introduction and outline

course title: Economics 477/677, Fixed Income Markets & Quantitative Methods
Fall 2019
classroom: Allen 326
times: Tuesdays & Thursdays, 1:25–2:40PM

professor: Lawrence Kreicher
office location: Social Sciences 329H
office hours: Tue/Thu: 10AM−Noon; Wed: 12:30−2:30PM

introduction and synopsis

Bonds and their derivatives make up the largest segment of the global capital market. They play key roles in the allocation of financial resources and the regulating of macroeconomic performance across countries and are valuable sources of information for policymakers. This course describes various types of fixed income securities and derivatives and develops tools for their valuation including discounting cash flows, constructing yield curves, calculating duration and convexity, hedging & risk management techniques, trading strategies, and probabilistic concepts underlying volatility and option pricing. We also study pricing of mortgage- and asset-backed securities.

prerequisites

An intermediate finance course, basic calculus & statistics, and good computational skills.

course administration

This course is primarily a lecture course. Class slides will be posted to the course website, but attending class is the best way to prepare for exams. In addition, fixed income is a highly computational discipline and a premium will be placed on obtaining precise, correct answers. **A basic *scientific* calculator will be required for all exams.** Devices capable of wireless transmissions or document storage may not be used during exams.

textbook/other course materials

There are no required texts for this course. Two optional texts that some students may find helpful are listed below, and appropriate optional readings in those texts are noted on the course schedule:

Fixed Income Securities: Tools for Today's Markets, B. Tuckman/A. Serrat (3rd edition/University edition, Wiley, 2012)

Fixed Income Securities: Valuation, Risk, & Risk Management, P. Veronesi (Wiley, 2010)

Daily readings about global bond markets from the *Wall Street Journal* and *Financial Times* will be posted to our course website.

grading

Your grade in this course will be based on the following:

Midterm Exam #1	25%
Midterm Exam #2	25%
Final Examination	40%
Problem Sets	5%
Class Participation	5%

examinations

There will be two midterm exams and a final. Only material covered in class or on problem sets will be tested. Both midterms will be 75 minutes in length and will be administered in class. The final exam will be three hours in length and will be cumulative. Exams will be closed-book; however, I may include a page in your exam booklets with a limited number of formulas for your reference.

There will be no makeup exams. If you miss a midterm exam due to a documented illness or emergency, I will calculate a "plug" exam score that preserves your position on the class curve. **Again, a basic *scientific* calculator will be required for all exams.**

problem sets & class participation

Three sets of problems will be assigned during the term and will be due on the dates marked on the class schedule.

Class participation will involve two elements: **a)** in-class problem-solving -- worksheets will be passed out, collected, and tallied; and **b)** emailing me a summary (2-3 sentences) once-a-week of one of the posted readings from the *WSJ* or *FT*.

accommodations

Any student who requires an academic accommodation for a disability must speak to me in person and provide me with official University documentation ***no later than the end of the second week of the term***. Any discussions will remain confidential.

If you have a religious, job-related, extracurricular, or other personal activity that conflicts with your participation in our course, please communicate with me as soon as possible and ***no later than the end of the second week of the term*** to discuss an appropriate accommodation.

honor principle

All students are expected to abide by the principals of academic integrity articulated in the Duke Community Standard. Academic dishonesty of any kind in our course is not acceptable; in particular, all work on exams must be your own.

tentative class schedule

Date	Topic	Optional Reading – Veronesi (V)/ Tuckman & Serrat (T&S)
Tue, 8/27	Introduction/Overview of Bond Markets	Ch. 1 (V)/Overview (T&S)
Thu, 8/29	Zeros & Coupon Bonds/Discounting	Ch. 2 (V)/Ch. 1 (T&S)
Tue, 9/3	Yields, Yield Curves, Term Structure	Ch. 2 (V)/Chs. 2-3 (T&S)
Thu, 9/5	Duration	Ch. 3 (V)/Chs. 4-5 (T&S)
Tue, 9/10	Immunization	Ch. 3 (V)
Thu, 9/12	Convexity	Ch. 4 (V)/Chs. 4-5 (T&S)
Tue, 9/17	Forward Contracts & Rates	Chs. 5, 7 (V)/Chs. 2, 13 (T&S)
Wed, 9/18	*** HW #1 DUE at my office by 5PM *****	
Thu, 9/19	**Midterm Exam #1 (in class)**	
Tue, 9/24	**NO CLASS**	
Thu, 9/26	Floating Rate Notes	Ch. 1 (V)
Tue, 10/1	Forward Rate Agreements	Ch. 5 § 2 (V)
Thu, 10/3	Swaps	Ch. 5 (V)/Ch. 16 (T&S)
Tue, 10/8	**NO CLASS, Fall Break**	
Thu, 10/10	No-Arbitrage Pricing of Derivatives	Ch. 9 (V)/Ch. 7 (T&S)
Tue, 10/15	Risk Neutral Probabilities	Ch. 9 (V)/Ch. 7 (T&S)
Thu, 10/17	Dynamic Trading Strategies	Ch. 10 (V)/Ch. 7 (T&S)
Tue, 10/22	Financial Engineering	Chs. 10-11 (V)/Chs. 9-10 (T&S)
Thu, 10/24	Short-Rate Duration & Hedging	Ch. 10 § 5 (V)
Tue, 10/29	**NO CLASS**	
Wed, 10/30	*** HW #2 DUE at my office by 5PM *****	

tentative class schedule

Date	Topic	Optional Reading – Veronesi (V)/ Tuckman & Serrat (T&S)
Thu, 10/31	**Midterm Exam #2 (in class)**	
Tue, 11/5	Caps, Floors, & Collars	Ch. 11 § 2 (V)/Ch. 18 (T&S)
Thu, 11/7	Callable Bonds	Ch. 12 (V)/Ch. 18 (T&S)
Tue, 11/12	Swaptions	Ch. 12 (V)/Ch. 18 (T&S)
Thu, 11/14	Mortgages & MBS, Part I	Ch. 8, 12 (V)/Ch. 20 (T&S)
Tue, 11/19	**NO CLASS**	
Thu, 11/21	Mortgages & MBS, Part II	
Tue, 11/26	Mortgages & MBS, Part III	
Thu, 11/28	**NO CLASS, Thanksgiving**	
Tue, 12/3	*Optional In-Class Review* *** HW #3 DUE at my office by 5PM ***	
Thu, 12/5	**NO CLASS**	
Sat, 12/14	**2–5PM, Final Exam, Allen 326**	