

Outline for ‘Financial Economics’ (EC5010) - Autumn Term 2007

Course Code and Title

EC5010 Financial Economics

Lecturer and Course Leader

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Aims

EC5010 is designed to provide participants with the tools for analysing financial markets and financial instruments. The first part of this course familiarise students with the modern theory of asset pricing. It begins by providing students with the foundations of choice under uncertainty. Thereafter, a general approach to contingent asset valuation, which builds on state prices, is employed to introduce the fundamental concept of arbitrage pricing and the notion of market completeness. The second part of the course introduces mean-variance portfolio analysis, laying the foundations for the Capital Asset Pricing Model (CAPM). The third part of the course is concerned with the pricing of options.

Learning Outcomes

Upon completion of the course students should

- be familiar with the theory of choice under uncertainty;
- have a thorough knowledge of state prices and arbitrage;
- have a firm grasp of mean-variance analysis;
- understand the salient features of risky-asset pricing models, in particular the Capital Asset Pricing Model (CAPM);
- be familiar with the basic features of options;
- have a thorough knowledge of price bounds on options;
- be able to price options using the Binomial model;
- be able to apply the Black-Scholes formula.

Course Delivery

The course will comprise a two-hour lecture each week. The detailed learning outcomes and recommended reading for each week are outlined below. Students will be provided with lecture notes. A fair share of the lectures will be dedicated to studying numerical examples illustrating various concepts and to working through exercises provided in the problem sets. These problem sets will be distributed well ahead of time, and students will be expected to prepare in-class discussion of problem sets by attempting to solve the exercises on their own.

The lecturer is available to students for consultation during advertised office hours or by appointment.

Assessment

During the summer term there will be a three-hour unseen examination, which contributes 100 percent to the final mark. The exam will test students' knowledge and understanding of the material covered in the course; their ability to solve numerical and algebraic representations of a model; their ability to interpret the models and key results; their ability to critically appraise models and their application. Students will be asked to prepare problem sets for presentation in class on a regular basis. Feedback on these will be provided both on an individual basis and in class. Students are also encouraged to solve in addition, on a self-assessment basis, questions provided in the textbooks below.

Reading

The main course text is:

[CWS] **T.E. Copeland, J.F. Weston, and K. Shastri (2004), Financial Theory and Corporate Policy, Addison-Wesley. (4th edition, International Edition)**

Much of the taught material will overlap with chapters from this textbook. The relevant chapters are indicated below. Multiple copies will be available on short loan in the Bedford Library. However, students are encouraged to buy their own copy. In addition, the course outline lists other required reading for selected topics, and additional material in form of lecture notes will be provided.

Supplementary textbooks:

[BKM] Z. Bodie, A. Kane, and A.J. Marcus, Investments, Irwin McGraw-Hill

[EG] E.J. Elton and M.J. Gruber, Modern portfolio theory and investment analysis, Wiley.

[GT] M. Grinblatt and S. Titman, Financial Markets and Corporate Strategy, Irwin McGraw-Hill.

[LP] H. Levy and T. Post, Investments, FT Prentice Hall.

The following are advanced textbooks that provide a more rigorous treatment of material covered in the course and beyond:

[R] S.M. Ross, 1999, *Mathematical Finance*, Cambridge University Press.

[BR] M. Baxter and A. Rennie, 1996, *Financial Calculus*, Cambridge University Press.

[HL] C. Huang and R.H. Litzenberger, 1988, *Foundations for Financial Economics*, Prentice Hall.

[I] J. Ingersoll, 1987, *Theory of Financial Decision Making*, Rowman and Littlefield.

[C] J. Cochrane, 2001, *Asset Pricing*, Princeton University Press.

[D] D. Duffie, 1996, *Dynamic Asset Pricing Theory*, Princeton University Press.

Supplementary reading:

The reading list below includes a number of text book chapters and journal articles that complement the main text and help deepen the understanding of a topic. Contributions marked with an asterisk (*) are available online via JSTOR at <http://www.jstor.org/browse> – for more information ask the library staff.

IMPORTANT NOTE: Financial Market Participants and Institutions

Students without a background of financial economics (e.g., as acquired in an under-graduate finance course) should familiarise themselves, through self-study, with the most important participants, securities, arrangements and regulations that constitute a modern financial system. The course itself will not give a systematic account of such issues but treat them as pre-requisites. For textbook treatments of institutional issues see, for example,

[BKM] Chapter 1, [EG] Chapter 2, [GT] Chapter 1, [LP] Part I

F. Fabozzi and Modigliani, F. (1996), *Capital Markets*, 2nd ed., Prentice-Hall. (Sections I and II)

Detailed Course Outline and Reading List

Lecture 1: Expected Utility Theory and Choice Under Uncertainty

In addition to learning the material covered in the reading and lecture, by the end of this week students should:

- understand the concepts and measures commonly used to model attitudes towards risk;
- be able to translate these concepts and measures into the expected-utility framework;
- be familiar with concepts of stochastic dominance.

Reading: [CWS] Chapter 3

Further useful reading: [HL] Chapters 1 and 2

A. Mas-Colell, M. Whinston, and J. Green (1995), *Microeconomic Theory*, Oxford University Press. (Chapter 6)

J.W. Pratt (1964), 'Risk Aversion in the Small and in the Large,' *Econometrica*, 32, 122-136. (*)

M. Rothschild and Stiglitz J. (1970), 'Increasing Risk I: A Definition,' *Journal of Economic Theory*, 2, 225-43. (*)

M. Rothschild and Stiglitz J. (1971), 'Increasing Risk II: Its Economic Consequences,' *Journal of Economic Theory*, 3, 66-84. (*)

Lectures 2 and 3: State Preference Theory

In addition to learning the material covered in the reading and the lecture, students should

- understand the concepts of state prices and arbitrage, and know how they are related;
- know the Fundamental Theorem of Asset Pricing.

Reading: [CWS] Chapter 4

Further useful reading: [HL] Chapter 5

K.J. Arrow (1964), 'The Role of Securities in the Optimal Allocation of Risk Bearing,' *Review of Economic Studies*, 31, 91-96. (*)

Lectures 4, 5 and 6: Mean-Variance Portfolio Theory

In addition to learning the material covered in the reading and the lecture, students should

- comprehend the trade-off between risk and return, both intuitively and algebraically;
- understand how the efficient frontier of risky assets is obtained;
- be able to characterize quantitatively ‘key’ portfolios such as the global minimum-variance portfolio and the tangency portfolio, and locate them in the mean/standard-deviation diagram.

Reading: [CWS] Chapter 5

Further useful reading: [HL] Chapter 3

The foundations of modern portfolio theory can be found in:

H.M. Markowitz (1952), ‘Portfolio Selection,’ *Journal of Finance*, 7, 77-91. (*)

H.M. Markowitz (1959), *Portfolio Selection: Efficient Diversification of Investments*, New York: John Wiley.

Lecture 6 and 7: The Capital Asset Pricing Model (CAPM) and Empirical Tests of Asset Pricing Models

In addition to learning the material covered in the reading and the lecture, students should

- understand and critically assess the additional assumptions imposed on mean-variance analysis to obtain the CAPM;
- understand both the standard and the zero-beta CAPM and be able to solve numerical examples thereof;
- know how mean-variance analysis relates to expected utility theory.

Reading: [CWS] Chapter 6

Further useful reading: [HL] Chapter 4

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

F. Black (1972), ‘Capital Market Equilibrium with Restricted Borrowing,’ *Journal of Business*, 45, 444-455. (*)

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

On empirical tests of asset pricing models:

R. Roll (1977), 'A Critique of the Asset Pricing Theory's Tests' *Journal of Financial Economics*, 4, 129-176.

E. Fama and J.D. Macbeth (1973), 'Risk, Return and Equilibrium: Empirical Tests,' *Journal of Political Economy*, 81, 607-636. (*)

E.F. Fama and K.R. French (1996) 'The CAPM is Wanted, Dead or Alive,' *Journal of Finance*, 51, 1947-1958. (*)

Lecture 8: Options: Features and Price Bounds

In addition to learning the material covered in the reading and the lecture, students should

- understand the rights and obligations of the parties involved in various types of option contracts;
- be able to describe the payoff structures resulting at an option's date of expiry;
- be familiar with the basic taxonomy used in options analysis;
- be able to work out a number of price bounds for options (depending on their type, the time left to expiry, and their strike price);
- understand the put-call parity relationship.

Reading: [CWS] Chapter 7

Lectures 9 and 10: Option Pricing Theory

In addition to learning the material covered in the reading and the lecture, students should

- understand the basic notion of binomial option pricing and the idea of arbitrage with a tracking portfolio;
- be able to price a plain-vanilla option in a two-period binomial framework;
- understand what the hedge ratio ('Delta') means;
- be able to apply the Black-Scholes option pricing formula;
- be able to derive and interpret the 'Greeks' based on the Black-Scholes formula.

Reading: [CWS] Chapter 7

Further useful reading:

Hull, J.C., *Options, Futures, and Other Derivatives*, Englewood Cliffs, NJ: Prentice-Hall.

M.S. Scholes (1998), 'Derivatives in a Dynamic Environment,' *American Economic Review*, 88, 350-370.

(*)

J. Cox, S. Ross, and M. Rubinstein (1979), 'Option Pricing: A Simplified Approach,' *Journal of Financial Economics*, 7, 229-263.