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TENTH EDITION

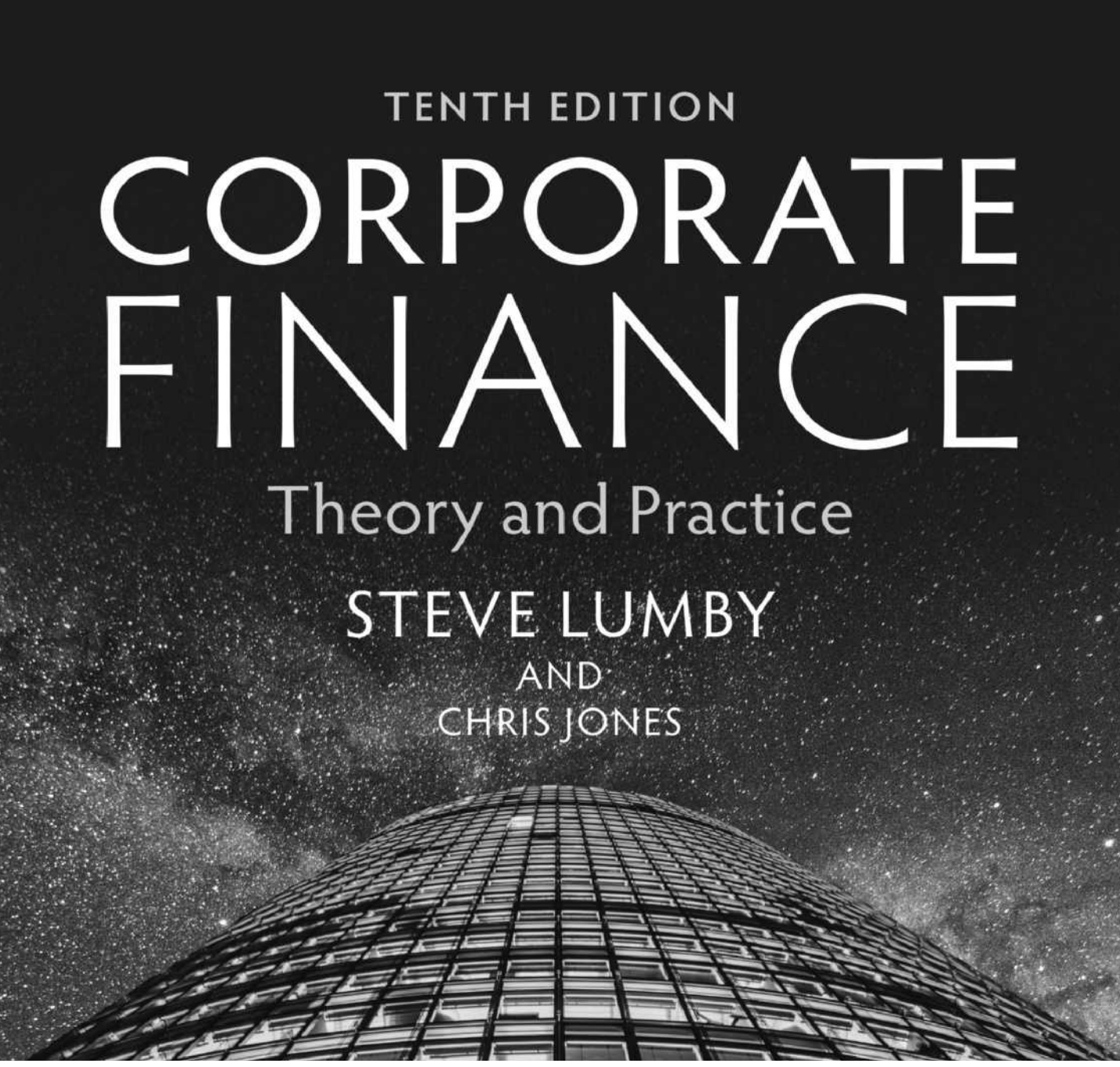
CORPORATE FINANCE

Theory and Practice

STEVE LUMBY
AND
CHRIS JONES

CORPORATE FINANCE

Theory & Practice



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Steve Lumby and Chris Jones

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ABOUT THE AUTHORS

Steve Lumby has been involved with teaching corporate finance over many years, in both universities and business schools. He is a former Managing Director of the LCA Business School. After five years in industry with the H.J. Heinz Company, he spent several years lecturing and researching in corporate finance at the London School of Economics. He has also held teaching posts at both King's College (University of London) and at Brunel University, and was a specialist advisor on finance to the Parliamentary Select Committee on Energy. His current appointment is as a Strategic Financial Management Module Leader for the University of London's Masters Professional Accountancy qualification.

Chris Jones has lectured in accounting and finance for over 30 years since leaving Arthur Young. He has now retired from his position as Principal Lecturer in Accounting and Finance at Sheffield Hallam University.

PREFACE

There is a popular feeling that 'theory' is opposed to practice and the merits lie with 'practice'. This is a false conclusion, based on a false supposition. If practice has long been successful and does not conform to theory, the theory is bad and in need of revision.... The distinction should not be between theory and practice; it should be between good theory and bad theory, between good practice and bad practice.... Practice is brick; theory is mortar. Both are essential and both must be good if we are to erect a worthy structure.

D. PAARLBERG, GREAT MYTHS OF ECONOMICS (1968)
NEW AMERICAN LIBRARY

The description in plain language will be a criterion of the degree of understanding that has been reached.

W. HEISENBERG, PHYSICS AND PHILOSOPHY (2007) HARPER
PERENNIAL MODERN CLASSICS (REPRINT EDITION).

This book takes these two quotations as its starting point. Its subject matter covers some of the more important financial decisions that face companies; principally, investment, financing and dividend decisions, together with the management of risk. These are areas of vital importance to companies because they represent the main ways by which firms can enhance the value for their owners. This importance is reflected in the fact that corporate finance is a standard element of virtually all undergraduate and postgraduate courses that are concerned with business and management, as well as being a prominent element in professional accountancy examinations.

It is with all these groups of people in mind that this book has been written. However, it is hoped that practising financial managers will also find its contents of interest, in that it may help to provoke thoughtful reflection on how financial decisions should be and are actually made.

The book's origins lie in the courses taught at various universities and business schools around the world at both undergraduate and postgraduate level and in the courses taught to students studying for professional accountancy qualifications. In many ways this is not *my* book but my *students'* book. Their searching questions have often prompted me to think through the subject matter in greater depth and to seek out alternative ways of providing clear and full explanations of the subject matter. This is not an easy book, but patience and application will be richly rewarded with understanding.

This new edition closely retains the format of the previous edition, but contains many amendments, clarifications and corrections in order to improve the overall 'learning experience' of the reader. Its objective is to provide a clear, thoughtful and systematic analysis of the key elements of corporate finance theory through a non-academic writing style and plenty of illustrative numerical examples.

It is all too easy for authors to lose sight of just how difficult some topics can be to the new reader. Familiarity, if not exactly breeding contempt, can sometimes lead to an over-concise exposition of the subject being discussed. Hopefully this pitfall has been avoided,

so that the changes made further enhance the book's clarity of presentation of what is quite a challenging subject matter.

The purpose of the Learning Objectives is to provide the reader with a 'road map' of what is to come in each chapter; while the summaries are designed to give an overview of the key areas that have been discussed in each chapter and to provide a snapshot of the main points. The suggested further reading has been compiled with particular emphasis on providing articles that are, in the main, accessible to those readers who do not possess a higher degree in mathematics! The quiz questions are to test both recall and understanding and to give the reader essential feedback – the quiz answers are tucked away at the back of the book, in order to reduce the temptation to cheat! Finally, the end-of-chapter exam-style problems have been selected to try and cover the major elements of each chapter's subject matter. The answers to many of these problems are available to students on the accompanying online platform. However, some are only available to course lecturers.

'Real World Views' feature boxes are interspersed throughout the text to help put theories and concepts into context, to present differing views from economies around the world and to invoke group debate. In this new edition, these have been carefully and thoughtfully updated by Angus Smith, with my thanks.

As I have said right from the start of the original edition, it should be made clear that this is not a 'how-to-do-it' book of corporate financial management. Such a book is not really possible in the complex, practical and ever-changing area of corporate finance. Instead, it is an attempt at a fairly detailed, reasoned discussion of the *normative theory* of corporate finance. Where examples have used real-world data, they are there for the purposes of exposition, rather than to encourage unthinking application of the theory to practical decision-making. It is not the aim to put forward theoretical solutions to practical problems, but to promote thought and reflection on how decisions are made and, perhaps, how they can be improved.

As far as possible, the presentation has been argued in descriptive and graphical terms rather than using a strict mathematical analysis. The reasons for this are two-fold. First, a mathematical treatment often excludes a great many potential enquirers and reduces the subject matter to a degree of terseness that makes unrealistic demands upon the concentration of the reader. Second, a mathematical treatment, although often rather elegant, can sometimes fail to make clear the full significance of important conclusions. However, it has been impossible to exclude mathematics completely – indeed it would have been counterproductive to do so in some areas – but its complexity has been kept to an absolute minimum. The derivation of formulae and relationships 'just for the sake' of it has been resisted and only occurs where the mathematical derivation leads to a greater understanding for the reader.

All that remains is to thank all the people at the publishers, Cengage, and in particular to Editorial Assistant Hayley Wallbridge, for all their help, understanding and general prodding to get the new edition finished and onto the bookshelves. Most of all, my thanks go to students everywhere who make writing and teaching so enjoyable! Anyway, time now to walk the dogs…

Steve Lumby
2018

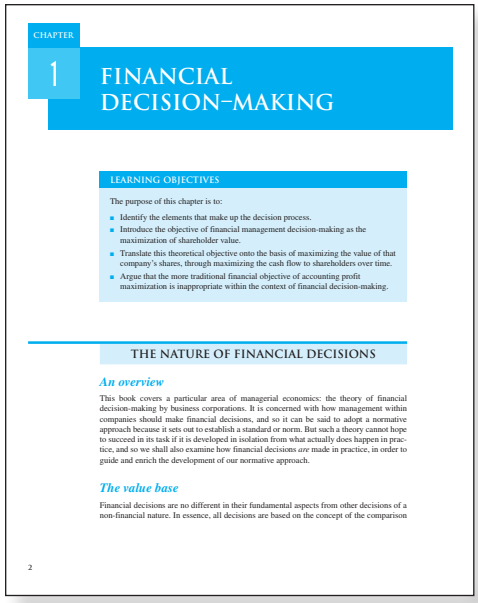
PUBLISHER'S ACKNOWLEDGEMENTS

The publisher would like to thank the following reviewers for their invaluable feedback in developing this new edition:

- Wim Westerman, University of Groningen (Netherlands)
- Graeme Elgin, Manchester Metropolitan University Business School (UK)
- Prof Janine Krüger, Nelson Mandela University (South Africa)

In addition, we wish to thank Dr Carl-Gustaf Malmstrom (Professor of Finance at SBS Swiss Business School) for his advice and assistance in sourcing ideas and composing the *Real World View* features.

WALK-THROUGH TOUR



CHAPTER 1

FINANCIAL DECISION-MAKING

LEARNING OBJECTIVES

The purpose of this chapter is to:

- Identify the elements that make up the decision process.
- Introduce the objective of financial management decision-making as the maximization of shareholder value.
- Translate this theoretical objective onto the basis of maximizing the value of that company's shares, through maximizing the cash flow to shareholders over time.
- Argue that the more traditional financial objective of accounting profit maximization is inappropriate within the context of financial decision-making.

THE NATURE OF FINANCIAL DECISIONS

An overview

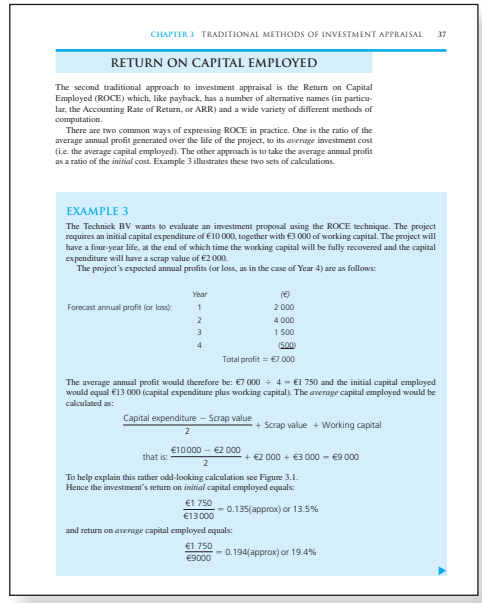
This book covers a particular area of managerial economics: the theory of financial decision-making by business corporations. It is concerned with how management within companies should make financial decisions, and so it can be said to adopt a normative approach because it sets out to establish a standard or norm. But such a theory cannot hope to succeed in its task if it is developed in isolation from what actually does happen in practice, and so we shall also examine how financial decisions *are* made in practice, in order to guide and enrich the development of our normative approach.

The value base

Financial decisions are no different in their fundamental aspects from other decisions of a non-financial nature. In essence, all decisions are based on the concept of the comparison

2

Learning Objectives – Listed at the start of each chapter, these provide the reader with a 'road map' of what is to come in each chapter.



CHAPTER 3 TRADITIONAL METHODS OF INVESTMENT APPRAISAL 37

RETURN ON CAPITAL EMPLOYED

The second traditional approach to investment appraisal is the Return on Capital Employed (ROCE) which, like payback, has a number of alternative names (in particular, the Accounting Rate of Return, or ARR) and a wide variety of different methods of computation.

There are two common ways of expressing ROCE in practice. One is the ratio of the average annual profit generated over the life of the project, to its *average* investment cost (i.e. the average capital employed). The other approach is to take the average annual profit as a ratio of the *initial* cost. Example 3 illustrates these two sets of calculations.

EXAMPLE 3

The Techniek BV wants to evaluate an investment proposal using the ROCE technique. The project requires an initial capital expenditure of €10 000, together with €3 000 of working capital. The project will have a four-year life, at the end of which time the working capital will be fully recovered and the capital expenditure will have a scrap value of €2 000.

The project's expected annual profits (or loss, as in the case of Year 4) are as follows:

	Year	(€)
Forecast annual profit (or loss):	1	2 000
	2	4 000
	3	1 500
	4	(500)
	Total profit =	€7 000

The average annual profit would therefore be: €7 000 ÷ 4 = €1 750 and the initial capital employed would equal €13 000 (capital expenditure plus working capital). The *average* capital employed would be calculated as:

$$\frac{\text{Capital expenditure} - \text{Scrap value}}{2} + \text{Scrap value} + \text{Working capital}$$

$$\text{that is: } \frac{€10\,000 - €2\,000}{2} + €2\,000 + €3\,000 = €9\,000$$

To help explain this rather odd-looking calculation see Figure 3.1.
Hence the investment's return on *initial* capital employed equals:

$$\frac{€1\,750}{€13\,000} = 0.135\text{(approx) or } 13.5\%$$

and return on *average* capital employed equals:

$$\frac{€1\,750}{€9000} = 0.194\text{(approx) or } 19.4\%$$

Examples and Scenarios – Examples and scenarios are dispersed throughout the text to illustrate practical application.

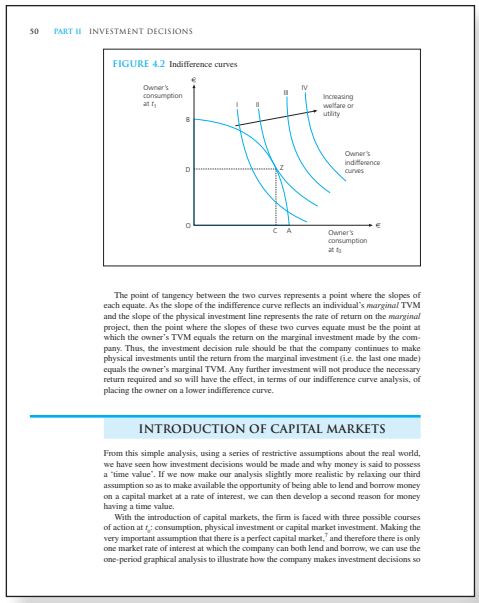


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FIGURE 4.2 Indifference curves

The point of tangency between the two curves represents a point where the slopes of each equate. As the slope of the indifference curve reflects an individual's *marginal* TVM and the slope of the physical investment line represents the rate of return on the *marginal* project, then the point where the slopes of these two curves equate must be the point at which the owner's TVM equals the return on the marginal investment made by the company. Thus, the investment decision rule should be that the company continues to make physical investments until the return from the marginal investment (i.e. the last one made) equals the owner's marginal TVM. Any further investment will not produce the necessary return required and so will have the effect, in terms of our indifference curve analysis, of placing the owner on a lower indifference curve.

INTRODUCTION OF CAPITAL MARKETS

From this simple analysis, using a series of restrictive assumptions about the real world, we have seen how investment decisions would be made and why money is said to possess a 'time value'. If we now make our analysis slightly more realistic by relaxing our third assumption so as to make available the opportunity of being able to lend and borrow money on a capital market at a rate of interest, we can then develop a second reason for money having a time value.

With the introduction of capital markets, the firm is faced with three possible courses of action at t_0: consumption, physical investment or capital market investment. Making the very important assumption that there is a perfect capital market,[7] and therefore there is only one market rate of interest at which the company can both lend and borrow, we can use the one-period graphical analysis to illustrate how the company makes investment decisions so

Numbered Figures and Tables – Clearly set out on the page, to aid the reader with quick conceptualization.

CHAPTER 6 NET PRESENT VALUE AND INTERNAL RATE OF RETURN 111

In many ways this modified IRR calculation achieves the best of all worlds. Its theoretical underpinning is that of NPV, but its method of evaluation is through the use of a user-friendly rate of return. Therefore, it can be seen as a cosmetic restatement of an NPV analysis.

NPV VERSUS IRR: CONCLUSION

Our analysis puts forward a very strong case for the use of the NPV decision rule for investment appraisal. At best, the IRR method (and particularly the modified IRR) might be used as a support and as a communication device on the basis of management's familiarity with rates of return, rather than NPVs, for the decision advice given by the NPV rule.[6] As a result of this conclusion, from now on we shall be implicitly assuming that the NPV technique will be the approach that should be used by companies in making capital investment decisions. It is the only technique from the four investigated that can be relied upon to give advice that will lead towards the maximizing of shareholder wealth.

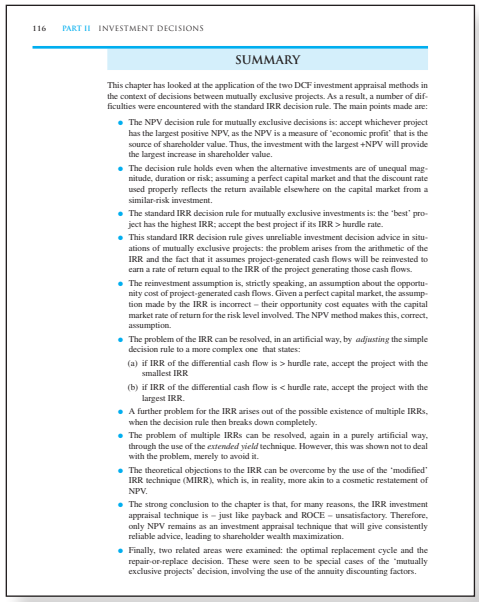
REAL WORLD VIEW: Limitations of the NPV and Its Practical Uses in Day-to-Day Life

As acknowledged throughout the examples in this book, all models have their limitations and the NPV is not exempt from detractors. A key issue is the inherent difficulty of predicting future cash flows with precision. As one commentator, Seth Klarman, notes, 'When future cash flows are reasonably predictable and an appropriate discount rate can be chosen, NPV analysis is one of the most accurate and precise methods of valuation. Unfortunately, cash flows are usually uncertain, often highly so.' Indeed, as one academic paper from 1998 argues further, the problem of assumptions underlying the rule not being met in practice results in some 'numerical examples wherein applying the NPV leads to erroneous decisions.'

It is the 'violation' of these assumptions – or, in other words, poor 'framing' of the specific scenario or problem in light of other ambiguities – that effectively distorts or even invalidates the NPV's actual usefulness. The two such assumptions questioned are, first, that the approval decision is 'now-or-never' (i.e. that only the one current chance to act will be presented) and second, that decision-making is driven only by a single-person or, alternatively, a multi-person firm (without taking into consideration 'information asymmetries among individuals'). There are cases, they contest, when both these assumptions are false.

However, limitations aside, others profess the NPV's broad usefulness to all people in everyday life, from consumers to homeowners and pet lovers. One blogger, for example, used the model to establish the 'best' deal when looking at the various options for personal finance, noting that 'NPV can be used for myriad situations you'll face in life.' He used NPV to help in decisions ranging from choosing to buy his yellow Labrador puppy from a pure-bred breeder (taking into consideration the greater initial outlay versus future veterinary bills which may be higher with an adopted dog), to opting to buy a new lawnmower rather than paying for a lawn management service. Another classic example is the use of energy-saving light bulbs, which cost more than standard light bulbs to purchase yet save on the bills over time. The blogger recognized that each model merely presented a simplified account of life's everyday problems (that may not account for all possibilities or uncertainties), yet nonetheless had real value in providing real analysis to aid his decision-making.

Real World Views – Boxes throughout help to provide context of application in practice and relevant developments in the real world.



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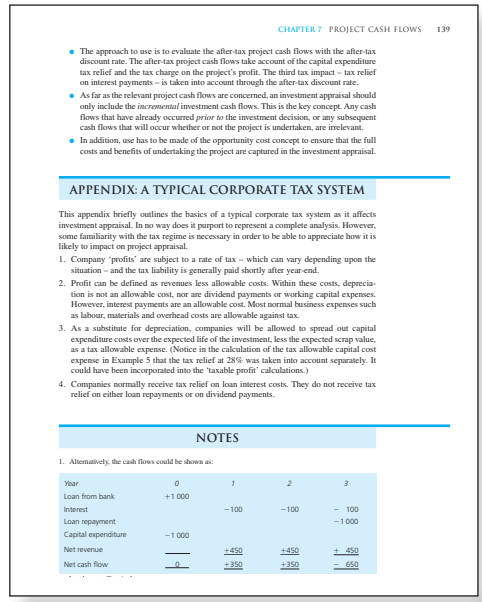
SUMMARY

This chapter has looked at the application of the two DCF investment appraisal methods in the context of decisions between mutually exclusive projects. As a result, a number of difficulties were encountered with the standard IRR decision rule. The main points made are:

- The NPV decision rule for mutually exclusive decisions is: accept whichever project has the largest positive NPV, as the NPV is a measure of 'economic profit' that is the source of shareholder value. Thus, the investment with the largest +NPV will provide the largest increase in shareholder value.
- The decision rule holds even when the alternative investments are of unequal magnitude, duration or risk; assuming a perfect capital market and that the discount rate used properly reflects the return available elsewhere on the capital market from a similar-risk investment.
- The standard IRR decision rule for mutually exclusive investments is: the 'best' project has the highest IRR; accept the best project if its IRR > hurdle rate.
- This standard IRR decision rule gives unreliable investment decision advice in situations of mutually exclusive projects: the problem arises from the arithmetic of the IRR and the fact that it assumes project-generated cash flows will be reinvested to earn a rate of return equal to the IRR of the project generating those cash flows.
- The reinvestment assumption is, strictly speaking, an assumption about the opportunity cost of project-generated cash flows. Given a perfect capital market, the assumption made by the IRR is incorrect – their opportunity cost equates with the capital market rate of return for the risk level involved. The NPV method makes this, correct, assumption.
- The problem of the IRR can be resolved, in an artificial way, by *adjusting* the simple decision rule to a more complex one that states:
  (a) if IRR of the differential cash flow is > hurdle rate, accept the project with the smallest IRR
  (b) if IRR of the differential cash flow is < hurdle rate, accept the project with the largest IRR.
- A further problem for the IRR arises out of the possible existence of multiple IRRs, when the decision rule then breaks down completely.
- The problem of multiple IRRs can be resolved, again in a purely artificial way, through the use of the *extended yield* technique. However, this was shown not to deal with the problem, merely to avoid it.
- The theoretical objections to the IRR can be overcome by the use of the 'modified' IRR technique (MIRR), which is, in reality, more akin to a cosmetic restatement of NPV.
- The strong conclusion to the chapter is that, for many reasons, the IRR investment appraisal technique is – just like payback and ROCE – unsatisfactory. Therefore, only NPV remains as an investment appraisal technique that will give consistently reliable advice, leading to shareholder wealth maximization.
- Finally, two related areas were examined: the optimal replacement cycle and the repair-or-replace decision. These were seen to be special cases of the 'mutually exclusive projects' decision, involving the use of the annuity discounting factors.

Summary – The end of each chapter has a summary designed to give an overview of the key areas that have been discussed, and to provide a snapshot of the main points.



CHAPTER 7 PROJECT CASH FLOWS 139

- The approach to use is to evaluate the after-tax project cash flows with the after-tax discount rate. The after-tax project cash flows take account of the capital expenditure tax relief and the tax charge on the project's profit. The third tax impact – tax relief on interest payments – is taken into account through the after-tax discount rate.
- As far as the relevant project cash flows are concerned, an investment appraisal should only include the *incremental* investment cash flows. This is the key concept. Any cash flows that have already occurred *prior to* the investment decision, or any subsequent cash flows that will occur whether or not the project is undertaken, are irrelevant.
- In addition, use has to be made of the opportunity cost concept to ensure that the full costs and benefits of undertaking the project are captured in the investment appraisal.

APPENDIX: A TYPICAL CORPORATE TAX SYSTEM

This appendix briefly outlines the basics of a typical corporate tax system as it affects investment appraisal. In no way does it purport to represent a complete analysis. However, some familiarity with the tax regime is necessary in order to be able to appreciate how it is likely to impact on project appraisal.

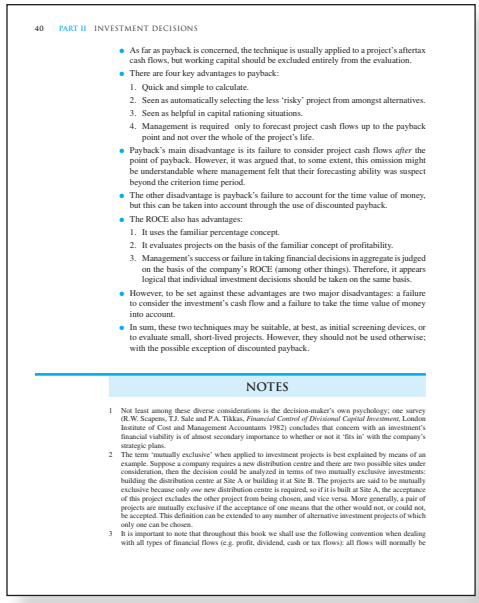
1. Company 'profits' are subject to a rate of tax – which can vary depending upon the situation – and the tax liability is generally paid shortly after year-end.
2. Profit can be defined as revenues less allowable costs. Within these costs, depreciation is not an allowable cost, nor are dividend payments or working capital expenses. However, interest payments are an allowable cost. Most normal business expenses such as labour, materials and overhead costs are allowable against tax.
3. As a substitute for depreciation, companies will be allowed to spread out capital expenditure costs over the expected life of the investment, less the expected scrap value, as a tax allowable expense. (Notice in the calculation of the tax allowable capital cost expense in Example 5 that the tax relief at 28% was taken into account separately. It could have been incorporated into the 'taxable profit' calculations.)
4. Companies normally receive tax relief on loan interest costs. They do not receive tax relief on either loan repayments or on dividend payments.

NOTES

1. Alternatively, the cash flows could be shown as:

Year	*0*	*1*	*2*	*3*
Loan from bank	+1 000			
Interest		−100	−100	− 100
Loan repayment				−1 000
Capital expenditure	−1 000			
Net revenue		+450	+450	+ 450
Net cash flow	−0	+350	+350	− 650

Appendix – Some chapters have an appendix, containing additional useful information.



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- As far as payback is concerned, the technique is usually applied to a project's aftertax cash flows, but working capital should be excluded entirely from the evaluation.
- There are four key advantages to payback:
  1. Quick and simple to calculate.
  2. Seen as automatically selecting the less 'risky' project from amongst alternatives.
  3. Seen as helpful in capital rationing situations.
  4. Management is required only to forecast project cash flows up to the payback point and not over the whole of the project's life.
- Payback's main disadvantage is its failure to consider project cash flows *after* the point of payback. However, it was argued that, to some extent, this omission might be understandable where management felt that their forecasting ability was suspect beyond the criterion time period.
- The other disadvantage is payback's failure to account for the time value of money, but this can be taken into account through the use of discounted payback.
- The ROCE also has advantages:
  1. It uses the familiar percentage concept.
  2. It evaluates projects on the basis of the familiar concept of profitability.
  3. Management's success or failure in taking financial decisions in aggregate is judged on the basis of the company's ROCE (among other things). Therefore, it appears logical that individual investment decisions should be taken on the same basis.
- However, to be set against these advantages are two major disadvantages: a failure to consider the investment's cash flow and a failure to take the time value of money into account.
- In sum, these two techniques may be suitable, at best, as initial screening devices, or to evaluate small, short-lived projects. However, they should not be used otherwise; with the possible exception of discounted payback.

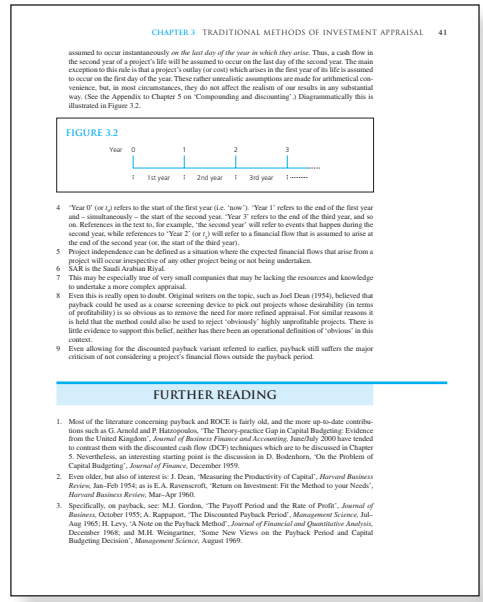
NOTES

1 Not least among these diverse considerations is the decision-maker's own psychology; one survey (R.W. Scapens, T.J. Sale and P.A. Tikkas, *Financial Control of Divisional Capital Investment*, London Institute of Cost and Management Accountants 1982) concludes that concern with an investment's financial viability is of almost secondary importance to whether or not it 'fits in' with the company's strategic plans.

2 The term 'mutually exclusive' when applied to investment projects is best explained by means of an example. Suppose a company requires a new distribution centre and there are two possible sites under consideration, then the decision could be analyzed in terms of two mutually exclusive investments: building the distribution centre at Site A or building it at Site B. The projects are said to be mutually exclusive because only *one* new distribution centre is required, so if it is built at Site A, the acceptance of this project excludes the other project from being chosen, and vice versa. More generally, a pair of projects are mutually exclusive if the acceptance of one means that the other would not, or could not, be accepted. This definition can be extended to any number of alternative investment projects of which only one can be chosen.

3 It is important to note that throughout this book we shall use the following convention when dealing with all types of financial flows (e.g. profit, dividend, cash or tax flows): all flows will normally be assumed to occur instantaneously *on the last day of the year in which they arise*. Thus, a cash flow in the second year of a project's life will be assumed to occur on the last day of the second year. The main exception to this rule is that a project's outlay (or cost) which arises in the first year of its life is assumed to occur on the first day of the year. These rather unrealistic assumptions are made for arithmetical convenience, but, in most circumstances, they do not affect the realism of our results in any substantial way. (See the Appendix to Chapter 5 on 'Compounding and discounting'.) Diagrammatically this is illustrated in Figure 3.2.

Notes – Useful end-of-chapter notes provide helpful additional information and clarification.



CHAPTER 3 TRADITIONAL METHODS OF INVESTMENT APPRAISAL 41

FIGURE 3.2

4 'Year 0' (or t_0) refers to the start of the first year (i.e. 'now'). 'Year 1' refers to the end of the first year and – simultaneously – the start of the second year. 'Year 3' refers to the end of the third year, and so on. References in the text to, for example, 'the second year' will refer to events that happen during the second year, while references to 'Year 2' (or t_2) will refer to a financial flow that is assumed to arise at the end of the second year (or, the start of the third year).

5 Project independence can be defined as a situation where the expected financial flows that arise from a project will occur irrespective of any other project being or not being undertaken.

6 SAR is the Saudi Arabian Riyal.

7 This may be especially true of very small companies that may be lacking the resources and knowledge to undertake a more complex appraisal.

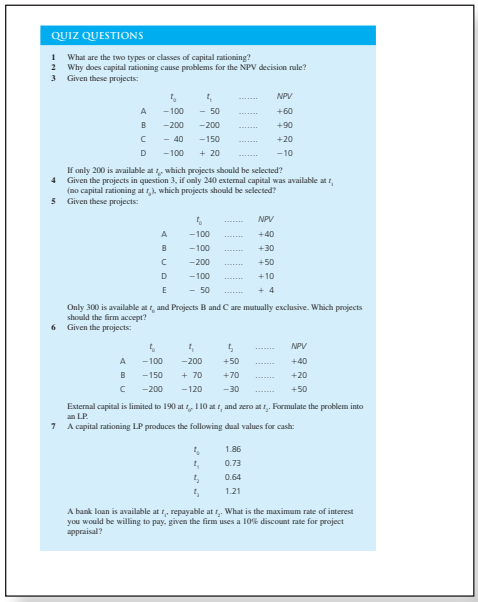
8 Even this is really open to doubt. Original writers on the topic, such as Joel Dean (1954), believed that payback could be used as a coarse screening device to pick out projects whose desirability (in terms of profitability) is so obvious as to remove the need for more refined appraisal. For similar reasons it is held that the method could also be used to reject 'obviously' highly unprofitable projects. There is little evidence to support this belief, neither has there been an operational definition of 'obvious' in this context.

9 Even allowing for the discounted payback variant referred to earlier, payback still suffers the major criticism of not considering a project's financial flows outside the payback period.

FURTHER READING

1. Most of the literature concerning payback and ROCE is fairly old, and the more up-to-date contributions such as G. Arnold and P. Hatzopoulos, 'The Theory-practice Gap in Capital Budgeting: Evidence from the United Kingdom', *Journal of Business Finance and Accounting*, June/July 2000 have tended to contrast them with the discounted cash flow (DCF) techniques which are to be discussed in Chapter 5. Nevertheless, an interesting starting point is the discussion in D. Bodenhorn, 'On the Problem of Capital Budgeting', *Journal of Finance*, December 1959.
2. Even older, but also of interest is: J. Dean, 'Measuring the Productivity of Capital', *Harvard Business Review*, Jan–Feb 1954; as is E.A. Ravenscroft, 'Return on Investment: Fit the Method to your Needs', *Harvard Business Review*, Mar–Apr 1960.
3. Specifically, on payback, see: M.J. Gordon, 'The Payoff Period and the Rate of Profit', *Journal of Business*, October 1955; A. Rappaport, 'The Discounted Payback Period', *Management Science*, Jul–Aug 1965; H. Levy, 'A Note on the Payback Method', *Journal of Financial and Quantitative Analysis*, December 1968; and M.H. Weingartner, 'Some New Views on the Payback Period and Capital Budgeting Decision', *Management Science*, August 1969.

Further Reading – Provide helpful directions to further sources of information, compiled with particular emphasis on providing articles that are, in the main, accessible to those readers who do not possess a higher degree in mathematics.



QUIZ QUESTIONS

1 What are the two types or classes of capital rationing?
2 Why does capital rationing cause problems for the NPV decision rule?
3 Given these projects:

	t_0	t_1	.....	NPV
A	−100	− 50	.....	+60
B	−200	−200	.....	+90
C	− 40	−150	.....	+20
D	−100	+ 20	.....	−10

If only 200 is available at t_0, which projects should be selected?
4 Given the projects in question 3, if only 240 external capital was available at t_1 (no capital rationing at t_0), which projects should be selected?
5 Given these projects:

	t_0	.....	NPV
A	−100	.....	+40
B	−100	.....	+30
C	−200	.....	+50
D	−100	.....	+10
E	− 50	.....	+ 4

Only 300 is available at t_0 and Projects B and C are mutually exclusive. Which projects should the firm accept?
6 Given the projects:

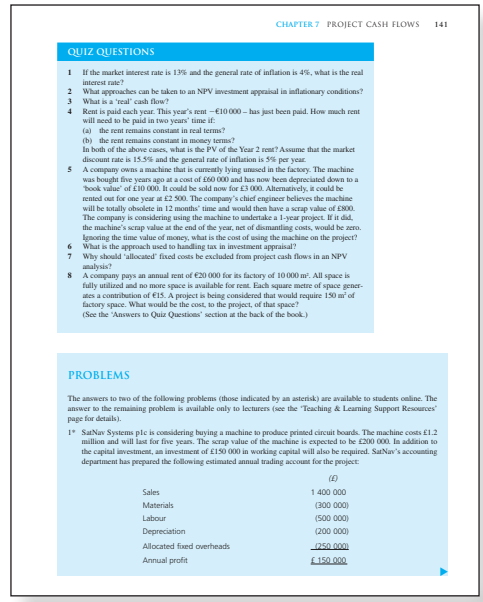
	t_0	t_1	t_2	.....	NPV
A	−100	−200	+50	.....	+40
B	−150	+ 70	+70	.....	+20
C	−200	−120	−30	.....	+50

External capital is limited to 190 at t_0, 110 at t_1 and zero at t_2. Formulate the problem into an LP.
7 A capital rationing LP produces the following dual values for cash:

t_0	1.86
t_1	0.73
t_2	0.64
t_3	1.21

A bank loan is available at t_1, repayable at t_3. What is the maximum rate of interest you would be willing to pay, given the firm uses a 10% discount rate for project appraisal?

Quiz Questions – Included at the end of every chapter, these test both recall and understanding and give the reader essential feedback.



QUIZ QUESTIONS

1 If the market interest rate is 13% and the general rate of inflation is 4%, what is the real interest rate?
2 What approaches can be taken to an NPV investment appraisal in inflationary conditions?
3 What is a 'real' cash flow?
4 Rent is paid each year. This year's rent −€10 000 – has just been paid. How much rent will need to be paid in two years' time if:
(a) the rent remains constant in real terms?
(b) the rent remains constant in money terms?
In both of the above cases, what is the PV of the Year 2 rent? Assume that the market discount rate is 15.5% and the general rate of inflation is 5% per year.
5 A company owns a machine that is currently lying unused in the factory. The machine was bought five years ago at a cost of £60 000 and has now been depreciated down to a 'book value' of £10 000. It could be sold now for £3 000. Alternatively, it could be rented out for one year at £2 500. The company's chief engineer believes the machine will be totally obsolete in 12 months' time and would then have a scrap value of £800. The company is considering using the machine to undertake a 1-year project. If it did, the machine's scrap value at the end of the year, net of dismantling costs, would be zero. Ignoring the time value of money, what is the cost of using the machine on the project?
6 What is the approach used to handling tax in investment appraisal?
7 Why should 'allocated' fixed costs be excluded from project cash flows in an NPV analysis?
8 A company pays an annual rent of €20 000 for its factory of 10 000 m². All space is fully utilized and no more space is available for rent. Each square metre of space generates a contribution of €15. A project is being considered that would require 150 m² of factory space. What would be the cost, to the project, of that space?
(See the 'Answers to Quiz Questions' section at the back of the book.)

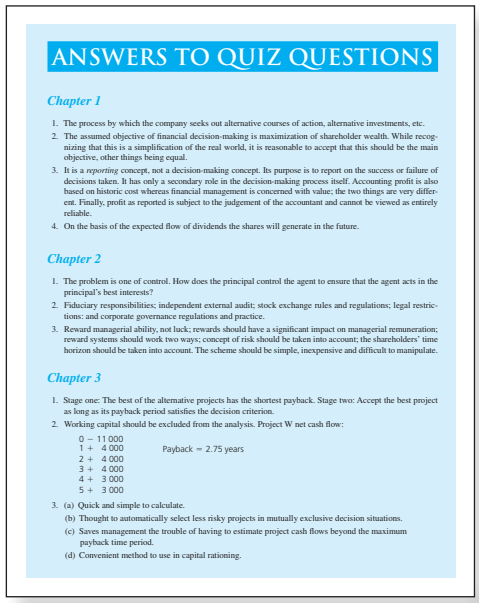
PROBLEMS

The answers to two of the following problems (those indicated by an asterisk) are available to students online. The answer to the remaining problem is available only to lecturers (see the 'Teaching & Learning Support Resources' page for details).

1* SatNav Systems plc is considering buying a machine to produce printed circuit boards. The machine costs £1.2 million and will last for five years. The scrap value of the machine is expected to be £200 000. In addition to the capital investment, an investment of £150 000 in working capital will also be required. SatNav's accounting department has prepared the following estimated annual trading account for the project:

	(£)
Sales	1 400 000
Materials	(300 000)
Labour	(500 000)
Depreciation	(200 000)
Allocated fixed overheads	(250 000)
Annual profit	£150 000

Problems – Exam-style questions which cover the major elements of each chapter's subject matter – some answers are included on the students' online platform, whilst others go on the lecturers' side only.



ANSWERS TO QUIZ QUESTIONS

Chapter 1

1. The process by which the company seeks out alternative courses of action, alternative investments, etc.
2. The assumed objective of financial decision-making is maximization of shareholder wealth. While recognizing that this is a simplification of the real world, it is reasonable to accept that this should be the main objective, other things being equal.
3. It is a *reporting* concept, not a decision-making concept. Its purpose is to report on the success or failure of decisions taken. It has only a secondary role in the decision-making process itself. Accounting profit is also based on historic cost whereas financial management is concerned with value; the two things are very different. Finally, profit as reported is subject to the judgement of the accountant and cannot be viewed as entirely reliable.
4. On the basis of the expected flow of dividends the shares will generate in the future.

Chapter 2

1. The problem is one of control. How does the principal control the agent to ensure that the agent acts in the principal's best interests?
2. Fiduciary responsibilities; independent external audit; stock exchange rules and regulations; legal restrictions; and corporate governance regulations and practice.
3. Reward managerial ability, not luck; rewards should have a significant impact on managerial remuneration; reward systems should work two ways; concept of risk should be taken into account; the shareholders' time horizon should be taken into account. The scheme should be simple, inexpensive and difficult to manipulate.

Chapter 3

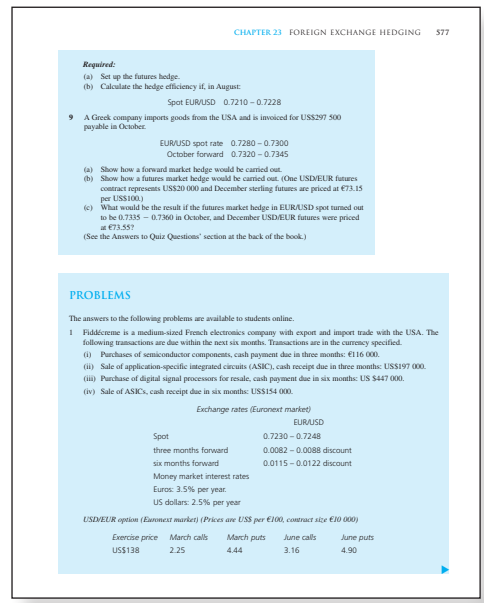
1. Stage one: The best of the alternative projects has the shortest payback. Stage two: Accept the best project as long as its payback period satisfies the decision criterion.
2. Working capital should be excluded from the analysis. Project W net cash flow:

0	− 11 000
1	+ 4 000
2	+ 4 000
3	+ 4 000
4	+ 3 000
5	+ 3 000

Payback = 2.75 years

3. (a) Quick and simple to calculate.
(b) Thought to automatically select less risky projects in mutually exclusive decision situations.
(c) Saves management the trouble of having to estimate project cash flows beyond the maximum payback time period.
(d) Convenient method to use in capital rationing.

Answers to Quiz Questions – Helpfully provided at the back of the book to enable students to easily test themselves.



Required:
(a) Set up the futures hedge.
(b) Calculate the hedge efficiency if, in August:

Spot EUR/USD 0.7210 – 0.7228

9 A Greek company imports goods from the USA and is invoiced for US$297 500 payable in October.

EUR/USD spot rate 0.7280 – 0.7300
October forward 0.7320 – 0.7345

(a) Show how a forward market hedge would be carried out.
(b) Show how a futures market hedge would be carried out. (One USD/EUR futures contract represents US$20 000 and December sterling futures are priced at €73.15 per US$100.)
(c) What would be the result if the futures market hedge in EUR/USD spot turned out to be 0.7335 – 0.7360 in October, and December USD/EUR futures were priced at €73.55?
(See the Answers to Quiz Questions' section at the back of the book.)

PROBLEMS

The answers to the following problems are available to students online.

1 Fiddécreme is a medium-sized French electronics company with export and import trade with the USA. The following transactions are due within the next six months. Transactions are in the currency specified.
(i) Purchases of semiconductor components, cash payment due in three months: €116 000.
(ii) Sale of application-specific integrated circuits (ASIC), cash receipt due in three months: US$197 000.
(iii) Purchase of digital signal processors for resale, cash payment due in six months: US $447 000.
(iv) Sale of ASICs, cash receipt due in six months: US$154 000.

Exchange rates (Euronext market)

	EUR/USD
Spot	0.7230 – 0.7248
three months forward	0.0082 – 0.0088 discount
six months forward	0.0115 – 0.0122 discount

Money market interest rates
Euros: 3.5% per year.
US dollars: 2.5% per year

USD/EUR option (Euronext market) (Prices are US$ per €100, contract size €10 000)

Exercise price	*March calls*	*March puts*	*June calls*	*June puts*
US$138	2.25	4.44	3.16	4.90

Answers to Problems – The majority of answers to the exam question-style problems are available to students online, though some lecturer-only answers are on the lecturers' password protected website.

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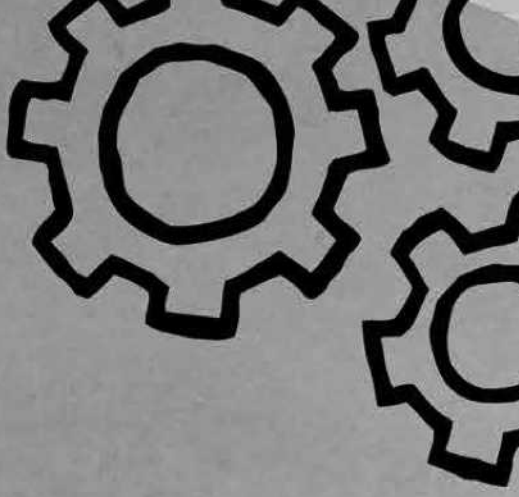

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PART

1

INTRODUCTION

1. **Financial decision-making**

2. **Decision objectives**

CHAPTER

1

FINANCIAL DECISION-MAKING

LEARNING OBJECTIVES

The purpose of this chapter is to:

- Identify the elements that make up the decision process.
- Introduce the objective of financial management decision-making as the maximization of shareholder value.
- Translate this theoretical objective onto the basis of maximizing the value of that company's shares, through maximizing the cash flow to shareholders over time.
- Argue that the more traditional financial objective of accounting profit maximization is inappropriate within the context of financial decision-making.

THE NATURE OF FINANCIAL DECISIONS

An overview

This book covers a particular area of managerial economics: the theory of financial decision-making by business corporations. It is concerned with how management within companies should make financial decisions, and so it can be said to adopt a normative approach because it sets out to establish a standard or norm. But such a theory cannot hope to succeed in its task if it is developed in isolation from what actually does happen in practice, and so we shall also examine how financial decisions *are* made in practice, in order to guide and enrich the development of our normative approach.

The value base

Financial decisions are no different in their fundamental aspects from other decisions of a non-financial nature. In essence, all decisions are based on the concept of the comparison

of alternatives, and it is in this sense that the theory of financial decisions really has its roots in valuation theory, because all the alternatives in any decision-making situation have to be valued in order to be compared. Therefore, although we can say that all types of decisions involve the same fundamental process, each is given its own unique characteristics by the valuation base that it employs.

The financial decision theory developed in this book is founded on the valuation bases that come from the idea of a competitive market economy. However, many parts of our financial theory will be applicable to other types of economic organization, and you may wish to consider and reflect upon the implications of our theory for more social value bases, such as those that might be appropriate to organizations that are within the public sector.

The 'model' approach and the structure of the text

This book is structured in five parts:

1. Introduction to the context of financial decisions – Chapters 1 and 2.
2. The capital investment decision – Chapters 3 to 8.
3. The impact of uncertainty on financial decisions – Chapters 9 to 14.
4. Financing decisions – Chapters 15 to 21.
5. Financial decisions in an international context – Chapters 22 to 24.

In the course of our development of a normative approach to financial decisions, a considerable number of abstractions from and simplifications of the 'real world' will be made, in order to distil the difficulties and focus attention on areas of major importance.

Adopting this type of 'modelling' approach is normal in the study of economics and related areas. However, it brings with it a danger that it is seen as fully describing a 'real' world and providing simple solutions to real-world problems. It is important to remember that we are developing a normative theory and are therefore attempting to give advice on how financial decisions *should* be taken. In general, we will work with simplified models and if the theory were to be followed in practice, without recognizing the full range of possible complicating factors, the quality of financial decisions made in business might deteriorate rather than improve.

The difficulties caused by taxation, inflation and capital scarcity will all be taken into account, as will the concept of risk and the fact that the future is uncertain. These real-world complexities will be added layer by layer to the simplified model with which we start. Even though that model might be a poor reflection of the real world, it provides a logically sound framework upon which to build.

A warning

As a final point, the reader should be constantly aware that the theory of financial decisions presented here is neither in a state of general detailed agreement, nor does it yet provide complete solutions to many of the important problems of financial decision-making. In order to reflect this state of affairs, we shall examine the causes and evidence of these controversies and point out the irrationalities, ambiguities and inconsistencies that necessarily accompany the development of any theory that aspires to real-world application.

THE DECISION PROCESS

In order to examine the decision process and to answer the question, 'How do we make a decision?', we have first to discuss the circumstances in which a decision needs to be made. We can specify two necessary conditions for a decision situation: the existence of alternatives and the existence of an objective or goal.

The first necessary condition

The existence of alternatives is necessary because, if there are no alternatives from which to choose, then there is no need for a decision. This condition can be specified further in that not only must alternatives exist, but they must be seen to exist by the potential decision-maker. There are two points of interest here.

First, notice that we talk of a decision *situation* and of a *potential* decision-maker. This is because the mere existence of perceived alternatives does not necessarily mean that a decision will be made. For instance, the potential decision-maker may well procrastinate, and therefore the passage of time takes him (or her) out of a decision situation and into a situation where there is only one possible course of action and no alternatives are available. (Death is the ultimate example of the passage of time removing a decision situation from an individual.)

The second point of interest is that we are *not* specifying that all possible alternatives are perceived; if they were, we could call this an optimal decision situation. We are, rather, examining how decisions are made, given that a particular decision situation exists. Whether the decision is truly optimal or non-optimal is of no concern at present.

The second necessary condition

The second necessary condition for a decision situation arises from the fact that the actual process of 'making a decision' is liable to cause the decision-maker to expend both time and effort. Rational decision-makers will be unwilling to do so unless they expect that some of the perceived alternatives will be preferred to others in relation to attaining the desired objective. Thus, the existence of an objective is the second necessary condition: without it, there will be no purpose in making a decision.[1]

Valuation of alternatives

Together, these two necessary conditions provide the rationale for making decisions: if the decision-maker does not perceive alternatives, or sees no reason to choose between the alternatives if they are perceived, then no decision will be made (except one of a totally arbitrary kind, as in note 1). But once these conditions do exist, a decision cannot actually be made until values are placed upon the alternatives. In fact, we can assert that the only reason why any alternative course of action is ever evaluated is in order to make a decision about it; therefore, the valuation method used must be related to the objective involved in making the decision and the way in which that objective is expressed.

For example, if our objective were to drive from A to B in the shortest possible time, then we should value the alternative routes from A to B by a common value criterion that was related to our objective of time, and choose whichever route took the shortest time.

Suppose there were three alternative routes: one we valued by time, one by distance and one by scenic beauty. We obviously could not make a decision because the alternatives have different measures or yardsticks of value and so cannot be compared. Alternatively, if all three routes were measured in terms of scenic beauty, we should again be unable to make a decision, even though we could compare the routes, because the basis of the comparison is not the one that gives the rationale for the decision: the value base of the objective, which in this example is 'time'.[2]

Therefore, any decision-making process consists of these three components: a series of perceived alternatives, an expectation that these alternatives are not all equally desirable in terms of attaining an objective held by the decision-maker, and a common value base related to the decision objective. So it is with all financial decisions made in business.

FINANCIAL DECISION-MAKING

This book focuses attention on only two of the three components that we have identified in the decision process and examines how they relate to the making of financial decisions: the expectation that the perceived alternatives are not all equally desirable in terms of attaining a specific objective, and the common value base that is related to this objective and is used to compare the alternatives.

The remaining component of the decision process is the series of perceived alternatives. We shall not be examining it in the main body of the text as it is primarily a condition for the decision *situation,* and we are concentrating on the actual decision-making, assuming that the decision situation already exists. However, this omission does not mean that the 'search process' (as it is called) for alternatives is unimportant. It is in fact extremely important. If this search process is not efficient in seeking out alternatives, then there is a grave danger that the decision itself will not be optimal because the 'most preferred' alternative may go unperceived.

The decision objective

Turning to the two decision process components that we shall examine in detail, we immediately become involved in a value judgement, because the objective we use for financial decision-making, and the consequent value base, will determine the decision reached as to which alternative is selected. Therefore, what objective are we going to use and what valuation base are we going to set up for our theory of financial decisions?

We stated earlier that the fundamental value judgement upon which our approach is based is the concept of a market economy. In such economies, it is reasonable to assume that companies exist for one overriding purpose: in order to benefit their owners.[3] While companies provide income for their employees and the wider local community, supply the needs of a particular market, and provide other benefits such as technological advance, the fact remains that the fundamental rationale for their existence must be to bring benefit to their owners.

This rationale for existence undoubtedly holds true for the great majority of privately owned companies and so management's objective in making financial decisions should be to further the very reason for the company's existence, of benefiting the owners, i.e. the shareholders. We shall see that there might be other managerial objectives but, in essence, we will treat those as deviating from what they should be (this is consistent with the idea of adopting a normative approach). So, if the decision objective is to benefit the owners, what is the value base to be used for the comparison of alternatives?

To answer this question, we have to examine the decision objective more closely. It is obvious from what we have already said that not only should company managements make financial decisions so as to benefit the owners (their shareholders), but they should also strive to maximize that benefit, otherwise shareholders will be interested in replacing them with a set of decision-makers who will do this. Therefore, what is meant by the term 'maximizing shareholders' benefit'?

Maximizing shareholder value

We are going to assume that maximizing benefit means maximizing 'value' or 'wealth'. Although there is nothing surprising about this, we have to be careful here because we are going to assume that maximizing the increase in the owners' value is the *only* way in which management decisions can benefit owners.

This is a slight simplification of the real world, because it is quite possible for shareholders to gain benefit from a company other than by increases in value. For example, shareholders of a company such as the UK property development company, Land Securities plc, may gain benefit from ownership in terms of pride in the fact that the company has a proactive stance towards protecting the environment for which it has won awards. This is also reflected in various ethical investment funds, which emphasize the virtuous, rather than wealth-generating, properties of their investments. However, despite the growing interest in environmental issues, we shall proceed on the assumption that increase in shareholder value is the main, if not the sole, source of benefit from company ownership.

Should we be concerned about companies selling military arms to countries that have repugnant policies, or firms causing pollution to land, air or water resources? Do these types of activity enter into consideration of our decision objective? On the basis of our underlying assumption about the nature of the economy, our answer must be that they should not, because if these activities were thought to be truly undesirable, governments would legislate or regulate to constrain companies' decision-choice alternatives so as to exclude them (as in many cases they do). Company decision-makers should only need to perceive and analyze the decision alternatives in terms of maximizing the owners' wealth. From this viewpoint we can treat financial decisions as not being anything to do with morality. Morality, the law and other considerations might act as a constraint on what a company does but they are entirely different issues and are generally assessed using different criteria.

In market economies, we can develop a theory of financial decisions for privately owned firms in this way because of the workings of the market system for company finance. Share capital, the substance of ownership, is normally provided through supply and demand markets (e.g. stock exchanges), which means that potential shareholders can buy shares in companies that they expect will provide them with the greatest possible increase in value (i.e. shareholders have to make financial decisions in much the same way as management, choosing between alternative ownership opportunities). Existing shareholders can sell their shares if they see other companies providing greater increases to their owners' value than they are receiving. (An important concept here, and one we have yet to deal with, is that the future is uncertain and so any decision amongst alternatives usually has a risk attached to it: the risk that the alternative chosen may not turn out as expected. Some alternatives are riskier than others and so shareholders will really want to own companies that they expect will give them the greatest possible increase in value, for a given level of risk. This concept will be considered more fully at a later stage.) Therefore, if a company were to make its decisions on a basis other than that of maximizing shareholder value, the whole rationale for the company's existence – so far as shareholders are concerned – would be in doubt and they would be likely to take their investment funds elsewhere. In the extreme case, company law provides the opportunity for shareholders to replace a company's decision-makers if enough of them believe that decisions are not being taken in their best interests.

REAL WORLD VIEW: The Rise of Shareholder Revolts

Shareholder 'revolts' are becoming increasingly commonplace. They often occur when senior management are considered to be rewarding themselves too generously at the expense of shareholders, especially if profits are down. Another frequent cause of revolt is when shareholders collectively believe poor management decisions will have a detrimental impact on the future of the company and its ongoing worth.

In terms of shareholder revolts caused by poor decision making, in March 2017 supermarket chain Tesco faced opposition from its two biggest shareholders, Schroders and Artisan Partners. Having just agreed to pay £214 million to settle a three year accounting scandal, shareholders opposed Tesco's proposed £3.7 billion acquisition of food wholesaler Booker Group Plc. Tesco's initial performance on the FTSE 100 index following the announcement of the Booker Group deal was poor, reflecting shareholder views that Tesco would be overpaying and causing the CEO further distraction.

Similarly, in January 2017, retailer Sports Direct also faced a shareholder revolt based on poor management decisions. In this case the chairman, Sir Keith Hellawell, was the centre of the rebellion. The company had been under intense pressure over the preceding 18 months due to a scandal about workers' conditions. Advisory groups such as the Institutional Shareholder Services were urging independent investors to vote against Sir Keith Hellawell's reappointment, due to repeated poor management. Despite a second vote and 54% of independent shareholders voting against him, with the support of chief executive Mike Ashely, Hellawell survived.

A classic example of a shareholder revolt against levels of executive pay is the revolt against global advertising firm WPP in 2016. 33% of investors voted to reject a new £70 million pay package for chief executive Sir Martin Sorrell, who is already the highest paid CEO of British FTSE 100 companies. His pay had risen at twice the year on year average increase in the company's total shareholder return and discontent was reflected in the rise from 22% to 33% of shareholders voting against the pay package.

Another example of a company facing a shareholder revolt over executive pay where the proposed plan was ultimately left unchanged is Crest Nicholson, one of the UK's largest house building firms. More than 58% of shareholders voted against a pay deal for top executives because they felt company profit targets were too easy to achieve. Despite the embarrassment of being the first major revolt in 2017, the company still plans to go ahead with the pay deals.

Executive pay plans do not always survive shareholder revolts as with WPP and Crest Nicholson. In February 2017, 32.7% of Thomas Cook shareholders voted to reject a planned 225% rise in CEO Peter Fankhauser's long term bonus, worth about £1.6 million a year. A further 20% of shareholders rejected the firm's overall pay policy. In response to this, Thomas Cook reduced the maximum payout for its chief executive. The share price dropped by 7.5% on this announcement amidst a tough period for the company.

Whether payment plans are changed or not, sometimes shareholders revolt against executive pay purely based on the performance of the company at the time. Mining company Anglo American announced a cap on executive bonuses in March 2017, following a revolt over high payouts after the company's stock price had crashed in 2016. The CEO's maximum bonus was reduced from 350% to 300% of basic salary to bring it into line with other executives.

A similar revolt took place at global investor Franklin Templeton after a terrible performance in 2016. Despite managing assets worth £1.5 trillion, it was the worst selling fund house globally in 2016, with assets depreciating by 5%, revenues dropping 16.7% to $6.4 billion and operating income falling by 21.8% in 2016. Excessive pay and lack of director independence were the main reasons cited by shareholders for the revolt.

Defining value

However, we still cannot determine the valuation base for financial decision-making until we have defined 'shareholder value', because the purpose of the valuation base is to act as a common denominator with which to make the alternative courses of action directly

comparable and to see which one leads furthest towards the decision objective. As the objective of financial decisions is assumed to be to 'maximize the increase in shareholders' value', let us define 'value' and so determine the valuation base.

Shareholder value (or shareholder wealth), can be defined as the capacity to consume and can be simply measured in terms of money or cash.[4] Thus, the objective of management becomes the maximization of shareholders' purchasing power, which can be achieved by maximizing the amount of cash paid out to shareholders in the form of dividends. But *which* dividends should a company's management try to maximize: this year's, next year's or what?

The point here is that it would be a relatively easy task for a company to maximize a single year's dividend, simply by selling up all the assets and paying a final liquidation dividend! Obviously, this is not what is meant by our decision objective of maximizing dividends, and the trouble arises through the omission of the time dimension. When fully defined, including the time dimension, the objective of a company's financial decision-makers becomes the maximizing of the *flow* of dividends to shareholders *over time.*

The role of accounting profit

There are two points of fundamental importance that arise from the development of this decision objective. First, the word 'profit' has not been mentioned and the emphasis has been laid on value defined as cash. Second, the introduction of the time dimension means that decisions must be analyzed not only in terms of immediate cash gains and losses, but also in terms of *future* gains and losses.

These two points are interlinked. Profit, when used in a business sense, is a concept developed by financial accountants in order to assist them with their reporting functions, performed on behalf of shareholders.

The accounting profit metric has been developed over very many years and arises out of the concept of the 'stewardship' function. It was designed as a means of providing evidence that the individuals who were tasked with managing the assets of others (the company's management team), had done so both diligently and responsibly. This stewardship principle still lies at the heart of the accounting profit metric. However, although annual company financial reports are produced each year and contain the 'profit' calculation, this should not be interpreted as being a measure of the increase in shareholder value over the year. Annual financial profit calculation is produced using a number of conventions and judgements which results in 'profit' and 'cash' becoming different concepts. As we will see, wealth, worth and value are all concepts related to the future (and to future cash flows) but accounting profit is related to the past.

Financial decisions are basically economic or resource allocation decisions. Management has to decide whether they should allocate the firm's scarce resources (land, labour, machinery, etc.) to a particular project. In such decisions the economic 'unit of account' is cash, not accounting profit, because it is cash which gives power to command resources (i.e. resources are purchased with cash, not profit). Thus, to use the accounting profit concept in financial decision-making would be to use an entirely inappropriate concept – as it is a concept that has been specially developed for reporting the *outcome* of decisions, rather than having been developed for helping to take the actual decision itself.

However, we cannot discard the accounting profit concept completely. To do so would be rather like a sports team whose policy is that they do not mind whether they win or lose, so long as in playing they give maximum entertainment to their supporters. This is fine, and it is probably the correct attitude, but often it is on the winning or losing that the success of the team is ultimately judged and therefore that part of the game cannot be ignored. So

it is with accounting profit. The company's financial decision-makers should have as their major concern the maximization of the flow of cash through time to the shareholders, but they should always do so with an eye to reported profit. Profitability, as expressed in annual financial reports, forms a major criterion by which shareholders and prospective shareholders judge a company's success and, as we shall see later, it is important that people do form correct judgements about a company's performance.

Therefore, with the exception of this proviso, we can say that the financial decision theory developed here is built on an analytical framework that is largely devoid of the accounting profit concept, although it would be correct to assume that, in the longer run, good company cash flows will result in good reported profits.

The time dimension

Turning to the second point of importance in our decision objective, we have to return to our discussion on value.

Any asset (such as a machine or a share in a company) is valued on the basis of the future gains, or losses, that the owner expects to receive. Furthermore, these gains and losses do not refer to just those made in a single time period, but to the whole period of future time for which the asset will exist. (This concept is sometimes referred to as the asset's earning power.)

Let us consider an asset of company ownership: a single share. Shares are traded (i.e. bought and sold) in supply and demand markets (stock markets), and so a share's market valuation represents an equilibrium value, a value at which demand for the share by people who wish to buy it equates with the supply of the share by people who wish to sell it. But what process actually gives a share its equilibrium price, what makes prospective purchasers wish to buy it at that price and what makes prospective sellers willing to sell it at that price? Let us examine the prospective purchaser's reasons.

Suppose a share of Jeddah Company has a stock market price of €25. Prospective owners of that share would only be willing to buy it if they thought it was worth €25. In other words, they would expect that the gains to be received from ownership would have a value of at least €25.

These gains of ownership consist of two elements: the stream of dividends received for as long as the share is owned, and the selling price received when the share is eventually sold (and so ownership relinquished) at some future point in time. However, it is important to note that this future selling price of the Jeddah share is itself based on the value the *succeeding* owner, in turn, puts on the benefits expected to be received from ownership – the dividend flow received and the selling price that they will receive upon selling the share at some future point in time. So the process goes on ad infinitum. Therefore, although there are two benefits of ownership, the dividends received and the future selling price, this latter benefit is itself determined by the flow of dividends expected to be generated by the share subsequent to its sale.

Given this argument, our theory will assume that shares derive their stock market price on the basis of the sum of the complete future dividend flow that they will produce through time. (As the future is uncertain, it is more correct to talk of valuation based on the *expected* dividend flow, but we shall return to this later.) Thus, the greater the future dividend flow, the more highly are the shares valued. Therefore, if our financial decision-makers are taking decisions so as to maximize dividend flow through time, then, via the direct link between dividend flow and a share's market price, this action will result in the *maximization of the market value of the company's shares.* It is this that we shall take as being the operational objective of financial management decision-making.[5]