IB9X80
Fixed Income and Credit Risk

Professor Philippe Mueller

Warwick Business School
Spring Term

▷ Administrative details
Instructor
Schedule
Assessment
Readings
Topics

Administrative details

Course overview

- Introduction: debt securities, markets, institutions (Topics 1, 7).
- Analytics of fixed income markets (Topics 2, 3, 4).
- Fixed income derivatives (Topics 4, 5, 9).
- Credit risky instruments (Topics 7, 8, 9, 10).
- Credit risk models (Topics 7, 8).
- Central banking and monetary policy (Topics 1, 6, 9, 10).

Contact information

Administrative details
▷ Instructor
Schedule
Assessment
Readings
Topics

- Lecturer:

  Professor Philippe Mueller

  philippe.mueller@wbs.ac.uk
  https://sites.google.com/site/philippebmueller/

Schedule

Administrative details
Instructor
▷ Schedule
Assessment
Readings
Topics

- 1h in-person lecture, 1h in-person seminar, plus pre-recorded content.
- Pre-recorded lectures to be uploaded on Mondays the latest.
- Lecture: TBC
- Seminars: TBC

Assessment and additional information

Administrative details
Instructor
Schedule
▷ Assessment
Readings
Topics

- Class test (10% of the final mark): in week 9 (TBC).
- Group project (20% of the final mark, 5% are allocated based on peer assessment): Empirical analysis of data submitted in the form of a written report.
- Final Exam (70% of the final mark): Two-hour long written examination.
- Calculators allowed for the exams.
- Lecture notes and additional course material will be posted on `my.wbs`.

Recommended readings

- **Pietro Veronesi: Fixed Income Securities: Valuation, Risk, and Risk Management, John Wiley & Sons, 2010**
- **Angel Serrat and Bruce Tuckman: Fixed Income Securities: Tools for Today's Markets, John Wiley & Sons, 3rd edition, 2011**
- **Anthony Saunders and Linda Allen: Credit Risk: Measurement In and Out of the Financial Crisis, John Wiley & Sons, 3rd edition, 2010**

Additional textbooks:

- Suresh M. Sundaresan: *Fixed Income Markets and Their Derivatives*, Academic Press, 3rd edition, 2009
- Frank Fabozzi: *Bond Markets, Analysis and Strategies*, Prentice Hall, 7th edition, 2010
- Zvi Bodie, Alex Kane and Alan Marcus, *Investments*, McGraw Hill, 10th edition, 2014
  Can be helpful for basic material

Course topics

Administrative details
Instructor
Schedule
Assessment
Readings
▷ Topics

- Topic 1: Overview of debt markets
- Topic 2: Basics of fixed income securities
- Topic 3: Interest rate risk management
- Topic 4: Interest rate derivatives
- Topic 5: Securitization and MBS
- Topic 6: Monetary policy and interest rates
- Topic 7: Introduction to credit risk and ratings-based models
- Topic 8: Structural and reduced form models
- Topic 9: Credit derivatives and ABS
- Topic 10: The credit crisis

Topic 1: Overview of debt markets

- Overview of debt contracts and classification of debt securities
- Players and their objectives
- The complexity of debt markets
- Government debt markets
- The money market
- The repo market
- MBS and ABS markets
- Fixed income derivatives markets
- No-arbitrage and the law of one price
- Risks of debt securities

Supplementary readings:

- Veronesi, Chapter 1.
- Tuckman and Serrat, pages 1-46.
- Sundaresan, Chapters 1, 4, 5.

Topic 2: Basics of fixed income securities

- Discount factors and interest rates
- Compounding
- Term structure of interest rates
- Zero coupon and coupon bonds
- Bootstrapping
- Yield to maturity
- Floating rate bonds
- Quoting conventions

Supplementary readings:

- Veronesi, Chapter 2.
- Sundaresan, Chapter 2, 8, 9.

Topic 3: Interest rate risk management

Administrative details
Instructor
Schedule
Assessment
Readings
▷ Topics

- ☐ Variation in interest rates and bond price volatility
- ☐ Duration
- ☐ Portfolio immunization
- ☐ Convexity
- ☐ Non-parallel shifts of the yield curve

Supplementary readings:

- Veronesi, Chapters 3, 4.
- Sundaresan, Chapters 7, 8, 9.
- Fabozzi, Chapters 4, 5.

Topic 4: Interest rate derivatives

Administrative details
Instructor
Schedule
Assessment
Readings
▷ Topics

- Forward rates and forward discount factors
- Forward rate agreements and forwards
- Swaps
- Interest rate futures
- Interest rate options

Supplementary readings:

- Veronesi, Chapters 5, 6.
- Sundaresan, Chapters 14, 15, 16, 17.

Topic 5: Securitization and MBS

- Securitization
- Mortgages and the prepayment option
- Mortgage-backed securities (MBS)
- Collateralized mortgage obligations (CMO)
- Hedging of MBS portfolios

Supplementary readings:

- Veronesi, Chapter 8.
- Sundaresan, Chapter 12.
- Fabozzi, Chapters 10, 11, 12, 15.

Topic 6: Monetary policy, inflation, and interest rates

- Roles of central banks
- Tools of monetary policy
- The Fed funds rate
- Inflation risk and economic activity

Supplementary readings:

- Veronesi, Chapter 7.
- Sundaresan, Chapters 3, 5.
- Federal Reserve Board, 2005, *Monetary Policy and the Economy.*

Topic 7: Introduction to credit risk and ratings based models

- ☐ Introduction to credit risk
- ☐ Ratings based models
- ☐ Transition probabilities
- ☐ Recovery rates

Topic 8: Structural and reduced form models

Administrative details
Instructor
Schedule
Assessment
Readings
▷ Topics

- ☐ Merton model
- ☐ KMV methodology
- ☐ Portfolio credit risk
- ☐ Reduced form models

Topic 9: Credit derivatives and asset-backed securities

Administrative details
Instructor
Schedule
Assessment
Readings
▷ Topics

- Credit default swaps (CDS)
- Securitization
- Collateralized debt obligations (CDOs)

Topic 10: The credit crisis

Administrative details
Instructor
Schedule
Assessment
Readings
▷ Topics

- Securitization and the housing bubble
- The credit crisis of 2007–2009
- Amplification mechanisms and monetary policy reactions

Supplementary readings:

- Brunnermeier, Markus K., 2009, "Deciphering the 2007-08 Liquidity and Credit Crunch," *Journal of Economic Perspectives* 23, 77–100.
- Gorton, Gary, 2008, "The Panic of 2007," in *Maintaining Stability in a Changing Financial System*, Proceedings of the 2008 Jackson Hole Conference, Federal Reserve Bank of Kansas City.