

Introductory Finance

Introduction

Main functions of financial markets
market/time/risk transfers between economic agents.

CHAPTER I. Basic notions

1. Classical products. Firms financing

stocks, indices, bonds, zero-coupon bonds,
interest rates,
primary/secondary market,
risks of stocks/bonds

2. Interest rates

3. Future and present value

1. **Future value**, capitalisation
compounded interest rates: discrete time, m periods per year, limit when $m \rightarrow \infty$
continuous compounding (as a limit case or directly in continuous time)
2. **Present value, pricing of a future cash flow**
 - a. **Deterministic flow**
present value today of a "risk-free asset" (in discrete time, in continuous time), ex: annuities
 - b. **General case: stochastic flow**
risk aversion, utility function, risk premium.
3. **Return**

CHAPTER II. Bonds and term structure of interest rates

1. Bonds prices, yields, and duration

Coupon rate, dirty/clean price, accrued, current yield, yield-to-maturity, duration.

2. Term structure of interest rates

Risk-free yield curve: Yield curve building, Main patterns and interpretation
Credit risk: default risk, rating, spreads.

3. Determinants of bond prices / risk factors

- a. Sensitivity to the reference yield curve deformations: translations (first 2 order terms, convexity), and other deformations (Nelson and Siegel model).
- b. credit risk
- c. Other risks (inflation, risk of call, reinvestment...).

4. Non-standard bonds

Floating-Rate Bonds, inflation-indexed bonds, convertible bonds...

Chapter III Derivatives

1. Description and use

1. **Forward contracts** definition, underlying assets list, examples of use for hedging, payoff,...
2. **Future contracts** aim, standardization, Clearinghouse, margin calls
3. **Options** call, put, European/American, payoff, exotic options.
Example: hedge of a currency risk.

2. Pricing assumptions and arbitrage argument

Assumptions, short selling, arbitrage opportunity, arbitrage argument.

- Applications:
1. Call-put parity
 2. Floating Rate Bond pricing.

3. Forward prices computation

on a security that provides no income, a known cash income (discrete or continuous),
on a commodity, then general result (cost of carry).
Contango/backwardation, convenience yield.
Example: currency forward rate, bonds futures.

4. Forward interest rates

5. Swaps

Interest rate swaps, currency swap, credit default swaps.

6. Options: some elements

Option prices properties, why a model of the process of the underlying asset price is needed.
Basic combinations of options.

Objectifs: description des principaux actifs financiers et étude de leurs motivation, évaluation et risque.

Contenu du cours:

Chapitre 1. Notions de base

Marchés, actions, obligations, indices, et leurs risques.

Taux d'intérêt, capitalisation, évaluation d'un cash-flow futur, cas aléatoire, aversion au risque.

Chapitre 2. Obligations et courbes de taux

Obligations : pricing, yield-to-maturity, duration.

Courbes de taux, construction, interprétation, risque de crédit, ratings, spreads.

Facteurs de risque : sensibilités aux déformations de la courbe de taux (duration, convexité, modèle de Nelson et Siegel), autres risques.

Chapitre 3. Produits dérivés

Description et utilisation : Forwards, Futures, Options.

Hypothèses de pricing et évaluation par arbitrage.

Calcul des prix forwards en fonction du coût de portage, formes de la courbe forward, notion de convenience yield.

FRA, taux forward instantané. Swaps, CDS.

Some elements of options pricing: modèle à une période.

Références:

Financial markets, institutions, and money. F.S. Mishkin

Portait-Poncet *Finance de marché - Instruments de base, produits dérivés, portefeuilles et risques.*

Fixed-income Securities. Valuation, Risk Management and Portfolio Strategies. Lionel Martellini, Philippe Priaulet, and Stéphane Priaulet.

The handbook of fixed income securities, Fabozzi, 4th edition; ed: Irwin.

Options, futures, and other derivative securities, J. Hull, Prentice-Hall (2018: 10th ed).