Derivatives Demystified

A Step-by-Step Guide to Forwards, Futures, Swaps and Options

Second Edition

Andrew M. Chisholm



_____ Contents _____

| A | cknowledgements | xix |
|---|--|------------------|
| 1 | The Origins and Growth of the Market | 1 |
| _ | Definitions | 1 |
| | Derivatives Building Blocks | 1 |
| | Forwards | . 2 |
| | Futures | 2 |
| | Swaps | 2 2 2 3 |
| | Options | 2 |
| | Market Participants | 3 |
| | Dealers | 3 |
| | Hedgers | 3 |
| | Speculators | 4 |
| | Arbitrageurs | 4 |
| | Supporting Organizations | 4 |
| | Early Origins of Derivatives | 5 |
| | Derivatives in the USA | 6 |
| | Overseas Developments, Innovation and Expansion | 7 |
| | An Example of Recent Innovation: Weather Derivatives | 7 |
| | Temperature-Linked Derivatives | 8 |
| | The value connection | 8 |
| | Summary and basis risks | 9 |
| | The Wild Beast of Finance? | 9 |
| | Enter Warren Buffett | 10 |
| | Lessons from Recent History | 10 |
| | Hammersmith & Fulham Council (1988/9) | 10 |
| | Metallgesellschaft (1993) | 10 |
| | Orange County (1994) | 11 |
| | Barings Bank (1995) | 11 |
| | Long-Term Capital Management (1998) | 12 |
| | Enron (2001) | 12 |
| | Allied Irish Banks (2002) | 12 |
| | AIG, Merrill Lynch and Lehman Brothers (2008) | 13 |

| | ٠ | ٠ | a |
|---|---|---|----------|
| 1 | 1 | 1 | Contents |

| | Creative Destruction and Contagion Effects | 13 |
|---|---|------|
| | The Modern OTC Derivatives Market | 13 |
| | The Exchange-Traded Derivatives Market | 15 |
| | Chapter Summary | 15 |
| 2 | Equity and Currency Forwards | 17 |
| | Introduction | 17 |
| | Equity Forward Contract | 17 |
| | The Forward Price | 18 |
| | Establishing the fair forward price | 19 |
| | Components of the forward price | 19 |
| | The Forward Price and Arbitrage Opportunities | 19 |
| | Closing the gap | 20 |
| | The forward price and commodities | 20 |
| | The Forward Price and the Expected Payout | 20 |
| | Expected payout from a forward | 21 |
| | Foreign Exchange Forwards | 21 |
| | The forward FX rate | 22 |
| | Managing Currency Risk | 22 |
| | Profits and losses on the export deal | 22 |
| | Hedging with an Outright Forward FX Deal | 23 |
| | Showing the results in a graph | 23 |
| | The Forward Foreign Exchange Rate | 24 |
| | The Forward FX Rate and Arbitrage Opportunities | . 25 |
| | Forward Points | 26 |
| | Calculating forward points | 26 |
| | FX Swaps | 27 |
| | Applications of FX Swaps | 28 |
| | Effects of the FX swap deal | 28 |
| | Chapter Summary | 28 |
| 3 | Forward Rate Agreements | 31 |
| | Introduction | 31 |
| | FRA Case Study: Corporate Borrower | 31 |
| | The FRA settlement | 32 |
| | Effective borrowing rate | 32 |
| | Results of the FRA Hedge | 33 |
| | The FRA hedge illustrated | 33 |
| | The FRA contract period | 34 |
| | The FRA as Two Payment Legs | 34 |
| | Net position with FRA hedge | 35 |
| | Dealing in FRAs | 36 |
| | The dealer's overall position | 36 |
| | FRA bid and ask rates | 36 |
| | Forward Interest Rates | 37 |
| | Chapter Summary | 37 |

| 1. 1. 1. 1. 1. 1. 1. 1. | | | Contents | ix |
|--|---|--|----------|----|
| Introduction 39 The Margining System and the Clearing House 39 Users of Futures Contracts 40 Hedgers 5peculators 40 Arbitrageurs 40 Commodity Futures 41 Futures Prices and the Basis 42 The basis 42 US Treasury Bond Futures 43 Tick size and tick value 43 Bond futures profit and loss calculations 44 US Treasury Bond Futures 44 Conversion or price factors 44 Conversion or price factors 44 Context and Equity Futures 45 The Cheapest-To-Deliver (CTD) Bond 45 Chapter Summary 46 5 Interest Rate and Equity Futures 47 Introduction 47 Final settlement value 48 Trading Eurodollar Futures 48 Trading Eurodollar Futures 48 Profits and losses in interest rate terms 49 Close out before expiry 49 Hedging with Interest Rate Futures 50 Eurodollar futures 60 Interest Rate Futures 70 Interest 70 Inter | 4 | Commodity and Bond Futures | | 39 |
| The Margining System and the Clearing House Users of Futures Contracts Hedgers Speculators Arbitrageurs Commodity Futures Futures Prices and the Basis The basis US Treasury Bond Futures Tick size and tick value Bond futures profit and loss calculations US Treasury Bond Futures: Tick size and tick value Bond futures profit and loss calculations US Treasury Bond Futures: Delivery Procedures Conversion or price factors Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures Finds yet utures CME S&P 500 Intures price quotation and basis Other major equity index futures Hedging with cquity index futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange elivery settlement price (EDSP) Single Stock Future of single stock futures The future of single stock futures | | | | |
| Users of Futures Contracts 40 Hedgers 40 Speculators 40 Arbitrageurs 40 Commodity Futures 41 Futures Prices and the Basis 42 The basis 42 US Treasury Bond Futures 43 Bond futures profit and loss calculations 44 US Treasury Bond Futures: Delivery Procedures 44 Conversion or price factors 44 Gilt Futures 45 The Cheapest-To-Deliver (CTD) Bond 45 Chapter Summary 46 5 Interest Rate and Equity Futures 47 Introduction 47 Eurodollar Futures 48 Calculating trading profits and losses 49 Profits and losses in interest rate terms 49 Close out before expiry 49 Hedging with Interest Rate Futures 50 Eurodollar futures hedge in a graph 50 Interest Rate Futures Prices 50 Arbitrage example 51 No arbitrage relationships 51 < | | | | |
| Hedgers Speculators 40 | | | | |
| Speculators | | • | | - |
| Arbitrageurs Commodity Futures Commodity Futures Futures Prices and the Basis The basis US Treasury Bond Futures Tick size and tick value Bond futures profit and loss calculations US Treasury Bond Futures: Delivery Procedures Conversion or price factors Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 5 Interest Rate and Equity Futures Introduction Furodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange estock futures Fitures (SSFs) The future of single stock futures 57 | | | | |
| Commodity Futures | | | | |
| Futures Prices and the Basis The basis US Treasury Bond Futures Tick size and tick value Bond futures profit and loss calculations US Treasury Bond Futures: Delivery Procedures Conversion or price factors Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 Intures price quotation and basis Other major equity index futures T-SE 100 Index Futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures of Single Stock futures of Single Stock futures of Single Stock futures of Single Stock futures Single Stock futures of Single Stock Futures Single Stock Futures of Single Stock Futures | | | | |
| The basis US Treasury Bond Futures Tick size and tick value Bond futures profit and loss calculations 43 US Treasury Bond Futures: Delivery Procedures Conversion or price factors 44 US Treasury Bond Futures: Delivery Procedures Conversion or price factors 45 Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 46 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures bedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures Hedging with equity index futures FT-SE 100 Index Futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures of Single stock futures Single Sto | | · · · · · · · · · · · · · · · · · · · | | |
| US Treasury Bond Futures Tick size and tick value Bond futures profit and loss calculations US Treasury Bond Futures: Delivery Procedures 44 Conversion or price factors 44 Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 45 Introduction Eurodollar Futures Trading Eurodollar Futures Acalculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 Index Futures Hedging with equity index futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFS) The future of single stock futures | | | | |
| Tick size and tick value Bond futures profit and loss calculations 44 US Treasury Bond Futures: Delivery Procedures Conversion or price factors 43 Gilt Futures 44 Chapter Summary 46 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Tinal settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures Hedging with equity index futures Hedging with equity index futures Hedging with equity index futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | |
| Bond futures profit and loss calculations US Treasury Bond Futures: Delivery Procedures Conversion or price factors 344 Conversion or price factors 345 Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 46 5 Interest Rate and Equity Futures Introduction 47 Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | • | | |
| US Treasury Bond Futures: Delivery Procedures Conversion or price factors Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Calculating trading profits and losses Profits and losses in a graph Hedging with Interest Rate Futures Eurodollar futures futures Summary Hedging with Interest Rate Futures Furdollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | |
| Conversion or price factors Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures Hedging with equity index futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 44 |
| Gilt Futures The Cheapest-To-Deliver (CTD) Bond Chapter Summary 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 Index Futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | · · · · · · · · · · · · · · · · · · · | | |
| The Cheapest-To-Deliver (CTD) Bond Chapter Summary 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures Hedging with equity index futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | |
| Chapter Summary Chapter Summary 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | |
| 5 Interest Rate and Equity Futures Introduction Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures Hedging with equity index futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | - | | |
| Introduction 47 Eurodollar Futures 47 Final settlement value 48 Trading Eurodollar Futures 48 Calculating trading profits and losses 49 Profits and losses in interest rate terms 49 Close out before expiry 49 Hedging with Interest Rate Futures 50 Eurodollar futures hedge in a graph 50 Interest Rate Futures Prices 50 Arbitrage example 51 No arbitrage relationships 51 Equity Index Futures 52 CME S&P 500 futures price quotation and basis 52 Other major equity index futures 53 Applications of S&P 500 Index Futures 53 Hedging with equity index futures 53 FT-SE 100 Index Futures 53 FT-SE 100 Index Futures 54 Trading campaign: Day 1 54 Trading campaign: Day 2 55 Trading campaign: Day 3 Establishing Net Profits and Losses 55 Exchange delivery settlement price (EDSP) 56 Single Stock Futures (SSFs) 56 The future of single stock futures | | Chapter Bahimary | | 10 |
| Eurodollar Futures Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures CME futures Applications of S&P 500 Index Futures Hedging with equity index futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | 5 | Interest Rate and Equity Futures | • | 47 |
| Final settlement value Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | Introduction | | 47 |
| Trading Eurodollar Futures Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures CME Japplications of S&P 500 Index Futures Hedging with equity index futures Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | Eurodollar Futures | | 47 |
| Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | Final settlement value | | 48 |
| Calculating trading profits and losses Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | Trading Eurodollar Futures | | 48 |
| Profits and losses in interest rate terms Close out before expiry Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | —————————————————————————————————————— | | 49 |
| Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 49 |
| Hedging with Interest Rate Futures Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | Close out before expiry | | 49 |
| Eurodollar futures hedge in a graph Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 50 |
| Interest Rate Futures Prices Arbitrage example No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 50 |
| No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 50 |
| No arbitrage relationships Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | Arbitrage example | | 51 |
| Equity Index Futures CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 51 |
| CME S&P 500 futures price quotation and basis Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures 53 FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 52 |
| Other major equity index futures contracts Applications of S&P 500 Index Futures Hedging with equity index futures 53 FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 52 |
| Applications of S&P 500 Index Futures Hedging with equity index futures 53 FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 53 |
| Hedging with equity index futures FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | |
| FT-SE 100 Index Futures Contracts Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | 53 |
| Trading campaign: Day 1 Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures | | | | |
| Trading campaign: Day 2 Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures 57 | | | | 54 |
| Trading campaign: Day 3 Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures 57 | | | | 55 |
| Establishing Net Profits and Losses Exchange delivery settlement price (EDSP) Single Stock Futures (SSFs) The future of single stock futures 57 | | * * · · | | |
| Exchange delivery settlement price (EDSP) 56 Single Stock Futures (SSFs) 56 The future of single stock futures 57 | | * * * * | | |
| Single Stock Futures (SSFs) 56 The future of single stock futures 57 | | | | |
| The future of single stock futures 57 | | · | | |
| $\boldsymbol{\mathcal{E}}$ | | | | |
| | | | | |

| 6 | Interest Rate Swaps | 59 |
|---|---|----|
| | Introduction | 59 |
| | Interest Rate Swap Structure | 59 |
| | Basic Single-Currency Interest Rate Swap | 60 |
| | Swap payment in one year | 60 |
| | Swap payment in two years | 61 |
| | The Swap as a Package of Spot and Forward Deals | 61 |
| | Rationale for the Swap Deal | 62 |
| | Swap Terminology and Swap Spreads | 62 |
| | Overnight index swaps | 63 |
| | Typical Swap Applications | 63 |
| | Fixing a borrowing rate | 63 |
| | Asset swap | 64 |
| | Asset-liability management (ALM) | 64 |
| | Switching to a fixed return | 64 |
| | Interest Rate Swap Variants | 64 |
| | Cross-Currency Interest Rate Swaps | 65 |
| | 1. Swap with Americo | 66 |
| | 2. Swap with Britco | 66 |
| | Net Borrowing Costs Using a Cross-Currency Swap | 66 |
| | The swap dealer's position | 67 |
| | Why does everyone win? | 67 |
| | Inflation Swaps | 67 |
| | Chapter Summary | 68 |
| 7 | Equity and Credit Default Swaps | 69 |
| | Introduction to Equity Swaps | 69 |
| | Equity Swap Case Study | 69 |
| | First swap payment | 70 |
| | Second swap payment | 71 |
| | Economic exposure | 71 |
| | Other Applications of Equity Swaps | 71 |
| | Total return equity swap | 72 |
| | Equity Index Swaps | 73 |
| | DAX equity index swap | 73 |
| | Hedging an Equity Index Swap | 74 |
| | Profit on the hedged swap | 75 |
| | Credit Default Swaps | 75 |
| | Credit Default Swap: Basic Structure | 76 |
| | CDS physical settlement | 76 |
| | CDS cash settlement | 76 |
| | Credit events | 77 |
| | Credit Default Swap Applications | 77 |
| | Credit Spreads | 78 |
| | The CDS Premium and the Credit Spread | 78 |
| | Cheapest-to-deliver (CTD) option | 79 |
| | Counterparty risk and CDS contracts | 79 |

| | | Contents | xi |
|---|--------------------------------------|----------|-----|
| | Pricing Models for CDS Premium | | 80 |
| | Establishing the CDS premium | | 80 |
| | Index Credit Default Swaps | | 80 |
| | Index CDS example | | 80 |
| | Applications of index CDS deals | | 81 |
| | Basket Credit Default Swaps | | 81 |
| | FTD basket default swap | | 81 |
| | STD basket default swap | | 82 |
| | Chapter Summary | | 82 |
| 8 | Fundamentals of Options | | 83 |
| • | Introduction | | 83 |
| | Definitions | | 83 |
| | Types of Options | | 83 |
| | Basic Option Trading Strategies | | 84 |
| | Intrinsic value | | 85 |
| | Time value | | 85 |
| | Total option value | | 85 |
| | Long Call: Expiry Payoff Profile | | 85 |
| | Downside and upside | , | 86 |
| | Long call and cash position compared | | 86 |
| | Short Call: Expiry Payoff Profile | | 87 |
| | Long Put: Expiry Payoff Profile | | 88 |
| | Long put expiry payoff profile | | 89 |
| | Long put versus shorting the stock | | 89 |
| | Short Put: Expiry Payoff Profile | • | 90 |
| | Summary: Intrinsic and Time Value | | 90 |
| 9 | Hedging with Options | | 93 |
| | Chapter Overview | • | 93 |
| | Futures Hedge Revisited | | 93 |
| | Results of a futures hedge | | 93 |
| | Protective Put | | 93 |
| | Protective put example | | 94 |
| | Maximum loss with protective put | | 95 |
| | Other break-even levels | | 96 |
| | Hedging with ATM Put Option | | 96 |
| | Covered Call Writing | | 97 |
| | Maximum profit on the covered call | | 97 |
| | Equity Collar | | 98 |
| | Zero-Cost Equity Collar | | 99 |
| | Protective PUT with a Barrier Option | | 100 |
| | Barrier option terms | | 101 |
| | Advantages and disadvantages | | 101 |
| | Behaviour of Barrier Options | | 101 |
| | Chapter Summary | | 102 |

| 10 | Exchange-Traded Equity Options | 103 |
|----|---|-------|
| | Introduction | 103 |
| | Basic Concepts | 103 |
| | Covered warrants | 104 |
| | CBOE Stock Options | 104 |
| | Expiry payoff profile | 105 |
| | Early exercise | 105 |
| | UK Stock Options on NYSE Liffe | 106 |
| | Exercise style | 106 |
| | Corporate actions and early exercise | 107 |
| | CME S&P 500 Index Options | 107 |
| | Option premium | 107 |
| | Long S&P 500 put: expiry payoff profile | 108 |
| | FT-SE 100 Index Options | 109 |
| | Chapter Summary | 109 |
| 11 | Currency or FX Options | 111 |
| | Introduction | 111 |
| | Users of Currency Options | 111 |
| | Hedging FX Exposures with Options: Case Study | 112 |
| | Performance of the hedge | 112 |
| | Graph of Hedged and Unhedged Positions | 113 |
| | Hedging with a Zero-Cost Collar | 114 |
| | Reducing Premium on FX Hedges | 115 |
| | Barrier option | 115 |
| | Pay-later option | 115 |
| | Instalment option | 115 |
| | Compound Options | 116 |
| | Hedging application | 116 |
| | Compound option structure | . 116 |
| | Exchange-Traded Currency Options | 117 |
| | CME currency options | 117 |
| | PHLX world currency options | 117 |
| | Chapter Summary | 118 |
| 12 | Interest Rate Options | 119 |
| | Introduction | 119 |
| | OTC Interest Rate Options | 119 |
| | OTC Interest Rate Option Case Study | 120 |
| | Caplet exercise and settlement | 121 |
| | Hedging a Loan with a Caplet | 121 |
| | Results of the hedge | 122 |
| | Interest Rate Cap | 123 |
| | Pricing caplets and caps | 123 |
| | Interest Rate Collar | 123 |
| | Zero-cost collar case study | 124 |

| | | Contents | xiii |
|----|--|----------|------|
| | Interest Rate Swap and Swaption | | 124 |
| | Payer swaption | | 125 |
| | Summary of Interest Rate Hedging Strategies | | 125 |
| | Eurodollar Options | | 126 |
| | Trading Eurodollar options | | 126 |
| | Profits and losses on Eurodollar options | | 126 |
| | Euro and Sterling Interest Rate Options | | 127 |
| | Bond Options | | 127 |
| | Hedging | | 128 |
| | Zero-cost collar | | 128 |
| | Covered call writing | | 128 |
| | Leveraged position taking | | 128 |
| | Exchange-Traded Bond Options | | 128 |
| | Euro-bund options (OGBL) | | 129 |
| | Long gilt option | | 129 |
| | Chapter Summary | | 130 |
| 13 | Option Valuation Concepts (1) | | 131 |
| | Introduction | | 131 |
| | Black-Scholes model | | 131 |
| | The Concept of a Riskless Hedge | , | 132 |
| | A Simple Option Pricing Model | | 132 |
| | Constructing a riskless hedge | | 133 |
| | Purpose of the hedge | | 133 |
| | Option Fair Value | | 134 |
| | Extending the Binomial Model | | 134 |
| | Dynamic hedging | | 135 |
| | Cost of Dynamic Hedging | | 135 |
| | The Black-Scholes Option Pricing Model | | 136 |
| | Inputs to Black-Scholes | | 136 |
| | Model inputs: spot price and strike price | | 136 |
| | Model inputs: time to expiry and cost of carry | | 137 |
| | Model input: volatility | | 137 |
| | Historical Volatility | | 137 |
| | Standard deviation | | 138 |
| | Measuring and Using Historical Volatility | | 139 |
| | Application to Black-Scholes | | 140 |
| | Chapter Summary | | 140 |
| 14 | Option Valuation Concepts (2) | | 141 |
| | Introduction | | 141 |
| | Problems with Historical Volatility | | 141 |
| | Implied Volatility | | 142 |
| | Applications of implied volatility | | 142 |
| | Black-Scholes Model Assumptions | | 143 |
| | Normal distribution | | 143 |
| | Continuous random walk | | 143 |

| \sim | | |
|--------|------|-----|
| ('A) | 1tei | nts |

| | Dynamic hedging | 143 |
|----|--|-------|
| | Fixed volatility | 143 |
| | • | 143 |
| | Value of a Call Option | 143 |
| | Time value for an in-the-money option | |
| | Value of a Put Option | 144 |
| | Equity Index and Currency Options | 145 |
| | Value of an FX call option | 146 |
| | Pricing Interest Rate Options | 146 |
| | Bond option pricing example | 146 |
| | Black model | 147 |
| | The Black model and interest rates | 147 |
| | Chapter Summary | 148 |
| 15 | Option Sensitivities: The 'Greeks' | 149 |
| | Introduction | 149 |
| | Delta (Δ or δ) | 149 |
| | Delta Behaviour | 150 |
| | Delta as the slope on the option price curve | 150 |
| | Delta as the Hedge Ratio | 151 |
| | Constructing the delta hedge | 151 |
| | The Effects of Changes in Delta | 152 |
| | Sensitivity of the delta hedge | 152 |
| | Readjusting the Delta Hedge | 153 |
| | Gamma (Γ or γ) | 153 |
| | Position gamma | 154 |
| | Gamma and the Spot Price of the Underlying | 154 |
| | Gamma curve | 155 |
| | Gamma and Time to Expiry | 155 |
| | Gamma curve | 156 |
| | Theta (Θ) | 156 |
| | Measuring theta | 157 |
| | Vega or Kappa (κ) | 157 |
| | Vega graph | 158 |
| | Rho (ρ) | 158 |
| | Rho on call options | 158 |
| | Rho on put options | 159 |
| | Summary of Greeks | . 159 |
| | Chapter Summary | 160 |
| 17 | Out of The Pro-Charles (4) | 4/1 |
| 16 | Option Trading Strategies (1) | 161 |
| | Introduction | 161 |
| | Bull Spread | 161 |
| | Bull spread with puts | 162 |
| | Bull Position with Digital Options | 162 |
| | Spot Price and Con Value | 163 |
| | Bear Spread | 164 |
| | Closing out before expiry | 165 |

| | | Contents | xv |
|----|---|----------|-----|
| | The Greeks for the Bear Spread | | 165 |
| | A high gamma trade | | 166 |
| | Put or Bear Ratio Spread | | 166 |
| | Long Straddle | | 167 |
| | Long Straddle Current Payoff Profile | | 168 |
| | Positive gamma | | 168 |
| | Potential Risks with a Long Straddle | | 169 |
| | Chapter Summary | | 170 |
| 17 | Option Trading Strategies (2) | | 171 |
| | Introduction | | 171 |
| | Chooser Option | | 171 |
| | Value of the chooser | | 171 |
| | Short Straddle | | 172 |
| | Expiry payoff profile | | 172 |
| | Short Straddle Current Payoff Profile | | 172 |
| | Negative gamma | | 173 |
| | Potential Profits with a Short Straddle | | 175 |
| | Current payoff recalculated | | 175 |
| | Managing the Risk on a Short Straddle | | 175 |
| | Dynamic hedging | | 176 |
| | Short Strangle | | 177 |
| | New Ways of Trading Volatility | | 177 |
| | Calendar or Time Spread | | 178 |
| | Theta values | | 179 |
| | Risks with the calendar spread | | 179 |
| | Chapter Summary | | 179 |
| 18 | Convertible and Exchangeable Bonds | | 181 |
| | Introduction | | 181 |
| | Investors in Convertible Bonds | | 181 |
| | Issuers of Convertible Bonds | | 182 |
| | Advantages for issuers | | 182 |
| | CB Measures of Value | | 183 |
| | Bond value | | 183 |
| | Parity or conversion value | | 183 |
| | Conversion premium | | 184 |
| | Conversion Premium and Parity | | 184 |
| | The conversion premium | | 185 |
| | Other Factors Affecting CB Value | | 185 |
| | Convertible Arbitrage | | 186 |
| | Classic CB arbitrage | | 186 |
| | Convertible Arbitrage Example | | 186 |
| | Profits and Risks with the CB Arbitrage Trade | | 187 |
| | Risks with CB arbitrage trade | | 188 |
| | Mandatorily Convertibles and Exchangeables | | 188 |
| | Simple example of ME bond | | 188 |

| | Structuring a Mandatorily Exchangeable (ME) Bond | 189 |
|----|--|-----|
| | Capital gains and losses on the ME bond | 189 |
| , | Chapter Summary | 190 |
| 19 | Structured Securities | 193 |
| | Introduction | 193 |
| | Capital Protection Equity-Linked Notes | 193 |
| | ELN maturity value | 194 |
| | Capital guarantee | 194 |
| | Generating the participation | 194 |
| | Calculating the participation rate | 195 |
| | Expiry Value of 100% Capital Protection Notes | 195 |
| | 100% Participation Equity-Linked Notes | 196 |
| | Features of the 100% participation notes | 197 |
| | Capped Participation Equity-Linked Notes | 197 |
| | Structure of the capped ELNs | 198 |
| | Average Price Notes | 199 |
| | Cost of average price options | 199 |
| | Locking in Interim Gains: Cliquet Options | 200 |
| | Using a cliquet option | 200 |
| | Securitization and CDOs | 201 |
| | The Basic CDO Structure | 202 |
| | Credit enhancement | 202 |
| | The senior tranche | 202 |
| | Rationale for Securitization | 203 |
| | Arbitrage CDOs | 203 |
| | The future of the CDO market | 203 |
| | Synthetic CDOs | 203 |
| | Risk on the AAA tranche | 204 |
| | Chapter Summary | 205 |
| 20 | Clearing, Settlement and Operational Risk | 207 |
| | Introduction | 207 |
| | Risk Management in General | 207 |
| | Settlement of Exchange-Traded Derivatives | 208 |
| | Major Clearing Houses | 209 |
| | Confirmation and Settlement of OTC Deals | 210 |
| | Default risk on OTC deals | 210 |
| | Controlling Counterparty Risk on OTC Derivatives | 211 |
| | Operational Risk | 211 |
| | Trade capture | 211 |
| | Confirmation | 212 |
| | Settlement | 212 |
| | Nostro reconciliation | 212 |
| | Position valuation | 212 |
| | Collateral and funding management | 212 |
| | Management information systems (MIS) | 212 |

| | Contents | xvii |
|--|----------|------|
| Best Practice in Operational Risk Management | | 213 |
| Segregation of duties | | 213 |
| Chapter Summary | | 213 |
| Appendix A: Financial Calculations | | 215 |
| Appendix B: Exotic Options | | 235 |
| Appendix C: Glossary of Terms | | 239 |
| Index | | 255 |

· /