

Contents

	Glossary of Terms	ix
1	An Introduction to the Concept of Volatility Trading	1
1.1	Traditional Investment and View Taking	1
1.2	Three Examples of Buying Volatility	4
1.3	The Instruments	7
2	A Review of Some Basic Concepts	9
2.1	Rates of Change and Gradients of Straight Lines	9
2.2	Long and Short	13
2.3	Profit, Loss and Price Changes	15
2.4	The Importance of Using Exposure and not Cost to Measure Risk	18
2.5	A Nonlinear Profit Profile of an Imaginary Investment	20
2.6	A Real Life Example of a Nonlinear Price Profile	23
2.7	Measuring Volatility	24
3	The Price Profile of Derivatives before Expiry	31
3.1	The Call Option	31
3.2	Options Terminology	33
3.3	Probability, Averages, Expected Payoffs and Fair Values	35
3.4	The Fair Value of a Call Option	37
3.5	The Nonlinearity of Call Option Prices and the Averaging Process	43
3.6	The Fair Value of a Longer-Dated Call Option	46
3.7	Introducing More Realistic Distributional Assumptions	47
3.8	Introducing Interest Rate and Dividend Considerations	49
3.9	Stock Exposure of Call Options and the Delta	50
3.10	The Delta as a Slope	53
3.11	The Delta Profile	54
3.12	Summary	55

4	The Simple Long Volatility Trade	56
4.1	Outperforming Stock Portfolios with Call Options	56
4.2	The Long Volatility Delta Neutral Trade	59
4.3	The Effects of Time Decay—Theta	68
4.4	An Alternative View on Option Fair Value	72
4.5	Volatility and Vega	75
4.6	Implied Volatility	78
4.7	The Importance of Curvature and Gamma	79
4.8	Time Decay Effects on Delta and Gamma	83
4.9	Delta Contours	86
4.10	Three Simulations	88
4.11	Vega Effects on Delta and Gamma	91
4.12	Worst Case Scenarios	93
4.13	Best Case Scenarios	95
5	The Short Volatility Trade	97
5.1	The Short Call Option	97
5.2	Sensitivities of the Short Call Option Position	100
5.3	The Simple Short Volatility Trade	103
5.4	Time Decay and Vega Effects	108
5.5	Best Case Scenario	108
5.6	The Worst Case Scenario	111
5.7	Long Volatility versus Short Volatility and More Simulations	112
6	Using Put Options in Volatility Trades	117
6.1	The Put Option	117
6.2	Put Price Sensitivities prior to Expiry	120
6.3	Time and Vega Effects on Put Options	123
6.4	The Long Volatility Trade with Put Options	123
6.5	The Equivalence of Put and Call Options	127
6.6	The Short Volatility Trade Using Put Options	136
6.7	Net Option Positions	137
6.8	Summary of Profiles	144
7	Managing Combinations of Options	145
7.1	Combination #1: the Vertical Call Spread	146
7.2	Combination #2: the Time Spread	152
7.3	Combination #3: Near-dated Two by One Ratio Put Spread with Far-dated Call	154
7.4	The Additivity of Sensitivities	156
7.5	Monitoring the Risk of a Complex Options Portfolio	158
7.6	Adjusting the Risk Profile of an Option Portfolio	162

Contents	vii
7.7 Approximate Direction Risk Assessment	169
7.8 Approximate Volatility Risk Assessment	171
7.9 Volatility Trades and Market Manipulation	172
7.10 Synthetic Options from Dynamic Trading of Stock	177
8 More Complex Aspects of Volatility Trading	182
8.1 Trading Mispriced Options	183
8.2 Trading Permanently Mispriced Options—Empirical Deltas	184
8.3 Different Volatilities for Different Strike Prices	186
8.4 Different Volatilities across Time	189
8.5 Floating Volatilities	190
8.6 The Effects of Transaction Costs	192
8.7 Arbitrages between Different Options Markets	193
8.8 Concluding Remarks	196
Appendix: The Software	197
Index	215