Asset Pricing Theory — PhD course at The Einaudi Institute for Economics and Finance

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1 Syllabus - Asset Pricing Theory I

1.1 Course Description

This course introduces students to doctoral level developments of financial theory. The main purpose is to give rigorous introductions to the analytical issues specific to financial economics.

Topics covered include: one period and multi-period portfolio choice, one period and multi-period asset pricing models, discrete time versus continuous time approach, PDE approach versus probabilistic approach.

1.2 Prerequisites

The prerequisites for this course are MSc level Microeconomics and Ph.D. level Microeconomics; MSc level course in Theory of Finance is a plus.

1.3 Evaluation

30 percent class work (Home work). 70 percent 3 hour written final exam.
Both parts of the evaluation need to be passed in order to get a grade in the course.

1.4 Textbook

The required reading for this course are journal articles.

I encourage you to do additional reading from Asset Pricing (J. H. Cochrane) or another Ph.D. textbook. It complements my series of lectures. As most Ph.D. textbooks, Cochrane provides a —high altitude— view of asset pricing. Many times it is lacking in details making it difficult to learn from. However, this book nicely links the theory to empirical work. You should read and re-read it through your Ph.D. education.

1.5 Course Outline

1. Review: Absence of Arbitrage (AoA), Primitive Securities, Contingent Claims, Martingales, Change of Numeraire, Optimal Allocations, Equilibrium, and State Price Deflators in a Simple (Normal) One Period Economy.

2. One Period Portfolio Theory

   Framework and Notations

   Efficient Portfolio in Absence of a Risk-free Asset

   Efficient Portfolio with a Risk-free Asset

   HARA Preferences and Cass-Stiglitz 2 Fund Separation

   CAPM

   APT and Factor Models

3. Dynamic Consumption and Portfolio Choices (The Merton Model)

   Framework - Dynamic Programming

   Cake Eating Problem in Discrete Time and in Continuous Time

   The Solution(s) with Static and Time-Varying Opportunity Set

4. The Equivalent Static Problem (Cox-Huang, Karatzas-Lehoczky-Shreve Approach)

   Framework

   The Solution

5. The Consumption Based CAPM in Continuous Time

   Framework

   The Solution

1.6 Literature Overview

1. Books: Prerequisites

   Copeland, Weston and Shastri, Financial Theory and Corporate Policy, 4e, Addison-Wesley (2005).

   Danthine and Donaldson, Intermediate Financial Theory, 2e, Elsevier (2005).

2. Books: Asset Pricing

   Cochrane, Asset Pricing, 2e, Princeton University Press (2005).

   Duffie, Dynamic Asset Pricing Theory, 3e, Princeton University Press (2001).

   Huang and Litzenberger, Foundations for Financial Economics, North-Holland (1988).

   Merton, Continuous-Time Finance, 2e, Oxford (1992).

3. Books: Stochastic Calculus

   Øksendal, Stochastic Differential Equations, 5e, Springer (2000).

4. Main Articles

   Breeden, D., 1979, An Intertemporal Asset Pricing Model with Stochastic Consumption and Investment Opportunities, Journal of Financial Economics 7, 265-96.

   Cox, J. C. and C. Huang, 1989, Optimal Consumption and Portfolio Policies when Asset Prices Follow a Diffusion Process, Journal of Econometric Theory 49, 33-83.

   Cox, J. C. and C. Huang, 1991, A Variational Problem Arising in Financial Economics, Journal of Mathematical Economics 20, 465-487.

   Detemple, J. B. and F. Zapatero, 1991, Asset Pricing in an Exchange Economy with Habit Formation, Econometrica 59, 1633-1657.

   Duffie, J. D. and W. R. Zame, 1989, The Consumption-Based Capital Asset Pricing Model, Econometrica 57, 1279-1298.

Dybvig, P. H. and Chi-fu Huang, 1988. Nonnegative Wealth, Absence of Arbitrage, and Feasible Consumption Plans, Review of Financial Studies 4, 377-401.

Harrison, M. and D. Kreps, 1979, Martingales and Arbitrage in Multiperiod Security Markets, Journal of Economic Theory 20, 381-408.

Karatzas, I., Lehoczky, J. P. and S. E. Shreve, 1987, Optimal Consumption and Portfolio Decisions for a 'Small Investor' on a Finite Horizon, SIAM Journal of Control and Optimization 25, 1557-1586.

Lintner, J., 1965, The Valuation of Risky Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets, Review of Economics and Statistics 47, 13-37.

Markowitz, H., 1952, Portfolio Selection, Journal of Finance 7, 77-91.

Merton, R. C., 1969, Lifetime Portfolio Selection under Uncertainty: The Continuous-Time Case, Review of Economics and Statistics 51, 247-257.

Merton, R. C., 1971, Optimal Consumption and Portfolio Rules in a Continuous-Time Model, Journal of Econometric Theory 3, 373-413.

Merton, R. C., 1972, An Analytic Derivation of the Efficient Portfolio Frontier, Journal of Financial and Quantitative Analysis 7, 1851-1872.

Mossin, J., 1966, Equilibrium in a Capital Asset Market, Econometrica 34, 768-783.

Ross, S., 1976, The Arbitrage Theory of Capital Asset Pricing, Journal of Economic Theory 13, 341-360.

Sharpe, W. F., 1964, Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk, Journal of Finance 19, 425-442.

5. Other Articles

Brennan, M. J., Schwartz, E. S., and R. Lagnado, 1997, Strategic Asset Allocation, Journal of Economic Dynamics & Control 21, 1377-1403.

Brennan, M. J., 1998, The Role of Learning in Dynamic Portfolio Decisions, European Finance Review 1, 295-306.

Cox, J.C., Ingersoll, J.E. and S.A. Ross, 1985a, An Intertemporal Asset Pricing Model with Rational Expectations, Econometrica 53, 363-384.

Cox, J.C., Ingersoll, J.E. and S.A. Ross, 1985b, A Theory of the Term Structure of Interest Rates, Econometrica 53, 389-403.

Long, J. B., 1990, The Numeraire Portfolio, Journal of Financial Economics 26, 29-69.

Merton, R. C., 1973, An Intertemporal Capital Asset Pricing Model, Econometrica 41, 867-887.