates, and a loss on the futures market.

Cash market gain: £6,000,000 × 1.5% × ${}^{6}/_{12}$ = £45,000

A futures market loss arises from selling at 87.25 and closing out the position at 88.50.

Futures market loss: 24 × 125 ticks @ £12.50 = £37,500

ie £6m × 1.25% × ${}^{6}/_{12}$ = £37,500

The hedge efficiency is $\frac{£45{,}000}{£37{,}500} = 120\%$

Example: hedging strategy (2)

5.5 We now extend the example to look at an alternative hedging method.

Required

Calculate, for situations (a) to (c) in Paragraph 5.3 above, whether the total cost of the loan after hedging would have been lower with the futures hedge chosen by the treasurer

or with an interest rate guarantee which she could have purchased at 13% for a premium of 0.25% of the size of the loan to be guaranteed.

Again, the time value of money, taxation and margin requirements are to be ignored.

5.6 *Futures hedge costs*

(a) Interest £6m × 15% × 6/12 = £450,000
Less gain £60,000 = £390,000

(b) Interest (as in (i)) £450,000
Less gain £52,500 = £397,500

(c) Interest £6m × 11.5% × 6/12 =£345,000
Add loss £37,500 = £382,500

The premium for the guarantee is:

£6m × 0.25% = £15,000.

The guarantee would be used in cases (a) and (b) when interest rates increase.

Then, total cost limiting interest rates to 13% is:

£6m × 13% × 6/12 = £390,000
Plus premium £15,000 equals £405,000.

This costs more than the futures contracts hedge in cases (a) and (b).

In case (c), the guarantee is not used.

Interest costs at 11.5% are:

£6m × 11.5% × 6/12 = £345,000
Plus £15,000 premium = £360,000.

This costs less than the futures hedge, reflecting the fact that declining to take up the interest rate option in the case of the guarantee has allowed the company to take advantage of the lower interest rates in the cash market.

Chapter roundup

- Interest rates, like exchange rates, can be very volatile.
- Factors involving interest rate risk include the following.
  - Fixed rates versus floating rate debt
  - The term of the loan
- A variety of financial instruments are available for reducing exposure to interest rate risk, including FRAs, futures, swaps and options.
- An interest rate guarantee is a form of interest rate option.

Test your knowledge

1 Define 'hedge efficiency'. (see para 1.5)
2 What is a forward interest rate agreement? (1.7)
3 Briefly explain the principles of gap analysis of interest rate risk. (1.14)
4 Who might use interest rate futures? (2.19, 2.21)
5 What is a 'swaption'? (3.12)
6 Explain what is meant by a 'zero cost collar'. (4.4)

Now try illustrative question 23 at the end of the Study Text

Part E
International operations

Chapter 23

FORMS OF INTERNATIONAL OPERATION. TRANSFER PRICING

This chapter covers the following topics.

		Syllabus reference
1	Forms of foreign investment	6(d)
2	Financing overseas subsidiaries	6(d)
3	Obtaining returns from subsidiaries	6(c)
4	Evaluating performance of overseas operations	6(c)

Introduction

In this chapter, we examine the different types of entity which are available for international operations by a company.

We also discuss various problems which countries face in relation to foreign direct investment (FDI).

1 FORMS OF FOREIGN INVESTMENT

12/94

1.1 Foreign direct investment (FDI) and the activities of multinational enterprises were previously discussed in Chapter 16 of this Text. Here we explore FDI from the perspective of the company undertaking it.

1.2 FDI provides an alternative to growth restricted to a firm's domestic market. A firm might develop horizontally in different countries, replicating its existing operations on a global basis. Vertical integration might have an international dimension through FDI to acquire raw material or component sources overseas (backwards integration) or to establish final production and distribution in other countries (forward integration). Diversification might alternatively provide the impetus to developing international interests.

1.3 Different forms of expansion overseas are available to meet various strategic objectives.

(a) Firms may expand by means of new 'start-up' investments, for example in manufacturing plants. This does allow flexibility, although it may be slow to achieve, expensive to maintain and slow to yield satisfactory results.

(b) A firm might take over or merge with established firms abroad. This provides a means of purchasing market information, market share and distribution channels. If speed of entry into the overseas market is a high priority, then acquisition may be preferred to start-up. However, enterprises available for takeover tend to be those which have high debt gearing, poor market performance and poor management. The better acquisitions will only be available at a premium.

(c) A *joint venture* with a local overseas partner might be entered into. A joint venture may be defined as 'the commitment, for more than a very short duration, of funds, facilities and services by two or more legally separate interests to an enterprise for their mutual benefit.' Different forms of joint venture are distinguished below.

Joint ventures

1.4 The two distinct types of joint venture are:

(a) industrial co-operation (contractual); and
(b) joint-equity.

A contractual joint venture is for a fixed period and the duties and responsibility of the parties are contractually defined. A joint-equity venture involves investment, is of no fixed duration and continually evolves.

1.5 There is a growing trend towards a contractual form of joint venture as a consequence of the high research and development costs and the 'critical mass' necessary to take advantage of economies of scale in industries such as automobile engineering. Japanese car manufacturers have for some time been forming joint ventures and alliances as well as establishing links with suppliers and customers. Contractual joint ventures have become a common means of establishing a presence in the newly emerging mixed economies of Eastern Europe.

As well as in the car industry, this form of joint venture is common in the aerospace industry.

A joint-equity venture may be the only way of establishing a presence in countries where full foreign ownership is discouraged, such as Nigeria, Japan and some Middle Eastern countries.

Economic interest groups

1.6 Economic interest groups are organisations set up to help parties to joint ventures cooperate with one another and to overcome the problems which can arise from differences in local legislation and culture.

European economic interest groups (EEIGs) form one example of economic interest groups which are of particular benefit to small and medium-sized enterprises. EEIGs are governed by European law rather than national laws and have full legal capacities. They cannot hold stakes in members' businesses, and thus the members remain independent.

Alternatives to FDI

1.7 *Exporting* and *licensing* stand as alternatives to FDI.

(a) Exporting may be direct selling by the firm's own export division into the overseas markets, or it may be indirect through agents, distributors, trading companies and various other such channels.

(b) Licensing involves conferring rights to make use of the licensor company's production process on producers located in the overseas market in return for royalty payments.

1.8 Exporting may be unattractive because of tariffs, quotas or other import restrictions in overseas markets, and local production may be the only feasible option in the case of bulky products such as cement and flat glass. Licensing also has the following advantages.

(a) It can allow fairly rapid penetration of overseas markets.

(b) It does not require substantial financial resources.

(c) Political risks are reduced since the licensee is likely to be a local company.

(d) Licensing may be a possibility where direct investment is restricted or prevented by a country.

(e) For a multinational company, licensing agreements provide a way for funds to be remitted to the parent company in the form of licence fees.

1.9 Disadvantages of licensing are as follows.

(a) The arrangement may give to the licensee know-how and technology which it can use in competing with the licensor after the license agreement has expired.

(b) It may be more difficult to maintain quality standards, and lower quality might affect the standing of a brand name in international markets.

(c) It might be possible for the licensee to compete with the licensor by exporting the produce to markets outside the licensee's area.

(d) Although relatively insubstantial financial resources are required, on the other hand relatively small cash inflows will be generated.

1.10 *Management contracts* whereby a firm agrees to sell management skills are sometimes used in combination with licensing. Such contracts can serve as a means of obtaining funds from subsidiaries, and may be a useful way of maintaining cash flows where other remittance restrictions apply.

1.11 Many multinationals use a combination of various methods of servicing international markets, depending on the particular circumstances.

Foreign subsidiaries

1.12 The basic structure of many multinationals consists of a parent company (a holding company) with subsidiaries in several countries. The subsidiaries may be wholly owned or just partly owned, and some may be owned through other subsidiaries. For example a UK parent company could own the holding company of a US group. Large multinationals have many subsidiaries in a large number of different countries and many of them are household names, for example Ford and Unilever.

The purpose of setting up subsidiaries abroad

1.13 Reasons for foreign direct investment were set out in some detail in Chapter 16. To summarise points made there, the following are some reasons why a parent company might want to set up subsidiary companies in other countries.

(a) *The location of markets*. If, say, there is a big market in Australia for the products of a UK company, it might be cheaper for the UK company to establish a manufacturing subsidiary in Australia, in order to save the costs of shipping finished goods from the UK to Australia.

(b) *The need for a sales organisation*. Some subsidiaries are not manufacturing subsidiaries, but provide a sales and marketing organisation in their country for the parent company's goods. For example, a US parent company might set up a subsidiary in the UK, in order to sell goods in the UK which are shipped over from the USA.

(c) *The opportunity to produce goods more cheaply*. If labour costs are much lower in one country than in another, it might be profitable for a multinational to set up a manufacturing subsidiary in the low-cost country, provided that the labour force in that country has the skills that are needed to produce good quality output. For example, a UK company might design a new type of computer and set up a subsidiary in the Far East, where labour costs are lower, to manufacture the computers. They would then be shipped to the UK for sale in the UK market.

(d) *The need to avoid import controls*. When a country has regulations which restrict the import of certain goods, or impose high tariffs on imports, a multinational might decide to set up a manufacturing subsidiary in that country.

(e) *The need to obtain access to raw materials*, particularly in less developed countries (LDCs).

(f) *The availability of grants and tax concessions*.

1.14 Whatever the reason for setting up subsidiaries abroad, the aim is to increase the profits of the multinational's parent company. However there are different approaches to increasing profits that the multinational might take.

(a) At one extreme, the parent company might choose to get as much money as it can from the subsidiary, and as quickly as it can. This would involve the transfer of all or most of the subsidiary's profits to the parent company.

(b) At the other extreme, the parent company might encourage a foreign subsidiary to develop its business gradually, to achieve long-term growth in sales and profits. To encourage growth, the subsidiary would be allowed to retain a large proportion of its profits, instead of remitting the profits to the parent company. A further consequence is that the economy of the country in which the subsidiary operates should be improved, with higher output adding to the country's gross domestic product and increasing employment.

The risks of multinationals

1.15 Multinational companies, like any other companies, must accept the normal risks of business. However, compared with companies that trade entirely within one country, and even with companies that export from their base in one country, multinationals face additional risks.

1.16 The main risks are as follows.

(a) *Foreign exchange risks*

(i) Any country that exports or imports faces the risk of higher costs or lower revenues because of adverse movements in foreign exchange rates. Multinationals that trade between one country and another therefore face this risk.

(ii) A company that owns assets in different countries (subsidiaries abroad) faces the risk of accounting losses due to adverse movements in exchange rates causing a fall in the value of those assets, as expressed in domestic currency.

(b) *Political risks and country risks*

A multinational can face risks of economic or political measures being taken by governments, affecting the operations of its subsidiaries abroad. Political risks are discussed further below.

(c) *Geographical separation*

The geographical separation of the parent company from its subsidiaries adds to the problems of management control of the group of companies as a whole.

Exercise 1

A management journal expressed (in 1989) the opinion that 'British investors have been bidding high for the acquisition of US companies. They are speculating on a scenario that an improved dollar will make the assets of those companies and the profit streams derived from them look cheap in the future.'

Required

Explain the above statement and discuss its validity, assuming that the exchange rate at the time of a particular acquisition was $1.50 = £1.

Solution

Consider a UK investor who is considering the purchase of a US company when the exchange rate is $1.50 = £1. The US company might cost $3,000,000 and generate annual income of $300,000. The cost would therefore be £2,000,000, and at present rates the annual income would be £200,000, a return of 10%.

If the dollar strengthened, so that the exchange rate became $1 = £1, the annual income would become £300,000, but the initial investment, having already been made at the old exchange rate, would be unaffected. The rate of return would thus rise to 15%.

While the calculations are sound, the statement in the question does not set out an easy way to achieve very high returns. Firstly, exchange rates are unpredictable; if the dollar weakened, the return on the sterling investment would fall rather than rise. Secondly, the sterling investment must be financed. It may well be that interest rates on sterling borrowings are higher than corresponding rates on US dollar borrowings, to reflect the scope for profitable investment overseas. This point will apply however the investment is to be financed, as high rates on borrowings imply high rates forgone on surplus cash not invested in the UK, and also high required rates of return on equity.

Political risks for multinationals

1.17 When a multinational company invests in another country, by setting up a subsidiary, it may face a political risk of action by that country's government which restricts the multinational's freedom.

(a) The government of a country will almost certainly want to encourage the development and growth of commerce and industry, but it might also be suspicious of the motives of multinationals which set up subsidiaries in their country, perhaps fearing exploitation.

(b) The government might offer incentives to encourage new investment from abroad, for example by offering cash grants towards the building of factories or the purchase of equipment.

1.18 On the other hand, the government might try to prevent the exploitation of the country by multinationals, and the various measures it might take include the following.

(a) Import quotas could be used to limit the quantities of goods that a subsidiary can buy from its parent company and import for resale in its domestic markets.

(b) Import tariffs could make imports (such as from parent companies) more expensive and domestically produced goods therefore more competitive.

(c) Legal standards of safety or quality could be imposed on imported goods to prevent multinationals from selling goods through a subsidiary which have been banned as dangerous in other countries.

(d) Exchange control regulations could be applied (see below).

(e) A government could restrict the ability of foreign companies to buy domestic companies, especially those that operate in politically sensitive industries such as defence contracting, communications, energy supply and so on.

(f) A government could nationalise foreign-owned companies and their assets (with or without compensation to the parent company).

(g) A government could insist on a minimum shareholding in companies by residents. This would force a multinational to offer some of the equity in a subsidiary to investors in the country where the subsidiary operates.

Exchange controls

1.19 Exchange controls restrict the flow of foreign exchange into and out of a country, usually to defend the local currency or to protect reserves of foreign currencies. Typically, a government might enforce regulations:

(a) rationing the supply of foreign exchange. Anyone wishing to make payments abroad in a foreign currency will be restricted by the limited supply, which stops them from buying as much as they want from abroad;

(b) restricting the types of transaction for which payments abroad are allowed, for example by suspending or banning the payment of dividends to foreign shareholders, such as parent companies in multinationals, who will then have the problem of 'blocked funds'.

1.20 Exchange controls are generally more restrictive in developing and less developed countries although some still exist in developed countries.

2 FINANCING OVERSEAS SUBSIDIARIES

2.1 The parent company will be largely financed in much the same way as any other large company, with share capital and reserves, loan capital and some short-term finance. But there are some differences in methods of financing:

(a) the parent company itself;
(b) the foreign subsidiaries.

2.2 The parent company itself is more likely than companies which have no foreign interests to raise finance in a foreign currency, or in its home currency from foreign sources.

2.3 The need to finance a foreign subsidiary raises the following questions.

(a) How much equity capital should the parent company put into the subsidiary?

(b) Should the subsidiary be allowed to retain a large proportion of its profits, to build up its equity reserves, or not?

(c) Should the parent company hold 100% of the equity of the subsidiary, or should it try to create a minority shareholding, perhaps by floating the subsidiary on the country's domestic stock exchange?

(d) Should the subsidiary be encouraged to borrow as much long term debt as it can, for example by raising large bank loans? If so, should the loans be in the domestic currency of the subsidiary's country, or should it try to raise a foreign currency loan?

(e) Should the subsidiary be encouraged to minimise its working capital investment by relying heavily on trade credit?

2.4 The method of financing a subsidiary will give some indication of the nature of the investment that the parent company is prepared to make. A sizeable equity investment (or long-term loans from the parent company to the subsidiary) would indicate a long-term investment by the parent company. In contrast, when a subsidiary is financed largely by debt capital and short-term liabilities (even if the trade creditor is the parent company, for goods supplied by the parent to the subsidiary), this would indicate a short-term investment policy.

2.5 When a UK company wishes to finance operations overseas, there may be a currency (foreign exchange) risk arising from the method of financing used. For example, if a UK company decides on an investment in the USA, to be financed with a sterling loan:

(a) the investment will provide returns in US dollars;
(b) the investors (the lenders) will want returns paid in sterling.

If the US dollar falls in value against sterling, the sterling value of the project's returns will also fall.

2.6 To reduce or to eliminate the currency risk of an overseas investment, a company might finance it with funds in the same currency as the investment.

The advantages of borrowing in the same currency as an investment are as follows.

(a) Assets and liabilities in the same currency can be matched, thus avoiding exchange losses on conversion in the group's annual accounts.

(b) Revenues in the foreign currency can be used to repay borrowings in the same currency, thus eliminating losses due to fluctuating exchange rates.

3 OBTAINING RETURNS FROM SUBSIDIARIES 12/95

3.1 When a foreign subsidiary makes a profit, the profit will be included in the total profits of the multinational group. The management of the parent company must decide, however:

(a) how the total profit of the group should be divided between the parent company and each of its subsidiaries, which is likely to depend on the transfer prices adopted;

(b) how the parent company should obtain the cash returns that it wants from each of its subsidiaries.

3.2 An example will show how shares of profits can be manipulated by accounting methods.

(a) Suppose that a US parent company ships some goods to a UK subsidiary. The goods cost US$40,000 to make, and they are sold in the UK by the subsidiary for £50,000, which is the equivalent, say, of US$75,000. The US multinational group will make a total profit of US$35,000. So how much profit from the US$35,000 has been earned by the US parent company, and how much has been earned by the UK subsidiary?

The answer depends on the transfer price at which the US parent sells the goods to its UK subsidiary.

(i) If the transfer price is US$45,000, the US parent company would make a profit of $5,000, leaving a profit of $30,000 for the UK subsidiary.

(ii) If the transfer price is US$70,000, the US parent company would make a profit of $30,000, leaving only a $5,000 profit for the UK subsidiary.

The transfer price will be set by management decision, so that the share of total profit between parent company and subsidiary can be manipulated to suit the preferences of management.

(b) The same choice of how to share total profits can be made in fixing a transfer price for goods made by a subsidiary and sold to the parent company or to another subsidiary.

3.3 The question of how profits are shared between parent company and subsidiary leads us on to the question of how a parent company obtains its returns in cash from its subsidiaries.

3.4 If a subsidiary earns a profit, but then retains and reinvests the profits, the parent company will not get any cash at all. Various ways of obtaining a cash return are as follows.

(a) The subsidiary could make a profit and pay a dividend out of profits.

(b) The parent company could sell goods or services to the subsidiary and obtain payment. The amount of this payment will depend on the volume of sales and also on the transfer price for the sales.

(c) A parent company which grants a subsidiary the right to make goods protected by patents can charge a *royalty* on any goods that the subsidiary sells. The size of any royalty can be adjusted to suit the wishes of the parent company's management.

(d) If the parent company makes a loan to a subsidiary, it can set the interest rate high or low, thereby affecting the profits of both companies. A high rate of interest on a loan, for example, would improve the parent company's profits to the detriment of the subsidiary's profits.

(e) *Management charges* may be levied by the parent company for costs incurred in the management of international operations.

3.5 When the subsidiary is in a country where there are exchange control regulations, the parent company may have difficulty in getting cash from the subsidiary.

The workings of transfer prices

3.6 A transfer price may be defined as the price at which goods or services are transferred from one process or department to another or from one member of a group to another. The extent to which costs and profit are covered by the price is a matter of company policy.

3.7 A transfer price may be based upon any of the following.

(a) Marginal cost: at marginal cost or with a gross profit margin added
(b) Full cost: at full cost, or at a full cost plus price
(c) Market price
(d) Market price less a discount
(e) Negotiated price, which could be based on any of (a) to (d) above

3.8 A transfer price based on cost might be at marginal cost or full cost, with no profit or contribution margin but in a profit centre system it is more likely to be a price based on marginal cost or full cost plus a margin for contribution or profit. This is to allow profit centres to make a profit on work they do for other profit centres, and so earn a reward for their effort and use of resources on the work.

3.9 Transfers based on market price might be any of the following.

(a) The actual market price at which the transferred goods or services could be sold on an external market

(b) The actual external market price, minus an amount that reflects the savings in costs (for example selling costs and bad debts) when goods are transferred internally

(c) The market price of similar goods which are sold on an external market, although the transferred goods are not exactly the same and do not themselves have an external market

The level of a transfer price

3.10 The size of the transfer price will affect the costs of one profit centre and the revenues of another. Since profit centre managers are held accountable for their costs, revenues, and profits, they are likely to dispute the size of transfer prices with each other, or disagree about whether one profit centre should do work for another or not. Transfer prices affect behaviour and decisions by profit centre managers.

3.11 In a system of profit centre accounting, the transfer price of goods and services between divisions is a focal issue. If managers of individual profit centres are tempted to take decisions that are harmful to other divisions and are not congruent with the goals of the organisation as a whole, the problem is likely to emerge in disputes about the transfer price.

(a) One profit centre manager might be reluctant to transfer goods and services to another division, arguing that he is not paid enough for the work.

(b) Alternatively, one profit centre manager might refuse to accept transfers of goods from another division, arguing that it would be too costly to do so.

3.12 Disagreements about output levels tend to focus on the transfer price. There is presumably a profit-maximising level of output and sales for the organisation as a whole. However, unless each profit centre also maximises its own profit at the corresponding level of output, there will be inter-divisional disagreements about output levels and the profit-maximising output will not be achieved.

3.13 Ideally, a transfer price should be set at a level that overcomes these problems.

(a) The transfer price should provide a selling price that enables the transferring division to earn a return for its efforts, and the receiving division to incur a cost for benefits received.

(b) The transfer price should be set at a level that enables profit centre performance to be measured commercially. This means that the transfer price should be a fair commercial price.

(c) The transfer price should encourage profit centre managers to agree on the amounts of goods and services to be transferred, which will also be at a level that is consistent with the aims of the organisation as a whole (for example maximising company profits).

3.14 Here is an exercise to revise basic transfer price calculations.

Exercise 2

A company has two profit centres, X and Y. Each will work at full capacity. X's total annual costs are £3,570,000 and Y's total annual costs excluding purchases from X are £1,500,000. 40% of X's output is transferred to Y, and the remaining 60% is sold externally for £4,800,000. All of Y's output is sold externally for £7,000,000.

Compute the profits of X, Y and the company as a whole:

(a) using a transfer price equal to market value;
(b) using a transfer price equal to full cost.

Solution

(a) *Transfer price equal to market value*

	X		Y		Total
	£'000	£'000	£'000	£'000	£'000
External sales		4,800		7,000	11,800
Transfer sales		3,200		0	
		8,000		7,000	
Transfer costs	0		3,200		
Own costs	3,570		1,500		5,070
		3,570		4,700	
Profit		4,430		2,300	6,730

(b) *Transfer price equal to full cost*

	X		Y		Total
	£'000	£'000	£'000	£'000	£'000
External sales		4,800		7,000	11,800
Transfer sales		1,428		0	
		6,228		7,000	
Transfer costs	0		1,428		
Own costs	3,570		1,500		5,070
		3,570		2,928	
		2,658		4,072	6,730

The advantages of market value transfer prices

3.15 In a decentralised company, divisional managers should have the opportunity to make output, selling and buying decisions which appear to be in the best interests of the division. (If every division optimises its performance, the company as a whole must inevitably achieve optimal results.) Thus a transferor division should be given the freedom to sell output on the open market, rather than to transfer them within the company. The reason for this option is that the selling division might find more profitable opportunities to sell other products: if output is switched to this new option, the transferee division is able to replace the internal supply by buying on the open market.

3.16 Giving profit centre managers the freedom to negotiate prices with other profit centres as though they were independent companies will tend to result in market-based transfer prices.

3.17 In most cases where the transfer price is at market price, internal transfers should be expected, because the buying division is likely to benefit from a better quality of service, greater flexibility, and dependability of supply. Both divisions may benefit from lower costs of administration, selling and transport. A market price as the transfer price would therefore result in decisions which would be in the best interests of the company or group as a whole.

The disadvantages of market value transfer prices

3.18 Market value as a transfer price does have certain disadvantages.

(a) The market price may be a temporary one, induced by adverse economic conditions, or dumping, or the market price might depend on the volume of output supplied to the external market by the profit centre.

(b) A transfer price at market value might, under some circumstances, act as a disincentive to use up any spare capacity in the divisions. A price based on incremental cost, in contrast, might provide an incentive to use up the spare resources in order to provide a marginal contribution to profit.

(c) Many products do not have an equivalent market price, so that the price of a similar product might be chosen. In such circumstances, the option to sell or buy on the open market does not exist.

(d) There might be an imperfect external market for the transferred item, so that if the transferring division tried to sell more externally, it would have to reduce its selling price.

(e) Internal transfers are often cheaper than external sales, with savings in selling costs, bad debt risks and possibly transport costs. It would therefore seem reasonable for the buying division to expect a discount on the external market price, and to negotiate for such a discount.

Tax implications of transfer pricing

3.19 If a UK resident company makes investments abroad it will be liable to corporation tax on the profits made, the taxable amount being before the deduction of any foreign taxes. The profits may be any of the following.

(a) Profits of an overseas branch or agency
(b) Income from foreign securities, for example debentures in overseas companies
(c) Dividends from overseas subsidiaries
(d) Capital gains on disposals of foreign assets

3.20 In many instances, a company will be subject to overseas taxes as well as to UK corporation tax on the same profits. Double taxation relief is, however, usually available in respect of the foreign tax suffered.

Example: transfer prices

3.21 A multinational company based in Beeland has subsidiary companies in Ceeland and in the UK.

The UK subsidiary manufactures machinery parts which are sold to the Ceeland subsidiary for a unit price of B$420 (420 Beeland dollars), where the parts are assembled. The UK subsidiary shows a profit of B$80 per unit; 200,000 units are sold annually.

The Ceeland subsidiary incurs further costs of B$400 per unit and sells the finished goods on for an equivalent of B$1,050.

All of the profits from the foreign subsidiaries are remitted to the parent company as dividends.

Double taxation treaties between Beeland, Ceeland and the UK allow companies to set foreign tax liabilities against their domestic tax liability.

The following rates of taxation apply.

	UK	*Beeland*	*Ceeland*
Tax on company profits	25%	35%	40%
Withholding tax on dividends	-	12%	10%

Required

Show the tax effect of increasing the transfer price between the UK and Ceeland subsidiaries by 25%.

Solution

3.22 The current position is as follows.

	UK company B$'000	*Ceeland company* B$'000	*Total* B$'000
Revenues and taxes in the local country			
Sales	84,000	210,000	294,000
Production expenses	(68,000)	(164,000)	(232,000)
Taxable profit	16,000	46,000	62,000
Tax (1)	(4,000)	(18,400)	(22,400)
Dividends to Beeland	12,000	27,600	39,600
Withholding tax (2)	0	2,760	2,760
Revenues and taxes in Beeland			
Dividend	12,000	27,600	39,600
Add back foreign tax paid	4,000	18,400	22,400
Taxable income	16,000	46,000	62,000
Beeland tax due	5,600	16,100	21,700
Foreign tax credit	(4,000)	(16,100)	(20,100)
Tax paid in Beeland (3)	1,600	-	1,600
Total tax (1) + (2) + (3)	5,600	21,160	26,760

An increase of 25% in the transfer price would have the following effect.

	UK company B$'000	*Ceeland company* B$'000	*Total* B$'000
Revenues and taxes in the local country			
Sales	105,000	210,000	315,000
Production expenses	(68,000)	(185,000)	(253,000)
Taxable profit	37,000	25,000	62,000
Tax (1)	(9,250)	(10,000)	(19,250)
Dividends to Beeland	27,750	15,000	42,750
Withholding tax (2)	0	1,500	1,500
Revenues and taxes in Beeland			
Dividend	27,750	15,000	42,750
Add back foreign tax paid	9,250	10,000	19,250
Taxable income	37,000	25,000	62,000
Beeland tax due	12,950	8,750	21,700
Foreign tax credit	(9,250)	(8,750)	(18,000)
Tax paid in Beeland (3)	3,700	-	3,700
Total tax (1) + (2) + (3)	12,950	11,500	24,450

The total tax payable by the company is therefore reduced by B$2,310,000 to B$24,450,000.

Controlled foreign companies

3.23 A UK resident company may choose to trade abroad through an investment in a local company. Providing there are no exchange control problems and cash flow requirements do not call for the repatriation of all profits to the UK, there will generally be a tax benefit in accumulating income in a foreign company whose effective tax rate is lower than that of the UK company. To prevent undue tax avoidance through the use of 'tax havens' in this way, there are special rules for 'controlled foreign companies' (CFCs).

3.24 Where UK resident persons have overall control of a company which is resident in a country with a lower level of tax, the profits of the controlled foreign company (CFC) might, under some circumstances, be apportioned to any corporate UK shareholders and taxed accordingly. No apportionment can be made to non-corporate persons. For the rules to apply, a UK company, together with connected or associated persons, must have at least a 10% stake in the overseas company.

3.25 A lower level of tax is defined as less than three quarters of the amount which would have been payable had the company been resident in the UK. The Revenue has published a list of those countries ('excluded countries') which it does not regard as low tax countries. Some countries are listed subject to qualifications relating to types of business or particular tax reliefs.

3.26 The CFC provisions only take effect where a direction is made by the Revenue. A clearance procedure exists for companies who wish to check in advance whether their plans will fall within the CFC rules.

The migration of companies

3.27 Because the overseas profits of a UK resident company are chargeable to corporation tax whereas the overseas profits of a non-UK resident company are not, UK companies might wish to transfer their residence in order to avoid paying UK corporation tax.

3.28 A company may freely transfer its residence out of the UK provided that:

(a) it gives notice to the Inland Revenue; and
(b) it pays an exit charge (based on unrealised capital gains on its assets).

Only companies incorporated abroad can emigrate, as companies incorporated in the UK are automatically UK resident.

Sales at artificial transfer prices

3.29 Where sales are made to a non-resident fellow group company at an undervalue, or purchases are made from such a company at an overvalue, the Revenue will substitute a market price in computing the profits chargeable to corporation tax. However, no corresponding relief is given for sales at overvalue or purchases at undervalue by the UK company.

Trading abroad

3.30 The controlled foreign companies legislation may reduce the attractiveness of setting up a subsidiary in a tax haven, as opposed to a branch of the UK company. However, a bona fide group structure may still be designed, avoiding the CFC rules, with the result that UK tax can be minimised by controlling the timing and amounts of dividends paid by the foreign subsidiary. At worst, a trading company treated as a CFC would have to distribute half of its profits to avoid an apportionment.

3.31 Where dividends are paid to the UK, there may be a cashflow advantage in that dividends will, if correctly timed, be assessed in a later accounting period than trading profits would have been.

3.32 If an overseas operation is expected to make losses at first and then become profitable, it may be sensible to start with a branch and then transfer the trade to a subsidiary. Provided all the assets (or all except cash) are transferred, and the consideration is in the form of shares, gains on the transfers of assets can be deducted from the value of the shares instead of being immediately taxable in the UK. Where the overseas country is a member state of the European Union, an alternative is to allow the gains to be taxable but to claim relief for tax which would have been payable overseas but for the EU Mergers Directive (which gives certain reliefs from tax).

Motivational aspects of transfer pricing

3.33 A principle of *responsibility accounting* is that profit centre managers should only be held accountable for those revenues and costs that they are in a position to control (or at least to explain). Short-term controllable costs are mainly variable, although there may be some fixed costs which are discretionary, and there will be some other directly attributable fixed costs too. A problem then is that of how transfer prices can be set that will encourage profit centre managers to make decisions about inter-divisional transfers of goods and services that are in the best interests of the organisation as a whole.

3.34 In a system of profit centre accounting, the transfer price of goods and services between divisions is a focal issue. If managers of individual profit centres are tempted to take decisions that are harmful to other divisions and are not congruent with the goals of the organisation as a whole, the problem is likely to emerge in disputes about the transfer price.

(a) One profit centre manager might be reluctant to transfer goods and services to another division, arguing that he is not paid enough for the work.

(b) Alternatively, one profit centre manager might refuse to accept more transfers of goods from another division, arguing that it is too costly or unprofitable to take the extra transfers.

3.35 The disagreements about output levels would tend to focus on the transfer price. When there are disagreements about how much work should be transferred, and how many external sales the division should make, there is presumably a profit-maximising level of output and sales for the organisation as a whole. However, unless each profit centre also maximises its own profit at this same level of output, there will be inter-divisional disagreements about output levels and the profit-maximising output will not be achieved.

4 EVALUATING PERFORMANCE OF OVERSEAS OPERATIONS

4.1 In an international context, the evaluation of performance takes different forms.

(a) For a multinational group as a whole, performance may be of special interest to investors and other outsiders. The diversified nature of the operations of a multinational group mean that caution must be exercised in interpreting the results of the performance analysis of the group and in comparing results with those of other multinational groups.

(b) Within a group, the performance of investment centres located in different countries can be assessed.

4.2 We looked earlier at various measures of performance for business enterprises. Measuring and evaluating the performance of overseas subsidiaries presents special problems, particularly because of the need to translate foreign exchange using a particular method. In practice, the method used is often that applying in the financial

accounting rules specified in SSAP 20, which are covered in BPP's Study Texts for ACCA Paper 13 and (excluding consolidated accounts) ACCA Paper 10.

4.3 International differences of various kinds can distort simple international comparisons of performance using financial data, for example as follows.

(a) A subsidiary in a low-interest country might finance another subsidiary in a high-interest country. The first subsidiary will have 'excess' interest charges while the second will show an undercharging of interest. A consistent method (for example, involving 'notional' intercompany charges) will be needed to reflect the situation.

(b) There may be very different economic environments facing subsidiaries in different countries, national limitations on remittances of funds and variations in work customs.

4.4 Research has shown that budget analysis - the comparison of sales and operating expenses with an earlier budget making use of price and volume variances - is the most important criterion for measuring performance of subsidiaries of multinational companies. This emphasis on budgets reflects the underlying principle that operating management is held *responsible* for the variables influencing performance which they can control, and that they are not held responsible for performance variations outside their control.

4.5 The system of control in a multinational enterprise must always allow intercountry comparisons to be made. This means that the overall operating budget must always be expressed in the currency of the parent company. Fluctuations in exchange rates will lead to variances between budget and actual figures. The resulting price variance is different in its implications from other price variances resulting from sales price or cost changes. Where responsibility for the exchange rate variance lies will depend upon the system of financial control in the particular organisation concerned.

4.6 Some argue that local managers should be held responsible for exchange rate variances, since the firm's ultimate goal is profitability in terms of the currency of the parent company and since local managers must be aware of the consequences of exchange rate variances.

(a) A control system which reflects this in the performance measurement process is one which uses projected exchange rates (rather than opening or closing rates) in setting the budget and closing rates (rather than opening or projected rates) in monitoring performance.

(b) Many multinationals using this method of evaluation do, however, show the exchange rate variance as a separate item in variance reports, allowing some latitude in the degree to which the local manager will actually be held responsible.

Chapter roundup

- In this chapter, we have examined problems specific to multinationals.
- Foreign direct investment (FDI) will generally be undertaken if exporting is more costly than overseas production. However, difficulties in repatriating profits and other political factors complicate the issue.
- Transfer pricing is of importance to multinational companies. There are legal provisions affecting transfer pricing which are aimed at preventing avoidance of tax.
- Different methods of transfer pricing also have different motivational effects on the cost centres involved.
- Evaluating the performance of overseas enterprises presents special problems.

Test your knowledge

1 What two different forms of joint venture can be distinguished? (see para 1.4)

2 Why might a company set up subsidiaries abroad? (1.13)

3 What are the main risks faced by multinationals? (1.16)

4 What measures might a government take to control local subsidiaries of a multinational? (1.18)

5 What exchange controls might a government apply? (1.19)

6 How might a parent company extract cash from a subsidiary? (3.4)

7 Identify the advantages and disadvantages of market value transfer prices. (3.15 - 3.18)

Now try illustrative question 24 at the end of the Study Text

Chapter 24

INTERNATIONAL INVESTMENT DECISIONS

This chapter covers the following topics.

		Syllabus reference
1	International portfolio diversification	6(d)
2	International CAPM	6(d)
3	Capital budgeting for foreign projects	6(d)
4	Taxation in the multinational environment	6(d)
5	International investment appraisal: example	6(d)

Introduction

In this chapter, we look at aspects of international investment decisions in the light of investment appraisal techniques and asset pricing theories covered earlier in the Study Text.

1 INTERNATIONAL PORTFOLIO DIVERSIFICATION

1.1 In Chapter 7, we saw how portfolio theory seeks to establish guidelines for building up a portfolio of investments. Given the increased liberalisation of domestic capital markets and the increasing internationalisation of the financial system, the investor seeking a diversified portfolio does not need to restrict choice of securities to domestic securities.

1.2 Approximately 7% of total world equities has been estimated to comprise cross-border holdings. Even so, it is arguable that there remains a domestic bias among many types of investor, which can be attributed to a number of barriers to international investment, including the following.

(a) Legal restrictions exist in some markets, limiting ownership of securities by foreign investors.

(b) Foreign exchange regulations may prohibit international investment or make it more expensive.

(c) Double taxation of income from foreign investment may deter investors.

(d) There are likely to be higher information and transaction costs associated with investing in foreign securities.

(e) Some types of investor may have a parochial 'home bias' for domestic investment.

1.3 There are a number of arguments in favour of international portfolio diversification.

Diversification of risk

1.4 A portfolio which is diversified internationally should in theory be less risky than a purely domestic portfolio. This is of advantage to any risk-averse investor.

1.5 As with a purely domestic portfolio, the extent to which risk is reduced by international diversification will depend upon the degree of correlation between individual securities in the portfolio. The lower the degree of correlation between returns on the securities, the more risk can be avoided by diversification.

1.6 On the international dimension, a number of factors help to ensure that there is often low correlation between returns on securities in different countries and therefore enhance the potential for risk reduction, including the following.

(a) Different countries are often at different stages of the trade cycle at any one time.

(b) Monetary, fiscal and exchange rate policies differ internationally.

(c) Different countries have different endowments of natural resources and different industrial bases.

(d) Potentially risky political events are likely to be localised within particular national or regional boundaries.

On the other hand, for countries within the same region having closely linked economies, such as the USA and Canada, correlations are relatively high.

1.7 A study published in *Financial Analysts Journal* (1974) found that a fully diversified international portfolio had less than half the risk (measured as the variance of portfolio return ÷ variance of return on a typical security) of a fully diversified US domestic portfolio.

Risks and returns

1.8 Securities markets in different countries differ considerably in the combination of risk and return which they offer. For example, a study of fifteen major stock markets over the period 1973 to 1982 found that the Hong Kong, Singapore and UK stock markets were characterised by high risk but high returns while the US market displayed low risk and low returns.

Exchange rates

1.9 Exchange rate fluctuations will generally have implications for international portfolio diversification where the investment is in a country whose currency floats against that of the investor's own country's currency. Indeed, the volatility in exchange rates between major currencies in recent years is sometimes cited as a barrier to international investment.

(Clearly, the barrier will be less important where currency values are linked in some way, as are the currencies in the European exchange rate mechanism (ERM). However, the widening of the fluctuation bands for most ERM currencies from 2¼% to 15% in August 1993 does widen the potential fluctuations between ERM currencies considerably.

1.10 Foreign exchange markets can often be almost as volatile as stock markets. Overall, fluctuations in exchange rates make international investment more risky, but this does not negate the fact that international portfolio diversification is worthwhile for investors wishing to reduce the risk of a portfolio.

Multinationals as diversified portfolios

1.11 Some of the costs and other barriers associated with international investment might be reduced if the investor is able to achieve international portfolio diversification by investing in the shares of a multinational company.

1.12 The evidence on this issue suggests that, unlike a portfolio of stocks drawn from different international markets, the share price behaviour of multinational companies

closely reflects that of non-multinational domestic firms. It follows that the reduction of risk (ie the reduction in the variance of portfolio return) which international portfolio diversification can achieve is not likely to be gained through the strategy of investing in a domestically based multinational.

The international cost of capital

1.13 Earlier in this Study Text, we have examined the weighted average cost of capital (WACC) of a firm. The WACC, you should by now appreciate, is a weighted average of the required returns for the various providers of finance to the firm.

1.14 The cost of capital is important for both the financing decision of the firm and for the investment decision.

The financing decision

1.15 The company will wish to keep the cost of funds after tax as low as possible within a reasonable level of risk, since the lower is the cost of capital the higher is the value of the firm. Multinational firms, having access to worldwide capital markets, are likely to be well placed to adjust the mix of the firm's finance so as to reduce the cost of capital.

1.16 There are various factors to consider in deciding the mix of finance.

(a) What are the relative costs of different types of fund? It must be borne in mind that an increase in one type of finance may have an effect on the cost (or return required) on other forms of finance.

(b) What is the appropriate mix of short-term and long-term finance?

(c) In the light of the arguments of Modigliani and Miller, what is the appropriate mix of debt and equity? The effect on risk for ordinary shareholders of increasing additional debt needs to be considered.

(d) Tax rules need to be considered. Because tax relief is available on debt interest, the mix of debt and equity can affect the tax liability of the firm.

The investment decision

1.17 It will be appropriate to adopt the firm's WACC as a discount rate if the following two conditions are satisfied.

(a) The systematic risk associated with the investment should be similar to that of the firm's other investments. In this context, we assume that the company's shareholders hold the shares within a well diversified portfolio.

(b) The method of financing of the project should not affect the level of gearing of the company.

1.18 An overseas project may alter the firm's total risk. Political risk and currency risk, both of which are unsystematic, are likely to increase. Total risk may be allowed for by:

(a) adjusting the discount rate for total risk; or

(b) accounting for risk in projected cash flows, using a discount rate adjusted for systematic business risk and financial risk as in the case of a domestic project.

1.19 In practice, it is common for firms to add a premium to the discount rate to account for risk. In comparing different approaches to adjusting for risk, the different characteristics of the special risks involved in international investment should be noted.

(a) *Political risk* is generally the risk of an adverse outcome in the form of possible expropriation of assets resulting from currently unforeseen changes in the political climate which may occur in the future. Since the risks cannot currently be foreseen,

the effect is likely to be on future cash flows. If political risk were to be adjusted for through the discount rate, all cash flows would be affected.

(b) *Currency risk* can have either favourable or adverse effects on the project cashflows. Whether the effect is favourable or adverse depends on the direction of change in exchange rates and on whether the cash flows concerned are inflows or outflows. Instead of adjusting the discount rate, it is more appropriate to adjust for this 'two-way' risk by reflecting alternative outcomes in the cash flow forecasts themselves.

Effects of international portfolio diversification

1.20 As already discussed, internationalisation of a portfolio provides a means of reducing the risk of the portfolio. For a firm contemplating a foreign investment, the degree of correlation between the stock markets of the two countries involved provides an indication of the level of systematic risk associated with the investment: the lower is the correlation coefficient, the lower is the likely level of systematic risk.

1.21 The possibility of lowering systematic risk through international investment suggests that a lower discount rate is appropriate for overseas investments. However, whether this is reasonable depends upon whether it is true that shareholders will accept a lower return on their equity in an internationally diversified firm for the reason that there is a reduction in the domestic (home-country) systematic risk. This is likely to be the case if the multinational firm is enabling shareholders to achieve international diversification that they would not otherwise be able to achieve, perhaps because of regulatory restrictions.

1.22 If the multinational firm is investing in countries in which shareholders can readily invest themselves directly, or via a managed investment fund such as a unit trust or investment trust, then there is no reason to suppose that shareholders will gain from the diversification within the multinational firm. In this case, there would seem to be no reason for the firm to use a lower discount rate for the overseas investment.

2 INTERNATIONAL CAPM

2.1 As we have seen, the possibility of international portfolio diversification increases the opportunities available to investors. Extension of the capital asset pricing model (CAPM), which we examined in Chapter 8, to the international case means that we must take into account exchange rate risk and market imperfections.

2.2 You will recall from Chapter 8 the CAPM formula giving the equilibrium expected return on a risky individual security.

$$E(r_j) = r_f + [E(r_m) - r_f]\beta_j$$

where $E(r_j)$ is the expected return from an individual security
r_f is the risk-free rate of return
$E(r_m)$ is the expected return from the market as a whole
β_j is the beta factor of the individual security

2.3 Recall also that one formula for calculating the beta value of a company's shares is

$$\beta = \frac{(\text{cov } x,y)}{\text{var } (x)}$$

where (cov x,y) is the covariance of returns on an individual company's shares (y) with returns for the market as a whole (x) and var (x) is the variance of returns for the market as a whole.

2.4 CAPM implies that investors receive returns above the risk-free rate only by bearing systematic (non-diversifiable) risk. Investors should diversify as much as possible and avoid unsystematic risk.

2.5 If we assume that the international capital market is simply like an enlarged domestic market, then we have an international CAPM formula as follows.

$$E(r_i) = r_f + [E(r_w) - r_f]\beta_w$$

where $E(r_w)$ is the expected return from the world market portfolio and β_w is a measure of the world systematic risk, given by the following formula:

$$\beta_w = \frac{(\text{cov } w,y)}{\text{var } (w)}$$

where (cov w,y) is the covariance of returns on the individual security (y) with returns on the world market (w) and var (w) is the variance of returns on the world market.

2.6 This analysis implies that the risk premium is proportional to the world systematic risk, β_w, and that investors can benefit from maximum diversification by investing in the world market portfolio consisting of all securities in the world economy.

2.7 In practice, such complete diversification will of course not be practicable. However, significant international diversification can be achieved by the following methods:

(a) direct investment in companies in different countries;
(b) investments in multinational enterprises;
(c) holdings in unit trusts or investment trusts which are diversified internationally.

Example: International CAPM

2.8 A company's shares have a covariance of returns of 17.8% relative to returns for the world market portfolio. The risk-free rate of return is 8% and the expected return on the world market portfolio is 11%. The standard deviation of returns for the world market is 30%.

Required

Calculate the international cost of equity capital for the company. Exchange rate risks and market imperfections can be ignored.

Solution

2.9 The variance is the square of the standard deviation and so the world beta value for the company is:

$$\frac{0.178}{0.3^2} = \frac{0.178}{0.09} = 1.98$$

The cost of equity capital is $8\% + (11 - 8) \times 1.98\% = 13.94\%$.

3 CAPITAL BUDGETING FOR FOREIGN PROJECTS 12/94

3.1 Multinational capital budgeting can be based on similar concepts to those used in the purely domestic case which we have examined earlier in this Study Text:

(a) using net present value (NPV) analysis, project cash flows are discounted using the firm's weighted average cost of capital; or

(b) the internal rate of return which equates project cash flows with project costs is found.

3.2 There are, however, some special considerations in the international case, including the following.

(a) For the purpose of assessing how expected performance compares with potential performance, it is necessary to compare the project's net present value with those of similar host country projects. This involves measuring the cash flows in terms of the currency of the host country.

(b) A foreign project also needs to be evaluated on its net present value in respect of the funds which can be remitted to the parent. The purpose of this second stage is to evaluate whether the cash flow remitted justifies the cash invested from the home country.

(c) Cash flows from the subsidiary may come about through a variety of means, including licensing fees and payments for imports from the parent company.

(d) The possibility of differing national rates of inflation needs to be taken into account.

The APV method

3.3 The adjusted present value (APV) method, which we analysed in Chapter 6, may be used for a project which is financed differently from the parent company. However, although the APV is a feasible method of analysis for foreign projects, it is not used nearly as much in practice as the traditional weighted average cost of capital method.

The Examiner for Paper 14 has stated that questions will not be set requiring application of the APV method in an international context.

Foreign exchange risk and overseas operations

3.4 When a UK company wishes to finance operations overseas, there may be a foreign exchange risk arising from the method of financing used. To reduce or eliminate the foreign exchange risk of an overseas investment, a company might finance it with funds raised in the same currency as the investment.

3.5 As you should appreciate from our earlier discussion of currency risk, there are advantages of borrowing in the same currency as an investment. Assets and liabilities in the same currency can be matched, thus avoiding exchange losses on conversion in the group's annual accounts. Revenues in the foreign currency can be used to repay borrowings in the same currency, thus eliminating losses due to fluctuating exchange rates.

Additional factors

3.6 Additional factors to be taken into account when appraising overseas investments are as follows.

(a) Political interference by overseas governments, including exchange controls, extra charges on the profits of overseas companies and employment legislation could be a danger.

(b) Differences in tax systems (and accounting practices) may be significant.

(c) The investor should allow for the extra risk associated with overseas investments, largely as a result of (a) and (b), as well as any foreign exchange risk through not matching foreign currency assets and liabilities, or not matching revenues and finance payments in the foreign currency.

(d) Some countries offer special finance incentives for investment in that country.

(e) It might be better to export than to set up a foreign subsidiary.

Loans in foreign currencies

3.7 A UK company could borrow in a foreign currency to finance an investment in sterling. For example, a company could finance a project in the UK by borrowing in US dollars. The loan could be raised:

(a) as a eurocurrency loan from a bank;
(b) in the case of very large companies, as a eurobond issue.

3.8 The *reason* for financing a project in a foreign currency would be the availability of a lower interest rate than the current market rate for sterling loans.

3.9 However, it is easy to be deceived by lower interest rates on eurocurrency loans, and foreign currency loans at a low interest rate could prove more expensive than a loan in domestic currency at a higher interest rate. Companies need to beware of this 'interest rate trap.' The project will pay back returns in sterling, but the loan, and interest on the loan, must be paid in the foreign currency. If the currency of the loan strengthens against sterling, the *sterling cost* of the loan interest and the loan repayment will increase.

3.10 For example, suppose that a UK company borrows $6,000,000 at an interest rate of 7%, when the exchange rate is $2 = £1. The loan would finance a UK investment costing £3,000,000. Annual interest on the loan would be $420,000, which would cost £210,000 if the exchange rate does not change. But if sterling falls in value against the dollar, to say $1.50 = £1, the loan interest will cost £280,000 a year, and the capital sum needed to repay the loan at the end of its term will be £4,000,000.

4 TAXATION IN THE MULTINATIONAL ENVIRONMENT

Tax planning

4.1 Tax planning for multinational companies is an extremely complex area. (We looked at the tax implications of transfer pricing in Chapter 23.) Each country has its own range of taxes, and multinational enterprises must usually seek local advice in each country, which may be available through international accounting firms.

Foreign tax credits

4.2 In order to prevent the same income being taxed twice *(double taxation)*, most countries give a tax credit for taxes on income paid to the host country.

4.3 For example, a Japanese subsidiary of a US firm earns the equivalent of $500,000 in yen. The subsidiary pays 40% income tax ($200,000) in Japan. The US parent can claim a credit against US taxes of $200,000 when the earnings are remitted to the parent company.

4.4 Foreign tax credits are also available for withholding taxes on sums paid to other countries as dividends, interest, royalties and in other forms.

Tax havens

4.5 *Tax havens* are used by some multinationals as a means of deferring tax on funds prior to their repatriation or reinvestment. A tax haven is likely to have the following characteristics.

(a) Tax on foreign investment or sales income earned by resident companies, and withholding tax on dividends paid to the parent, should be low.

(b) There should be a stable government and a stable currency.

(c) There should be adequate financial services support facilities.

5 INTERNATIONAL INVESTMENT APPRAISAL: EXAMPLE

5.1 In this section of the chapter, we work through a detailed international investment appraisal question.

5.2 Stoppall plc specialises in the construction of dams. The company has an excellent reputation and has been contacted by the representatives of a water authority in Scotland and a developing country, Bargonia, as each wishes to have a large new dam

constructed. Stoppall has a full order book, but with the use of sub-contractors, could undertake one further project only. Both the Scottish and the Bargonian projects would take five years to complete.

5.3 The estimated cash outflows associated with the two projects are presented below.

Scottish project

Year	*0*	*1*	*2*	*3*	*4*	*5*
	£m	£m	£m	£m	£m	£m
Plant and machinery	20	5	3	1		
Vehicles	5	5	3	1		
Materials		25	24	26	28	14
Labour		12	14	15	16	17
Other expenses		11	10	12	14	16
Interest payments		35	42	42	42	42

Bargonian project

Year	*0*	*1*	*2*	*3*	*4*	*5*
	£m	£m	£m	£m	£m	£m
Plant and machinery	10	7	6	1		
Vehicles	5	3	4	2		
Materials		28	26	29	23	25
Labour		17	16	18	22	26
Other expenses		16	17	16	16	14
Interest payments		38	49	50	50	50

5.4 All expenses are payable in pounds sterling at the end of the year concerned with the exception of the initial outlays which are payable at the commencement of the projects.

5.5 Payment would be received in stages for both projects. The Scottish water authority would make an initial payment of 15% of the total price of £420 million, with a further 20% payable at both the start of year 2 and year 3, 25% at the end of year 4 and the remainder on completion of the project.

The Bargonian government has offered to make payment in either the local currency, the Dowl, or in $US.

Stoppall has indicated that, because of uncertainty about the future strength and convertibility of the Dowl, a 50% initial payment would be required with a further 20% at the end of year 2 and the balance on completion. The total price of the Bargonian project is 140,250 million Dowl or $US 900 million.

Payment in $US would require a 20% initial payment, with the remainder in equal annual instalments, the last being on completion of the project.

5.6 UK taxation, at the rate of 33% on worldwide net operating receipts, is payable one year in arrears. Tax allowable depreciation exists on all fixed assets at 20% per year on a straight line basis. The fixed assets are expected to have a negligible value at the end of the five year projects. Stoppall has other taxable income besides these proposed projects. No foreign taxation would be payable in connection with the Bargonian project.

5.7 Stoppall bases its estimates of future foreign exchange rates on projections of inflation.

Projected annual inflation levels

Year	*UK*	*USA*	*Bargonia*
1	5%	5%	20%
2	5%	5%	30%
3	5%	7%	30%
4	5%	7%	30%
5	5%	7%	30%
6	5%	7%	30%

The systematic risk of the Scottish project is estimated to be 1.5 and of the Bargonian project 1.625. The risk free rate is 7% a year and market return is 15% a year.

Cash flow estimates already include the effects of projected inflation.

Current exchange rates are 1.60 $/£ and 250.0 Dowl/£.

5.8 *Required*

Evaluate whether Stoppall should construct the dam in Scotland or in Bargonia. If Stoppall selected Bargonia should it request payment in Dowl or $US?

Costs of credit insurance are to be ignored.

Solution

5.9 First of all, we calculate the discount rates to apply.

Scottish project	7% + (15 – 7) × 1.5%	= 19% a year
Bargonian project	7% + (15 – 7) × 1.625%	= 20% a year

5.10 Next, we can analyse the cashflows for the Scottish project.

Scottish project

Year	*0*	*1*	*2*	*3*	*4*	*5*
	£m	£m	£m	£m	£m	£m
Fixed asset purchases in year	25	10	6	2		
Cumulative purchases	25	35	41	43		
Depreciation per year		5	7	8.2	8.6	14.2

Taxation computations

Year	*0*	*1*	*2*	*3*	*4*	*5*
	£m	£m	£m	£m	£m	£m
Receipts from project	63.00	84.00	84.00	-	105.00	84.00
Tax allowable costs						
Materials		(25.00)	(24.00)	(26.00)	(28.00)	(14.00)
Labour		(12.00)	(14.00)	(15.00)	(16.00)	(17.00)
Other expenses		(11.00)	(10.00)	(12.00)	(14.00)	(16.00)
Depreciation		(5.00)	(7.00)	(8.20)	(8.60)	(14.20)
Taxable profit	63.00	31.00	29.00	(61.20)	38.40	22.80
Tax at 33% - payable 1 year in arrears	(20.79)	(10.23)	(9.57)	20.20	(12.67)	(7.52)

NPV analysis

Year	*0*	*1*	*2*	*3*	*4*	*5*	*6*
	£m	£m	£m	£m	£m	£m	£m
Receipts from project	63.00	84.00	84.00	-	105.00	84.00	
Fixed asset purchases	(25.00)	(10.00)	(6.00)	(2.00)			
Annual costs							
Materials		(25.00)	(24.00)	(26.00)	(28.00)	(14.00)	
Labour		(12.00)	(14.00)	(15.00)	(16.00)	(17.00)	
Other expenses		(11.00)	(10.00)	(12.00)	(14.00)	(16.00)	
Taxation		(20.79)	(10.23)	(9.57)	20.20	(12.67)	(7.52)
Net cash flow	38.00	5.21	19.77	(64.57)	67.20	24.33	(7.52)
Discount factor at 19%	1.000	0.840	0.706	0.593	0.499	0.419	0.352
Present value	38.00	4.38	13.96	(38.29)	33.53	10.19	(2.65)

NPV = + £59,120,000

5.11 Exchange rates for the Bargonian project receipts can be estimated, assuming that purchasing power parity is maintained, as follows.

Recall from Chapter 19 that:

$$S_t = S_o \times \frac{1 + i_f}{1 + i_{uk}}$$

	Factor	*$/£*	*Factor*	*Dowl/£*
Current		1.60		250
Year 1	$\times \frac{1.05}{1.05}$	= 1.60	$\times \frac{1.2}{1.05}$	= 286
Year 2	$\times \frac{1.05}{1.05}$	= 1.60	$\times \frac{1.3}{1.05}$	= 354
Year 3	$\times \frac{1.07}{1.05}$	= 1.63	$\times \frac{1.3}{1.05}$	= 438
Year 4	$\times \frac{1.07}{1.05}$	= 1.66	$\times \frac{1.3}{1.05}$	= 543
Year 5	$\times \frac{1.07}{1.05}$	= 1.69	$\times \frac{1.3}{1.05}$	= 672
Year 6	$\times \frac{1.07}{1.05}$	= 1.73	$\times \frac{1.3}{1.05}$	= 832

Estimated receipts from the Bargonian project are then as follows.

Year		*US$ Amount*	*Exchange rate*	*Amount*		*Amount*	*Exchange rate*	*Amount*
		$m		£m		Million Dowls		£m
0	(20%)	180	1.60	112.5	(50%)	70,125	250	280.5
1	(16%)	144	1.60	90.0		-		
2	(16%)	144	1.60	90.0	(20%)	28,050	354	79.2
3	(16%)	144	1.63	88.3		-		
4	(16%)	144	1.66	86.7		-		
5	(16%)	144	1.69	85.2	(30%)	42,075	672	62.6
		900				140,250		

5.12 The steps of the NPV analysis if the Bargonian project is priced in Dowls can be set out as below.

Year	*0*	*1*	*2*	*3*	*4*	*5*
	£m	£m	£m	£m	£m	£m
Fixed asset purchases in year	15	10	10	3		
Cumulative purchases	15	25	35	38		
Depreciation per year		3	5	7	7.6	15.4

Taxation computations

Year	*0*	*1*	*2*	*3*	*4*	*5*
	£m	£m	£m	£m	£m	£m
Receipts from project	280.50	0.00	79.20	0.00	0.00	62.60
Tax allowable costs						
Materials		(28.00)	(26.00)	(29.00)	(23.00)	(25.00)
Labour		(17.00)	(16.00)	(18.00)	(22.00)	(26.00)
Other expenses		(16.00)	(17.00)	(16.00)	(16.00)	(14.00)
Depreciation		(3.00)	(5.00)	(7.00)	(7.60)	(15.40)
Taxable	280.50	(64.00)	15.20	(70.00)	(68.60)	(17.80)
Taxation (33%)	(92.57)	21.12	(5.02)	23.10	22.64	5.87

Note that interest payments are ignored, because the cost of finance will be implied in the discount rate used.

NPV analysis

Year	*0* £m	*1* £m	*2* £m	*3* £m	*4* £m	*5* £m	*6* £m
Receipts from project	280.50		79.20			62.60	
Fixed asset purchases	(15.00)	(10.00)	(10.00)	(3.00)			
Materials		(28.00)	(26.00)	(29.00)	(23.00)	(25.00)	
Labour		(17.00)	(16.00)	(18.00)	(22.00)	(26.00)	
Other expenses		(16.00)	(17.00)	(16.00)	(16.00)	(14.00)	
Taxation		(92.57)	21.12	(5.02)	23.10	22.64	5.87
Net cash flow	265.50	(163.57)	31.32	(71.02)	(37.90)	20.24	5.87
Discount factor at 20%	1.000	0.833	0.694	0.579	0.482	0.402	0.335
Present value	265.50	(136.25)	21.74	(41.12)	(18.27)	8.14	1.97

NPV = £101,710,000

5.13 Now we evaluate the Bargonian project if it is priced in US dollars.

Year	*0* £m	*1* £m	*2* £m	*3* £m	*4* £m	*5* £m
Receipts from project	112.5	90.0	90.0	88.3	86.7	85.2
Tax allowable costs						
Materials		(28.0)	(26.0)	(29.0)	(23.0)	(25.0)
Labour		(17.0)	(16.0)	(18.0)	(22.0)	(26.0)
Other expenses		(16.0)	(17.0)	(16.0)	(16.0)	(14.0)
Depreciation		(3.0)	(5.0)	(7.0)	(7.6)	(15.4)
Taxable	112.5	26.0	26.0	18.3	18.1	4.8
Tax at 33%, 1 yr in arrears	(37.13)	(8.58)	(8.58)	(6.04)	(5.97)	(1.58)

NPV analysis

Year	*0* £m	*1* £m	*2* £m	*3* £m	*4* £m	*5* £m	*6* £m
Receipts from project	112.50	90.00	90.00	88.30	86.70	85.20	
Fixed asset purchases	(15.00)	(10.00)	(10.00)	(3.00)			
Materials		(28.00)	(26.00)	(29.00)	(23.00)	(25.00)	
Labour		(17.00)	(16.00)	(18.00)	(22.00)	(26.00)	
Other expenses		(16.00)	(17.00)	(16.00)	(16.00)	(14.00)	
Taxation		(37.13)	(8.58)	(8.58)	(6.04)	(5.97)	(1.58)
Net cash flow	97.50	(18.13)	12.42	13.72	19.66	14.23	(1.58)
Discount factor at 20%	1.000	0.833	0.694	0.579	0.482	0.402	0.335
Present value	97.50	(15.10)	8.62	7.94	9.48	5.72	(0.53)

NPV = £113,630,000

5.14 *Recommendation*

On the basis of the estimates given, the Bargonian project should be undertaken, with the contract priced in US dollars.

Exercise

Flagwaver plc is considering whether to establish a subsidiary in the USA, at a cost of $2,400,000. This would be represented by fixed assets of $2,000,000 and working capital of $400,000. The subsidiary would produce a product which would achieve annual sales of $1,600,000 and incur cash expenditures of $1,000,000 a year.

The company has a planning horizon of four years, at the end of which it expects the realisable value of the subsidiary's fixed assets to be $800,000.

It is the company's policy to remit the maximum funds possible to the parent company at the end of each year.

Tax is payable at the rate of 35% in the USA and is payable one year in arrears. A double taxation treaty exists between the UK and the USA and so no UK taxation is expected to arise.

Tax allowable depreciation is at a rate of 25% on a straight line basis on all fixed assets.

Because of the fluctuations in the exchange rate between the US dollar and sterling, the company would protect itself against the risk by raising a eurodollar loan to finance the investment. The company's cost of capital for the project is 16%.

Calculate the NPV of the project.

Solution

The annual writing down allowance (WDA) is 25% of US$2,000,000 = $500,000, from which the annual tax saving would be (at 35%) $175,000.

Year	*Invest-ment* $m	*Contri-bution* $m	*Tax on contri-bution* $m	*Tax saving on WDA & tax on realisable value* $m	*Net cash flow* $m	*Discount factor* 16%	*Present value* $m
0	(2.4)				(2.400)	1.000	(2.400)
1		0.6		0.175	0.775	0.862	0.668
2		0.6	(0.21)	0.175	0.565	0.743	0.420
3		0.6	(0.21)	0.175	0.565	0.641	0.362
4	1.2*	0.6	(0.21)	0.175	1.765	0.552	0.974
5			(0.21)	(0.28)**	(0.490)	0.476	(0.233)
							(0.209)

* Fixed assets realisable value $800,000 plus working capital $400,000

** It is assumed that tax would be payable on the realisable value of the fixed assets, since the tax written down value of the assets would be zero. 35% of $800,000 is $280,000.

The NPV is negative and so the project would not be viable at a discount rate of 16%.

Chapter roundup

- International portfolio diversification brings advantages resulting from differences in the economies of different countries.
- The CAPM can be extended to cover international portfolio risk, but in practice foreign exchange fluctuations and market imperfections also need to be considered.
- The appraisal of foreign projects involves a number of complexities which do not arise in the case of domestic projects, including international tax complications and differential rates of inflation.

Test your knowledge

1 What barriers are there to international investment? (see para 1.2)

2 What factors ensure that there is low correlation between returns on securities in different national securities markets around the world? (1.6)

3 What does the international CAPM indicate about international portfolio diversification? (2.6)

4 What special considerations are there in applying NPV analysis to the appraisal of foreign projects? (3.2)

5 Why might a multinational company make use of a tax haven, and what characteristics is a tax haven likely to have? (4.5)

Now try illustrative question 25 at the end of the Study Text

Chapter 25

THE TREASURY FUNCTION

This chapter covers the following topics.

		Syllabus reference
1	Treasury departments	4(a), 6(c)
2	Payments between companies	4(a), 6(c)
3	Cash management services	4(a), 6(c)
4	Short-term investments	4(a), 6(c)

Introduction

In this chapter, we discuss the work of the treasury function, which in larger companies will form a separate department.

Whether a treasury department is treated as a cost centre or a profit centre can have significant implications for how it approaches its role and may reflect the strategy of the organisation as a whole.

1 TREASURY DEPARTMENTS 6/96

1.1 Large companies, including multinationals, often rely heavily for both long-term and short-term funds on the financial and currency markets. These markets are volatile, with interest rates and foreign exchange rates changing continually and by significant amounts. Many large companies have set up separate treasury departments to manage cash and foreign currency.

1.2 Treasurership can be defined as the function concerned with the provision and use of finance. It covers provision of capital, short-term borrowing, foreign currency management, banking, collections and money market investment.

1.3 A treasury department, even in a large company, is likely to be quite small, with perhaps a staff of three to six qualified accountants, bankers or corporate treasurers working under a Treasurer, who is responsible to the Finance Director. In some cases, where the company or organisation handles very large amounts of cash or foreign currency dealings, and often has large cash surpluses, the treasury department might be a little bigger.

The role of the treasurer

1.4 The Association of Corporate Treasurers has listed the experience it will require from its student members before they are eligible for full membership of the Association. This list of required experience gives a good indication of the roles of treasury departments.

(a) *Corporate financial objectives*

(i) financial aims and strategies;
(ii) financial and treasury policies;
(iii) financial and treasury systems.

(b) *Liquidity management*: making sure the company has the liquid funds it needs, and invests any surplus funds, even for very short terms.

(i) working capital and money transmission management;
(ii) banking relationships and arrangements;
(iii) money management.

Cash management and liquidity management are probably the most obvious responsibilities of a treasurer. In some organisations, the task is largely one of controlling stocks, debtors, creditors and bank overdrafts.

In cash-rich companies, the treasurer will invest surplus funds to earn a good yield until they are required again for another purpose.

A good relationship with one or more banks is desirable, so that the treasurer can negotiate overdraft facilities, money market loans or longer term loans at reasonable interest rates.

(c) *Funding management*

(i) funding policies and procedures;
(ii) sources of funds;
(iii) types of funds.

Funding management is concerned with all forms of borrowing, and alternative sources of funds, such as leasing and factoring.

The treasurer needs to know:

(i) where funds are obtainable;
(ii) for how long;
(iii) at what interest rate;
(iv) whether security would be required;
(v) whether interest rates would be fixed or variable.

If a company borrows, say, £10,000,000, even a difference of ¼% in the interest cost of the loan obtained would be worth £25,000 in interest charges each year.

(d) *Currency management*

(i) exposure policies and procedures;
(ii) exchange dealing, including futures and options;
(iii) international monetary economics and exchange regulations.

Currency dealings can save or cost a company considerable amounts of money, and the success or shortcomings of the corporate treasurer can have a significant impact on the profit and loss account of a company which is heavily involved in foreign trade.

(e) *Corporate finance*

(i) equity capital management;
(ii) business acquisitions and sales;
(iii) project finance and joint ventures.

Corporate finance is concerned with matters such as raising share capital, its form (ordinary or preference, or different classes of ordinary shares), obtaining a stock exchange listing, dividend policy, financial information for management, mergers, acquisitions and business sales.

(f) *Related subjects*

(i) corporate taxation (domestic and foreign tax);
(ii) risk management and insurance;
(iii) pension fund investment management.

Centralised or decentralised cash management?

1.5 A large company may have a number of subsidiaries and divisions. In the case of a multinational, these will be located in different countries. It will be necessary to decide whether the treasury function should be centralised.

1.6 With centralised cash management:

(a) the central Treasury department effectively acts as the bank to the group;

(b) the central Treasury has the job of ensuring that individual operating units have all the funds they need at the right time.

1.7 The following are advantages of having a centralised specialist treasury department.

(a) Centralised liquidity management:

(i) avoids having a mix of cash surpluses and overdrafts in different localised bank accounts;

(ii) facilitates bulk cash flows, so that lower bank charges can be negotiated.

(b) Larger volumes of cash are available to invest, giving better short-term investment opportunities (for example money markets, high-interest accounts and CDs).

(c) Any borrowing can be arranged in bulk, at lower interest rates than for smaller borrowings, and perhaps on the eurocurrency or eurobond markets.

(d) Foreign currency risk management is likely to be improved in a group of companies. A central treasury department can match foreign currency income earned by one subsidiary with expenditure in the same currency by another subsidiary. In this way, the risk of losses on adverse exchange rate movements can be avoided without the expense of forward exchange contracts or other hedging methods.

(e) A specialist treasury department will employ experts with knowledge of dealing in forward contracts, futures, options, eurocurrency markets, swaps and so on. Localised departments could not have such expertise.

(f) The centralised pool of funds required for precautionary purposes will be smaller than the sum of separate precautionary balances which would need to be held under decentralised treasury arrangements.

(g) Through having a separate profit centre, attention will be focused on the contribution to group profit performance that can be achieved by good cash, funding, investment and foreign currency management.

1.8 If cash management is decentralised:

(a) sources of finance can be diversified and can match local assets;

(b) greater autonomy can be given to subsidiaries and divisions because of the closer relationships they will have with the decentralised cash management function;

(c) the decentralised Treasury function may be able to be more responsive to the needs of individual operating units;

(d) since cash balances will not be aggregated at group level, there will be more limited opportunities to invest such balances on a short-term basis.

The treasury department as cost centre or profit centre

1.9 A treasury department might be managed either as a cost centre or as a profit centre. For a group of companies, this decision may need to be made for treasury departments in separate subsidiaries as well as for the central corporate treasury department.

1.10 In a cost centre, managers have an incentive only to keep the costs of the department within budgeted spending targets. The cost centre approach implies that the treasury is there to perform a service of a certain standard to other departments in the enterprise. The treasury is treated much like any other service department.

1.11 However, some companies (including BP, for example) are able to make significant profits from their treasury activities. Treating the treasury department as a profit centre recognises the fact that treasury activities such as speculation may earn revenues for the

company, and may as a result make treasury staff more motivated. The profit centre approach is probably going to be appropriate only if the company has a high level of foreign exchange transactions.

1.12 If a profit centre approach is being considered, the following issues should be addressed.

(a) *Competence of staff.* It may be unreasonable to expect local managers to have sufficient expertise in the area of treasury management to carry out speculative treasury operations competently. Mistakes in this specialised field may be costly. It may only be appropriate to operate a larger centralised treasury as a profit centre, and additional specialist staff demanding high salaries may need to be recruited.

(b) *Controls.* Adequate controls must be in place to prevent costly errors and overexposure to risks such as foreign exchange risks. It is possible to enter into a very large foreign exchange deal over the telephone.

(c) *Information.* A treasury team which trades in futures and options or in currencies is competing with other traders employed by major financial institutions who may have better knowledge of the market because of the large number of customers they deal with. In order to compete effectively, the team needs to have detailed and up-to-date market information.

(d) *Attitudes to risk.* The more aggressive approach to risk-taking which is characteristic of treasury professionals may be difficult to reconcile with the more measured approach to risk which may prevail within the board of directors. The recognition of treasury operations as profit making activities may not fit well with the main business operations of the company.

(e) *Internal charges.* If the department is to be a true profit centre, then market prices should be charged for its services to other departments. It may be difficult to put realistic prices on some services, such as arrangement of finance or general financial advice.

(f) *Performance evaluation.* Even with a profit centre approach, it may be difficult to measure the success of a treasury team for the reason that successful treasury activities sometimes involve *avoiding* the incurring of costs, for example when a currency devalues. For example, a treasury team which hedges a future foreign currency receipt over a period when the domestic currency undergoes devaluation (as sterling did in 1992 when it left the European exchange rate mechanism) may avoid a substantial loss for the company.

The treasury function in the multinational firm

1.13 Cash management in a multinational firm may be improved by both *centralisation* and *multilateral netting.*

Centralised cash management in the multinational firm

1.14 If cash management within a multinational firm is centralised, each subsidiary holds only the minimum cash balance required for transaction purposes. All excess funds will be remitted to the central Treasury department.

1.15 Funds held in the central pool of funds can be returned quickly to the local subsidiary by telegraphic transfer or by means of worldwide bank credit facilities. The firm's bank can instruct its branch office in the country in which the subsidiary is located to advance funds to the subsidiary. Multinationals' central pools of funds are generally maintained in major financial centres such as London, New York, Tokyo and Zurich.

Multilateral netting

Examined 6/94

1.16 Where there is a large number of separate foreign currency transactions between different subsidiaries, the obligations of different subsidiaries may be netted off against each other on a multilateral basis, in the ways explained in an earlier chapter. This may bring the advantage of reduced transaction costs because there will be a reduced level of

transfers between different currencies. However, in some countries, including France and Italy for example, there are regulations limiting or prohibiting netting.

We looked at multilateral netting, with a worked example, in Chapter 20.

2 PAYMENTS BETWEEN COMPANIES

2.1 Various methods of payment used in trade, including international trade, each have their own distinguishing features, and will now be described in turn.

Payment by cheque

2.2 Payment by cheque is a *slow* method of settlement, because the payee must wait for the cheque to be returned to the drawer's bank for clearance before his own account is credited. The exporter will arrange for his bank to collect the payment. (In international trade, cheques must always be sent for collection.) The collection procedures for a cheque are as follows.

(a) If a foreign buyer draws a cheque in favour of a UK exporter;

(i) the buyer will post the cheque to the UK exporter;

(ii) the exporter will present the cheque to his bank in the UK;

(iii) the bank in the UK will send the cheque to the buyer's bank in the buyer's own country, which will then pay the amount of the cheque and debit its customer's account, ie the buyer's account;

(iv) on receiving payment from the buyer's bank, the bank in the UK will pay the exporter (or credit his account) after deducting collection charges.

(b) If the foreign buyer writes a cheque for an amount in sterling, he will have to arrange with his bank to have his account debited with an appropriate amount of his local currency. If the cheque is written in the buyer's own currency (or a third currency):

(i) the UK exporter may have a foreign currency bank account in that currency with a bank in the UK. He would then arrange to have this account credited with the cheque payment;

(ii) otherwise the exporter will have to arrange with his UK bank to have his sterling account credited with an appropriate amount of sterling. The bank would buy the foreign currency in exchange for sterling.

2.3 If a UK importer wished to pay an overseas supplier by cheque, much the same procedures operate in reverse. Suppose that a UK importer buys goods from a German supplier, costing DM 18,000, and the agreed method of payment is by cheque.

(a) The UK importer would have to write a cheque for DM18,000 in favour of the German supplier. If the importer does not have a foreign currency account in deutschmarks, he would have to buy DM18,000 from his bank, in exchange for sterling, so that his bank account would be debited with the sterling equivalent of DM18,000. The cheque would be posted to the German supplier.

(b) The German supplier would present the cheque to his own bank in Germany for payment.

(c) The German bank would remit the cheque to the UK, and the importer's bank would make the payment in DM.

(d) The German bank, upon payment by the UK bank, would credit the account of its customer with the DM18,000.

2.4 A UK customer should not use his sterling cheques, which have been coded for use through the London Clearing House, for making such payments.

2.5 A cheque can be made out in any currency, not just the currency of the drawer's bank account. The cost of a cheque for the *buyer* is low, although the exporter incurs collection charges. These are advantages of payment by cheque. However, the long time it takes to collect payment by cheque is a serious inconvenience. Cheques are often payable in the buyer's country, and so the exporter must arrange for the money to be collected through his bank from abroad.

2.6 Payment by cheque of a debt in international trade might also be unsatisfactory for the following reasons.

(a) The exporter (payee) will have to ask his bank to arrange to collect the payment for him, and the bank will make a *collection charge*.

(b) The cheque might contravene the exchange control regulations of the buyer's country, so that settlement would be delayed until the necessary authorisation to make payment has been obtained.

(c) Many companies are unaware that they are receiving an advance if their account is credited immediately in domestic currency when they present a cheque drawn on an overseas bank to their bank. The bank will charge interest on their advance.

(d) The cheque might not be paid when presented. If the cheque is unpaid, the bank will reclaim the advance, converting the domestic currency into the currency of the cheque at the prevailing exchange rate, possibly resulting in an exchange loss.

Float

2.7 The term 'float' is sometimes used to describe the amount of money tied up between:

(a) the time when a payment is initiated (for example when a debtor sends a cheque in payment, probably by post); and

(b) the time when the funds become available for use in the recipient's bank account.

2.8 There are three reasons why there might be a lengthy float.

(a) *Transmission delay*. When payment is sent through the post, it will take a day or longer for the payment to reach the payee.

(b) *Delay in banking the payments received (lodgment delay).* The payee, on receipt of a cheque or cash, might delay presenting the cheque or the cash to his bank. The length of this delay will depend on administrative procedures in the payee's organisation.

(c) *The time needed for a bank to clear a cheque (clearance delay).* A payment is not available for use in the payee's bank account until the cheque has been cleared. This will usually take two or three days for cheques payable in the UK. For cheques payable abroad, the delay is much longer.

2.9 There are several measures that could be taken to reduce the float.

(a) The payee should ensure that the lodgment delay is kept to a minimum. Cheques received should be presented to the bank on the day of receipt.

(b) The payee might, in some cases, arrange to collect cheques from the payer's premises. This would only be practicable, however, if the payer is local. The payment would have to be large to make the extra effort worthwhile.

(c) The payer might be asked to pay through his own branch of a bank. The payer can give his bank detailed payment instructions, and use the credit clearing system of the bank giro. The *bank giro* is a means of making credit transfers for customers of other banks and other branches. The payee might include a bank giro credit slip on the bottom of his invoice, to help with this method of payment.

(d) BACS (Bankers' Automated Clearing Services Ltd) is a banking system which provides for the computerised transfer of funds between banks. In addition, BACS is available to corporate customers of banks for making payments. The customer must supply a magnetic tape or disk to BACS, which contains details of payments,

and payment will be made in two days. BACS is now commonly used by companies for salary payments.

(e) For regular payments *standing orders* or *direct debits* might be used.

(f) *CHAPS* (Clearing House Automated Payments System) is a computerised system for banks to make same-day clearances (that is, immediate payment) between each other. It has been estimated that over £50 billion passes through CHAPS each day. CHAPS replaced the 'walks' system where a bank sent a messenger with a cheque or draft, on foot, to another bank for on the spot payment. Each member bank of CHAPS can allow its own corporate customers to make immediate transfers of funds through CHAPS. However, there is a large minimum size for payments using CHAPS.

(g) For international payments, lock boxes may be used (discussed below).

Inefficient cash management

2.10 A lengthy float suggests inefficient cash management. But there are other types of delay in receiving payment from debtors, which might also suggest inefficient cash management.

(a) There is the delay created by the length of credit given to customers. There is often a 'normal' credit period for an industry, and companies might be unable to grant less time for payment than this.

(b) There are avoidable delays caused by poor administration (in addition to lodgment delay), such as:

(i) failure to notify the invoicing department that goods have been despatched, so that invoices are not sent promptly;

(ii) cheques from debtors being made out incorrectly, to the wrong company perhaps, because invoices do not contain clear instructions.

Example: cash management (1)

2.11 Ryan Coates owns a chain of seven clothes shops in the London area. Takings at each shop are remitted once a week on Thursday evening to the head office, and are then banked at the start of business on Friday morning. As business is expanding, Ryan Coates has hired an accountant to help him. The accountant gave him the following advice.

'Turnover at the seven shops totalled £1,950,000 last year, at a constant daily rate, but you were paying bank overdraft charges at a rate of 11%. You could have reduced your overdraft costs by banking the shop takings each day, except on Saturdays. Saturday takings could have been banked on Mondays.'

Comment on the significance of this statement, stating your assumptions. The shops are closed on Sundays.

Solution

2.12 (a) A bank overdraft rate of 11% a year is approximately 11/365 = 0.03% a day.

(b) Annual takings of £1,950,000 would be an average of £1,950,000/312 = £6,250 a day for the seven shops in total, on the assumption that they opened for a 52 week year of six days a week (312 days).

(c) Using the approximate overdraft cost of 0.03% a day, the cost of holding £6,250 for one day instead of banking it is 0.03% × £6,250 = £1.875.

(d) Banking all takings up to Thursday evening of each week on Friday morning involves an unnecessary delay in paying cash into the bank. The cost of this delay would be either:

(i) the opportunity cost of investment capital for the business; or
(ii) the cost of avoidable bank overdraft charges.

It is assumed here that the overdraft cost is higher and is therefore more appropriate.

Takings on	*Could be banked on*	*Number of days delay incurred by Friday banking*
Monday	Tuesday	3
Tuesday	Wednesday	2
Wednesday	Thursday	1
Thursday	Friday	0
Friday	Monday	4
Saturday	Monday	4
		14

In one week, the total number of days delay incurred by Friday banking is 14. At a cost of £1.875 a day, the weekly cost of Friday banking was £1.875 × 14 = £26.25, and the annual cost of Friday banking was £26.25 × 52 = £1,365.

(e) *Conclusion*. The company could have saved about £1,365 a year in bank overdraft charges last year. If the overdraft rate remains at 11% and turnover continues to increase, the saving from daily banking would be even higher next year.

Speeding up settlement by cheque: lock boxes

2.13 In spite of there being quicker ways of getting paid, such as electronic transfer, a large proportion of trade in Europe is still settled by cheque.

2.14 Cheque payment is often preferred by buyers as it helps to delay payment. After it is received by the creditor, the cheque must be presented to a local banks branch which will then forward it to the national head office of the bank of the creditor company, which must in turn present it to the debtor's bank overseas. This process can take up to 28 days to be completed.

2.15 If electronic transfer is not possible and payment by cheque must be accepted, it is possible to reduce the time taken for the payment process to only five days instead of 28 using a 'lock box' arrangement. Suppose you export to a customer which is a German company. You set up a 'lock box' bank account with a reputable German bank. You then ask the German customer to present the cheque to the German bank, providing full account details for the 'lock box'. Clearance of the cheque is then as fast as for a domestic cheque, with the funds being remitted electronically to your bank account.

2.16 Lock box arrangements are possible in Europe and North America. Within North America, lock boxes help to overcome delays in the postal service resulting from the large distances involved.

Payment by bill of exchange

2.17 Bills of exchange are a commonly used method of settlement in international trade.

2.18 *Bills of exchange* are a form of IOU. When A sells goods to B, the settlement of the debt might be arranged by means of a bill of exchange (called a trade bill as B is a trader). A will draw a bill on B (asking B to pay a certain sum of money on a certain date in the future, such as 90 days after the date of the bill). B then accepts the bill, by signing it, and returns it to A. By accepting the bill, B is acknowledging its debt to A and is giving a promise to pay. After the credit period (the term of the bill) has expired, B will pay A the money owed.

Payment by banker's draft

2.19 A banker's draft is a cheque drawn by a bank on one of its own bank accounts. For example, a banker's draft might be issued by a UK bank instructing payment out of its own bank account with a 'correspondent' bank in an overseas country.

2.20 The procedures for paying debts to overseas suppliers by means of a banker's draft are as follows.

(a) Suppose that a firm in the UK wishes to pay a supplier in France, in francs, by means of a banker's draft. The firm will make a written request to its UK bank to provide the draft. In this request, the firm will authorise the bank:

(i) to purchase francs 'spot' on his behalf; and

(ii) to debit his account with the sterling equivalent of the draft plus bank commission.

(If the *UK firm* maintains a bank account in French currency with the UK bank, it can authorise the draft to be provided by debiting this currency account.)

(b) The UK bank debits the firm's account and gives the draft to an authorised representative of the firm.

(c) The draft must be sent by the *firm* to its supplier in France. In other words, it is the responsibility of the bank's customer to arrange to send the draft overseas. The draft could be lost or stolen in transit, and banks are reluctant to put a stop on a missing draft, because it would reflect badly on their financial reputation if they dishonoured their own 'cheques'. A banker's draft has a reputation as a guarantee of payment, and banks would not wish to tarnish it.

(d) The draft would be drawn on a bank account held by the UK bank itself with a correspondent bank in France. This account would be held in francs.

(e) The UK bank would inform the French bank about the issue of the draft and would ask the French bank to debit the UK bank's account when the draft is presented by the French supplier. This request would be sent by airmail letter.

(f) The French supplier would eventually present the draft to the French bank for payment, and the French bank would:

(i) make the payment; and
(ii) debit the UK bank's (francs) account.

2.21 The procedures described above relate to a draft denominated in a foreign currency but, alternatively, a banker's draft could also be issued authorising payment in sterling, in which case the overseas supplier would present the draft to his bank in France and ask the bank to collect the payment.

2.22 Banker's drafts are fairly commonly used, but they are a *slow* method of payment and would not be used when quick payment is required.

2.23 An advantage of a banker's draft is that the exporter receives direct notification that the payment is now available to him. If the draft is for an advance payment, and the exporter is waiting to receive it before shipping the goods abroad, this direct notification to the exporter might help to speed up the shipment.

Mail transfer (mail payment orders)

2.24 A mail transfer (MT) is:

(a) a payment order in writing;

(b) sent by one bank to another bank (overseas);

(c) which can be *authenticated* as having been authorised by a proper official in the sending bank;

(d) and which instructs the other bank to pay a certain sum of money;

(e) to a *specified beneficiary* (or on application by a specified beneficiary).

The payment order is sent from the instructing bank to the overseas bank by airmail.

2.25 As is the case with banker's drafts, the overseas bank will have an account in the name of the instructing bank, and it is this account which will be debited with the amount paid to the beneficiary. Unlike a banker's draft, a mail transfer is sent by the bank itself to another bank, not by the bank's customer to the overseas supplier.

2.26 The procedures for a mail transfer are as follows.

(a) Suppose that a UK firm wishes to pay a debt to a German supplier in deutschmarks. The firm will give a written instruction to its bank in the UK to issue a mail transfer, specifying the full name and address of the beneficiary to whom the payment should be made. (Alternatively, if the payment is to be made through the banking system in the beneficiary's country, the MT must specify the bank and account number of the beneficiary, to which the payment will be credited). The UK firm will authorise the bank to debit its account with the sterling equivalent of the payment in deutschmarks (at the 'spot' rate of exchange) plus bank charges. If the firm has an account in deutschmarks, it can authorise payment by debiting this account with the amount of the mail transfer plus bank charges.

(b) The UK bank debits the UK firm's account as authorised.

(c) The bank then sends instructions to its correspondent bank in Germany, giving details of payment. The instruction must be capable of authentication, by means of an authorised signature of an official in the UK bank (the correspondent bank in Germany would keep a list of authorised signatures against which mail transfer payments can be made). The instruction will also authorise the German bank to debit the account held with it by the UK bank.

(d) The German bank will debit the account of the UK bank, and pay the beneficiary (or transfer the money to the beneficiary's account).

2.27 Because mail transfer (MT) involves airmail communication between one bank and another, it is a quicker method of payment than a banker's draft at no extra cost. However, there is always a possibility that instructions sent by airmail will be delayed or lost in the post, and there are quicker methods of arranging payment.

Telegraphic transfer (TT): cable or telex payment orders

2.28 Telegraphic transfers (TT) or 'cable payment orders' are the same as mail transfers, except that instructions are sent by cable or telex instead of by airmail. TT is therefore slightly more costly to the paying bank's customer than mail transfer, but it speeds up payment.

2.29 Large payments should be made by TT or by SWIFT (see below) because the marginal extra cost of TT over MT might be outweighed by the extra interest earnings or savings in interest costs which would be achievable if TT were used.

2.30 A further advantage of TT over MT is that there is no danger of instructions being delayed or lost in the post.

SWIFT

2.31 The ease with which payments can be transferred between enterprises and between enterprises and its customers who are private individuals has been enhanced by the development of various electronic funds transfer operations. These include SWIFT and BACS.

2.32 SWIFT (the Society for Worldwide Interbank Financial Telecommunications) provides an electronic funds transfer (EFT) and payment system for its shareholder banks worldwide. Most major North American and Western European banks are members. Since its establishment, non-banks have been admitted as eligible users, and users

include securities houses, recognised exchanges, central clearing institutions, moneybrokers and fund managers.

2.33 SWIFT is a secure telecommunications network which facilitates rapid international transfers between the member banks. SWIFT now handles about one and three-quarter million messages a day. To do so, it imposes standard formats on certain types of message to facilitate Electronic Data Interchange (EDI). These include:

(a) purchase and sales orders;
(b) clearing instructions;
(c) foreign exchange confirmations;
(d) balance reporting;
(e) securities statements;
(f) trade confirmations.

2.34 Standardisation is a feature of information technology development. In SWIFT, for example, there are standard codes used for each currency (eg the SWIFT code for pounds sterling is STG and for US dollars USD).

2.35 Smart cards are used to control access to terminals. This replaces a system (which the company tacitly admits was potentially flawed) involving the exchange of codes on paper. Each message is given a unique input and output number, and, if these do not follow the expected sequence, the system rejects the message and shuts down the transmitting terminal.

2.36 In September 1992 a further group of messages was added to the system to cover the borrowing and lending of securities. It is estimated that SWIFT is handling traffic which is currently increasing at 35% per annum. There is a constant need for a two-way flow of information and responses, particularly as cross-border trading and investment increases.

2.37 As more and more banks become members of SWIFT, the use of mail transfer and telegraphic transfer will decline because SWIFT uses its own comparable methods of payment.

(a) A 'SWIFT message' is a payment equivalent to one by *mail* transfer, where the paying bank and correspondent bank overseas are both members of SWIFT. A SWIFT message is referred to as an International Money Transfer (IMT).

(b) Similarly a 'priority SWIFT message' is a payment equivalent to one by telegraphic transfer. A priority SWIFT message is referred to as an Express International Money Transfer (EIMT).

The distinction between non-urgent and urgent SWIFT messages is the speed of taking action to make the settlement, not the time that it takes for the message to be transmitted.

2.38 Thus, if the instructing bank and the bank required to make the payment are both members of SWIFT, an MT message would be sent as a SWIFT message and a TT message as a priority SWIFT message. It is only when the banks are not members of SWIFT that MT or TT messages would be used.

2.39 Not all banks are members of SWIFT, but membership has grown considerably. In particular, you should be aware for your examination that major banks in North America and Western Europe are likely to be members. Knowing this, if a question asks you about the quickest method by which a customer of a UK bank can pay money to a named beneficiary in, say, Canada, your answer should be that payment would be arranged by means of a priority SWIFT message (EIMT).

Procedures for settlement by MT, TT or SWIFT

2.40 Payment by MT, TT or SWIFT might be expressed either in sterling or in any foreign currency. The procedures for making a payment by MT, TT or SWIFT are as follows. We will consider the steps to be taken by a UK bank making a payment to an overseas beneficiary on behalf of a UK importer.

(a) *The bank sending the payment instruction* (in this case, the UK bank)

(i) The bank's customer gives a written instruction to the bank, indicating that a certain sum of money is to be paid to a named beneficiary abroad, and that the bank is to send the payment instruction by MT or TT (or IMT or EIMT). The instruction must give the beneficiary's name and address and, if possible, the name of the beneficiary's bank.

(ii) The customer authorises his account to be debited with the amount of the payment. If the payment is required in a foreign currency, and the customer does not have an account in that currency, he will also have to arrange for the bank to sell him the currency, and so authorise the debiting of his account with the sterling equivalent of the foreign currency to be paid.

(iii) The bank debits the customer's account with the amount of the payment, plus the charges and any foreign exchange commission.

(iv) The bank then sends an authenticated payment instruction, by MT or TT (whichever has been indicated by the customer), or SWIFT if appropriate.

(v) The payment to the beneficiary abroad is effected, as far as the UK bank is concerned, by the transfer of funds to the bank overseas. The overseas bank then arranges to make the payment to the overseas beneficiary.

(b) *The bank receiving the payment instruction* (in this case, the bank overseas)

(i) The overseas bank receives the payment instruction. SWIFT messages are received as a printout message at the receiving bank's end of the system.

(ii) It must check that the instructing bank has sufficient funds in its account to make the payment, or that alternative arrangements for reimbursing the bank have been made.

(iii) If the payment is in foreign currency - ie the currency of the overseas bank's country, the overseas bank will debit the currency account of the bank sending the MT, TT or SWIFT instruction. If the payment is in sterling, the UK bank sending the payment instruction will already have credited its sterling account with the overseas bank before sending out the instruction.

(iv) The overseas bank makes the payment to the beneficiary.

International money orders

2.41 An international money order is a means of transferring comparatively small sums of money from one country to another through the agency of the Post Office or possibly an international bank (eg Barclays). Since only small amounts are involved, international money orders are best suited to small orders where the exporter asks for payment in advance since the small amount of money involved would perhaps not financially justify allowing credit to the buyer or the minimum bank charges associated with collections or letters of credit.

Methods of settlement compared: a summary

2.42 Methods of settlement include cheques and banker's drafts. These are relatively slow. Cheque settlement can be speeded up by the use of lock boxes. Mail transfers or international money transfers are quicker and telegraphic transfers or express international money transfers are even quicker.

2.43 MT is a quicker method of payment than a banker's draft, because a draft is given to the importer to send to the beneficiary, and so there is usually some administrative delay in getting the draft sent to the beneficiary.

2.44 An international money transfer would be sent by ordinary SWIFT message. SWIFT has a computer/switching network which is used to transfer instructions and messages from one bank to another bank in a different country, without the need to use ordinary mail, telex or 'public' cable transmission. An IMT can therefore be sent, provided that a suitable bank in the supplier's country is a member of the SWIFT organisation.

2.45 Telegraphic transfer is a very fast method of settlement, because the payment order is sent to a bank in the supplier's country by means of telex or cable message. An express international money transfer (EIMT) is similar to a TT, with the exception that the payment order will be sent by the SWIFT network as a 'priority SWIFT message'.

Applying probabilities in cash management problems

2.46 Questions could require you to apply probabilities to cash management problems. The following example illustrates this approach.

Example: cash management (2)

2.47 Sinkos Wim Ltd has an overdraft facility of £100,000, and currently has an overdraft balance at the bank of £34,000. The company maintains a cash float of £10,000 for transactions and precautionary purposes. It is unclear whether a long awaited economic recovery will take place, and the company has prepared cash budgets as set out below for the next three months using two different assumptions about economic events. The cash flow in months 2 and 3 depend on the cash flows in the previous month.

Estimated net cash flows

Month 1		*Month 2*		*Month 3*	
Probability	*Cash flow* £'000	*Probability*	*Cash flow* £'000	*Probability*	*Cash flow* £'000
		0.8	25	0.5	30
0.7	(40)			0.5	20
		0.2	10	0.5	10
				0.5	0
		0.8	0	0.5	(10)
0.3	(60)			0.5	(20)
		0.2	(10)	0.5	(40)
				0.5	(50)

Required

If the company intends to maintain a cash float of £10,000 at the end of each month, what is the probability that this will be possible at the end of each of months 1, 2 and 3 given the current overdraft limit?

Solution

2.48 The opening balance at the beginning of month 1 is £10,000.

Month 1				*Month 2*				*Month 3*			
Prob.	*Cash flow* £'000	*Clos. bal.* £'000	*Over-draft* £'000	*Prob.*	*Cash flow* £'000	*Clos. bal.* £'000	*Over-draft* £'000	*Prob.*	*Cash flow* £'000	*Clos. bal.* £'000	*Over-draft* £'000
								0.28	30	10	19
				0.56	25	10	49	0.28	20	10	29
0.7	(40)	10	74								
								0.07	10	10	54
				0.14	10	10	64	0.07	0	10	64
								0.12	(10)	6	100
				0.24	0	10	94	0.12	(20)	(4)	100
0.3	(60)	10	94								
								0.03	(40)	(34)	100
				0.06	(10)	6	100	0.03	(50)	(44)	100

The probabilities that the cash float of £10,000 can be maintained at the end of each month are as follows.

Month 1: $0.7 + 0.3 = 1.0$

Month 2: $0.56 + 0.14 + 0.24 = 0.94$

Month 3: $0.28 + 0.28 + 0.07 + 0.07 = 0.7$

Exercise

Using the figures in the above example, state the probabilities that the company completely runs out of cash at the end of each month.

Solution

Under none of the projected outcomes for months 1 and 2 does the company run out of cash.

For month 3, the probability of the company running out of cash is:

$0.12 + 0.03 + 0.03 = 0.18$

3 CASH MANAGEMENT SERVICES

3.1 One of the banks' services is a cash management service for corporate customers. A company with many different bank accounts can obtain information about the cash balance in each account through a computer terminal in the company's treasury department linked to the bank's computer. The company can then arrange to move cash from one account to another and so manage its cash position more efficiently and make optimal use of its funds deposited with banks or in various money market investments. A cash management service can be provided to a company with several bank accounts in the UK, or, through an international network of banks, to a multinational company with accounts in different currencies in various countries.

3.2 The cash management services provided by the banks comprise three basic services.

(a) *Account reporting*

(i) Information is given about the balances on sterling or currency accounts whether held in the UK or overseas, including details of the cleared balances for the previous day and any uncleared items.

(ii) Forecast balance reports, which take into account uncleared items and automated entries (BACS credits and debits, standing orders and direct debits) can be obtained.

(iii) Reports giving details of individual transactions can be obtained.

(b) *Funds transfer*
The customer can initiate sterling and currency payments through his terminal. Banks will also give customers with substantial cash floats the opportunity to get in touch with money market dealers directly and deposit funds in the money markets.

(c) *Decision support services*
A rates information service, giving information on foreign exchange rates and money market (sterling deposit) interest rates, can be used.

Cash pooling

3.3 *Cash pooling* is a procedure whereby debit and credit balances held with the same bank by companies within a group are set off against each other so that interest costs can be reduced.

3.4 A cash pooling arrangement is administered by the bank at which the accounts are held and involves transferring all account balances to a 'dummy' account. The interest chargeable or payable is that based on the net balance in the dummy account. No actual movement of funds occurs. The group will need to have a policy on how to allocate interest savings resulting from pooling.

Example: cash pooling

3.5 Two group companies K and L have accounts with the same bank. During September 19X4, K has an overdraft of £120,000 and L has a credit balance of £200,000. The bank charges interest on the group's overdraft balances at a rate of 0.8% per month and pays interest of 0.5% per month on credit balances.

Required

Calculate how much interest would be gained by adopting cash pooling for September 19X4.

Solution

3.6

Without cash pooling	£
Interest charged (120,000 × 0.008)	(960)
Interest receivable (200,000 × 0.005)	1,000
Net interest receivable	40
With cash pooling	
The net balance is (200,000 – 120,000)	£80,000
Interest receivable (80,000 × 0.005)	£400
The net gain is (400 – 40)	£360

4 SHORT-TERM INVESTMENTS

4.1 Companies and other organisations sometimes have a surplus of cash and become 'cash rich'. A cash surplus is likely to be temporary, but while it exists the company should seek to obtain a good return by investing or depositing the cash, without the risk of a capital loss (or at least, without the risk of an excessive capital loss).

4.2 Three possible reasons for a cash surplus are:

(a) profitability from trading operations;

(b) low capital expenditure, perhaps because of an absence of profitable new investment opportunities;

(c) receipts from selling parts of the business.

The board of directors might keep the surplus in liquid form:

(a) to benefit from high interest rates that might be available from bank deposits, when returns on re-investment in the company appear to be lower;

(b) to have cash available should a strategic opportunity arise, perhaps for the takeover of another company for which a cash consideration might be needed;

(c) to buy back shares from shareholders in the near future;

(d) to pay an increased dividend to shareholders.

Short-term investments

4.3 Temporary cash surpluses are likely to be:

(a) deposited with a bank or similar financial institution;

(b) invested in short-term debt instruments. Debt instruments are debt securities which can be traded;

(c) invested in longer term debt instruments, which can be sold on the stock market when the company eventually needs the cash;

(d) invested in shares of listed companies, which can be sold on the stock market when the company eventually needs the cash.

4.4 The problem with (c) and (d) is the risk of capital losses due to a fall in the market value of the securities. With short-term debt instruments (item (b)) any capital losses should not be large, because of the short term to maturity. With bank deposits (item (a)) the risk of capital losses is minimal.

Short-term deposits

4.5 Cash can of course be put into a bank deposit to earn interest. The rate of interest obtainable depends on the size of the deposit, and varies from bank to bank.

4.6 There are other types of deposit.

(a) *Money market lending*. There is a very large money market in the UK for inter-bank lending, with banks lending to each other and borrowing from each other for short terms ranging from as little as overnight up to terms of a year or more. The international money markets, as mentioned elsewhere in this Text, provide a way of earning interest on deposits for periods from overnight up to five years.

The interest rates in the market are related to the London Interbank Offer Rate (LIBOR) and the London Interbank Bid Rate (LIBID).

(i) A large company will be able to lend surplus cash directly to a borrowing bank in the market.

(ii) A smaller company with a fairly large cash surplus will usually be able to arrange to lend money on the interbank market, but through its bank, and possibly on condition that the money can only be withdrawn at three months notice.

(b) *Local authority deposits*. Local authorities often need short-term cash, and investors can deposit funds with them for periods ranging from overnight up to one year or more.

(c) *Finance house deposits*. These are time deposits with finance houses (usually subsidiaries of banks).

4.7 Deposits with banks, local authorities and finance houses are non-negotiable, which means that the investor who deposits funds cannot sell the deposit to another investor, should an unexpected need for cash arise. The deposit will only be released back to the investor when its term ends.

Short-term debt instruments

4.8 There are a number of short-term debt instruments which an investor can re-sell before the debt matures and is repaid.

4.9 These debt instruments include:

(a) certificates of deposit (CDs);
(b) Treasury bills;
(c) bank bills, also called sterling bankers' acceptances;
(d) trade bills or bills of exchange (discussed earlier in connection with foreign trade);
(e) local authority bonds;
(f) commercial paper (CP).

Items (c) to (e) are normally purchased initially by banks, and are ways for companies to raise short-term funds rather than to invest surplus cash.

Certificates of deposit (CDs)

4.10 A CD is a security that is issued by a bank, acknowledging that a certain amount of money has been deposited with it for a certain period of time (usually, a short term). The CD is issued to the depositor, and attracts a stated amount of interest. The depositor will be another bank or a large commercial organisation. CDs are negotiable and traded on the CD market (a money market), so if a CD holder wishes to obtain immediate cash, he can sell the CD on the market at any time. This secondhand market in CDs makes them attractive, flexible investments for organisations with excess cash.

4.11 A company with surplus cash can:

(a) deposit a certain amount of cash with a bank for a fixed period, and receive a certificate of deposit from the bank; or

(b) buy an existing CD, which may have a much shorter period to maturity, on the CD market.

4.12 CDs are mainly denominated in sterling, but there is a growing market in US dollar CDs, and in deposits linked to the value of the European currency unit (ecu).

Treasury bills

4.13 Treasury bills are issued weekly by the government to finance short-term cash deficiencies in the government's expenditure programme. They are IOUs issued by the government, giving a promise to pay a certain amount to their holder on maturity. Treasury bills have a term of 91 days to maturity, after which the holder is paid the full value of the bill. Most Treasury bills are denominated in sterling, but some are in ecus.

4.14 Treasury bills do not pay interest, but the purchase price of a Treasury bill is less than its face value, the amount that the government will eventually pay on maturity. There is thus an implied rate of interest in the price at which the bills are traded. The secondhand value of Treasury bills in the discount market (the money market in which they are traded) varies with current interest rates but will never exceed their face value.

4.15 A company can arrange through its bank to invest in Treasury bills. Since they are negotiable, they can be re-sold, if required, on the discount market before their maturity date.

Eligible bank bills (sterling bankers' acceptances)

4.16 Bank bills are IOUs issued by a bank. Eligible bank bills are bills issued by 'eligible' banks: top-rated banks whose bills the Bank of England will agree to buy on the money market. They are denominated in sterling and are short-term.

Like Treasury bills, they are negotiable and traded on the discount market. Most purchasers of bank bills are other banks, including the Bank of England.

Local authority bonds

4.17 These are short-term securities issued by local authorities to raise cash. They carry interest, and are repayable on maturity. They are traded secondhand in the money market, and so, like CDs, are a flexible investment for organisations with excess cash. They are not always available, however.

Commercial paper

4.18 A large company can raise short-term finance by issuing commercial paper, which we looked at in Chapter 17.

Chapter roundup

- In this chapter we have looked at aspects of the treasury function and various methods of cash transmission and international payment.
- A small company may have little choice but to accept the range of services offered by their bank managers or the facilities offered by overseas suppliers.
- Larger companies and multinational enterprises are in a position to adopt a more active role in managing deposits, borrowings and foreign debtors.

Test your knowledge

1 What is the role of the treasurer? (see para 1.4)

2 What advantages are there in centralised treasury management? (1.7)

3 What issues need to be addressed if the treasury function is to be considered as a profit centre? (1.12)

4 What are the advantages and disadvantages of settling foreign debts by cheque? (2.5, 2.6)

5 What cash management services are offered by banks? (3.1, 3.2)

6 What is 'cash pooling'? (3.3, 3.4)

7 What short-term debt instruments are available for the investment of surplus cash? (4.9)

Now try illustrative question 26 at the end of the Study Text

Appendix:
Mathematical tables and formulae

MATHEMATICAL TABLES

Present value table

Present value of 1, ie $(1+r)^{-n}$

where r = discount rate

n = number of periods until payment

Periods	Discount rates (r)									
(n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239

	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065

Annuity table

Present value of an annuity of 1, ie $\frac{1-(1+r)^{-n}}{r}$

where r = discount rate

n = number of periods

Periods	Discount rates (r)									
(n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606

	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675

FORMULAE

The formulae currently provided to Paper 14 candidates are set out below.

Ke (i) $E(r_j) = r_f + [E(r_m) - r_f]\beta_j$

(ii) $\frac{D_1}{P_0} + g$

WACC $Ke_g \frac{E}{E+D} + Kd(1-t)\frac{D}{E+D}$

or $Ke_u \left[1 - \frac{Dt}{E+D}\right]$

2 asset portfolio $\sigma_p = \sqrt{\sigma_a^2 x^2 + \sigma_b^2 (1-x)^2 + 2x(1-x)p_{ab}\sigma_a\sigma_b}$

Purchasing power parity $\frac{i_f - i_{uk}}{1 + i_{uk}}$

Corporate beta $\beta_a = \beta_e \frac{E}{E + D(1-t)} + \beta_d \frac{D(1-t)}{E + D(1-t)}$

Illustrative questions and suggested solutions

Some questions are given mark and time allocations

1 FINANCIAL OBJECTIVE

The primary objective in financial management is usually assumed to be the maximisation (or improvement) of the wealth of ordinary shareholders. One way this can be achieved is to obtain a consistent rate of growth in the earnings per share.

The ability of a company to achieve such consistent growth depends to some extent on:

(a) the external environment of the company;
(b) the company's operating cost structure;
(c) the company's capital gearing and the cost of debt capital.

Required

(a) Show how these factors are relevant to a consistent growth in earnings per share, using the information provided below about two companies, X Ltd and Y Ltd.

(b) Discuss the financial management of both companies, insofar as the information provided allows.

Note. Earnings per share (EPS) are the profits distributable to ordinary shareholders (after interest, tax and preference dividend) divided by the number of ordinary shares in issue.

	X Ltd				*Y Ltd*			
Year	*19X1*	*19X2*	*19X3*	*19X4*	*19X1*	*19X2*	*19X3*	*19X4*
	£'000	*£'000*	*£'000*	*£'000*	*£'000*	*£'000*	*£'000*	*£'000*
Profit & loss account								
Turnover	100	124	175	254	400	448	582	728
Variable costs	60	77	112	165	120	140	192	286
Fixed costs	26	31	42	58	180	196	230	256
Total costs	86	108	154	223	300	336	422	542
Earnings before interest and tax	14	16	21	31	100	112	160	186
Less interest	4	4	7	8	10	16	19	19
Earnings before tax	10	12	14	23	90	96	141	167
Less tax	4	5	6	11	40	44	70	83
Distributable profits	6	7	8	12	50	52	71	84
Less dividends	3	3	4	4	18	18	30	40
Retained earnings	3	4	4	8	32	34	41	44
Balance sheet								
Fixed assets	29	42	56	64	300	318	400	425
Net current assets	31	34	49	72	80	153	207	232
	60	76	105	136	380	471	607	657
Ordinary shares of £1	20	20	20	25	200	200	250	250
Asset revaluation reserve	0	12	16	20	0	0	0	0
Reserves	15	19	23	31	100	134	175	225
Equity funds	35	51	59	76	300	334	425	475
Loans	25	25	46	60	80	137	182	182
	60	76	105	136	380	471	607	657
EPS (pence)	30.0	35.0	40.0	48.0	25.0	26.0	28.4	33.6

2 AGENCY THEORY (10 marks) *18 mins*

Agency theory presents the firm as a combination of competing interest groups, two of which are shareholders and management.

Required

Discuss how the firm's attitude to risk might vary depending on whether shareholder objectives or management-oriented goals predominate in the firm's planning.

3 MUGGINS PLC

Muggins plc is evaluating a project to produce a new product. The product has an expected life of four years. Costs associated with the product are expected to be as follows.

Variable costs per unit
Labour: £30
Materials:
6 kg of material X at £1.64 per kg
3 units of component Y at £4.20 per unit
Other variable costs: £4.40

Indirect costs each year
Apportionment of head office salaries £118,000
Apportionment of general building occupancy £168,000
Other overheads £80,000, of which £60,000 represent additional cash expenditures (including rent of machinery)

To manufacture the product, a product manager will have to be recruited at an annual gross cost of £34,000, and one assistant manager whose current annual salary is £30,000 will be transferred from another department, where he will be replaced by a new appointee at a cost of £27,000 a year.

The necessary machinery will be rented. It will be installed in the company's factory. This will take up space that would otherwise be rented to another local company for £135,000 a year. This rent (for the factory space) is not subject to any uncertainty, as a binding four year lease would be created.

60,000 kg of material X are already in stock, at a purchase value of £98,400. They have no use other than the manufacture of the new product. Their disposal value is £50,000.

Expected sales volumes of the product, at the proposed selling price of £125 a unit, are as follows.

Year	*Expected sales*
	Units
1	10,000
2	18,000
3	18,000
4	19,000

All sales and costs will be on a cash basis and should be assumed to occur at the end of the year. Ignore taxation.

The company requires that certainty-equivalent cash flows have a positive NPV at a discount rate of 14%. Adjustment factors to arrive at certainty-equivalent amounts are as follows.

Year	*Costs*	*Benefits*
1	1.1	0.9
2	1.3	0.8
3	1.4	0.7
4	1.5	0.6

Required

Is the project acceptable?

4 SHARE VALUES

(a) Outline the fundamental analysis theory of share values, giving numerical examples.

(b) To what extent is the validity of the fundamental analysis theory affected by the efficiency of the stock market?

5 CRYSTAL PLC

The following figures have been extracted from the most recent accounts of Crystal plc.

BALANCE SHEET AS ON 30 JUNE 19X9

	£'000	£'000
Fixed assets		10,115
Investments		821
Current assets	3,658	
Less current liabilities	1,735	
		1,923
		12,859
Ordinary share capital		
Authorised: 4,000,000 shares of £1		
Issued: 3,000,000 shares of £1		3,000
Reserves		6,542
Shareholders' funds		9,542
7% Debentures		1,300
Deferred taxation		583
Corporation tax		1,434
		12,859

Summary of profits and dividends

Year ended 30 June:	*19X5*	*19X6*	*19X7*	*19X8*	*19X9*
	£'000	£'000	£'000	£'000	£'000
Profit after interest and before tax	1,737	2,090	1,940	1,866	2,179
Less tax	573	690	640	616	719
Profit after interest and tax	1,164	1,400	1,300	1,250	1,460
Less dividends	620	680	740	740	810
Added to reserves	544	720	560	510	650

The current (1 July 19X9) market value of Crystal plc's ordinary shares is £3.27 per share cum div. An annual dividend of £810,000 is due for payment shortly. The debentures are redeemable at par in ten years time. Their current market value is £77.10 per cent. Annual interest has just been paid on the debentures. There have been no issues or redemptions of ordinary shares or debentures during the past five years.

The current rate of corporation tax is 33%, and the current basic rate of income tax is 25%. Assume that there have been no changes in the system or rates of taxation during the last five years.

Required

(a) Estimate the cost of capital which Crystal plc should use as a discount rate when appraising new investment opportunities.

(b) Discuss any difficulties and uncertainties in your estimates.

6 EMMA PLC

Emma plc is currently financed by 3,000,000 £1 ordinary shares, which have a market value ex div of £3.20 each. The company has always been an all equity company, but is now considering raising some debt finance for a new project.

The after tax operating cash flows of the project would be as follows.

Cost	£3,600,000
Benefit	£500,000 a year in perpetuity

The project would be financed by the issue at par of £3,600,000 of 10% debt capital. The very large increase in gearing that this would involve is thought to be feasible. Indeed, it has been suggested that the resulting gearing (measured in market value rather than book value terms) and weighted average cost of capital would be at the optimum level.

Emma plc's current after tax cost of equity is 16% and the new project would have the same operating risk characteristics as the company's existing projects. The company pays out all its after tax earnings as dividends.

The tax rate is 33% and there is no delay in receiving the benefit of tax relief.

Ignore issue costs.

Required

(a) The company's objective is to maximise the wealth of its shareholders. Apply Modigliani and Miller's propositions to calculate whether the project would be worthwhile:

(i) if it were all-equity financed;

(ii) if it were financed by the proposed issue of debt capital;

(iii) if Emma plc had already been a geared company with its weighted average cost of capital at the optimum level, and if the project had been financed in such a way as to leave this weighted average cost of capital unchanged.

(b) Assuming that the project is financed by the issue of debt capital:

(i) calculate the weighted average cost of capital after undertaking the project;

(ii) calculate the incremental cost of capital when compared with the company's previous all equity state. The incremental cost of capital is found by relating the incremental after tax benefits of the project to the increase in the market value of the company as a consequence of the project.

(iii) Use the results in (b)(i) and (b)(ii) to support your conclusions in (a)(ii) and (a)(iii) above.

7 PORTFOLIO (10 marks) *18 mins*

You are considering making an investment in one or both of two securities, X and Y, and you are given the following information.

Security	*Possible rates of return %*	*Probability of occurrence*
X	30	0.3
	25	0.4
	20	0.3
Y	50	0.2
	30	0.6
	10	0.2

Required

(a) Calculate the expected return for each security separately and for a portfolio comprising 60% X and 40% Y, assuming no correlation between the possible rates of return from the shares comprising the portfolio. (4 marks)

(b) Calculate the risk of each security separately and of the portfolio as defined above. Measure risk by the standard deviation of returns from the expected rate of return. (6 marks)

8 CANADIAN PLC (35 marks) *63 mins*

Canadian plc is a regional electricity generating company with several coal, oil and gas powered generating stations. The opportunity to bid for the coal mine supplying one of its local stations has arisen, and you have been asked to assess the project. If Canadian does not bid for the pit, then it is likely to close, in which case coal for the station would have to be obtained from overseas.

Canadian's bid is likely to be successful if priced at £6 million. Regional development fund finance is available at a subsidised interest rate of 4% for the full cost of the purchase, as against Canadian's marginal cost of debt if financed commercially. If Canadian invests a further £6 million in updated machinery, the pit is likely to generate £10 million of coal per annum for the next five years at current UK coal prices. Operating costs will total £3 million per annum, plus depreciation. Thereafter it will have to close, at a net cost after asset sales of £17 million, which includes redundancy, cleanup and associated costs, at present prices.

You have ascertained the following information about the coal industry.

	Coal industry (average)
Gearing (debt/equity):	
Book values	1 to 0.5
Market values	1:1
Equity beta	0.7
Debt beta	0.2

Capital allowances would be available at 25% on a reducing balance basis for all new machinery. The purchase price can be depreciated for tax at 25% per annum straight line. All other costs are tax allowable in full.

Other than the regional development fund loan (repayable after 5 years), the project would be financed by retained earnings. The project is likely to add another £3 million of borrowing capacity to Canadian, in addition to the £6 million regional development fund loan. Corporation tax is expected to remain to 30% during the life of the project. The company as a whole expects to be in a tax payable position for all years except the third year of the project.

Assume that all prices rise with the RPI, currently by 3% pa, except coal prices, which in view of reduced demand are set to remain static. You may assume that original investment cashflows arise at the start of the first year, and that all other cashflows arise at the end of the year in which the costs are incurred, except for tax, which lags one year. Treasury bills currently yield 8%, and the return required of the market portfolio is currently 16%.

You have discovered the following information concerning Canadian.

	Canadian plc
Gearing (debt/equity):	
Book values	1 to 1
Market value	1:2
Equity beta	1.0
Debt beta	0.25
P/E ratio	14
Dividend yield	6%
Share price	220 pence
Number of ordinary shares	8 million

Required

Write a memorandum for the finance director advising on whether the mine should be acquired. you should divide your memorandum into the following sections:

(a) Overall summary and conclusion (5 marks)
(b) Detailed numerical workings (20 marks)
(c) Assumptions behind the report (7 marks)
(d) Areas for further research (3 marks)

9 DIVIDEND POLICY

Outline the factors which a listed company should take into account in the determination of its dividend policy.

10 WORKING CAPITAL

(a) In an article dealing with company liquidity, the statement was made that 'it is widely accepted that stronger and more profitable companies have a higher proportion of working capital'.

Set out and comment on the various circumstances under which this belief might or might not be true.

(b) Discuss whether long-term or short-term sources of funds should be used to finance trade debtors and stocks.

11 THREE DECISIONS (10 marks) *18 mins*

For the purpose of achieving the long-term financial objectives of a company, the financial manager will be faced with decisions on investment policy, on financing policy and on dividend policy.

Required

(a) Explain the nature of these three types of decision and the extent to which they are inter-related. (5 marks)

(b) List the types of current and forecast information which might be relevant to each decision. (5 marks)

12 FORECASTING FAILURE (10 marks) *18 mins*

(a) Discuss the theories, or arguments, which suggest that financial analysis can be used to forecast the probability of a given firm's failure; and

(b) explain why such an analysis, even if properly applied, may not always predict failure.

13 MR JONES

(a) RD plc has made a takeover bid for LO plc. RD plc's share price has been performing well in recent months as the market believes its Managing Director, Mr Jones, has the ability to improve dramatically the company's earnings. The acquisition of LO plc, an erratic performer in recent years, seems to be a sensible move in commercial terms. However, the market does not react to the terms of the bid as Mr Jones expected and he finds RD plc's share price falls.

A summary of the financial data before the bid is as follows.

	RD plc	*LO plc*
Number of shares in issue	5 million	15 million
Earnings available to ordinary shareholders	£2.5 million	£7.5 million
P/E ratio	12.5	7.5

Mr Jones' estimated financial data post-acquisition:

Estimated market capitalisation	£125 million
Estimated share price	£8.33
Estimated EPS	£0.67
Estimated equivalent value of one old LO plc share	£5.55

The offer is 10 RD plc shares for 15 LO plc shares. At the time of the bid announcement, no information is related other than the bid terms and the comment by Mr Jones that he hopes to 'turn LO round'. The expected rate of return on RD plc's equity capital is 15% per annum constant.

Required

(i) Suggest how Mr Jones might have calculated post-acquisition values.

(ii) Write a short report suggesting a probable post-acquisition share price and advising shareholders in both RD plc and LO plc on whether the bid should proceed.

(b) It is later announced that the proposed merger is expected to result in immediate administrative savings of £5 million. Sales of redundant assets by the end of the first year are expected to realise £10 million. Net income is expected to increase by £7.5 million per annum for the foreseeable future as a result of a more aggressive marketing policy for LO plc's business.

Note. You should assume all figures are net of tax.

Required

Explain how this new information would affect your estimate of a probable post-acquisition share price, and comment on how it might affect LO plc's bargaining position.

14 BLACK RAVEN LTD

Black Raven Ltd is a prosperous private company, whose owners are also the directors. The directors have decided to sell their business, and have begun a search for organisations interested in its purchase. They have asked for your assessment of the price per ordinary share a purchaser might be expected to offer.

Relevant information is as follows.

THE MOST RECENT BALANCE SHEET

	£'000	£'000	£'000
Fixed assets (net book value)			
Land and buildings			800
Plant and equipment			450
Motor vehicles			55
Patents			2
			1,307
Current assets			
Stock		250	
Debtors		125	
Cash		8	
		383	
Current liabilities			
Creditors	180		
Taxation	50		
		230	
			153
			1,460
Long-term liability			
Loan secured on property			400
			1,060
Share capital (300,000 ordinary shares of £1)			300
Reserves			760
			1,060

The profits after tax and interest but before dividends over the last five years have been as follows.

		£
Year	1	90,000
	2	80,000
	3	105,000
	4	90,000
	5 (most recent)	100,000

The annual dividend has been £45,000 (gross) for the last six years.

The company's five year plan forecasts an after-tax profit of £100,000 for the next 12 months, with an increase of 4% a year over each of the next four years.

As part of their preparations to sell the company, the directors of Black Raven Ltd have had the fixed assets revalued by an independent expert, with the following results.

	£
Land and buildings	1,075,000
Plant and equipment	480,000
Motor vehicles	45,000

The gross dividend yields and P/E ratios of three quoted companies in the same industry as Black Raven Ltd over the last three years have been as follows.

	Albatross plc		*Bullfinch plc*		*Crow plc*	
	Div. yield	*P/E ratio*	*Div. yield*	*P/E ratio*	*Div. yield*	*P/E ratio*
	%		%		%	
Recent year	12	8.5	11.0	9.0	13.0	10.0
Previous year	12	8.0	10.6	8.5	12.6	9.5
Three years ago	12	8.5	9.3	8.0	12.4	9.0
Average	12	8.33	10.3	8.5	12.7	9.5

Large companies in the industry apply an after-tax cost of capital of about 18% to acquisition proposals when the investment is not backed by tangible assets, as opposed to a rate of only 14% on the net tangible assets.

Your assessment of the net cash flows which would accrue to a purchasing company, allowing for taxation and the capital expenditure required after the acquisition to achieve the company's target five year plan, is as follows.

	£
Year 1	120,000
Year 2	120,000
Year 3	140,000
Year 4	70,000
Year 5	120,000

Required

Use the information provided to suggest seven valuations which prospective purchasers might make.

15 BRIVE PLC (30 marks) *54 mins*

The latest balance sheet for Brive plc is summarised below.

	£'000	£'000	£'000
Fixed assets at net book value			5,700
Current assets			
Stock and work in progress		3,500	
Debtors		1,800	
		5,300	
Less current liabilities			
Unsecured creditors	4,000		
Bank overdraft (unsecured)	1,600		
		5,600	
Working capital			(300)
Total assets less current liabilities			5,400
Liabilities falling due after more than one year			
10% secured debentures			3,000
Net assets			2,400

	£'000
Capital and reserves	
Called up share capital	4,000
Profit and loss account	(1,600)
	2,400

Brive plc's called up capital consists of 4,000,000 £1 ordinary shares issued and fully paid. The fixed assets comprise freehold property with a book value of £3,000,000 and plant and machinery with a book value of £2,700,000. The debentures are secured on the freehold property.

In recent years the company has suffered a series of trading losses which have brought it to the brink of liquidation. The directors estimate that in a forced sale the assets will realise the following amounts.

Freehold premises	£2,000,000
Plant and machinery	£1,000,000
Stock	£1,700,000
Debtors	£1,700,000

The costs of liquidation are estimated at £770,000.

However, trading conditions are now improving and the directors estimate that if new investment in plant and machinery costing £2,500,000 were undertaken the company should be able to generate annual profits before interest of £1,750,000. In order to take advantage of this they have put forward the following proposed reconstruction scheme.

(a) Freehold premises should be written down by £1,000,000, plant and machinery by £1,100,000, stocks and work in progress by £800,000 and debtors by £100,000.

(b) The ordinary shares should be written down by £3,000,000 and the debit balance on the profit and loss account written off.

(c) The secured debenture holders would exchange their debentures for £1,500,000 ordinary shares and £1,300,000 14% unsecured loan stock repayable in five years' time.

(d) The bank overdraft should be written off and the bank should receive £1,200,000 of 14% unsecured loan stock repayable in five years time in compensation.

(e) The unsecured creditors should be written down by 25%.

(f) A rights issue of 1 for 1 at par is to be made on the share capital after the above adjustments have been made.

(g) £2,500,000 will be invested in new plant and machinery.

Required

(a) Prepare the balance sheet of the company after the completion of the reconstruction. (8 marks)

(b) Prepare a report, including appropriate calculations, discussing the advantages and disadvantages of the proposed reconstruction from the point of view of:

(i) the ordinary shareholders;
(ii) the secured debenture holders;
(iii) the bank; and
(iv) the unsecured creditors. (22 marks)

Ignore taxation.

16 COMMON MARKET

(a) State the differences between free trade areas, customs unions and common markets.

(b) What economic benefits might countries gain from forming a common market?

17 IMF AND MULTINATIONALS

(a) What is the purpose of the International Monetary Fund and how does it operate?

(b) Describe the main features of the eurocurrency, eurobond and euroequity markets.

(c) What factors might be important to the financial manager of a multinational company when deciding whether to borrow funds on the domestic bond market or the eurocurrency or eurobond markets?

18 AARDVARK LTD (10 marks) *18 mins*

Aardvark Ltd has been having some difficulty with the collection of debts from export customers. At present the company makes no special arrangements for export sales.

As a result the company is considering either:

(a) employing the services of a non-recourse export factoring company; or
(b) insuring its exports against non-payment through and insurer.

The two alternatives also provide possible ways of financing sales.

An export factor will, if required, provide immediate finance of 80% of export credit sales at an interest rate of 2% above bank base rate (the base rate is 8%). The service fee for debt collection is 3% of credit sales. If the factor is used, administrative savings of £35,000 a year should be possible.

A comprehensive insurance policy costs 35 pence per £100 insured and covers 90% of the risk of non-payment for exports. The insurer will probably allow Aardvark Ltd to assign its rights to a bank, in return for which the bank will provide an advance of 70% of the sales value of insured debts, at a cost of 1.5% above base rate.

Aardvark's annual exports total £1,000,000. Export sales are on open account terms of 60 days credit, but on average payments have been 30 days late. Approximately 0.5%, by value, of credit sales result in bad debts which have to be written off.

The company is able to borrow on overdraft from its bank, unsecured, at 2.5% above base rate. Assume a 360 day year.

Required

Determine which combination of export administration and financing Aardvark Ltd should use.

19 PURCHASING POWER PARITY AND THE EMS

What do you understand by the theory of purchasing power parity? Discuss the implications of this theory for the operation of the European Monetary System (EMS).

20 IMPORT-EXPORT MERCHANT

An import-export merchant contracts on 31 December to buy 1,500 tonnes of a certain product from a supplier in country X at a price of X$11,820 per tonne. Shipment will be made direct to a customer in country Y to whom he has sold the product at Y$462 per tonne. Of the total quantity, 500 tonnes will be shipped during January and the balance by the end of February. Payment to the suppliers is to be made immediately on shipment, whilst one month's credit from the date of shipment is allowed to the country Y customer.

The merchant arranges with his bank to cover these transactions in sterling on the forward exchange market, the exchange rates at 31 December being those given below.

	X$	*Y$*
Spot	107.45 - 107.75	3.84 - 3.88
1 month forward	55 - 105 c dis	2½ - 1½ c premium
2 months forward	75 - 175 c dis	4 - 3 c premium
3 months forward	106 - 250 c dis	6½ - 5½ c premium

Exchange commission is 1 per mille (maximum £10) on each transaction.

Required

(a) Calculate (to the nearest pound) the profit the merchant will make on the transaction.

(b) Explain how calculations of further exchange profit or loss would be made if:

(i) the February shipment were cancelled;
(ii) the February shipment were delayed until April.

21 MULTILATERAL NETTING (10 marks) *18 mins*

Certain organisational and policy adjustments may be made internally by a business for the purpose of minimising the effects of transactions in foreign currencies.

A group of companies controlled from the United Kingdom includes subsidiaries in Belgium, France and the USA. It is forecast that at the end of the current month, inter-company indebtedness will be as follows.

(a) The Belgian subsidiary will be owed 144,381,000 Belgian francs by the French subsidiary and will owe the USA subsidiary $1,060,070.

(b) The French subsidiary will be owed 14,438,000 French francs by the USA subsidiary and will owe it $800,000.

It is a function of the central treasury department to net off inter-company balances as far as possible and to issue instructions for settlement of the net balances. For this purpose the relevant exchange rates in terms of £1 are $1.415; French francs 10.215; Belgian francs 68.10.

Required

Calculate the net payments to be made in respect of the above balances and state the possible advantages and disadvantages of such multilateral netting.

22 EXPORTERS PLC

Exporters plc, a UK company, is due to receive 500,000 Northland dollars in six months' time for goods supplied. The company decides to hedge its currency exposure by using the forward market. The short-term interest rate in the UK is 12% per annum and the equivalent rate in Northland is 15%. The spot rate of exchange is 2.5 Northland dollars to the pound.

Required

(a) Calculate how much Exporters plc actually gains or loses as a result of the hedging transaction if, at the end of the six months, the pound, in relation to the Northland dollar, has (i) gained 4%, (ii) lost 2% or (iii) remained stable. You may assume that the forward rate of exchange simply reflects the interest differential in the two countries (ie it reflects the interest rate parity analysis of forward rates).

(b) Explain the rationale behind the interest rate parity analysis of forward rates.

(c) Compare a forward market currency hedge with (i) a currency futures hedge, (ii) a currency options hedge. Indicate in each of the three cases how the hedging facility is actually provided, the nature of the costs and the potential outcomes of the hedge.

23 INDUSTRIAL COMPANY

(a) What risks might an industrial company face as a result of interest rate movements?

(b) Explain the main financial instruments which a company can use to reduce these risks.

24 OVERSEAS INVESTMENT

The board of A plc, a UK company engaged in merchandising consumer products, is considering expanding its operations by setting up a subsidiary in an overseas country. The necessary fixed assets would be mainly land and buildings. Merchandise for sale would be supplied initially from the UK. The operating risks are known, and the directors wish to minimise the parent company's exposure to exchange risk.

You are required, with this in mind, to discuss possible means of:

(a) financing the initial investment in the subsidiary;

(b) arranging remittances to the parent company of funds arising from the operations of the subsidiary;

(c) minimising currency losses arising either from operating transactions or from the effects of a significant decline in the value of the local currency.

Taxation may be ignored.

25 X AND Y

X Limited (incorporated in England) and Y (Pty) Ltd (a South African company) are two private companies of approximately the same size, working together in the same field. They have been cooperating well for some years and the directors of both companies are proposing to put this cooperation on a more formal footing by amalgamating the companies. It is thus hoped to facilitate international marketing of both of their product ranges.

Neither company is quoted.

The rand/sterling exchange rate has oscillated between 4.92 and 6.04 over the last year.

X Limited's directors wish to set up XY (International) Limited when equity would be allocated to the existing owners of each company on a 50/50 basis.

Y (Pty) Ltd's board would prefer a mutual exchange of shares so that half of X Limited and half of Y (Pty) Ltd is owned by the shareholders of the other company.

Required

(a) Outline the advantages and disadvantages of the two approaches referred to.

(b) Discuss what might be gained were each of the companies to issue loan stock to each other and describe how the results of X Limited would be affected by such an arrangement.

(c) Explain how the control of remittances by a government overseas may affect a foreign investor.

26 FINANCIAL CONTROL

(a) Discuss the possible advantages and disadvantages of centralising the financial functions of a group of companies.

(b) If you were the managing director of a group of companies suggest, giving reasons for your suggestions, what financial ratios (or combinations of financial ratios) you might find useful in order to monitor, evaluate and control the activities of the group.

What problems might exist with the use of financial ratios as a financial control system within a group of companies?

1 FINANCIAL OBJECTIVE

(a) In the last three years, each company has achieved a reasonably consistent increase in growth in EPS, with Y Ltd's growth rate doubling in each of these years. The ability of the companies to do this depends partly on:

(i) *the external environment*. This includes market demand and inflation. The large increase in turnover of both companies, because of price or sales volume increases, has contributed to the increase in EBIT, and therefore to the increase in distributable earnings. The rate of taxation as a percentage of EBIT appears to have risen slightly between 19X1 and 19X4; this had the effect of reducing the rate of growth in EPS;

(ii) *the companies' operating cost structures*. Although variable costs as a percentage of sales rose in both companies between 19X1 and 19X4, there was a reduction in the ratio of fixed costs to sales, so that the operating profit to sales ratio remained fairly constant over this period. This meant that EBIT increased at about the same rate as the rate of increase in sales. However, since X Ltd operates with a lower contribution/sales ratio than Y Ltd, an increase in turnover will have a much greater effect on the EBIT (and therefore the EPS) of Y Ltd than of X Ltd. In 19X4, each extra pound of sales earned X Ltd 35p contribution before tax, compared with 61p for Y Ltd;

(iii) *gearing*. X Ltd is more highly geared than Y Ltd. This might explain X Ltd's stronger earnings growth. The gearing ratio of X Ltd remained fairly constant in the period, although it would have been much higher but for the asset revaluation reserve. Y Ltd increased its gearing ratio substantially in 19X2. Interest rates appear to have fallen during the period, so both companies financed their expansion to a considerable extent by acquiring relatively cheap loans.

(b) The financial management of X Ltd shows some cause for concern in spite of the increase in turnover, profits and EPS.

(i) The gearing of the company is rather high. In 19X4 it is 44%, and if the asset revaluation reserve is removed, the gearing ratio is 60/116 = 52%. Although we do not know the working capital structure, the debt ratio is probably in excess of 50%, and it is surprising that the company was able to raise an extra £14,000 in loans in 19X4 (£60,000 - £46,000). The higher rates of interest paid by X Ltd (compared to Y Ltd) probably reflect the higher risk of investing in X Ltd.

(ii) The revaluation of assets (by £12,000 out of £42,000 in 19X2) seems surprisingly high.

(iii) The need for additional sources of funds to finance the growth in sales has meant that earnings have had to be retained. It is perhaps significant that in 19X4 dividends were only a third of distributable profits, whereas in earlier years the fraction was about half.

(iv) It would appear, from results in 19X4 when a high proportion of earnings were retained and a new issue of shares was made, that the company is reaching the limit of its ability to borrow without first reducing its gearing and debt ratios. It should be expected, however, that in view of the increasing profitability, the company should be able to restore itself to a position of financial strength with prudent financial management.

Even so, ROI is quite high, and the company might therefore be attractive to investors.

Y Ltd has lower gearing than X Ltd, and there has been no revaluation of assets. Any such revaluation would reduce the gearing ratio considerably. The interest cover in Y Ltd is very high, and this too suggests good security for lenders.

The company's rate of growth in EPS is high, and if the company wishes to continue to expand rapidly, it appears to be in a sound financial position to do so.

(i) Retained earnings are high.

(ii) At the same time, dividends have risen more quickly than earnings, and shareholders are receiving the benefit of the growth in profits. This is likely to increase the value of Y Ltd's shares.

(iii) The company was able to raise an extra £50,000 in new shares in 19X3, and loan capital has more than doubled. There would appear to be scope for further borrowing if required.

(iv) ROI is about 28% in 19X4, rather higher than for X Ltd.

Y Ltd offers security to lenders, safe gearing, and a fast growth in profits and dividends. In these respects, its financial management appears to be very sound. Some thought should be given, however, to a revaluation of the company's fixed assets, if this seems appropriate.

Workings

	X Ltd				Y Ltd			
	19X1	*19X2*	*19X3*	*19X4*	*19X1*	*19X2*	*19X3*	*19X4*
Growth in EBIT (%)		14.3%	31.2%	47.6%		12.0%	42.9%	16.2%
Growth in EPS (%)		16.7%	14.3%	20.0%		4.0%	9.2%	18.3%
Growth in EPS (pence)		5	5	8		1	2.4	5.2
Cost structure	%	%	%	%	%	%	%	%
Variable cost/sales ratio	60	62	64	65	30	31	33	39
Fixed cost/sales ratio	26	25	24	23	45	44	40	35
EBIT/sales ratio	14	13	12	12	25	25	27	26
	100	100	100	100	100	100	100	100
Gearing ratio (Loans/capital employed)	42%	33%	44%	44%	21%	29%	30%	28%
Interest cover (EBIT/interest)	3.5×	4.0×	3.0×	3.9×	10.0×	7.0×	8.4×	9.8×
Average cost of interest (Interest/loan capital)	16%	16%	15%	13%	12.5%	12%	10%	10%

	X Ltd				Y Ltd			
	19X1	*19X2*	*19X3*	*19X4*	*19X1*	*19X2*	*19X3*	*19X4*
		£'000	£'000	£'000		£'000	£'000	£'000
Financing of increases in assets								
Extra shares		0	0	5		0	50	0
Revaluation		12	4	4		0	0	0
Retained profits		4	4	8		34	41	50
Equity		16	8	17		34	91	50
Loans		0	21	14		57	45	0
Increase in assets		16	29	31		91	136	50
ROI								
(i) EBIT/capital employed	23%	21%	20%	23%	26%	24%	26%	28%
(ii) Earnings before tax /equity capital	29%	24%	24%	30%	30%	29%	33%	35%

2 AGENCY THEORY

The agency theory of the firm sees the company as a team whose members act in their own self interest but who at the same time accept that their individual success is dependent on the survival of the company in competition with other firms. Traditional theory holds that the main objective of a company is to maximise the wealth of the ordinary shareholders, and thus much attention has been directed to the attitudes and desires of the shareholders.

The return to the shareholders will be maximised through some combination of dividend payments and capital growth. In general, a shareholder will prefer a certain current income to an uncertain future income, in other words will demonstrate risk aversion. In practical terms, this means that shareholders will prefer to see a satisfactory level of dividends in the short term rather than sacrifice these in the expectation of a higher level of payments in the future, but with a greater level of risk attached. The effect of this on policy making within the firm is that there will be some

tendency towards short-termism and risk avoidance; however at the same time there will be a concern to secure the survival and growth of the firm in the long term which tempers this tendency. It is also true that a shareholder can spread his risk by investing in a number of different companies and therefore he may well be prepared to accept a degree of risk in an individual company in anticipation of higher returns.

Managers on the other hand are in a significantly different position. Their financial security is primarily determined by the fortunes of the employing company. In practice this means that they are likely to be more risk averse in their decision making. The difference is that managers are interested in the total risk position of the company, while a diversified shareholder is only interested in the systematic risk of the company.

Due to the separation of ownership and control these factors mean that in practice organisations often behave differently from the manner predicted by traditional theory. The agency theory of the firm seeks to provide a behavioural explanation for some of these divergences.

3 MUGGINS PLC

Certainty equivalent cash flows

	Year 1	*Year 2*	*Year 3*	*Year 4*
	£'000	£'000	£'000	£'000
Sales (W1)	1,125	1,800	1,575	1,425
Material X (W2)	50	230	248	280
Other variable costs (W3)	517	1,100	1,184	1,340
Management salaries (W4)	67	79	85	92
Rental: opportunity cost	135	135	135	135
Other overheads (× 1.1, 1.3, 1.4, 1.5)	66	78	84	90
	835	1,622	1,736	1,937
Sales less cash costs	290	178	(161)	(512)
Discount factor at 14%	0.877	0.769	0.675	0.592
Present value	254	137	(109)	(303)

The net present value is -£21,000, so the project is not acceptable.

Workings

1 *Sales*

Year 1 10,000 × £125 × 0.9
Year 2 18,000 × £125 × 0.8
Year 3 18,000 × £125 × 0.7
Year 4 19,000 × £125 × 0.6

2 *Material X*

Year 1 £50,000 opportunity cost
Year 2 18,000 × 6 × £1.64 × 1.3
Year 3 18,000 × 6 × £1.64 × 1.4
Year 4 19,000 × 6 × £1.64 × 1.5

3 *Other variable costs*

Per unit: £30 + 3 × £4.20 + £4.40 = £47
Year 1 10,000 × £47 × 1.1
Year 2 18,000 × £47 × 1.3
Year 3 18,000 × £47 × 1.4
Year 4 19,000 × £47 × 1.5

4 *Management salaries*

Year 1 £34,000 + £27,000 = £61,000 × 1.1
Year 2 £61,000 × 1.3
Year 3 £61,000 × 1.4
Year 4 £61,000 × 1.5

5 Apportioned costs are irrelevant because they are not incremental cash flows.

4 SHARE VALUES

(a) The fundamental analysis theory of share values states that the value of a share is the present value of the expected future dividends. No buyer would pay more for the share than this amount, because he would only have to invest this amount elsewhere to obtain the same income stream; and no seller would accept less than this amount, as to do so would involve an avoidable loss of wealth.

The theory assumes that there is a single discount rate applicable to all investors and potential investors in the shares (of one class) in a given company. This rate is applied to the expected future dividends to obtain a present value.

Examples

(i) X plc is expected to pay a dividend of 30p a share each year for ever, starting one year from now. An appropriate discount rate is 25%. The current market value per share (ex div) should be 30p/0.25 = £1.20.

(ii) Y plc is expected to pay a dividend of 21p a share one year from now. Thereafter, dividends are expected to rise by 3% a year. An appropriate discount rate is 15%. The current market value (taking into account the expected dividend growth) is:

$$\frac{21}{1.15} + \frac{21 \times 1.03}{1.15^2} + \frac{21 \times 1.03^2}{1.15^3} + \ldots = \frac{21}{0.15 - 0.03} = 175p = £1.75$$

The theory can be applied to the valuation of interest-bearing securities. The income stream from such securities is usually known with certainty, whereas future dividends from shares can only be estimated. With redeemable securities, not only the interest but also the amount due on maturity must be discounted in arriving at a present value.

(b) In an efficient stock market, no one investor dominates the market, transaction costs are not a significant deterrent to dealing and the prices at which shares are bought and sold reflect all available relevant information. Share prices will therefore be set in a rational way, taking account of the prospects for companies, and one would expect the fundamental analysis theory to apply. Exactly how it would apply would depend on the level of efficiency of the stock market, which is considered below.

If the stock market is inefficient, share prices may differ significantly and permanently from what the fundamental analysis theory would lead one to expect. A dominant investor or high dealing costs may distort prices; and if share prices do not reflect all available relevant information about companies, they may come to bear little relation to likely future dividends.

The level of efficiency of a stock market in this sense depends on the extent to which market prices reflect relevant information. Under weak form efficiency, only information about past price movements and their implications is reflected in current market prices; under semi-strong form efficiency, all publicly available information is reflected in current market prices; and under strong form efficiency, even confidential information (such as secret plans for new investments) is reflected in current market prices.

Information about a company, such as recent results or a proposed new investment, is normally known to only a few people at first. It is published, and after a while several investors will have dealt in the company's shares at prices which reflect the information. Thus whatever the level of efficiency of the stock market, if it is efficient at all then share prices will eventually reflect each item of relevant information about the company. Share prices should therefore be determined according to the principles of the fundamental analysis theory, although perhaps after some delay, even if the stock market shows only weak form efficiency.

5 CRYSTAL PLC

(a) The post-tax weighted average cost of capital should first be calculated.

(i) *Ordinary shares*

	£
Market value of shares cum div.	3.27
Less dividend per share (810 ÷ 3,000)	0.27
Market value of shares ex div.	3.00

The formula for calculating the cost of equity when there is dividend growth is:

$$r = \frac{D_0(1 + g)}{P_0} + g$$

where r = cost of equity
D_0 = current dividend
g = rate of growth
P_0 = current ex div market value.

In this case we shall estimate the future rate of growth (g) from the average growth in dividends over the past four years.

$$810 = 620\ (1 + g)^4$$

$$(1 + g)^4 = \frac{810}{620}$$

$$= 1.3065$$

$$(1 + g) = 1.069$$

$$g = 0.069 = 6.9\%$$

$$r = \frac{0.27 \times 1.069}{3} + 0.069 = 16.5\%$$

(ii) *7% Debentures*

In order to find the post-tax cost of the debentures, which are redeemable in ten years time, it is necessary to find the discount rate (IRR) which will give the future post-tax cash flows a present value of £77.10.

The relevant cash flows are:

(1) annual interest payments, net of tax, which are £1,300 × 7% × 67% = £60.97 (for ten years);

(2) a capital repayment of £1,300 (in ten years time).

It is assumed that tax relief on the debenture interest arises at the same time as the interest payment. In practice the cash flow effect is unlikely to be felt for about a year, but this will have no significant effect on the calculations.

	Present value
Try 8%	£'000
Current market value of debentures (1,300 at £77.10 per cent)	(1,002.3)
Annual interest payments net of tax £60.97 × 6.710 (8% for ten years)	409.1
Capital repayment £1,300 × 0.463 (8% in ten years time)	601.9
NPV	8.7

Try 9%	£'000
Current market value of debentures	(1,002.3)
Annual interest payments net of tax 60.97 × 6.418	391.3
Capital repayment 1,300 × 0.422	548.6
NPV	(62.4)

$$\text{IRR} = 8\% + \left[\frac{8.7}{8.7 - -62.4} \times (9 - 8)\right]\%$$

$$= 8.12\%$$

(iii) *The weighted average cost of capital*

	Market value	*Cost*	*Product*
	£'000	%	
Equity	9,000	16.50	1,485
7% Debentures	1,002	8.12	81
	10,002		1,566

$$\frac{1,566}{10,002} \times 100 = 15.7\%$$

The above calculations suggest that a discount rate in the region of 16% might be appropriate for the appraisal of new investment opportunities.

(b) Difficulties and uncertainties in the above estimates arise in a number of areas.

(i) *The cost of equity.* The above calculation assumes that all shareholders have the same marginal cost of capital and the same dividend expectations, which is unrealistic. In addition, it is assumed that dividend growth has been and will be at a constant rate of 6.9%. In fact, actual growth in the years 19X5/6 and 19X8/9 was in excess of 9%, while in the year 19X7/8 there was no dividend growth. 6.9% is merely the average rate of growth for the past four years. The rate of future growth will depend more on the return from future projects undertaken than on the past dividend record.

(ii) *The use of the weighted average cost of capital.* Use of the weighted average cost of capital as a discount rate is only justified where the company in question has achieved what it believes to be the optimal capital structure (the mix of debt and equity) and where it intends to maintain this structure in the long term.

(iii) *The projects themselves.* The weighted average cost of capital makes no allowance for the business risk of individual projects. In practice some companies, having calculated the WACC, then add a premium for risk. In this case, for example, if one used a risk premium of 5% the final discount rate would be 21%. Ideally the risk premium should vary from project to project, since not all projects are equally risky. In general, the riskier the project the higher the discount rate which should be used.

6 EMMA PLC

(a) (i)

Year	*Cash flow*	*Discount factor*	*Present value*
	£m	16%	£m
0	(3.6)	1.0	(3.600)
In perpetuity	0.5	$1 \div 0.16$	3.125
		NPV =	(0.475)

The NPV is negative and the project should not be undertaken.

(ii) The tax shield on the debt is represented by Dt, where:

D = £3,600,000
t = 0.33
Dt = £3,600 × 0.33 = £1,188,000

	£m
NPV if all-equity financed	(0.475)
Tax shield on debt	1.188
NPV with debt financing	0.713

Since the NPV is positive, the project is worthwhile if it is financed by debt.

(iii) The gearing of the company after the project is undertaken in (a)(ii) would be:

$$\frac{D}{D + V_{eg}} = \frac{3.6}{(3.6 + 10.313)} = 0.2587508$$

Using the formula:

$V_g = V_u + Dt$

but applying it only to the incremental project, we get:

$V_g = 3.125m^* + (0.33 \times 0.2587508V_g)$

$0.9146V_g = 3.125m$

$V_g = 3.417m$

(*V_u is the value of benefits calculated in (a)(i)).

	£m
Project benefits	3.417
Project cost	3.600
Loss in value due to project	0.183

Again, as in (a)(i), the project would not be worthwhile.

(b) (i) $WACC_g = Ke_u\left[1 - \frac{Dt}{E + D}\right]$

$$WACC_g = 0.16 \times [1 - \frac{3.6 \times 0.33}{(10.313 + 3.6)}]$$

= 0.14634, which is just over 14.6%

(ii) The incremental cost of capital is:

$$\frac{\text{Incremental after-tax annual cash benefits in perpetuity}}{\text{Incremental value of the company}}$$

$$= \frac{£500,000}{£13,913,000 - £9,600,000} \times 100\%$$

$$= \frac{£500,000}{£4,313,000} \times 100\% = 11.5929\%$$

(iii) The figures in (b)(i) and (b)(ii) can be used to support the solutions in (a)(ii) and (a)(iii) as follows.

(1)

WACC	£m
PV of cost	(3.600)
PV of benefits £500,000 ÷ 0.14634	3.417
NPV	(0.183)

This supports the solution in (a)(iii).

(2)

Incremental WACC	£m
PV of cost	(3.600)
PV of benefits £500,000 ÷ 0.115929	4.313
Increase in equity value from incremental investment	0.713

This supports the solution in (a)(ii).

7 PORTFOLIO

(a)

		Return	*Probability*	*EV*
		%		%
(i)	Security X	30	0.3	9
		25	0.4	10
		20	0.3	6
	Expected return, security X			25
(ii)	Security Y	50	0.2	10
		30	0.6	18
		10	0.2	2
	Expected return, security Y			30

(iii) Portfolio of 60% X and 40% Y
The expected return is (60% of 25%) + (40% of 30%) = 15% + 12% = 27%

(b) (i) Security X. The average return, $\bar{x}$, is 25%.

Return		*Probability*	
x	$(x - \bar{x})$	*p*	$p(x - \bar{x})^2$
30	5	0.3	7.5
25	0	0.4	0
20	(5)	0.3	7.5
			15.0

Risk = standard deviation = $\sqrt{15}$ = 3.87%

(ii) Security Y: The average return, $\bar{x}$, is 30%.

Return		*Probability*	
x	$(x - \bar{x})$	*p*	$p(x - \bar{x})^2$
50	20	0.2	80
30	0	0.6	0
10	(20)	0.2	80
			160

Risk = standard deviation = $\sqrt{160}$ = 12.65%

(iii) $$\sigma_p = \sqrt{\sigma_X{}^2 w^2 + \sigma_Y{}^2 (1-w)^2 + 2w(1-w)p_{XY}\sigma_X\sigma_Y}$$

The correlation coefficient p_{xy} is 0.

$$\sigma = \sqrt{(15)(0.6)^2 + (160)(0.4)^2}$$

$$= \sqrt{5.4 + 25.6} = \sqrt{31} = 5.6\%$$

8 CANADIAN PLC

MEMORANDUM

To: The Finance Director
From: Accountant
Date: 12 December 19X5
Subject: Proposed investment in local coal mine

(a) *Overall summary and conclusion*

I have performed an analysis of the available figures using the adjusted present value technique (APV). This method is appropriate because the project:

(i) represents an activity fundamentally different from that of the company;

(ii) has a fundamentally different risk profile, as evidenced by the differing betas, from Canadian;

(iii) is to be financed using a gearing ratio different from the company;

(iv) is a significant investment for the company (ie is not a marginal investment).

An alternative to this method might be the adjusted discount rate method, in which an estimate is made of the appropriate discount rate to use and the project cash flows discounted at this rate. However, insufficient data is available to perform this sort of analysis.

APV demonstrates that although the project itself does not appear attractive under the stated assumptions (a negative NPV of £1,218,000), the total project allowing for the financing effects has a positive net present value of £706,000. These positive financing effects result from the interest savings on the Regional Development Board loan, plus the tax effects of the additional debt capacity of the firm.

However, I should stress that these figures assume a great deal about the future, both as regards the values of the factors that have been taken into account, and the factors that have been ignored. I would refer you to the later sections of this memo, but broadly:

(i) there would be substantial implications for power station X if this pit were to close. These costs should also be considered in coming to our conclusion;

(ii) even if the power station is judged viable in the absence of the pit, buying coal from overseas will expose us to currency fluctuations which would need to be managed;

(iii) no sensitivity analysis has been carried out. It would appear likely that the project is highly sensitive to the price of coal, and to the level of redundancy and environmental cleanup costs. This implies a high degree of political risk, which will be outstanding for five years.

(b) *Workings*

The adjusted present value represents the NPV of the project based on an all equity financed situation, adjusted for any finance costs/benefits.

The appropriate discount rate is found from the formula:

$$\beta \text{ asset} = \beta_e \frac{E}{E + D(1-t)} + \beta_d \frac{D(1-t)}{E + D(1-t)}$$

This should be based on the betas for the coal mining industry, which obviously has a different risk profile from that of the power generation industry.

$$\beta \text{ asset} = 0.7 \times \frac{1}{1 + 1(1 - 0.3)} + 0.2 \times \frac{(1 - 0.3)}{1 + 1(1 - 0.3)} = 0.494$$

Therefore the appropriate discount rate is:

k_e = 8% + (16% – 8%) × 0.494
=12%

The cashflows generated by the project are therefore discounted at 12% to find the base NPV.

Cashflow forecast, £'000s

Year	*0*	*1*	*2*	*3*	*4*	*5*	*6*
Inflows							
Value of coal production		10,000	10,000	10,000	10,000	10,000	
Outflows							
Operating costs		(3,090)	(3,183)	(3,278)	(3,377)	(3,478)	
Initial investment	(12,000)						
Final payment						(19,708)	
Tax			(1,173)		(1,313)	(1,347)	4,525
Tax from year 3					(1,258)		
Net cashflow	(12,000)	6,910	5,644	6,722	4,052	(14,533)	4,525
NPV factor	1.000	0.797	0.712	0.636	0.567	0.597	0.452
NPV	(12,000)	5,509	4,018	4,272	2,299	(7,363)	2,047
Total NPV	(1,218)						

Workings:

Year	1	2	3	4	5
Tax calculations:					
Operating cashflows					
inflows	10,000	10,000	10,000	10,000	10,000
outflows	(3,090)	(3,183)	(3,278)	(3,377)	(3,478)
Capital allowances					
on equipment	(1,500)	(1,125)	(844)	(633)	(1,898)
on mine	(1,500)	(1,500)	(1,500)	(1,500)	
Termination costs					(19,708)
Net taxable flow	3,910	4,192	4,378	4,491	(15,084)
Tax on taxable flow	1,173	1,258	1,313	1,347	(4,525)

Some authors have argued that tax is a certain cashflow, and therefore should not be discounted back at the ungeared discount rate, at least not between the year it is 'earned' and the year it is paid. However, it is common to do so, and indeed, as this case shows in year 3, tax is not always paid in the year in which the project cashflows would predict that it is due.

Financing effects are as follows.

Borrowing effect

The company can borrow a total of £6 million (the regional development loan) plus the £3 million increase in the borrowing capacity as a result of this project. This means that debt benefits flow on a total of £9 million of additional debt. This is worth:

Debt benefit = Total debt × Canadian's borrowing rate × tax rate

Canadian's borrowing rate can be found using CAPM as:

k_d = 8% + (16% – 8%) × 0.25
=10%

Therefore the increase in debt capacity is worth:

£9 million × 10% × 30% = £270,000 pa

This tax benefit will be received between the years 2 and 6, and should be discounted at the cost of debt (10%).

$$£270,000 \times 3.791 \times \frac{1}{110} = £931,000$$

Regional development loan.

The value of the subsidy can be related directly to the cost of debt that Canadian plc would otherwise have paid (10%).

Therefore the saving in interest charges is:

£6 million × (10% – 4%) = £360,000 pa

Again, this is discounted at the cost of debt. However, there are two things to notice:

(i) the benefit of the interest rate reduction is received in years 1-5

(ii) there is an associated reduction in the tax benefit, detrimental in years 2-6, of the interest cost × tax charge.

Present value of interest saved in years 1-5:

£360,000 × 3.791 = £1,365,000

Present value of tax benefit foregone in years 2-6:

$$£6m \times 6\% \times 30\% \times 3.791 \times \frac{1}{110} = £372,000$$

The expected APV of the project, including financing effects, will therefore be:

	£'000
NPV of project	(1,218)
NPV of tax shelter on interest	931
NPV of interest saved	1,365
NPV of tax benefit forgone on interest saved	(372)
	706

(c) *Assumptions behind this report*

As regards the data used in the report, it assumes the following.

(i) The various output and costing figures are reasonably accurate.

(ii) The Regional Development Board loan is obtained.

(iii) The cleanup and redundancy costs are correctly estimated - this assumes a stable political environment over the next five years.

(iv) The tax regime is at least as favourable as regards capital allowances as at present over the next five years.

(v) Retained earnings are available to finance the equity component of the project. If additional equity finance were required then issue costs could make this project unviable.

(vi) The RPI can be accurately used as a measure of the cost inflation factors that will affect the pit.

(vii) The price of coal will stay at the current level for the foreseeable future.

(viii) That the debt capacity added to the firm is accurate. It is not known how this figure is arrived at, but the project might well affect the total perceived risk of the firm for both equity and debt, and therefore change borrowing capacities for the rest of the firm.

As regards the APV model, it assumes the following.

(i) The value of the tax shield is the full corporate tax rate. This is questionable when shareholders obtain the benefit of a dividend imputation system and annual capital gains tax allowances.

(ii) The project will contribute a full £9 million to the borrowing capacity of the group for the whole of its useful life. In reality it is likely that the asset base, and hence the borrowing capacity, will diminish over time.

(iii) The CAPM can be used to arrive at an ungeared cost of capital, which can then be used to discount the cash flows over five years. The CAPM is an annual model, so the assumption must be questioned.

(d) *Areas for further research*

(i) This memo is incomplete without a detailed sensitivity analysis being carried out. Such an analysis would seek to determine which of the above assumptions was likely to change, and by how much.

(ii) It is also not possible to assess whether this project is advisable in isolation from other capital opportunities and needs of the firm. It is unclear whether capital is in short supply.

(iii) The scenario presumes that there is no alternative bidder for the mine. However, it is possible that supplies to Station X might be secured by offering a fixed price contract to an alternative bidder for the supply of coal. In this case we ourselves can avoid the risks inherent in this industry, about which we know so little, and concentrate on our strengths.

9 DIVIDEND POLICY

The factors influencing dividend policy may be considered under four main headings.

Legal and procedural factors

Under the Companies Acts, dividends may only be paid out of accumulated, realised profits, so far as not previously utilised (by distribution or capitalisation) less accumulated realised losses, so far as not previously written off. In addition, a public company must not make a distribution of dividend if to do so would reduce its net assets below the aggregate of its called-up share capital and undistributable reserves.

In the past, governments have operated policies restraining dividends. However, no such policies exist at present or are proposed.

Shareholders usually have the power at the AGM to vote to reduce the size of the final dividend, but not to increase it. Thus the directors are in a strong position in determining the dividend policy of the company.

Practical constraints

These include the following.

(a) *Liquidity*. The company must maintain adequate liquidity, particularly in a period of expansion, and must also take into account the need to pay ACT on the dividend.

(b) *Inflation*. In a period of inflation, the company will need to retain a proportion of its profits within the business just to maintain the operating capability.

(c) *Earnings stability*. In a company with generally stable earnings it will be possible to sustain a higher payout ratio than in a firm where there are large annual fluctuations in the level of profits.

(d) *Funds needed for investment*. Retained earnings form a readily available form of finance for new investment which are free of transaction costs (by comparison with the cost of arranging loans and new share issues).

Relationship to financing

The level of dividend payments and therefore the payout ratio inevitably has an effect on the level of funds retained for reinvestment within the business. Retained earnings are frequently the preferred source of finance, and research has shown this to be the single most important source of funds in the UK in the last few years. The advantages of retained earnings are as follows.

(a) Control is maintained - a new issue of shares may alter the structure of ownership and control within the company.

(b) Transaction costs are low.

(c) Gearing is kept down, and therefore the company is less vulnerable to interest rate fluctuations.

However, if the company is embarking on a period of major expansion, it is unlikely that retained earnings alone will be able to satisfy its demands for capital. If it is considering making a new issue of shares, then it will be very concerned to ensure that the share price is high and stable to enable the issue to be successful. Traditional theory holds that the market price of shares is linked to the level of dividends which are seen as a means of maximising shareholder wealth, high dividends being linked with high share prices. Thus it is in the interests of the company to make the shares attractive by operating a reasonably generous and stable dividend policy.

In contrast with this, Modigliani and Miller contended that dividend levels were irrelevant in the determination of share prices. They claimed that investors are indifferent between dividend payments and capital gains, the value of a company being dependent upon the earning power of its assets. However this view is based upon a number of assumptions which cause problems.

(a) It assumes that income from dividends and capital gains are subject to unified taxation. However in practice, although the same marginal tax rates apply, the investor has a separate allowance for capital gains tax, and he also has the ability to determine the timing of capital gains for himself in order to optimise his tax position.

(b) It does not take into account that investors in general prefer a certain current income to an uncertain future income.

(c) It assumes that markets are perfect, and that the transaction costs involved in trading shares are irrelevant. In practice this is not the case, and investors will require some level of regular income to compensate for this and to avoid the need to sell shares to obtain income.

Shareholder expectations

The main financial aim of a company must be the maximisation of shareholder wealth. This can be achieved by some combination of capital growth and dividend payments. The mix that will be preferred will depend on the current tax situation of investors, the extent to which they rely on their shares to provide a regular income, and their attitude to uncertainty. In general, as described above, an investor will prefer a certain current income to an uncertain future one, and thus some level of dividends will be required.

In conclusion, a company with the aim of maximising the wealth of the ordinary shareholders must decide whether profits should be distributed or whether investors would be better off if the profits were reinvested in the business. The directors must take into account the income and tax situation of its shareholders, together with the effect of its dividend policy on its ability to raise further finance and on its gearing level. It will be constrained by the legal and procedural requirements and by practical considerations.

10 WORKING CAPITAL

(a) In order to carry on a business successfully a company cannot just invest in capital projects and fixed assets. It must also invest in and exercise control over working capital: stocks, debtors and creditors. This working capital has an important bearing on a company's cash needs and cash flows, and therefore on its liquidity which is as important as its profitability.

Different companies will have different working capital needs depending on the nature of the company's business. The statement in the question that 'stronger and more profitable companies have a higher proportion of working capital' may well be true for a manufacturing company. A manufacturing company will need substantial levels of stocks and will probably have high levels of debtors and creditors as well. However, an equally profitable service company may have a much lower proportion of working capital as although it may have debtors and some creditors, a service company is unlikely to have large stocks.

Even in manufacturing companies, a decision to use Just in Time techniques of production, if implemented successfully, would result in lower stocks, with smaller batches being produced and so smaller stocks of finished goods.

So a company need not necessarily have a high proportion of working capital in order to be profitable or strong. Conversely companies with high proportions of working capital are not necessarily profitable, well managed companies. It may be that in some companies the reason for high working capital is bad management. Stock control and credit control may be lax whilst not enough advantage is being taken of available trade credit. A much more profitable company may have lower levels of working capital due to an efficient stock-holding policy, tight credit and minimum cash holdings.

(b) There is no rigid rule as to how, ideally, trade debtors and stocks should be financed. Generally current assets are financed by a mixture of short-term and long-term funds.

However, certain values of ratios are accepted as being 'ideal' although these will vary depending upon the circumstances of an individual company. The ratios used to measure the financing of current assets are the liquidity ratios.

(i) The current ratio (current assets:current liabilities) is generally thought to be ideal at a ratio of 2:1. This means that half of current assets should be financed by current liabilities and half by long-term funds.

(ii) The quick ratio (current assets minus stock:current liabilities) is generally thought to be ideal at a ratio of 1:1.

When deciding upon the policy to be adopted by a company in financing its trade debtors and stocks, the management of a company must balance the cost of financing against the risk of insolvency. If the company's creditors suddenly demand immediate payment or the bank demands repayment of the company's overdraft, the company will be in danger of insolvency unless it is able to turn enough of its assets into cash quickly. Trade debtors can be more easily converted into cash than stocks, as stocks must first be sold to generate debtors and the debts must be collected in cash: if the company's current assets were financed wholly by its trade creditors or overdraft (a current ratio of 1:1) then there would be a danger of the company's becoming insolvent.

On the other hand current liabilities are often a much cheaper form of finance than long-term funds. Creditors and amounts owing in taxation rarely carry an interest cost and bank overdraft interest is calculated on the balance borrowed from day to day.

Therefore trade debtors and stocks should be financed by a mixture of long-term and short-term funds while the proportions in which these two sources of finance are used will vary from enterprise to enterprise. Companies have to consider whether in the interest of higher profits it is worth accepting the risk of insolvency by increasing current liabilities. The final decision on how current assets are financed will therefore depend on the management's attitude to this risk.

11 THREE DECISIONS

(a) *Investment decisions*

These decisions involve the selection of new projects, or of companies or other securities to invest in. Such decisions will be taken in the light of required rates of return and estimated risks. Financial managers should also consider the effect on cash flows, and the ease with which investments can be withdrawn from should it be necessary.

Financing decisions

Once investments have been identified as possibly suitable for the company, methods of financing them must be selected. Possibilities include new share issues, loans, the retention of profits and sales of assets. The costs of different sources of finance will be relevant here.

Dividend decisions

When a company makes profits, they may be distributed to shareholders or retained in the business. The directors must decide how much to distribute, taking into account the needs of the business and the preferences of shareholders for current income or future capital gains.

These three types of decision all interact. The acceptability of an investment depends on the cost of the chosen method of finance. One possible source of finance is the retention of profits, and hence the restriction of dividends. A company's dividend policy may well affect its share price, and hence the scope for financing investments by share issues. Loans for

investments may be made conditional on a certain dividend policy. Finally, the selection of profitable investments should give scope for increased dividends in the future.

(b) *Relevant information*

(i) *Investment decisions: new projects*

Estimated amounts and timings of cash flows
The level of uncertainty of those estimates
An appropriate discount rate, and the net present value at that rate
The internal rate of return
The impact on accounting profit
Details of alternative projects

(ii) *Investment decisions: investment in other companies and securities*

Amounts available to invest
Current and forecast returns
Market rates of return
Prospects for capital growth
Levels of risk involved

(iii) *Financing decisions*

Possible sources of finance
The current share price
The current state of the stock market
Current and forecast interest rates
The company's level of gearing
Cash flow projections

(iv) *Dividend decisions*

Profits available for distribution
Market expectations
The need to maintain a high share price
Cash flow projections
Opportunities for internal use of retained profits

12 FORECASTING FAILURE

(a) There are a variety of approaches that have been used to attempt to predict company failure. One of these is the use of the 'Z-score' developed by Altman on the basis of the analysis of a relatively small sample of US firms, both failed companies and going concerns. In this analysis, five factors emerged as being key factors in determining the financial soundness of a company, and these five factors could then be weighted to produce a single Z-score which could be used to predict the likelihood of failure. Other approaches focus on the use of ratio analysis to predict instability.

All these approaches are developed by attempting to correlate failure with the financial profile of the company immediately prior to failure. They are thus all clearly historic in approach and are descriptive rather than explanatory. Although the results at times seem to give some empirical success in predicting failure, it is unreasonable to expect a given formula or approach to be capable of predicting failure in economic and commercial situations which are significantly different from those under which the formula was derived.

The historical approach is only valid if the data to which the formula is applied can reasonably be expected to form the basis of a valid projection of the future. In practice, this is often not the case, a given set of financial relationships only being a snapshot from one angle of the firm at one given point in time.

A further factor to be considered is the way in which an attempt to predict failure can become a self-fulfilling prophecy. If a bank monitors the performance of its clients against a certain set of yardsticks and in so doing believes it has identified one which is on the brink of collapse, it may decide on this basis to withdraw its support. This action may in itself then bring about the failure of the company which might otherwise have survived.

(b) Reasons why even properly applied models may not predict failure correctly include the following.

(i) Failure is often apparently catastrophic due to the concealment of the true financial situation through manipulation of the accounts.

(ii) Good management may mean that the company is able to analyse the problems itself and take avoiding action, in other words to use the analysis to prevent the predicted outcome from taking place.

(iii) Certain companies and industries may have a unique combination of financial structure and trading conditions which mean that ratios which would generally indicate problems are not in fact dangerous. For example, food retailers can operate with apparently very low current and quick ratios due to the fact that the majority of their customers pay cash while they receive credit from their suppliers.

13 MR JONES

(a) (i) Mr Jones' estimate of the post acquisition share price of £8.33 is based on a total of 15m shares in issue at a market capitalisation of £125m. If this market capitalisation estimate was based on earnings, then it can only be assumed that he has applied RD's current P/E ratio of 12.5 to the group's combined earnings of £10m (£2.5m + £7.5m).

The estimated EPS is arrived at by dividing this combined earnings figure by the 15m total number of shares in issue post-acquisition.

The estimated equivalent value of one old LO share is then found by taking the estimated post-acquisition share price and multiplying by 10/15 - the basis of the offer for the shares.

(ii) REPORT

To: A N Other
From: A N Accountant 23 May 19X5
Subject: Pricing of RD plc's offer for LO plc

Calculation of likely post-acquisition share price

The probable post-acquisition share price can be estimated by finding the total market capitalisation of the new group and dividing this by the number of shares in issue following the acquisition. This method assumes that the existing market capitalisations are a fair reflection of the value of the two companies, and ignores any synergistic effects arising from the acquisition:

	RD	*LO*	*Group*
Earnings available to equity	£2.5m	£7.5m	
P/E ratio	12.5	7.5	
Market capitalisation	£31.25m	£56.25m	£87.5m
Number of shares in issue			15m
Theoretical share price			£5.83

Effect on shareholders in RD plc

The shareholders in RD plc will retain the same number of shares after the acquisition, but their price will have fallen from £6.25 to £5.83 per share. This represents a loss in value of £2.1m (5m × (£6.25 – £5.83)) to the shareholders. In addition RD will have to issue a further 10m shares to the shareholders of LO. This means that the shareholders in RD will have lost control of the group, owning only one third of the total number of shares in issue post-acquisition. Thus on the basis of the information provided, this bid does not appear to be in the best interests of the shareholders in RD. However, these calculations do not take into account any earnings improvement in LO after the change of ownership. If Mr Jones is indeed able to bring about a significant improvement in performance then the bid could hold some long term benefits for the shareholders, in financial terms at least.

Effect on shareholders in LO plc

As calculated above, the bid will result in a transfer of value of some £2m to the shareholders in LO. In addition the LO shareholders will hold the majority of shares in the new group. The bid is therefore in their interests and should be accepted unless the directors of LO believe they can produce substantial improvements in earnings performance in the near future.

(b) The new information will affect the value of the combined group as follows. The improvement in net income of £7.5m will be capitalised at 15% (RD's cost of capital) to give a value of £50m.

	£m
Market capitalisation as calculated above	87.5
Add: One-off administrative savings	5.0
Sale of assets at end of year 1	
£10m × 0.87 (discounted at 15%)	8.7
Improvement in net income	50.0
Revised market capitalisation	151.2
Number of shares in issue	15m
Theoretical share price	£10.08

The shareholders in LO therefore own an additional potential value of £63.7m (£151.2m – £87.5m). Whether they are able to use this knowledge to gain an improvement in the offer depends on their bargaining position. If a takeover of LO is an attractive proposition to other companies as well as RD this may mean that the shareholders are able to push the price up to what another bidder would be prepared to pay. The precise amount will depend on the size of the increase in value that the other bidders believe they could realise. If however there are no other potential offers then the shareholders may not be able to obtain much improvement on RD's initial offer.

14 BLACK RAVEN LTD

(a) *An assets basis valuation*

If we assume that a purchaser would accept the revaluation of assets by the independent valuer, an assets valuation of equity would be as follows.

	£	£
Fixed assets		
(ignore patents, assumed to have no market value)		
Land and buildings		1,075,000
Plant and equipment		480,000
Motor vehicles		45,000
		1,600,000
Current assets		383,000
		1,983,000
Less: current liabilities	230,000	
loan	400,000	
		630,000
Asset value of equity (300,000 shares)		1,353,000

Value per share = £4.51

Unless the purchasing company intends to sell the assets acquired, it is more likely that a valuation would be based on earnings.

(b) *Earnings basis valuations*

If the purchaser believes that earnings over the last five years are an appropriate measure for valuation, we could take average earnings in these years, which were

$$\frac{£465,000}{5} = £93,000$$

An appropriate P/E ratio for an earnings basis valuation might be the average of the three publicly quoted companies for the recent year. (A trend towards an increase in the P/E ratio over three years is assumed, and even though average earnings have been taken, the most recent year's P/E ratios are considered to be the only figures which are appropriate.)

	P/E ratio	
Albatross plc	8.5	
Bullfinch plc	9.0	
Crow plc	10.0	
Average	9.167	(i)
Reduce by about 40% to allow for unquoted status	5.5	(ii)

Share valuations on a past earnings basis are as follows.

	P/E ratio	*Earnings* £'000	*Valuation* £'000	*Number of shares*	*Value per share*
(i)	9.167	93	852.5	300,000	£2.84
(ii)	5.5	93	511.5	300,000	£1.71

Because of the unquoted status of Black Raven Ltd, purchasers would probably apply a lower P/E ratio, and an offer of about £1.71 per share would be more likely than one of £2.84.

Future earnings might be used. Forecast earnings based on the company's five year plan will be used.

		£	
Expected earnings:	Year 1	100,000	
	Year 2	104,000	
	Year 3	108,160	
	Year 4	112,486	
	Year 5	116,986	
	Average	108,326.4	(say £108,000)

A share valuation on an expected earnings basis would be as follows.

P/E ratio	*Average future earnings*	*Valuation*	*Value per share*
5.5	£108,000	£594,000	£1.98

It is not clear whether the purchasing company would accept Black Raven's own estimates of earnings.

(c) *A dividend yield basis of valuation with no growth*

There seems to have been a general pattern of increase in dividend yields to shareholders in quoted companies, and it is reasonable to suppose that investors in Black Raven would require at least the same yield.

An average yield for the recent year for the three quoted companies will be used. This is 12%. The only reliable dividend figure for Black Raven Ltd is £45,000 a year gross, in spite of the expected increase in future earnings. A yield basis valuation would therefore be

$$\frac{£45,000}{12\%} = £375,000 \text{ or } £1.25 \text{ per share.}$$

A purchasing company would, however, be more concerned with earnings than with dividends if it intended to buy the entire company, and an offer price of £1.25 should be considered too low. On the other hand, since Black Raven Ltd is an unquoted company, a higher yield than 12% might be expected.

(d) *A dividend yield basis of valuation, with growth*

Since earnings are expected to increase by 4% a year, it could be argued that a similar growth rate in dividends would be expected. We shall assume that the required yield is 17%, rather more than the 12% for quoted companies because Black Raven Ltd is unquoted. However, in the absence of information about the expected growth of dividends in the quoted companies, the choice of 12%, 17% or whatever, is not much better than a guess.

$$P_0 = \frac{D_0(1+g)}{(r-g)} = \frac{45,000(1.04)}{(0.17-0.04)} = £360,000 \text{ or } £1.20 \text{ per share.}$$

(e) *The discounted value of future cash flows*

The present value of cash inflows from an investment by a purchaser of Black Raven Ltd's shares would be discounted at either 18% or 14%, depending on the view taken of Black Raven Ltd's assets. Although the loan of £400,000 is secured on some of the company's property, there are enough assets against which there is no charge to assume that a purchaser would consider the investment to be backed by tangible assets.

The present value of the benefits from the investment would be as follows.

Year	*Cash flow*	*Discount factor*	*PV of cash flow*
	£'000	14%	£'000
1	120	0.877	105.24
2	120	0.769	92.28
3	140	0.675	94.50
4	70	0.592	41.44
5	120	0.519	62.28
			395.74

A valuation per share of £1.32 might therefore be made. This basis of valuation is one which a purchasing company ought to consider. It might be argued that cash flows beyond year 5 should be considered and a higher valuation could be appropriate, but a figure of less than £2 per share would be offered on a DCF valuation basis.

(f) *The accounting rate of return method*

If a company wishing to take over Black Raven Ltd expects to make an accounting rate of return of, say, 20%, and assuming that a return of £100,000 is assumed for this purpose the valuation of Black Raven Ltd might be:

$$\frac{£100,000}{20\%} = £500,000, \text{ or } £1.67 \text{ per share.}$$

(g) *The super-profits method*

If we assume that the normal rate of profit is 5% on net assets, the normal profits might be as follows (although 'net assets' could be defined in other ways).

	£
Asset value of equity (see (a))	1,353,000
Add asset value of loan stock	400,000
Net assets	1,753,000
Actual (current) profit	100,000
Less normal profit after taxation (5%)	87,650
Super-profits	12,350
Goodwill (say two years purchase of super-profits)	£24,700

The total purchase consideration for equity would be £1,353,000 + £24,700 = £1,377,700 or £4.59 per share.

(h) *Summary*

Any of the preceding valuations might be made, but since share valuation is largely a subjective matter, many other prices might be offered. In view of the high asset values of the company an asset stripping purchaser might come forward.

15 BRIVE PLC

Tutorial note. Part (a) requires the preparation of the post-reconstruction balance sheet. Since there are a reasonable number of adjustments to be made it is helpful to tabulate these to avoid errors.

In your report in part (b) you will need to calculate the returns to all parties in the event of a liquidation. When calculating the amount due to the debenture holders, the realisable value of the property should be used and not the book value.

The advantages and disadvantages can be evaluated by calculating the return on the incremental investment to be made by each party. Remember to include the cash foregone when calculating the incremental investment. A discussion of the effect of the reconstruction on the level of risk borne by the different parties is also useful.

Suggested Solution

REPORT

To: Board of Directors
From: M Accountant
Date: 17 September 19X5
Subject: Proposed capital reconstruction

Introduction

The purpose of this report is to evaluate the implications of the proposed capital reconstruction of Brive plc for the various affected parties, including the shareholders, debenture holders, unsecured creditors and the bank. Calculations showing the effect of the reconstruction on the balance sheet are included as an appendix to this report.

Ordinary shareholders

In the event of Brive going into liquidation, the ordinary shareholders would be most unlikely to receive anything for their shares, since the net proceeds of the liquidation would be as follows.

	£
Property	2,000,000
Plant	1,000,000
Stock	1,700,000
Debtors	1,700,000
Liquidation costs	(770,000)
	5,630,000

The total amount due to the creditors, bank and debenture holders is £8,600,000, leaving nothing available for the shareholders.

If the reconstruction is undertaken, the existing shareholders will have to provide an additional £1m of capital in subscribing to the rights issue. However, if the projections are correct the effect of this should be to bring Brive back into profit, with earnings after interest amounting to £1.4m (£1.75m – £0.35m) per annum. This amounts to earnings per share of 28p which should permit Brive to start paying a dividend and providing some return to the shareholders again. The fact that the company is returning to profit should also make it possible to sell the shares if required which is presumably difficult at the present time. However there would be a substantial shift in the balance of control with the existing shareholders being left with only 40% of the equity, the balance being in the hands of the present debenture holders.

Secured debenture holders

Under the existing arrangements, the amount owing to the debenture holders is £3m. Although the debentures are secured on the property which has a book value of £3m, in the event of a forced sale this would only be likely to realise £2m giving a shortfall of £1m. The debenture holders would rank alongside the bank and the other creditors for repayment of this balance. As has been calculated above, the amount that would be realised on liquidation and available to the unsecured creditors would be £3.63m (net of property proceeds). The total amount owed is:

	£m
Debenture holders	1.0
Bank (overdraft)	1.6
Creditors	4.0
	6.6

The debenture holders would therefore only receive 55 pence in the pound on the balance owing, giving a total payout of 85 pence in the pound ((£2m + £0.55m)/£3.0m).

Under the proposed scheme, the debenture holders would receive £2.8m of new capital in return for the old debentures ie 93.33 pence in the pound in the form of capital rather than cash. Of this, £1.3m would be in the form of 14% unsecured loan stock, and the remainder in the form of equity. They would also have to subscribe an additional £1.5m to take up the rights issue. Their total investment in the reconstruction would therefore be:

	£m
Cash foregone from liquidation	2.55
Additional cash investment	1.50
	4.05

Returns would be:

	£
Interest (£1.3m × 14%)	182,000
Return on equity (£3m × 0.28)	840,000
	1,022,000

This represents a return of 25.23% which is likely to be above that which could be earned elsewhere thus making the scheme attractive to the debenture holders. However, in addition they would have to forego their security on the property and rank partly with the unsecured creditors

and partly with the equity. They should therefore be confident of the ability of the management to deliver the projected returns before consenting to the scheme.

The bank

Since the overdraft is unsecured, the bank would rank for repayment alongside the unsecured creditors. As calculated above, the amount to be repaid would be 55 pence in the pound, and the bank would thus recover £880,000 in the event of a liquidation. In the reconstruction, the bank would have to write off £400,000, but would receive interest of 14% per annum leading to repayment of the balance in five years time.

The investment that the bank would be making would therefore be the cash forgone from the liquidation of £880,000. The annual returns would be £168,000 (14% × £1.2m) which represents a return on the incremental investment of 19.1%. Provided that the bank is confident of the financial projections of the management, it stands to receive £1.2m in five years' time. The effective return of 19.1% in the meantime is in excess of current overdraft rates, and the level of security is improved since there would no longer be secured debenture holders ranking ahead of the bank for repayment. The scheme is therefore likely to be attractive to the bank.

Unsecured creditors

If Brive goes into liquidation the unsecured creditors will receive 55 pence in the pound ie £2.2m. Under the proposed scheme they would stand to receive 75 pence in the pound with apparently no significant delay in payment. If Brive continues to operate they will be able to continue to trade with the company and generate further profits from the business. The proposed scheme therefore seems attractive from their point of view.

Conclusions

The proposed scheme appears to hold benefits for all the parties involved. It is also in the interests of Brive's customers and workforce for the company to continue to trade. However these benefits will only be realised if the directors are correct in their forecast of trading conditions and if the new investment can achieve the projected returns. All parties should satisfy themselves as to these points before considering proceeding further with the reconstruction.

	Before	*Adjustment*					*After*
	£'000	*a*	*b*	*c*	*d*	*e–g*	£'000
Fixed assets	5,700	(2,100)				2,500	6,100
Current assets							
Stock	3,500	(800)					2,700
Debtors	1,800	(100)					1,700
	5,300						4,400
Creditors	(4,000)					1,000	(3,000)
Overdraft	(1,600)				1,600		0
Working capital	(300)						1,400
Total assets	5,400						7,500
10% Debentures	(3,000)			3,000			0
14% Stock				(1,300)	(1,200)		(2,500)
Net assets	2,400						5,000
Capital and reserves							
Share capital	4,000		(3,000)	1,500		2,500	5,000
P&L account	(1,600)		1,600				0
	2,400						5,000

16 COMMON MARKET

Tutorial note. This is a question on the different types of international trade agreement and the benefits from engaging in free trade and economic co-operation. Bear in mind that a common market such as the EU is a localised free trade area which may (as the EU does) adopt protectionist measures which militate against freedom of trade with countries outside the common market area.

Suggested solution

(a) A free trade area exists when there is no restriction on the movement of goods and services between countries. This may be extended into a customs union when there is a free trade

area between all member countries of the union, and in addition there are common external tariffs applying to imports from non-member countries into any part of the union. In other words, the union promotes free trade among its members but acts as a protectionist bloc against the rest of the world.

A common market encompasses the idea of a customs union but has a number of additional features. In addition to free trade among member countries there is also complete mobility of the factors of production. A British citizen has the freedom to work in any other country of the European community, for example. A common market will also aim to achieve stronger links between member countries, for example by harmonising government economic policies and by establishing a closer political confederation.

(b) The most obvious benefits which countries might gain from forming a common market are associated with free trade between them. The benefits of free trade are illustrated by the law of comparative advantage which states that countries should specialise in producing those goods where they have a comparative advantage. Specialisation, together with free trade, will result in an increase in total output and all countries will be able, to a great or lesser extent, to share in the benefits.

In particular, different countries have different factor endowments and, as the international mobility of these factors tends to be severely limited, trade increases the range of goods and services available in a particular country. By becoming part of a common market, imports from other member countries are available more cheaply and easily. Imports of certain raw materials or types of capital equipment not otherwise available in a particular country will improve its productive potential, enabling a faster rate of economic growth to be achieved. Similarly, improvements in the range and quality of consumer goods available will tend to enhance a country's standard of living.

In addition, there is a larger market for domestic output and firms may be able to benefit from economies of scale by engaging in export activities. Economies of scale improve efficiency in the use of resources and enable output to be produced at lower cost. This also raises the possibility of benefits to consumers if these cost savings are passed on in the form of lower prices. In addition, the extension of the market in which firms operate increases the amount of competition they face and hence should improve efficiency.

Establishment of a common market is often accompanied by some form of exchange rate agreement between members and this in turn is likely to encourage further trade as it reduces uncertainty for both exporters and importers. Stability of exchange rates is also beneficial to a government in formulating its domestic economic policies.

Membership of a common market may be particularly beneficial to smaller or weaker economies as, in addition to increasing the availability of essential factors of production and the range of goods and services available to domestic consumers, it also enables them to benefit from any economic growth experienced by their fellow members. Spin-offs may be in the form of larger markets for their exports, lower import prices, improved employment opportunities and so on.

In addition to fostering economic ties between countries, common markets provide the basis for stronger political links. Again, this may be particularly important for smaller countries enabling them to benefit from an enhanced position in the world economy. It may also encourage further international economic co-operation, in turn providing an additional stimulus to growth.

17 IMF AND MULTINATIONALS

(a) The International Monetary Fund was established in 1944 following the Bretton Woods conference, and it started operations in 1947. The Bretton Woods conference aimed to encourage a more stable pattern of world trade after World War II than that which had existed previously. In the 1930s, there had been floating exchange rates after the abandonment of the gold standard. Bretton Woods introduced a period of fixed exchange rates. The IMF was intended to assist the process of co-operation in monetary matters involving foreign exchange and to help to stabilise exchange rates. The International Bank for Reconstruction and Development (the 'World Bank') was set up alongside the IMF and had the role of promoting capital investment in member countries, following the damage suffered in World War II.

The IMF has three broad aims.

(i) It aims to promote international monetary co-operation through establishing a code of conduct for making international payments and providing for greater exchange rate stability.

(ii) The Fund provides financial support to countries which have temporary balance of payments deficits.

(iii) It aims to provide for an orderly growth in international liquidity, through its scheme of Special Drawing Rights (SDRs), which were launched in 1970.

The Fund operates by making funds for lending available out of the subscriptions or 'quotas' of member countries. 75% of members' quotas are contributed in the member countries' own currency and 25% is in other currencies, mainly US dollars and SDRs. Quota levels are set according to the size of member countries' economies. IMF loans are generally repayable in three to five years.

The SDR was created with the purpose of providing a new form of international liquidity, and ensuring that there is enough international liquidity for the world's needs. The supply of SDRs is subject to periodic review, and is increased by international consent. However, a proposal for a substantial increase in the volume of SDRs in 1989 was resisted, mainly by the USA, on the grounds that an excessive growth of the international money supply would add to inflation rates throughout the world.

SDRs count as part of the member country's official reserves and are in proportion with quotas. Quotas, which have expanded in line with the expansion in international trade, determine the voting rights of members.

A board of directors manages the fund; the directors are nominated by major economies. The USA is a major contributor to the IMF, accounting for about 20% of quotas.

The IMF applies conditions to loans which can be harsh on the borrowing country. The Fund regards its lending as fairly short-term. In order to repay borrowings quickly, a country is expected to take effective action to improve their balance of payments position. The IMF generally takes the position that a country should take deflationary measures which reduce the demand for goods and services in the economy. This may require increases in taxation and cuts in government spending. The deflationary measures necessary may lead to falls in the standard of living in the country and increases in unemployment. The objective from the point of view of the IMF will be to reduce levels of imports. Reductions in price inflation should enable the industries of the country to direct resources into export markets.

During the 1960s and 1970s, the IMF's lending limits proved to be insufficient to meet demand for international liquidity and the fund made arrangements to increase the borrowing capacity of countries with balance of payments difficulties. Apart from increasing quotas, the Fund has sold gold and has powers to borrow from any source, whether official or private. So far, however, supplementary borrowing by the IMF has been restricted to official sources, and the IMF, unlike the World Bank, has not tapped the international commercial markets as a source of borrowing.

(b) The euromarkets are international money and capital markets in which organisations from one country raise funds from lenders in other countries, usually in a currency that is not the domestic currency of the borrowing organisation.

Eurocurrency is a term used to describe funds in a currency deposited with a bank which is outside the currency's country of origin. For example, eurodollars are US dollars deposited with a bank outside the USA. The eurocurrency markets are markets for the lending and borrowing of eurocurrency. Banks with which eurocurrency is deposited will re-lend the currency to borrowers, and so companies which wish to borrow in a foreign currency can borrow eurocurrency from a bank. Eurocurrency borrowing is mainly short term, but can be medium term (up to five years or so).

Interest rates on eurocurrency lending are about the same (but not necessarily exactly the same) as domestic interest rates available in the currency's country of origin.

Eurocurrency loans can be very large, and in the case of large loans, a syndicate of banks might provide the funds to the borrower.

Eurobonds are bonds issued by a borrowing company or other organisation, in two or more financial centres at the same time and often in foreign currency. The term of a eurobond issue is typically 10 to 15 years, and eurobonds are marketable, with fairly well-established 'secondhand' markets for trading in them, the bonds being quoted on one or more stock markets. Only well-established, large, and creditworthy borrowers can issue eurobonds.

The *euro-equity market* relates to the issue of equity shares by multinational companies on two or more international stock markets at the same time. The company's shares are then traded in the two or more markets simultaneously. This has an effect on share prices. If a share is traded on the New York and London exchanges, say, a fall in its price on the New York exchange will result in a matching fall in its price in London.

(c) The factors which are relevant to choosing between borrowing on the euromarkets or the domestic markets are as follows.

(i) *The currency that the borrower wants to obtain.* Multinational companies often want to borrow in a foreign currency (to reduce their foreign exchange exposure) and it might be more convenient to borrow on the euromarkets than in a foreign domestic market. Where foreign exchange exposure can be reduced by matching income in a foreign currency against interest and capital repayments on borrowing, a further advantage of euromarket borrowing might be that interest rates on a foreign currency borrowing might be lower than domestic interest rates: for a UK company, interest rates on deutschmarks might be a lot less than interest rates on sterling.

(ii) *Cost.* There is often a small difference in interest rates between eurocurrency and domestic markets. On large borrowing, however, even a small difference in rates can result in a large difference in the total interest charge on the loan.

(iii) *Timing and speed.* In the past, it has usually been possible to raise money on the Euromarkets more quickly than on the domestic markets.

(iv) *Security.* Euromarket loans are usually unsecured, whereas domestic market loans are more commonly secured. Large borrowers might wish to avoid having to give security and prefer to ask lenders to rely on the borrower's high credit rating.

(v) *Size of loan.* It is often easier for a large multinational to raise very large sums on the Euromarkets rather than in a domestic financial market.

18 AARDVARK LTD

Aardvark Ltd has the following options.

(a) It can continue its existing policy.

(b) It can use the export factor, either in combination with its existing overdraft, or using the 80% finance offered by the factor.

(c) It can use the insurer with the assignment of policy rights (since cheaper finance is available at no extra cost.

It is assumed that all export debts will be financed by an overdraft or by special lending arrangements.

(a) *Use of the export factor for debt collection only*

	£
Service fee (3% × £1,000,000)	(30,000)
Bad debts saved (by insurance) (0.5% × £1,000,000)	5,000
Administration costs saved	35,000
Net saving	10,000

(b) *Use of the export factor for debt collection and finance*

That there will be a saving in finance charges of 0.5% a year on 80% of the average debtors required.

	£
Service fee for debt collection	(30,000)
Interest costs saved (0.5% × 80% × £1,000,000 × 90/360)	1,000
Bad debts saved	5,000
Administrative costs saved	35,000
Net saving	11,000

(c) *Use of the insurer*

If the insurer was used, there is a saving of 1% on 70% of the finance required, since 70% of finance will be obtained at just 1.5% above base rate, instead of 2.5% above base rate.

	£
Insurance costs (0.35% × £1,000,000)	(3,500)
Savings in bank interest (1% × 70% × £1,000,000 ×90/360)	1,750
Savings in bad debts (90% × 0.5% × £1,000,000)	4,500
Net saving	2,750

Conclusion

Aardvark Ltd should use the services of the export factor, and obtain finance for 80% of export credit sales from the factor.

19 PURCHASING POWER PARITY AND THE EMS

The theory of purchasing power parity implies that the equilibrium exchange rate between two currencies is that at which each currency has the same domestic purchasing power. For example, if the pound/dollar exchange rate is $2 = £1, then purchasing power parity exists if the money amounts of $2 and £1 can buy the same amount of goods and services in each of the relevant countries. There will often, however, be difficulties in making comparisons between the purchasing power of currencies arising out of the differences in available commodities and market structures in the different countries.

Purchasing power parity theory would predict that, in the long term at least, the exchange rate for currency A against currency B will change by the proportion:

$$\frac{1 + a}{1 + b}$$

where a is the rate of inflation in the country of currency A over the period (expressed as a proportion), and b is the rate of inflation in the country of currency B over the same period.

The theory is based on the idea that if purchasing powers differed significantly between countries, then people would exchange currencies in order to buy goods where they are cheaper. In reality, this is often not practical because of the costs of transport and because of tariffs. It may also be argued that exchange rates are determined not by trade of goods and services between countries, but by the demand for and supply of foreign currencies. These will be influenced by other factors such as capital transfers and government policy. During the 1980s, sterling fluctuated in its dollar exchange value between a rate of around $2.40 and a little over $1.00. These wide fluctuations clearly did not reflect movements in the relative prices of goods and services in the UK and the USA.

The exchange rate mechanism (ERM) of the European Monetary System is designed to stabilise exchange rates of member currencies, based on permitted margins around central 'parity' rates for each currency. Although realignments of currencies are possible, these are intended to be occasional only. The wide fluctuations sometimes experienced by floating currencies, as illustrated by the pound/dollar exchange rates in the 1980s which were mentioned above, are not to be expected within the EMS.

Stabilisation of exchange rates would imply the following consequences in the light of purchasing power parity theory. Firstly, the theory would imply that a currency entering the system should aim to enter at a central rate which establishes parity of purchasing power with the other currencies in the system. Our earlier analysis suggests that if this is not achieved, the central rate will not be a long-term equilibrium rate for that currency and in time one might expect market pressure to be exerted on the exchange rate to bring it into line with the purchasing power parity rate.

For currencies already within the ERM, the theory would suggest that differences in inflation rates between different countries would lead to pressures on exchange rates to adjust, with higher inflation countries having currencies which would be under pressure to depreciate in order to restore currency values in line with their purchasing power equivalents. Whether exchange rates are realigned to adjust for these pressures will depend upon the action taken by member countries in the ERM. The authorities may be unwilling to allow currencies of high-inflation countries to depreciate.

A consequence of applying the theory to the operation of the ERM could thus be that the option of currency depreciation to bring purchasing power parities into line following different inflation rates in different countries is removed. One might then expect that the removal of this option would help to stabilise average price levels between member countries: since the exchange rate cannot adjust, the domestic purchasing power of currencies - in other words, the prices of goods and services - must also stabilise to maintain the equilibrium parity exchange rates. Our original

objections to purchasing power parity theory concerning the other influences on exchange rates, coupled with other influences on domestic price levels, may prevent this from happening quickly. However, the liberalisation of markets for goods and services among EU countries should serve to remove some of the obstacles to the option of buying goods where they are cheapest within Europe.

When the UK joined the ERM in 1990, one of the potential benefits claimed for membership was that the UK inflation rate should be expected to approach average European levels as the result of membership. However, the UK's membership later had to be suspended, and in August 1993 the ERM permitted fluctuation bands had to be widened to 15%. It is arguable that a lack of purchasing power parity made the ERM unsustainable.

20 IMPORT-EXPORT MERCHANT

(a) The foreign exchange operations are assumed to occur as follows. On 31 December, the merchant will arrange four foreign exchange transactions. These are:

(i) to obtain sufficient X$ to purchase 500 tonnes in January, at the spot rate;

(ii) to obtain sufficient X$ to purchase 1,000 tonnes in February, at the one month forward rate, that is, at the beginning of February;

(iii) to sell Y$ to be received from the customer (for the first 500 tonnes) in February, at the end of February rate (two months forward);

(iv) to sell Y$ to be received by the end of March on the final 1,000 tonnes at the end of March rate (three months forward).

The bank selling rate (customer buying rate) is the left hand figure in each case and the bank buying rate (customer selling rate) for foreign currency is the right hand figure.

Purchase costs		X$	£
(i) January:	X$11,820 × 500 tonnes	5,910,000	
	Rate of conversion	107.45	
			55,002
(ii) February	X$11,820 × 1,000 tonnes	11,820,000	
	Rate of conversion (107.45 + 0.55)*	108.00	
			109,444
Purchases			164,446

*add discount

Sales value		Y$	£
(i)	January sales (462 × 500)	231,000	
	Rate of conversion (3.88 - 0.03)**	3.85	
			60,000
(ii)	February sales (462 × 1,000)	462,000	
	Rate of conversion (3.88 - 0.055)**	3.825	
			120,784
	Sales		180,784

**subtract premium

The commission of £1 per mille or 0.001 on each of the four transactions (i) to (iv) would exceed £10 in every case, therefore the total commission is 4 × £10 = £40.

	£
Sales	180,784
Less cost of sales	164,446
Profit on transaction	16,338
Less commission	40
Net profit	16,298

(b) If the February shipment were cancelled after the merchant has entered into the forward exchange contracts, the contracts would still have to be honoured. He would still have to buy X$11,820,000 at a rate of 108.00, and would have to sell Y$462,000 at a rate of 3.825. Without the February shipment, the merchant would be obliged to 'close out' the contracts. He would have:

(i) to sell the X$ he must buy, at the spot rate available at the time;

(ii) to buy Y$ at the available spot rate (or at a suitable forward rate) on the foreign exchange market, for resale.

In both (i) and (ii) there would probably be a loss because the resale of the foreign currencies would probably earn less (in pounds) than it would cost the merchant to buy them (depending on how exchange rates have moved since the original forward exchange contracts were entered into).

If the February shipment were delayed for two months until April, the contracts entered into at the end of December would still have to be honoured.

The X$11,820,000 would be obtained too early and it is unlikely that the merchant would have enough funds in his business to hold them for two months. He might sell the X$ he must buy in February, and make a loss on this transaction, and then enter into another forward exchange contract to obtain X$11,820,000 in April.

The merchant would have to sell Y$462,000 in March, so he would have to buy this amount at the spot rate in order to resell it. There would probably be a loss on this transaction, just as if the February shipment had been cancelled. The merchant would then probably decide to enter into another forward exchange contract to sell Y$462,000 two months later than originally expected, that is, in May.

The effect of a delay in shipment would then be similar to the effect of a cancellation, with the exception that the merchant would arrange two further foreign exchange contracts, one to buy more X$ and the other to sell forward more Y$.

The merchant would really be trying to extend each of his forward exchange contracts by a further two months. The merchant's bank might offer him slightly better exchange rates to extend the contracts than he would have to use to close out the contracts and make new contracts.

21 MULTILATERAL NETTING

It is assumed that the settlement of the net balances will be in pounds sterling.

		Receipts due £	*Payments due* £	*Net receipts* £	*Net payments* £
(a)	Belgian subsidiary				
	From French subsidiary (BF 144,381,000 ÷ 68.10)	2,120,132			
	To US subsidiary ($1,060,070 ÷ 1.415)		749,166		
	Net	2,120,132	749,166	1,370,966	
(b)	French subsidiary				
	To Belgian subsidiary (as above)		2,120,132		
	From US subsidiary (FF 14,438,000 ÷ 10.215)	1,413,412			
	To US subsidiary ($800,000 ÷ 1.415)		565,371		
	Net	1,413,412	2,685,503		1,272,091
(c)	US subsidiary				
	From Belgian subsidiary	749,166			
	From French subsidiary	565,371			
	To French subsidiary (all as above)		1,413,412		
	Net	1,314,537	1,413,412		98,875
	Total net receipts/payments			1,370,966	1,370,966

The multilateral netting calls for a payment by the French subsidiary to the Belgian subsidiary of £1,272,091 and a payment by the US subsidiary to the Belgian subsidiary of £98,875.

The possible advantages of multilateral netting

(a) Multilateral netting reduces the number of transactions that have to be made in settlement of inter-company debts, and so should reduce costs.

(b) Regular multilateral netting will prevent a situation arising in which one subsidiary builds up excessive liabilities with another, so that one subsidiary finances another's operations.

The possible disadvantages of multilateral netting

(a) With debts in any of three foreign currencies, and settlements in sterling, each subsidiary is exposed to losses or gains on foreign currency movements from the date that the liability is incurred. This is undesirable, because it might distort operating results when exchange rate changes are large.

(b) Some subsidiaries might not have the cash to settle outstanding liabilities on the due date, and would need to discuss financing arrangements with the group's central treasury department.

(c) These arrangements might create a conflict between the head office and the management of the subsidiaries, objecting to excessive central control of their operations.

(d) There could be adverse tax implications.

22 EXPORTERS PLC

Tutorial note. The first two parts of the question require a knowledge of the theory underlying exchange rate movements and their relationship to interest rates, and an ability to calculate effects of different exchange rate movements. It provides the opportunity to demonstrate an understanding of extreme movements in the European currency markets in recent years.

The final part deals with the practicalities of using the currency markets and an awareness of the options available to a trader in seeking to hedge against currency movements.

Suggested solution

(a) First calculate the forward rate of exchange at which the hedging contract is made.

The company will receive $500,000 in six months' time.
Assuming an interest rate of 15%, this equates to $465,116.2 at today's date ($500,000 / 1.075).

$465,116.2 at the spot rate of $2.50 equates to £186,046.50.

£186,046.50 at an interest rate of 12% would be worth £197,209.30 in six months' time (£186,046.50 × 1.06).

The forward rate is therefore $2.5354 (500,000 / 197,209.30).

The effect on Exporters plc in the event of the pound moving in different ways over the six month period can now be calculated.

(i) If the pound gains 4%, the exchange rate will be $2.60 ($2.50 × 1.04). $500,000 would therefore buy only £192,307.70. Hedging has saved the company £4,901.60 (£197,209.30 - £192,307.70).

(ii) If the pound loses 2%, the exchange rate will be $2.45 ($2.50 × 0.98). $500,000 would therefore buy £204,081.60. Hedging has cost the company £6,872.30 (£204,081.60 - £197,209.30).

(iii) If the pound remains at $2.50, the transaction would realise £200,000. Hedging has therefore cost the company £2,790.70 (£200,000 - £197,209.30).

(b) The interest rate parity theory describes the relationship between the spot rate and the forward rate of exchange at any one time. The theory states that in equilibrium, the difference in interest rates between two countries equates to the difference between the forward and spot rates of exchange. All other things being equal, traders in the money market can invest or borrow in the currency that offers them the best interest rates; however they will lose on the currency side of the transaction since they will receive a lower exchange rate at the end of the period. This is because banks avoid leaving currency risks exposed so that when a trader sells a currency forward, the banker will borrow that currency to balance the transaction. The banker will pass the cost of the difference in interest rates available in the two currencies on to the trader through the exchange rate applied.

As recent events have shown however, traders who believe that a currency is going to be devalued can speculate against that currency, and even when artificially high interest rates are introduced in support of the exchange rate, they will continue to sell in the expectation that devaluation will eventually be inevitable. Thus factors other than differential interest

rates can be seen to have an effect on the relationship between spot and forward exchange rates.

(c) A forward market currency hedge is a contract to buy or sell a specific amount of currency on a specific date at a specific price agreed in advance. Contracts can be arranged through the banks in most currencies. Since the outcome of the contract is known in advance, the company is able to plan its cash movements with some degree of certainty. However it runs the risk that the currency markets may move in a manner different to that expected and implied in the agreement, and it may therefore lose out against the spot rate.

(i) Currency futures are similar in principle to forward market currency hedges, however they are generally for standard amounts and restricted to the most frequently traded currencies. They cannot be provided by the bank but must be traded on separate markets. The risks of costs being incurred through exchange rates moving differently to expectations are similar to those associated with forward market hedges; however the trader is able to realise a profit if the market moves in his favour by taking out a further futures contract in the opposite direction.

(ii) An options hedge is a contract which provides the right to buy or sell a specific amount of currency on a specific date at a specific rate. However, unlike the forward exchange contract, there is no obligation to exercise the option on the due date. Thus in the case of Exporters plc, the company would be protected from the effects of the pound strengthening, but would be able to benefit from any weakening of the pound. The cost of this takes the form of a premium payable on the contract. Options are available either in a tailor-made form specific to the trader's requirements from the bank, or in a standard form in certain currencies only from an options exchange.

23 INDUSTRIAL COMPANY

Tutorial note. Note that the requirement in (b) is to explain the financial instruments, not merely to 'outline' them. You need to show that you understand how the various financial instruments are used.

Suggested solution

(a) There are a number of different risks facing commercial organisations. All businesses have to contend with the ups and downs of business life, booms and slumps, risky decisions about what to produce, what prices to charge, how and where to market their goods and so on. Firms which have borrowed money, or are about to borrow money in the near future, face the additional risk of exposure to interest rate changes.

If a company has a considerable amount of variable rate debt (for example a large overdraft or variable rate bank loan) then it faces the risk that interest rates may rise and its repayments increase. The effect of this on the business could be dramatic, reducing cashflow and profit and perhaps, if the rise in rates is a large one and the company highly geared (with a high proportion of debt), bringing the risk of liquidation.

Alternatively, a business with a large amount of fixed rate borrowing (for example a fixed rate loan or fixed interest preference shares or debentures) is exposed to a fall in interest rates. If the company has borrowed large sums at 10% fixed, and a short time later rates fall to 8%, it will be paying more for its debt than it needs to. Cashflow and profits could be better if only the debt were not at a fixed rate.

Companies thinking about borrowing in the near future also face risk. Should they borrow at a fixed rate now because they are worried about a rise in interest rates or should they wait in the hope that rates may fall shortly? A wrong decision could be costly.

Finally, there are companies with debt capital maturing that will need to be replaced. A company may have issued £5 million of debenture stock due to mature between 19X3 and 19X5. The company itself will have the choice as to exactly when they will repay the holders of the debt. If they think that interest rates are likely to be lower in 19X3 than in 19X5 they can repay the debenture holders early in 19X3 and replace the debt with a new issue of debentures then. If they think rates will be lower in 19X5 they can wait and replace the debt when it is cheaper to do so. Decisions like this are risky: making the wrong choice could cost millions of pounds.

(b) There are a number of ways that companies can reduce interest rate exposure.

(i) Large companies can make sure that they have a mix of both fixed and variable rate debt so that whichever way interest rates move they do not suffer too much. It is only

when a company has an imbalance between fixed rate borrowing and variable rate borrowing that exposure really becomes a problem.

(ii) A company may wish to take out a forward rate agreement (FRA) with their bank. If the company believes that it would be seriously affected by rates in excess of, say, 10% they may be able to 'fix' their borrowing at this rate. If rates actually rise above 10%, the bank pays the difference to the customer and if rates fall below 10%, the customer pays the difference to the bank. Although the company can never gain from interest rate movements through an FRA, it can remove the risk of rates rising.

(iii) It is possible to 'cap' an interest rate to reduce or remove the risk of a rate rise. A company can 'cap' its borrowing at say, 10%. This places an upper limit on the rate the company pays for borrowing a particular sum. Having bought a 'cap' they will use it if rates rise above 10% but if rates are currently 8% they have the advantage of actually borrowing at 8%. The 'cap' provides protection from rate rises whilst leaving the company free to enjoy the benefits of falling rates.

(iv) The opposite of a 'cap' is a 'floor'. If the company is worried about rates falling (because it has variable rate investments for example), it can purchase a 'floor'. Once rates fall below the floor the bank will pay the company the difference.

(v) Very large companies may consider an interest rate 'swap'. A company worried about the fact that it has a lot of variable rate debt, and that rates will rise, may want to swap its variable rate debt for fixed rate debt. Similarly, a company with a lot of fixed rate debt that anticipates a fall in rates may want to 'swap' its fixed rate debt for floating rate. Matching up these two types of company will usually be the job of a bank or another intermediary. The bank will collect the payments of the two companies and ensure that the terms of the 'swap' are carried out.

24 OVERSEAS INVESTMENT

(a) To reduce exposure to exchange risk, the subsidiary should be financed as far as possible by funds denominated in the subsidiary's local currency. Interest on debt, debt capital repayments and dividend payments on any equity capital raised from outside the group can then all be made out of the income generated from the subsidiary's operations, without the need for conversion to or from sterling.

However, it will not be possible to rely entirely on local finance. Initially, an equity injection will be required. The parent company will certainly provide more than half of this equity, and may well wish to provide all of it so as to have a wholly-owned subsidiary. It may well not be possible to finance the subsidiary almost entirely by debt, with only a small proportion of equity, because many countries have laws requiring a certain minimum proportion of equity.

Subject to such laws, however, it is probably desirable to finance the subsidiary as far as possible by local debt, of a term as long as the life of the assets which it will finance. In that way both transactions exposure (on payments to service the finance) and translation exposure (on conversion of the subsidiary's accounts into sterling) will be minimised. Transactions exposure will be minimised because payments to providers of capital will be in the same currency as the company's operating income, and translation exposure will be minimised because assets and liabilities in the local currency will be netted off.

(b) Remittances to the parent company may be made by payments of loan interest and dividends on capital provided by the parent company, by payments of management charges and by payments for goods supplied from the UK.

In all three cases, laws in the subsidiary's country may have an impact. Loan interest, dividends and management charges may be limited to reasonable commercial rates, and there may be a limit on the proportion of profits which can be distributed as dividends. Payments for imported goods may well be limited to a reasonable arm's length price, to prevent transfers of profits which would circumvent restrictions on dividends.

Subject to such restrictions, the payment of dividends may be the best way of remitting funds to the UK. This is because dividends can be of varying amounts and paid at irregular intervals. The amounts and timing of payments can therefore be varied to take advantage of favourable movements in exchange rates. Alternatively, dividend payments can be planned well in advance and protected by hedging. Of course, if there are minority interests in the subsidiary, perhaps because of laws requiring a local equity stake, dividends may be considered less desirable.

The parent company should bear in mind the risk that currency restrictions will be imposed, making it impossible for the subsidiary to remit funds at a desirable level.

(c) If the parent company is to supply the subsidiary with goods for sale, there will inevitably be some operating transactions exposed to exchange risk. The subsidiary will have only local currency (from sales) with which to pay for the goods, but the parent will ultimately want sterling. This risk can, however, be minimised in several ways. The parent could put receipts into an interest bearing foreign currency account, and convert the accumulated balance to sterling only when the exchange rate was favourable; the parent could protect receipts through forward exchange contracts; or the parent could use the proceeds to buy goods it requires from the subsidiary's country, or from a country whose currency is stably related to that of the subsidiary's country, thus avoiding any conversion into sterling.

If the currency of the subsidiary's country were to decline in value, some losses would inevitably be suffered. The sterling value of receipts from sales would fall, and the sterling value of the subsidiary's fixed assets would also fall. The subsidiary would also have to pay more (in its local currency) for imported goods. Limited protection can be obtained by financing the subsidiary with local borrowings, thus reducing the net assets denominated in its local currency. Another possibility is to anticipate the decline in that currency's value and take out an additional long-term loan in the currency. The funds borrowed can be converted into sterling immediately, and the loan can then be repaid from the future income of the subsidiary. However, it should be borne in mind that the income may itself be reduced by the increased cost of imports.

25 X AND Y

(a) Establishing a new company XY (International) is likely to involve more set-up costs such as legal expenses than the alternative of an exchange of shares. Furthermore, there could be complications regarding the domicile of a new company. Different domiciles will have different taxation implications and may also affect the ability of the company to remit dividends to its shareholders. Such implications will need to be considered in coming to a decision on the most advantageous arrangement.

The transfer option could be preferred under UK tax legislation because individual shareholders' translation gains would not be subject to tax liability at the time of exchange if no disposal of interest were involved.

XY (International) might be operated as a holding company or as a trading company. In either case, existing managements would continue to operate in the respective countries. There would need to be a single board of directors, presenting the possibility of difficulties in all parties reaching agreement, including on such matters as the level of distribution of profits and dividends. If XY (International) operated as a holding company this might offer the best prospect of dismantling the merger if that proved to be necessary.

Under either type of arrangement, there would need to be some sacrifice of control by each management team in the operations in their own country as they will need to take note of the views of the other management team.

Under the proposal to transfer shares on a 50/50 basis, neither side would have a voting majority. This could lead to difficulties if it did not prove to be possible to agree on operational issues (for example, on a capital expenditure project), and the businesses could each develop in very different ways.

(b) The arrangement involved here is effectively an exchange of debt, and will only be possible if covenants or other requirements are not breached. The exchange of risk will introduce currency exchange implications. The loan stock held by the UK company would bear a smaller return if the rand were to weaken in value and vice versa. The loan stock exchange would, however, help to demonstrate mutual confidence between the two companies.

There would be certain effects on the balance sheet of X Limited. The loan stock held in Y would be reflected in fixed assets, while the loan stock repayable to Y would be shown as other long term liabilities. In the profit and loss account, interest receivable from Y would appear as other income, while interest charges payable to Y would also be shown. There would be an increase in the apparent gearing of the company because of the higher level of debt.

(c) Control of remittances by a government is a form of exchange control which stops the currency being fully convertible. Such measures imposed by government as a form of protection in order to rectify, or avoid, a balance of payments deficit and to prevent a

depreciation in the nation's currency. Such controls were imposed in 1939 in the UK as a wartime measure and the last controls were finally abolished in 1979. Exchange controls are discouraged by the OECD but are still imposed by many developing countries.

The foreign investor will suffer from the problem that it will be difficult to 'repatriate' dividends from the investment. Faced with this difficulty, the investor may respond in different ways. If the investor is less concerned about the flow of dividends, he may not see the controls as a major impediment, but ultimately the value of the investment must depend upon the ability to receive distributions of profits. One response of the foreign investor is to avoid investments in countries in which controls over remittances exist. This could hamper investment in the local economy but on the other hand it may allow local entrepreneurs to operate more easily. However, this may mean that enterprises in the country are less efficient than they would be if there was foreign competition, to the possible detriment of consumers in the country.

Another possible response of the foreign investor is to find ways of avoiding the exchange controls, for example by seeking returns through royalties or by setting transfer prices for part-processed goods at non-market levels. The government exerting the controls will have to close such 'loopholes' through further control and regulation if it wants the controls to have an effect.

26 FINANCIAL CONTROL

(a) The following are advantages of centralising a group's financial functions.

(i) A centralised department for financial functions could probably afford to employ specialists (such as foreign currency dealers and tax specialists) which individual subsidiaries could not.

(ii) Financial activities can be organised more efficiently in a variety of ways.

(1) There could be better co-ordination of foreign currency inflows and outflows. A centralised treasury function might be able to set up foreign currency bank accounts, and match inflows in one currency earned by one subsidiary with payments in the same currency by another subsidiary. This would eliminate foreign exchange risk in the currency, at little cost, in a way that individual subsidiaries could not do on their own. Centralised foreign exchange management would also avoid the risk that an individual subsidiary might allow itself to become over-exposed to foreign currency risk.

(2) Better co-ordination of fund-raising would be possible. If several subsidiaries need extra finance, a centralised finance department should be able to provide it at a lower cost than individual subsidiaries could achieve on their own, for example by lending cash surpluses of one subsidiary to another in the group, or by raising a single large loan or making an equity issue, instead of leaving individual subsidiaries to obtain their own bank loans.

(3) Centralised tax management would probably be beneficial for the group.

(4) Cash surpluses of some subsidiaries can be pooled with cash deficits of others, so as to minimise bank overdraft requirements.

(iii) The capital expenditure budget can be formulated, evaluated and approved on a group basis.

(iv) Centralised financial control would allow the head office to monitor the performance of individual subsidiaries in the area of financial management. For example, there would be close central monitoring of credit management by subsidiaries.

(v) There might be some savings in administrative costs, with fewer staff needed in total in a centralised department than in a large number of decentralised departments.

There are some disadvantages to having a group's financial functions centralised.

(i) A centralised department might be slow moving and inefficient, if it is required to carry out many diverse functions.

(ii) In a multinational group, financial staff at head office might be unaware of local conditions in the country that a subsidiary is operating in. Decision-making from head office could be inefficient. Subsidiaries in other countries would also need some measure of control over their cash, since it would be pointless to transfer funds from one country to another just for the sake of having centralised bank accounts.

(iii) If key financial decisions are taken at head office, there is likely to be some loss of motivation among senior managers in the subsidiaries.

(iv) Decisions are likely to be delayed when they are taken at head office. Where speedy decisions are needed, profit-making opportunities might be missed.

(b) The activities of subsidiaries within the group can be monitored, evaluated and controlled by means of a variety of financial ratios. Ratios can be grouped into those indicating profitability and asset use, those indicating debt and gearing levels, and those indicating liquidity.

Profitability and asset use

The most significant ratio will be return on investment, which compares the profits being earned by the company with the total assets it is using. A target ROI will probably be set for each subsidiary in the group, as well as for the group as a whole.

Profit/sales ratios should be used to measure the profit margin on sales that the company is earning. Both the gross margin (sales minus cost of sales as a percentage of sales turnover) and the net margin (pre-tax profit as a percentage of sales) should be monitored.

Trends in the gross margin percentage or the net margin percentage can be analysed more closely by monitoring a variety of cost/sales ratios, such as materials costs/sales and labour costs/sales.

Return on investment depends on asset use as well as profit margins, and so asset turnover ratios should be monitored. Both working capital and fixed asset use should be controlled, and suitable ratios include:

(i) sales: assets employed;
(ii) sales: fixed assets employed;
(iii) working capital per £1 sales;
(iv) stock turnover;
(v) debtors' collection period.

Debt and gearing

Individual subsidiaries should not become over-burdened with debt, and a number of ratios can be used to monitor trends and changes in the debt position of a company. The most useful ratios are:

(i) the gearing ratio: the ratio of prior charge capital to equity capital;
(ii) the debt ratio: the ratio of total liabilities to total assets;
(iii) the interest cover: the ratio of profit before interest to interest costs;
(iv) the cash flow ratio: the ratio of net cash inflow to total debts.

Liquidity

A company should be able to meet its short-term commitments to pay creditors, and trends in liquidity could provide important indications of the ability of a company to continue to do this. The two ratios commonly used to monitor liquidity are the current ratio (current assets: current liabilities) and the quick ratio or acid test ratio (current assets minus stocks: current liabilities). An increasing sales: working capital ratio might also indicate declining liquidity rather than better working capital management.

At a group level, other financial ratios which must be monitored are shareholder ratios. For a quoted company, dividend yield, P/E ratio and EPS are the most important.

The problems with using financial ratios for control within a group are as follows.

(i) The ratios of one subsidiary will be compared with the ratios of another, and some will be judged to have performed better than others. However, inter-company comparisons might be unfair, especially if their fixed assets differ in age or nature. For example, a subsidiary with ageing assets might achieve a much higher ROI in the short term than a subsidiary that has invested in new fixed assets, and a subsidiary with relatively few fixed assets, such as one operating in a service industry, will often achieve a higher ROI than a subsidiary which must invest heavily in fixed assets.

(ii) Where subsidiaries trade with each other, the level of profitability achieved by each of them will depend to some extent on the transfer prices that have been fixed for this trading. Where transfer prices are below market prices, the buying subsidiary will benefit at the expense of the selling subsidiary.

(iii) Where there are subsidiaries in different countries, a comparison of their ratios might be misleading. For example, in a country where debt capital is much more widely used, gearing levels should be higher.

(iv) The way in which head office charges are allocated to subsidiaries might affect their profitability significantly.

(v) The managers of subsidiaries will probably try to manipulate their results to make them appear better to the head office controllers.

(vi) Unless financial ratios are measured and reported regularly, they might be available too late to be of much practical value for control purposes.

(vii) Financial ratios are unsuitable for monitoring certain decisions by managers in subsidiaries because they are retrospective and take a short-term view of performance. In particular, capital expenditure decisions should be assessed on the basis of their long term expected future costs and benefits. Since profits from capital projects usually take time to build up, the short-term effect of new investment is usually a fall in profits and ROI. If financial ratios are used to measure performance, the managers of subsidiaries might be criticised for deteriorating performance when in fact they have undertaken investment which in the longer term might be highly profitable, and for which they ought to be rewarded.

Class questions

1 INTEREST YIELD CURVE (10 marks) *18 mins*

(a) Explain what is meant by the interest yield curve, illustrating your explanation numerically and with a freehand graph. (5 marks)

(b) Suggest what information might be derived from the interest yield curve in the area of financial forecasting. (5 marks)

2 LEISURE INTERNATIONAL PLC

The following is an extract from the balance sheet of Leisure International plc at 30 June 19X2.

	£'000
Ordinary shares of 50p each	5,200
Reserves	4,850
9% preference shares of £1 each	4,500
14% debentures	5,000
Total long-term funds	19,550

The ordinary shares are quoted at 80p. Assume that the market estimate of the next ordinary dividend is 4p, growing thereafter at 12% per annum indefinitely. The preference shares, which are irredeemable, are quoted at 72p and the debentures are quoted at par. Corporation tax is 35%.

Required

(a) Use the relevant data above to estimate 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.

(b) 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.

(c) Assume that the debentures 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 debentures, the cutoff rate for project acceptance should be the after-tax interest rate on the debentures rather than the WACC. Comment on this suggestion.

(d) Assume that instead of raising £5 million of 14% debentures, the company had raised the equivalent amount in preference shares giving the same yield as the existing preference capital.

(i) Demonstrate that the returns offered to investors in the two securities are consistent with investor risk aversion.

(ii) Calculate how Leisure International plc's equity earnings would have been affected if the preference shares had been issued instead of the loan capital.

Assume income tax at 25% where relevant.

3 BETTALUCK PLC

Bettaluck plc has been enjoying a substantial net cash inflow, and until the surplus funds are needed to meet tax and dividend payments, and to finance further capital expenditure in several months time, they have been invested in a small portfolio of short-term equity investments.

Details of the portfolio, which consists of shares in four UK listed companies, are as follows.

Company	*Number of shares held*	*Beta equity coefficient*	*Market price per share*	*Latest dividend yield* %	*Expected return on equity in the next year* %
Dashing plc	60,000	1.16	£4.29	6.1	19.5
Elegant plc	80,000	1.28	£2.92	3.4	24.0
Fantastic plc	100,000	0.90	£2.17	5.7	17.5
Gaudy plc	125,000	1.50	£3.14	3.3	23.0

The current market return is 19% a year and the Treasury bill yield is 11% a year.

Required

(a) On the basis of the data given, calculate the risk of Bettaluck plc's short-term investment portfolio relative to that of the market.

(b) Recommend, with reasons, whether Bettaluck plc should change the composition of its portfolio.

4 P/E RATIOS (10 marks) *18 mins*

List and discuss briefly five reasons why companies in the same type of business might have different P/E ratios.

Comment on the view that the P/E ratio is 'an attempt to value a company in terms of its earnings'.

5 LEIVERS

(a) Discuss how managers' objectives might differ from those of shareholders, especially if managers are not closely monitored by shareholders, and are not subject to constraints and/or incentives imposed by shareholders. For these differing objectives mention the policies that managers might adopt that are likely to be considered sub-optimal from the shareholders' point of view.

(b) In recent years there has been a large increase in the number of management buyouts, often when a company is in financial distress. What are the possible financial advantages of a company's shares being sold to a group of managers rather than the company's being liquidated?

(c) Five managers of Leivers Ltd are discussing the possibility of a management buy-out of the part of the company that they work for. The buy-out would require a total of £700,000, of which £525,000 would comprise the purchase cost, and £175,000 the funds for a small expansion in activity and for working capital. The managers believe that they could jointly provide £70,000.

Required

(i) Discuss possible sources of finance that the managers might use to raise the required funds.

(ii) What are likely to be the major factors that a potential supplier of finance will consider before deciding whether to offer finance? What type of security or other conditions might providers of finance specify?

6 GOVERNMENT

(a) Outline the major government activities that influence financial management and briefly illustrate how government activities affect companies in achieving their financial objectives.

(b) Your company is subject to an unexpected takeover bid by a rival company. Your board of directors proposes to reject the bid, but believes that increased bids might follow.

Discuss the policies that your company might adopt to defend itself against the takeover bid(s), and comment upon the significance of the City Code on takeovers and mergers in this process.

7 LEADING AND LAGGING (10 marks) *18 mins*

(a) Explain the terms 'leading' and 'lagging' in relation to foreign currency settlements and state the circumstances under which this technique might be used.

(5 marks)

(b) Explain the procedures for matching foreign currency receipts and payments, having regard to the possibility that these might be on different time scales, and state their possible advantages.

(5 marks)

This question is concerned with internal techniques and does not require reference to methods involving external bodies, such as forward contracts, options or swaps.

8 BRINGASOCK LTD (35 marks) *63 mins*

(a) What is meant by hedging in the context of interest rate risk? (6 marks)

(b) Explain how the following interest rate hedging techniques operate:

(i) interest rate swaps;
(ii) forward rate agreements (FRAs);
(iii) interest rate futures. (14 marks)

(c) Bringasock Ltd sells shoes to Italy. A shipment has just been made to a major Italian customer, who has been invoiced in Italian lire, payable in three months time. The amount due is 56,000,000 lire.

Bringasock's financial director has the following information about foreign exchange rates and interest rates.

Exchange rate, lire/£

Spot	2,320 - 2,322
3 months forward	15 - 23 dis

Interest rates	*Sterling*		*Lire*	
	Deposit	*Borrowing*	*Deposit*	*Borrowing*
	6%	8%	10%	12%

(i) What course of action would you recommend to the finance director for converting the lire into sterling, so as to maximise sterling receipts from the shipment? (10 marks)

(ii) How would your advice differ, if at all, were Bringasock Ltd also due to make a payment of 30,000,000 lire to an Italian supplier in three months time? (5 marks)

9 VEREY PLC (30 marks) *54 mins*

Verey plc is a quoted manufacturing company trading solely in the UK. It has the following capital structure.

	Book value	*Market value*
	£'000	£'000
£1 ordinary shares	2,500	4,000
10% secured debentures	1,000	980
14% unsecured loan stock	800	795
	4,300	5,775

The secured debentures were issued ten years ago and will not be redeemed for another 20 years, but the unsecured loan stock must be redeemed at par in six months time. All market values are ex div or ex int, a final dividend and half a year's interest being payable next week. Interest is covered four times.

The company has no cash available in excess of what it needs for working capital. It is contemplating an investment in a factory in Redland which would cost R$800,000 (R$ is the local currency), and which would yield a steady annual operating income of R$90,000. The present exchange rate is R$2 = £1, but this rate could fluctuate. There are no exchange controls.

Required

(a) Comment on the company's existing capital structure, and on how it might finance the redemption of the loan stock and the investment in Redland. Make any assumptions you need to, but state them clearly. Ignore taxation. (20 marks)

(b) Outline the factors that a company should consider when developing a long-term financial plan to cover three years or more. (6 marks)

(c) Briefly describe the major types of financial model that might be used to assist in the preparation of such plans, and discuss the problems that companies face in long-term planning. (9 marks)

10 WOPPIT

(a) The managing director of Woppit plc is worried about the volatility of the company's traded option price. He considers that such volatility might be seen as financial weakness and make the company more likely to be the target of a takeover bid.

Required

Explain what factors influence the price of a traded option and whether volatility of a company's share option price is necessarily a sign of financial weakness.

(b) As a defence against a possible takeover bid the managing director proposes that Woppit make a bid for Grapper plc, in order to increase Woppit's size and, hence, make a bid for Woppit more difficult. The companies are in the same industry.

Woppit's equity beta is 1.2 and Grapper's is 1.05. The risk-free rate and market return are estimated to be 10% and 16% per year respectively. The growth rate of after tax earnings of Woppit in recent years has been 15% per year and of Grapper 12% per year. Both companies maintain an approximately constant dividend payout ratio.

Woppit's directors require information about how much premium above the current market price to offer for Grapper's shares. Two suggestions are:

(i) the price should be based upon the balance sheet net worth of the company, adjusted for the current value of land and buildings, plus estimated after tax profits for the next five years;

(ii) the price should be based upon a valuation using the dividend valuation model, using existing growth rate estimates.

Summarised financial data for the two companies are shown below.

MOST RECENT BALANCE SHEETS

	Woppit		*Grapper*	
	£m	£m	£m	£m
Land and buildings (net)[1]		560		150
Plant and machinery (net)		720		280
Stock	340		240	
Debtors	300		210	
Bank	20		40	
		660		490
Less Trade creditors	200		110	
Overdraft	30		10	
Tax payable	120		40	
Dividends payable	50		40	
		400		200
Total assets less current liabilities		1,540		720
Financed by:				
Ordinary shares[2]		200		100
Share premium		420		220
Other reserves		400		300
		1,020		620
Loans due after one year		520		100
		1,540		720

Notes

1 Woppit's land and buildings have been recently revalued. Grapper's have not been revalued for four years, during which time the average value of industrial land and buildings has increased by 25% per year.

2 Woppit 10 pence par value, Grapper 25 pence par value.

MOST RECENT PROFIT AND LOSS ACCOUNTS

	Woppit £m	*Grapper* £m
Turnover	3,500	1,540
Operating profit	700	255
Net interest	120	22
Taxable profit	580	233
Taxation	203	82
Profit attributable to shareholders	377	151
Dividends	113	76
Retained profit	264	75

The current share price of Woppit is 310 pence and of Grapper 470 pence.

Required

(i) Calculate the premium per share above Grapper's current share price that would result from the two suggested valuation methods. Discuss which, if either, of these values should be the bid price.

State clearly any assumptions that you make.

(ii) Assess the managing director's strategy of seeking growth by acquisition in order to make a bid for Woppit more difficult.

(iii) Illustrate how Woppit might achieve benefits through improvements in operational efficiency if it acquires Grapper.

Glossary and Index

Acceptance credit A financial investment similar to a bill of exchange drawn by a company on a bank.

Accounting rate of return The return on investment yielded by a capital project.

American option An option which can be exercised on any day between two dates (the option period). Sometimes called an 'American-style' option. See also **European option.**

Arbitrage The exploitation for profit of differences in prices of an asset in different markets.

Arbitrage pricing theory A model which assumes that the return on a security is based on a number of independent factors, to each of which a particular risk premium is attached.

At the money A situation in which, for an option contract, the market price of the share or other asset is equal to the **exercise price.**

Balance of payments The statistical accounting record of all of a country's external transactions in a given period.

Beta factor In portfolio theory, a measure of the volatility of the price of a security, and thus of its **systematic risk,** used to calculate appropriate discount rates in the capital asset pricing model.

Bill of exchange An unconditional written order given by one party (the drawer of the bill) to another (the drawee).

Blocked funds Funds affected by government regulations restricting flows of money out of a country.

Call option An **option contract** to *buy* a commodity or financial instrument.

Cap An agreement which sets a maximum rate of interest for a borrower.

CAPM The capital asset pricing model.

Cartel An association of suppliers for the purpose of cooperating on the fixing of variables such as price and output levels.

Certainty-equivalent approach A method of risk analysis in which the expected cash flows of a project are converted to equivalent riskless amounts. The greater the risk of an expected cash flow, the smaller the certainty-equivalent value for receipts and the larger the certainty equivalent value for payments.

CHIPS The Clearing House Interbank Payments System.

Clientele effect The tendency of companies to attract particular types of shareholder because of their management organisation and policies, particularly dividend policies.

CME Chicago Mercantile Exchange.

Collar A combination of a **cap** and a **floor,** thus setting the range of interest rates faced by the borrower.

Common market A **customs union** combined with provisions for the free movement of factors production (primarily capital and labour).

Countertrade A general term used to describe a variety of commercial arrangements for reciprocal international trade or barter.

Coupon The rate of gross interest on loan stock expressed as a percentage of the nominal value of the stock.

Currency future A contract to buy or to sell a specified amount of a foreign currency at a future date or on one of a limited number of future dates.

Currency option A contract providing an option, but not an obligation, to buy or to sell a certain amount of currency at a specified rate of exchange (the **exercise price**) at some time in the future.

Customs union An extension of the concept of a **free trade area** to include common external tariffs applying to imports from outside the area to any country within it. See also **common market.**

DCF Discounted cash flow.

Deep discount bonds Loan stock issued at a price which is at a large discount to the face value or nominal value of the stock and which will be redeemable at or above par on maturity.

Delta value (or hedge ratio) The relationship, only valid for small price changes, represented by the change in the price of a **call option** divided by the change in the price of the underlying asset, indicating how much of the asset which the writer of the option should hold in order to hedge the risk of the option position.

Derivative A financial security whose value is derived partly from the value and characteristics of an underlying security. **Option contracts, financial futures** and **swaps** are types of derivative.

Devaluation A reduction in the fixed or pegged exchange rate between one currency and other currencies.

Disintermediation The bypassing of financial intermediaries in order to arrange lending and borrowing directly between the ultimate parties to the transaction.

Economic risk The risk of changes in the present value of future cash flows arising from movements in foreign exchange rates.

EEIGs European Economic Interest Groups: a form of economic interest group governed by European law. Economic interest groups facilitate co-operation between parties to multinational joint ventures.

EMCF The European Monetary Co-operation Fund: a fund to facilitate exchange rate stabilisation within the EMS and also to finance temporary **balance of payments** disequilibria by providing short and medium-term funds to member countries.

EMS The European Monetary System, within which the Exchange Rate Mechanism (ERM) was set up. See also **EMCF**.

Entrepôt trade Trade involving a country which mainly provides the service of a distributing port.

EU The European Union, formerly known as the European Community.

Eurobond markets Markets in which long-term securities are sold outside the country in which the borrower is based.

Eurocurrency Currency which is held by individuals and institutions outside the country of issue of that currency.

European Economic Area (EEA) An association comprising EU member states plus Norway and Iceland and providing for the free movement of goods, services, capital and people throughout the area.

European option An option which can be exercised only on a specific date. Sometimes called a European-style option. See also **American option**.

European Union (EU) Austria, Belgium, Denmark, Eire, Finland, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

Exercise price (or strike price) For an **option contract**, the price at which the underlying commodity or financial instrument can be bought (in the case of a **call option**) or sold (in the case of a **put option**).

Factoring An arrangement to have debts collected by a factor company, which advances a proportion of the money it is due to collect.

FDI Foreign direct investment.

Financial engineering The combination or splitting of financial instruments in order to create new financial instruments.

Financial futures Contracts to purchase or to sell a standard quantity of a financial instrument at a specific date in the future.

Financial intermediary A party bringing together providers and users of finance, either as broker or as principal.

Floor An agreement which sets a minimum rate of interest for a borrower.

Foreign exchange risk Risk of adverse movements in exchange rates affecting anticipated foreign exchange transactions.

Forfaiting A method of export finance whereby a bank purchases from a company a number of sales invoices or promissory notes, usually obtaining a guarantee of payment of the invoices or notes.

Forward discount The difference between the forward exchange rate for a currency and the **spot rate**, where the former is lower than the latter.

Forward foreign exchange contract An agreement for the purchase or sale of a specified quantity of a stated foreign currency on a fixed date in the future at a rate of exchange which is fixed at the time the agreement is made.

Forward interest rate agreement (FRA) An agreement to borrow or to lend a sum of money in the future at an interest rate which is fixed at the time the agreement is made.

Forward premium The difference between the forward exchange rate for a currency and the

spot rate, where the former is higher than the latter.

Free trade area A regional association of countries in which there is free movement of goods and services between members. See also **Customs union** and **Common market**.

Gamma value The relationship which indicates the change in **delta value** relative to the change in the price of the underlying asset.

Gearing The ratio of debt to equity in a company, or in an individual's portfolio.

Goal congruence Accordance between the objectives of agents acting within an organisation and the objectives of the organisation as a whole.

Hedge ratio See **delta value**.

Hedging Reducing exposure to risk.

Horizontal integration The merging of firms producing similar products.

IBRD The International Bank for Reconstruction and Development (The World Bank).

IMF (The International Monetary Fund) an agency established in 1945 in order to foster international monetary cooperation and balanced growth in international trade, to help member countries in rectifying balance of payments deficits and to promote stability in exchange rates.

IMM International Monetary Market, a division of the **CME** in which **financial futures** and options on futures are traded.

In the money For a **call option**, a situation in which the current market price of the underlying asset at a time when the option is exercisable is higher than the **exercise price**.

Interest rate parity The principle that the **forward discounts** and **forward premiums** between currencies reflect differences in interest rates on time deposits in the relevant currencies. Where the principle fails to hold, **arbitrage** becomes possible.

Interest rate swap An agreement whereby the parties to the agreement exchange interest rate commitments.

Internal rate of return A method of investment appraisal whereby discounting is applied in order to establish the discount rate at which the net present value of the investment is zero.

LAFTA The Latin American Free Trade Area, a **free trade area** comprising South American nations.

LDCs 'Less developed countries': a term referring to non-industrialised nations.

Leveraged takeover A takeover which is achieved using a high proportion of debt.

LIBOR The London Inter-Bank Offer Rate, being the rate of interest applying to wholesale money market lending between London banks.

Licensing An alternative to foreign direct investment by which overseas producers are given rights to use the licensor's production process in return for royalty payments.

LIFFE London International Financial Futures and Options Exchange. LIFFE is usually pronounced as 'life'.

Management buy-in The purchase of all or part of a business from its owners by new managers from outside the business.

Management buy-out The purchase of all or part of a business from its owners by its managers.

Merchant bank A bank which provides services such as investment management, foreign exchange and raising of finance to predominantly corporate customers.

Monopoly A market with one dominant supplier of a product.

Most favoured nation A clause in the GATT international trade agreement binding the parties to grant to each other treatment which is as favourable as that offered to any other GATT member in respect of tariffs and other trading conditions. (See **World Trade Organisation** on GATT.)

Multinational An enterprise which owns or controls production or service facilities or subsidiaries in another country from that in which it is based.

NAFTA The North American Free Trade Association: the second largest **free trade area** after the **European Economic Area**, comprising Canada, the USA and Mexico.

Naked option An **option contract** which is not held for the purposes of **hedging**.

Net present value The anticipated net gain from an investment obtained by discounting all relevant future cash flows.

Netting The process of setting credit balances against debit balances to reduce net amounts owed between companies.

Oligopoly A market dominated by a few suppliers. (See also **Cartel**.)

Option contract An agreement whereby the purchaser has the right (option) but not the obligation to buy from or sells to the seller (or writer of the option) a specified amount of a commodity or financial instrument in a specified future period at a price fixed in the contract. See **Call option** and **Put option**.

Out of the money For a **call option**, a situation in which the current market price of the share or other asset when the option is exercisable is lower than the **exercise price**.

Over-the-counter option An **option contract** which is specially created to suit the specific requirements of the company.

Over-the-counter trading Trading of shares and other financial instruments outside the official supervised and regulated exchanged.

Overtrading Excessive trading by a business with insufficient long-term capital at its disposal, raising the risks of liquidity problems.

Payback period In investment appraisal, the period over which the net income derived from a project comes to equate with the initial investment outlay.

Political risk The risk that political action will affect the position and value of a company.

Post-audit procedures The review of the cash inflows and outflows in respect of a project after it has reached the end of its life or some time after it began.

Purchasing power parity theory The theory that, in the long run at least, exchange rates between currencies will tend to reflect the relative purchasing powers of each currency.

Put option An **option contract** to *sell* a commodity or financial instrument.

Securitisation The issuing of tradable securities as an alternative to borrowing from a bank.

Sell-off The sale of part of a company to a third party.

Signalling The use of dividend policy to indicate the future prospects of an enterprise.

Speculation The acceptance of risk in undertaking uncovered transactions.

Spin-off The creation of a new company or companies to which assets of an existing company are transferred and in which shareholders own shares in proportion to their holdings in the existing company.

Spot rate The rate for exchange of foreign currencies with immediate delivery.

Strike price See **Exercise price**.

Swap A contract in which parties exchange cash flows (for example, interest payments in the case of an interest rate swap).

Swaption A 'hybrid' hedging instrument which provides the purchaser with an option to buy a swap (such as an interest rate swap).

SWIFT The Society for Worldwide Interbank Financial Telecommunication.

Systematic risk That part of risk in respect of an investment which cannot be reduced by diversification.

Tax haven A country with lenient tax rules or relatively low tax rates, which are often designed to attract foreign investment.

Time value For options, the difference between the market value (price) of the option and its intrinsic value.

Trade cycle The periodic fluctuation over the long-run period of levels of economic activity, for example of output and employment, forming a regular pattern.

Transactional risk The risk that exchange rate movements will adversely affect international trading transactions of an enterprise.

Transfer price The price at which transactions in goods or services between different parts of the same enterprise are accounted for.

Translational risk The risk that the book values of assets and liabilities may change as a result of movements in exchange rates.

Venture capital Risk capital lent normally in return for an equity stake.

Vertical integration The extension of a firm's activities into earlier (backward integration) or later (forward integration) stages of production.

Warehousing The activity of an intermediary regularly entering into contracts for one side of a swap before finding another party to enter into the other side of the swap.

Warrant A right given by the company to an investor which allows the investor to subscribe for new shares at some future date or dates at a pre-determined price (the exercise price).

World Trade Organisation (WTO) The body set up to implement the most recent (1993) GATT agreement. GATT (the General Agreement on Tariffs and Trade) is the name of a multilateral agreement which sets out rules for the conduct of international trade.

Z-score Altman's method for predicting business failure.

Zero coupon bonds Bonds issued at a discount to their redemption value and carrying no interest.

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