Math 9814 / Fall 2018 / Spruill

VC 9-130 / Tuesdays 6:05-9:00pm

Introduction to Financial Instruments

Course Overview

Purpose:

This survey course builds the intuition for, and describes the mathematical foundation of, methods to price, hedge, and measure the risk of individual financial instruments across asset classes. You will gain an understanding of what purpose these instruments serve, how they are related to other instruments, what factors influence their value, and to some degree how they are traded. More broadly, you will see the fundamental importance (and, in some cases, the limitations) of the no-arbitrage assumption in modern finance, and will gain an understanding of other assumptions upon which the field commonly relies.

The focus of the course is not primarily mathematical rigor; nor is it programming or software design. Nevertheless, these things—addressed more fully in your other courses—will be integrated in presentations of key concepts, and in your assignments.

Instructor:

Bob Spruill will teach the course. He can best be contacted through QuantNet, where his screen name is bob.

The instructor will be available on a limited basis for individual meetings, primarily after class.

TA's:

Bledar Kulemani (bledarkulemani@gmail.com)
Avinash Oza (avioza@gmail.com)

Course Texts:

Class notes posted on QuantNet

Assignments:

- Weekly group homework consisting of problems and programming assignments (~50%)
- Final exam (~50%)

Homework Details:

Each week, a homework assignment including some exercises, coding, or derivations will be given. The assignment will be posted concurrently with the week's class notes, and will be due by the following class meeting. Homework must be completed and turned in by each homework group. Submissions that are 1 week late or less will receive reduced grades; submissions will not be accepted more than 1 week late, except by special arrangement with the instructor and TA.

All code submitted must be in Excel VBA. Code should be written by each homework team and should be submitted in its entirety to the TA each week, in a format where the TA can not only inspect the code but can easily run it—e.g., by modifying inputs—to evaluate its function.

Homework may be discussed collaboratively through QuantNet, including sharing of results. However, each group's submitted work must be its own—no copy / pasting or sharing of code between groups is permitted.

Schedule of Topics:

Please note that due to business travel, one or more of these dates may need to be changed. I will endeavor to keep to the schedule, or provide as much notice as possible if I cannot.

Class 1 (8/28)
Interest, Yield, Duration
New Instruments: Zero-Coupon Bond, Fixed-Coupon Bond
Notes: Chapters 1 and 2

Class 2 (9/4)
Floaters, IR Swaps, Credit Part 1
New Instruments: FRA, FRN, Vanilla Fixed-Float Swap
Notes: Chapters 3 and 4

Class 3 (9/25)
Credit Part 2
New Instruments: CDS, CDS Index
Notes: Chapters 4 and 5

Class 4 (10/2)
Forwards, Futures, Options
New Instruments: Equity Forward, Bond Forward, Commodity Futures, Equity Option
Notes: Chapters 6, 7, and 8

Class 5 (10/9)
Greeks and Option Strategies
New Instruments: None

Notes: Chapters 9 and 10

Class 6 (10/16)
Options on FX, Futures, and Interest Rates
New Instruments: FX Forward, Vanilla FX Option, Options on Futures, Caps/Floors, Swaptions
Notes: Chapters 12 and 13

Class 7 (10/23)
In-class review, preparation for final
New Instruments: None
Notes: None