Schulich School of Business   **York University**

FINE 7100: Theory of Finance

Fall 2007

Instructor: Melanie Cao   Time: M 2:30 – 5:30pm   Secretary: Lucy Sirianni
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Course Prerequisites:

This is a first-year Ph.D. finance course. As prerequisites, it requires a sound understanding of microeconomic theory and an understanding and appreciation of finance problems. This background will come from the MA economic theory and the second year MBA level finance courses. It is presumed that students are already familiar with the material in Copeland, T. E. and J. F. Weston (4th edition), "Financial Theory and Corporate Policy", Addison-Wesley (1997). In addition, this course also assumes a technical background on calculus, probability theory and stochastic calculus.

This course is also open to MBA students with a strong background in economics and mathematics. Students should obtain the explicit permission from the instructor and register as an Independent Study course. An alternative grading scheme will be used.

Course Objective:

The main focus of this course is on individuals' consumption and investment decisions under uncertainties and their implications for security valuations. The precise topics are:

(1) Utility theory and state preference,
(2) Stochastic dominance,
(3) Portfolio frontier and two-fund separation,
(4) Valuation of assets by no-arbitrage,
(5) Individual's consumption-portfolio selection theory,
(6) Intertemporal economy and equilibrium asset valuation (including derivative security valuation),
(7) Equivalent Martingale pricing principle,
(8) Application of Continuous-Time Model to Current Finance Issues,
(9) Liquidity in Financial Markets.

Required Material:

> Huang, Chi-fu and R. H. Litzenberger, *Foundations for Financial Economics*, Prentice Hall Inc., Upper Saddle River, New Jersey, 1988.

> Merton, R*., Continuous-Time Finance*, Blackwell, 1997.

> Lecture notes

Additional Recommended Books:

> **Elementary texts for review and reference:**

> Copeland, T. E. and J. F. Weston (4th edition*), Financial Theory and Corporate Policy*, Addison-Wesley 1997.

> Fama and Miller, *The Theory of Finance*, Holt, Rinehart and Winston, New York, 1972.

> Hirshleifer, J., *Investment, Interest and Capital*, Prentice Hall Inc., New Jersey, 1970.

> **Advanced texts:**

> Duffie, D., *Dynamic Asset Pricing Theory*, 2nd edition, Princeton University Press, 1996.

> Ingersoll, J., *Theory of Financial Decision Making*, Rowman and Littlefield, 1987.

Lecture notes in PDF form will be emailed to students at the beginning of the term. To make the classroom learning more efficient, students are expected to read the relevant materials before each class and review them afterwards.

Evaluation

During the term, each student is required to complete 3 problem sets independently. Also, each student will present at least a paper at the end of the term. The precise paper will be assigned to each student at the beginning of the term. In addition, there will be a final exam covering all topics discussed in class.

The precise evaluation scheme is as follows:

Problem sets:	15%
Presentations:	15%
Referee Report	20%
Final exam:	50%

	100%

Course Outline

Varian, H. R., *The Arbitrage Principle in Financial Economics,* Economic Perspectives, Vol. 1, No. 2, Fall 1987, 55-72.

Topic 5:   Individual Optimal Consumption-Portfolio Selection Problem
Intertemporal Economy and Competitive Equilibrium: the Discrete-time Approach

Lecture notes

Topic 6:   Equilibrium Valuation of Fundamental Assets and the Equivalent Martingale
Approach: the Discrete-time Approach

Lecture notes

Chapters 5, 7 and 8 in Huang and Litzenberger:

Chapters 3 and 4 in Duffie

Epstein, L. G. and S. Zin, "*Substitution, Risk Aversion and Temporal Behavior of Consumption and Asset Returns: An Empirical Analysis*", Journal of Political Economy, 1991.

Epstein, L. G. and S. Zin, "*Substitution, Risk Aversion and Temporal Behavior of Consumption and Asset Returns: Theoretical Framework*", Econometrica, 1989.

Harrison, M. and D. Kreps, 1979, "*Martingale and Multiperiod Securities Markets*", Journal of Economic Theory, 20, 381-408.

Jermann, U. J., 1998, "*Asset Pricing in Production Economies*", Journal of Monetary Economics, Vol. 41, No. 2, 257 - 276.

Lucas, R. E., 1978, "*Asset Prices in an Exchange Economy*," Econometrica, 46, 1429-1445.

Mehra, R and E. Prescott, 1985, "The Equity Premium, a Puzzle", Journal of Monetary Economics, 15, 145-161.

Mark Rubinstein, 2001, "Rational Markets: Yes or No? The Affirmative Case", Financial Analysts Journal, May-June issue.

Topic 7:   Derivative Security Valuation: Equilibrium Valuation and Equivalent
Martingale Approach in Discrete-Time Set-up

Lecture notes

Chapter 6 in Huang and Litzenberger

Topic 8:   Continuous-Time Models

Topic 8.1:   Individual Optimal Consumption-Portfolio Selection Problem

Lecture notes

Chapters 4, 5, 6 in Merton (1997)

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, "*Optimum Consumption and Portfolio Rules in a Continuous-time Model",* Journal of Economic Theory, 3, 373-413.

Topic 8.2:   Equilibrium Valuation and Equivalent Martingale Approach
              Derivative Security Valuation

Lecture notes

Amin, K. I. and V. K. Ng, 1993, "Option *Valuation with Systematic Stochastic Volatility*," Journal of Finance, 48, No. 3, 881-910.

Bailey, W. and R. Stulz, 1989, "The Pricing of Stock Index Options in a General Equilibrium Model," Journal of Financial and Quantitative Analysis, 24, 1-12.

Bakshi, G. S. and Z. Chen, 1997, "Equilibrium Valuation of Foreign Exchange Claims," Journal of Finance, 52, 799-826.

Cox, C. J., Ingersoll, J. and S. A. Ross, 1985a, "*An Intertemporal General Equilibrium Model of Asset Price*," Econometrica, 53, No. 2, 363-384.

Cao, M., 2001, *"Systematic Jump Risks in a Small Open Economy: Simultaneous Equilibrium Valuation of Options on the Market Portfolio and the Exchange Rate*", *Journal of International Money and Finance*, Vol. 20, No. 2, 191 – 218

Naik, V. and M. Lee, 1990, "*General Equilibrium Pricing of Options on the Market Portfolio with Discontinuous Returns*," Review of Financial Studies, 3, No.4, 493-521.

Ni, S. X., 2006, "Stock Option Returns: a Puzzle", manuscript, Hong Kong University of Science and Technology.

Topic 8.3:   Pricing Derivative Securities by No-Arbitrage

Lecture notes

Chapter 9 in Merton

Black, F. and M. Scholes, 1973, "*The Pricing of Options and Corporate Liabilities",* Journal of Political Economy, 81, 637-654.

Merton, R. C., 1976, "*Option Pricing when Underlying Stock Returns are Discontinuous",* Journal of Financial Economics, 3, 125-144.

Topic 8.4:   Interest Rate Models

Cox, C. J., Ingersoll, J. and S. A. Ross, 1985b, "*A Theory of the Term Structure of Interest Rates*," Econometrica, 53, No. 2, 384-407.

Vasicek, O., 1977, "An Equilibrium Characterization of the Term Structure," Journal of Financial Economics, 5, 177-188.

Topic 9:   Application of Continuous-Time Model to Current Finance Issues

Issue 1: Real Estate Finance and Portfolio Selection Problem

Cauley, S., A. Pavlov, E. Schwartz, *Implications of Homeownership to Strategic Asset Allocation, ma*anuscript, UCLA.

Issue 2: Banking

Cuoco, D., H Liu, *An Analysis of VaR-based Capital Requirements*, manuscript, Wharton School.

Issue 3: Illiquidity and CEO Option Valuation

Cao, M. and J. Wei, *Incentive Stocks and Options with Trading Restrictions – not as Restricted as We Thought*, 2004, forthcoming *Research in Finance.*

Ingersoll, J. E., 2002, *The Subjective and Objective Evaluation of Incentive Stock Options*, manuscript, Yale University, forthcoming Journal of Business.

Issue 4: Illiquidity and Private Valuation of Restricted Stocks

Kahl, M., Liu, J. and F. A. Longstaff, 2001, *Paper Millionaires: How Valuable is Stock to a Stockholder who is Restricted from Selling it*? Journal of Financial Economics, 67(3), 385-410.

Issue 5: Restricted Trading, Liquidity and Equilibrium Asset Pricing

Cochrane, J. H., Longstaff, F. A. and P. Santa-Clara, 2005, *Two Trees*, manuscript, UCLA.

Longstaff, F. A., 2005, *Asset Pricing in Markets with Illiquid Assets*? Manuscript, UCLA.

Topic 10:   Liquidity in a Market-Micro Structure Context

Amihud, Y., 2002, *Illiquidity and Stock Returns: Cross-section and time-series effects*, Journal of Financial Market, 5, 31 – 56.

Cao, M. and J. Wei, 2007, *Commonality in Liquidity: Evidence from the Option Market,* working paper.

Chan, K., Chung, Y. P. and H. Johnson, 1995, *The Intraday Behavior of Bid-Ask Spreads for NYSE and CBOE Options*, Journal of Financial Quantitative Analysis, Vol. 3, No. 3, 329 - 346.

Chordia, R., Roll, R. and A. Subrahmanyam, 2000, *Commonality in Liqiudity*, Journal of Financial Economics, 56, 3 - 28,
de Jone, F. and J. Driessen, 2005, *Liquidity Risk Premia in Corporate Bond Markets*, working paper, University of Amsterdam.

Deuskar, Gupta and Subrahmanyam, 2004, *Liquidity effects and volatility smiles in interest rate option market*, working paper, New York University.

Domowitz, I., Hansch, O. and X. Wang, *Liquidity, Liquidity Commonality and Its Impact on Portfolio Theory,* working paper.

Feranado, C.S., 2003, *Commonality in Liquidity: The Transmission of Liquidity Shocks across Investors and Securities*, Journal of Financial Intermediation, 12, 233-254.

Fernando, C.S., R. Herring and A. Subrahmanyam, *Commonality in Liquidity and Market Collapse: Theory and Application to the Market for Perps*, working paper.

Fleming, M. J., 2003, *Measuring Treasury Market Liquidity*, Economic Policy Review, Vol. 9, No. 3, 83 – 108, Federal Reserve Bank of New York.

Foster, F. D. and S. Viswanathan, 1990, *A Theory of Intraday Variations in Volume, Variance, and Trading Costs in Securities Market*, Review of Financial Studies, Vol. 3, No. 4, 593 – 624.

George, T.J. and F.A. Longstaff, 1993, *Bid-Ask Spreads and Trading Activity in the S&P100 Index Option Market*, Journal of Financial Quantitative Analysis, Vol. 28, No. 3, 381 – 397.

Thomas, H. and M. Martens, *Spread decomposition and commonality in liquidity*, working paper.

Longstaff, F.A., 1995, *option pricing and the martingale restriction*, Review of Financial Studies, Vol.8, No. 4, 1091 – 1124.

Kalodera, I. and C. Schlag, 2004, *An Empirical Analysis of the Relation between Option Market Liquidity and Stock Market Activity*, working paper, Goethe University.

Mayhew, S., Sarin, A. and K. Shastri, 1999, *What Drives Option Liquidity*, working paper, University of Pittsburgh.

Vijh, A.M., 1990, *Liquidity of the CBOE Equity Options*, Journal of Finance, Vol. XLV, No. 3, 1157 – 1179.