Contents

List of Tables xiii
List of Figures xvii
Preface xxii
About the Author xxiii
Acknowledgments xxv

CHAPTER 1
Foreign Exchange Derivatives 1
  1.1 Literature Review 1
  1.2 A Journey through the History of Options 1
  1.3 Currency Options 3
  1.4 Technical Issues for Vanilla Options 4
    1.4.1 Valuation in the Black-Scholes Model 6
    1.4.2 A Note on the Forward 8
    1.4.3 Vanilla Greeks in the Black-Scholes Model 8
    1.4.4 Reoccurring Identities 11
    1.4.5 Homogeneity based Relationships 13
    1.4.6 Quotation Conventions 14
    1.4.7 Strike in Terms of Delta 20
    1.4.8 Volatility in Terms of Delta 21
    1.4.9 Volatility and Delta for a Given Strike 21
    1.4.10 Greeks in Terms of Deltas 22
    1.4.11 Settlement 26
    1.4.12 Exercises 30
  1.5 Volatility 33
    1.5.1 Historic Volatility 33
    1.5.2 Historic Correlation 36
    1.5.3 Volatility Smile 37
    1.5.4 At-The-Money Volatility Interpolation 44
    1.5.5 Volatility Smile Conventions 45
    1.5.6 At-The-Money Definition 45
    1.5.7 Interpolation of the Volatility on Fixed Maturity Pillars 45
1.5.8 Interpolation of the Volatility Spread between Maturity Pillars 48
1.5.9 Volatility Sources 49
1.5.10 Volatility Cones 52
1.5.11 Stochastic Volatility 52
1.5.12 Exercises 54

1.6 Basic Strategies Containing Vanilla Options 55
1.6.1 Call and Put Spread 56
1.6.2 Risk Reversal 61
1.6.3 Straddle 64
1.6.4 Strangle 65
1.6.5 Butterfly 67
1.6.6 Condor 70
1.6.7 Seagull 72
1.6.8 Calendar Spread 75
1.6.9 Exercises 75

1.7 First Generation Exotics 76
1.7.1 Classification 76
1.7.2 European Digitals and the Windmill Effect 77
1.7.3 Barrier Options 81
1.7.4 Touch Contracts 93
1.7.5 Compound and Installment 105
1.7.6 Asian Options 117
1.7.7 Lookback Options 126
1.7.8 Forward Start, Ratchet, and Cliquet Options 136
1.7.9 Power Options 138
1.7.10 Quanto Options 147
1.7.11 Exercises 152

1.8 Second Generation Exotics (Single Currency Pair) 156
1.8.1 Multiplicity Power Options 156
1.8.2 Corridors/Range Accruals 157
1.8.3 Faders 160
1.8.4 Exotic Barrier Options 162
1.8.5 Pay-Later Options 166
1.8.6 Step Up and Step Down Options 169
1.8.7 Options and Forwards on the Harmonic Average 169
1.8.8 Variance and Volatility Swaps 170
1.8.9 Forward Volatility Agreements (FVAs) 174
1.8.10 Exercises 176

1.9 Second Generation Exotics (Multiple Currency Pairs) 177
1.9.1 Spread and Exchange Options 177
1.9.2 Baskets 179
1.9.3 Outside Barrier Options 185
1.9.4 Best-of and Worst-of Options 188
1.9.5 Other Multi-Currency Options 191
1.9.6 Correlation Swap 192
1.9.7 Exercises 192

CHAPTER 2
Structured Products 197

2.1 Forward Transactions 197
  2.1.1 Outright Forward 198
  2.1.2 Participating Forward 200
  2.1.3 Participating Collar 202
  2.1.4 Fade-In Forward 203
  2.1.5 Knock-Out Forward 205
  2.1.6 Shark Forward 206
  2.1.7 Fader Shark Forward 210
  2.1.8 Butterfly Forward 212
  2.1.9 Range Forward 214
  2.1.10 Range Accrual Forward 215
  2.1.11 Accumulative Forward 218
  2.1.12 Boomerang Forward 224
  2.1.13 Amortizing Forward 225
  2.1.14 Auto-Renewal Forward 227
  2.1.15 Double Shark Forward 228
  2.1.16 Forward Start Chooser Forward 229
  2.1.17 Free Style Forward 229
  2.1.18 Boosted Spot/Forward 229
  2.1.19 Flexi Forward/Time Option 231
  2.1.20 Strike Leverage Forward 232
  2.1.21 Escalator Ratio Forward 232
  2.1.22 Intrinsic Value Ratio Knock-Out Forward 234
  2.1.23 Tender Linked Forward 236
  2.1.24 Exercises 237

2.2 Target Forwards 241
  2.2.1 Plain Target Forward 241
  2.2.2 Leveraged Target Forward 244
  2.2.3 Target Profit Forward 246
  2.2.4 Pivot Target Forward (PTF) 252
  2.2.5 KIKO Tarn 255
  2.2.6 Target Forwards in the Media 259
  2.2.7 Valuation and Hedging of Target Forwards 260
  2.2.8 Exercises 265

2.3 Series of Strategies 266
  2.3.1 Shark Forward Series 267
  2.3.2 Collar Extra Series 269
  2.3.3 Exercises 270
CONTENTS

2.4 Deposits, Loans, Bonds, and Certificates 270
2.4.1 Dual Currency Deposit/Loan 270
2.4.2 Performance-Linked Deposits 273
2.4.3 Tunnel Deposit/Loan 275
2.4.4 Corridor Deposit/Loan 277
2.4.5 Turbo Deposit/Loan 279
2.4.6 Tower Deposit/Loan 281
2.4.7 FX-linked Bonds 283
2.4.8 FX-Express Certificate 284
2.4.9 Exercises 285

2.5 Interest Rate and Cross Currency Swaps 286
2.5.1 Cross Currency Swap 286
2.5.2 Hanseatic Swap 293
2.5.3 Turbo Cross Currency Swap 296
2.5.4 Buffered Cross Currency Swap 298
2.5.5 Flip Swap 299
2.5.6 Corridor Swap 301
2.5.7 Currency Related Swap (CRS) 303
2.5.8 Double-No-Touch Linked Swap 307
2.5.9 Range Reset Swap 309
2.5.10 Exercises 309

2.6 Participation Notes 310
2.6.1 Gold Participation Note 310
2.6.2 Basket-Linked Note 312
2.6.3 Issuer Swap 313
2.6.4 Moving Strike Turbo Spot Unlimited 313

2.7 Hybrid FX Products 314
2.7.1 Long-Term FX Options 315
2.7.2 Power Reverse Dual Currency Bonds 315
2.7.3 Hybrid Forward Contracts 320
2.7.4 Dual Asset Range Accrual Note 321

2.8 Treasury Case Studies 322
2.8.1 FX Protection for EM Currencies with High Swap Points 322
2.8.2 Exit Strategies for a Sick Floan 323
2.8.3 Trade Ideas for FX Risk Management in View of Brexit 328
2.8.4 Inverse DCD 330
2.8.5 Exercises 331

CHAPTER 3
Hedge Accounting 335

3.1 Hedge Accounting under IAS 39 335
3.1.1 Introduction 335
3.1.2 Financial Instruments 336
3.1.3 Evaluation of Financial Instruments 349
3.1.4 Hedge Accounting 356
3.1.5 Methods for Testing Hedge Effectiveness 364
3.1.6 Testing for Effectiveness – A Case Study of the Forward Plus 372
3.1.7 Conclusion 390
3.1.8 Relevant Original Sources for Accounting Standards 392

3.2 Hedge Accounting under IFRS 9 392
3.2.1 Hedge Effectiveness 392
3.2.2 Documentation and Qualifying Criteria 393
3.2.3 Case Study: Shark Forward 393
3.2.4 Conclusion and Outlook 397

CHAPTER 4

Foreign Exchange Markets 399

4.1 Vanna-Volga Pricing 399
4.1.1 Cost of Vanna and Volga 399
4.1.2 Observations 402
4.1.3 Consistency Check 403
4.1.4 Adjustment Factor 405
4.1.5 Volatility for Risk Reversals, Butterflies, and Theoretical Value 405
4.1.6 Pricing Barrier Options 405
4.1.7 Pricing Double Barrier Options 406
4.1.8 Pricing Double-No-Touch Contracts 406
4.1.9 Pricing Path-Independent Contracts 407
4.1.10 No-Touch Probability 407
4.1.11 The Cost of Trading and its Implication on the One-Touch MTM 407
4.1.12 Example 409
4.1.13 Further Applications 410
4.1.14 Critical Assessment 410

4.2 Bid-Ask Spreads 410
4.2.1 Vanilla Spreads 411
4.2.2 Spreading Vanilla Structures 412
4.2.3 One-Touch Spreads 412
4.2.4 Spreads for First Generation Exotics 412
4.2.5 Minimal Bid-Ask Spread 413
4.2.6 Bid-Ask Prices 413

4.3 Systems and Software 413
4.3.1 Position Keeping 414
4.3.2 Reference Prices and Volatilities 414
4.3.3 Straight Through Processing 414
4.3.4 Disclaimers 415

4.4 Trading and Sales 415
4.4.1 Proprietary Trading 416
4.4.2 Sales-Driven Trading 416
4.4.3 Inter Bank Sales 416
4.4.4 Branch Sales 416
4.4.5 Institutional Sales 416
4.4.6 Corporate Sales 417
4.4.7 Private Banking 417
4.4.8 Retail FX Derivatives 417
4.4.9 Exchange Traded FX Derivatives 417
4.4.10 Casino FX Products 417
4.4.11 Treasury 418
4.4.12 Fixings and Cutoffs 418
4.4.13 Trading Floor Joke 421
4.5 Currency Pairs 421
   4.5.1 ISO 4217 Currency Code List 421
4.6 Things to Remember 424
4.7 Glossary 424

Bibliography 427

Index 433