FIN 4113/5113
Derivative Securities and Markets
Fall 2012

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Office Hours: Tues and Thurs 11:00-12:00
(Also available most hours M&W mornings)

Course Description: Derivative securities, such as futures, forwards, options, and swaps are studied and analyzed along with their uses in investments, banking, portfolio management, and risk management. We will study how futures, swap, and option contracts are constructed, how they are valued, and how they are used for speculation, hedging, and risk management. While the course is general, energy derivatives receive considerable attention.

Derivatives is an analytical and numbers intensive class. I try to keep the math to a minimum and it is not advanced - a little calculus in the options part. However, due to the topic, there is a strong dose of algebra and a lot of number crunching. Be forewarned.

Prerequisite: FIN4103 or equivalent.

Text: Fundamentals of Derivatives Markets by Robert L. McDonald, Addison-Wesley. Do not confuse with his longer and slightly more advanced text, Derivatives Markets.

Possible Supplements (purely optional): Options, Futures, and Other Derivatives by John C. Hull (Prentice Hall). More advanced and mathematical than McDonald; this is a classic text in the field.

Futures, Options, and Swaps by Kolb and Overdahl (Blackwell Publishing). This text is richer in institutional detail than McDonald and Hull and used to be the recommended preparation for the derivatives portion of the CFA exam.

Characteristics and Risks of Standardized Options. This is a booklet prepared by the options exchanges and SEC to explain option trading and the risk involved. It is available at www.cboe.com.

Web Materials: Links to web sites with free educational materials and other derivatives information will be posted on D2L.

Wall Street Journal: Everyone needs access to futures and option (closing) prices on US futures and options exchanges. Almost all the needed figures are available free on various exchange websites. I will mostly use the Wall Street Journal site at www.wsj.com. I think most of the needed prices are available without a paid subscription. The paper version of the WSJ is not necessary. I will likely assign some current articles from the WSJ, Economist, and other publications but will post on D2L.
Course Requirements:

Problem Sets or Quizzes: I strongly believe you only really learn this material by doing it. Consequently, every week (when there is not an exam) there will be a problem set, mini case, or short quiz. These problem sets are an important part of the course. Some of these are lengthy so be forewarned. These and any accompanying data sets will be posted on D2L along (later) with my answers. You are expected to work the problem sets on schedule and to be prepared to present or discuss your answers in class. Problem set answers (normally in the form of Excel spreadsheets) should be submitted to the dropbox in D2L. I will choose one or two problems/questions to grade and will check that you submitted complete answers to the other questions. The top grades are reserved for those who not only get the correct answer but present their answers in a clear, concise, and easy to understand form. Group work is encouraged and a single answer set may be turned in for up to three people provided that all three participate and fully understand your answers. [Make sure all participants are listed in the comments section when you post your answers to D2L as well as in the file itself.] Because I post my answers on D2L soon after class, problem sets cannot be turned in late. Since I know people have emergencies and conflicts, in calculating final problem set grades, I drop the lowest score (or the one than you have to miss). These are intended as learning exercises; I am available for help, hints, or checks.

Exams: There will be two exams and a comprehensive final exam. You are allowed one 8.5 x 11 sheet of formulae/notes on the exams. The content is up to you but you (or your group) must prepare. You cannot just minimize and bring copies of my slides.

Grading:

  Class participation                     10%
  Problem sets/quizzes                   10%
  Exams (25% each)                        50%
  Final                                   30%

Communications: We will use D2L as the main communications device. I will post problem sets, class lecture slides, readings, and other materials there. Because they contain numerous questions followed by my answers, class slides will not be posted until after the class session. Links to several derivatives websites are also listed on D2L. All assignments, such as the graded problem sets, should be submitted to the D2L dropbox. You can send email messages to me directly at lederington@ou.edu or using D2L. D2L sends all email messages to your OU.Net address.

Accommodation of Students with Disabilities: Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

Academic Integrity and Misconduct: All students are expected to honor the University’s rules on academic conduct as outlined at: http://www.ou.edu/provost/integrity/.

Laptops in Class: You are welcome to bring laptops to class. I will sometimes visit derivatives websites and you may find it useful to follow. It may also be helpful to have access to your problem set answers. Please restrict laptop use in the classroom to material pertinent to this
class, e.g., derivatives websites and your problem set answers, since I find student use of laptops to socialize or surf the web extremely distracting. Class attendance is voluntary; if you wish to surf the web during class time, please stay home.

COURSE OUTLINE AND READING LIST

Note: The dates indicated are approximate. Because of uncertainty about how long topics will take and the possibility of guest speakers, adjustments are likely.

Note: A few readings outside the text will likely be added later.

August 21-23

Introduction to Derivatives
- Derivatives and uses.
- Bid and ask prices and short-selling
- Forwards, futures, and options.
- Reading futures and option prices
- Option payoff patterns.

Readings: McDonald: chapters 1-2.
- "Inside exchanges race to invent new bets," WSJ July 6, 2007

August 28, 30, and Sept 4

Option Combinations:
- Insurance strategies and collars
- Put-Call Parity
- Bull and Bear spreads
- Straddles and strangles
- Introduction to Structured Products

Readings: McDonald: chapter 3.

September 6 and 11:

Basics of Hedging and Risk Management:
- Hedging with forwards and options
- Why and how firms hedge
- Designing a hedge
- Cross-hedging

Readings: McDonald: chapter 4
- "Hedges pay off for NG producers," WSJ 8/12/09.
September 13, 18, 20 and 25:

Futures and Forwards
   The basis
   The Cost-of-Carry Model
   The expectations hypothesis and price discovery
   Margins and marking to market
   Corners and squeezes
   Comparison of exchange and OTC markets
   Eurodollar market and interest rate hedging
   2008 financial crisis and Dodd-Frank

Readings: McDonald, chapters 5, 6, sections 7.1 and 7.2 of chapter 7, and Appendix B.
   Note: the text starts with forwards on stocks. I think it is easiest to start with
   commodity futures so chapter 5 and sections 6.1 and 6.2 of chapter 6 need
   to be read together.
   “Where has all the oil gone?” WSJ, Oct 6, 2007.

First Exam: September 27
   The exam will cover chapters 1-6 in the text, other readings through the section on
   futures and problem sets to date.

October 2 and 4:
   Swaps
   Description
   Commodity swaps
   Interest rate swaps
   Currency swaps
   Counterparty risk
   Pricing swaps using futures
   (Note: credit default swaps will be covered in FIN 5332)

Readings: McDonald, chapter 8
   “Reforming the over-the-counter derivatives market: what’s to be gained?
   Federal Reserve Bank of Cleveland, July 2010
   “Derivatives and Risk Management in the Petroleum, Natural Gas, and Electricity
   Industries, by Energy Information Administration (chapters 1-3).

October 9 and 11:
   Option Price Properties:
   Put-Call Parity
   Bounds on option prices
   Option prices and the stock price, exercise price, and time-to-expiration
   European versus American options

Readings: McDonald, Chapter 9.
October 16, 18, 23, and 25:

**Pricing Options: The Binomial Model:**
- Binomial Trees
- Single period and multiperiod models
- Measuring returns
- The log normal return distribution assumptions
- Risk-neutral pricing
- Exercising American Options
- Approximating continuous prices with the binomial model
- Estimating volatility

**Readings:** McDonald, chapter 10 Appendix 10.A

**Second Exam: October 30**

November 1, 6, and 8:

**The Black-Scholes Model**
- The Black-Scholes model
- Options on futures, commodities, and indices
- Implied volatility
- Option Greeks
- Interest rate options
- Delta hedging

**Readings:** McDonald, chapter 11.

November 13, 15, and 20:

**Financial Engineering**
- Structured notes and products
- Valuing complicated securities
- Credit default swaps

**Readings:** McDonald, chapter 12

November 27 and 29

**Corporate Applications**
- Debt, equity, and warrants
- Convertible bonds
- Put and call options on bonds
- Employee stock options
- Options and collars in acquisitions

**Readings:** McDonald, chapter 13

December 4 and 6:

**Real Options**
- Valuing real projects with options
- Research and development as options
- Real options in energy

**Readings:** McDonald, chapter 14
December 14 - Final Exam