Course Description

This course employs both lectures and case studies to cover the foundations of financial derivatives and their applications. We cover both linear instruments, such as forward, futures, and swaps, as well as non-linear instruments such as options and credit derivatives. The use of case studies will help cement the concepts learnt in lectures and practically illustrate the use – and misuse – of financial derivatives in the real world. The course material spans different markets, such as stocks, foreign currencies, interest rates, commodities, and defaultable securities. Applications and case studies include topics related to financial risk management, the dislocation of capital and arbitrage opportunities during the 2007 - 2008 financial crisis, the valuation of customized financial products, the valuation and hedging of corporate securities (such as warrants, corporate bonds and equity), and the study of credit risk and credit derivatives.

The course is analytical in nature and requires the knowledge of calculus, probability, statistics, and regression analysis. The use of spreadsheet packages such as Excel is important for solving homework assignments and performing the required case analysis.

The course web site is

http://faculty.chicagobooth.edu/pietro.veronesi/teaching/BUS35100.htm

Required Material


Optional Material

(A) Derivatives


(B) Fixed Income


(C) Financial Risk Management


**Prerequisites**

Investments (35000) is a strict prerequisite for this course. More generally, students should be familiar with topics covered in basic investments courses, such as continuously compounded interest rates, stock returns, discounting and the present value formula, as well as the CAPM. In addition, students should be familiar with calculus, and regression analysis.

Homework 0, pre-assigned and due on the first day of class, will be used to assess whether students satisfy the prerequisites. This is the only homework that has to be taken individually (see below). You can find homework 0 on the course web site

http://faculty.chicagobooth.edu/pietro.veronesi/teaching/BUS35100.htm

Finally, students should have a working knowledge of Microsoft Excel or other spreadsheet program to do the weekly assignments.

**Course Requirements**

The course requirements consist of weekly problem sets, a midterm in-class exam, and a final take-home exam. Problem sets (except for homework 0) can be done in groups, with a maximum of 3 students in each group. Each problem set must be turned in at the beginning of class, and will be returned, graded, the following week. No late homework will be accepted (zero score). However, to give you flexibility, I let you “default” on one homework, as only the best 8 assignments (out of 9) will be used in the final grade. The last homework cannot be dropped.

Students can expect to spend about 6 - 7 hours / week of study outside class.
**Grading**

Problem sets, midterm, and final are individually scored on a 100 point scale, and count towards the final grade according to the following proportions: 30%, 30%, 40%, respectively.

A provisional grade for graduating students is given to students in good standing, meaning that they performed in the upper 75% of the midterm or homework assignments.

**Teaching Assistant and Review Sessions**

The teaching assistant for this course is TBA. The TA will lead weekly review sessions to clarify the material covered in class and to prepare students for the following homework. The TA is also available to answer questions on homework or other material.

**Office Hours**

Although I am available weekly to see students (see below) to answer questions, many questions can efficiently be answered by email. Please, try to ask your question by email first, and you should receive an answer within a few hours. For clarifying questions this is especially useful, as I can then forward your question to the whole class.

Office hour: 1 hour before class (8am – 9am, Faculty Suite, 4th floor). For long meetings, please send an email to fix an appointment.

**Disability Accommodation**

If you have a documented disability (or think you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the University's programs or services, please contact Student Disability Services as soon as possible. To receive a reasonable accommodation, you must be appropriately registered with Student Disability Services. Please contact the office at 773-702-6000/TTY 773-795-1186 or disabilities@uchicago.edu, or visit the website at disabilities.uchicago.edu. Student Disability Services is located at 5501 S. Ellis Avenue.

If you have an approved accommodation from Student Disability Services that you plan to use in this course, please contact Academic Services (AcademicServices@lists.chicagobooth.edu) as soon as possible. Academic Services will provide support to you and me and coordinate the details of your accommodations on your behalf.
Class Schedule

NOTE: The following class schedule is *very preliminary* and subject to change.

Class 1 (A)  Introduction to Derivative Securities

Readings:
Teaching Note 1
McDonald: Ch. 1

Class 1 (B)  Forwards Contracts and Covered Interest Parity

Readings:
Teaching Notes 2
McDonald: Ch. 5 - 6

Notes: Homework 0 due at the beginning of class.
Homework 1 assigned: Hedging FX Risk with Forwards.
*Case Study*: FX Risk at EADS (HBS Case # 9-213-080)

Class 2  Futures, Forwards, and Swaps

Readings:
Teaching Notes 2
McDonald: Ch. 5 - 6, 8

Notes: Homework 1 due at the beginning of class.
Homework 2 assigned: Speculating with Futures and Amaranth crash.
*Related Case Study*: The Amaranth Debacle: A Failure of Risk Measures or a Failure of Risk Management?

Class 2 (A)  Futures, Forwards, and Swaps (cntd)

Readings:
Teaching Notes 2
McDonald: Ch. 5 - 6, 8

Class 3 (B)  Introduction to Options

Readings:
Teaching Notes 3
McDonald: Ch 3, 9

Notes: Homework 2 due at the beginning of class.
Homework 3 assigned: Greece Currency Swaps and Hedging Commodity Risk with Options.
Related Case Study 1: Greece Off-the-Market 2001 Currency Swaps.
Related Case Study 2: Southwest Jet Fuel Hedging Program.

Class 4 (A)  Options’ Strategies: Spreads, Collars, etc.

Readings:
Teaching Notes 3
McDonald: Ch.3

Class 4 (B)  Binomial Trees and Risk Neutral Pricing

Readings:
Teaching Notes 4.
McDonald: Ch 10

Notes: Homework 3 due at the beginning of class.
Related Case Study: The Collapse of Barings Bank

Class 5 (A)  Binomial Trees: Multi Period Model

Readings:
Teaching Notes 4.
McDonald: Ch 10, 11

Class 5 (B)  The Black-Scholes-Merton formula

Readings:
Teaching Notes 5.
McDonald: Ch 12

Notes: Homework 4 due at the beginning of class.
Homework 5. Pricing options by Black and Scholes.
Related Case Study: American Barrick Resource Corporation: Managing Gold Price Risk

Class 6 (A)  The Options’ Greeks and Dynamic Replication

Reading:
Teaching Notes 5.
McDonald: Ch 12

Class 6(B)  Empirical issues with BSM formula and Implied Volatility

Reading:
Teaching Note 6
McDonald: Ch 12

Notes: Homework 5 due at the beginning of class.

Class 7 (A)  **Midterm**

Class 7 (B)  **Exotic Options and Pricing by Monte Carlo Simulations**

Reading:
Teaching Note 7
McDonald: Ch 14

Notes: Homework 6 assigned. Implied volatility and the valuation of structured securities: Morgan Stanley PLUS
*Related Case Study:* Times Mirror’s PEPS

Class 8(A)  **Financial Engineering and Structured Securities**

Reading:  Teaching Note 7
McDonald: Ch. 15

Class 8(B)  **American Options and Binomial Trees**

Readings:
Teaching Notes 8
McDonald: Ch. 10 - 11

Notes: Homework 6 due at the beginning of class.
Homework 7 assigned. Valuing American Options on Binomial Trees.

Class 9 (A)  **Corporate Securities as Options and Credit Derivatives**

Readings:
Teaching Notes 9
McDonald: Ch. 16

Class 9 (B)  **Fixed Income Securities and Derivatives**

Readings:
Teaching Notes 10
McDonald: Ch. 7.

Notes: Homework 7 due at the beginning of class.
Homework 8: Citigroup's Default Probability during the 2008 Financial Crisis.
Class 10 (A)  Fixed Income Securities and Derivatives
   Examples: Callable Bonds, Mortgage Backed Securities

Class 10 (B)  Class Wrap up
   Notes: Homework 8 due at the beginning of class.