Fixed Income Instruments

module 5, academic year 2021-2022

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Course description

The course is designed to provide a framework for the practical analysis of fixed income instruments. The primary focus is to gain skill and knowledge on calculating bond and swap prices, understanding swap and zero curves, general hedging practices, and some general principles of the credit analysis.

Course requirements, grading, and attendance policies

Attendency. No formal attendance policy is applied to the course, however, the attendance of each class is expected.
Prerequisites. Familiarity with basic financial products and derivatives is desired.
Grading. The course grade is determined by results of home assignments and final exam:

- (40%) Home assignments. Total 4 (four) home assignments are required to be completed thought-out the course.
- (60%) Final exam. The exam covers all topics from the course. The minimum passing threshold of the exam is 40% out of 100%.

The total weighted and adjusted passing score is 40% out of 100%.

Course contents

Class		Comments
1	Intro to debt instruments and Bond fundamentals	• Types and features of debt securities • Bond properties and characteristics • Bond's math (yield, duration, convexity, etc.) • Bond portfolio's math (yield, duration, etc.)
2	Bond fundamentals (cont.)	• Bootstrapping zero-coupon (spot) and forward curves • Application of hedging • Forward and future bond prices • REPO and reverse REPO application
3	Money Market	• Interest rates: spot and forward rates • FRA (forward rate agreement) • Interest rate parity • Exchange rates: current and forward
4	Interest Rate Swaps	• IRS valuation basics • Bootstrapping swap zero curve • Amortizing IRS • Interest Risk management of IRS • IRS unwinding mechanics

Class		Comments
5	Asset Swaps	• Asset Swap valuation basics • Yield/Yield and Par/Par ASW • Application of ASW spread for measuring bond credit risk
6	Credit Default Swaps	• Default Rates and Recovery Rates • Quantifying credit risk: probabilities of default, exposure at default, loss given default • CDS valuation basics • Bootstrapping default probabilities
7	Course overview and fixed-income market overview	• Course overview • Debt market structure overview • What else to learn: commodity instruments, non-linear instruments (inflation products, structured products)

Description of course methodology
Students need a laptop and Excel to perform exercises for every lesson in the course.

Course materials

Required textbooks and materials

1. Barbara S. Petitt. Fixed Income Analysis (4th Edition)
2. F.J. Fabozzi. The Handbook of Fixed Income Securities, McGraw Hill (7th Edition)
3. Donald J. Smith. Bond Math: The Theory Behind the Formulas (2nd Edition)
4. John C. Hull. Options, Futures, and Other Derivatives (7th Edition)

Additional materials

1. Darrell Duffie, Kenneth J. Singleton. Credit Risk: Pricing, Measurement, and Management
2. Jiri Witzany. Credit Risk Management: Pricing, Measurement, and Modeling

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.