Contents

Foreword	13
----------	----

Introduction and Acknowledgements 17

Part I Markets 19

_	NA I C	
	Market Structure	21

- I.I Market Development 22
- I.I.I Historical Development 22
- 1.1.2 Size and Growth of the Market 27
- 1.2 Market Participants 27
- 1.2.1 Banks 28
- 1.2.2 Insurance Companies 29
- 1.2.3 Funds and Asset Managers 30
- 1.2.4 Retail Clients 30
- 1.2.5 Hedge Funds 30
- I.3 Issuing Debt from a Company's Viewpoint 31
- 1.4 Ratings and Rating Agencies 33
- 1.4.1 Are Ratings an Efficient Source for Pricing Credits? 36
- 1.5 Credit Classes 39
- 1.5.1 High-Grade Universe 39
- 1.5.2 High-Yield and Crossover Credits 40
- 1.5.3 High-Quality Segment 41
- 1.5.4 Asset Backed Securities 42

2 Instruments 45

- 2.1 Straight Bonds 45
- 2.2 Bonds with Embedded Options 47
- 2.3 Exotics 48
- 2.3.1 Payment-in-Kind Notes 49

2.3.2	Hybrid	ls or Su	bordinated	l Corporate	Bonds	50
-------	--------	----------	------------	-------------	-------	----

- 2.4 Hybrid Bank Capital 53
- 2.5 Single-Name Credit Derivatives 55
- 2.5.1 Credit Default Swaps 55
- 2.5.2 Digital Default Swaps 58
- 2.5.3 Equity Default Swaps 58
- 2.5.4 Recovery Default Swaps 60
- 2.5.5 Constant Maturity Credit Default Swaps 61
- 2.6 Portfolio Credit Derivatives 62
- 2.6.1 Basket/Index Swaps iTraxx Europe Benchmark 62
- 2.6.2 Default Baskets 65
- 2.6.3 Standardized iTraxx Tranches 67
- 2.6.4 Spread Options 68
- 2.6.5 Future Contracts 70
- 2.7 Outlook on Product Development 70

3 Company and Debt Instrument Analysis 73

- 3.1 Sovereign Risk and Government Support 74
- 3.2 Business Risk 74
- 3.3 Financial Risk 82
- 3.3.1 Off-Balance-Sheet Adjustments 86
- 3.3.2 Adjustment of Ratios 91
- 3.4 The Rating Agencies' Methodology 93
- 3.5 Evaluation of Specific Debt Instruments 96
- 3.6 Recovery Rate Estimates 99

4 The Economics of Credit Spreads 103

- 4.1 Macro Drivers 103
- 4.1.1 Credits in the Business Cycle 103
- 4.1.2 Yields and Spreads 106
- 4.1.3 Credits and Exchange Rates 108
- 4.1.4 Credits and Commodity Prices 109
- 4.1.5 Credits and Inflation 111
- 4.1.6 Credits and External Shocks 113
- 4.2 Micro Drivers 115
- 4.3 Credit Quality 117
- 4.3.1 Credit Quality Trend 117

4.3.2	Default Rates 117
4.3.3	Recovery Rates: The Collins & Aikman Case 120
4.3.4	Implied Ratings 122
4.4	Equity–Debt Linkage 123
4.4.I	The Basic Merton Approach: Structural Models 123
4.4.2	Merton in Practice 128
4.4.3	Leap-Put Skewness as an Equity–Debt Indicator 131
4.4.4	Empirical Evidence for the Equity–Debt Linkage 133
4.5	Market Technicals 136
4.5.1	Is there a New Issuance Premium? 137
4.5.2	Technical Bid 138
4.5.3	The Impact of Syndicated Loans on Corporate Bonds 139

Part II Models 141

5 Fixed Income Basics 143

- 5.1 Basic Valuation Concepts 143
- 5.1.1 The Discount Function 143
- 5.1.2 Spot Rates and the Term Structure of Interest Rates 149
- 5.1.3 Forward Rates 154
- 5.2 Obtaining the Term Structure of Interest Rates 158
- 5.3 The Yield to Maturity 159
- 5.4 Measurement of Interest Rate Risk 162

6 Spread Measures 171

- 6.1 Basic Considerations 171
- 6.2 Yield Spreads 173
- 6.3 Z-Spreads 177
- 6.4 Asset Swap Spreads 180
- 6.5 Spread Measures for Floaters 184
- 6.6 Spreads and the Real Economy 186
- 6.7 Conclusion 192

7 Basics of Credit Risk Models 195

- 7.1 The Components of Credit Risk 196
- 7.2 A Single-Step, Two-Stage Model 198

- 7.3 A Multi-Step Model for Zero Coupon Bonds 202
- 7.4 The Multi-Step Model 208
- 7.5 Continuous-Time Approach 210
- 7.6 Recovery Treatment 217
- 7.6.1 Fitch's Recovery-Rating Methodology 228
- 7.7 The Term Structure of Credit Spreads 231

8 Single-Name Models 237

- 8.1 Reduced-Form Models 238
- 8.1.1 Binomial Tree Models for Default Risk 244
- 8.1.2 Reduced-Form Models and Illiquid Claims 249
- 8.2 Structural Models 250
- 8.3 Rating-Based Transition Matrix Models 260
- 8.3.1 Redefining the Default Event 265

9 Portfolio Models 271

- 9.1 The Loss Distribution and its Impact on Portfolio Derivatives 273
- 9.2 Independent Defaults 276
- 9.3 Default Dependency 282
- 9.4 Term-Structure Effects 288
- 9.5 Valuing First-to-Default Baskets 289
- 9.6 Valuing CDO Tranches with the HLPGC Model 292
- 9.7 Spread Dispersion 296
- 9.8 Price Discovery versus Model Competition 300

10 Valuation of Credit Derivatives 303

- 10.1 Credit Default Swaps 304
- 10.1.1 Discrete-Time Model 305
- 10.1.2 Obtaining the Survival Probability Curve 311
- 10.1.3 Forward CDS Valuation 314
- 10.1.4 CDS Sensitivities 316
- 10.1.5 Continuous-Time Model 318
- 10.1.6 Bloomberg's CDSW Function 319
- 10.2 Options on Credit-Risky Instruments 322
- 10.2.1 Single-Name Credit Default Swaptions 323
- 10.2.2 Index Swaptions 326
- 10.3 CDS Indices 327

10.4	$n^{ m th}$ -to-Default Baskets	330
10.4	16 -10-DCIauli Daskets	22

- 10.5 Collateralized Debt Obligations 337
- 10.5.1 Standardized iTraxx Tranches 338
- 10.5.2 Compound and Base Correlation 341
- 10.5.3 Sensitivities of iTraxx Index Tranches 346
- 10.6 Exotic Derivatives 357
- 10.6.1 Equity Default Swaps 357
- 10.6.2 Constant Maturity Structures 358
- 10.6.3 Digital Default Swaps and Recovery Swaps 360

11 Portfolio Risk Measurement 365

- II.I Risk Measures 365
- II.I.I Market Risk versus Credit Risk 365
- II.I.2 Value at Risk and Conditional Value at Risk 367
- II.I.3 Risk Components 372
- II.2 Credit Portfolio Models 373

Part III Management 377

12 Principles of Credit Portfolio Management 379

- 12.1 The Role of ACPM in the Asset Allocation Process 379
- 12.2 Management Styles: Passive or Active 386
- 12.2.1 Passive Management 386
- 12.2.2 Active Management 388
- 2.3 Quantitative and Fundamental Credit Research 389
- 12.4 Diversification in Credit Portfolios 391
- 12.5 Credit Risk Management in an ALM Environment 393
- 12.6 Credits in the Global Asset Allocation 394
- 12.6.1 Increasing Importance of Credit-Risky Instruments 394
- 12.6.2 Credits, Government Bonds, and Equities 395
- 12.7 Building Blocks of Credit Portfolio Management 397
- 12.7.1 Step 1: Investment Targets 398
- 12.7.2 Step 2: Risk Factors 400
- 12.7.3 Step 3: Economic Variables 401
- 12.7.4 Step 4: Forecasting and Scenario Assessment 401
- 12.7.5 Step 5: Sensitivities 402
- 12.7.6 Step 6: Portfolio Optimization Analysis 403

- 12.7.7 Step 7: Portfolio Adjustments 404
- 12.7.8 Step 8: Performance Analysis 405
- 12.8 Key Portfolio Figures 406

13 Portfolio Allocation 409

- 13.1 Indices 410
- 13.1.1 The Function of Indices 410
- 13.1.2 The iBoxx € Index Universe 411
- 13.1.3 Analyzing the RDAX 413
- 13.2 Sector Allocation in a Markowitz Framework 418
- 13.3 Quality Allocation 421
- 13.4 Tools to Derive the Optimal Allocation 424
- 13.4.1 Alpha and Beta 425
- 13.4.2 The Shortcomings of a Beta Analysis 425
- 13.4.3 Aggregated Z-Scores 427
- 13.4.4 Equity Volatility as a Tool in the Allocation Process 428

14 Performance Measures 431

- 14.1 Tracking Error 432
- 14.2 Sharpe Ratio and Treynor Ratio 433
- 14.3 Information Ratio 435
- 14.4 Summary 436

15 Performance Analysis 437

- 15.1 Return Accumulation 437
- 15.2 Return Attribution Analysis 438

16 Hedging Credit Risk 443

- 16.1 Hedging on a Single-Name Level 443
- 16.1.1 Basic Considerations 443
- 16.1.2 Hedging Default Risk 445
- 16.1.3 Hedging Spread Risk 448
- 16.2 Hedging on a Portfolio Level 452
- 16.2.1 Basic Considerations 453
- 16.2.2 Hedging Systematic Spread Risk for a Single Cash Bond 453
- 16.2.3 Hedging Systematic Spread Risk for a Credit Portfolio 458

17 Trading Strategies 469

- 17.1 Trading Cash Bonds 469
- 17.2 Trading Strategies with Single-Name CDS 472
- 17.2.1 Plain-Vanilla CDS Trades 474
- 17.2.2 Switch Ideas 474
- 17.2.3 Curve Trades 475
- 17.3 Portfolio Derivatives Trades 476
- 17.3.1 Single Name versus Sector or Market 476
- 17.3.2 Core-Satellite Strategies 477
- 17.3.3 Sector and Segment Trades 478
- 17.3.4 Trading the Skew 479
- 17.3.5 Basis Trades 481
- 17.3.6 First-to-Default Baskets 482
- 17.3.7 iTraxx Tranches versus Default Baskets 485
- 17.3.8 Playing the Steepness of the iTraxx Curve 488
- 17.4 Spread Options: Single and Complex Strategies 489
- 17.5 CPPI Strategies Including iTraxx Indices 490
- 17.6 Correlation Trading 492
- 17.7 Capital Structure Arbitrage Trades 494
- 17.8 Recovery Trades 495
- 17.9 EDS versus CDS and the Role of DDS 496
- 17.10 CDS-Cash-Repo Arbitrage 500
- 17.10.1 The Repo Market 500
- 17.10.2 How an Arbitrage Trade Works 501

18 Operational Issues: Accounting 503

- 18.1 An Introduction to IAS 39 504
- 18.1.1 The Scope of IAS 39 504
- 18.1.2 Categories of Financial Instruments 505
- 18.1.3 Measurement 507
- 18.1.4 Recognition and Derecognition 512
- 18.1.5 Embedded Derivatives 513
- 18.1.6 Hedge Accounting 515
- 18.2 IAS 39 Accounting for Credit Instruments 518
- 18.2.1 Bonds and Loans 518

- 18.2.2 Credit Default Swaps 521
- 18.2.3 Total Return Swaps 523
- 18.2.4 Credit Linked Notes 525
- 18.2.5 iTraxx Products 526
- 18.2.6 Other Instruments of Interest 527

19 Operational Issues: Basel II 529

- 19.1 An Introduction to Basel II 529
- 19.1.1 The Basic Structure 529
- 19.1.2 The Standardized Approach 533
- 19.1.3 The Foundation IRB Approach 534
- 19.1.4 The Advanced IRB Approach 538
- 19.1.5 Securitization Transactions 540
- 19.1.6 Credit Risk Mitigation 543
- 19.2 Basel II for Credit Instruments 547
- 19.2.1 Credit Default Swaps 547
- 19.2.2 Total Return Swaps 550
- 19.2.3 Credit Linked Notes 551
- 19.2.4 Default Baskets 553
- 19.2.5 iTraxx Products 555

Part IV Appendix 557

- A.1 Analytics with Bloomberg and Reuters 559
- A.1.1 Bloomberg 559
- A.1.2 Reuters 560
- A.2 Default and Recovery Data from Rating Agencies 563

References 569

Index 575