

# Econ 514: Fixed Income Markets and Quantitative Methods

Fall 2015

MW 4:40 – 5:55pm, Soc Sci 124

Instructor: Mary Beth Fisher

Office hours: T TH 1:30 – 3:00pm, or by appointment.

## Course synopsis

Areas of focus include: The value of money and discounted cash flow concepts, statistics, probability concepts, correlation & regression, understanding risks associated with bonds, and bonds with embedded options, and mortgages and the mortgage markets.

The course begins with a brief overview of the global fixed income markets: classes of fixed income securities, trends in issuance, investor base and risk perspectives. The primary quantitative focus will be on the valuation of fixed income securities and their derivatives – including discounting cash flows, constructing yield curves, calculating duration and convexity, trading strategies, and probabilistic techniques underlying volatility and option pricing. The mechanics and information content of interest rate swaps, corporate credit curves, and the spreads between these and “risk free” interest rate curves will also be covered. The final section of the course will review mortgage and asset-backed securities markets and pricing. Throughout the course we will explore various legal, regulatory and public policy issues that impact the fixed income market.

## Textbooks and other course materials

Fixed Income Securities: Tools for Today's Markets, by Bruce Tuckman and Angel Serrat. Wiley Finance Series; Third Edition (2012).

We will discuss a variety of statistics and data compiled by SIFMA on the US bond and equity markets, available [here](#).

[SIFMA US Capital Markets Quarterly Data Deck](#)

Learning to use Bloomberg is *strongly encouraged*.

Other reading materials will be provided as assigned.

## Exams, assignments and grading

Two in-class exams during the semester, and a final exam. There will be one individual assignment.

Final exam 35%; in-class exams 20% each; individual assignment 25%.

No make-up exams will be given, or late assignments accepted, without a note from your academic dean explaining your absence and requiring the make-up.

## Errata

This class is primarily a lecture course. Although we will have discussions and your participation is greatly encouraged, it will not be explicitly factored into your grade. Class attendance is therefore not mandatory (*round of applause*, I know).

That being said, there are a few caveats.

- The material is difficult, I do not hand out or post comprehensive lecture notes, and attending class is absolutely the best method for test preparation.
- Habitual truancy will not make me inclined to help you cover any deficits outside of class.

All cell phones should be off and put away during class.

## Course Outline

Part I: Overview of the Fixed Income Markets

Part II: Bond pricing – Chapters 1-3, Tuckman and Serrat

- Cash flows, discount factors, present and future value
- Spot, forward and zero coupon rates
- Yield, carry and rolldown, rates of return
- Bond portfolio strategies

### Exam 1

Part III: Interest rate and credit risk – Chapters 4-6, 16 Tuckman and Serrat

- Duration and convexity
- Swaps
- Bond and swap trading strategies
- Bond indentures
- Corporate credit

### Exam 2

Part IV: Financing and liquidity – Chapter 12, Tuckman and Serrat

- Repurchase agreements
- Fed funds, commercial paper, Libor

Part V: Fixed income derivatives and hedging – Chapters 13-15, 18 Tuckman and Serrat

- Interest rate futures
- Interest rate volatility and vol trading strategies
- Bonds with embedded options

### Individual assignment

Part VI: Securitization and public policy – Chapter 20 Tuckman and Serrat

- Securitization
- Mortgage-backed securities

- Other asset-backed securities (credit card, student loan, auto)
- The US government's role in housing finance

## Final Exam

# Duke University's Academic Honor Code

## The Duke Community Standard and Definitions

### I. The Duke Community Standard

Duke University is a community of scholars and learners, committed to the principles of honesty, trustworthiness, fairness, and respect for others. Students share with faculty and staff the responsibility for promoting a climate of integrity. As citizens of this community, students are expected to adhere to these fundamental values at all times, in both their academic and non-academic endeavors.

#### The Pledge

Students affirm their commitment to uphold the values of the Duke University community by signing a pledge that states:

1. I will not lie, cheat, or steal in my academic endeavors, nor will I accept the actions of those who do.
2. I will conduct myself responsibly and honorably in all my activities as a Duke student.

#### The Reaffirmation

Upon completion of each academic assignment, students will be expected to reaffirm the above commitment by signing this statement: "I have adhered to the Duke Community Standard in completing this assignment." [Student Signature]

### II. Definitions

Lying is the expression of a material untruth made with the intent to mislead another or with reckless disregard for the truth of the matter asserted. The material untruth may be uttered or presented, verbally, electronically, or in writing, to another member of the University community (student, faculty or staff). An untruth is material when it relates to or affects in a significant way activities of legitimate concern to the University community.

Cheating is the act of wrongfully using or attempting to use unauthorized materials, information, study aids, or the ideas or work of another in order to gain an unfair advantage. It includes, but is not limited to:

- plagiarism;
  - giving unauthorized aid to another student or receiving unauthorized aid from another person on tests, quizzes, assignments or examinations;
  - using or consulting unauthorized materials or using unauthorized equipment or devices on tests, quizzes, assignments or examinations;
  - using any material portion of a paper or project to fulfill the requirements of more than one course unless the student has received prior permission to do so;
  - intentionally commencing work or failing to terminate work on any examination, test, quiz or assignment according to the time constraints imposed; or
  - failing to adhere to an instructor's specific directions with respect to the terms of academic integrity or academic honesty.
- "Plagiarism" occurs when a student, with intent to deceive or with reckless disregard for proper scholarly procedures, presents any information, ideas or phrasing of another as if they were his or her own and does not give appropriate credit to the original source. Proper scholarly procedures require that all quoted material be identified by quotation marks or indentation on the page, and the source of information and ideas, if from another, must be identified and be attributed to that source. Students are responsible for learning proper scholarly procedure.

The term "assignment" includes any work, required or volunteered, and submitted to a faculty member for review and/or academic credit.

All academic work undertaken by a student must be completed independently unless the faculty member or other responsible authority expressly authorizes collaboration with another.

Stealing is the intentional taking or appropriating of the academic work product of another without consent or permission and with the intent to keep or use the academic work product without the owner's or the rightful possessor's permission.

Responsible and Honorable Conduct means adhering to state and federal laws, residential and academic regulations, and the policies of Duke University as explicated in the Bulletin of Information and Regulations of Duke University.

**III. Students' Obligation to Report Potential Cases of Academic Dishonesty.** Under the Duke Community Standard, students affirm their commitment not to lie, cheat, or steal in academic endeavors, *nor accept the actions of those who do*.

Therefore, upon learning of or witnessing a potential case of academic dishonesty, students are required to provide immediately:

- a signed written statement of the observed behavior to the appropriate faculty member and/or to the Associate Dean for Judicial Affairs (Dean K.C. Wallace, Box 90946, 668-3853); and
- the name or description of the person(s) alleged to have committed the violation.

Students who knowingly do not fulfill this obligation are themselves subject to sanctions.

The following comments are courtesy of Professor Connel Fullenkamp, Director of Undergraduate Studies in the Economics Department. I fully endorse and follow this policy.

**Any kind of academic dishonesty is a Code violation**, including witnessing a Code violation and not reporting it. The most serious type of academic dishonesty is handing in someone else's work and claiming that it is your own. This includes, in the context of essay writing, plagiarism. It also includes collaborating, *even with a student who is not in this course or section*, on any graded work that is supposed to be done independently. All quizzes and exams are to be done independently, as well as all paper writing. I may allow collaboration on other exercises, and if so, I will explicitly state the type and extent that I will allow. If I do not specify, you are to assume that you must work independently.

Yet another type of academic dishonesty is using work that is not original--that is, recycling your own or other students' work from other courses or sections of this course to be handed in to meet the requirements of this course, or using one piece of work to satisfy the requirements in two different courses simultaneously. In the latter case, I may allow this **if** you clear this with me ahead of time.

I believe that you are honest. Nevertheless, if I see evidence of any academic dishonesty, I will confront it according to the procedures described in the Bulletin of Duke University.