Futures and Options (GB.3335.00)

Summer 2017

Professor Menachem Brenner

Course Description: This is a course in derivatives markets: structure, valuation and strategies. It combines theory, empirical findings and practical applications. The main applications include the equities markets, foreign exchange and commodities (e.g. oil, gold, silver). The key derivatives instruments discussed include forwards, futures and options. Readings, cases and examples include the recent Financial Crisis, the 1987 Crash, LTCM, Amaranth, Metallgesellschaft, etc.

It has two parts: The first part deals with the structure of futures markets, pricing of futures contracts and hedging with such contracts. The second, and larger, part deals with options markets; strategies; pricing and position analysis. It includes topics like: pricing Executive Stock Options, Short Selling, Value-at-Risk, Exotic Options, Volatility Derivatives (VIX) and Trading Volatility. The course will consist of lectures, discussions and problem solving.

Prerequisites: All core courses. This course requires a very basic knowledge of futures and options. Remind yourself of the basic features of futures, calls, puts and payoff diagrams.

Exams and Grading: Due to the intensive nature of the course, there will only be a final exam (multiple-choice exam). Class participation may improve your grade.
The grade distribution is: A (30%-35%), B (50%-65%); C (0%-5%); D, F (remainder if any).

Problem Sets: Posted on NYU CLASSES. There will be 7-8 problem sets. Solutions to the problem sets will be posted after you had a chance to solve them. Additional problems will be presented and discussed in class.

Required Material: You are responsible for the material covered in class, for all announcements made in class, for material posted on NYU CLASSES and sent by e-mail. The problem sets and all handouts are part of the class material.

Required book: **Hull John** (H) Options, Futures and Other Derivatives, Prentice Hall, 9th ed.
The book is not a substitute for the lecture notes and class discussions. Some topics and details are not covered by the book.

Recommended book: Sundaram Rangarajan and Sanjiv Das, Derivatives, Principles and Practice. McCgraw-Hill/Irwin, 2010.

Market Tracking: You are expected to follow the markets on a daily basis. In particular, you should pay attention to 'fair value' of Gold, SPX futures, and Implied Volatility from index options (e.g. VIX). **Market tracking questions may appear on the exam.**
Your internet 'favorites' should include the exchange sites; CME, CBOE. You are also expected to read the financial press. Pay special attention to the futures and options columns in the **WSJ**&**FT.**

Schedule of Classes: 6 Sundays starting on July 2 to August 6. Hours: 9:00-12:00, 1:00-4:00.

E-mail: Check your mail regularly for additional material, announcements, and assignments.

Office Hours: Thursday 4:00-6:00 & by appointment.

Office; Rm. 9-55. KMEC

Homepage: Other information appears on the Stern Web Site (**stern.nyu.edu/~mbrenner**)

Classroom Responsibilities:

Class Attendance: Students are expected to attend all classes and be on time.

Cell phones: You should turn off your cell phone before you enter the class.

No Laptops or any email/internet devices are allowed in class.

Honor Code: You are responsible for maintaining Stern's honor code.

Course Outline

Recommended Textbook: John Hull (H): Options, Futures and Other Derivatives, Prentice Hall, 2015, 9th edition.

I. Overview of Derivatives Markets (H: Ch.1)

II. Futures Markets

1. Forward and Futures: Overview/Comparison
2. The Structure of the Futures Markets (H: Ch. 2)
3. The Cost of Carry Model (H: pp. 104-109, 115-120)
   a) Arbitrage Pricing; **Gold Example**
   b) **FX** forwards , **Stock Index** Futures
4. Hedging with Futures (H: pp. 49-61)

III. Options Markets

1. Options Strategies and Markets (H: Ch. 10, 12)

2. Options Valuation

   a) Arbitrage Conditions (H: pp.238-241)

   b) Put-Call Parity (Extended) (H: pp. 241-251)

   c) The Binomial Model (+ The American Put) (H: Ch. 13)

   d) The Black-Scholes-Merton Model (H: pp.321-331, 335-339, 341-342)

   e) Options on FX, Indices, Futures (H: pp. 367-379)

   f) Volatility; "smiles" and "skews" (H: pp. 432-440)

   g) Sensitivity Analysis (the Greek letters) (H: pp. 400-421)

3. Risk Management (H: pp. 494-497)

4. Exotic Options (H: Ch. 26, optional)

5. Applications: Structured Products, Volatility Derivatives