Fixed Income Securities
Syllabus
Department of Accounting
Graduate Institute of Finance & Banking
National Cheng Kung University
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Classes: Wed. 2-4

Purpose:
"Fixed-income securities" is a term for broader definition of bonds. Fixed-income securities include all types of financial assets such as bonds, convertible bonds, mortgage-backed securities, collateralized debt obligations, floaters, and the derivatives whose payoffs depend on these securities. Modern financial managers and investors are getting more subject to the risks associated with fixed-income securities: interest rate risk, credit risk, liquidity risk, etc, in the dynamic integrated global financial markets. Knowledge of traditional investment tools such as time deposits, stocks, and mutual funds is not enough in such an environment. The subprime mortgage crisis in 2007 causes CEOs of investment banks to step down. Dow Jones Industrial Average has plummeted by more than 20% since then. On September 15, 2008, the fourth largest investment bank in the U.S., Lehman Brothers, filed for Chapter 11 bankruptcy in Manhattan Court in New York. DJIA fell by 4.42% on the single day.

The purpose of this curse is to provide students the basic ideas in fixed-income securities. Other than understanding the fixed-income securities, three functions are to be emphasized: pricing, risk management and portfolio management. However, materials covered are only introductory, and students who is interested in these areas should read more related articles in academic journals or professional magazines.

Software:
EViews, Excel, SAS or Matlab, etc. are helpful for FIS analysis.

Required textbook:
2. Fixed-income securities course pack
Course outline:

Basics:

- Introduction (Ch.1, CP.1: Background to the 2007 financial crisis, Goodhart, 2008)
  - The instruments, the players and the rules (CP.2)
- Bond pricing (Ch.2)
  - Yield to maturity
  - Floaters and inverse floaters
  - Synthetic bonds: arbitrage and pricing (CP.3)
  - Replicating bond portfolios using Excel
  - Using linear programming to search for arbitrage opportunities
- Interpreting bond yields (Ch.3)
- Bond price volatility: duration (delta), convexity (gamma) and theta (Ch.4, CP.4)
- Bond yields and term structure of interest rates (Ch.5, CP.5)
  - Zero coupon bonds and spot rate
  - Treasury and agency securities markets (Ch.6)
  - Interest rate quotes in U.S. fixed income markets (CP.6)
- Corporate debt instruments (Ch.7, CP.7)

Securitization:

- Residential mortgage loans (Ch.10)
- Mortgage pass-through securities: Residential MBS and commercial MBSs (Ch.11, Ch.13)
- Collateralized mortgage obligations (CMOs) (Ch.12)
- Asset-backed securities (Ch.15)
- Collateralized debt obligations (CDOs) (Ch.16, CP.8)

Derivatives:

- Analysis of bonds with embedded options (Ch.18)
- Convertible bonds (Ch.20)
- Interest rate futures and options (Ch.27, 28, CP.9)
- Interest rate swaps and agreements (Ch.29)
- Credit derivatives (Ch.30)

Mathematical modeling:

- Fitting the yield curves (CP.10)
- Vasicek and Cox, Ingersoll and Ross term structure models (CP.11), Estimating one-factor CIR model with EViews (CP.14)
- Credit risk modeling: KMV model (Ch.22, CP.12), Comparative analysis of current credit risk models (Crouhy, 2000, JBF) (CP.13)

Grade:  
- Mid-term Exam 30%  
  - Final Exam 30%  
  - Assignments 30%  
  - Participation 10%