Business Finance 920—Theory of Finance

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Course Description

Theory of Finance is the theoretical asset-pricing course in the yearlong Ph.D. sequence in finance. Its primary audience is second-year Ph.D. students in finance and economics who have already completed the microeconomics sequence. Students are encouraged to familiarize themselves with matrix algebra, calculus, and probability theory prior to or during the first two weeks of this course. Basic knowledge about stocks, bonds, derivatives (such as options and futures) is required. Basic knowledge of stochastic calculus is helpful, but not required.

This course provides a detailed treatment of the theoretical foundations of modern financial economics. Students should aim to have a thorough understanding of all basic principles of asset pricing theory. At the same time, you should learn the necessary tools and techniques to start doing original research. The course is based on lectures, in-class discussions, readings and homework. As with any course, successful completion is more likely if you keep up with the material throughout the course, rather than falling behind and trying to catch up later.

Class Sessions

The course will meet for lectures and class discussions weekly on Wednesdays from 1:45 PM to 4:45 PM in Gerlach 285 from September 19 until November 28. I encourage you to participate actively in the class and to ask questions, rather than listening passively to the material presented. Attendance at class is important, since we may not always follow the textbook closely; furthermore, active participation in class discussions is likely to result in more effective learning of the material than passive reading of the course materials.

Course Grading

The course grade is based on homework assignments (20%), a midterm exam (30%), and a final exam (50%).

Homework will be assigned most weeks, and is due at the beginning of the class of the following week. The two lowest homework grades for each student will not be used in calculation of the course grade. However, the due dates on homework assignments will be strictly enforced. In no case, no matter how exceptional the circumstances, can an assignment be accepted after solutions have been made available. Homework assignments are to be done individually.

The midterm exam is scheduled for the class session on 7 November 2007 (week 8). The final exam is scheduled for Thursday, 6 December 2007 (exam week) at 11:30 AM.

Each exam will cover the course material presented up until that point (i.e., the final exam is cumulative), and will be based on the class lectures/discussions, the readings, and the homework assignments. Exams are closed-book, and electronic tools other than a calculator are not permitted.

Both the homework assignments and the exams will typically have questions across the full range of difficulty, from very easy to very hard. So you should not be discouraged if you struggle with some of the questions at first, although ideally you would be able to answer all of them by the end of the course.

If you are unable to take the midterm or final at the scheduled time, let me know as soon as possible. It is much easier to deal with any exceptional situation before-the-fact rather than after-the-fact.

If you feel that any of your course work has been graded incorrectly, you should submit a request for regrade in a timely fashion, and in writing. Include a brief statement of why you think the exam question or homework problem in question has been graded incorrectly. The request should focus on the correctness of the answer provided; adjustments cannot be made for the number of points deducted for a particular type of error, unless it is inconsistent with the number of points deducted from other students for similar errors.

Course Materials

The textbook for the course is available at the bookstore:

[1] Pennacchi, G. (2007): "Theory of Asset Pricing," Addison Wesley.

This book is new, so its use is experimental. However, in the past, there has not been a single suitable textbook that covers the material in this course, and consequently, multiple books were used. The Pennacchi book was expressly designed for a course similar to *Theory of Finance*, so we are using it this year.

The following two books are optional, and are also available at the university bookstore:

[2] Duffie, D. (2001): "Dynamic Asset Pricing Theory," Princeton University Press, 3rd edition.

[3] Ingersoll, J. (1987): "Theory of Financial Decision Making," Rowman & Littlefield.

The Duffie book is thoroughly in the modern school of asset pricing; the Ingersoll book presents a more classical approach. Other books that might be helpful are:

[4] Huang, C., and R. Litzenberger (1988): "Foundations for Financial Economics," Prentice-Hall.

[5] Cochrane, J. (2001): "Asset Pricing," Princeton University Press.

The Huang and Litzenberger book, like Ingersoll, focuses on a more traditional approach to asset pricing, but may be out of print and difficult to find. The Cochrane book is in a more modern school, but includes a lot of material on empirical work.

Some books that might be helpful with the mathematical material covered in the continuous-time part of the course are:

[6] Musiela, M., and M. Rutkowski (2005): "Martingale Methods in Financial Modeling," Springer Verlag, 2nd edition.

[7] Neftci, S. (2000): "An Introduction to the Mathematics of Financial Derivatives," Academic Press, 2nd edition.

[8] Karatzas, I., and S. Shreve (1991): "Brownian Motion and Stochastic Calculus," Springler Verlag, 2nd edition.

[9] Protter, P. (2003): "Stochastic Integration and Differential Equations," Springler Verlag, 2nd edition.

[10] Shreve, S. (2004): "Stochastic Calculus for Finance II: Continuous-Time Models," Springer Verlag.

There are many other books, both general and specialized, on the theory of portfolio choice and asset pricing, that may be helpful.

Acknowledgments

Much of the syllabus and structure of the course has been developed by Professor Bing Han of University of Texas at Austin, who has taught *Theory of Finance* in the past.

Course Outline

The course will cover most if not all of the following topics. Readings for each topic are shown. Some articles do not fit neatly into one of the categories, but rather contain material that is relevant for several topics. Also, the outline follows the structure of the Pennacchi book. The other books are organized differently, and chapters do not always fall into one of the listed categories. In those cases, the chapters have been force fit into a category, but may nonetheless have relevance for other sections.

We will tend to follow Pennacchi; students should use their judgment in deciding how to allocate their time to the large numbers of references listed below. The more of the references you can read, the better you will understand that topic. It is unlikely that anyone will read all of the references, but a successful researcher must be intimately familiar with the literature in his/her area of specialization.

I. Overview

[11] Barberis, N., and R. Thaler (2002): "A Survey of Behavioral Finance," NBER working paper.

[12] Campbell, J. (2000): "Asset Pricing at the Millennium," *Journal of Finance*, 55, 1515-1567.

[13] Campbell, J. (2001): "Understanding Risk and Return," Marshall Lectures, Harvard University.

[14] Cochrane, J. (1999): "New Facts in Finance," *Economic Perspectives*, 23, 36-58.

[15] Constantinides, G. (1989): "Theory of Valuation: Overview and Recent Developments," in *Theory of Valuation: Frontiers of Modern Financial Theory*, ed. by S. Bhattacharya and G. Constantinides. Rowman & Littlefield.

[16] Dai, Q., and K. Singleton (2003): "Term Structure Dynamics in Theory and Reality," *Review of Financial Studies*, 16, 631-678.

[17] Duffie, D. (2003): "Intertemporal Asset Pricing Models," in *Handbook of the Economics of Finance*, ed. by G. Constantinides, M. Harris, and R. Stulz. Elsevier/North-Holland.

[18] Easley, D., and M. O'Hara (2003): "Asset Prices and Market Microstructure," in *Handbook of the Economics of Finance*, ed. by G. Constantinides, M. Harris, and R. Stulz. Elsevier/North-Holland.

[19] Hirshleifer, D. (2001): "Investor Psychology and Asset Pricing," *Journal of Finance*, 56, 1533-1598.

[20] Ross, S., and P. H. Dybvig (2003): "Arbitrage, State Prices and Portfolio Theory," in *Handbook of the Economics of Finance*, ed. by G. Constantinides, M. Harris, R. Stulz. Elsevier/North-Holland.

[21] Stulz, R., and A. Karolyi (2003): "Issues in International Asset Pricing," in *Handbook of the Economics of Finance*, ed. by G. Constantinides, M. Harris, and R. Stulz. Elsevier/North-Holland.

[22] Sundaresan, S. (2000): "Continuous-Time Methods in Finance: A Review and an Assessment," *Journal of Finance*, 55, 1569-1622.

[23] Whaley, R. (2003): "Derivatives," in *Handbook of the Economics of Finance*, ed. by G. Constantinides, M. Harris, and R. Stulz. Elsevier/North-Holland.

II. Expected Utility

— Pennacchi, chapter 1.

— Cochrane, chapter 1.

— Duffie, chapter 1.

— Huang and Litzenberger, chapters 1 and 2.

— Ingersoll, chapters 1-3.

[24] Arrow, K. (1970): "Essays in the Theory of Risk Bearing," North-Holland.

[25] Barsky, R., F. Juster, M. Kimball, and M. D. Shapiro (1997): "Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study," *Quarterly Journal of Economics*, 112, 537-579.

[26] Bernoulli, D. (1954): "Exposition of a New Theory on the Measurement of Risk," *Econometrica*, 22, 23-36.

[27] Kahneman, D., and A. Tversky (1979): "Prospect Theory: an Analysis of Decision Under Risk," *Econometrica*, 47, 263-292.

[28] Machina, M. (1982): "Expected Utility Analysis without the Independence Axiom," *Econometrica*, 50, 277-323.

[29] Machina, M. (1987): "Choice Under Uncertainty: Problems Solved and Unsolved," *Journal of Economic Perspectives*, 1, 121-154.

[30] Pratt, J. (1964): "Risk Aversion on the Small and in the Large," *Econometrica*, 32, 122-136.

[31] Rabin, M., and R. Thaler (2001): "Anomalies: Risk Aversion," *Journal of Economic Perspectives*, 15, 219-232.

[32] Ross, S. (1981): "Some Stronger Measures of Risk Aversion in the Small and the Large with Applications," *Econometrica*, 49, 621-638.

[33] von Neumann, J., and O. Morgenstern (1944): "Theory of Games and Economic Behavior," Princeton University Press.

III. Mean-Variance Analysis

— Pennacchi, chapter 2.

— Huang and Litzenberger, chapters 3 and 4.

— Ingersoll, chapter 4.

[34] Anderson, R., and J.-P. Danthine (1981): "Cross Hedging," *Journal of Political Economy*, 89, 1182-1196.

[35] Black, F. (1972): "Capital market equilibrium with restricted borrowing," *Journal of Business*, 45, 444-454.

[36] Kraus, A., and R. Litzenberger (1976): "Skewness Preference and the Valuation of Risk Assets," *Journal of Finance*, 31, 1085-1100.

[37] Markowitz, H. (1952): "Portfolio Selection," *Journal of Finance*, 7, 77-91.

[38] Markowitz, H., G. Todd, and W. Sharpe (2000): "Mean-Variance Analysis in Portfolio Choice and Capital Markets," Wiley.

[39] Merton, R. (1972): "An Analytical Derivation of the Efficient Portfolio Frontier," *Journal of Financial and Quantitative Analysis*, 7, 1851-1872.

[40] Ross, S. (1978): "Mutual fund separation in financial theory: The separation distributions," *Journal of Economic Theory*, 17, 254-286.

[41] Tobin, J. (1958): "Liquidity Preference as Behavior Towards Risk," *Review of Economic Studies*, 25, 65-86.

IV. Linear Factor Models

— Pennacchi, chapter 3.

— Cochrane, chapters 5 and 9.

— Huang and Litzenberger, chapter 4.

— Ingersoll, chapters 5-8.

[42] Carhart, M. (1997): "On Persistence in Mutual Fund Performance," *Journal of Finance*, 52, 57-82.

[43] Fama, E., and K. French (1993): "Common Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics*, 33, 3-56.

[44] Huberman, G. (1983): "A Simple Approach to Arbitrage Pricing Theory," *Journal of Economic Theory*, 28, 1983-1991.

[45] Jagannathan, R., and Z. Wang (1996): "The Conditional CAPM and the Cross-Section of Stock Returns," *Journal of Finance*, 51, 3-53.

[46] Lakonishok, J., A. Shleifer, and R. Vishny (1994): "Contrarian Investment, Extrapolation, and Risk," *Journal of Finance*, 49, 1541-1578.

[47] 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.

[**48**] Mossin, J. (1966): "Equilibrium in a Capital Asset Market," *Econometrica*, 34, 768-783.

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

[**50**] Ross, S. (1976): "Arbitrage theory of capital asset pricing," *Journal of Economic Theory*, 13, 341-360.

[**51**] Sharpe, W. (1964): "Capital asset prices: A theory of capital market equilibrium under conditions of risk," *Journal of Finance*, 19, 425-442.

[**52**] Shleifer, A., and R. Vishny (1997): "The Limits of Arbitrage," *Journal of Finance*, 52, 35-55.

[**53**] Treynor J. (1961): "Toward a Theory of Market Value of Risky Assets," unpublished manuscript.

V. Arbitrage, Market Completeness, State Prices

— Pennacchi, chapter 4.

— Cochrane, chapter 6.

— Duffie, chapter 1.

— Huang and Litzenberger, chapters 5 and 8.

— Ingersoll, chapters 9 and 15.

[**54**] Arrow, K. (1964): "The Role of Securities in the Optimal Allocation of Risk-Bearing," *Review of Economic Studies*, 31, 91-96.

[**55**] Campbell, J. (1999): "Asset Prices, Consumption, and the Business Cycle," in *Handbook of Macroeconomics*, ed. by J. B. Taylor and M. Woodford. North-Holland.

[**56**] Debreu, G. (1972): "Theory of Value: An Axiomatic Analysis of Economic Equilibrium," Yale University Press.

[**57**] Hansen, L., and R. Jagannathan (1991): "Implications of Security Market Data for Models of Dynamic Economies," *Journal of Political Economy*, 99, 225-262.

[**58**] Mehra, R., and E. Prescott (1985): "The Equity Premium: A Puzzle," *Journal of Monetary Economics*, 15, 145-161.

[**59**] Shiller, R. (1982): "Consumption, Asset Markets, and Macroeconomic Fluctuations," *Carnegie Rochester Conference Series on Public Policy*, 17, 203-238.

[**60**] Siegel, J., and R. Thaler (1997): "Anomalies: The Equity Premium Puzzle," *Journal of Economic Perspectives*, 11, 191-200.

[**61**] Welch, I. (2000): "Views of Financial Economists on the Equity Premium and on Professional Controversies," *Journal of Business*, 73, 501-537.

VI. Multiperiod Portfolio Choice

— Pennacchi, chapters 5-6.

— Cochrane, chapters 2, 8, and 9.

— Duffie, chapters 3 and 4.

— Huang and Litzenberger, chapter 7.

— Ingersoll, chapters 10-11.

[62] Bakshi, G., and Z. Chen (1996): "Inflation, Asset Prices, and the Term Structure of Interest Rates in Monetary Economies," *Review of Financial Studies*, 9, 241-275.

[63] Cox, J., J. Ingersoll, and S. Ross (1985): "An Intertemporal General Equilibrium Model of Asset Prices," *Econometrica*, 53, 363-384.

[64] Hansen, L., and S. Richard (1987): "The Role of Conditioning Information in Deducing Testable Restrictions Implied by Asset Pricing Models," *Econometrica*, 55, 587-614.

[65] Hansen, L., and K. Singleton (1983): "Stochastic Consumption, Risk Aversion, and the Temporal Behavior of Asset Returns," *Journal of Political Economy*, 91, 249-265.

[66] Lucas, R. (1978): "Asset Prices in an Exchange Economy," *Econometrica*, 46, 1429-1445.

[67] Samuelson, P. (1965): "Lifetime Portfolio Selection by Dynamic Stochastic Programming," *Review of Economics and Statistics*, 51, 239-246.

[68] Santos, M., and M. Woodford (1997): "Rational Asset Pricing Bubbles," *Econometrica*, 65, 19-57.

VII. Contingent Claims Pricing

— Pennacchi, chapters 7-9.

— Cochrane, chapter 3.

— Duffie, chapters 5 and 8.

— Huang and Litzenberger, chapter 6.

— Ingersoll, chapters 14, 16, and 17.

[69] Black, F., and M. Scholes (1973): "The Pricing of Options and Corporate Liabilities," *Journal of Political Economy*, 81, 637-659.

[70] Brennan, M. (1979): "The Pricing of Contingent Claims in Discrete Time Models," *Journal of Finance*, 34, 53-68.

[71] Cox, J., S. Ross, and M. Rubinstein (1979): "Option Pricing: A Simplified Approach," *Journal of Financial Economics*, 3, 145-166.

[72] Heston, S. (1993): "A Closed-Form Solution for Options with Stochastic Volatility with Applications to Bond and Currency Options," *Review of Financial Studies*, 6, 327-343.

[73] Hull, J., and A. White (1987): "The pricing of options on assets with stochastic volatilities," *Journal of Finance*, 42, 281-300.

[74] Lo, A. (1988): "Maximum Likelihood Estimation of Generalized Itô Processes with Discretely Sampled Data," *Econometric Theory*, 4, 231-247.

[75] Lo, A., and J. Wang (1995): "Implementing Option Pricing Models When Asset Returns Are Predictable," *Journal of Finance*, 50, 87-129.

[76] Merton, R. (1973): "Theory of Rational Option Pricing," *Bell Journal of Economics and Management Science*, 4, 141-183.

[77] Merton, R. (1976): "Option pricing when underlying stock returns are discontinuous," *Journal of Financial Economics*, 3, 125-144.

VIII. Arbitrage, Martingales, Pricing Kernels

— Pennacchi, chapter 10.

— Cochrane, chapters 2, 4, and 7.

— Duffie, chapters 2 and 6.

[78] Aït-Sahalia, Y., and A. Lo (1998): "Nonparametric Estimation of State-Price Densities Implicit in Financial Asset Prices," *Journal of Finance*, 53, 499-547.

[79] Breeden, D., and R. Litzenberger (1978): "Prices of State-Contingent Claims Implicit in Option Prices," *Journal of Business*, 51, 621-651.

[80] Cox, J., and S. Ross (1976): "The Evaluation of Options for Alternative Stochastic Processes," *Journal of Financial Economics*, 3, 145-166.

[81] Harrison, J., and D. Kreps (1979): "Martingales and Arbitrage in Multiperiod Securities Markets," *Journal of Economic Theory*, 20, 381-308.

[82] Harrison, J., and S. Pliska (1981): "Martingales and Stochastic Integrals in Multiperiod Securities Markets," *Journal of Economic Theory*, 20, 381-408.

[83] Jackwerth, J. (2000): "Recovering Risk Aversion from Option Prices and Realized Returns," *Review of Financial Studies*, 13, 433-451.

[84] Pan, J. (2002): "The jump-risk premia implicit in options: evidence from an integrated time-series study," *Journal of Financial Economics*, 63, 3-50.

IX. Continuous-time Portfolio Choice

— Pennacchi, chapter 12.

— Duffie, chapter 9.

— Ingersoll, chapters 12 and 13.

[**85**] Bajeaux-Besnainou, L., J. Jordan, and R. Portrait (2001): "An Asset Allocation Puzzle: A Comment," *American Economic Review*, 91, 1170-1180.

[**86**] Bodie, Z., R. Merton, and W. Samuelson (1992): "Labor Supply Flexibility and Portfolio Choice in a Life-Cycle Model," *Journal of Economic Dynamics and Control*, 16, 427-450.

[**87**] Brennan, M., and Y. Xia (2002): "Dynamic Asset Allocation Under Inflation," *Journal of Finance*, 57, 1201-1238.

[**88**] Campbell, J., and L. Viceira (2002): "Strategic Asset Allocation: Portfolio Choice for Long-Term Investors," Oxford University Press.

[**89**] Canner, N., N. Mankiw, and D. Weil (1997): "An Asset Allocation Puzzle," *American Economic Review*, 87, 181-191.

[**90**] Duffie, D., W. Fleming, M. Soner, and T. Zariphopoulou (1997): "Hedging in Incomplete Markets with HARA Utility," *Journal of Economic Dynamics and Control*, 21, 753-782.

[**91**] He, H., and Pearson, N. (1991): "Consumption and Portfolio Policies with Incomplete Markets and Short-Sale Constraints: The Infinite Dimensional Case," *Journal of Economic Theory*, 54, 259-304.

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[**93**] Merton, R. (1971): "Optimum Consumption and Portfolio Rules in a Continuous-Time Model," *Journal of Economic Theory*, 3, 373-413.

[**94**] Merton, R. (1992): "Continuous Time Finance," Blackwell..

[**95**] Wachter, J. (2002): "Portfolio and Consumption Decisions Under Mean-Reverting Returns: An Exact Solution for Complete Markets," *Journal of Financial and Quantitative Analysis*, 37, 63-91.

X. Continuous-time Equilibrium Models

— Pennacchi, chapter 13.

— Duffie, chapter 10.

[**96**] Andersen, T., T. Bollerslev, F. Diebold, and H. Ebens (2001): "The Distribution of Realized Stock Return Volatility," *Journal of Financial Economics*, 61, 43-76.

[**97**] Bollerslev, T., R. Chou, and K. Kroner (1992): "ARCH Modeling in Finance: A Review of Theory and Empirical Evidence," *Journal of Econometrics*, 52, 5-59.

[**98**] Breeden, D. (1979): "An intertemporal capital pricing model with stochastic consumption and investment opportunities," *Journal of Financial Economics*, 7, 265-296.

[**99**] Fama, E., and K. French (1988): "Permanent and Temporary Components of Stock Prices," *Journal of Political Economy*, 96, 246-273.

[**100**] Jegadeesh, N., and S. Titman (1993): "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency," *Journal of Finance*, 48, 65-91.

[**101**] Lettau, M., and S. Ludvigson (2001): "Resurrecting the (C)CAPM: A Cross-Sectional Test When Risk Premia are Time-Varying," *Journal of Political Economy*, 109, 1238-1287.

[**102**] Pennacchi, G. (1991): "Identifying the Dynamics of Real Interest Rates and Inflation: Evidence Using Survey Data," *Review of Financial Studies*, 4, 53-86.

[**103**] Poterba, J., and L. Summers (1988): "Mean Reversion in Stock Returns: Evidence and Implications," *Journal of Financial Economics*, 22, 27-59.

XI. Habit Formation and Recursive Utility Models

— Pennacchi, chapter 14.

[**104**] Bhamra, H., and R. Uppal (2003): "The Role of Risk Aversion and Intertemporal Substitution in Dynamic Consumption-Portfolio Choice with Recursive Utility," London Business School working paper.

[**105**] Constantinides, G. (1990): "Habit Formation: A Resolution of the Equity Premium Puzzle," *Journal of Political Economy*, 98, 519-543.

[**106**] Campbell, J., and J. Cochrane (1999): "By Force of Habit: A Consumption Based Explanation of Aggregate Stock Market Behavior," *Journal of Political Economy*, 107, 205-251.

[**107**] Duffie D., and L. Epstein (1992): "Asset Pricing with Stochastic Differential Utility," *Review of Financial Studies*, 5, 411-436.

[**108**] Duffie D., and L. Epstein (1992): "Stochastic Differential Utility," *Econometrica*, 60, 353-394.

[**109**] Epstein, L., and S. Zin (1989): "Substitution, Risk Aversion, and the Temporal Behavior of Consumption and Asset Returns: A Theoretical Framework," *Econometrica*, 57, 937-969.

[**110**] Obsfeldt, M. (1994): "Risk-Taking, Global Diversification, and Growth," *American Economic Review*, 84, 1310-1329.

[**111**] Schroder, M., and C. Skiadas (2002): "An Isomorphism Between Asset Pricing Models With and Without Linear Habit Formation," *Review of Financial Studies*, 15, 1189-1221.

XII. Term Structure

— Pennacchi, chapter 17.

— Duffie, chapter 7.

— Ingersoll, chapter 18.

[112] Ahn, D.-H., R. Dittmar, and A. Gallant (2002): "Quadratic Term Structure Models: Theory and Evidence," *Review of Financial Studies*, 15, 243-288.

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[114] Campbell, J., and R. Shiller (1991): "Yield Spreads and Interest Rate Movements: A Bird's Eye View," *Review of Economic Studies*, 58, 495-514.

[115] Chan, K., G. Karolyi, F. Longstaff, and A. Sanders (1992): "An Empirical Comparison of Alternative Models of Short-Term interest Rate," *Journal of Finance*, 47, 1209-1228.

[116] Cheridito, P., D. Filipović, and R. Kimmel (2007): "Market Price of Risk Specifications for Affine Models: Theory and Evidence," *Journal of Financial Economics*, 83, 123-170.

[117] Constantinides, G. (1992): "A Theory of the Nominal Term Structure of Interest Rates," *Review of Financial Studies*, 5, 531-552.

[118] Cox, J., J. Ingersoll, and S. Ross (1985): "A Theory of the Term Structure of Interest Rates," *Econometrica*, 53, 385-408.

[119] Dai, Q., and K. Singleton (2000): "Specification Analysis of Affine Term Structure Models," *Journal of Finance*, 55, 1943-1978.

[120] Duarte, J. (2004): "Evaluating an Alternative Risk Preference in Affine Term Structure Models," *Review of Financial Studies*, 17, 379-404.

[121] Duffee, G. (2002): "Term Premia and Interest Rate Forecasts in Affine Models," *Journal of Finance*, 57, 405-443.

[122] Duffie, D., and R. Kan (1996): "A Yield-Factor Model of Interest Rates," *Mathematical Finance*, 51, 921-949.

[123] Duffie, D., J. Pan, and K. Singleton (2000): "Transform Analysis and Asset Pricing for Affine Jump-Diffusions," *Econometrica*, 68, 1343-1376.

[124] Heath, D., R. Jarrow, and A. Morton (1992): "Bond Pricing and the Term Structure of Interest Rates: A New Methodology for Contingent Claim Valuation," *Econometrica*, 60, 77-105.

[125] Kimmel, R. (2004): "Modeling the Term Structure of Interest Rates: A New Approach," *Journal of Financial Economics*, 72, 143-183.

[126] Longstaff, F., and E. Schwartz (1992): "Interest Rate Volatility and the Term Structure: A Two-Factor General Equilibrium Model," *Journal of Finance*, 47, 1259-1282.

[127] Vasicek, O. (1977): "An Equilibrium Characterization of the Term Structure," *Journal of Financial Economics*, 5, 177-188.