

FUNDAMENTALS OF CORPORATE FINANCE 2ND EDITION

Copyright © Pearson Australia (a division of Pearson Australia Group Pty Ltd) 2014

Pearson Australia
Unit 4, Level 3
14 Aquatic Drive
Frenchs Forest NSW 2086

www.pearson.com.au

Authorised adaptation from the United States edition entitled *Fundamentals of Corporate Finance*, 2nd edition, ISBN 0132148234/9780132148238 by Berk, Jonathan; DeMarzo, Peter; Harford, Jarrad (the 'Original authors'); published by Pearson Education, Inc., publishing as Prentice Hall, Copyright © 2012.

Second adaptation edition published by Pearson Australia Group Pty Ltd, Copyright © 2014

The *Copyright Act 1968* of Australia allows a maximum of one chapter or 10% of this book, whichever is the greater, to be copied by any educational institution for its educational purposes provided that that educational institution (or the body that administers it) has given a remuneration notice to Copyright Agency Limited (CAL) under the Act. For details of the CAL licence for educational institutions contact: Copyright Agency Limited, telephone: (02) 9394 7600, email: info@copyright.com.au

All rights reserved. Except under the conditions described in the *Copyright Act 1968* of Australia and subsequent amendments, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner.

Senior Acquisitions Editor: Simone Bella
Manager—Product Development: Michael Stone
Team Leader—Editorial: Sandra Goodall
Project Editor: Sara Haddad
Development Editor: Anna Carter
Media Content Developer, MyFinanceLab: Adam Catarius
Editorial Coordinator: Germaine Silva
Production Controller: Julie McArthur
Copyright and Pictures Team Leader: Megan Retka-Tidd
Copy Editor: Fiona Crawford
Proofreader: Sara Haddad
Indexer: Mary Coe
Cover and internal design by em&jon design
Typeset by Midland Typesetters, Australia

Printed in China

1 2 3 4 5 18 17 16 15 14

National Library of Australia
Cataloguing-in-Publication Data

Author: Berk, Jonathan, author.

Title: Fundamentals of corporate finance / Jonathan Berk, Peter DeMarzo, Jarrad Harford, Guy Ford, Vito Mollica, Nigel Finch.

Edition: 2 edition.

ISBN: 9781442564060 (paperback)
ISBN: 9781442564640 (vital source)

Notes: Includes index.

Subjects: Corporations—Finance—Textbooks.

Other Authors/Contributors:
DeMarzo, Peter, author.
Harford, Jarrad, author.
Ford, Guy, author.
Mollica, Vito, author.
Finch, Nigel, author.

Dewey Number: 658.15

Every effort has been made to trace and acknowledge copyright. However, should any infringement have occurred, the publishers tender their apologies and invite copyright owners to contact them. Due to copyright restrictions, we may have been unable to include material from the print edition of the book in this digital edition, although every effort has been made to minimise instances of missing content.

Neither Morningstar, nor its affiliates nor their content providers guarantee the data or content contained herein to be accurate, complete or timely nor will they have any liability for its use or distribution. Any general advice prepared by Morningstar Australasia Pty Ltd ABN: 95 090 665 544, AFSL: 240892 (a subsidiary of Morningstar, Inc.), has been done so without reference to your objectives, financial situation or needs. You should consider the advice in light of these matters and, if applicable, the relevant product disclosure statement before making any decision to invest. Some material is copyright and published under licence from ASX Operations Pty Limited ACN 004 523 782 ('ASXO').
DISCLOSURE: Employees may have an interest in the securities discussed in this report. Please refer to our Financial Services Guide (FSG) for more information at www.morningstar.com.au/fsg.

BRIEF CONTENTS

Preface	xvi		
Guided Tour: For Students	xviii		
Guided Tour: For Educators	xxii		
PART 1 INTRODUCTION	1		
1 Corporate Finance and the Financial Manager	2		
2 Introduction to Financial Statement Analysis	25		
PART 2 INTEREST RATES AND VALUING CASH FLOWS	63		
3 Time Value of Money: An Introduction	64		
4 Time Value of Money: Valuing Cash Flow Streams	89		
5 Interest Rates	126		
6 Bond Valuation	154		
7 Share Valuation: The Dividend-Discount Model	191		
PART 3 VALUATION AND THE FIRM	219		
8 Investment Decision Rules	220		
9 Fundamentals of Capital Budgeting	259		
10 Share Valuation: A Second Look	295		
		PART 4 RISK AND RETURN	327
		11 Risk and Return in Capital Markets	328
		12 Systematic Risk and the Equity Risk Premium	355
		13 The Cost of Capital	390
		PART 5 LONG-TERM FINANCING	419
		14 Raising Capital	420
		15 Debt Financing	449
		PART 6 CAPITAL STRUCTURE AND VALUATION	473
		16 Capital Structure	474
		17 Payout Policy	511
		PART 7 FINANCIAL PLANNING	551
		18 Financial Modelling and Pro-forma Analysis	552
		19 Working Capital Management	581
		PART 8 SPECIAL TOPICS	609
		20 Option Applications and Corporate Finance	610
		21 Mergers and Acquisitions	635
		22 International Corporate Finance	665
		23 Insurance and Risk Management	702
		Index	723

DETAILED CONTENTS

Preface	xvi	Types of financial institutions	19
New to this edition	xvii	Roles of financial institutions.....	19
Guided Tour: For Students	xviii	MyFinanceLab.....	21
Guided Tour: For Educators.....	xxii	Problems	22
Acknowledgements.....	xxvi	Notes.....	24
MyFinanceLab and accuracy review	xxvi		
Reviewers	xxvi		
About the authors	xxvii		
PART 1 INTRODUCTION	1	Chapter 2 Introduction to Financial	
Chapter 1 Corporate Finance and the		Statement Analysis	25
Financial Manager	2	2.1 Firms' disclosure of financial information	26
1.1 Why study finance?	3	International Financial Reporting Standards.....	26
1.2 The three types of firms	4	Preparation of financial statements	27
Sole traders	4	Types of financial statements	27
Partnerships.....	4	2.2 The balance sheet	28
Corporations.....	5	Assets.....	28
Tax implications for corporate entities	7	Liabilities.....	30
• FINANCE IN FOCUS: Corporate taxation around		Shareholders' equity	30
the world.....	9	2.3 Balance sheet analysis	32
1.3 The financial manager	10	Market-to-book ratio	32
Making investment decisions	10	Debt–equity ratio.....	32
Making financing decisions.....	10	Enterprise value	33
Managing short-term cash needs.....	10	Other balance sheet information.....	35
The goal of the financial manager.....	11	2.4 The income statement	36
1.4 The financial manager's place in the corporation.....	11	Earnings calculations.....	36
The corporate management team	12	2.5 Income statement analysis	38
Ethics and incentives in corporations.....	12	Profitability ratios.....	38
• FINANCE IN FOCUS: Two strikes you're out.....	14	Asset efficiency	39
1.5 The stock market.....	16	Working capital ratios.....	39
The largest stock markets	16	EBITDA	40
The Australian Securities Exchange	16	Leverage ratios	40
• FINANCE IN FOCUS: All Ords, SPI, S&P/ASX 200:		Investment returns.....	40
Awash with abbreviations.....	18	The DuPont Identity.....	41
1.6 Financial institutions.....	18	Valuation ratios.....	42
The financial cycle.....	18	• COMMON MISTAKE: Mismatched ratios.....	43
		2.6 The statement of cash flows	46
		Operating activity	46
		Investment activity.....	48
		Financing activity	48

2.7 Other financial statement information.....	49
Management discussion and analysis.....	50
Statement of changes in equity.....	50
Notes to the financial statements.....	50
2.8 Financial reporting in practice	50
Enron.....	51
HIH Insurance	51
Centro	52
CLERP 9 and the ASX Good Corporate Governance Principles	53
The financial statements: A useful starting point.....	53
MyFinanceLab.....	54
Review questions.....	57
Problems	57
Data case.....	61
Notes.....	62

PART 2 INTEREST RATES AND VALUING CASH FLOWS 63

Chapter 3 Time Value of Money: An Introduction 64

3.1 Cost–benefit analysis.....	65
Role of the financial manager	65
Quantifying costs and benefits	66
• FINANCE IN FOCUS: When competitive market prices are not available	68
3.2 Market prices and the Valuation Principle.....	69
The Valuation Principle	69
Why there can be only one competitive price for a good	70
• FINANCE IN FOCUS: Arbitrage	70
• FINANCE IN FOCUS: Your personal financial decisions	71
3.3 The time value of money and interest rates.....	72
The time value of money	72
The interest rate: Converting cash across time	72
Timelines	76
3.4 Valuing cash flows at different points in time.....	77
Rule 1: Comparing and combining values.....	77

• COMMON MISTAKE: Summing cash flows across time	78
Rule 2: Compounding.....	78
• FINANCE IN FOCUS: Rule of 72.....	80
Rule 3: Discounting.....	80
• USING A FINANCIAL CALCULATOR	82
MyFinanceLab.....	84
Review questions.....	85
Problems	85
Notes.....	88

Chapter 4 Time Value of Money: Valuing Cash Flow Streams 89

4.1 Valuing a stream of cash flows	90
Applying the rules of valuing cash flows to a cash flow stream	90
• USING A FINANCIAL CALCULATOR: Solving for present and future values of cash flow streams.....	94
4.2 Perpetuities.....	96
Perpetuities.....	96
• FINANCE IN FOCUS: Historical examples of perpetuities	98
• COMMON MISTAKE: Discounting one too many times	99
4.3 Annuities	100
Present value of an annuity.....	100
Future value of an annuity	103
4.4 Growing Cash Flows.....	104
Growing perpetuity	104
Growing annuity.....	106
4.5 Solving for variables other than present value or future value	108
Solving for the cash flows.....	108
Rate of return	110
Solving for the number of periods	113
MyFinanceLab.....	116
Review questions.....	117
Problems	117

Data case.....	121	6.4 Why bond prices change.....	165
Notes.....	122	Interest rate changes and bond prices.....	166
APPENDIX A: Using a financial calculator	123	Time and bond prices	168
Specifying decimal places	123	Interest rate risk and bond prices	170
toggling between the beginning and end of a period.....	123	• FINANCE IN FOCUS: Clean and dirty prices for	
Set the number of periods per year.....	123	coupon bonds	173
Solving for the future value of an annuity (Example 4.5)	124	Bond prices in practice.....	173
Solving for the rate of return.....	124	6.5 Corporate bonds.....	175
Chapter 5: Interest Rates	126	Credit risk.....	175
5.1 Interest rate quotes and adjustments.....	127	Corporate bond yields	175
The effective annual rate	128	Bond ratings	176
Adjusting the discount rate to different time periods	128	Credit spreads.....	176
Annual percentage rates.....	130	MyFinanceLab.....	180
• COMMON MISTAKE: Using the effective annual		Review questions.....	181
rate in the annuity formula	130	Problems	182
5.2 Application: Discount rates and loans.....	133	Data case.....	184
Calculating loan payments.....	133	Notes.....	185
Calculating the outstanding loan balance	134	APPENDIX A: Solving for the yield to maturity of a	
5.3 The determinants of interest rates.....	137	bond using a financial calculator	186
Inflation and real versus nominal rates	137	APPENDIX B: The yield curve and the Law of One Price....	187
Investment and interest rate policy.....	139	Valuing a coupon bond with zero-coupon prices	187
• FINANCE IN FOCUS: How is inflation actually		Valuing a coupon bond using zero-coupon yields	188
calculated?	140	Coupon bond yields.....	188
The yield curve and discount rates	140	Treasury yield curves	190
• COMMON MISTAKE: Using the annuity formula		Chapter 7: Share Valuation:	
when discount rates vary	143	The Dividend-Discount Model	191
The yield curve and the economy.....	143	7.1 Share basics.....	192
5.4 The opportunity cost of capital	146	Share market reporting: Share quotes.....	192
MyFinanceLab.....	149	Ordinary shares.....	193
Review questions.....	150	Preference shares.....	194
Problems	151	7.2 The dividend-discount model	195
Notes.....	153	A one-year investor.....	195
Chapter 6: Bond Valuation.....	154	Dividend yields, capital gains and total returns.....	196
6.1 Bond terminology.....	155	A multiyear investor	197
6.2 Zero-coupon bonds	156	Dividend-discount model equation	198
Zero-coupon bond cash flows	156	7.3 Estimating dividends in the dividend-discount model	199
Yield to maturity of a zero-coupon bond	157	Constant dividend growth	199
Risk-free interest rates.....	158	Dividends versus investment and growth	200
6.3 Coupon bonds.....	160	Changing growth rates.....	203
Coupon bond cash flows.....	160	• COMMON MISTAKE: Forgetting to 'grow' this	
Yield to maturity of a coupon bond	161	year's dividend.....	204
• FINANCE IN FOCUS: The Australian Treasury market	162	Value drivers and the dividend-discount model.....	206
• FINANCE IN FOCUS: Finding bond yields on the Web...	163	7.4 Limitations of the dividend-discount model	207
Coupon bond price quotes	164	Uncertain dividend forecasts.....	207
		Non-dividend-paying shares	208

7.5 Share repurchases and the total payout model	208
7.6 Putting it all together	210
MyFinanceLab.....	211
Review questions	213
Problems	213
Notes.....	215
Part 2: Integrative case.....	217
Case questions	218

PART 3 VALUATION AND THE FIRM 219

Chapter 8 Investment Decision Rules 220

8.1 The NPV decision rule.....	221
Net present value.....	221
The NPV decision rule	222
8.2 Using the NPV rule.....	224
Organising the cash flows and computing the net present value	224
The NPV profile	225
Measuring sensitivity with the internal rate of return.....	226
Alternative rules versus the NPV rule.....	226
8.3 Alternative decision rules	227
• USING EXCEL: Calculating the net present value and the internal rate of return.....	227
The payback rule	229
The IRR rule	230
• COMMON MISTAKE: Internal rate of return versus the IRR rule.....	234
Modified internal rate of return	235
• FINANCE IN FOCUS: Why do rules other than the NPV rule persist?.....	235
8.4 Choosing between projects	237
Differences in scale	239
Timing of the cash flows.....	243
8.5 Evaluating projects with different lives	244
Important considerations when using the equivalent annual annuity.....	246
8.6 Choosing among projects when resources are limited ...	247
Evaluating projects with different resource requirements	247
8.7 Putting it all together	250
MyFinanceLab.....	252
Review questions	253
Problems	253
Data case.....	258
Notes.....	258

Chapter 9 Fundamentals of Capital Budgeting 259

9.1 The capital budgeting process	260
9.2 Forecasting incremental earnings	261
Operating expenses versus capital expenditures.....	262
Incremental revenue and cost estimates.....	262
Taxes	263
Incremental earnings forecast	263
9.3 Determining incremental free cash flow	267
Converting from earnings to free cash flow	267
Calculating free cash flow directly.....	271
Calculating the net present value	272
9.4 Other effects on incremental free cash flow.....	273
Opportunity costs	273
• COMMON MISTAKE: The opportunity cost of an idle asset	274
Project externalities.....	274
Sunk costs	274
• COMMON MISTAKE: The sunk cost fallacy	275
Adjusting free cash flow	275
Replacement decisions.....	278
9.5 Analysing the project	279
Sensitivity analysis.....	280
Break-even analysis.....	280
Scenario analysis.....	282
9.6 Real options in capital budgeting	283
Option to delay.....	283
Option to expand	283
Option to abandon	283
MyFinanceLab.....	285
Review questions.....	287
Problems	287
Data case.....	292
Notes.....	293

Chapter 10 Share Valuation: A Second Look 295

10.1 The discounted free cash flow model	296
Valuing the enterprise.....	297
Implementing the model.....	297
Connection to capital budgeting	299
10.2 Valuation based on comparable firms	301
Valuation multiples	302
Limitations of multiples.....	306

Comparison with discounted cash flow methods	307	Diversifiable risk and the risk premium	347
Share valuation techniques: The final word	307	The importance of systematic risk	347
10.3 Information, competition and share prices	308	• COMMON MISTAKE: A fallacy of long-run diversification	349
Information in share prices	308	MyFinanceLab	350
Competition and efficient markets	310	Review questions	351
• FINANCE IN FOCUS: Forms of market efficiency	311	Problems	352
Lessons for investors and corporate managers	314	Notes	354
The efficient markets hypothesis versus no arbitrage	314		
10.4 Individual biases and trading	315	Chapter 12 Systematic Risk and the Equity Risk Premium	355
Excessive trading and overconfidence	315	12.1 The expected return of a portfolio	356
Hanging on to losers and the disposition effect	316	Portfolio weights	356
Investor attention, mood and experience	317	Expected portfolio return	358
MyFinanceLab	318	12.2 The volatility of a portfolio	360
Review questions	319	Diversifying risks	360
Problems	319	Measuring shares' co-movement: Correlation	362
Data case	323	• USING EXCEL: Calculating the correlation between two sets of returns	364
Notes	324	Computing a portfolio's variance and standard deviation	364
Part 3: Integrative case	325	The volatility of a large portfolio	367
Proposal 1	325	• FINANCE IN FOCUS: Nobel Prize	368
Proposal 2	325	12.3 Measuring systematic risk	368
Case questions	326	Role of the market portfolio	368
		Share market indices as the market portfolio	369
		Market risk and beta	371
		• COMMON MISTAKE: Mixing standard deviation and beta	372
		Estimating beta from historical returns	373
		12.4 Putting it all together: The Capital Asset Pricing Model	375
		The CAPM equation relating risk to expected return	375
		• FINANCE IN FOCUS: Why not estimate expected returns directly?	376
		The security market line	377
		The Capital Asset Pricing Model and portfolios	379
		Summary of the Capital Asset Pricing Model	380
		The big picture	380
		MyFinanceLab	381
		Review questions	382
		Problems	382
		Notes	386
		APPENDIX	387
		Alternative models of systematic risk	387
		Fama–French–Carhart factor specification	387
PART 4 RISK AND RETURN	327		
Chapter 11 Risk and Return in Capital Markets	328		
11.1 A first look at risk and return	329		
11.2 Historical risks and returns of shares	330		
Computing historical returns	330		
Average annual returns	333		
• FINANCE IN FOCUS: Arithmetic average returns versus compound annual returns	334		
The variance and volatility of returns	336		
• USING EXCEL: Computing the standard deviation of historical returns	337		
• COMMON MISTAKE: Mistakes when computing standard deviation	338		
The normal distribution	338		
11.3 The historical trade-off between risk and return	340		
The returns of large portfolios	340		
The returns of individual shares	340		
11.4 Common versus independent risk	342		
Theft versus earthquake insurance: An example	342		
Types of risk	342		
11.5 Diversification in share portfolios	344		
Unsystematic versus systematic risk	344		

Chapter 13 The Cost of Capital.....	390		
13.1 A first look at the weighted average cost of capital	391		
The firm's capital structure.....	391		
Opportunity cost and the overall cost of capital	392		
Weighted averages and the overall cost of capital.....	392		
Weighted average cost of capital calculations	393		
13.2 The firm's costs of debt and equity capital	394		
Cost of debt capital	395		
• COMMON MISTAKE: Using the coupon rate as the cost of debt	395		
Cost of preference share capital.....	397		
Cost of ordinary share capital	397		
13.3 A second look at the weighted average cost of capital	400		
Weighted average cost of capital equation	400		
Weighted average cost of capital in practice	401		
Methods in practice.....	401		
13.4 Using the weighted average cost of capital to value a project	403		
Key assumptions	404		
WACC method application: Extending the life of a mine.....	405		
Summary of the WACC method.....	406		
13.5 Project-based costs of capital	406		
Cost of capital for a new acquisition	407		
Divisional costs of capital	407		
13.6 When raising external capital is costly	408		
MyFinanceLab.....	411		
Review questions	412		
Problems	413		
Data case.....	415		
Notes.....	416		
Part 4: Integrative case.....	417		
Case questions	417		
PART 5 LONG-TERM FINANCING	419		
Chapter 14 Raising Capital.....	420		
14.1 Equity financing for private companies	421		
Sources of funding.....	421		
• FINANCE IN FOCUS: Creating angels.....	422		
Securities and valuation	424		
Exiting an investment in a private company.....	426		
14.2 Taking your firm public: The initial public offering	426		
Advantages and disadvantages of going public.....	426		
• FINANCE IN FOCUS: Facebook IPO.....	427		
Primary and secondary IPO offerings.....	428		
Other IPO types	433		
• FINANCE IN FOCUS: Google's IPO.....	436		
14.3 IPO puzzles	437		
Underpriced IPOs.....	437		
'Hot' and 'cold' IPO markets	437		
High cost of issuing an IPO	439		
Poor post-IPO long-run share performance.....	440		
14.4 Raising additional capital: The seasoned equity offering	441		
SEO process.....	441		
SEO price reaction	441		
SEO costs.....	443		
MyFinanceLab.....	444		
Review questions	445		
Problems	445		
Notes.....	448		
Chapter 15 Debt Financing	449		
15.1 Corporate debt.....	450		
Private debt	450		
• FINANCE IN FOCUS: Debt financing at Woolworths: Bank loans	451		
• FINANCE IN FOCUS: Debt financing at Woolworths: 144A and private placements	452		
Public debt	452		
• FINANCE IN FOCUS: Debt financing at Woolworths: Public debt	454		
15.2 Bond covenants	455		
Types of covenants	456		
Advantages of covenants.....	457		
• FINANCE IN FOCUS: Wesfarmers' covenants.....	457		
15.3 Repayment provisions	458		
Call provisions.....	458		
Sinking funds.....	459		
Convertible provisions.....	461		
• FINANCE IN FOCUS: Convertible bonds	463		
MyFinanceLab.....	465		
Review questions	466		
Problems	466		
Notes.....	467		
APPENDIX.....	468		
Part 5: Integrative case.....	469		
Case questions	471		

PART 6 CAPITAL STRUCTURE AND VALUATION 473

Chapter 16 Capital Structure 474

16.1 Capital structure choices	475
Capital structure choices across industries.....	475
Capital structure choices within industries	476
16.2 Capital structure in perfect capital markets.....	477
Application: Financing a new business	478
Leverage and firm value.....	479
The effect of leverage on risk and return	480
Home-made leverage	482
Leverage and the cost of capital.....	482
• COMMON MISTAKE: Capital structure fallacies.....	485
Leverage and earnings per share.....	485
Equity issuances and dilution	485
Modigliani and Miller and the real world	486
• FINANCE IN FOCUS: Franco Modigliani and Merton Miller	486
16.3 Debt and taxes.....	487
The interest tax deduction and firm value	487
Value of the interest tax shield	488
The interest tax shield with permanent debt	490
Leverage and the weighted average cost of capital with taxes.....	492
Debt and taxes: The bottom line.....	492
16.4 The costs of bankruptcy and financial distress.....	493
Direct costs of bankruptcy	494
Indirect costs of financial distress.....	494
16.5 Optimal capital structure: The trade-off theory.....	495
Differences across firms	496
Optimal leverage	496
16.6 Additional consequences of leverage: Agency costs and information	497
Agency costs	498
Debt and information	499
16.7 Capital structure: Putting it all together.....	502
MyFinanceLab.....	503
Review questions.....	505
Problems	505
Notes.....	510

Chapter 17 Payout Policy 511

17.1 Cash distributions to shareholders	512
Dividends.....	513
Share repurchases.....	514

17.2 Dividends versus share repurchases in a perfect capital market.....	514
Alternative policy 1: Pay a dividend with excess cash.....	515
Alternative policy 2: Share repurchase (no dividend).....	516
• COMMON MISTAKE: Repurchases and the supply of shares.....	517
Alternative policy 3: High dividend (equity issue).....	518
Modigliani–Miller and dividend policy irrelevance	518
• COMMON MISTAKE: The bird in the hand fallacy	520
Dividend policy with perfect capital markets.....	520
17.3 Dividends and share repurchases under personal taxes.....	521
Taxes on dividends and capital gains.....	521
Dividend imputation	521
Taxation of capital gains	524
Dividends versus capital gains	525
Share repurchases structured as dividends	525
Optimal dividend policy with taxes	526
17.4 Payout versus retention of cash	526
Retaining cash with perfect capital markets.....	527
Retaining cash with imperfect capital markets.....	528
17.5 Signalling with payout policy.....	531
Dividend smoothing.....	531
Dividend signalling.....	531
• FINANCE IN FOCUS: National Australia Bank’s dividend cut.....	532
Signalling and share repurchases.....	532
17.6 Dividend reinvestment plans and bonus issues.....	533
Dividend reinvestment plans	533
Bonus issues	534
17.7 Dividend imputation and share valuation.....	534
Valuation and franking credits: The theory.....	535
Estimating gamma	537
Valuation and franking credits: Market practice	540
• COMMON MISTAKE: Franking credits are irrelevant to foreign shareholders.....	541
17.8 Advice for the financial manager.....	542
MyFinanceLab.....	543
Review questions.....	545
Problems	546
Data case.....	548
Notes.....	549
Part 5: Integrative case.....	550
Case questions	550

PART 7 FINANCIAL PLANNING 551

Chapter 18 Financial Modelling and

Pro-forma Analysis 552

18.1 Goals of long-term financial planning 553

Identify important linkages 553

Analyse the impact of potential business plans 554

Plan for future funding needs 554

18.2 Forecasting financial statements: The percent of sales method 554

Percent of sales method 555

Pro-forma income statement 556

Pro-forma balance sheet 557

• COMMON MISTAKE: Confusing shareholders' equity with retained earnings 558

Making the balance sheet balance: Net new financing 558

Choosing a forecast target 559

18.3 Forecasting a planned expansion 561

KMS Designs' expansion: Financing needs 561

KMS Designs' expansion: Pro-forma statement 563

Forecasting the balance sheet 564

• COMMON MISTAKE: Treating forecasts as fact 565

18.4 Growth and firm value 566

Sustainable growth rate and external financing 567

18.5 Valuing the expansion 571

Forecasting free cash flows 571

• COMMON MISTAKE: Confusing total and incremental net working capital 572

KMS Designs' expansion: Effect on firm value 572

MyFinanceLab 576

Review questions 577

Problems 577

Notes 580

Chapter 19 Working Capital

Management 581

19.1 Overview of working capital 582

The cash cycle 582

Working capital needs by industry 585

Firm value and working capital 586

19.2 Trade credit 587

Trade credit terms 587

Trade credit and market frictions 588

• COMMON MISTAKE: Using APR instead of EAR to compute the cost of trade credit 588

Managing float 590

19.3 Receivables management 591

Determining the credit policy 591

• FINANCE IN FOCUS: The 5 Cs of credit 592

Monitoring accounts receivable 592

19.4 Payables management 596

Determining accounts payable days outstanding 596

Stretching accounts payable 597

19.5 Inventory management 598

Benefits of holding inventory 598

Costs of holding inventory 599

• FINANCE IN FOCUS: Inventory management adds to the bottom line at Woolworths 600

19.6 Cash management 600

Motivation for holding cash 600

Alternative investments 601

MyFinanceLab 602

Review questions 603

Problems 603

Data case 607

Notes 608

PART 8 SPECIAL TOPICS 609

Chapter 20 Option Applications and

Corporate Finance 610

20.1 Option basics 611

Option contracts 611

Share option quotations 613

Options on other financial securities 614

• FINANCE IN FOCUS: Options are for more than just shares 615

20.2 Option payoffs at expiration 615

The long position in an option contract 615

The short position in an option contract 617

Profits for holding an option to expiration 617

Returns for holding an option to expiration 620

20.3 Factors affecting option prices 621

Exercise price and share price 621

Option prices and the exercise date 621

Option prices and the risk-free rate 622

Option prices and volatility 622

20.4 The Black–Scholes option pricing formula	624	MyFinanceLab.....	660
20.5 Put–call parity	624	Review questions.....	662
Portfolio insurance.....	625	Problems	662
20.6 Options and corporate finance	628	Notes.....	663
MyFinanceLab.....	630		
Review questions.....	631		
Problems	632		
Data case.....	633		
Notes.....	634		
Chapter 21 Mergers and Acquisitions	635	Chapter 22 International Corporate	
21.1 Background and historical trends.....	636	Finance.....	665
Merger waves.....	636	22.1 Foreign exchange.....	666
Types of mergers	638	The foreign exchange market.....	668
21.2 Market reaction to a takeover	638	Exchange rates	669
21.3 Reasons to acquire.....	639	22.2 Exchange rate risk.....	670
Economies of scale and scope.....	639	Exchange rate fluctuations.....	670
Vertical integration	640	Hedging with forward contracts	672
Expertise.....	640	Cash-and-carry and the pricing of currency forwards.....	674
Monopoly gains.....	640	Hedging exchange rate risk with options	677
Efficiency gains.....	641	22.3 Internationally integrated capital markets	679
Tax savings from operating losses	641	• COMMON MISTAKE: Forgetting to flip the	
Diversification.....	643	exchange rate	680
Earnings growth	643	22.4 Valuation of foreign currency cash flows	682
Managerial motives to merge	645	Application: Ityesi Packaging.....	682
21.4 The takeover process	646	The Law of One Price as a robustness check	684
Valuation	646	22.5 Valuation and international taxation	686
The offer	647	A single foreign project with immediate repatriation	
Merger ‘arbitrage’.....	648	of earnings	686
Tax and accounting issues.....	650	Multiple foreign projects and deferral of earnings	
Board and shareholder approval	651	repatriation.....	687
21.5 Takeover defences.....	652	22.6 Internationally segmented capital markets	688
Poison pills.....	652	Differential access to markets	688
Staggered boards	653	Macro-level distortions	689
White knights	653	Implications of internationally segmented capital	
Golden parachutes	653	markets	689
Recapitalisation	654	22.7 Capital budgeting with exchange rate risk	692
Other defensive strategies.....	654	Application: Ityesi Packaging.....	693
21.6 Who gets the value added from a takeover?	655	Conclusion.....	694
The free rider problem.....	655	MyFinanceLab.....	695
Toeholds.....	656	Review questions.....	697
The leveraged buyout	656	Problems	697
Competition	658	Data case.....	700
• FINANCE IN FOCUS: The leveraged buyout of MYOB.....	659	Notes.....	701
		Chapter 23 Insurance and Risk	
		Management.....	702
		23.1 Insurance	703
		The role of insurance: An example	703

Insurance pricing in a perfect market	704	Interest rate risk measurement: Duration	715
The value of insurance	706	Duration-based hedging	715
The costs of insurance	708	Swap-based hedging	716
The insurance decision	710	MyFinanceLab.....	719
23.2 Commodity price risk	711	Review questions.....	720
Hedging with vertical integration and storage.....	711	Problems	720
Hedging with long-term contracts	712	Notes.....	722
Hedging with futures contracts.....	713		
23.3 Interest rate risk	715	Index	723

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 \times 0.30 = \$30 in taxes at the corporate level, leaving $100 - 30 = 70$ in after-tax earnings per share to distribute.
You will pay $70 \times 0.45 = 31.50$ 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 \times 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 $100 \times 0.45 = 45$; 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.

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.

Modified internal rate of return

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)**.

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.

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 8 255

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

EXAMPLE 4.6

ENDING 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:

$$PV = \$30\,000/0.08 = \$375\,000 \text{ today}$$

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

$$0 \quad 1 \quad 2 \quad 3 \quad \dots$$

$$\$30\,000 \quad \$30\,000 \times 1.04 \quad \$30\,000 \times 1.04^2$$

The cost of the party next year is \$30 000, and the cost then increases 4% per year forever. From the timeline, we recognize 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:

$$PV = \$30\,000/0.08 - 0.04 = \$750\,000 \text{ today}$$

Evaluate

You need to double the size of your gift!

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.

Growing annuity

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

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

Because the annuity has only a finite number of terms, Eq. 4.8 also works when $g > r$. 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

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

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

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

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.

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.

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

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.

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.

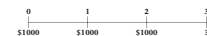
Rule 2: to calculate a cash flow's future value, we must compound it using Eq. 3.1 from Chapter 3.

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

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:



- Execute
 $PV = \frac{15,000}{1.06^5} = \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. 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

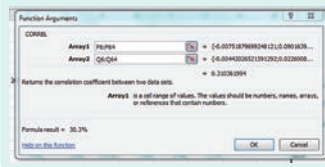


USING EXCEL

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 Woodwards 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:

$$\text{Var}(R_p) = w_1^2 \text{SD}(R_1)^2 + w_2^2 \text{SD}(R_2)^2 + 2w_1 w_2 \text{Corr}(R_1, R_2) \text{SD}(R_1) \text{SD}(R_2) \quad (12.4)$$

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 $\text{Corr}(R_1, R_2)$).¹² 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

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 BAI 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.

→ CONCEPT CHECK

- How are operating expenses and capital expenditures treated differently when calculating incremental earnings?
- Why do we focus only on incremental revenue and costs, rather than all revenue and costs of the firm?

9.3 DETERMINING INCREMENTAL FREE CASH FLOW

As discussed in Chapter 2, earnings are an accounting measure of the firm's performance. They do not represent real profits: the firm cannot use its earnings to buy goods, pay employees, fund new investments or pay dividends to shareholders. To do those things, the firm needs cash. Thus, to evaluate a capital budgeting decision, we must determine its consequences for the firm's available cash. The incremental effect of a project on the firm's available cash is the project's **incremental free cash flow (FCF)**.

Converting from earnings to free cash flow

As discussed in Chapter 2, there are important differences between earnings and cash flow. Earnings include non-cash charges, such as depreciation, but do not include expenditures on capital investment. To determine a project's free cash flow from its incremental earnings, we must adjust for these differences.

Capital expenditures and depreciation. As we have noted, depreciation is not a cash expense that is paid by the firm. Rather, it is a method used for accounting and tax purposes to allocate the original purchase cost of the asset over its life. Because depreciation is not a cash flow, we do not include it in the cash flow forecast. However, that does not mean we can ignore depreciation. The depreciation expense reduces our taxable earnings and in doing so reduces our taxes. Taxes are cash flows, so because depreciation affects our cash flows, it still matters. Our approach for handling depreciation is to add it back to the incremental earnings to recognise the fact that we still have the cash flow associated with it.

For example, a project has incremental gross profit (revenue minus costs) of \$1 million and a \$200 000 depreciation expense. If the firm's tax rate is 30%, then the incremental earnings will be $(\$1\,000\,000 - \$200\,000) \times (1 - 0.30) = \$560\,000$. However, the firm will still have \$760 000 because the \$200 000 depreciation expense is not an actual cash outflow. Table 9.1 shows the calculation to get the incremental free cash flow in this case. Blue boxes indicate all of the actual cash flows in the column labelled 'Correct'. A good way to check to make sure the incremental free cash flow is correct is to sum the actual cash flows. In this case, the firm generated \$1 000 000 in gross profit (a positive cash flow), paid \$240 000 in taxes (a negative cash flow), and was left with \$1 000 000 - \$240 000 = \$760 000, which is the amount shown as the incremental free cash flow. In the last column, labelled 'Incorrect', we show what would happen if you just ignored depreciation altogether. Because EBIT would be too high, the taxes would be too high as well and, consequently, the incremental free cash flow would be too low. (Note that the difference of \$60 000 between the two cases is entirely due to the difference in tax payments.)

LEARNING OBJECTIVE 3

Convert forecasted earnings to free cash flows and compute a project's net present value.

free cash flow (FCF) The incremental effect of a project on a firm's available cash.

- In the early 1980s, inflation was in the double-digits and the yield curve sloped sharply downward. What did the yield curve say about investors' expectations about future inflation rates?
- What do we mean when we refer to the 'opportunity cost' of capital?

PROBLEMS

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

Interest rate quotes and adjustments

- 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:
 - six months;
 - one year;
 - one month.
- 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?
- Which do you prefer: a bank account that pays 5% per year (EAR) for three years or:
 - an account that pays 2.5% every six months for three years?
 - an account that pays 7.5% every 18 months for three years?
 - an account that pays 0.5% per month for three years?
- You have been offered a job with an unusual bonus structure. As long as you stay with the firm, you will get an extra \$10 000 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)?
- 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.)
- 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?
- 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?
- You have been accepted into a full-time course at a university. The university guarantees that your tuition will not increase for the three years you attend university. The first \$10000 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

- You make monthly payments on your car loan. It has a quoted APR of 5% (monthly compounding). What percentage of the outstanding principal do you pay in interest each month?
- Suppose Capital One is advertising a 60-month, 5.99% APR motorcycle loan. If you need to borrow \$8000 to purchase your dream Harley-Davidson, what will your monthly payment be?
- Suppose La Jolie Bank is offering a 30-year mortgage with an EAR of 6.80%. If you plan to borrow \$150 000, what will your monthly payment be?
- 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 toward the principal of the loan and how much will go toward interest?
- *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 6.5% to 6.25% 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?

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.

DATA CASE*

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 he 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.
- Obtain Target's financial statements for the past four years from <http://www.firmsof.com>.
 - Enter the ticker symbol (TGT) in the box and click on 'Get Quotes'.
 - Next click on 'Income Statement' under 'Financials'. Copy and paste the data into Excel.
 - Click on 'Balance Sheet' and copy and paste the data so that it is on the same worksheet as the income statement.
 - Obtain Walmart's (WMT) ratios for comparison from the Reuters web site (www.reuters.com/finance/).
 - Enter the ticker symbol (WMT) in the box, click 'Search' and then select the symbol 'WMTN'.
 - Select 'Financials' and then scroll down to find the efficiency ratios and copy and paste them into your spreadsheet where Target's financial statements are located.
 - Compute the CCC for Target for each of the last four years.
 - Compute the inventory days using 'Cost of Revenue' as cost of goods sold and a 365-day year.
 - Compute accounts receivable days using a 365-day year.
 - Compute accounts payable days using a 365-day year.
 - Compute the CCC for each year.
 - How has Target's CCC changed over the last few years?
 - Compare Target's inventory and receivables turnover ratios for the most recent year to the industry average.
 - Compute the inventory turnover ratio as cost of revenue/inventory.
 - Compute the receivable turnover ratio as total revenue/receivables.
 - How do Target's numbers compare to Walmart's?
 - Determine how Target's free cash flow would change if Target's inventory and accounts receivable balances were adjusted to meet Walmart's ratios.
 - Determine the amount of additional free cash flow that would be available if Target adjusted its accounts payable days to 75 days.
 - 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 targeting the CCC more in line with industry averages.

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 analysis on hand to gather the following required information:

- The risk-free rate of interest in this case, the yield of the 10-year government bond, which is 3%.
- HydroTech:
 - market capitalisation (its market value of equity), \$100 million;
 - CAPM beta, 1.2;
 - total book value of debt outstanding, \$50 million;
 - cash, \$10 million.
- 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

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

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.

PART 1 INTRODUCTION

Ch. 1: Corporate Finance and the Financial Manager

Ch. 2: Introduction to Financial Statement Analysis

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

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

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

PART 3 VALUATION AND THE FIRM

Ch. 8: Investment Decision Rules

Ch. 9: Fundamentals of Capital Budgeting

Ch. 10: Share Valuation: A Second Look

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

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

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

PART 5 LONG-TERM FINANCING

Ch. 14: Raising Capital

Ch. 15: Debt Financing

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

PART 6 CAPITAL STRUCTURE AND VALUATION

Ch. 16: Capital Structure

Ch. 17: Payout Policy

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

PART 7 FINANCIAL PLANNING

Ch. 18: Financial Modelling and Pro-forma Analysis

Ch. 19: Working Capital Management

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

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

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

MyFinanceLab for Berk/DeMarzo/Harford/Ford/Mollica/Finch Fundamentals of Corporate Finance, 2nd edition A guided tour for students and educators

Auto-generated tests and assignments

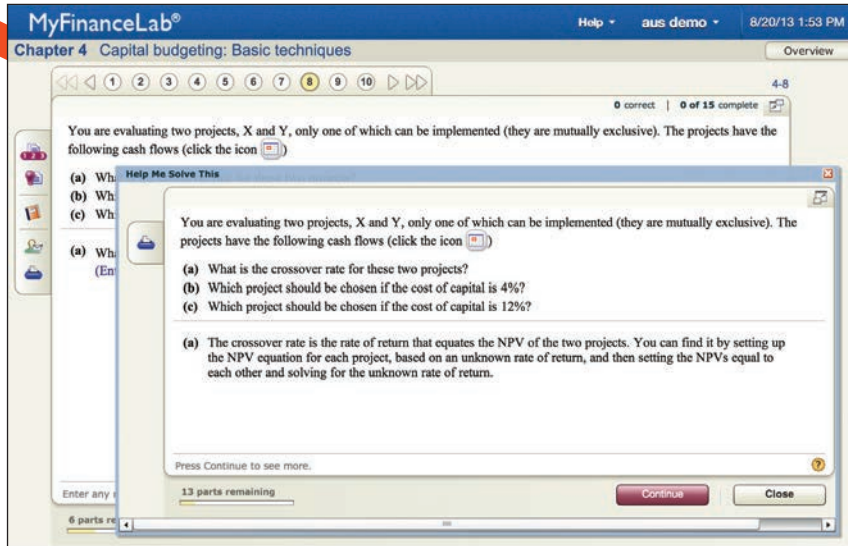
Each MyLab comes with pre-loaded assignments, all of which are automatically graded and include selected end-of-chapter questions and problems from the textbook.

The screenshot displays the MyFinanceLab interface. On the left, the 'Upcoming Assignments...' section shows 'Chapter 1-A' and 'My Course Documents'. Below this, 'Announcements' includes a note about 'Correct answer format for numbers' and 'Notation: get numbers right', with examples of correct and incorrect input formats. It also mentions 'Tolerance: being precise' and provides a 'Numeric Answer Tolerance' table. On the right, the 'My Results' section shows an 'Overall Score' of 'No Results Yet' (0%) and a 'Course Timeline' graph. Below that, 'My Progress' shows 'Tests' at 0/1 and 'Study Plan' at 0/41.

Assignable content

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

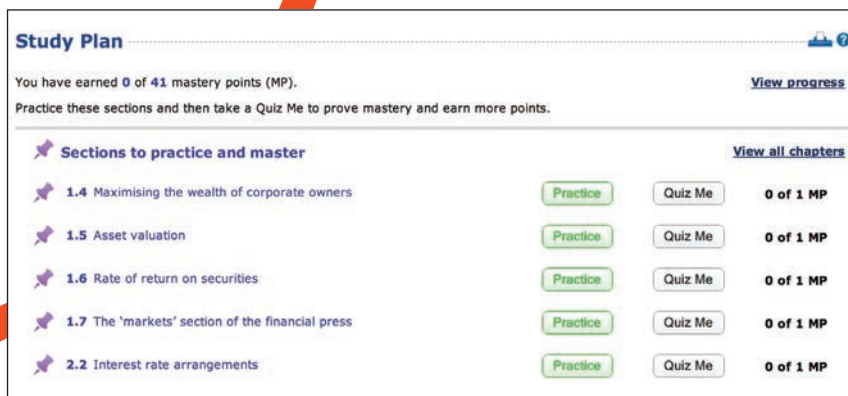
The screenshot shows the 'New Test' configuration interface. It has three steps: '1 Start', '2 Add/Remove Content', and '3 Choose Settings'. The 'Add/Remove Content' step is active, showing fields for 'Name' (Chapter 1 Test), 'Book' (Frino/Hill/Chen: Introduction to Corporate Finance, 5e (Aust)), 'Chapter' (1. Preliminary concepts), and 'Section' (All Sections). The 'Question Source' section has checkboxes for 'Show publisher questions', 'Show additional test bank questions', 'Show custom questions (+) for this book', and 'Show other custom questions'. Below, there is a list of 'Available Questions (19)' with checkboxes and question IDs (e.g., 1-1, 1-2, etc.). A 'My Selections (0)' table is also visible. Instructions on the right explain how to add questions and use pooling options.



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.

ACKNOWLEDGEMENTS

Given the scope of this project, identifying the many people who made it happen is a tall order. This educational package is the result of the expertise and hard work of many talented colleagues.

At Pearson Australia, we would like to single out Simone Bella, for her continued leadership and market insight; Michael Stone and Anna Carter, for their critical eye and uncanny ability to juggle the writing, reviewing and editing process without missing a beat; our production team, led by Sara Haddad and Sandra Goodall, for expertly managing the transformation of our Word files into a beautiful bound book; to Adam Catarius for devising and overseeing development of the new content in MyFinanceLab; and to Germaine Silva for working with a talented group of authors to develop the learning and teaching package for educators.



MYFINANCELAB AND ACCURACY REVIEW

We would like to thank Tony Martin from La Trobe University for a significant contribution to both the text and MyFinanceLab.

Tony checked every equation, as well as every mathematical notation, symbol and calculation in the textbook three times over to ensure nothing slipped through the cracks.

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.

REVIEWERS

Sukanto Bhattacharya, Deakin University
Dr Terry Boulter, Deakin University
Zhian Chen, University of New South Wales
Dr Sisira Colombage, Monash University
Dr Mary Dunkley, Swinburne University
Siqiwen Li, James Cook University
Maria Strydom, Monash University

ABOUT THE AUTHORS

Jonathan Berk is the A.P. Giannini Professor of Finance at the Graduate School of Business, Stanford University, and is a Research Associate at the National Bureau of Economic Research. Prior to Stanford, he was the Sylvan Coleman Professor of Finance at the Haas School of Business at the University of California, Berkeley, where he taught the introductory Corporate Finance course. Before earning his PhD from Yale University, he worked as an associate at Goldman Sachs, where his education in finance really began. His research has won a number of awards including the TIAA-CREF Paul A. Samuelson Award, the Smith Breeden Prize, Best Paper of the Year in *The Review of Financial Studies*, and the FAME Research Prize. His paper 'A Critique of Size-Related Anomalies' was selected as one of the two best papers ever published in *The Review of Financial Studies*. In recognition of his influence on the practice of finance, he has received the Bernstein-Fabozzi/Jacobs Levy Award, the Graham and Dodd Award of Excellence, and the Roger F. Murray Prize. He served as an Associate Editor of the *Journal of Finance* for eight years and is currently an Advisory Editor at the journal. Born in Johannesburg, South Africa, Professor Berk is married, has two daughters, and is an avid skier and cyclist.



Jonathan Berk, Peter DeMarzo and Jarrad Harford

Peter DeMarzo is the Mizuho Financial Group Professor of Finance and Senior Associate Dean for Academic Affairs at Stanford Graduate School of Business. He is also a Research Associate at the National Bureau of Economic Research. He currently teaches MBA and PhD courses in Corporate Finance and Financial Modelling. Prior to Stanford, he taught at the Haas School of Business and the Kellogg Graduate School of Management, and he was a National Fellow at the Hoover Institution. Professor DeMarzo received the Sloan Teaching Excellence Award at Stanford in 2004 and 2006 and the Earl F. Cheit Outstanding Teaching Award at the University of California, Berkeley, in 1998. Professor DeMarzo has served as an Associate Editor for *The Review of Financial Studies*, *Financial Management*, and the *B.E. Journals in Economic Analysis and Policy*, as well as a Director of the American Finance Association. He is currently President of the Western Finance Association. Professor DeMarzo has received numerous awards for his research including the Western Finance Association Corporate Finance Award and the Barclays Global Investors/Michael Brennan Best Paper Award from *The Review of Financial Studies*. Professor DeMarzo was born in Whitestone, New York, is married, and has three sons. He and his family enjoy hiking, biking and skiing.

Jarrad Harford is the Marion B. Ingersoll Professor of Finance at the University of Washington. Prior to Washington, Professor Harford taught at the Lundquist College of Business at the University of Oregon. He received his PhD in Finance with a minor in Organisations and Markets from the University of Rochester. Professor Harford has taught the core undergraduate finance course, Business Finance, for over 13 years, as well as an elective in Mergers and Acquisitions, and 'Finance for Non-financial Executives' in the executive education program. He has won numerous awards for his teaching, including the UW Finance Professor of the Year (2010), Interfraternity Council Excellence in Teaching Award (2007 and 2008), ISMBA Excellence in Teaching Award (2006), and the Wells Fargo Faculty Award for Undergraduate Teaching (2005). He is also the Faculty Director of the UW Business School Undergraduate Honors Program. Professor Harford serves as an Associate Editor for *The Journal of Financial Economics*, *Journal of Financial and Quantitative Analysis* and *Journal of Corporate Finance*. Professor Harford was born in State College, Pennsylvania, is married, and has two sons. He and his family enjoy travelling, hiking and skiing.



Guy Ford is an Associate Professor of Finance and Deputy Dean at the Macquarie Graduate School of Management. Guy is formerly of the Treasury Management Division of the Commonwealth Bank of Australia, where he worked primarily in the area of balance sheet risk management. He teaches in the areas of corporate finance, corporate acquisitions and strategic finance. He also delivers a number of custom executive education programs in the area of strategic financial management. He is the author of a number of books and has published his research in local and international journals.



Vito Mollica is Lecturer and Director of Higher Degree Research at the Macquarie Graduate School of Management. He received his PhD in economics from The University of Sydney and was awarded a Marie Curie Fellowship from Aarhus University. Before joining academia, Dr Mollica was a foundation team member of a property funds management group specialising in residential real estate investment and research. Currently Dr Mollica teaches financial management to MBA students and his research interests are in the areas of market microstructure, anomalies in empirical capital markets and real estate.

PART

1

INTRODUCTION

CHAPTER 1 CORPORATE FINANCE AND THE FINANCIAL MANAGER

CHAPTER 2 INTRODUCTION TO FINANCIAL STATEMENT ANALYSIS

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?

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

LEARNING OBJECTIVE 1

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

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

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.

sole trader

A business owned and run by one person.

partnership

A business owned and run by more than one owner.

Partnerships

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.

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

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.

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

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

EXAMPLE 1.1

- **Execute**

$\$100 \text{ per share} \times 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 \times 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 \text{ per share} \times 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 \times 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.



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?