

B40.3340 Advanced Futures and Options
Fall 1998
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Office hours:
Mon: 4:30 - 6:30
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Thurs. 7:00 - 7:45

Advanced Futures and Options

Overview

This course will cover the theory and practice of derivatives at the advanced MBA level. **Students should have completed B40.3335 Futures and Options, which is a prerequisite for this course.**

Material will be presented on all types of derivative instruments, including forwards and futures, options, swaps, caps and floors, “exotic” options, structured products, etc. The focus will be on developing an intuitive understanding of the theoretical principles of valuation and risk management for derivatives, and on practical problem solving. Students must have, or quickly develop, a high degree of competence with Excel, which will be used extensively throughout the course.

Course Materials:

Required Textbook:

(H) Hull. Options, Futures, and Derivative Securities, 3rd ed. Prentice-Hall, 1997.

(F) Figlewski. Selected draft chapters from, Futures Markets. (work in progress).

Lecture Notes and Other Readings:

Lecture notes and other readings, including several draft chapters from a textbook on futures markets, will be distributed in class and/or available to be downloaded from my website.

Computer software:

Microsoft Excel will be used extensively for homework assignments and for in-class demonstrations. Excel spreadsheets used for the course will be available to be downloaded from the mainframe computer and from my website.

Homework:

There will be frequent graded homework assignments. Answers will be provided one week after an assignment is due. Late homework will not be accepted once the answers have been posted.

Grader / Tutor / Teaching Assistant: Chris Mann (cmann@stern.nyu.edu) will be the assistant for the course. He will hold regular office hours and problem sessions. Times and place will be announced.

Grading:

Homework: 50%

Two in-class quizzes: 30%

Final exam/project: 20%

COURSE OUTLINE

<u>Class/ Date</u>	<u>Topic</u>	<u>Reading</u>
	I. BASICS	
1. Sept. 8	* interest rate conventions and calculations	review H1,H2,F1
2. Sept. 10	* the mathematics of asset returns	H3, H10
	II. FUTURES PRICING AND HEDGING	
3. Sept. 15	* forwards: cost of carry model, FRAs	H4, F5
4. Sept. 17	* futures: hedge design based on dollar equivalence	F3
5. Sept. 22	* futures: statistical hedging	F4
6. Sept. 24	* futures: examples, pricing and hedging fine points	
7. Sept. 29	* futures: stock index futures strategies	F9
	III. OPTION MODELS	
8. Oct. 1	* put-call parity; binomial model, convergence, American exercise	review H6, H7, H9
9. Oct. 6	* Black-Scholes, PDE, Greek letters, delta hedging	H11, H14
10. Oct. 8	* QUIZ #1	

<u>Class/ Date</u>	<u>Topic</u>	<u>Reading</u>
11. Oct. 13	* Other option models: Black '76, stochastic volatility, etc.	H12
12. Oct. 15	* convexity, generalized hedging	
13. Oct. 20	* index options, portfolio insurance	
IV. INTEREST RATE DERIVATIVES		
14. Oct. 22	* fitting yield curves, interest rate models	H16, H17.1-17.11
15. Oct. 27	* basics of swaps; caps and floors	H5
16. Oct. 29	* implementing interest rate models: building the interest rate tree	finish H17
17. Nov. 3	* implementing interest rate models: valuing interest rate derivatives	
18. Nov. 5	* examples	
19. Nov. 10	* QUIZ #2	
V. EXOTIC OPTIONS AND NUMERICAL SOLUTION TECHNIQUES		
20. Nov. 12	* packages; binary; structured products	H18
21. Nov. 17	* path dependent: barriers, lookbacks	Rubinstein
22. Nov. 19	* lattice models: binomial, trinomial, adaptive mesh	H15
23. Nov. 24	* Monte Carlo techniques: basic, variance reduction, low discrepancy	
24. Dec. 1	* examples	
VI. RISK MANAGEMENT		
25. Dec. 3	* non-market derivatives risks (credit risk, model risk)	H19
26. Dec. 8	* volatility, jumps and fat tails	
27. Dec. 10	* VaR, RAROC, etc.	H20