

Contents

Preface

Part 1 Interest rates and foreign exchange	1
<i>Chapter 1: Compounding and discounting</i>	3
1.1 Time value of money	3
1.2 Notation and definitions	5
1.3 Simple interest, bills and other money market securities	5
1.4 Compound interest	11
1.5 Linear interpolation	14
1.6 Real interest rates	15
Chapter 1 exercises	17
<i>Chapter 2: The valuation of cash flows</i>	19
2.1 Cash flow representation	19
2.2 Valuing annuities	21
2.3 Quotation of interest rates	25
2.4 Continuous time compounding and discounting	30
2.5 Fixed interest securities	32
2.6 Duration and value sensitivity	41
2.7 Interest rate futures	43
2.8 Fixed interest pricing	50
Chapter 2 exercises	52
<i>Chapter 3: Zeros, forwards and the term structure</i>	55
3.1 A brief mystery of time	56
3.2 Zero coupon rates	57
3.3 Implied forward rates	59
3.4 Forwards, bill futures, and no-arbitrage	61
3.5 Computing zeros and forwards	63

3.6	Algorithm: computing zeros and forwards from swap data	66
3.7	Concluding remarks	73
	Chapter 3 exercises	74
<i>Chapter 4: FX spot and forwards</i>		77
4.1	Spot exchange rates	77
4.2	Inversions	83
4.3	Cross rates	84
4.4	Money market forward rates	90
	Chapter 4 exercises	95
Part 2 Doing it the EXCEL way		99
<i>Chapter 5: Learning by doing</i>		101
5.1	Step by step bond valuation	102
5.2	Do-it-yourself fixed interest workshop	111
<i>Chapter 6: Swaps: A pricing application</i>		121
6.1	Interest rate swaps (IRS)	122
6.2	Valuation of an IRS, using zero coupon & forward rates	131
6.3	Cross currency interest rate swaps (CIRS)	137
6.4	Credit default swaps (CDS)	140
6.5	End of chapter summary	144
	Chapter 6 exercises	145
Part 3 Statistical analysis and probability processes		147
<i>Chapter 7: Statistics without becoming one</i>		149
7.1	Data	149
7.2	Data exploration	151
7.3	Summary measures	154
7.4	Distribution function and densities	158
7.5	Sampling distributions and hypothesis testing	162
7.6	Application: Value at Risk and economic capital	165
7.7	Review	170
	Chapter 7 exercises	171
<i>Chapter 8: Regression and all that</i>		173
8.1	Bivariate data exploration	173
8.2	Regression statistics	178
8.3	More regression theory: goodness of fit	182

8.4	The CAPM beta	185
8.5	Regression extensions: multiple regression	193
	Chapter 8 exercises	197
	<i>Chapter 9: Introduction to stochastic processes</i>	199
9.1	Expectations	200
9.2	Hedging	201
9.3	Random walks and Ito processes	208
9.4	How Ito processes are used	216
9.5	Volatility models	221
9.6	Other time series buzzwords	223
	Chapter 9 exercises	226
	<i>Chapter 10: Many variables</i>	229
10.1	Vectors and matrices	229
10.2	Matrix inverses and equation solving	234
10.3	Matrices with Excel	236
10.4	Statistics with matrices	238
10.5	Excel workshop: mean-variance portfolio statistics	241
	Chapter 10 exercises	245
	Appendix: General mathematical review	247
A1	Order of operations	247
A2	Multiplication and division with signed numbers	248
A3	Powers and indices	250
A4	Logarithms	254
A5	Calculus	256
	Index	261