Fundamentals of

CORPORATE FINANCE

3rd EDITION

CONTENTS

DETAILED CONTENTS

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 American 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.

THIRD EDITION

In this third 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. We have added new 'Finance in Focus' sections and updated content to reflect the current business environment.

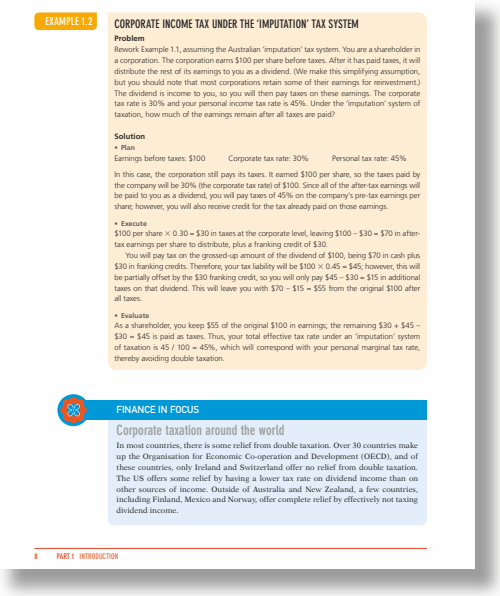
GUIDED TOUR: FOR STUDENTS

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 its value. 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.



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

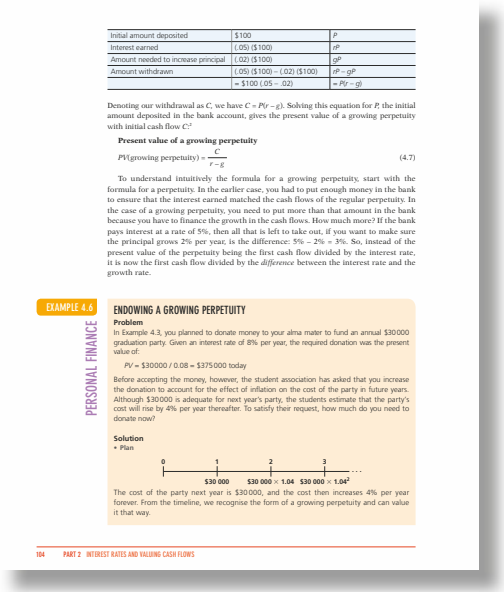
Corporate taxation around the world

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.

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.



Initial amount deposited	$100	P
Interest earned	(.05) ($100)	rP
Amount needed to increase principal	(.02) ($100)	gP
Amount withdrawn	(.05) ($100) – (.02) ($100)	$rP - gP$
	= $100 (.05 – .02)	$= P(r - g)$

Denoting our withdrawal as C, we have $C = P(r - g)$. Solving this equation for P, the initial amount deposited in the bank account, gives the present value of a growing perpetuity with initial cash flow C:

Present value of a growing perpetuity

$$PV(\text{growing perpetuity}) = \frac{C}{r - g} \tag{4.7}$$

To understand intuitively the formula for a growing perpetuity, start with the formula for a perpetuity. In the earlier case, you had to put enough money in the bank to ensure that the interest earned matched the cash flows of the regular perpetuity. In the case of a growing perpetuity, you need to put more than that amount in the bank because you have to finance the growth in the cash flows. How much more? If the bank pays interest at a rate of 5%, then all that is left to take out, if you want to make sure the principal grows 2% per year, is the difference: 5% – 2% = 3%. So, instead of the present value of the perpetuity being the first cash flow divided by the interest rate, it is now the first cash flow divided by the *difference* between the interest rate and the growth rate.

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:

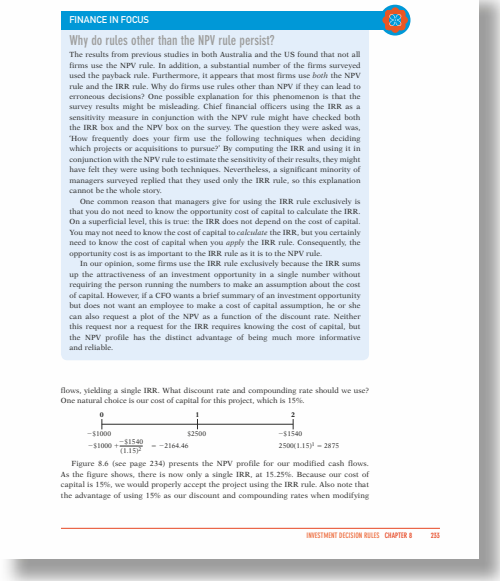
PV = $30000 / 0.08 = $375 000 today

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

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.



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 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 an 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.

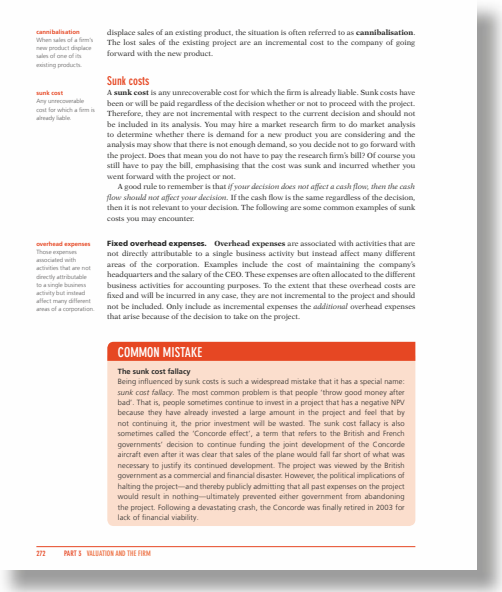
flows, yielding a single IRR. What discount rate and compounding rate should we use? One natural choice is our cost of capital for this project, which is 15%.

$$-\$1000 + \frac{-\$1540}{(1.15)^2} = -2164.46 \qquad 2500(1.15)^1 = 2875$$

Figure 8.6 (see page 234) presents the NPV profile for our modified cash flows. As the figure shows, there is now only a single IRR, at 15.25%. Because our cost of capital is 15%, we would properly accept the project using the IRR rule. Also note that the advantage of using 15% as our discount and compounding rates when modifying

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.



cannibalisation When sales of a firm's new product displace sales of one of its existing products.

displace sales of an existing product, the situation is often referred to as **cannibalisation**. The lost sales of the existing project are an incremental cost to the company of going forward with the new product.

Sunk costs

sunk cost Any unrecoverable cost for which a firm is already liable.

A **sunk cost** is any unrecoverable cost for which the firm is already liable. Sunk costs have been or will be paid regardless of the decision whether or not to proceed with the project. Therefore, they are not incremental with respect to the current decision and should not be included in its analysis. You may hire a market research firm to do market analysis to determine whether there is demand for a new product you are considering and the analysis may show that there is not enough demand, so you decide not to go forward with the project. Does that mean you do not have to pay the research firm's bill? Of course you still have to pay the bill, emphasising that the cost was sunk and incurred whether you went forward with the project or not.

A good rule to remember is that *if your decision does not affect a cash flow, then the cash flow should not affect your decision*. If the cash flow is the same regardless of the decision, then it is not relevant to your decision. The following are some common examples of sunk costs you may encounter.

overhead expenses Those expenses associated with activities that are not directly attributable to a single business activity but instead affect many different areas of a corporation.

Fixed overhead expenses. **Overhead expenses** are associated with activities that are not directly attributable to a single business activity but instead affect many different areas of the corporation. Examples include the cost of maintaining the company's headquarters and the salary of the CEO. These expenses are often allocated to the different business activities for accounting purposes. To the extent that these overhead costs are fixed and will be incurred in any case, they are not incremental to the project and should not be included. Only include as incremental expenses the *additional* overhead expenses that arise because of the decision to take on the project.

COMMON MISTAKE

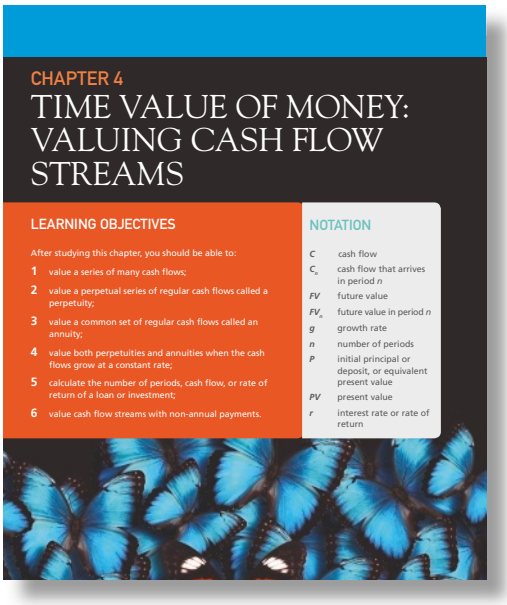
The sunk cost fallacy

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. Following a devastating crash, the Concorde was finally retired in 2003 for lack of financial viability.

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:


CHAPTER 4

TIME VALUE OF MONEY: VALUING CASH FLOW STREAMS

LEARNING OBJECTIVES

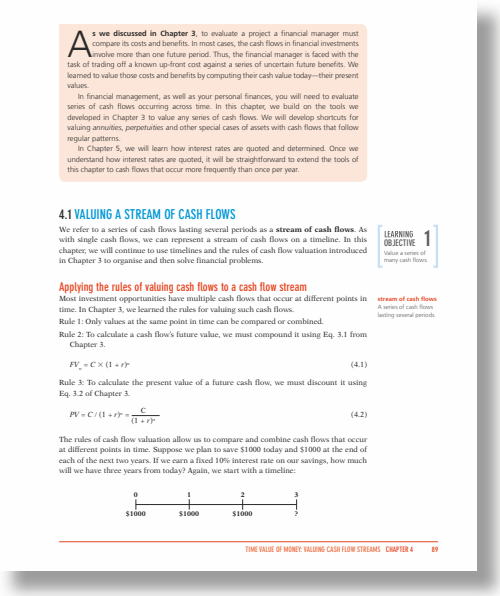
After studying this chapter, you should be able to:

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;
6. value cash flow streams with non-annual payments.

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

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.


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.

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 for valuing 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.

$$FV_n = C \times (1 + r)^n \quad (4.1)$$

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

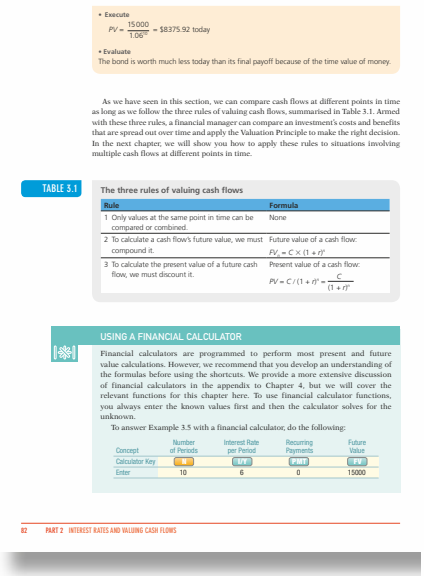
$$PV = C / (1 + r)^n = \frac{C}{(1 + r)^n} \quad (4.2)$$

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:

TIME VALUE OF MONEY: VALUING CASH FLOW STREAMS CHAPTER 4 89

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.


• Execute

$PV = \frac{15\,000}{1.08^{10}} = \$8375.92$ today

• Evaluate

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

As we have 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: $PV = C / (1 + r)^n = \frac{C}{(1 + r)^n}$

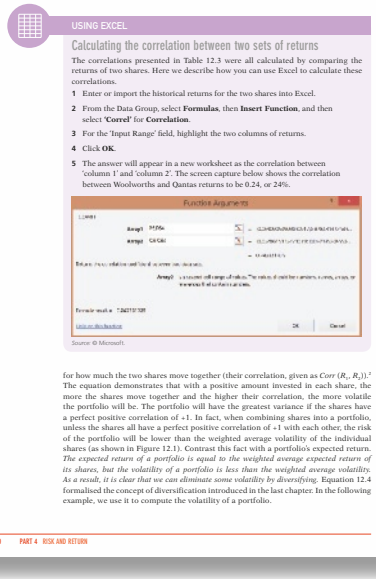
USING A FINANCIAL CALCULATOR

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 will 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. 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 0.24, or 24%.

Function Arguments

Source: © Microsoft.

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 will be. The portfolio will have the greatest variance if the shares have a perfect positive correlation of +1. In fact, when combining shares into a portfolio, unless the shares all have a perfect positive correlation of +1 with each other, the risk of the portfolio will be lower than the weighted average volatility of the individual shares (as shown in Figure 12.1). Contrast this fact with a portfolio's expected return. *The expected return of a portfolio is equal to the weighted average expected return of its shares, but the volatility of a portfolio is less than the weighted average volatility. As a result, it is clear that we can eliminate some volatility by diversifying.* Equation 12.4 formalised the concept of diversification introduced in the last chapter. In the following example, we use it to compute the volatility of a portfolio.

360 PART 4 RISK AND RETURN

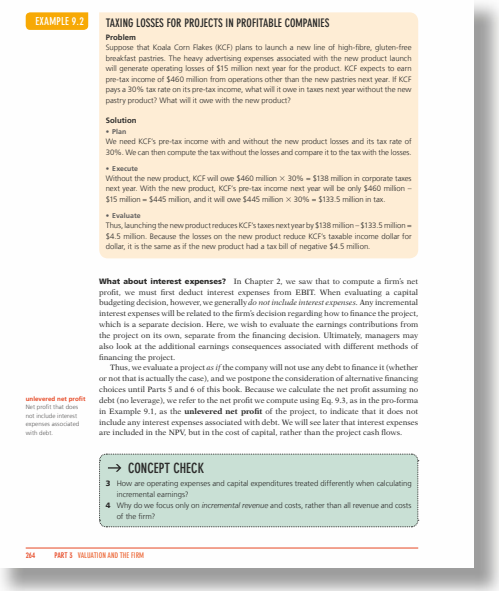
Using Excel boxes describe Excel techniques and include screenshots to serve as a guide for you when using this technology.

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.



EXAMPLE 9.2

TAXING LOSSES FOR PROJECTS IN PROFITABLE COMPANIES

Problem

Suppose that Koala Corn Flakes (KCF) plans to launch a new line of high-fibre, gluten-free breakfast pastries. The heavy advertising expenses associated with the new product launch will generate operating losses of $15 million next year for the product. KCF expects to earn pre-tax income of $460 million from operations other than the new pastries next year. If KCF pays a 30% tax rate on its pre-tax income, what will it owe in taxes next year without the new pastry product? What will it owe with the new product?

Solution

* **Plan**

We need KCF's pre-tax income with and without the new product losses and its tax rate of 30%. We can then compute the tax without the losses and compare it to the tax with the losses.

* **Execute**

Without the new product, KCF will owe $460 million × 30% = $138 million in corporate taxes next year. With the new product, KCF's pre-tax income next year will be only $460 million − $15 million = $445 million, and it will owe $445 million × 30% = $133.5 million in tax.

* **Evaluate**

Thus, launching the new product reduces KCF's taxes next year by $138 million − $133.5 million = $4.5 million. Because the losses on the new product reduce KCF's taxable income dollar for dollar, it is the same as if the new product had a tax bill of negative $4.5 million.

What about interest expenses? In Chapter 2, we saw that to compute a firm's net profit, we must first deduct interest expenses from EBIT. When evaluating a capital budgeting decision, however, we generally *do not include interest expenses*. Any incremental interest expenses will be related to the firm's decision regarding how to finance the project, which is a separate decision. Here, we wish to evaluate the earnings contributions from the project on its own, separate from the financing decision. Ultimately, managers may also look at the additional earnings consequences associated with different methods of financing the project.

Thus, we evaluate a project as *if* the company will not use any debt to finance it (whether or not that is actually the case), and we postpone the consideration of alternative financing choices until Parts 5 and 6 of this book. Because we calculate the net profit assuming no debt (no leverage), we refer to the net profit we compute using Eq. 9.3, as in the pro-forma in Example 9.1, as the **unlevered net profit** of the project, to indicate that it does not include any interest expenses associated with debt. We will see later that interest expenses are included in the NPV, but in the cost of capital, rather than the project cash flows.

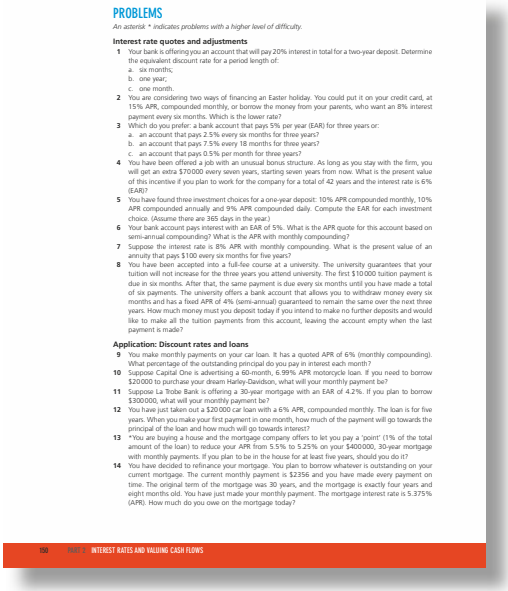
unlevered net profit
Net profit that does not include interest expenses associated with debt.

→ CONCEPT CHECK

3 How are operating expenses and capital expenditures treated differently when calculating incremental earnings?

4 Why do we focus only on *incremental revenue* and costs, rather than all revenue and costs of the firm?

264 PART 5 VALUATION AND THE FIRM



PROBLEMS

*An asterisk * indicates problems with a higher level of difficulty.*

Interest rate quotes and adjustments

1 Your bank is offering you an account that will pay 20% interest in total for a two-year deposit. Determine the equivalent discount rate for a period length of:
   a. six months;
   b. one year;
   c. one month.
2 You are considering two ways of financing an Easter holiday. You could put it on your credit card, at 15% APR, compounded monthly, or borrow the money from your parents, who want an 8% interest payment every six months. Which is the lower rate?
3 Which do you prefer: a bank account that pays 5% per year (EAR) for three years or:
   a. an account that pays 2.5% every six months for three years?
   b. an account that pays 7.5% every 18 months for three years?
   c. an account that pays 0.5% per month for three years?
4 You have been offered a job with an unusual bonus structure. As long as you stay with the firm, you will get an extra $70 000 every seven years, starting seven years from now. What is the present value of this incentive if you plan to work for the company for a total of 42 years and the interest rate is 6% (EAR)?
5 You have found three investment choices for a one-year deposit: 10% APR compounded monthly, 10% APR compounded annually and 9% APR compounded daily. Compute the EAR for each investment choice. (Assume there are 365 days in the year.)
6 Your bank account pays interest with an EAR of 5%. What is the APR quote for this account based on semi-annual compounding? What is the APR with monthly compounding?
7 Suppose the interest rate is 8% APR with monthly compounding. What is the present value of an annuity that pays $100 every six months for five years?
8 You have been accepted into a full-fee course at a university. The university guarantees that your tuition will not increase for the three years you attend university. The first $10 000 tuition payment is due in six months. After that, the same payment is due every six months until you have made a total of six payments. The university offers a bank account that allows you to withdraw money every six months and has a fixed APR of 4% (semi-annual) guaranteed to remain the same over the next three years. How much money must you deposit today if you intend to make no further deposits and would like to make all the tuition payments from this account, leaving the account empty when the last payment is made?

Application: Discount rates and loans

9 You make monthly payments on your car loan. It has a quoted APR of 6% (monthly compounding). What percentage of the outstanding principal do you pay in interest each month?
10 Suppose Capital One is advertising a 60-month, 6.99% APR motorcycle loan. If you need to borrow $20 000 to purchase your dream Harley-Davidson, what will your monthly payment be?
11 Suppose La Trobe Bank is offering a 30-year mortgage with an EAR of 4.2%. If you plan to borrow $300 000, what will your monthly payment be?
12 You have just taken out a $20 000 car loan with a 6% APR, compounded monthly. The loan is for five years. When you make your first payment in one month, how much of the payment will go towards the principal of the loan and how much will go towards interest?
13 *You are buying a house and the mortgage company offers to let you pay a 'point' (1% of the total amount of the loan) to reduce your APR from 5.5% to 5.25% on your $400 000, 30-year mortgage with monthly payments. If you plan to be in the house for at least five years, should you do it?
14 You have decided to refinance your mortgage. You plan to borrow whatever is outstanding on your current mortgage. The current monthly payment is $2356 and you have made every payment on time. The original term of the mortgage was 30 years, and the mortgage is exactly four years and eight months old. You have just made your monthly payment. The mortgage interest rate is 5.375% (APR). How much do you owe on the mortgage today?

150 PART 3 INTEREST RATES AND VALUING CASH FLOWS

End-of-chapter **problems** offer first-rate materials for you to practise and build confidence. Selected end-of-chapter problems are available in MyLab™ Finance, 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.

DATA CASE[4]

You are the chief financial officer of Target. This afternoon you played golf with a member of the company's board of directors. Somewhere during the back nine, the board member enthusiastically described a recent article she had read in a leading management journal. This article noted several companies that had improved their share price performance through effective working capital management, and the board member was intrigued. She wondered whether Target was managing its working capital effectively and, if not, whether the company could accomplish something similar. How was Target managing its working capital, and how does it compare to its competitor Walmart, a company well known for working capital management?

Upon returning home, you decide to do a quick preliminary investigation using information freely available on the internet.

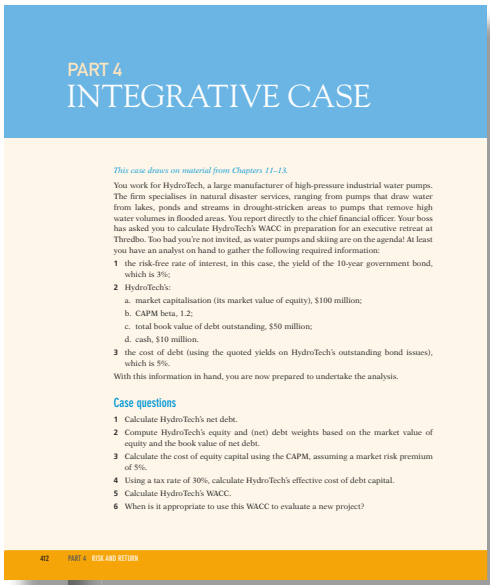
1 Obtain Target's financial statements for the past four years from http://money.msn.com.
   a. Enter the ticker symbol (TGT) in the box and click on 'TGT Target Corp'. Click on 'Target Corp'.
   b. Next click on 'Income Statement' under 'Financials'. Copy and paste the data into Excel.
   c. Click on 'Balance Sheet' and copy and paste the data so that it is on the same worksheet as the income statement.
2 Obtain Walmart's (WMT) financial statements for comparison from the same website. Enter the ticker symbol (WMT) in the box and click on 'WMT Wal-Mart Stores'.
3 Compute the CCC for Target for each of the last four years.
   a. Compute the inventory days using 'Cost of Revenue' as cost of goods sold and a 365-day year.
   b. Compute accounts receivable days using a 365-day year.
   c. Compute accounts payable days using a 365-day year.
   d. Compute the CCC for each year.
4 How has Target's CCC changed over the last few years?
5 Compare Target's inventory and receivables turnover ratios for the most recent year to those of Walmart.
   a. Compute the inventory turnover ratio as cost of revenue / inventory.
   b. Compute the receivable turnover ratio as total revenue / net receivables.
   c. How do Target's numbers compare to Walmart's?
6 Determine how Target's free cash flow would change if Target's inventory and accounts receivable balances were adjusted to meet Walmart's ratios.
7 Determine the amount of additional free cash flow that would be available if Target adjusted its accounts payable days to 75 days.
8 Determine the net amount of additional free cash flow and Target's CCC if its inventory and receivables turnover ratios were at Walmart's levels and its payable days were 75 days.

What are your impressions regarding Target's working capital management based on this preliminary analysis? Discuss any advantages and disadvantages of bringing the CCC more in line with its competitor.

NOTES

1 When you use your credit card to pay for your groceries, it is a cash sale for the store. The credit card company pays the store cash upon confirmation of the transaction, even if you do not pay your credit card bill on time.
2 Hasbro 1999 Annual Report, http://investor.hasbro.com/secfiling.cfm?filingID=46080-00-3&CIK=46080.
3 See T. Opler, L. Pinkowitz, R. Stulz and R. Williamson, 'The Determinants and Implications of Corporate Cash Holdings', *Journal of Financial Economics*, 52, 1 (1999), pp. 3–46.
4 If the data sets on the websites indicated for this case become unavailable in the future, the data sets will be posted on the textbook's website.

WORKING CAPITAL MANAGEMENT CHAPTER 15 547



PART 4

INTEGRATIVE CASE

This case draws on material from Chapters 11–13.

You work for HydroTech, a large manufacturer of high-pressure industrial water pumps. The firm specialises in natural disaster services, ranging from pumps that draw water from lakes, ponds and streams in drought-stricken areas to pumps that remove high water volumes in flooded areas. You report directly to the chief financial officer. Your boss has asked you to calculate HydroTech's WACC in preparation for an executive retreat at Thredbo. Too bad you're not invited, as water pumps and skiing are on the agenda! At least you have an analyst on hand to gather the following required information:

1 the risk-free rate of interest, in this case, the yield of the 10-year government bond, which is 3%;
2 HydroTech's:
   a. market capitalisation (its market value of equity), $100 million;
   b. CAPM beta, 1.2;
   c. total book value of debt outstanding, $50 million;
   d. cash, $10 million.
3 the cost of debt (using the quoted yields on HydroTech's outstanding bond issues), which is 5%.

With this information in hand, you are now prepared to undertake the analysis.

Case questions

1 Calculate HydroTech's net debt.
2 Compute HydroTech's equity and (net) debt weights based on the market value of equity and the book value of net debt.
3 Calculate the cost of equity capital using the CAPM, assuming a market risk premium of 5%.
4 Using a tax rate of 30%, calculate HydroTech's effective cost of debt capital.
5 Calculate HydroTech's WACC.
6 When is it appropriate to use this WACC to evaluate a new project?

412 PART 4 RISK AND RETURN

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.

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.

PART 1 INTRODUCTION
Ch. 1: Corporate Finance and the Financial Manager
Ch. 2: Introduction to Financial Statement Analysis

PART 2 INTEREST RATES AND VALUING CASH FLOWS
Ch. 3: Time Value of Money: An Introduction
Ch. 4: Time Value of Money: Valuing Cash Flow Streams
Ch. 5: Interest Rates
Ch. 6: Bond Valuation
Ch. 7: Share Valuation: The Dividend-Discount Model

PART 3 VALUATION AND THE FIRM
Ch. 8: Investment Decision Rules
Ch. 9: Fundamentals of Capital Budgeting
Ch. 10: Share Valuation: A Second Look

PART 4 RISK AND RETURN
Ch. 11: Risk and Return in Capital Markets
Ch. 12: Systematic Risk and the Equity Risk Premium
Ch. 13: The Cost of Capital

PART 5 LONG-TERM FINANCING
Ch. 14: Raising Capital
Ch. 15: Debt Financing

PART 6 CAPITAL STRUCTURE AND VALUATION
Ch. 16: Capital Structure
Ch. 17: Payout Policy

PART 7 FINANCIAL PLANNING
Ch. 18: Financial Modelling and Pro-forma Analysis
Ch. 19: Working Capital Management

PART 8 SPECIAL TOPICS
Ch. 20: Option Applications and Corporate Finance
Ch. 21: Mergers and Acquisitions
Ch. 22: International Corporate Finance
Ch. 23: Insurance and Risk Management

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

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

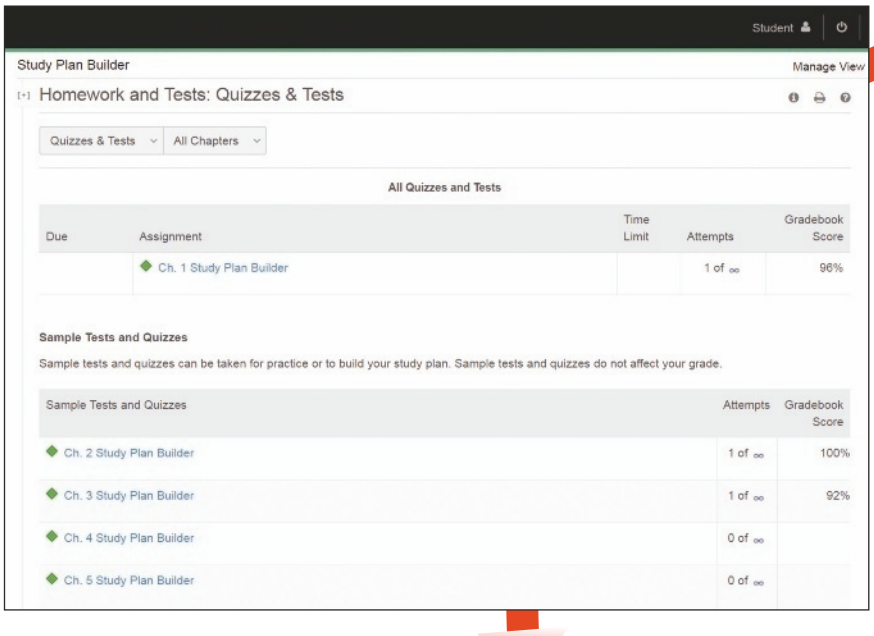
Looks at the overall market for mergers and acquisitions and considers the motivations for and the typical process of a transaction

MyLab Finance for Berk/DeMarzo/Harford/Ford/Mollica
Fundamentals of Corporate Finance, 3rd edition

A guided tour for students and educators

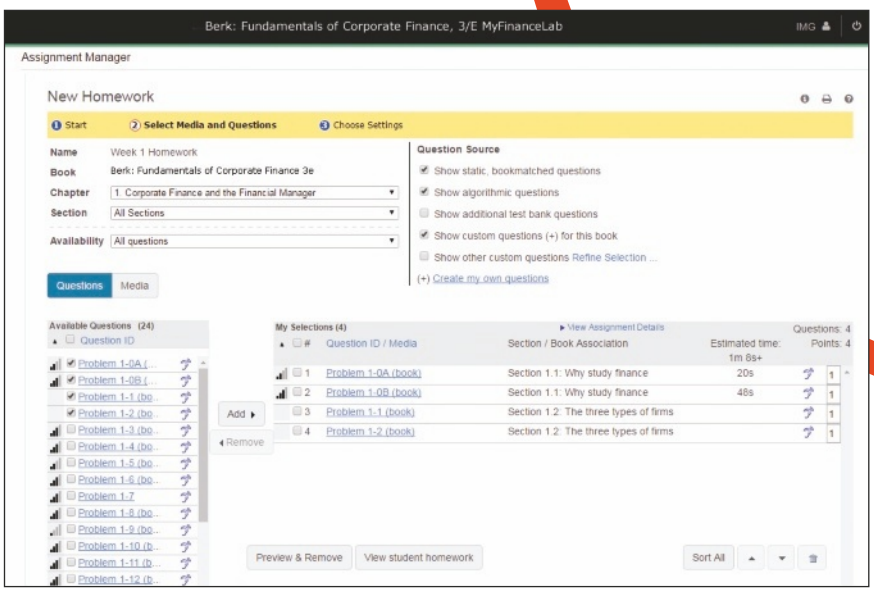
Auto-generated tests and assignments

Each MyLab comes with pre-loaded assignments, all of which are automatically graded and include selected end-of-chapter questions and problems from the textbook.

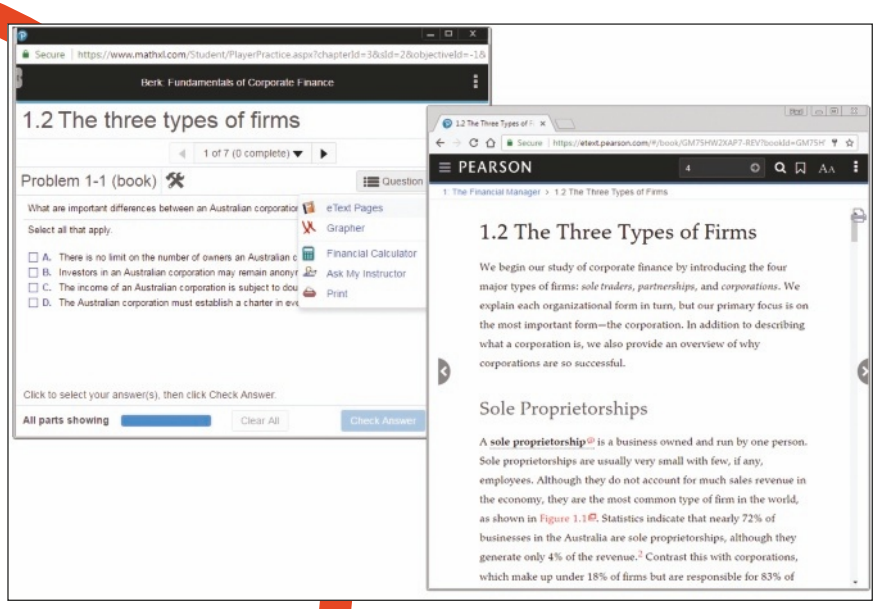


Assignable content

Educators can select content from the Study Plan and/or Test Bank and assign to students as homework or quizzes.



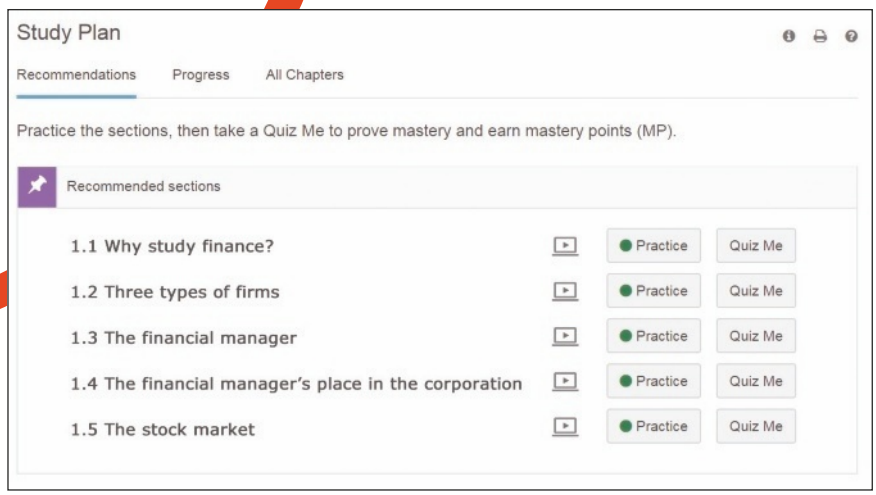
MyLab Finance www.pearsonmylabandmastering.com



Learning resources

To further reinforce understanding, Study Plan and homework problems link to additional learning resources.

- Step-by-step guided solutions
- Animations
- Links to relevant sections of the eText for review of material for all Study Plan questions.



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.