ECONOMÍA FINANCIERA Y GESTIÓN DEL RIESGO

ECON 4510

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Fechas: 28 de Junio al 13 de Julio
Horario: Junio 28 a Julio 6 de 9:00 a.m. a 12:00 m
Julio 9 a Julio 13 de 8:00 a.m. a 12:00 m
Salón: G-101 (28 de junio al 6 de julio) **- SD-801** (9 al 13 de julio)

1. Objectives

This course serves two functions. First, it provides students with a thorough coverage of the principles of asset pricing and the basics of risk management. It introduces students to advanced finance theory that forms the foundation of m odern finance. Second, the course offers students with hands-on experience by using computable algorithms to measure market and credit risk of portfolios of several different instruments.

The course is divided into two parts. The first pa rt is mostly theoretical and provides the econom ic foundations of financial economics: the general equilibrium model with incomplete markets, asset pricing of contingent claims (options, futures, etc.), welfare theorems, bankruptcy, financial stability, etc.

The second part deals with basic m ethods for quantifying and managing market and credit risk of several instruments (stocks, b onds, personal credits, etc). A particular emphasis will be placed on Bayesian techniques for asset alloca tion and risk m anagement. For the second pa rt of the course we'll have one hour of individual hands-on com putational experiments using excel or any other soft ware that students are knowledgeable. We'll work in R but students are welcome to use any software they wish.

Course Lecturers

There will be a total of 11 lectures.

- First 6, three hour lectures: Dimitrios Tsomocus. : June 28, 29, July 3, 4, 5 and 6.
- Next 5, four hour lectu res: Each lecture will be a 2.5 hours theory lecture and then a 1.5 hour practical computational lecture.

Assessment Method

There will be two problem sets and two final exams: one problem set and one final exam after each part. The problems set (to go) and final exam (in class) of Professor Tsomocus will be theoretical. The problem set and final for Professor Riascos will be practical computational problems (to go).

References

Part I: Tsomocus

- T. Copeland and J. Weston (1992), Financial Theory and Corporate Policy, Addison Wesley. A good mixture of theory and evidence.
- J-P Danthine and J. Donaldson (2002), Intermediate Financial Theory, Prentice Hall
- C.- F Huang and R.H. Litzenberger (1988), Foundations of Financial Econom ics , Prentice Hall
- J. Hull (2003), Options, Futures and Other Derivatives, Prentice Hall.
- J. Ingersoll (1987), Theory of Financial Decision Making, Rowman and Littlefield
- S. E. Shreve (2004), Stochastic Calculus for Finance I: The Binom ial Asset Pricing Model, Springer.
- S.F. Le Roy and J. W erner (2001), Principles of Financial Economics, Cambridge University Press.

Part II: Riascos

- [R] Riascos, A. (2012). Lecture Notes and Presentations.
- [Ch] Christoffersen, P (2003). Elements of Financial Risk Management. Academic Press.
- [L] Luenberger, D (1998). Investment Science. Oxford Universidty Press.
- [M] Meucci, A (2003). Risk and Asset Allocation. Springer Finance.
- [QRM] Mc Neil, J. Frey, R: AND P. Em brechts (2005). Quantitative Risk Managem ent. Springer Finance.

Program

Part I

- **LECTURE # 1, 2 : Equilibrium in security markets**
  - Consumption-Based Security Pricing / Lucas Model
  - First Pass at the CAPM
  - Equity Premium Puzzle
  - Complete vs. incomplete markets
  - Representative vs. heterogeneous agent models

Readings:

- Le Roy and Werner, ch. 14 and 15
- Danthine and Donanldson, ch. 9
- Lucas, R. (1978), ``Asset Prices in an Exchange Ec onomy'', Econometrica, Vol 46 (6), pp 1429-1445

- Mehra, R. and E. Prescott (1985) ``The Equity Premium: A Puzzle", Journal of Monetary Economics, Vol. 10, pp 335-359
- Weil P. (1992) ``Equilibrium asset prices with undiversifiable labor income risk", Journal of Economic Dynamics and Control Vol. 16, pp. 769-790

- **LECTURE # 3, 4 : General Equilibrium with Incomplete Markets**

    - State prices and risk-neutral probabilities
    - Spanning
    - Constrained inefficiency
    - Modigliani and Miller
    - Effectively Complete Markets

Readings:

- Geanakoplos, J.D. 1990. "An Introduction to General Equilibrium with Incomplete Asset Markets," *Journal of Mathematical Economics*, 19:1-38.
- Le Roy and Werner, ch. 5, 6, 16.1-16.7
- Ross, S.A. 1976. "Options and Efficiency," *Quarterly Journal of Economics*, 90: 75-89

- **LECTURE # 5: Options Pricing, C.A.P.M and A.P.T**

    - Binomial Asset Pricing Model
    - Options
    - Dynamic completion of the markets
    - Cox-Ross-Rubinstein
    - Radom-Nikodym Derivative Process
    - Exotics
    - Numerical Procedures

Additional readings:

- Hull, ch. 8-10, 18
- Shreve, ch. 1 and 3
- Cox, J., Ross S.A. and Rubinstein, M. 1979. "Option Pricing: A Simplified Approach," *Journal of Financial Economics*, 7: 229-63
- Polemarchakis, H.M., and Bon-Il Ku.1990. "Options and Equilibrium," *Journal of Mathematical Economics*, 19:107-112
- Portfolio theory
- Mutual fund, SML, efficiency theorem
- Factor pricing
- A.P.T.

Additional readings:

- Geanakoplos, J. and Shubik M. 1990. "The Capital Asset Pricing Model as a General Equilibrium with Incomplete Markets." *The Geneva Papers on Risk and Insurance Theory* , 15(1): 55-71

- Huberman, G. 1982. "A Simple Approach to Arbitrage Pricing Theory," *Journal of Economic Theory*, 28: 183-91.
- Markowitz, H.M. 1952. "Portfolio Selection," *Journal of Finance*, 7:77-91
- Mossin, J. 1965. "Equilibrium in a Capital Asset market," *Econometrica*, 34(4):768-783.
- Sharpe, W.F.1964. "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk," *Journal of Finance*, 19(3):425-442.
- Tobin, J. 1958. "Liquidity Preference as Behaviour Towards Risk," *Review of Economic Studies*, 26:65-86.

LECTURE # 6: Exam (three hours)

Part II

- **LECTURE # 1: Elements of Risk Theory**
    - Basic model
    - Examples
    - Conditional and non conditional distributions
    - Risk Measures
    - Backtesting
    - Risk aggregation

  Readings:

  [R]. Notas de clase.

  [QRM]. Chapter 1 and 2.

- **LECTURE # 2: Measuring Market and Credit Risk**
    - Application I: Stocks portfolio
    - Bonds II: Bonds portfolio
    - Mixture models
    - CreditRisk+

  Readings:

  [R]. Lecture Notes.

  [L]. Chapters 3, 4 and 5.

- **LECTURE # 3: Portfolio Optimization I**
    - Markovitz portfolio theory.

- Resampled efficient frontier.
- Bootstrap estimates of performance.

Readings:

- [R]. Lecture notes.
- [M]. Chapter 6.

- **LECTURE # 4: Bayesian Techniques**

  Readings:

  [R]. Lecture notes.

- **LECTURE # 5: Portfolio Optimization II**

  - Introduction to the Bayesian approach to portfolio selection.
  - The Black-Litterman model.
  - Shrinkage estimators.
  - Full Bayesian approach.

  Readings:

  - [R]. Lecture notes

Nota:
La nota definitiva se aproximará al múltiplo de 0.5 más cercano de acuerdo a la siguiente regla: 2.75 a 3.24 = 3.0; 3.25 a 3.74 = 3.5, etc.

Fecha de Retiro:
El estudiante podrá retirar el curso, sin devolución, hasta un día hábil antes de la fecha de entrega del examen final.