

MSI 016
LZI

Martingale Method in Option Pricing Theory

by

Lei Ngai Heng

Master of Science in Mathematics

2003



**Faculty of Science and Technology
University of Macau**

Contents

Chapter 1:	Introduction.....	1
1.1	Financial Derivatives	1
1.2	Option Pricing and Hedging Strategies.....	2
1.3	Prerequisites in Probability Theory	3
Chapter 2:	A Simple Model in Option Pricing.....	6
2.1	Some Classes of Options in Financial Market	6
2.2	A Two-Period Binomial Model	7
2.3	The Risk-Neutral Probability	8
2.4	The Hedging Strategy	10
Chapter 3:	The Black-Scholes Model.....	12
3.1	Black-Scholes Model	12
3.2	The Black-Scholes Equation	14
Chapter 4:	Martingale Method for Itô's Model.....	16
4.1	Martingales and Martingale Representation Theorem.....	16
4.2	The Equivalent Martingale Measure.....	17
4.3	Pricing A European Option.....	19
Chapter 5:	Martingale Method for General Model.....	22
5.1	Semimartingales	22
5.2	A General Financial Model	23
5.3	Finding Hedging Strategy	26
	Reference.....	29