Antti Suhonen

Spring 2022

28E00900 FIXED INCOME

FINAL SYLLABUS

Please note: The syllabus is based on current (February 2022) COVID guidance from the Finnish government and Aalto university management. The expectation is that we will revert to on-campus teaching and exams by the fourth period. Should the guidance change, the course arrangements will be adjusted accordingly.

Overview and Objectives:

The course covers a wide range of fixed income markets and instruments and introduces tools employed by market practitioners for valuation, analysis and risk management.

Topics discussed include the global fixed income market structure, key instruments traded in both government and corporate bond markets, derivatives such as forwards, futures, and swaps, interest rate modelling, risk management, as well as the impact of macroeconomic events and central bank actions on fixed income markets.

The objective of the course is to give participants a solid understanding of the fundamental concepts behind valuation and risk management of key fixed income instruments, to understand the practical applications of such concepts, and to be able to describe and analyze the current state of fixed income markets. The course is aimed especially at students interested in a career in banking, financial services, asset management, corporate financial management, or in the academia.

Lecturer:

Antti Suhonen (antti.suhonen@aalto.fi)

Office hours: By appointment, please email to arrange meeting.

Teaching Assistant:

Aleksi Pitkäjärvi (aleksi.pitkajarvi@aalto.fi)

Office hours: After the exercise sessions or by appointment (room V314)

Lectures:

Tuesdays 1.3. – 22.3. and 5.4. 10.15-11.45, 29.3. 10.15 – 14.00

Wednesdays 2.3 – 30.3. 13.15-17.00. **No lecture on Wednesday 6.4.**

All lectures (except the visiting lecture on March 30th – see Note 5 below) are held in hall V002.

Notes:

1. The lectures start on **Tuesday, March 1st**

2. Please remember to **sign up** if you intend to take the course.

3. The **Wednesday lectures** will run from 13.15 to 14.45 and will be followed (around 15.00) by an **exercise session** (see exceptions in 4. and 5. below). This session will consist of further worked examples of formulae and other quantitative concepts covered during the week's lectures, as well as a review of model solutions to previous week's Graded Assignment. Participation to the exercise sessions is highly encouraged, as they form part of the syllabus based on student feedback from previous years' classes. At a minimum, one member of each team should aim to attend the sessions each week and share the information with team-mates.

4. The **final exercise session** will take place exceptionally on **Tuesday, March 29th** at 12.00 Noon (following the lecture).

5. The lecture on **Wednesday, March 30th** will take place at Nordea Markets in Vallila,

6. There is **no lecture** on Wednesday, April 6th.

Exams:

11.4. and 23.5.

The exams will be traditional paper exams on campus.

Prerequisites:

This is not a mathematical finance course, however fixed income is an inherently quantitative subject and students should have passed **28C00450 Derivatives and Fixed Income** prior to taking this course, or have otherwise acquired working knowledge of calculus, probability and regression analysis as well as knowledge of common derivative products (forwards, futures, and options).

Workload:

Please see the course structure later in this document. This is an advanced level course with commensurate workload. You should expect to spend a reasonable amount of time on the coursework and exercises and plan the rest of your schedule and commitments accordingly.

Preparation:

Students are expected to read the relevant chapters (where applicable) prior to attending the lectures.

The lectures and assignments will also include discussion on topical issues in global fixed income markets. Some useful resources include:

www.ft.com

www.bloomberg.com

www.reuters.com

www.cnbc.com

www.economist.com

http://online.wsj.com/mdc/public/page/mdc_bonds.html

The course will start with an overview of global fixed income markets. Students are expected to be familiar with the monetary policy objectives and tools of major central banks – the following resources provide a useful recap and should be read prior to the first lecture.

www.federalreserve.gov (sections on Fed's purpose and functions, monetary policy tools)

www.ecb.europa.eu (monetary policy section)

The following link gives a synopsis of some of the new monetary policy tools that have been introduced since the global financial crisis.

https://www.economist.com/schools-brief/2013/09/21/controlling-interest

For more recent summaries on global fixed income markets, please read also the following:

- The eternal zero, The Economist, Oct 8th 2020 https://www.economist.com/special-report/2020/10/08/the-eternal-zero
- https://www.bis.org/publ/qtrpdf/r_qt2112.pdf (p. 7-17)
- How high will interest rates go? The Economist, Feb 5th, 2022 https://www.economist.com/leaders/2022/02/05/interest-rates-may-have-to-rise-sharply-to-fight-inflation

Required reading:

Tuckman, B. & Serrat, A., 2012, *Fixed Income Securities: Tools for today's markets* (3rd edition), John Wiley & Sons, Inc.

Other articles assigned during lectures.

Optional reading - academic:

Hull, J., 2011, *Options, Futures and Other Derivatives*. An excellent primer and reference book. The sections on credit and credit derivatives are a useful companion to the Tuckman book.

Veronesi, P., 2010, *Fixed Income Securities. Valuation, Risk, and Risk Management*. This textbook has a more rigorous quantitative approach and covers term structure modelling techniques in greater depth and detail than Tuckman & Serrat.

Optional reading - applied:

Ilmanen, A., 2011, *Expected Returns.* Good summary of theories and evidence on risk premia across asset classes, strategies and investment styles.

Lewis, M., 1989, *Liar's Poker*. A classic account of investment banking in the 1980's and the early days of the US mortgage bond market. Still very entertaining.

Lewis, M., 2011, *The Big Short*. A dramatized account of events leading up to the financial crisis of 2007-9. Alternatively, see the movie version (caution – both contain strong language).

Lowenstein, R., 2001, *When Genius Failed*. A great review of one of the biggest hedge fund failures of all time, gives a perspective on the limitations of financial models, arbitrage and risk management.

Requirements:

1. Lectures
2. Weekly Graded Assignments
3. Course Project
4. Written exam. The exam will be based on
    a. Lectures and handouts
    b. Additional reading referenced during the lectures
    c. Selected chapters from the textbook

Grading:

- Graded Assignments: 25 credits
- Course Project: 25 credits
- Final exam: 50 credits (minimum 20/50 credits required)
- Max. 5 bonus credits may be awarded for active class participation
- Max. 5 bonus credits may be awarded for exceptional work in Course Project
- The Graded Assignments and Course Project will be completed in teams. Each member of a team will receive the same grade
- Minimum aggregate credits required for pass: 50/100

Graded Assignments and Course Project:

The structure is as follows:

1. Graded Assignments
    - Test questions following lectures 2, 4, 6 and 8
    - The questions will consist of short exam-type problems
    - Credits available for each Graded Assignment to be announced
    - Assignments will be posted on the course home page in MyCourses following the relevant lecture
    - Deadline for handing in the assignments is 10AM on the following Tuesday (i.e. March 8th for Assignment 1, March 15th for Assignment 2, March 22nd for Assignment 3 and March 29th for Assignment 4)
    - Format: Excel spreadsheet, to be submitted via MyCourses by one member of each team
    - Model solutions will be presented at the exercise session following each submission deadline day and posted on the course home page afterwards. The exercise session should be your main venue for discussing the assignments, however you can also contact Aleksi Pitkäjärvi if you would like to review the problems / solutions in more detail.

2. Course Project
    - See description below
    - Deadline for handing in the Course Project is March 31st

Teams

The Graded Assignments and Course Project will be done in teams. Maximum team size is four students, and the provisional maximum number of teams is 20. I will reserve the right to merge smaller teams in the interest of course logistics and effective learning.

https://docs.google.com/spreadsheets/d/1QzJtbN3rvPg3R6H-bFJBki0_bMZn4LtJs5np6LF0aQs/edit#gid=0

Course Project

The Course Project involves the creation of a trade or product idea, or the analysis of an existing research paper, fixed income market segment, product, or trade idea. The trade or product should be relevant to the subject matter of the course, which means that you can look at anything in the world of rates, credit, securitization, lending and interest rate or credit derivatives. It could involve investing, trading, financing or hedging as an example.

Your submission should cover the following aspects:

1. Description of the idea and the opportunity
2. Macroeconomic or financial market context, including historical performance / trends
3. Brief summary of academic research on the product / idea
4. Brief summary of practical (market) research on the product / idea
5. Analysis of the opportunity, practical implementation and the risks to the product / idea. What assumptions are made, and how could they be challenged?

The purpose of the assignment is not to re-invent the wheel – the world is full of financial innovation, lot of it useful and some less so. Do not hesitate to improve on an existing idea, product or service – but please ensure you give credit for where it is due by clearly acknowledging your sources and references.

Lectures and course outline:

1.3. Introduction to the course, housekeeping issues, overview of global fixed income markets and instruments, market conventions

Pre-reading: Assigned articles (see section "Preparation" above), Textbook chapter 0 and 15 (section on Fed Funds)

2.3. Yield to maturity, compounding conventions, PnL decomposition, monetary policy, and central banks. Exercise session from 3PM onwards.

8.3. Discount factors, zero coupon, forward, and par rates, spreads

Chapters 1 and 2

9.3. Duration, DV01, convexity. Exercise session from 3PM onwards.

Chapters 3 and 4

15.3. Multi-factor risk metrics, evolution of interest rates, and the term structure

Chapters 5, 6, 8

16.3. Interest rate derivatives. Exercise session from 3PM onwards.

Chapters 12-16

22.3. Interest rate options and term structure models

Chapters 7, 9, 10, 11, 18

23.3. Credit markets: Corporate bonds, and Credit Default Swaps. Exercise session from 3PM onwards.

Chapter 19; Ch. 23-24 of Hull recommended

29.3. Debt capital markets and the changing landscape of corporate borrowing. Exercise session from Noon onwards.

30.3. Guest lecture hosted by Nordea Markets

- Fixed income market outlook
- Recent structural changes in the fixed income markets
- Practical introduction to Fixed Income trading and Debt Capital Markets
- Introduction to various fixed income job functions in an investment bank

5.4. Course Project presentations, exam information, feedback, and discussion.

6.4. No lecture

Scholastic honesty and academic integrity

Highest standards of scholastic honesty are expected of participants to the course. Examples of scholastic dishonesty include but are not limited to co-operation on assignments and case studies between groups, sharing of answers or other means of collusion during the final exam, and other plagiarism of other people's work (whether sourced from the Internet or from fellow students).

By submitting course work and exam answers you confirm that you have complied with the University's Code of Academic Integrity:

https://into.aalto.fi/display/ensaannot/Aalto+University+Code+of+Academic+Integrity+and+Handling+Violations+Thereof