FUNDAMENTALS OF CORPORATE FINANCE

2ND EDITION

BERK
DEMARZO
HARFORD
FORD
MOLLICA
FINCH

ALWAYS LEARNING

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2ND EDITION

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PREFACE

Finance educators are united by their commitment to shaping future generations of financial professionals as well as instilling financial awareness and skills in non-majors. Our goal with *Fundamentals of Corporate Finance* is to provide an accessible presentation for both finance and non-finance majors.

Writing an Australian edition of a popular US text is both an easy and a difficult task. The easy component derives from the fact that we had an outstanding manuscript to work with. Having taught corporate finance courses for many years to undergraduate and postgraduate students, and to senior executives in various organisations, we came to the task with a thorough knowledge both of what books were available, and of what works and what doesn't work for students when it comes to textbooks and their pedagogy. We have long viewed Berk, DeMarzo and Harford as an exceptional finance textbook and, as such, were thrilled when approached to adapt it for Australasian conditions. The book achieves a fine balance between the theoretical underpinnings of finance—which the authors skilfully convey in their manuscript—and relevant practical exercises and examples that reflect contemporary market practice. Rarely have we come across a textbook in finance that captures and explains difficult concepts in such a clear and accessible style as this one. Accordingly, this book serves as a valuable reference for academics, finance practitioners and students alike.

The difficult component of our task derives from the fact that we had to ensure we upheld the reputation and integrity of the book. An adaptation is more than changing spelling, symbols and data in tables. In many cases the essence of arguments must change markedly when factors such as market size, tax regimes and other peculiarities of the local region are taken into consideration. This necessitated substantial rewriting of some chapters and fine-tuning of others. At the same time, we were mindful that we all must go about our business in a highly integrated global market. It is not an easy task capturing all the relevant elements of investment, financing, dividend and risk management decisions in both a regional and an international setting. This is the goal we set out to achieve and we trust we have achieved it.

In this second edition we have incorporated around 60 Australian firms in the book in case studies, examples and exercises, such as a discounted cash flow valuation of JB Hi-Fi. We have incorporated the Australian regulatory and institutional setting where relevant, and have included a detailed discussion of how an imputation tax system should impact on the cost of capital and valuation of Australian firms.

NEW TO THIS EDITION

In general terms, in our work on the second edition, we took great care to update all text discussions and figures, tables and facts to reflect key developments in the field and to provide the clearest presentation possible. Specific highlights include the following.

- **Reorganised flow of topics in Chapters 3 and 4.** Mastering the tools for discounting cash flows is central to students' success in the introductory course. As always, mastery comes with practice and by approaching complex topics in manageable units. We begin our step-by-step look at the time value of money in Chapter 3, which provides intuition for time value concepts, introduces the Valuation Principle, and presents rules for valuing cash flows. Chapter 4 addresses cash flow valuation for multi-period investments.
- **New two-pronged approach to share valuation.** Immediately following bond valuation, Chapter 7 opens with key background coverage of share quotes and the mechanics of share trades and then presents the dividend-discount model. We delay the discussion of the discounted cash flow model until after we have covered capital budgeting. In Chapter 10, we introduce the discounted cash flow model by building on concepts already developed in the capital budgeting chapters. Chapter 10 also discusses market efficiency and includes a new discussion of investor behaviour.
- **Expanded special topics section.** The new mergers and acquisitions chapter looks at the overall market for takeovers, motivations for pursuing acquisitions and the typical process.

Emphasis on valuation

As painful as the Global Financial Crisis was, there is a silver lining: with the increasing focus on finance in the news, today's undergraduate students arrive in the classroom with an interest in finance. We strive to use that natural interest and motivation to overcome their fear of the subject and communicate time-tested core principles. Again, we take what has worked in the classroom and apply it to the text: by providing examples involving companies familiar to students, making consistent use of real-world data and demonstrating personal finance applications of core concepts, we strive to keep both non-finance and finance majors engaged.

By learning to apply the Valuation Principle, students develop the skills to make the types of comparisons—among loan options, investments, projects and so on—that turn them into knowledgeable, confident financial consumers and managers. When students see how to apply finance to their personal lives and future careers, they grasp that finance is more than abstract, mathematically based concepts.

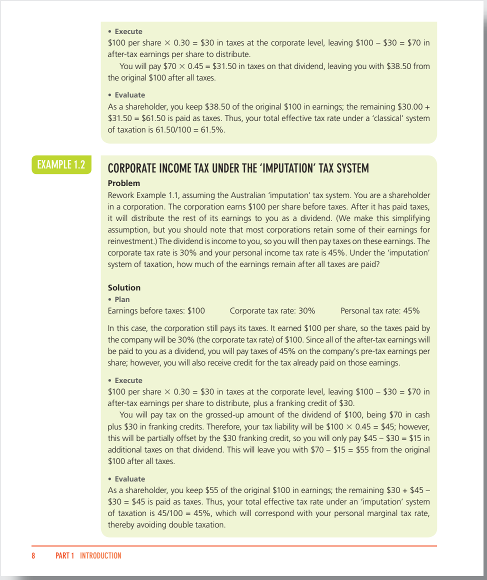
GUIDED TOUR: FOR STUDENTS

BRIDGING THEORY AND PRACTICE

Study aids with a practical focus

To be successful, you need to master the core concepts and learn to identify and solve problems that today's practitioners face.

The **Valuation Principle** is presented as the foundation of all financial decision making: the central idea is that a firm should take projects or make investments that increase the value of the firm. The tools of finance determine the impact of a project or investment on the firm's value by comparing the costs and benefits in equivalent terms. The Valuation Principle is first introduced in Chapter 3, revisited in the part openers and integrated throughout the text.



- **Execute**

$100 per share × 0.30 = $30 in taxes at the corporate level, leaving $100 – $30 = $70 in after-tax earnings per share to distribute.

You will pay $70 × 0.45 = $31.50 in taxes on that dividend, leaving you with $38.50 from the original $100 after all taxes.

- **Evaluate**

As a shareholder, you keep $38.50 of the original $100 in earnings; the remaining $30.00 + $31.50 = $61.50 is paid as taxes. Thus, your total effective tax rate under a 'classical' system of taxation is 61.50/100 = 61.5%.

EXAMPLE 1.2

CORPORATE INCOME TAX UNDER THE 'IMPUTATION' TAX SYSTEM

Problem

Rework Example 1.1, assuming the Australian 'imputation' tax system. You are a shareholder in a corporation. The corporation earns $100 per share before taxes. After it has paid taxes, it will distribute the rest of its earnings to you as a dividend. (We make this simplifying assumption, but you should note that most corporations retain some of their earnings for reinvestment.) The dividend is income to you, so you will then pay taxes on these earnings. The corporate tax rate is 30% and your personal income tax rate is 45%. Under the 'imputation' system of taxation, how much of the earnings remain after all taxes are paid?

Solution

- **Plan**

Earnings before taxes: $100 Corporate tax rate: 30% Personal tax rate: 45%

In this case, the corporation still pays its taxes. It earned $100 per share, so the taxes paid by the company will be 30% (the corporate tax rate) of $100. Since all of the after-tax earnings will be paid to you as a dividend, you will pay taxes of 45% on the company's pre-tax earnings per share; however, you will also receive credit for the tax already paid on those earnings.

- **Execute**

$100 per share × 0.30 = $30 in taxes at the corporate level, leaving $100 – $30 = $70 in after-tax earnings per share to distribute, plus a franking credit of $30.

You will pay tax on the grossed-up amount of the dividend of $100, being $70 in cash plus $30 in franking credits. Therefore, your tax liability will be $100 × 0.45 = $45; however, this will be partially offset by the $30 franking credit, so you will only pay $45 – $30 = $15 in additional taxes on that dividend. This will leave you with $70 – $15 = $55 from the original $100 after all taxes.

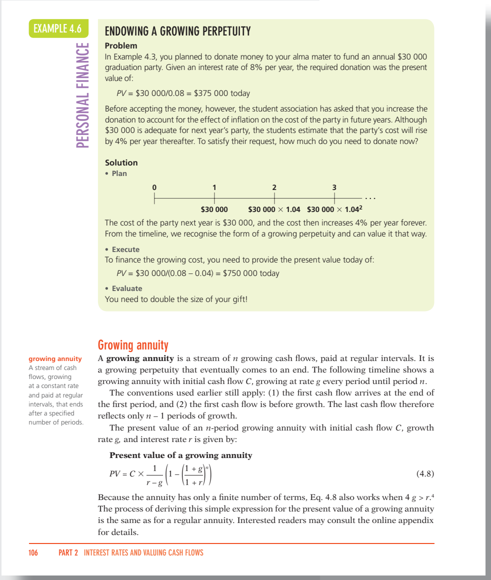
- **Evaluate**

As a shareholder, you keep $55 of the original $100 in earnings; the remaining $30 + $45 – $30 = $45 is paid as taxes. Thus, your total effective tax rate under an 'imputation' system of taxation is 45/100 = 45%, which will correspond with your personal marginal tax rate, thereby avoiding double taxation.

8 PART 1 INTRODUCTION

Guided Problem Solutions (GPS) are examples that accompany every important concept using a consistent problem-solving methodology that breaks the solution process into three steps: plan, execute and evaluate. This approach aids your comprehension, enhances your ability to model the solution process when tackling problems on your own and demonstrates the importance of interpreting the mathematical solution.

Personal Finance GPS examples showcase the use of financial analysis in everyday life by setting problems in scenarios such as purchasing a new car or house, and saving for retirement.



EXAMPLE 4.6

PERSONAL FINANCE

ENDOWING A GROWING PERPETUITY

Problem

In Example 4.3, you planned to donate money to your alma mater to fund an annual $30 000 graduation party. Given an interest rate of 8% per year, the required donation was the present value of:

PV = $30 000/0.08 = $375 000 today

Before accepting the money, however, the student association has asked that you increase the donation to account for the effect of inflation on the cost of the party in future years. Although $30 000 is adequate for next year's party, the students estimate that the party's cost will rise by 4% per year thereafter. To satisfy their request, how much do you need to donate now?

Solution

- **Plan**

0	1	2	3	...
	$30 000	$30 000 × 1.04	$30 000 × 1.04^2	

The cost of the party next year is $30 000, and the cost then increases 4% per year forever. From the timeline, we recognise the form of a growing perpetuity and can value it that way.

- **Execute**

To finance the growing cost, you need to provide the present value today of:

PV = $30 000/(0.08 – 0.04) = $750 000 today

- **Evaluate**

You need to double the size of your gift!

Growing annuity

growing annuity A stream of cash flows, growing at a constant rate and paid at regular intervals, that ends after a specified number of periods.

A **growing annuity** is a stream of n growing cash flows, paid at regular intervals. It is a growing perpetuity that eventually comes to an end. The following timeline shows a growing annuity with initial cash flow C, growing at rate g every period until period n.

The conventions used earlier still apply: (1) the first cash flow arrives at the end of the first period, and (2) the first cash flow is before growth. The last cash flow therefore reflects only $n - 1$ periods of growth.

The present value of an n-period growing annuity with initial cash flow C, growth rate g, and interest rate r is given by:

Present value of a growing annuity

$$PV = C \times \frac{1}{r-g}\left(1-\left(\frac{1+g}{1+r}\right)^{n}\right) \qquad (4.8)$$

Because the annuity has only a finite number of terms, Eq. 4.8 also works when 4 $g > r$.[4] The process of deriving this simple expression for the present value of a growing annuity is the same as for a regular annuity. Interested readers may consult the online appendix for details.

106 PART 2 INTEREST RATES AND VALUING CASH FLOWS

Modified internal rate of return

modified internal rate of return (MIRR) The discount rate that sets the NPV of modified cash flows of a project equal to zero. Cash flows are modified so there is only one negative cash flow (and one sign-change) to ensure that only one IRR exists.

The fact that there can be multiple IRRs for the cash flows from a project is a clear disadvantage for the IRR. To overcome this, some have proposed various ways of modifying the cash flows before computing the IRR. All these modifications have the common feature that they group the cash flows so that there is only one negative cash flow, occurring at either the beginning or the end. In that case, there is only one sign-change for the cash flows as a whole and hence only one IRR. This new IRR, computed as the discount rate that sets the NPV of the modified cash flows of the project equal to zero, is called the **modified internal rate of return (MIRR)**.

FINANCE IN FOCUS

Why do rules other than the NPV rule persist?

The results from previous studies in both Australia and the US found that not all firms use the NPV rule. In addition, a substantial number of the firms surveyed used the payback rule. Furthermore, it appears that most firms use *both* the NPV rule and the IRR rule. Why do firms use rules other than NPV if they can lead to erroneous decisions? One possible explanation for this phenomenon is that the survey results might be misleading. Chief financial officers (CFOs) using the IRR as a sensitivity measure in conjunction with the NPV rule might have checked both the IRR box and the NPV box on the survey. The question they were asked was, 'How frequently does your firm use the following techniques when deciding which projects or acquisitions to pursue?' By computing the IRR and using it in conjunction with the NPV rule to estimate the sensitivity of their results, they might have felt they were using both techniques. Nevertheless, a significant minority of managers surveyed replied that they used only the IRR rule, so this explanation cannot be the whole story.

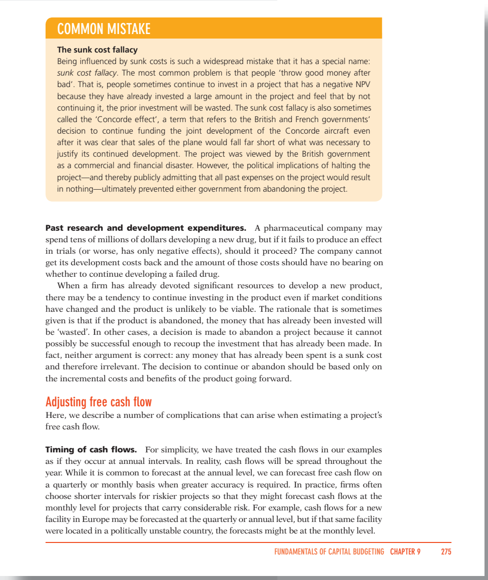
One common reason that managers give for using the IRR rule exclusively is that you do not need to know the opportunity cost of capital to calculate the IRR. On a superficial level, this is true: the IRR does not depend on the cost of capital. You may not need to know the cost of capital to *calculate* the IRR, but you certainly need to know the cost of capital when you *apply* the IRR rule. Consequently, the opportunity cost is as important to the IRR rule as it is to the NPV rule.

In our opinion, some firms use the IRR rule exclusively because the IRR sums up the attractiveness of investment opportunity in a single number without requiring the person running the numbers to make an assumption about the cost of capital. However, if a CFO wants a brief summary of an investment opportunity but does not want an employee to make a cost of capital assumption, he or she can also request a plot of the NPV as a function of the discount rate. Neither this request nor a request for the IRR requires knowing the cost of capital, but the NPV profile has the distinct advantage of being much more informative and reliable.

INVESTMENT DECISION RULES CHAPTER 8 235

Finance in Focus boxes highlight contemporary examples of how theory works in the real world, impacting business problems and company practices.

Common Mistake boxes alert you to frequently made mistakes stemming from misunderstanding core concepts and calculations—in the classroom and in the field.



COMMON MISTAKE

The sunk cost fallacy

Being influenced by sunk costs is such a widespread mistake that it has a special name: *sunk cost fallacy*. The most common problem is that people 'throw good money after bad'. That is, people sometimes continue to invest in a project that has a negative NPV because they have already invested a large amount in the project and feel that by not continuing it, the prior investment will be wasted. The sunk cost fallacy is also sometimes called the 'Concorde effect', a term that refers to the British and French governments' decision to continue funding the joint development of the Concorde aircraft even after it was clear that sales of the plane would fall far short of what was necessary to justify its continued development. The project was viewed by the British government as a commercial and financial disaster. However, the political implications of halting the project—and thereby publicly admitting that all past expenses on the project would result in nothing—ultimately prevented either government from abandoning the project.

Past research and development expenditures. A pharmaceutical company may spend tens of millions of dollars developing a new drug, but if it fails to produce an effect in trials (or worse, has only negative effects), should it proceed? The company cannot get its development costs back and the amount of those costs should have no bearing on whether to continue developing a failed drug.

When a firm has already devoted significant resources to develop a new product, there may be a tendency to continue investing in the product even if market conditions have changed and the product is unlikely to be viable. The rationale that is sometimes given is that if the product is abandoned, the money that has already been invested will be 'wasted'. In other cases, a decision is made to abandon a project because it cannot possibly be successful enough to recoup the investment that has already been made. In fact, neither argument is correct: any money that has already been spent is a sunk cost and therefore irrelevant. The decision to continue or abandon should be based only on the incremental costs and benefits of the product going forward.

Adjusting free cash flow

Here, we describe a number of complications that can arise when estimating a project's free cash flow.

Timing of cash flows. For simplicity, we have treated the cash flows in our examples as if they occur at annual intervals. In reality, cash flows will be spread throughout the year. While it is common to forecast at the annual level, we can forecast free cash flow on a quarterly or monthly basis when greater accuracy is required. In practice, firms often choose shorter intervals for riskier projects so that they might forecast cash flows at the monthly level for projects that carry considerable risk. For example, cash flows for a new facility in Europe may be forecasted at the quarterly or annual level, but if that same facility were located in a politically unstable country, the forecasts might be at the monthly level.

FUNDAMENTALS OF CAPITAL BUDGETING CHAPTER 9 275

TEACHING EVERY STUDENT TO THINK FINANCE

Simplified presentation of mathematics

Because one of the hardest parts of learning finance for non-majors is mastering the jargon, maths and non-standardised notation, *Fundamentals of Corporate Finance* systematically uses:

Notation boxes. Each chapter begins with a notation box that defines the variables and the acronyms used in the chapter and serves as a 'legend' for your reference.

CHAPTER 4

TIME VALUE OF MONEY: VALUING CASH FLOW STREAMS

LEARNING OBJECTIVES

After studying this chapter, you should be able to:

1 value a series of many cash flows;
2 value a perpetual series of regular cash flows called a *perpetuity*;
3 value a common set of regular cash flows called an annuity;
4 value both perpetuities and annuities when the cash flows grow at a constant rate;
5 calculate the number of periods, cash flow, or rate of return of a loan or investment.

NOTATION

C	cash flow
C_n	cash flow that arrives in period n
FV	future value
FV_n	future value in period n
g	growth rate
n	number of periods
P	initial principal or deposit, or equivalent present value
PV	present value
r	interest rate or rate of return

As we discussed in Chapter 3, to evaluate a project a financial manager must compare its costs and benefits. In most cases, the cash flows in financial investments involve more than one future period. Thus, the financial manager is faced with the task of trading off a known up-front cost against a series of uncertain future benefits. We learned to value those costs and benefits by computing their cash value today—their present values.

In financial management, as well as your personal finances, you will need to evaluate series of cash flows occurring across time. In this chapter, we build on the tools we developed in Chapter 3 to value any series of cash flows. We will develop shortcuts for valuing *annuities*, *perpetuities* and other special cases of assets with cash flows that follow regular patterns.

In Chapter 5, we will learn how interest rates are quoted and determined. Once we understand how interest rates are quoted, it will be straightforward to extend the tools of this chapter to cash flows that occur more frequently than once per year.

Numbered and labelled equations. The first time a full equation is given in notation form it is numbered. Key equations are titled and revisited in the summary and in end papers.

Timelines. Introduced in Chapter 3, timelines are emphasised as the important first step in solving every problem that involves cash flow.

4.1 VALUING A STREAM OF CASH FLOWS

LEARNING OBJECTIVE 1 Value a series of many cash flows.

We refer to a series of cash flows lasting several periods as a **stream of cash flows**. As with single cash flows, we can represent a stream of cash flows on a timeline. In this chapter we will continue to use timelines and the rules of cash flow valuation introduced in Chapter 3 to organise and then solve financial problems.

stream of cash flows A series of cash flows lasting several periods.

Applying the rules of valuing cash flows to a cash flow stream

Most investment opportunities have multiple cash flows that occur at different points in time. In Chapter 3, we learned the rules to value such cash flows.

Rule 1: only values at the same point in time can be compared or combined.

Rule 2: to calculate a cash flow's future value, we must compound it using Eq. 3.1 from Chapter 3.

$$FV_n = C \times (1 + r)^n \tag{4.1}$$

Rule 3: to calculate the present value of a future cash flow, we must discount it using Eq. 3.2 of Chapter 3.

$$PV = C / (1 + r)^n = \frac{C}{(1 + r)^n} \tag{4.2}$$

The rules of cash flow valuation allow us to compare and combine cash flows that occur at different points in time. Suppose we plan to save $1000 today and $1000 at the end of each of the next two years. If we earn a fixed 10% interest rate on our savings, how much will we have three years from today? Again, we start with a timeline:

0	1	2	3
$1000	$1000	$1000	?

90 PART 2 INTEREST RATES AND VALUING CASH FLOWS

• Execute

$PV = \frac{15\,000}{1.06^{10}} = \$8375.92$ today

• Evaluate

The bond is worth much less today than its final payoff because of the time value of money.

As we've seen in this section, we can compare cash flows at different points in time as long as we follow the three rules of valuing cash flows, summarised in Table 3.1. Armed with these three rules, a financial manager can compare an investment's costs and benefits that are spread out over time and apply the Valuation Principle to make the right decision. In the next chapter, we will show you how to apply these rules to situations involving multiple cash flows at different points in time.

TABLE 3.1 The three rules of valuing cash flows

Rule	Formula
1 Only values at the same point in time can be compared or combined.	None
2 To calculate a cash flow's future value, we must compound it.	Future value of a cash flow: $FV_n = C \times (1 + r)^n$
3 To calculate the present value of a future cash flow, we must discount it.	Present value of a cash flow: $PV = C / (1 + r)^n = \frac{C}{(1 + r)^n}$

USING A FINANCIAL CALCULATOR

Financial calculators are programmed to perform most present and future value calculations. However, we recommend that you develop an understanding of the formulas before using the shortcuts. We provide a more extensive discussion of financial calculators in the appendix to Chapter 4, but we'll cover the relevant functions for this chapter here. To use financial calculator functions, you always enter the known values first and then the calculator solves for the unknown.

To answer Example 3.5 with a financial calculator, do the following:

Concept	Number of Periods	Interest Rate per Period	Recurring Payments	Future Value
Calculator Key	N	I/Y	PMT	FV
Enter	10	6	0	15000

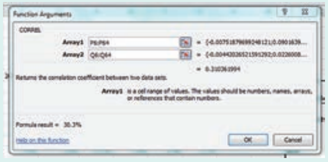
82 PART 2 INTEREST RATES AND VALUING CASH FLOWS

USING EXCEL

Calculating the correlation between two sets of returns

The correlations presented in Table 12.3 were all calculated by comparing the returns of two shares. Here we describe how you can use Excel to calculate these correlations.

1 Enter or import the historical returns for the two shares into Excel.
2 Next, from the Data Group, select **Formulas**, then **Insert Function**, and then select **'Correl'** for **Correlation**.
3 For the 'Input Range' field, highlight the two columns of returns.
4 Click **OK**.
5 The answer will appear in a new worksheet as the correlation between 'column 1' and 'column 2'. The screen capture below shows the correlation between Woolworths and Qantas returns to be 0.31 or 31%.



Computing a portfolio's variance and standard deviation

We now have the tools to formally compute portfolio variance. The formula for the variance of a two-share portfolio is:

$$Var(R_P) = \underbrace{w_1^2 SD(R_1)^2}_{\text{Accounting for the risk of share 1}} + \underbrace{w_2^2 SD(R_2)^2}_{\text{Accounting for the risk of share 2}} + \underbrace{2w_1w_2 Corr(R_1, R_2) SD(R_1) SD(R_2)}_{\text{Adjustment for how much the two shares move together}} \tag{12.4}$$

The three parts of Eq. 12.4 each account for an important determinant of the overall variance of the portfolio: the risk of share 1, the risk of share 2 and an adjustment for how much the two shares move together (their correlation, given as $Corr(R_1, R_2)$).[2] The equation demonstrates that with a positive amount invested in each share, the more the shares move together and the higher their correlation, the more volatile the portfolio

364 PART 4 RISK AND RETURN

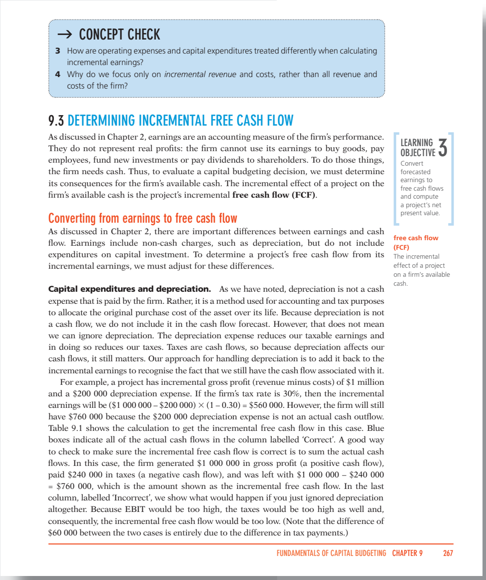
Using Excel boxes describe Excel techniques and include screenshots to serve as a guide for you when using this technology.

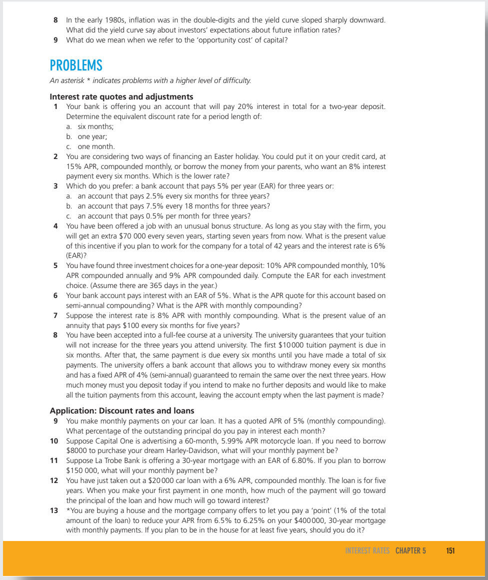
Financial calculator instructions, including a box in Chapter 4 on solving for future and present values, and appendices to Chapters 4, 6 and 15 with keystrokes for HP-10BII and TI BAII Plus Professional, highlight this problem-solving tool.

PRACTISE FINANCE TO LEARN FINANCE

Working problems is the proven way to cement and demonstrate an understanding of finance.

Concept Check questions at the end of each section enable you to test your understanding and target areas needing further review.

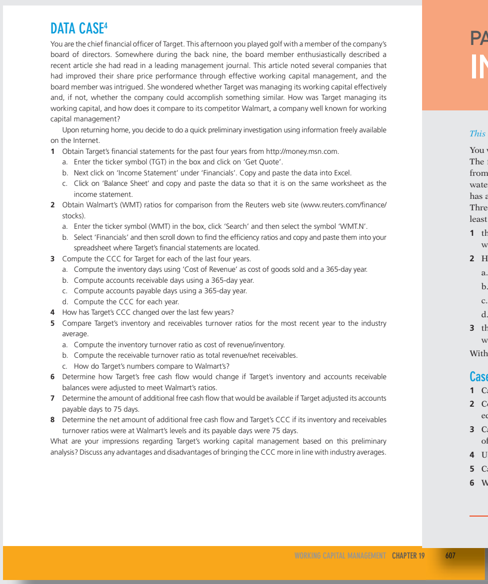


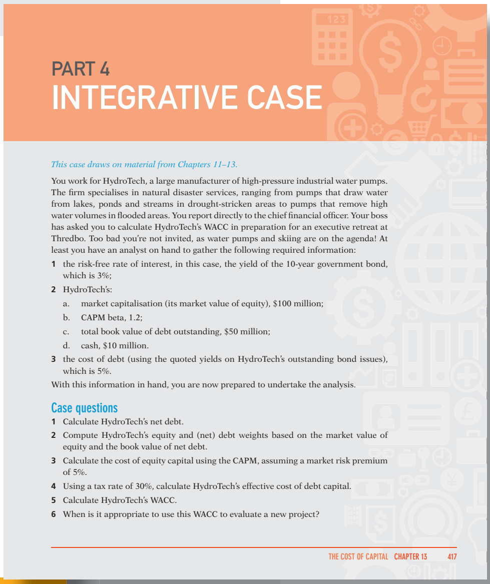


End-of-chapter **problems** offer first-rate materials for you to practise and build confidence. Selected end-of-chapter problems are available in MyFinanceLab, the fully integrated homework and tutorial system.

Data Cases present in-depth scenarios in a business setting with questions designed to guide students' analysis.

Integrative Cases occur at the end of most parts and present a capstone extended problem for each part with a scenario and data for you to analyse based on that subset of chapters.





GUIDED TOUR: FOR EDUCATORS

Solutions Manual

The **Solutions Manual** provides students with detailed, accuracy-verified solutions to all the in-chapter and end-of-chapter problems in the book.

PowerPoint Presentation

The **PowerPoint Presentation** is available in lecture form and includes art and tables from the book and additional examples. Revised for this edition, the PowerPoint presentation includes tables and figures, examples, key terms and spreadsheet tables from the textbook.

Test Bank

The **Test Bank** provides a wealth of accuracy-verified testing material. Updated for the new edition, each chapter offers a wide variety of true/false, short answer and multiple-choice questions. Questions are verified by difficulty level and skill type, and correlated to the chapter topics. Numerical problems include step-by-step solutions.

Every question is available in **TestGen® software** for both Windows® and Macintosh® computers. This easy-to-use testing software is a valuable test preparation tool that allows professors to view, edit and add questions.

FLEXIBILITY GUIDE

Fundamentals of Corporate Finance offers coverage of the major topical areas for introductory-level undergraduate courses. Our focus is on financial decision making related to the corporation's choice of which investments to make or how to raise the capital required to fund an investment. We designed the book with the need for flexibility and with consideration of time pressures throughout the semester in mind.

Introduces the Valuation Principle and time value of money techniques for single-period investments

Presents how interest rates are quoted and compounding for all frequencies

New chapter introduces stocks and presents the dividend-discount model as an application of the time value of money

Introduces the NPV rule as the 'golden rule' against which we evaluate other investment decision rules

Provides a clear focus on the distinction between earnings and free cash flow

Builds on capital budgeting material by valuing the ownership claim to the firm's free cash flows and addresses market efficiency and behavioural finance

Calculates and uses the firm's overall costs of capital with the WACC method

These chapters begin with perfect markets and then show how frictions, including agency costs and asymmetric information, can influence financial policy

Makes the critical distinction between sustainable and value-increasing growth in determining the firm's value

New chapter looks at the overall market for mergers and acquisitions and considers the motivations for and the typical process of a transaction

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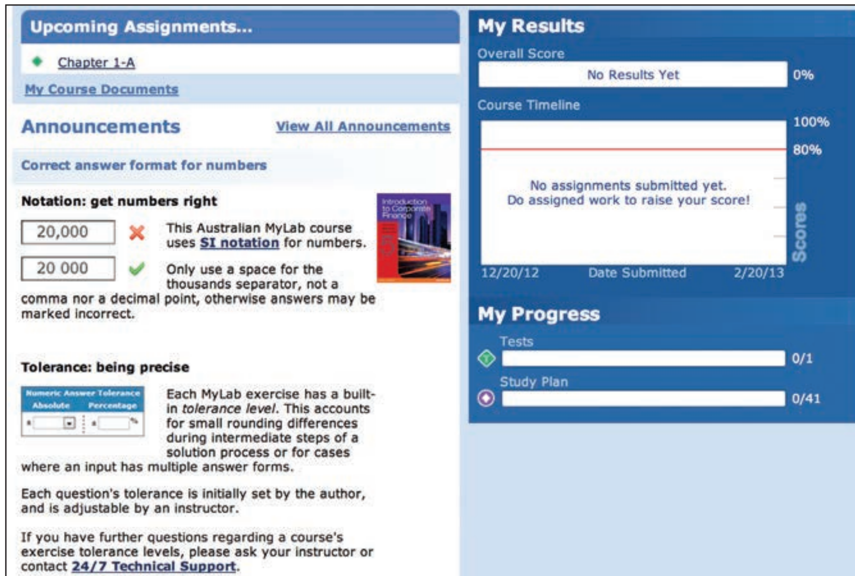

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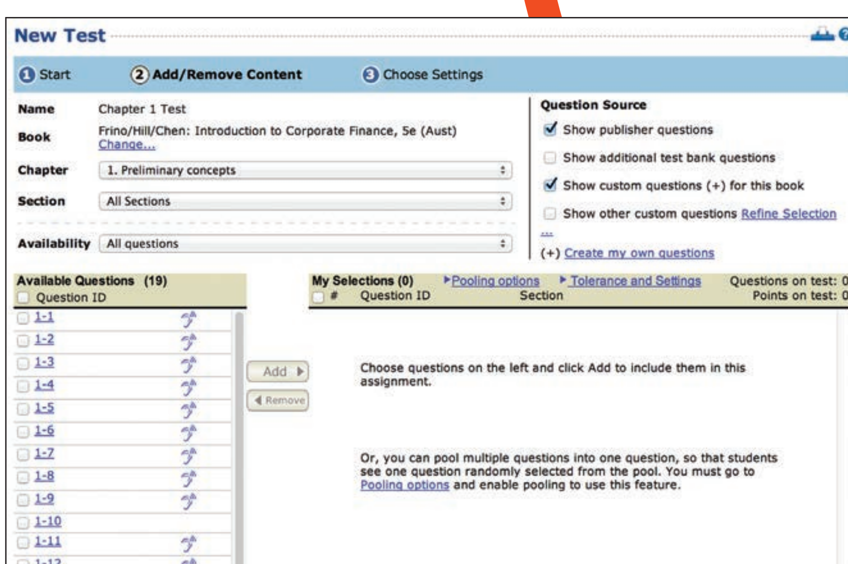

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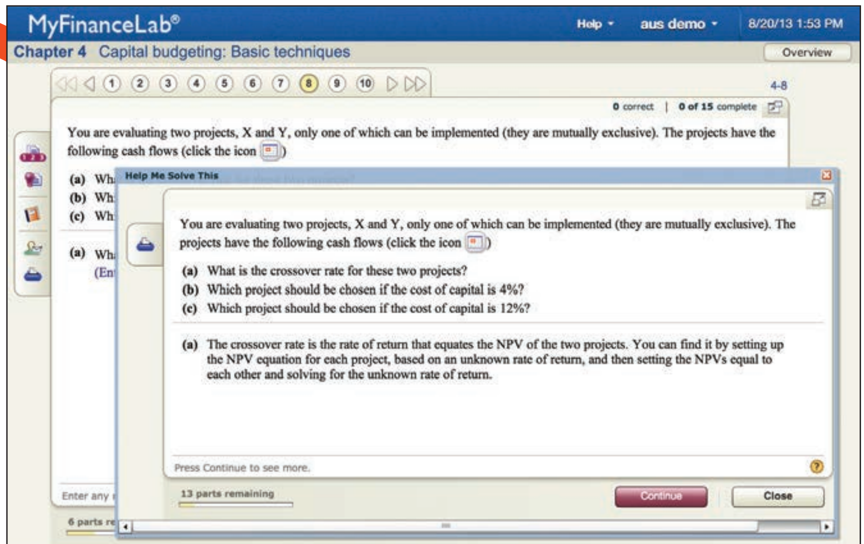

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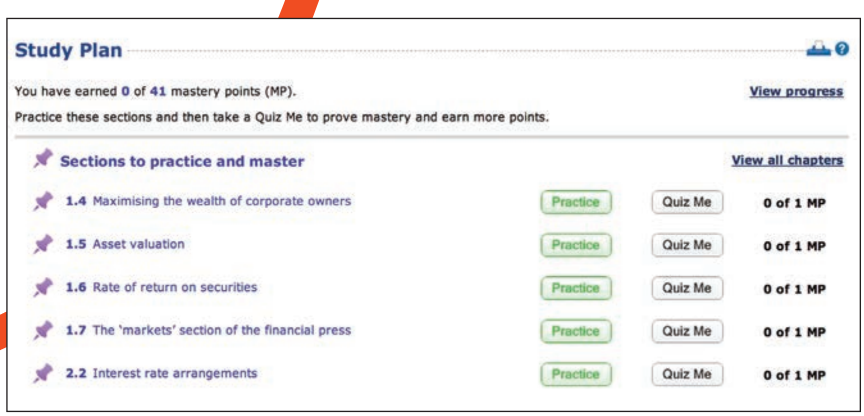

Study plan

A personalised Study Plan is generated from each student's results on assignments or sample tests. The Study Plan indicates Learning Objectives where they need more practice, and helps them work towards mastery.

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MYFINANCELAB AND ACCURACY REVIEW

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Tony also authored the end-of-chapter questions for both text and MyFinanceLab, and developed the solutions for both, to ensure consistency across the print and digital components.

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PART 1

INTRODUCTION

Valuation Principle connection. What is corporate finance? No matter what your role in a corporation, an understanding of why and how financial decisions are made is essential. The focus of this book is how to make optimal corporate financial decisions. In this first part of the book, we lay the foundation for our study of corporate finance. In Chapter 1, we begin by introducing the corporation and related business forms. We then examine the role of financial managers and outside investors in decision making for the firm. To make optimal decisions, a decision maker needs information. As a result, in Chapter 2 we review and analyse an important source of information for corporate decision making—the firm's accounting statements. These chapters will introduce us to the role and objective of the financial manager and some of the information the financial manager uses in applying the Valuation Principle to make optimal decisions. Then, in Part 2, we will introduce and begin applying the Valuation Principle.

CHAPTER 1

CORPORATE FINANCE AND THE FINANCIAL MANAGER

LEARNING OBJECTIVES

After studying this chapter you should be able to:

1. identify the importance of financial information in both your personal and business life;
2. understand the important features of the three main types of firms and see why the advantages of the corporate form have led it to dominate economic activity;
3. explain the goal of the financial manager and the reasoning behind that goal, as well as understand the three main types of decisions a financial manager makes;
4. understand how a corporation is managed and controlled, the financial manager's place in it, and some of the ethical issues financial managers face;
5. understand the importance of financial markets, such as stock markets, to a corporation and the financial manager's role as liaison to those markets;
6. recognise the role that financial institutions play in the financial cycle of the economy.

This book focuses on how people in corporations make financial decisions. Despite its name, much of what we discuss in corporate finance applies to the financial decisions made within any organisation, including not-for-profit entities such as charities and universities. In this chapter, we introduce the three main types of firms. We stress corporations, however, because they represent around 90% of Australian business revenue. We also highlight the financial manager's critical role inside any business enterprise. What products to launch, how to pay to develop those products, what profits to keep and how to return profits to investors—all of these decisions and many more fall within corporate finance. The financial manager makes these decisions with the goal of maximising the value of the business, which is determined in the financial markets. In this chapter and throughout the book, we will motivate this goal, provide you with the tools to make financial management decisions, and show you how the financial markets provide funds to a corporation and produce market prices that are key inputs to any financial manager's investment analysis.

1.1 WHY STUDY FINANCE?

LEARNING OBJECTIVE 1
Identify the importance of financial information in both your personal and business life.

Finance and financial thinking are everywhere in our daily lives. Consider your decision to go to university. You surely weighed alternatives, such as starting a full-time job immediately, and then decided that university provided you with the greatest net benefit. More and more, individuals are taking charge of their personal finances with decisions such as:

- when to start saving and how much to save for retirement;
- whether a car loan or lease is more advantageous;
- whether particular shares are a good investment;
- how to evaluate the terms for a home mortgage.

Our career paths have become less predictable and more dynamic. In previous generations, it was common to work for one employer for your entire career. Today, that would be highly unusual. Most of us will instead change jobs, and possibly even careers, many times. With each new opportunity, we must weigh all the costs and benefits, financial and otherwise.

Some financial decisions, such as whether to pay $3 for your morning coffee, are simple, but most are more complex. In your business career, you may face such questions as:

- Should your firm launch a new product?
- Which supplier should your firm choose?
- Should your firm produce a part of the product or outsource production?
- Should your firm issue new shares or borrow money instead?
- How can you raise money for your start-up firm?

In this book, you will learn how all of these decisions in your personal life and inside a business are tied together by one powerful concept, the *Valuation Principle*. The Valuation Principle shows how to make the costs and benefits of a decision comparable so that we can weigh them properly. Learning to apply the Valuation Principle will give you the skills to make the types of comparisons—among loan options, investments and projects—that will turn you into a knowledgeable, confident financial consumer and manager.

From 2007 to 2012 we witnessed a credit freeze, a severe stock market decline, sovereign debt crisis, and the failures of well-known financial institutions. Attempts to understand these elements of the crisis, their origins, and how they affect our businesses and personal finances have highlighted the need for learning core financial principles and concepts.

Whether you plan to major in finance or simply take this one course, you will find the fundamental financial knowledge gained here to be essential in both your personal and business life.

1.2 THE THREE TYPES OF FIRMS

LEARNING OBJECTIVE 2
Understand the important features of the three main types of firms and see why the advantages of the corporate form have led it to dominate economic activity.

We begin our study of corporate finance by examining the types of firms that financial managers run. There are three main types of firms: sole traders, partnerships and corporations. We explain each organisational form in turn, but our primary focus is on the most important form—the corporation.

Sole traders

sole trader
A business owned and run by one person.

A **sole trader** is a business owned and run by one person. Sole traders are the simplest business structure and consist of an individual trading on their own. That person controls and manages the business. Although they do not account for much sales revenue in the economy, they are the most common type of firm in the world.

We now consider the key features of a sole trader.

1 Sole traders have the advantage of being straightforward to set up. Consequently, many new businesses use this organisational form.

2 The principal limitation of a sole trader is that there is no separation between the firm and the owner—the firm can have only one owner who runs the business. If there are other investors, they cannot hold an ownership stake in the firm.

3 The owner has unlimited personal liability for any of the firm's debts. That is, if the firm defaults on any debt payment, the lender can (and will) require the owner to repay the loan from personal assets. An owner who cannot afford to repay a loan for which he or she is personally liable must declare personal bankruptcy.

4 The life of a sole trader is limited to the life of the owner. It is also difficult to transfer ownership of a sole proprietorship.

For most growing businesses, the disadvantages of being a sole trader outweigh the advantages. As soon as the firm reaches the point at which it can borrow without the owner agreeing to be personally liable, the owners typically convert the business into another form. Conversion also has other benefits that we will consider as we discuss the other forms below.

Partnerships

partnership
A business owned and run by more than one owner.

A **partnership** is a business owned and run by more than one owner. Key features include the following:

1 *All* the partners are liable for the firm's debt. That is, a lender can require *any* partner to repay all the firm's outstanding debts.

2 The partnership ends in the event of the death or withdrawal of any single partner.

3 Partners can avoid liquidation if the partnership agreement provides for alternatives such as a buyout of a deceased or withdrawn partner.

Some old and established businesses remain as partnerships or sole traders. Often these firms are the types of businesses in which the owners' personal reputations are the basis for the businesses. For example, law firms, medical practices and accounting firms are frequently organised as partnerships. For such enterprises, the partners' personal liability increases the confidence of the firm's clients that the partners will strive to maintain the firm's reputation.

A **limited partnership** is a partnership with two kinds of owners, general partners and limited partners. In this case, the general partners have the same rights and privileges as partners in any general partnership—they are personally liable for the firm's debt obligations. Limited partners, however, have **limited liability**—that is, their liability is limited to their investment. Their private property cannot be seized to pay off the firm's outstanding debts. Furthermore, the death or withdrawal of a limited partner does not dissolve the partnership, and a limited partner's interest is transferable. However, a limited partner has no management authority and cannot legally be involved in the managerial decision making for the business.

limited partnership A partnership with two kinds of owners, general partners and limited partners.

limited liability When an investor's liability is limited to his or her investment.

Corporations

A **corporation** is a legally defined, artificial being (a legal entity), separate from its owners. As such, it has many of the legal powers that people have. It can enter into contracts, acquire assets in its own name, sue and be sued, and incur obligations directly without recourse to owners. Because a corporation is a legal entity separate and distinct from its owners, it is solely responsible for its own obligations. Consequently, the owners of a corporation (or its employees, customers, etc.) are not liable for any obligations the corporation enters into. Similarly, the corporation is not liable for any personal obligations of its owners.

corporation A legally defined, artificial being, separate from its owners.

In the same way that it is difficult to imagine modern business life without email and mobile phones, the corporation revolutionised the economy. Corporations have operated for more than three centuries, starting originally in London in the late 17th century. However, in 1720, in a bizarre turn of events that led to the spectacular collapse of the South Sea Company, corporations were banned in England when Parliament passed the *Bubble Act*, which made it a criminal offence to create a company. Today it is unimaginable that a government would ban this type of firm. The *Bubble Act* was ultimately repealed in 1825 and incorporation was once again legally permitted in England.

In the US the corporation went through a revolutionary transformation in the 1890s, the results of which included: (a) elimination of the requirement that a corporation could exist only for a limited time, for a narrowly defined purpose, and could operate only in a particular location; (b) allowing one company to own shares in another; and (c) substantial loosening of the controls on mergers and acquisitions.

Today, the corporation is the dominant business form (in terms of revenue) all over the world.

In Australia, the two most popular types of corporations are 'private' companies and 'public' companies. Private companies have restrictions on the number of non-employee shareholders (a maximum of 50), and are not required to appoint an auditor.

Public companies can have an unlimited number of shareholders and are required to appoint an auditor. All public companies are also required to lodge audited financial accounts with the companies regulator, the Australian Securities and Investments Commission (ASIC). Some larger private companies may also be required to lodge accounts with the ASIC if they are deemed to be a 'reporting entity'.

A company is sometimes required to be incorporated as a public company if it intends to undertake certain activities, such as holding a securities licence, being listed on the stock exchange, or operating a bank or other approved deposit-taking institution.

Formation of a corporation. A corporation must be legally formed, which means that the country in which it is incorporated must formally give its consent to the incorporation by chartering it. Setting up a corporation is more costly than setting up as a sole trader, but the cost is not prohibitive. In Australia, the cost to register and incorporate a company with the ASIC starts at $410 and can be done online in a matter of minutes. Every corporation in Australia is issued with a unique, nine-digit number, an Australian Company Number (ACN), which must be shown on a range of documents. The purpose of the ACN is to ensure adequate identification of companies when transacting business. Every corporation also has a constitution, which specifies the initial rules that govern how the corporation is run. The conduct of corporations, their shareholders, and their directors and officers is regulated under the *Corporations Act 2001*.

Ownership of a corporation. While there are limits on the number of shareholders in a private company, there is no limit on the number of owners a public company can have. Because most corporations have many owners, each owner owns only a fraction of the corporation. The entire ownership stake of a corporation is divided into **shares**. The collection of all the outstanding shares of a corporation is known as its **equity**. An owner of a share in the corporation is known as a **shareholder**. Shareholders may be entitled to **dividend payments**; that is, payments made at the discretion of the corporation to its equity holders. Shareholders usually receive a share of the dividend payments that is proportional to the number of shares they own. For example, a shareholder who owns 25% of the firm's shares will be entitled to 25% of the total dividend payment.

shares
The ownership or equity of a corporation divided into shares.

equity
The collection of all the outstanding shares of a corporation.

shareholder
An owner of a share of the equity in a corporation.

dividend payments
Payments made at the discretion of the corporation to its equity holders.

A unique feature of a corporation is that there is no limitation on who can own its shares. That is, an owner of a corporation need not have any special expertise or qualification. This feature allows free trade in the shares of the corporation and provides one of the most important advantages of organising a firm as a corporation, rather than as a sole trader or partnership. Corporations can raise substantial amounts of capital because they can sell ownership shares to anonymous outside investors.

The availability of outside funding has enabled corporations to dominate the economy. Let's look at one of the world's largest firms, BHP Billiton, as an example. BHP Billiton reported trading revenue of $70.9 billion over the 12 months from July 2011 to June 2012. The total value of the company (the wealth in the company the owners collectively owned) as of August 2012 was approximately $102.23 billion. The company employed over 40 000 people worldwide. Putting these numbers into perspective, the $71.8 billion in gross domestic product (GDP) in 2011 would rank BHP Billiton behind Oman as the 64th richest *country* (out of more than 182).[1] Oman has almost 2.8 million people, about 71 times the number of employees at BHP Billiton.

Tax implications for corporate entities

An important difference between the types of corporate organisational forms is the way they are taxed. Because a corporation is a separate legal entity, a corporation's profits are subject to taxation separate from its owners' tax obligations. First, the corporation pays tax on its profits, and then when the remaining profits are distributed to the shareholders, the shareholders pay their own personal income tax on this income. This could lead to a situation where shareholders of a corporation pay taxes twice, and this system is sometimes referred to as a 'classical' tax system. However, it does not apply in Australia. In July 1987, Australia abandoned the 'classical' tax system and adopted instead an 'imputation' system of taxation as the method of taxing corporate earnings. Under a 'classical' tax system, corporate profits are taxed twice: once in the hands of the company and again in the hands of the shareholder. The 'imputation' system of taxation was introduced to overcome the double taxation of corporate profits by allowing a company to transfer a tax credit (called a 'franking credit') to the shareholder for the amount of tax the company has paid. This franking credit is then used by the individual shareholder to reduce his or her own personal taxation liability, or any excess is paid back as a tax refund. Only shareholders who are resident taxpayers in Australia are entitled to use the franking credit to offset their tax liability, which means that for many foreign investors there is no benefit from imputation.

CORPORATE INCOME TAX UNDER THE 'CLASSICAL' TAX SYSTEM

EXAMPLE 1.1

Problem

You are a shareholder in a corporation. The corporation earns $100 per share before taxes. After it has paid taxes, it will distribute the rest of its earnings to you as a dividend. (We make this simplifying assumption, but you should note that most corporations retain some of their earnings for reinvestment.) The dividend is income to you, so you will then pay taxes on these earnings. The corporate tax rate is 30% and your personal income tax rate is 45%. Under a 'classical' system of taxation, how much of the earnings remain after all taxes are paid?

Solution

- **Plan**

Earnings before taxes: $100 Corporate tax rate: 30% Personal tax rate: 45%

We first need to calculate the corporation's earnings after taxes by subtracting the taxes paid from the pre-tax earnings of $100. The taxes paid will be 30% (the corporate tax rate) of $100. Since all of the after-tax earnings will be paid to you as a dividend, you will pay taxes of 45% on that amount. The amount left over is what remains after all taxes are paid.

continued

• **Execute**

\$100 per share × 0.30 = \$30 in taxes at the corporate level, leaving \$100 – \$30 = \$70 in after-tax earnings per share to distribute.

You will pay \$70 × 0.45 = \$31.50 in taxes on that dividend, leaving you with \$38.50 from the original \$100 after all taxes.

• **Evaluate**

As a shareholder, you keep \$38.50 of the original \$100 in earnings; the remaining \$30.00 + \$31.50 = \$61.50 is paid as taxes. Thus, your total effective tax rate under a 'classical' system of taxation is 61.50/100 = 61.5%.

EXAMPLE 1.2

CORPORATE INCOME TAX UNDER THE 'IMPUTATION' TAX SYSTEM

Problem

Rework Example 1.1, assuming the Australian 'imputation' tax system. You are a shareholder in a corporation. The corporation earns \$100 per share before taxes. After it has paid taxes, it will distribute the rest of its earnings to you as a dividend. (We make this simplifying assumption, but you should note that most corporations retain some of their earnings for reinvestment.) The dividend is income to you, so you will then pay taxes on these earnings. The corporate tax rate is 30% and your personal income tax rate is 45%. Under the 'imputation' system of taxation, how much of the earnings remain after all taxes are paid?

Solution

• **Plan**

Earnings before taxes: \$100   Corporate tax rate: 30%   Personal tax rate: 45%

In this case, the corporation still pays its taxes. It earned \$100 per share, so the taxes paid by the company will be 30% (the corporate tax rate) of \$100. Since all of the after-tax earnings will be paid to you as a dividend, you will pay taxes of 45% on the company's pre-tax earnings per share; however, you will also receive credit for the tax already paid on those earnings.

• **Execute**

\$100 per share × 0.30 = \$30 in taxes at the corporate level, leaving \$100 – \$30 = \$70 in after-tax earnings per share to distribute, plus a franking credit of \$30.

You will pay tax on the grossed-up amount of the dividend of \$100, being \$70 in cash plus \$30 in franking credits. Therefore, your tax liability will be \$100 × 0.45 = \$45; however, this will be partially offset by the \$30 franking credit, so you will only pay \$45 – \$30 = \$15 in additional taxes on that dividend. This will leave you with \$70 – \$15 = \$55 from the original \$100 after all taxes.

• **Evaluate**

As a shareholder, you keep \$55 of the original \$100 in earnings; the remaining \$30 + \$45 – \$30 = \$45 is paid as taxes. Thus, your total effective tax rate under an 'imputation' system of taxation is 45/100 = 45%, which will correspond with your personal marginal tax rate, thereby avoiding double taxation.

FINANCE IN FOCUS

Corporate taxation around the world

In most countries, there is some relief from double taxation. Over 30 countries make up the Organisation for Economic Co-operation and Development (OECD), and of these countries, only Ireland and Switzerland offer no relief from double taxation. The US offers some relief by having a lower tax rate on dividend income than on other sources of income. Outside of Australia and New Zealand, a few countries, including Finland, Mexico and Norway, offer complete relief by effectively not taxing dividend income.

As we have discussed, there are three main types of firms: sole traders, partnerships (general and limited) and corporations. To help you see the differences among them, Table 1.1 compares and contrasts the main characteristics of each.

TABLE 1.1

Characteristics of the different types of firms

	Number of owners	Liability for firm's debts	Owners manage the firm	Ownership change dissolves firm	Taxation
Sole trader	One	Yes	Yes	Yes	Personal
Partnership	Two to 20 (generally, but with higher maximum numbers for some partnerships)	Yes; each partner is liable for the entire amount	Yes	Yes	Personal
Limited partnership	At least one general partner (GP), no limit on limited partners (LP)	GP: Yes LP: No	GP: Yes LP: No	GP: Yes LP: No	Personal
Corporation	Unlimited	No	No	No	Company

→ CONCEPT CHECK

1 What is a corporation? How does it differ from a limited partnership?

2 What are the advantages and disadvantages of organising a business as a corporation?