

SJM SCHOOL OF MANAGEMENT, IIT BOMBAY
MG 775: Derivatives and Risk Management
Faculty (Visiting): Ramaprasad Bhar (UNSW, Sydney, www.bhar.id.au)

Course Aims and Outcomes

Course Aims

This course is to provide a rigorous introduction to fundamental pricing principles and hedging techniques in derivative markets. It focuses on main types of exchange-traded options and futures contracts. It is designed to acquaint students with the tools that are necessary to analyse common issues in derivative markets. In particular, appreciable time will be spent on investigating various arbitrage opportunities and developing risk management strategies using derivative instruments.

Student Learning Outcomes

Upon completion, students are expected to be able to understand the mechanics of buying, selling, exercising, and settling the derivative instruments, determine value of these instruments, and use them to manage financial risk.

Teaching Strategies

This course consists of standard two-hour lectures twice weekly. The lectures will deliver the materials primarily covered by the textbook. Students are expected to read the relevant chapters in the textbook before attending each lecture. Sufficient time will be devoted to the end of chapter problems.

Evaluation

Quiz/Test	30%
Group Assignment	10%
Final Exam	60%

Textbook

The suggested textbook for this course is: Options, Futures and Other Derivative Securities, by John C. Hull, 5th Ed., Prentice-Hall, 2002, or later. This textbook is widely used in courses and on the “street”. It includes almost everything you ever wanted to know about the derivatives. It can be hard reading, but it is well worth the effort. Although, edition 6 is now available, the coverage of chapters we are concerned with is largely unchanged.

The relevant chapters are: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 18, and 19.

References

Most securities exchanges provide materials related to various derivatives traded in those exchanges. These materials may be accessed via the relevant web pages and the usual search mechanisms may be used to locate such sites. Here are some examples of relevant exchanges: CBOT (Chicago Board of Trade), CME (Chicago mercantile Exchange), LIFFE (London International Financial Futures Exchange), SFE (Sydney Futures Exchange) etc.

Lecture Program

The lecture topics are broadly classified as follows. We intend to cover the chapters 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 18, and 19. These chapters will be covered mostly in sequence and in lecture number order. However, some longer chapters may overflow to more than one lecture.

Introduction to forwards, futures, and swaps (Chapters/Sections: 1, 2, 3, 4)

- Introduction to derivatives
- Mechanics of futures markets
- Pricing forwards and futures
- Hedging with futures contracts

Swaps (Chapter 6)

- Interest rate swap
- Valuation swap

Introductory option pricing, (Chapters/Sections: 7, 8, 9, 14.1-14.4)

- What makes option-pricing work?
- Mechanics of options markets
- Trading strategies involving options
- Put-call parity
- Factors affecting option prices
 - Impact of volatility on option prices
- Price relationships between European and American options
 - Bounds on American option prices
- Hedging

Binomial Option Pricing (Chapter 10)

- Pricing European options on non-dividend paying stocks
- Binomial model for stock prices process
 - Risk-neutral valuation
- Incorporating dividends into binomial option pricing
- American option pricing using the binomial tree approach

Continuous time modelling (Chapters/Sections: 11, 12, 13)

- Stochastic processes (preliminaries)
- Modelling behaviour of stock prices
- Ito's lemma
- A general option pricing equation and the Black-Scholes model
- Risk-neutral valuation in the continuous time framework
- Estimating the stock's volatility
- Incorporating dividends into continuous time option pricing
- Options on forward/futures contracts, stock indices, currencies

Hedging with options and numerical techniques (Chapters 14, 18)

- The “Greeks”
- Portfolio insurance
- Numerical procedures

Exotic options and Extension to Black-Scholes option pricing. (Chapters/Sections: 19)

- Types of exotic options
- Path-dependent derivatives
- Barrier options and look back options
- Options on two correlated assets
- Static options replication
- Pricing biases
- Alternative models

Suggested Practice Problems

The following are only suggestive. These suggestions are subject to changes/additions as announced in the class.

Chapter 1:	5, 6, 12, 15, 17, 27
Chapter 2:	1, 3, 10, 11, 12, 16, 19, 22, 24, 25
Chapter 3:	2, 3, 4, 6, 7, 8, 9, 11, 12, 14, 16, 17, 18, 19, 20,21, 22
Chapter 4:	1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 16, 18, 19, 21
Chapter 6:	1, 2, 3, 5, 6, 7, 8, 11, 15, 16
Chapter 7:	1, 3, 6, 7, 8, 9, 11, 13
Chapter 8:	1, 2, 3, 4, 5, 6, 8, 9, 13, 14, 15, 17
Chapter 9:	1-4, 7, 10, 14
Chapter 10:	1-6, 8-13
Chapter 11:	1, 2, 3, 5, 8, 9
Chapter 12:	1-6, 10, 11, 14, 16, 20
Chapter 13:	1, 2, 4, 7, 13, 15, 16, 18, 24, 34, 35
Chapter 14:	1, 2, 3, 7, 9, 10, 16, 22
Chapter 18:	1, 3, 6
Chapter 19:	1, 2, 5, 7, 12, 18

Session Time Table

January 2008

Mon	Tue	Wed	Thu	Fri	Sat	Sun
	1	2 DRM	3 FI	4	5	6
7 DRM	8 FI	9 DRM	10 FI	11	12	13
14 DRM	15 FI	16 DRM	17 FI	18	19	20
21 DRM	22 FI	23 DRM	24 FI	25	26	27
28 DRM	29 FI	30 DRM	31 FI			

February 2008

Mon	Tue	Wed	Thu	Fri	Sat	Sun
				1	2	3
4 DRM	5 FI	6 DRM	7 FI	8	9	10
11 DRM	12 FI	13 DRM	14 FI	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

Derivative and Risk Management (DRM)
Fixed Income Securities (FI)