FNCE 235/725: Fixed Income Securities

Spring 2013

Syllabus

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TA office hours are at the TA cubicles in the Finance Department (2300 SHDH). The times will be posted on the course homepage.

Course Description

The course covers the valuation of a wide variety of fixed income securities and derivatives including pure discount bonds, coupon bonds, forwards and options on fixed income securities, interest-rate swaps, floating-rate notes, and mortgages. The course focuses on analytic tools used in bond portfolio management and interest rate risk management. These tools include yield curve construction, duration and convexity, and formal term structure models.

Among relevant topics not covered in the course are the relation between macroeconomic variables and interest rates, taxes, and multi-factor models of the term structure. Default risk and corporate bonds will also not be discussed in depth, as these topics are covered in other courses.

Prerequisites

Students must have taken introductory courses in finance and statistics.
FNCE 235: FNCE 100-101 and STAT 101
FNCE 725: FNCE 601-602 and STAT 621

Lectures
Section 235001 Tu/Thu 9:00 -10:30 (SHDH 211)
Section 725001 Tu/Thu 10:30 -12:00 (SHDH 211)
Section 235002 Tu/Thu 1:30 - 3:00 (SHDH 105)

First Class Assignment

During our first class session on Thursday, January 10, we will discuss the recent events surrounding the LIBOR manipulation scandal, which highlights some of the important issues in fixed income markets that we will explore over the course of the semester.

I expect the students to read the following articles, available online, in order to be prepared to participate in the discussion:

The rotten heart of finance, *The Economist*, http://www.economist.com/node/21558281

The LIBOR Mess: How Did It Happen -- and What Lies Ahead?
Knowledge@Wharton, http://knowledge.wharton.upenn.edu/article.cfm?articleid=3056

LIBOR Scandal: Yep, It's as Bad as We Thought, TIME,
http://business.time.com/2012/12/20/libor-scandal-yep-its-as-bad-as-we-thought/#ixzz2GMlJbblk

Course Materials

1. The course pack contains lecture notes (*Adventures in Debentures* by Michael Gibbons) and is available online through Study.Net. We will follow it closely throughout most of the course. See course schedule below for a tentative outline of the chapters we will cover (beware that the order of topics and the pace may change as the course proceeds). To assist students who have not yet decided to take the course, the first five chapters of the course pack will be posted on the course webpage.

As lectures will be following the notes in the course pack, you will need to bring the relevant chapters of the Course Pack to class. Additional handouts will be distributed during the course via Canvas as necessary.

2. There is a supplementary textbook, available at the bookstore:

> Pietro Veronesi, 2010. Fixed Income Securities: Valuation, Risk, and Risk Management

This is a relatively new textbook, and its way of presenting the material differs somewhat from the way it is done in the course. Although students are not responsible directly for the material in this book that is not covered explicitly in class, it is very helpful in mastering the material and solving homework/exam problems, as well as a general reference on the subject.

For students who find it helpful to see the material presented in different ways, the following textbooks are on reserve at the Lippincott Library Reserve Desk. Students are not responsible directly for the material in these books.

> John C. Hull, 2011. Options, futures, and other derivative securities. Eighth edition.
>
> Suresh Sundaresan, 2009. Fixed Income Markets and their derivatives. Third edition.
>
> Bruce Tuckman and Angel Serrat, 2012. Fixed income securities: tools for today's markets. Third edition.

3. Announcements, problem sets, solutions, and other material will be posted on the course **Canvas** website:
https://wharton.instructure.com/courses/935618

Note that Wharton computing accounts are required in order to access **Canvas**. Enrolled non-Wharton students may obtain an account starting on the first day of the class at: http://accounts.wharton.upenn.edu

Special drop/add dates

The Finance Department's Drop and Add Deadlines are different than the University's.

FINANCE DROP DEADLINE IS JANUARY 18 (5PM)

Should you decide to drop this course, you must do so through Penn In Touch by the Finance Department's drop deadline. If you drop the course after the department deadline you will receive a "W" on your transcript. Those who decide to add the course after the drop deadline above need to see Andrea Rollins in the Finance department.

Requirements

1. There are two exams given in class (see "Schedule" for the dates). The first exam is worth 25% of the final grade and the second is worth 30%. They are discussed in more detail later in the syllabus.
2. A term project is worth 40% of the final grade. It will have two parts, each worth 20% of the final grade. The first part will be due in the middle of the semester. The second part will be distributed during the final week of class and will be due on the first day of the Final Exam period.
3. Problem sets will be assigned on a near-weekly basis. They are discussed in more detail later in the syllabus. In addition, I will assign supplementary readings occasionally, and will expect students to be prepared to discuss them in class. Together, problem sets and participation in the discussion of assigned reading will count for 5% of the final grade. In addition, a student whose final score is just below the margin between two letter grades may have their grade adjusted upward based on their work in problem sets and class participation.

Attendance and class participation

1. Because the Course Pack itself is not self-sufficient and is meant as a complement to and not a substitute for the lectures, class attendance is considered vital.
2. You must attend the lecture for the section for which you are registered.
3. Students are expected to have read all assigned materials in preparation for class.

4. Class participation is greatly encouraged. Your questions not only help me better judge how the class is absorbing the material, they also help generate discussion. To this same end, I will cold-call. Although I expect students to be prepared, no student's grade is ever penalized for saying something wrong in class.
5. I may not be able to answer all questions to your satisfaction in class, especially if the answer involves material beyond that lecture's content. I am always happy to discuss such questions during my office hours.
6. To make it easier for me to get to know you, please sit in the same seat at each class session. Please bring a name tent to class.
7. Most students find it most convenient to use a hardcopy of the Course Pack. If you prefer to use the electronic version of the Course Pack on a laptop, iPad, etc., you are free to do so, but please refrain from unrelated web-surfing during lecture as it is distracting to other students.

Help and Review Sessions

There will be help sessions throughout the semester. The dates and times are yet to be confirmed.

Problem Sets

Many problem sets will be assigned during the semester and are due before class begins. Late answers will not be accepted. For all of the problem sets you may work with other students in the class. A team of people need only submit one copy of their solution for a particular problem set. Every member of the team will receive the same grade. Teams may be comprised of students from differing sections and differing programs (e.g., undergraduate and MBA). Team size is 5 students or less. Solutions to each problem set will be available after your answers have been turned in. Your graded answers will be returned to a file cabinet in the Finance Department in Steinberg-Dietrich Hall. The problem sets will be graded by giving a "check-plus," "check," "check-minus," or "no credit." Although I won't be discussing most of the problem sets in class, the help and review sessions are structured to address your questions about the problem sets.

The main purpose of the problem sets is to increase your understanding of the material and help you prepare for the exam. I may re-use problems that have proven helpful to students in prior years. So although you can easily

find solutions to problem sets, you're much better off working through every problem since that practice will serve you well in the exams.

Examinations

There will be two in-class examinations during the semester. The (tentative) dates are listed on the course schedule. They will be closed-book. For the first exam, you may bring an 8 ½ x 11 piece of paper of notes. You may write on both sides. For the second exam, you may bring two such pieces of paper. The second exam concentrates on material taught since the first exam, but material presented earlier may also appear on this exam.
You may bring a calculator to the exam, but not a computer (please do not plan on using your phone as a calculator).
Following university rules, exams may be postponed because of "illness, a death in the family, or some other unusual event." If such a circumstance arises, undergraduates must petition their dean's office for a makeup exam. MBA students must petition the MBA Program Office.

Term Project
The term Project will involve applying concepts from the lectures to valuation and hedging of real-life fixed income securities. The Project is computational in nature, and will require extensive use or Excel (or other equivalent software). Details will be described later in the semester.

Grades
Scores on term project and the two in-class exams will be standardized. Each student's final score is the weighted sum of these three standardized values, where the weights are 25% (exam 1), 30% (exam 2), and 40% (term project); in addition, homework assignments and class participation contribute 5%.

Course Schedule (preliminary and subject to change)

Lectures 1-8:

Traditional tools of Interest Rate Risk Management (Course Pack Chapters 1 – 12)

February 19: Midterm Exam 1 (in class)

Lectures 10-14:

Term structure of interest rates (Vasicek model, binomial trees – Chapters 13-17)

March 18: Term project Part I due

Lectures 15-20:

Bond Options and Bonds with Embedded Options; Floating-Rate Securities (Chapters 18-27)

April 9: Midterm Exam 2 (in class)

Lectures 21-26:

Home Mortgages (Chapter 28); Overview of Credit Default Risk (not in Course Pack)

April 29: Term project Part II due