Contents

Acknowledgement i

List of Figures v

List of Tables ix

Chapter 1. Introduction 1
  1. History of Financial Mathematics 1
  2. History of Financial Market in India 9
  3. Thesis at a Glance 11

Chapter 2. Basics and Preliminaries 13
  4. Types of Traders, Forward, and Futures 13
  5. Options and its Classification 20
  6. Advantages and Disadvantages of Derivatives 25
  7. Stochastic Process 28
  8. Some Basic Theorems 40
  9. Greek Letters 47

Chapter 3. Option Pricing Models 53
  10. Introduction 53
  11. A Simple Model for Asset Prices 55
  12. The Black-Scholes-Merton Option Pricing Model 64
13. The Binomial Option Pricing Model 77
14. Transition from Binomial to Binary 88
15. Trinomial Trees 98

Chapter 4. Fractional Brownian Motion and Predictability Indices 107
16. Random Walk 108
17. Hurst Exponent 110
18. Brownian Motion and Fractional Brownian Motion 112
19. Methods of Estimating Volatility 120
20. Predictability Index and Analysis for VIX 127
21. Data Analysis for Market Parameters 131
22. Conclusion 144

Chapter 5. Applications of MADM in Finance 147
23. Introduction 148
24. The SAW Method 151
25. The AHP Method 152
26. p-TOPSIS Method 157
27. Modified TOPSIS Method 161
28. p-VIKOR Method 162
29. Ranking of Stocks by Applying MADM Methods 168

Chapter 6. Future Scope 177

Bibliography 179
Author Index 185
Symbol Index 187
Index 188