

FINA553: Fixed Income Securities

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I. Course Objective

This course will focus on the principles and practices of valuation and trading of fixed income securities and their derivatives. There will be an independent project on estimation of the term structure of interest rates based on actual bond data. The estimated term structure may also be used for other assignments on valuation, trading and duration.

II. Course Grade

The final course grade will be based on the following:

1. Constructive class discussion including homework, attendance and short quizzes 10%
2. Midterm examination 30%
3. Independent project 30%
4. Final examination 30%

Students can and should have unlimited consultation with fellow students on any homework assignments and the project, but the execution of all assignments and written submissions are required to be completely independent. Exact answers from multiple students may result in penalties for all involved at the discretion of the instructor. No formula sheet is permitted at the mid-term and final exams, which will be held in class. Calculators with no hidden cheat-sheets may be used during exams. Absence from exams will not be excused except for serious medical reasons with doctor's letter. Students found cheating during exams will receive zero credit and may face further disciplinary actions.

III. Course Requirements

1. Students' own class notes taken from materials presented and displayed by professor, and questions and answers from fellow students. Students that secure the highest in examinations have generally taken comprehensive notes with a thorough understanding of materials.
2. Rapt attention to instructor and fellow students.
3. Class attendance.
4. Relevant chapters and sections, as mentioned from time to time, from a background textbook: *Fixed Income Securities, Tools for Today's Markets* by Bruce Tuckman, John Wiley and Sons. This book will serve as an informal guide. All the materials in the book may not be fully covered and any material that is covered may not be presented in exactly the same format as in the book. Though this is an excellent guidebook, experience shows that presuming to gain the necessary understanding in this course from reading the book alone is counterproductive. This course will be built on classroom presentations starting from the level of understanding and skills of students in this course. No other material on the course except this course outline will be available.

5. Access to the Internet and a financial calculator like HP-12C or better.
6. Computer skills with facility to program in any package like Minitab, RATS, SAS, Excel, etc. No specific computer program will be prescribed. This is a course on finance, not computer programming. So, computer skills needed to execute the project and other assignments will be the sole responsibility of students.
7. Complete familiarity with basic financial calculations like the net present value, internal rate of return, and yield to maturity of bonds using some financial calculator. The course will review some of these materials on continuous and discrete times, as and when necessary, but it is absolutely mandatory that students possess a deep understanding of these basic financial calculations.
8. Each student is required to hand in within two weeks a recent picture affixed to the top-left corner of a 8"x11" paper with own name written in English, ID number, e-mail address, course number, section, and major.

IV. Course Description

1. Current prices of future dollars and the concept of discount factors.
2. Arbitrage-free fair prices of bond using replicating portfolios.
3. The concept and practice of trading based on a comparison of market price with the fair price of a bond.
1. Estimating term structures of discount factors, spot interest rates, and forward rates using real data; and applications of term structures.
2. Estimation and application of duration and convexity of bonds.
3. Estimation and application of key rate durations.
4. Arbitrage-free pricing of interest rate contingent claims like puts and calls written on bonds.
4. The art and practice of term-structure modeling.
7. Selected applications like valuation of floaters, collars, and caps.
9. Interest rate swaps.
10. Interest rate futures and forwards.
11. Asset backed securities.
12. Other topics based on class interest.

V. Prerequisites for Success in the Course

FINA521 (Investments) or FINA522 (Portfolio Management) is a prerequisite for this course. Concurrent registration in FINA551 (Options and Futures) is recommended. The prerequisite for success in this course include the following:

1. A thorough grounding in Econometrics and Business Statistics.
2. A knack for solving problems involving intense quantitative reasoning.
3. The ability to visualize how profits can be made in the real world.

It is necessary that students have a strong commitment to work diligently, to write class notes sincerely, to come prepared with a cumulative understanding of materials covered in all previous classes, and to initiate and participate in constructive class discussion. Anyone facing extenuating circumstances for missing a class is required to copy class notes from a fellow student and to complete assignments by the due dates. Assignments after due dates will not be accepted for credit, but students are required to complete all assignments sincerely even after the due dates since

the exam materials include assignments. It is the responsibility of every student to take comprehensive class notes including questions and answers from fellow students. Examinations will be based on all material covered, which will generally be in the best class notes, and relevant chapters and sections of the textbook. In case some student points out that some examination material is not covered in class or in the relevant sections of the book, the professor will have the discretion to cite such materials noted by any other student and/or the relevant section of the book. It is thus mandatory that students remain attentive in class and take notes very accurately to avoid losing points in examinations. Someone not sure of own note taking skills may ally any other fellow students through mutual understanding.

VI. How to Obtain Best Grades in this Course

To receive the best grades, students need to focus on the following:

1. Complete familiarity with basic financial functions like (i) computation of present values of cash flows discounted with interest rates compounded continuously and at different other frequencies, and (ii) the internal rates of return. These skills must have been acquired in a basic finance course and/or while learning the functions through the handbook of a basic financial calculator like HP-12C. It is imperative that students review this prerequisite stuff thoroughly and carry a financial calculator, if not HP-12C, to every class. The professor will also help you thoroughly understand these basic financial functions through specific computations in the context of problems solved in this course. But, it is only your responsibility to master the prerequisite financial calculations and to not let them stand in the your way to learn fixed income securities.
2. Learn all materials, and presume no topic as trivial. Doubts about some “little” topic can cause accumulated havoc.
3. Take comprehensive class notes including questions and answers from fellow students and the professor.
4. Do not gossip at anytime, especially, when others are asking questions and/or the professor is responding to such questions. Gossiping is a recipe for bad performance in this course. Besides, the professor reserves the right to evict gossiping students from classroom because it is a serious obstruction to learning. Students desperately needing to chat may leave the classroom at anytime.
5. The style of instruction for this course is to build up from the current understanding level of the class. So, the professor may begin discourse on a topic very familiar or easy to students. As a result of such discourse, many students feel overconfident and then become inattentive while the professor is imparting new material, vital for exams, projects and assignments. Rapt attention to and a comprehensive understanding of all covered materials are crucial for success in this course.
6. Pay serious attention to questions and answers, because some questions may lead to new course topics and so the professor’s answer may likely introduce new material that may catch inattentive students unawares.
7. When the professor adopts a different route to clarify the same concept, some students tend to neglect the alternate route because they are “sure” of the concept! But, this can pose problems in solving questions on the same concept but with different given information.
8. Come prepared to every class with a cumulative understanding of the material covered thus far in the course.
9. Mechanical understanding of calculations for solving problems in this course is necessary, but not sufficient. A thorough understanding of concepts as well as ideas is paramount.

This course induces you to think like a decision maker and so you need to fully assimilate and appreciate the thought process behind every solution. After each class and before coming to the next class, you need to ruminate over the ideas and the thought process driving the material covered. Remember that only you can make yourself think.

10. The professor is here to help you achieve the best grade, but it is your answers to questions in tests, homework, and project that determine your grade. Any claim about an understanding of the material without a demonstration through written responses to questions will not translate into a good grade. A standard problem with grading is that it misses some geniuses sometime. But, this being the best method adopted by the universities, your grades will be exclusively based on a written demonstration of your skills. You need to write on your own at home/dorm to practice how to use the new language of fixed income securities. Proper communication is an enormously important in this field of finance, which accounts for 60-70% of all investment banking business in the real world. The professor will help you familiarize with the field jargons, but it is ultimately your responsibility to pick up the language of communication in fixed income securities. What matters in the real world is not just what you know, but how best you can express what you know.
11. The professor's grade distribution for this course has varied from 10% to 50% A's, 50% B's, 0%-40% C's and 0-10% D's. There is no curving. Scores of 90% or more will translate to "A," 80%-89% to "B," 70%-79% to "C," and 60%-69% to "D." Lower grades than "D" are rare because most students who are not confident to secure at least 60% drop out. While the professor will make every effort to help a student get at least a D grade, there is no guarantee about it as there have been cases of failure in this course.

VII. About the Professor

Sankarshan Acharya is a tenured finance professor at the University of Illinois at Chicago. He received Ph.D. in Finance with an award for "excellent performance in doctoral program" from Kellogg Graduate School of Management, Northwestern University. He has earned the Master of Technology in Industrial Management from India's most prestigious Indian Institute of Technology. During his finance professorship at Stern School of Business of New York University, he wrote on optimal bank closure and deposit insurance pricing policies, presented at the American Finance Association meetings and published in the leading journal of the finance field, *Journal of Finance*. His research has sparked a lot of excitement, resulting in invitations from the US Congress to help draft the US bank regulatory law, and from the Board of Governors of the Federal Reserve System for presentations. He has helped the Federal Reserve Board in establishing optimal bank capital standards, and advised the Federal Deposit Insurance Corporation on deposit insurance reforms. His research has been enacted in the US Bank Regulatory Law and is a required reading for American and European bank regulators. He currently teaches Corporate Finance, Options and Futures Markets and Fixed Income Securities. He has been elected to serve the Executive Committee of the College of Business Administration at the University of Illinois at Chicago for six years.

His publications have been extensively used in the real world. For instance, the results from a paper in the *Journal of Finance* on optimal bank reorganization policies and pricing of federal deposit insurance have been adopted into the US bank regulatory law (FDIC Improvement Act 1991). Another paper published in the *International Economic Review* on developing country debt buybacks as signals of a country's creditworthiness was the basis of debt reduction schemes floated for the heavily indebted Latin American countries through what is famously known as "Brady Bonds." [Mr. Brady is a former US Treasury Secretary.] A paper in the *Journal of Finance* on measuring the value of latent information (cited in an American Finance Association Presidential Address) is commonly used in top finance Ph.D. programs and research. A latest paper in the *Financial Analysts Journal* on a new methodology for bond rating points out serious flaws in the current rating norms and how to improve bond rating standards to preclude the catastrophe that led to unprecedented corporate bond defaults in the US history like those issued by World Com and Enron. This paper has received serious attention at all major rating agencies, as indicated by the feedback from the CEOs of those companies.