FNCE 394/894: Managing Fixed-Income Portfolios
Spring 2017
Syllabus

Instructor: Prof. Scott Richard
Office: 3257 SH-DH
Phone: (215)-898-3004
Email: scottri@wharton.upenn.edu
Classroom:
Office hours: 4:30 – 5:30 pm on Tuesday. Please make an appointment by email if you like to meet with me outside of regular office hours.

Teaching Assistant: Jeff Jackson
Email: jejack@wharton.upenn.edu
Office hours:

Prerequisite: FNCE 235/725 Fixed Income Securities

Required Text: I will distribute a draft of my e-book, Fixed Income Portfolio Management with Models, to all class members free of charge.   You will also have access to spreadsheets which contain operational versions of the models presented in class.

Recommended Texts:

> Bond Markets, Analysis, and Strategies**,** Latest Edition, by Frank J. Fabozzi**.** Strong institutional details; all markets covered.

> Fixed Income Markets and Their Derivatives, Latest Edition, 2009 by Suresh Sundaresan.   Good balance of institutional details and models; all markets covered.

> Fixed Income Securities: Valuation, Risk, and Risk Management, 2010, by Pietro Veronesi.   Strong analytical presentation; no material on credit.

> Quantitative Management of Bond Portfolios, 2007, by Dynkin, Gould, Hyman, Konstantinovsky, and Phelps.   Written for practioners.

Course Description: The goal of this course is to teach you how to manage a real portfolio of Treasury, sovereign, corporate and mortgage bonds.   We develop three basic models for the Treasury yield curve, corporate and sovereign credit spreads, and mortgage spreads.   We use these models to find value in the bond market.   To implement the concepts learned in class, students form teams to manage a paper portfolio using Barclays Point, a state-of-the-art portfolio management system. Your team trades a $1 billion portfolio of bonds for which your goal is to outperform the Barclays Aggregate Index.   You trade real securities at real prices – only the money is fake.

We begin by relating the term structure of interest rates to the market's view of the fundamental macroeconomic states of growth, unemployment and inflation. To do this we need to understand a

multifactor term structure model, which extends the Vasicek model you studied in the prerequisite course.

Any bond other than a Treasury has an embedded option, either to default, prepay, or in some other way reduce the promised payments to bondholders.   Robert Merton was the first to recognize explicitly that any corporate bond can be evaluated by calculating the value of the default option. Merton's model and its extensions are currently the state of the art models used in asset management firms for valuing bonds which have default risk.   We apply Merton's model to the valuation of corporate bonds, credit default swaps (CDS), and sovereign debt.   Understanding Merton's model allows us to link market forecasts in the credit market (or CDS market) with forecasts in the stock market.   If there is a discrepancy in these forecasts, there is usually a profit opportunity.

Next, we turn to the valuation of Agency MBS which requires you to learn about Monte Carlo simulation and about homeowner prepayment and default modeling.   The Agency MBS market is second only to the US Treasury market in size, liquidity and economic importance.   Because a government Agency guarantees the timely payment of principle and interest, the dominant risk in a MBS is prepayment risk, i.e., that homeowners will choose to prepay when you do not want them to.

Finally, we bring everything together to analyze how to construct portfolios with desirable risk/return profiles.   We will emphasize building the cheapest portfolio in which we bear risks that are offering an unusually high expected return.

Barclays POINT System:

Barclays Capital has generously offered Wharton a rare opportunity to use a real-world state-of-the-art bond portfolio system in the classroom.   Your investment team will begin with a portfolio that mimics the Barclays Aggregate Index of investment grade US dollar denominated bonds.   You will be able to trade this portfolio every day at real world prices.   Your goal is to outperform the Barclays Aggregate Index over the semester.   You will have the full use of the Barclay analytics to help you analyze potential trades.   In a departure from real world money management, you will be graded on your analysis rather than your performance.   (Even the best designed portfolio can suffer setbacks in only four months.)   This is the key feature of this course so please make sure you attend the training session and become familiar with the POINT system.

Lectures and Presentations: The course is a combination of lectures by me and presentations by you.   We meet 29 times during this semester, of which 21 are lectures and discussions, and 8 in-class team presentations. Class participation is encouraged and may affect your grade if you are on the cusp of two grades.

There is a **MANDATORY** Tutorial on Barclays POINT system on Friday, January 20, from 9:00 to 12:00.

Course Materials

1. I will make book chapters and spreadsheets available to you electronically before each class.

2. There is no textbook for the course, but I assume that you have covered the material in the textbook for the prerequisite Fixed-Income course, <u>Fixed Income Securities: Valuation, Risk, and Risk Management</u>, 2010, by Pietro Veronesi. If you own any of the recommended text, you need not buy another book if you have learned the material in the book you own.

3. **Grade**

There are two team presentations shown on the schedule below. Each presentation will last 30 minutes and will determine 20% of your grade. You are also required to analyze individually two trades of your choosing. Each individual written trade analysis is worth 30% of your grade. **Late papers will be penalized 0.5 points (out of 10) per day for the first two days and 1.0 points per day for every day thereafter.** I will use class participation to move up or down students who are on the cusp of two grades.

Class	Date	Topic
1	Jan 12	Overview of this course. Review of basic fixed income markets. The Barclays Aggregate Index Organize investment teams.
2	Jan 17	Introduction to the Term Structure of Interest Rates (Ch. 1)
3	Jan 19	Chapter 1 Continued
4	Jan 20 FRIDAY	MANDATORY Tutorial on Barclays POINT system 9:00 to 12:00 in JMHH 375
5	Jan 24	Review of Initial Portfolios, Guidelines, and Reports
6	Jan 26	US Macroeconomic Data and the Yield Curve(Ch. 2)
7	Jan 31	Chapter 2 Continued
8	Feb 2	A Non-Linear Model of the Term Structure with Positive Interest Rates. (Ch.3)
9	Feb 7	Chapter 3 Continued Using the Model to Invest and Hedge (Ch. 4)
10	Feb 9	Chapter 4 Continued
11	Feb 14	TIPS (Ch. 5)
12	Feb 16	Sector Spread Risks (Ch. 7).
13	Feb 21	Equities (Ch. 6)
14	Feb 23	Team Meetings to Discuss Potential Trades
15	Feb 28	Team Presentations
16	Mar 2	Team Presentations
	Mar 7 & 9	Spring Break
	Mar 12	First Trade Written Analysis Due
17	Mar 14	Credit: The Merton Model and Extensions (Ch. 8)
18	Mar 16	Chapter 8 Continued
19	Mar 21	Credit Analysis by Industry; Bloomberg Credit Model
20	Mar 23	Barclays Credit Models; Sovereign Debt (Ch. 9)
21	Mar 28	The US Agency and Mortgage Markets (Ch. 10)
22	Mar 30	Modeling Mortgage Backed Securities (MBS)
23	Apr 4	Modeling Mortgage Backed Securities (MBS)
24	Apr 6	Mortgage Analysis
25	Apr 11	Mortgage Derivatives IO & PO
26	Apr 13	Team Meetings to Discuss Potential Trades
27	Apr 18	Guest lecture
28	Apr 20	Team Presentations
29	Apr 25	Team Presentations Second Trade Written Analysis Due

This schedule is not rigid.   We will revise it as necessary as the course progresses.