

Contents

I	Introduction and Motivation for International Finance	1
1	Why does the Existence of Borders Matter for Finance?	3
1.1	Key Issues in International Business Finance	4
1.1.1	Exchange-rate Risk	4
1.1.2	Segmentation of the Consumer-good Markets	6
1.1.3	Credit risk	7
1.1.4	Political risk	7
1.1.5	Capital-Market Segmentation Issues, including Aspects of Corporate Governance	8
1.1.6	International Tax Issues	10
1.2	What is on the International CFO's desk?	11
1.2.1	Valuation	11
1.2.2	Funding	11
1.2.3	Hedging and, more Generally, Risk Management	12
1.2.4	Interrelations Between Risk Management, Funding and Valuation	12
1.3	Overview of this Book	13
1.3.1	Part I: Motivation and Background Matter	13
1.3.2	Part II: International Financial Markets	13
1.3.3	Part III: Exchange Risk, Exposure, and Risk Management	14
1.3.4	Part IV: Long-term Financing and Investment Decisions	14
2	International Finance: Institutional Background	17
2.1	Money and Banking: A Brief Review	17
2.1.1	The Roles of Money	18
2.1.2	How Money Is Created	18
2.2	The International Payment Mechanism	30
2.2.1	Some Basic Principles	30
2.2.2	Domestic Interbank Transfers: Real-time Gross Settlement vs. Periodic Netting	32
2.2.3	International payments	34
2.3	International ("Euro") Money and Bond Markets	35
2.4	What is the Balance of Payments?	37
2.4.1	Definition & Principles Underlying the Balance of Payments	37
2.4.2	Some Nitty-gritty	40
2.4.3	Statistical Discrepancy/Errors and Omissions	43
2.4.4	Where do Current Account Surpluses or Deficits Come From?	44
2.4.5	The Net International Investment Account	45
2.5	Exchange-rate Regimes	47
2.5.1	Fixed Exchange Rates Relative to Gold	48

2.5.2	Fixed Exchange Rates vis-à-vis a Single Currency	49
2.5.3	Fixed Exchange Rates Relative to a Basket	53
2.5.4	The 1979–1993 Exchange Rate Mechanism (ERM) of the European Monetary System	55
2.5.5	Other Exchange Rate Systems	60
2.6	Test Your Understanding	61
2.6.1	Quiz Questions	61
2.6.2	Applications	63
II Currency Markets		67
3 Spot Markets for Foreign Currency		73
3.1	Exchange Rates	73
3.1.1	Definition of Exchange Rates	74
3.1.2	Our Convention: Home Currency per Unit of Foreign Currency . .	75
3.1.3	The Indirect Quoting Convention	76
3.1.4	Bid and Ask Rates	78
3.1.5	Primary rates <i>v</i> cross rates	79
3.1.6	Inverting Exchange Rates in the Presence of Spreads	81
3.2	Major Markets for Foreign Exchange	82
3.2.1	How Exchange Markets Work	82
3.2.2	Markets by Location and by Currency	89
3.2.3	Markets by Delivery Date	90
3.3	The Law of One Price for Spot Exchange Quotes	92
3.3.1	Arbitrage across Competing Market Makers	95
3.3.2	Shopping Around across Competing Market Makers	95
3.3.3	Triangular Arbitrage	96
3.4	Translating FC Figures: Nominal rates, PPP rates, and Deviations from PPP	102
3.4.1	The PPP rate	103
3.4.2	Commodity Price Parity	107
3.4.3	The Real Exchange Rate and (Deviations from) Absolute PPP . .	108
3.4.4	The Change in the Real Rate and (deviations from) Relative PPP	109
3.5	CFO's Summary	114
3.6	TekNotes	116
3.7	Test Your Understanding	117
3.7.1	Quiz Questions	117
3.7.2	Applications	119
4 Understanding Forward Exchange Rates for Currency		123
4.1	Introduction to Forward Contracts	123
4.2	The Relation Between Exchange and Money Markets	127
4.3	The Law of One Price and Covered Interest Parity	132
4.3.1	Arbitrage and Covered Interest Parity	133
4.3.2	Shopping Around (The Pointlessness of —)	135
4.3.3	Unfrequently Asked Questions on CIP	135
4.4	The Market Value of an Outstanding Forward Contract	140
4.4.1	A general formula	140
4.4.2	Corollary 1: The Value of a Forward Contract at Expiration . . .	142
4.4.3	Corollary 2: The Value of a Forward Contract at Inception	144

4.4.4	Corollary 3: The Forward Rate and the Risk-Adjusted Expected Future Spot Rate	145
4.4.5	Implications for Spot Values; the Role of Interest Rates	147
4.4.6	Implications for the Valuation of Foreign-Currency Assets or Liabilities	149
4.4.7	Implication for the Relevance of Hedging	150
4.5	CFO's Summary	151
4.6	Appendix: Interest Rates, Returns, and Bond Yields	153
4.6.1	Links Between Interest Rates and Effective Returns	153
4.6.2	Common Pitfalls in Computing Effective Returns	156
4.7	Appendix: The Forward Forward and the Forward Rate Agreement	158
4.7.1	Forward Contracts on Interest Rates	158
4.7.2	Why FRAs Exist	159
4.7.3	The Valuation of FFs (or FRAs)	159
4.7.4	Forward Interest Rates as the Core of the Term Structure(s)	163
4.8	Test Your Understanding	168
4.8.1	Quiz Questions	168
4.8.2	Applications	169
5	Using Forwards for International Financial Management	171
5.1	Practical Aspects of Forwards in Real-world Markets	171
5.1.1	Quoting Forward Rates with Bid-Ask Spreads	171
5.1.2	Provisions for Default	173
5.2	Using Forward Contracts (1): Arbitrage	176
5.2.1	Synthetic Forward Rates	177
5.2.2	Implications of Arbitrage and Shopping-around	177
5.2.3	Back to the Second Law	178
5.3	Using Forward Contracts (2): Hedging Contractual Exposure	179
5.3.1	Measuring Exposure from Transactions on a Particular Date	180
5.3.2	Hedging Contractual Exposure from Transactions on a Particular Date	182
5.4	Using Forward Contracts (3): Speculation	188
5.4.1	Speculating on the Future Spot Rate	188
5.4.2	Speculating on the Forward Rate or on the Swap Rate	190
5.5	Using Forward Contracts (4): Minimizing the Impact of Market Imperfections	192
5.5.1	Shopping Around to Minimize Transaction Costs	192
5.5.2	Swapping for Tax Reasons	196
5.5.3	Swapping for Information-cost Reasons	197
5.5.4	Swapping for Legal Reasons: Replicating Back-to-Back Loans	199
5.6	Using the Forward Rate in Commercial, Financial and Accounting Decisions	207
5.6.1	The Forward Rate as the Intelligent Accountant's Guide	207
5.6.2	The Forward Rate as the Intelligent Salesperson's Guide	209
5.6.3	The Forward Rate as the Intelligent CFO's Guide	209
5.7	CFO's Summary	211
5.7.1	Key Ideas for Arbitrageurs, Hedgers, and Speculators	211
5.7.2	The Economic Roles of Arbitrageurs, Hedgers, and Speculators	213
5.8	Test Your Understanding	215
5.8.1	Quiz Questions	215
5.8.2	Applications	217

6	The Market for Currency Futures	219
6.1	Handling Default Risk in Forward Markets: Old & New Tricks	220
6.1.1	Default Risk and Illiquidity of Forward Contracts	220
6.1.2	Standard Ways of Reducing Default Risk in the Forward Market	221
6.1.3	Reducing Default Risk by Variable Collateral or Periodic Recontracting	222
6.2	How Futures Contracts Differ from Forward Markets	225
6.2.1	Marking to Market	225
6.2.2	Margin Requirements	227
6.2.3	Organized Markets	228
6.2.4	Standardized Contracts	230
6.2.5	The Clearing Corporation	231
6.2.6	How Futures Prices Are Reported	232
6.3	Effect of Marking to Market on Futures Prices	233
6.4	Hedging with Futures Contracts	236
6.4.1	The Generic Problem and its Theoretical Solution	237
6.4.2	Case 1: The Perfect Match	238
6.4.3	Case 2: The Currency-Mismatch Hedge or Cross-Hedge	239
6.4.4	Case 3: The Delta hedge	241
6.4.5	Case 4: The Cross-and-Delta hedge	242
6.4.6	Adjusting for the Sizes of the Spot Exposure and the Futures Contract	243
6.4.7	More About Regression-based Hedges	243
6.4.8	Hedging with Futures Using Contracts on More than One Currency	245
6.5	The CFO's conclusion: Pros and Cons of Futures Contracts Relative to Forward Contracts	245
6.6	Appendix: Eurocurrency Futures Contracts	247
6.6.1	The Forward Price on a CD	248
6.6.2	Modern Eurodollar Futures Quotes	249
6.7	Test Your Understanding	254
6.7.1	Quiz Questions	254
6.7.2	Applications	257
7	Markets for Currency Swaps	261
7.1	How the Modern Swap came About	262
7.1.1	The Grandfather Tailor-made Swap: IBM-WB	262
7.1.2	Subsequent Evolution of the Swap Market	265
7.2	The Fixed-for-Fixed Currency Swaps	267
7.2.1	Motivations for Undertaking a Currency Swap	267
7.2.2	Characteristics of the Modern Currency Swap	267
7.3	Interest Rate Swaps	274
7.3.1	Coupon Swaps (Fixed-for-Floating)	275
7.3.2	Base Swaps	279
7.4	Cross-Currency Swaps	280
7.5	CFO's Summary	281
7.6	TekNotes	283
7.7	Test Your Understanding	284
7.7.1	Quiz Questions	284
7.7.2	Applications	284
8	Currency Options (1): Concepts and Uses	287
8.1	An Introduction to Currency Options	288

8.1.1	Call Options	288
8.1.2	Put Options	291
8.1.3	Option Premiums and Option Writing	292
8.1.4	European-style Puts and Calls as Chopped-up Forwards	292
8.1.5	Jargon: Moneyness, Intrinsic Value, and Time Value	293
8.2	Institutional Aspects of Options Markets	294
8.2.1	Traded Options	294
8.2.2	Over-The-Counter Markets	297
8.3	An Aside: Futures-style Options on Futures	298
8.3.1	Options on Currency Futures	298
8.3.2	Forward-style options	299
8.3.3	Futures-Style Options	299
8.3.4	Futures-Style Options on Futures	300
8.4	Using Options (1): Arbitrage	301
8.5	Using Options (2): Hedging	308
8.5.1	Hedging the Risk of a Loss without Eliminating Possible Gains	308
8.5.2	Hedging Positions with Quantity Risk	310
8.5.3	Hedging Nonlinear Exposure	312
8.6	Using Options (3): Speculation	315
8.6.1	Speculating on the Direction of Changes	316
8.6.2	Speculating on Changes in Volatility	316
8.7	CFO's Summary	318
8.8	Test Your Understanding	322
8.8.1	Quiz Questions	322
8.8.2	Applications	325
9	Currency Options (2): Hedging and Valuation	329
9.1	The Logic of Binomial Option Pricing: One-period Problems	330
9.1.1	The Replication Approach	332
9.1.2	The Forward Hedging Approach	332
9.1.3	The Risk-Adjusted Probability Interpretation	334
9.1.4	American-style Options	336
9.2	Notation and Assumptions for the Multiperiod Binomial Model	337
9.2.1	The Standard Version of the Binomial Model	337
9.2.2	Does the Model make Sense?	339
9.2.3	Further Notation	341
9.2.4	How to Choose u and d ?	342
9.3	Stepwise Multiperiod Binomial Option Pricing	344
9.3.1	Dynamic Hedging or Replication: a European-style option	344
9.3.2	What can go Wrong?	348
9.3.3	American-style Options	349
9.4	Toward Black-Merton-Scholes (European Options)	350
9.4.1	A Shortcut for European Options	351
9.4.2	The General Formula	352
9.4.3	The Delta of an Option	355
9.5	CFO's Summary	355
9.6	TekNotes	357
9.7	Test Your Understanding	363
9.7.1	Quiz Questions	363
9.7.2	Applications	365

III	Exchange Risk, Exposure, and Risk Management	369
10	Do We Know What Makes Forex Markets Tick?	375
10.1	The behavior of spot exchange rates	378
10.1.1	Why Levels of (log) exchange rates have bad statistical properties	378
10.1.2	Changes in log rates: findings	381
10.1.3	Concluding Discussion	389
10.2	The PPP Theory and the behavior of the Real Exchange Rate.	392
10.2.1	Issues with PPP Tests	392
10.2.2	Computations and Findings	395
10.2.3	Concluding Discussion	401
10.3	Exchange Rates and Economic Policy Fundamentals	407
10.3.1	The Monetary Approach to the Exchange Rate	408
10.3.2	Computations and Findings	410
10.3.3	Real Business Cycle Models	415
10.3.4	Taylor Rule Models	416
10.3.5	Concluding discussion	417
10.4	Conclusion	419
11	Do Forex Markets Themselves See What’s Coming?	433
11.1	The Forward Rate as a Black-Box Predictor	433
11.1.1	How to Verify the Forward Rate’s Performance as a Predictor	433
11.1.2	Statistical Analysis of Forecast Errors: Computations and findings	436
11.1.3	Trading rules	443
11.1.4	The Forward Bias: Concluding discussion	447
11.2	Forecasts by Specialists	453
11.2.1	Forecasts Implied by Central Bank Interventions	453
11.2.2	Evaluating the Performance of Professional Traders and Forecasters	455
11.3	The CFO’s summary	458
11.4	Test Your Understanding	464
11.4.1	Quiz Questions	464
12	(When) Should a Firm Hedge its Exchange Risk?	471
12.1	The effect of corporate hedging may not just be “additive”	472
12.1.1	Corporate Hedging Reduces Costs of Bankruptcy and Financial Distress	473
12.1.2	Hedging Reduces Agency Costs	476
12.1.3	Hedging Reduces Expected Taxes	478
12.1.4	Hedging May Also Provide Better Information for Internal Decision Making	479
12.1.5	Hedged Results May Better Show Management’s Quality to Shareholders, and Pleases Wall Street	480
12.2	FAQs about hedging	480
12.2.1	FAQ1: Why can’t Firms leave Hedging to the Shareholders—Home-made Hedging?	480
12.2.2	FAQ2: Does Hedging make the Currency of Invoicing Irrelevant?	481
12.2.3	FAQ3: “My Accountant tells me that Hedging has cost me 2.17m. So how can you call this a Zero-cost Option?”	484
12.2.4	FAQ4: “Doesn’t Spot Hedging Affect the Interest Tax Shield, as Interest Rates are so Different Across Currencies?”	485
12.3	CFO’s Summary	486

12.4	Test Your Understanding	487
12.4.1	Quiz Questions	487
12.4.2	Applications	489
13	Measuring Exposure to Exchange Rates	491
13.1	The Concepts of Risk and Exposure: a brief survey	492
13.2	Contractual-Exposure Hedging and its Limits	494
13.2.1	What does Management of Contractual Exposure Achieve?	494
13.2.2	How Certain are Certain Cashflows Anyway?	496
13.2.3	Hedging “Likely” Cashflows: what’s new?	497
13.3	Measuring and Hedging of Operating Exposure	498
13.3.1	Operating Exposure Comes in all Shapes & Sizes	499
13.3.2	The Minimum-Variance Approach to Measuring and Hedging Op- erating Exposure	502
13.3.3	Economic Exposure: CFO’s Summary	509
13.4	Accounting Exposure	511
13.4.1	Accounting Exposure of Contractual Forex Positions	512
13.4.2	Why Firms Need to Translate Financial Statements	514
13.4.3	The Choice of Different Translation Methods	516
13.4.4	Accounting Exposure: CFO’s Summary	522
13.5	Test Your Understanding: contractual exposure	524
13.5.1	Quiz Questions	524
13.5.2	Applications	526
13.6	Test Your Understanding: Operating exposure	528
13.6.1	Quiz Questions	528
13.6.2	Applications	530
14	Value-at-Risk: Quantifying Overall net Market Risks	533
14.1	Risk Budgeting—a Factor-based, Linear Approach	534
14.1.1	Factors and Exposures: a Sneak Preview	535
14.1.2	Domestic Interest risk	538
14.1.3	Equity Investments	540
14.1.4	Foreign Bonds; Currency Forwards and Swaps; Options	541
14.1.5	Aggregates for the portfolio as a whole	542
14.2	The Linear/Normal VaR Model: Potential Flaws & Corrections	543
14.2.1	A Zero-Drift (“Martingale”) Process	543
14.2.2	A Constant-Variance Process	544
14.2.3	Constant Linear Relationships Between Factors.	550
14.2.4	Linearizations in the Mapping from Factors to Returns	551
14.2.5	Choice of the factors	552
14.2.6	Normality of Changes in the Portfolio Value	552
14.2.7	All Assets can be Liquidated in one Day	554
14.2.8	Parametric VaR: Summing up	555
14.3	Historical Backtesting, Bootstrapping, Monte Carlo, and Stress Testing	556
14.3.1	Backtesting	556
14.3.2	Bootstrapping and Monte Carlo Simulation	558
14.3.3	Stress Testing	559
14.4	CFO’s summary	561
14.5	Test Your Understanding	565
14.5.1	Quiz Questions	565
14.5.2	Applications	566

15	Managing Credit Risk in International Trade	569
15.1	Payment Modes Without Bank Participation	570
15.1.1	Cash Payment after Delivery	570
15.1.2	Cash Payment before Shipping	571
15.1.3	Trade Bills	572
15.1.4	The Problems with Legal Redress	574
15.2	Documentary Payment Modes with Bank Participation	575
15.2.1	Documents against Payment	576
15.2.2	Documents against Acceptance	578
15.2.3	Obtaining a Guarantee from the Importer's Bank: The Letter of Credit	578
15.2.4	Advised L/Cs and Confirmed L/Cs	580
15.3	Other Standard Ways to cope with Default Risk	582
15.3.1	Factoring	582
15.3.2	Credit Insurance	583
15.3.3	Export-Backed Financing	583
15.4	CEO's Summary	585
15.5	Test your Understanding	587
15.5.1	Quiz Questions	587
15.5.2	Applications	588
IV	Long-Term International Funding and Direct Investment	591
16	International Fixed-Income Markets	599
16.1	"Euro" Deposits and Loans	600
16.1.1	Historic, Proximate Causes of Euromoney's growth	600
16.1.2	Comparative Advantages in the Medium Run	602
16.1.3	Where we are now: a Truly International Market	603
16.1.4	International Deposits	605
16.1.5	International Credits and Loans	606
16.2	International Bond & Commercial-paper Markets	613
16.2.1	Why Eurobond Markets Exist	614
16.2.2	Institutional Aspects of the International Bond Market	616
16.2.3	Commercial Paper	620
16.3	How to Weigh your Borrowing Alternatives	621
16.3.1	Comparing all-in Costs of Alternatives in Open, Developed Markets	622
16.3.2	Comparing all-in Costs of Alternatives in Regulated, Incomplete Markets	628
16.4	CFO's Summary	631
16.5	Test Your Understanding	633
16.5.1	Quiz Questions	633
16.5.2	Applications	635
17	Segmentation and Integration in the World's Stock Exchanges	637
17.1	Background Information on International Stock Markets	641
17.1.1	How Large and how International are Stock Markets?	641
17.1.2	How do Stock Markets Work?	646
17.1.3	Certificates, Receipts: Different Aliases for a Company's Stocks	654
17.2	Why don't Exchanges Simply Merge?	660
17.2.1	Home bias	660

17.2.2	Differences in Corporate Governance and Legal/Regulatory Environment	661
17.3	Can Unification be Achieved by A Winner Taking All?	667
17.3.1	Centripetal <i>v</i> Centrifugal Effects in Networks	668
17.3.2	Clienteles for Regional and Niche Players?	669
17.3.3	Even New York is not perfect	671
17.3.4	London's Comeback	677
17.4	The CEO's Summary	680
17.5	Test Your Understanding	682
17.5.1	Quiz Questions	682
18	Why—or when—Should we Cross-list our Shares?	683
18.1	Why Might Companies Want to list Shares Abroad?	684
18.1.1	Possible Gains from Foreign or Cross-listings	685
18.1.2	Costs of a cross-listing	687
18.2	Shareholders Likely Reaction to Diversification Opportunities	688
18.2.1	Why would Investors Diversify Internationally?	688
18.2.2	Why would Companies Prefer Global Investors? a Partial-equilibrium Exploration	690
18.3	Sifting Through The Empirics on Cross-listing Effects	693
18.3.1	The 1980-2000 Conventional Wisdom	693
18.3.2	Puzzles with the Received Wisdom	694
18.3.3	Five Lessons from the Recent Lit	695
18.4	The CFO's Summary	702
18.5	Test Your Understanding	704
18.5.1	Quiz Questions	704
19	Setting the Cost of International Capital	705
19.1	The Link between Capital-market Segmentation and the Sequencing of Discounting and Translation	708
19.2	The Single-Country CAPM	711
19.2.1	How Asset Returns Determine the Portfolio Return	712
19.2.2	The Tangency Solution: Graphical Discussion	713
19.2.3	How Portfolio Choice Affects Mean and Variance of the Portfolio Return	715
19.2.4	Efficient Portfolios: A Review	717
19.2.5	The Market Portfolio as the Benchmark	720
19.2.6	A Replication Interpretation of the CAPM	721
19.2.7	When to Use the Single-Country CAPM	722
19.3	The International CAPM	723
19.3.1	International diversification and the traditional CAPM	723
19.3.2	Why Exchange Risk Pops up in the International Asset Pricing Model	724
19.3.3	Do Assets have a Clear Nationality?	727
19.3.4	The International CAPM	729
19.3.5	The N-Country CAPM	730
19.3.6	Empirical Tests of the International CAPM	731
19.4	The CFO's Summary <i>re</i> Capital Budgeting	733
19.4.1	Determining the Relevant Model	733
19.4.2	Estimating the Risk of a Project	734
19.4.3	Estimating the Risk premia	736

19.5	Technical Notes	737
19.6	Test Your Understanding: basics of the CAPM	742
19.6.1	Quiz Questions	742
19.6.2	Applications	742
19.7	Test Your Understanding: iCAPM	744
19.7.1	Quiz Questions	744
19.7.2	Applications	747
20	International Taxation of Foreign Investments	749
20.1	Forms of Foreign Activity	749
20.1.1	Modes of Operation (1): A Managerial Perspective	750
20.1.2	Modes of Operation (2): A Legal Perspective	751
20.1.3	Modes of Operation (3): A Fiscal Perspective	752
20.2	Multiple Taxation versus Tax Neutrality	755
20.2.1	Tax Neutrality	756
20.3	International Taxation of a Branch (1): the Credit System	759
20.3.1	Disagreement on the Tax Basis	759
20.3.2	The Problem of Excess Tax Credits	760
20.3.3	Tax Planning for a Branch under the Credit System	763
20.4	International Taxation of a Branch (2): the Exclusion System	765
20.4.1	Partial Exclusion and Progressive Taxes	765
20.4.2	Disagreement on the Tax Basis	766
20.4.3	Tax Planning for a Branch under the Exclusion System	766
20.5	Remittances from a Subsidiary: An Overview	768
20.5.1	Capital Transactions	768
20.5.2	Dividends	769
20.5.3	Other Forms of Remittances (Unbundling)	770
20.5.4	Transfer Pricing	771
20.6	International Taxation of a Subsidiary (1): the Credit System	771
20.6.1	Direct and Indirect Tax Credits on Foreign Dividends	771
20.6.2	Tax Planning through Unbundling of the Intragroup Transfers	775
20.7	International Taxation of a Subsidiary (2): the Exclusion System	777
20.8	CFO's Summary	779
20.9	Test Your Understanding	781
20.9.1	Quiz Questions	781
20.9.2	Applications	783
21	Putting it all Together: International Capital Budgeting	787
21.1	Domestic Capital Budgeting: A Quick Review	787
21.1.1	Net Present Value (NPV)	788
21.1.2	Adjusted Net Present Value (ANPV)	793
21.1.3	The Interest Tax Shield Controversy	794
21.1.4	Why We Use ANPV Rather than the Weighted Average Cost of Capital	797
21.2	i-NPV issue #1: How to Deal with the Implications of Non-equity Financing	799
21.2.1	Step 1: The Branch Scenario or Bundled Approach	801
21.2.2	Step 2: The Unbundling Stage	803
21.2.3	Step 3: The Implications of External Financing	805
21.3	i-NPV issue #2: How to Deal with Exchange Rates	807
21.4	i-NPV issue #3: How to Deal with Political Risks	809
21.4.1	Proactive Management of Transfer Risk	809

21.4.2	Management of Transfer Risk after the Imposition of Capital Controls	811
21.4.3	How to Account for Transfer Risk in NPV Calculations	812
21.4.4	Other Political Risks	813
21.5	Issue #4: Make sure to Include All Incremental Cash Flows	814
21.6	Other Things to do in Spreadsheets While you're There	815
21.7	CFO's summary	817
21.8	TekNotes	820
21.9	Test Your Understanding	823
21.9.1	Quiz Questions	823
21.9.2	Applications	825
22	Negotiating a Joint-Venture Contract: the NPV Perspective	827
22.1	The Three-Step Approach to Joint-Venture Capital Budgeting	829
22.2	A Framework for Profit Sharing	831
22.3	Case I: A Simple Pro-Rata Joint Branch with Neutral Taxes and Integrated Capital Markets	832
22.4	Case II: Valuing A Pro-Rata Joint Branch When Taxes Differ	834
22.5	Case III: An Unbundled Joint Venture with a License Contract or a Man- agement Contract	837
22.5.1	Possible Motivations for a License Contract	838
22.5.2	The Equal-Gains Principle with a License Contract	840
22.5.3	Finding Fair Equity Share when Terms of License Contract Are Given	842
22.5.4	Finding the Fair Royalty for a Given Equity Share	843
22.6	CFO's Summary & Extensions	844
22.7	Test Your Understanding	849
22.7.1	Quiz Questions	849
22.7.2	Applications	850