

Princeton University

Bendheim Center for Finance

Annual Report 2005

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Director's Introduction

The mission of Princeton University's Bendheim Center for Finance is twofold: First, to develop new courses and programs in finance that will afford exciting learning opportunities to Princeton students; and second, to establish a leading center for modern financial research.

Under the aegis of the BCF, Princeton's existing finance curriculum is being expanded and improved, and two new academic programs have been created: An Undergraduate Certificate in Finance in 1999 and a Master Program in Finance in 2001. Center-affiliated faculty teach in both programs as well as in a variety of contexts in their home departments across the University. By bringing together outstanding scholars from a wide variety of disciplines in a well-equipped setting that encourages dialogue and interaction, the BCF is a powerful environment in which to conduct significant research in finance. It also serves as a major venue where the world's leading experts in finance from academia, government and the private sector can meet regularly to exchange views and information.

Proximity to Wall Street and other important centers of private-sector financial research provide an additional source of intellectual stimulation and interchange for the BCF. Students are able to explore internships and longer-term job opportunities in a wide variety of finance-related areas. The BCF also encourages students at all levels to conduct finance-related research at the University by providing such services as funding senior thesis projects, serving as a clearinghouse and major source of data, and providing expert faculty advisors.

Faculty

The scholars in the BCF are chosen for their ability to deploy cutting-edge methodologies to a wide range of finance-related topics, from stock-price determination to public policy toward financial markets to the role of financial institutions in economic growth. The Center supports these leading scholars by encouraging their individual, collaborative and multidisciplinary research and by providing facilities (including computer and data support), research assistance, financial resources and venues for the exchange of ideas (such as weekly seminars and conferences). The University's existing strengths in areas such as economics, mathematics and statistics, operations research and psychology provide a serious disciplinary basis for this research, leveraging our resources to produce a truly distinguished program. To promote maximum interchange among disciplines, all Center faculty have appointments in regular University departments as well as in the BCF.

Thirty-one faculty members, representing six different departments, are currently affiliated with the BCF. Our newest hire is Hyun Song Shin, an applied microeconomic theorist, with a primary interest in financial economics. Shin will join us as Professor of Economics and Finance on February 1, 2006. His former position was as Professor of Finance at the London School of Economics. Shin received his Ph.D. from Oxford University's Nuffield College in 1988. He has been a Research Fellow of the Centre for Economic Policy Research since 1998, a Council member of the European Economic Association since 2001, Co-director of the Regulation and Financial Stability Programme, Financial Markets Group, LSE since 2002, and elected a Fellow of the Econometric Society in 2005. From 1995-1999 he was Managing Editor of *Review of Economic Studies* and between 1999-2003 Chairman of its Editorial Board.

Undergraduate Certificate in Finance

Now in its seventh year, the Undergraduate Certificate in Finance (UCF) continues to do extremely well, attracting record numbers of students. We expect to enroll over 160 juniors from the Class of 2007. In previous years, the numbers were as follows: Class of '00: 61, '01: 82, '02: 85, '03: 122, '04: 113, '05: 126, '06: 185. This will bring our total number of undergraduate students in the program (juniors and seniors) to nearly 350 this coming year, a number that is stressing our limited advising resources.

As you know, we have decided, in conjunction with the Dean of the College, to put in place tougher admission requirements into the UCF, starting with the Class of 2008, in order to limit the size of the program to a more manageable level. Specifically, a minimum B+ average in the three prerequisite courses (mathematics, statistics and microeconomics) and a minimum grade of B in each of them will be required for ECO and ORF majors. Once admitted, a minimum B average computed over the two core courses ECO 362 and 363, the 3 elective courses, and the independent work will be required of all students to earn the certificate. We set these cutoffs based on the grade data from previous classes, with the objective of limiting the number of UCF students to approximately 100, of which we expect about 70 to major in the ECO or ORF departments. We designed the tougher criteria for ECO and ORF students specifically to avoid "crowding out" the non-ECO/ORF majors from the UCF.

Students earning the UCF are drawn from a wide cross-section of departments on campus, 21 in total for the Class of 2006. In addition, UCF students are an extremely talented subgroup of the already high-achieving Princeton classes. They continue to receive a high proportion of the prizes awarded by their respective departments: 5 UCF students received a combination of departmental prizes and honors and athletic awards; 14 UCF students received departmental prizes and honors; 7 UCF students received athletic awards; 2 UCF students received U.S. Military Awards; 10 UCF students were elected to Phi Beta Kappa Society; 23 UCF students were elected to membership in Society of Sigma Xi; finally, 32 UCF students received some form of honors (19 cum laude, 10 magna cum laude and 3 summa cum laude).

Master in Finance

The third full class of the Center's Master in Finance (MFin) graduated in June 2005. Reflecting the interdisciplinary nature of the BCF, the MFin program is nearly unique in producing students with extensive training in both quantitative methods (drawing on the strengths of our Engineering, Computer Science, Mathematics and other departments) and in Economics. This set of skills makes our Master students highly sought after in the job market. The program is designed to be completed in four semesters, but students with strong backgrounds will be able to finish more quickly, in as little as one year.

Because business schools do not generally offer so specialized a program, or expect their students to have such a strong mathematical background, Princeton's MFin offers students a significant advantage in obtaining coveted positions in investment banking, brokerage houses, and similar firms. BCF faculty also benefit from the program because it provides a forum in which they can develop an active intellectual interchange with leading private-sector financial researchers and practitioners.

We have continued to invest heavily in the placement of our graduating students. The networking efforts of our two dedicated placement advisors, the strong support from our Corporate Affiliates and Advisory Council, and the success enjoyed by our first two graduating classes has been reflected in a strong demand for our 2005 graduates, all of whom accepted

permanent employment in financial firms or went on to Ph.D. programs. Our two year students all accepted offers of summer internships from financial firms.

We have repeated our three-day “boot camp” introductory program which we developed in 2003 for the incoming students prior to the beginning of classes in September. The camp focuses on a refresher of various finance topics, the types of careers for which the MFin degree prepares students and some useful information on interviewing skills.

MFin applications for 2005-06 exceeded the level of the previous year, reaching 296 in January 2005. We intend to continue keeping the program small and selective. We admitted 30 students this year, and 19 will be enrolling this coming fall. Our selectivity rate continues to be exceptionally high, with our program admitting 10% of its applicant pool. This is a substantially smaller percentage than our peer programs in quantitative finance (NYU, Columbia, Carnegie-Mellon, Berkeley, Chicago, Stanford, etc.) and one that is comparable to the most selective business schools. Our yield (66% this year) was also excellent, despite the absence in most cases of financial aid. Overall, this is a very good sign for the continued success of our program.

We have continued to conduct interviews of the most promising subset of our applicant pool using our Advisory Council. This process helps us ascertain which of the strong academic candidates we had identified through their written applications also excelled in areas such as communication and leadership. In addition to the obvious benefit of collecting very useful information about potential students, we get a positive “halo” effect with the strongest candidates who get to meet our industry-leading Advisory Council members.

Ph.D. Students

Ph.D. students in the Bendheim Center for Finance are admitted through the Department of Economics, the Department of Operations Research and Financial Engineering or the Program in Applied and Computational Mathematics. Six students graduated in 2005. Our students continue to achieve high quality placements which will further raise the visibility of the Center in the world of academic finance and industry.

- Albina Danilova’s topic was “Emergence of Stochastic Volatility from Informational Heterogeneity.” She has accepted an Assistant Professor position in the Mathematical Finance group at Oxford University.
- Brishti Guha wrote on the topic of “Malfeasance and the Market : Essays in Corporate Cheating” and has accepted an Assistant Professor position at the Singapore Management University.
- Christian Julliard’s thesis deals with the interaction of macroeconomic aggregates and financial market equilibria. He has accepted an Assistant Professor position at the London School of Economics.
- Michael Ludkovski’s thesis deals with computational finance and pricing of managerial flexibility for energy derivatives. He will be pursuing his career as an Assistant Professor in the Mathematics Department at the University of Michigan in Ann Arbor.
- Áureo de Paula’s research focuses on theoretical and empirical aspects of social interactions. He has accepted a position as an Assistant Professor in the Department of Economics at University of Pennsylvania.

- Natalia Piqueira's dissertation is an empirical investigation of the importance of liquidity and trading activity for asset pricing. She has accepted an Assistant Professor position at the C. T. Bauer College of Business, University of Houston.

Fund Raising

Looking forward, our greatest challenge will be to continue to recruit and retain top-flight faculty. Faculty recruitment and retention is essential to our new educational initiatives and for continued expansion of course offerings. To be successful in this very competitive market, we have found it necessary to make commitments to provide research support for faculty members. All of this requires active fund raising and we continue to work closely with the Development Office to increase the Center's resources.

With the improving economy, our Corporate Affiliates Program has been quite successful. Under this program, financial firms are asked to make annual gifts to the Center. In exchange, member firms are given certain privileges, such as the right to receive Center publications, to send representatives to Center events, and to receive assistance in recruiting our students (both undergraduate and master students) for internships and permanent jobs. Members for 2004-05 are the Citadel Investments Group, Citigroup, Deutsche Bank, Goldman Sachs, JP Morgan Chase, Lehman Brothers, Merrill Lynch, Moody's Corporation and Morgan Stanley.

Advisory Council

The Center relies on the help and advice of prominent alumni working in the financial sector. The sixth annual meeting of the Advisory Council took place on campus on May 6, 2005. The agenda was centered on the placement of future Master students, fine-tuning of the undergraduate Certificate in Finance, and the design of the benefits offered to Corporate Affiliates. Council members were pleased to note the continued success of the Center's programs.

Conclusion

Finance is important to Princeton's continued success as an educational and research institution because of increasing demands for training in these areas by our students at all levels and because these fields have become central to research efforts in diverse disciplines, including economics. As one of the world's leading research and teaching universities, Princeton has much to offer to the future development and effective application of finance, including distinguished academic programs that can provide support in such areas as operations research, mathematics and statistics, decision science, and organizational theory. It is not Princeton's objective to create a simulacrum of a business school. Rather, our strategy is to focus on those portions of the conventional business school curriculum in which it has existing strengths, such as fields that can be solidly grounded in analytical, discipline-based research, and emphasize interdisciplinary research. Indeed, research and teaching in finance with an essential interdisciplinary component constitutes the distinguishing feature of the BCF.

By helping to attract outstanding new faculty, by encouraging and supporting the work of existing faculty, and by bringing to campus outstanding scholars and practitioners from private industry, the Center continues to stimulate exciting new research, dialogue and collaboration. And through its educational programs, the Center enhances the education, training and career opportunities of many of the world's very best students.

Tarun Al-Schali

Yacine Aït-Sahalia
Otto A. Hack '03 Professor of Finance and Economics
Director, Bendheim Center for Finance
August 2005

Faculty

Dilip Abreu is a Professor of Economics. His research interests include behavioral economics and finance, economic theory and game theory. He is a Fellow of the Econometric Society and a current member of its Council, and a Fellow of the American Academy of Arts and Sciences. He received a B.A. from Bombay University, an M.Phil. from Oxford University and a Ph.D. in Economics from Princeton.

Courses taught:

- ECO 502: Microeconomic Theory
- ECO 514: Game Theory
- ECO 418: Strategy and Information

Undergraduate students advised:

- Howard Deutsch, "On-campus Recruiting as a Two-sided Matching Problem or, How I Managed to Find a Job"
- Adam Nebesar, "Oil and War: New Methods for Estimating the Macroeconomic Effects of Oil Shocks, Using War in Iraq as a Case Study"

Graduate student advised:

- Attila Ambrus, "Coalitional Rationalizability"

Representative publications:

- "Evolutionary Stability in a Reputational Model of Bargaining," *Games and Economic Behavior*, August 2003 (with R. Sethi).
- "Bubbles and Crashes," *Econometrica* 71(1), 173-204, January 2003 (with M. Brunnermeier).
- "Synchronization Risk and Delayed Arbitrage," *Journal of Financial Economics* 66, 341-360, December 2002 (with M. Brunnermeier).
- "Bargaining and Reputation," *Econometrica* 68(1), 85-117, January 2000 (with F. Gul).
- "On the Theory of Infinitely Repeated Games with Discounting," *Econometrica* 56(2), 383-396, March 1988.

Yacine Aït-Sahalia is the Otto A. Hack '03 Professor of Finance and Economics and the Director of the Bendheim Center for Finance at Princeton University. He was previously a professor at the

University of Chicago's Graduate School of Business. A past Sloan Research Fellow, he was named an outstanding faculty by *Business Week's 1997 Guide to the Best Business Schools*, and is the recipient of the 1997 Michael Brennan Award, the 1998 Cornerstone Research Award, the 2001 FAME Research Award and the 2003 Aigner Award. He is a Fellow of the Econometric Society, the Institute of Mathematical Statistics, and a Research Associate for the National Bureau of Economic Research. He currently serves as an Editor of the *Review of Financial Studies*. He received his Ph.D. in Economics from the Massachusetts Institute of Technology in 1993 and his undergraduate degree from France's École Polytechnique.

Course taught:

- ECO 462/FIN 515: Portfolio Theory and Asset Management

Graduate students advised:

- Jialin Yu, "Saddlepoint Methods in Finance"
- Julio Cacho-Diaz, "Optimal Portfolio Choice in the Presence of Jumps"
- Rodrigo Guimaraes, "Comparing the Information in Currency Options and the Domestic and Foreign Term Structures of Interest Rates"

Representative publications:

- "How Often to Sample a Continuous-time Process in the Presence of Market Microstructure Noise," *Review of Financial Studies*, 2005 (with P. Mykland and L. Zhang).
- "Estimators of Diffusions with Randomly Spaced Discrete Observations: A General Theory," *Annals of Statistics*, 2004 (with P. Mykland).
- "Disentangling Diffusions from Jumps," *Journal of Financial Economics*, 2004.
- "The Effects of Random and Discrete Sampling When Estimating Continuous-time Diffusions," *Econometrica*, 2003 (with P. Mykland).
- "Maximum-likelihood Estimation of Discretely-Sampled Diffusions: A Closed-form Approximation Approach," *Econometrica*, 2002.

Alexandre d'Aspremont joined Princeton's ORFE department in September 2004. His research focuses on interest rate option pricing and risk-management, applications of convex optimization to finance, and large-scale convex optimization in general. He received his undergraduate and graduate degrees from École Polytechnique and his Ph.D. from Stanford University in 2004. He is a member of the Institute for Operations Research and the Management Sciences (INFORMS) and the Society for Industrial and Applied Mathematics (SIAM).

Courses taught:

- ORF311: Optimization under Uncertainty.
- ORF515/FIN503: Asset Pricing II: Stochastic Calculus and Advanced Derivatives.

Undergraduate students advised:

- Emma Taylor, "Google versus Goldman: Can Dutch Auctions Revolutionize Wall Street?"
- Ashleigh Kreider, "Principal Component Analysis and Sparse Principal Component Analysis as Applied in Yield Curve Analysis and Handwritten Digit Recognition"
- Avery Kiser "Exotic Options: Their Definition, Purpose and Application"

Representative publications:

"Static versus Dynamic Arbitrage Bounds on Multivariate Option Prices," ArXiv: cs.CE/0407029. To appear in *IMA Volumes in Mathematics and Its Applications*.

"A Direct Formulation for Sparse PCA Using Semidefinite Programming," NIPS 2004 (with L. El Ghaoui, M. I. Jordan, and G. R. G. Lanckriet).

"Static Arbitrage Bounds on Basket Option Prices," submitted. Preprint on ArXiv: math.OE/0302243 (with L. El Ghaoui).

"Risk-Management Methods for the Libor Market Model Using Semidefinite Programming," to appear in *Journal of Computational Finance*.

"Interest Rate Model Calibration using Semidefinite Programming," *Applied Mathematical Finance* 10(3), September 2003, pp. 183-213.

Ben S. Bernanke taught at the Stanford Graduate School of Business before coming to Princeton in 1985. He is currently on leave from his position as the Howard Harrison and Gabrielle Snyder Beck Professor of Economics and Public Affairs. His research focuses primarily on monetary policy, the role of financial markets in the macroeconomy, and economic history. Bernanke is a Fellow of the Econometric Society, a Fellow of the American Academy of Arts and Sciences, a Research Associate of the National Bureau of Economic Research, and a Guggenheim Fellow. Ben took the oath of office as a member of the Board of Governors of the Federal Reserve System in August 2002 and was recently nominated as chair of President Bush's Council of Economic Advisers. He earned his Ph.D. from the Massachusetts Institute of Technology in 1979.

Representative publications:

- "Is Growth Exogenous? Taking Mankiw, Romer, and Weil Seriously," in *NBER Macroeconomics Annual*, 2001 (with R. Gurkaynak).
- "Should Central Banks Respond to Movements in Asset Prices?" , *American Economic Review*, May 2001 (with M. Gertler).
- *Essays on the Great Depression*, Princeton: Princeton University Press, 2000.
- "Measuring Monetary Policy," *Quarterly Journal of Economics*, 113(3), 869-902, August 1998 (with I. Mihov).

- *Inflation Targeting: Lessons from the International Experience*, Princeton: Princeton University Press, 1998 (with T. Laubach, F. Mishkin, and A. Posen).
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Swati Bhatt has been at Princeton since September 1992, teaching at the Woodrow Wilson School and in the Department of Economics. She obtained her Ph.D. in Economics from Princeton University in 1986 and worked as a research economist at the Federal Reserve Bank of New York until 1990. She then taught at the Stern School of Business prior to joining Princeton. She is currently Director of Student Programs (undergraduate and graduate) at the Bendheim Center and Lecturer, Woodrow Wilson School of Public and International Affairs. Her research interests center on empirical corporate finance, venture capital and the entrepreneurship process.

Courses taught:

- ECO 320: Financial Derivatives and Arbitrage
- WWS 582: Topics in Applied Economics

Undergraduate students advised:

- Andrew Geant, "Reforming the Rating Industry: A Rating Accuracy Index (RAI)"
 - Maggie Todd, "Venture Capital Deal Terms and Financial Contracting Theory; Analysis of External Risk Factors"
 - Dana Lime, "The Long-term Financial Implications of Layoffs in Fortune 500 Firms: An Analysis of the Potential Benefits Hypothesis"
 - Carolyn Joei, "A Worthwhile Investment: The Benefits of Art as a Nontraditional Asset Class"
 - Amy Wu, "The Periodic Term Structure in an Enhanced Index Fund and Its Implications for Market Efficiency" (awarded the prize for best empirical economics thesis in 2004)
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David Blair is Director of Corporate Relations for the Bendheim Center for Finance. Previously he had been a Managing Director with Morgan Stanley and, prior thereto, a partner in the law firm of White & Case. His responsibilities with the Center include i) managing the Corporate Affiliates program which seeks support for the Bendheim Center from firms interested in finance and which works with corporations to build partnerships investigating financial topics of mutual interest, ii) advising undergraduates and Master in Finance candidates on career issues, including the development of applied finance programs and interview enhancement techniques for the Master in Finance program, iii) facilitating the recruiting activities of Corporate Affiliates by coordinating on-campus recruiting presentations and organization of events at the Bendheim Center, and iv) developing and teaching a special seminar in applied finance. He received his undergraduate degree from Princeton and graduate degrees in law and business from Columbia University.

Course taught:

- Freshman Seminar FRS 122: Modern Financial Markets

Undergraduate students advised:

- Alidia Clagett, “After the Fall: An Analysis of the Stock Market Bubbles of 1929, 1966-69, and 2000”
- Gordon Grant, “An Analysis of the Housing Market in the United States: Bubbling Along?”
- Ryan Watson, “A Critical Analysis of Royalty Trusts and their Ability to Provide Publicly-traded, Integrated Oil Companies during Periods of Supply Disruption”

Alan Blinder is the Gordon S. Rentschler Memorial Professor of Economics. He is also the Co-Director of the Center for Economic Policy Studies at Princeton University, which he founded in 1989. He is former Vice Chairman of the Board of Governors of the Federal Reserve System (1994-1996) and before that was a member of President Clinton’s original Council of Economic Advisers (1993-1994). He also served briefly as Deputy Assistant Director of the Congressional Budget Office in 1975. He is a partner in the Promontory Financial Group, Vice Chairman of Promontory Interfinancial Network, Vice Chairman of the G7 Group, a Trustee of the Russell Sage Foundation, and has been elected to the American Philosophical Society and the American Academy of Arts and Sciences. He is the author or co-author of 17 books and has written scores of scholarly articles on topics such as fiscal policy, monetary policy, and the distribution of income. He received his Ph.D. from the Massachusetts Institute of Technology.

Courses taught:

- ECO 101: Introduction to Macroeconomics
- WWS 593c: Policy Analysis: The Political Economy of Central Banking

Representative publications:

- “Are Two Heads Better than One? Monetary Policy by Committee,” *Journal of Money, Credit and Banking*, 2005 (with John Morgan).
- “What Does the Public Know about Economic Policy, and How Does It Know It?”, *Brookings Papers on Economic Activity* 1: 2004 (with A. Krueger).
- *The Quiet Revolution: Central Banking Goes Modern*, Yale University Press, 2003.
- *Downsizing in America*, Russell Sage Foundation, 2003 (with W. Baumol and E. Wolff).
- *The Fabulous Decade: Macroeconomic Lessons from the 1990s*, The Century Fund, 2001 (with J. Yellen).

Patrick Bolton is the John H. Scully '66 Professor of Finance and Economics at Princeton University. He received his Ph.D. in Economics from the London School of Economics and his B.A. in Political Science from the Institut d’ Etudes Politiques de Paris. He is a Fellow of the Econometric Society, the Center for Economic Policy Research (CEPR), the National Bureau of Economic Research (NBER), and the European Corporate Governance Institute (ECGI). He is the author of *Contract Theory* (MIT Press, 2005) and he has edited the volume *Credit Markets for the*

Poor (Russell Sage Foundation, 2005). Professor Bolton's main research interests are in contact theory, corporate finance, political economy and industrial organization. He is currently a managing editor of the *Journal of the European Economic Association* and a member of the Editorial Boards of several other Journals.

Courses taught:

- ECO 526: Financial Economics II
- ECO 542: Regulation of Industry and Antitrust Policy

Graduate students advised:

- Alvaro Bustos
- Sylvain Champonnois
- Andrei Hagiu, "Platforms, Pricing, Commitment and Variety in Two-sided Markets"
- Umit Kaya, "Essays In Corporate Governance"
- Marc Martos-Vila
- Chunhui Miao
- Anders Nielsen
- Martin Oehmke
- Elod Takats
- Yosuke Yasuda

Representative publications:

- "Corporate Governance and Control," in the *Handbook of the Economics of Finance*, edited by George Constantinides, Milton Harris and René Stulz, North-Holland, 2003 (with M. Becht and A. Roell).
- "Towards a Statutory Approach to Sovereign Debt Restructuring: Lessons from Corporate Bankruptcy Practice around the World," *IMF Staff Papers*, 2003.
- "Incomplete Social Contracts," with Philippe Aghion, *Journal of the European Economic Association*, 1, 38-67, 2003.
- "Exit Options in Corporate Finance: Liquidity versus Incentives", with Philippe Aghion and Jean Tirole, *Review of Finance*, 327-53, 2004.
- "Political Intervention in Debt Contracts," *Journal of Political Economy*, 110, 1103-34, October 2002 (with H. Rosenthal).

Markus Brunnermeier is an Assistant Professor in the Department of Economics and member of Princeton's Bendheim Center for Finance and the International Economics Section and he is an academic consultant to the New York Federal Reserve Bank. Prof. Brunnermeier was awarded his Ph.D. by the London School of Economics, where he was also affiliated with its Financial Markets Group. His research focuses on stock market bubbles, financial and liquidity crisis, as well as behavioral economics. He shows that bubbles persist since sophisticated traders prefer to ride a stock market bubble rather than to go against it. His work on financial crisis and risk management studies the interaction between funding and market liquidity and "predatory trading" and explains why liquidity dries up when it is needed most. His research in behavioral finance proposes a shift away from the rational expectations paradigm towards "optimal expectations." He won various awards, including the Sloan Research Fellowship, the Smith-Breeden Prize for the best paper published in the *Journal of Finance* 2004, grants from the National Science Foundation and he was selected for the Review of Economic Studies Tour.

Course taught:

- FIN 501: Asset Pricing I: Pricing Models and Derivatives

Representative publications:

- "Optimal Expectations," *American Economic Review*, forthcoming (with Jonathan Parker).
- "Information Leakage and Market Efficiency," *Review of Financial Studies*, 18(2), 417-457, 2005.
- "Predatory Trading," *Journal of Finance*, forthcoming (with L. Pedersen).
- "Hedge Funds and the Technology Bubble," *Journal of Finance*, 59(5), 2007-2034, 2004, (with S. Nagel). Smith Breeden Prize for the best article published in the *Journal of Finance*, 2004 (First Prize).
- "Bubbles and Crashes," *Econometrica*, 71(1), 173-204, 2003 (with D. Abreu).

René Carmona, Paul M. Wythes '55 Professor of Engineering and Finance, is with the Department of Operations Research and Financial Engineering. As Director of Graduate Studies of the Bendheim Center, he is responsible for the Master in Finance program. He joined Princeton University in 1995. He was granted the "Agrégation" of Mathematics (federal degree) in June 1969, and a "These d'Etat" in Probability from the University of Marseille in June 1977. He was elected Fellow of the Institute of Mathematical Statistics in 1984. He is a member of the American Mathematical Society, the Society for Industrial and Applied Mathematics and the Institute of Mathematical Statistics. His research interests center on stochastic partial differential equations, statistical analysis of financial data, pricing in incomplete markets, weather derivatives, energy and credit markets.

Courses taught:

- ORF 505/FIN 505: Modern Regression and Time Series
- ORF 531/FIN 531: Computational Finance in C++

- ORF 557: Malliavin Calculus and Applications to Finance

Graduate students advised:

- Albina Danilova, "Indifference Pricing for Weather Derivatives"
- Valdo Durrleman, "From Implied to Spot Volatility"
- Mike Ludkovski, "Monte Carlo Pricing of Energy Tolling Agreements"
- Lixin Wang, "Applications of the Malliavin Calculus to the Analysis of Stochastic Partial Differential Equations"

Recent publications:

- "Pricing and Hedging Spread Options," SIAM Review, December 2004 (with V. Durrleman)
- "Convenience Yield Model with Partial Observation and Exponential Utility" IJTAF (with M. Ludkovski)
- "Interest Rate Models: an Infinite Dimensional Stochastic Analysis Perspective" (research monograph).
- *Statistical Analysis of Financial Data in Splus* (textbook).

Patrick Cheridito received his Ph.D. from ETH Zurich (Switzerland) in 2001 and visited universities in Vienna, Paris, Barcelona and Pisa in the academic year 2001-02, before visiting the BCF in 2002-03. Since September 2003 he is an Assistant Professor in the Department of Operations Research and Financial Engineering. His research interests center on the theory of stochastic processes and their applications to finance. In the last year he has been working on the following research projects: Together with Damir Filipović (University of Munich) and Robert Kimmel (Bendheim Center) he worked on affine models for interest rates. With Mete Soner (Koc University in Istanbul) and Nizar Touzi (Crest in Paris) he studied the problem of hedging contingent claims under gamma constraints. With Freddy Delbaen and Michael Kupper (both ETH Zurich) he studied dynamic risk measures.

Courses taught:

- ORF 435: Financial Risk Management
- ORF 535: Financial Risk Management
- ORF 527: Stochastic Calculus and Finance
- ORF 558: Stochastic Analysis Seminar

Undergraduate students advised:

- Richard Apple, "How Deep is the Hole? A Stochastic Analysis of the Pension Benefit Guaranty Corporation"
- Ceyda Dagdelen, "Risk Measures and Capital Requirements"
- Elizabeth Larkins, "The Wealth of Nations: An Analysis of the Correlation between United States Economic Indicators and the Probability of Default of Emerging Market Countries"
- Andrea Leewong, "The Stock Market Overreaction Mystery: Human Judgment Bias in Financial Decision-making"
- Joseph McConnell, "Optimal High School Sizes in Relation to School Demographics"
- Joseph Solomond, "Measuring Risk in Sectors of the S&P 500: Calculating VaR and Expected Shortfall Assuming Heavy Tailed Distributions"

Graduate student advised:

- Andrew Moroz, "Determining the Minimum Super-replication Cost of a Contingent Claim under Delta and Gamma Constraints in Discrete Time"

Gregory Chow is Professor of Economics and Class of 1913 Professor of Political Economy, Emeritus, at Princeton University. He was Manager of Economic Research at the I.B.M. Thomas J. Watson Research Center from 1962-1970, and Director of the Econometric Research Program at Princeton University from 1970-1997. The Program was renamed the Gregory C. Chow Econometric Research Program in 2001. Professor Chow is a member of the American Philosophical Society and of Academia Sinica and a Fellow of the American Statistical Association and of the Econometric Society. He has served as Associate Editor or Co-editor of the *American Economic Review*, *China Economic Review*, *International Economic Review*, *Journal of Economic Dynamics and Control*, *MOCT-MOST*, and the *Review of Economics and Statistics*. Professor Chow's contributions to economics cover three main areas: econometrics, including the often used "Chow test" for parameter stability, the estimation of simultaneous stochastic equations and criteria for model selection; dynamic economics, including spectral methods and optimal control methods for the analysis of econometric models and dynamic optimization under uncertainty to be solved by the method of Lagrange multipliers (in lieu of dynamic programming); and the Chinese economy, an institutional, theoretical and quantitative approach to its study. He received his Ph.D. from the University of Chicago.

Course taught:

- ECO 379: The Chinese Economy

Representative publications:

- *Knowing China*. Singapore, World Scientific Publishing Co., 2004.
- "A Time-series Analysis of the Shanghai and New York Stock Price Indices," *Annals of Economics and Finance*, 17-35, May 2003 (with C. Lawler).
- *China's Economic Transformation*. Oxford: Blackwell Publishers, 2002.

- *Dynamic Economics: Optimization by the Lagrange Method. Oxford: Oxford University Press, 1997.*
- "Equity Premium and Consumption Sensitivity when the Consumer-investor Allows for Unfavorable Circumstances," *Journal of Economic Dynamics and Control*, 26(9-10), 1417-1429, August 2002 (with L. Zheng).

Erhan Çinlar first came to Princeton University as a Visiting Professor of Statistics in 1979-80. He is currently the Chair of Operations Research and Financial Engineering and also holds the Norman J. Sollenberger Professor of Engineering chair. He is a Fellow of the Institute of Mathematical Statistics, a Fellow of INFORMS, an elected member of the International Statistical Institute and is the recipient of the Science Prize of TUBITAK. He has served as editor or associate editor of over 12 journals on probability theory and its applications. His research interests center on martingales, Markov processes, stochastic differential equations, dynamic point processes, mass transport by stochastic flows, and their applications to mathematics of insurance and finance, reliability of complex systems, and modeling and estimation of natural hazards.

Courses taught:

- ORF 309: Probability and Stochastic Systems
- ORF 526: Stochastic Modeling
- ORF 551/APC 521: Probability Theory
- ORF 554: Markov Processes
- ORF 557: Stochastic Analysis Seminar

Representative publications:

- "Lyapunov Exponents of Poisson Shot-noise Velocity Fields," *Stochastic Processes and Their Applications*, 94, 29-49, 2001 (with M. Caglar).
- "Spectral Expansion of the Occupation Measure for Birth and Death on a Flow," *Stochastic Processes and Their Applications*, 74, 203-215, 1998 (with J. Kao).
- "Dispersion of Particle Systems in Brownian Flows," *Advances in Applied Probability*, 28, 53-74, 1996 (with C. Zirbel).
- "Mass Transport by Brownian Flows," in *Stochastic Models in Geosystems*, edited by S. A. Molchanov. IMA Volumes in Mathematics and Its Applications, Springer-Verlag, 1996 (with C. Zirbel).
- "Conditional Levy Processes," *Computers and Mathematics*, 46, 993-997, 2003.

Savas Dayanik joined Princeton's ORFE Department in September 2002. His research interests center on applied probability, stochastic processes and modeling, optimal stopping, optimal

stochastic control, with applications to finance, investment decision analysis and operations management. He received his Ph.D. from Columbia University in 2002 in Operations Research with concentration in Applied Probability. He received the first prize in the INFORMS 2002 George E. Nicholson Student Paper Competition in November 2002. One of his papers on the quickest detection of Poisson disorder was selected as the finalist in the INFORMS 2004 Junior Faculty Interest Group Paper Competition. He is a member of Institute for Operations Research and the Management Sciences (INFORMS) and Institute of Mathematical Statistics (IMS).

Courses taught:

- ORF 245: Fundamentals of Engineering Statistics
- ORF 526: Stochastic Modeling
- ORF 542: Controlled Markov Processes

Undergraduate students advised:

- Kevin Foster, "Your Team is Going Broke! Now Switch to Variable Ticket Pricing. An Analysis of N.B.A. Game Attendance to be Used with Revenue Management Techniques"
- Nada Siddiqui, "Re-engineering Portfolio Theory: Optimizing the Diversification of Moet Hennessy-Louis Vuitton (LVMH)"
- Devaushi Singham, "The Option to Abandon as Applied to the Sequential Investment Problem"
- Carl Zhang, "Speculation, Liquidity, and Information: The Puzzle of Chinese B-shares"

Graduate students advised:

- Masahiko Egami
- Semih S. Sezer

Representative publications:

- "Adaptive Poisson Disorder Problem," submitted to *Annals of Applied Probability*, 2005 (with E. Bayraktar and I. Karatzas).
- "Poisson Disorder Problem with Exponential Penalty for Delay," submitted to *Mathematics of Operations Research*, 2004 (with E. Bayraktar).
- "The Effectiveness of Several Performance Bounds for Capacitated Production, Partial-order-service Assemble-to-order Systems," *Manufacturing and Service Operations Management*, 5, 230-251, 2003 (with J. Song and S. Xu).
- "On the Optimal Stopping Problem for One-dimensional Diffusions," *Stochastic Processes and their Applications*, 107(2), 173-212, 2003 (with I. Karatzas).
- "An Adaptive Bayesian Replacement Policy with Minimal Repair," *Operations Research*, 50(3), 552-558, 2002 (with U. Gurler).

Jianqing Fan is Professor of Operations Research and Financial Engineering since the fall of 2003. A specialist in statistics, he served as a faculty member at the University of North Carolina, University of California at Los Angeles, and the Chinese University of Hong Kong over the last 14 years. He also was chair of the statistics department of the Chinese University, where he received teaching awards in 2001 and 2002. In addition, Professor Fan received the 2000 President's Award from the Committee of Presidents of Statistical Societies, recognizing the most outstanding statistician under age 40. He is an elected member of the International Statistical Institute and an elected Fellow of the Institute of Mathematical Statistics and the American Statistical Association. He served on the board of the International Chinese Statistical Association from 2000 to 2002, and the Council of the Institute of Mathematical Statistics from 2003 to 2005. He is one of the top 10 highly cited researchers in mathematical sciences between 1991-2001 and 1993-2003, 1994-2004, according to *Thomson Incites*. He coauthored three books. He serves as the editor of *The Annals of Statistics, and Probability Theory and Related Fields*, and as an Associate Editor of the *Journal of the American Statistical Association*. He has served as an Editor of *Journal of Multivariate Analysis* (1998-2000), and an Associate Editor of *The Annals of Statistics* (1998-2002) and *Statistica Sinica* (1996-2002). He earned his bachelor's degree from Fudan University in China, his master's degree from Academia Sinica in China, and his doctoral degree from the University of California at Berkeley. His research interests are financial econometrics, risk management, computational biology, nonlinear time series, high-dimensional data analyses, likelihood theory, nonparametric tests, generalized linear models, analysis of longitudinal data, and model selections.

Courses taught:

- ORF 504/FIN 504: Financial Econometrics
- ORF 569/FIN 569: Statistical Theory and Methods

Undergraduates advised:

- Elisa Cheung, "The Importance of Macroeconomic Variables in Explaining Credit Spreads"
- Cyrena Chih, "Parimutuel Derivatives"
- Christopher Kirk, "A Method to 'March Madness': Modeling the NCAA Basketball Tournament"
- Rodrigo Javier Montoya, "Pricing Catastrophy Insurance Derivatives: Sensitivity Analysis of the PCS Loss Index"
- Jenny Tsai, "Restrictive Migration Policies and the Creation of an Urban Underclass: The Case of Shanghai"

Graduate students advised:

- Yingying Fan
- Clifford Lam
- Yue Niu

Representative publications:

- “A Re-examination of Stanton's Diffusion Estimations with Applications to Financial Model Validation,” *Journal of American Statistical Association*, 98, 118-134, 2004 (with C. Zhang).
- “On Non-concave Penalized Likelihood with Diverging Number of Parameters,” *The Annals of Statistics*, 32, 928-961, 2004 (with H. Peng).
- *Nonlinear Time Series: Nonparametric and Parametric Methods*, 570pp, Springer-Verlag, New York. *Figures and Computer Programs*, 2003 (with Q. Yao).
- “Time-dependent Diffusion Models for Term Structure Dynamics and the Stock Price Volatility,” *Statistica Sinica*, 13, 965-992, 2003 (with J. Jiang, C. Zhang, and Z. Zhou).
- *Local Polynomial Modeling and Its Applications*, 341pp, Chapman and Hall, London, 1996 (with I. Gijbels).

Victoria Henderson is an Assistant Professor in the Department of Operations Research and Financial Engineering. She received her Ph.D. from the University of Bath in 1999 and has since held research positions at ETH Zurich, Warwick Business School and the University of Oxford. Her research interests are in the area of derivatives, including incomplete markets, non-traded assets, real options, executive stock options, and exotic options. She is also interested in optimal portfolio choice problems.

Courses taught:

- ORF 515/FIN 503: Asset Pricing II: Stochastic Calculus and Advanced Derivatives
- ORF 555: Fixed Income Models

Undergraduate students advised:

- Kate Barber, “A Rounding Model for Option Pricing”
- Michelle Breyer, “Extendible Options: Pricing and Analysis”
- Nimish Jain, “Real Options: A Comparative Evaluation of Existing Models”

Graduate student advised:

- Milda Darguzaitė, “Implied Volatility Modeling—Theory and Applications to Currency Options Data”

Representative publications:

- “Analytical Comparisons of Option Prices in Stochastic Volatility Models,” *Mathematical Finance*, 15(1), 49-59, January 2005.
- “On the Equivalence of Floating and Fixed-strike Asian Options,” *Journal of Applied Probability*, 39(2), June 2002 (with R. Wojakowski).

- “Valuation of Claims on Non-traded Assets using Utility Maximization,” *Mathematical Finance*, 12(4), 351-373, October 2002.
- “Local Time, Coupling and the Passport Option,” *Finance and Stochastics*, 4(1), 69-80, January 2000 (with D. Hobson).

Harrison Hong joined Princeton in 2003 as a Professor of Economics and Finance after having spent the year visiting us from the Graduate School of Business at Stanford University. Harrison’s interests focus on behavioral finance, asset pricing with differences of opinion and short-sales constraints, asset pricing with market imperfections, career concerns and herding, social interaction and investor behavior in stock markets, and mutual funds. He is a member of the American Economic Association, American Finance Association, and the Western Finance Association. He received his Ph.D. from the Massachusetts Institute of Technology in 1997.

Courses taught:

- ECO 462/FIN 515: Portfolio Theory and Asset Management
- ECO 525: Financial Economics I

Undergraduate students advised:

- Kevin Crowe, Jr., “The Emergence of an Asset Class: An Empirical Analysis of Private Equity Performance”
- Donald Komorous, “The Stock Split Anomaly: An Analysis of Underreaction to Stock Splits”
- Lauren Washychyn, “Does Expensing Stock Options Cause Share Prices to Decline?”
- Scott Willig, “Dividend Taxation and Market Valuation”

Representative publications:

- “Bad News Travels Slowly: Size, Analyst Coverage, and the Profitability of Momentum Strategies,” *Journal of Finance*, February 2000.
- “Security Analyst Career Concerns and Herding of Earnings Forecasts,” *Rand Journal of Economics*, Spring 2000.
- “A Model of Returns and Trading in Futures Markets,” *Journal of Finance*, April 2000.
- “A Unified Theory of Underreaction, Momentum Trading, and Overreaction in Asset Markets,” *Journal of Finance*, December 1999.

Daniel Kahneman is the Eugene Higgins Professor of Psychology and Professor of Public Affairs in the Woodrow Wilson School since 1993. He is the co-recipient of the 2002 Nobel Prize in Economic Sciences. He is a member of the National Academy of Sciences, and in 2002 received (together with his late colleague Amos Tversky) the prestigious Grawemeyer Award in Psychology. He is a Fellow of the American Academy of Arts and Sciences, the Econometric

Society, the American Psychological Association and the Canadian Psychological Association. He is currently on the Editorial Boards of the *Journal of Behavioral Decision Making*, *Thinking and Reasoning*, and *Economics and Philosophy*. He received his Ph.D. in 1961 from the University of California.

Courses taught:

- PSY 101: Introduction to Psychology
- WWS 312/PSY 321: The Psychology of Decision Making and Judgment
- PSY 528/WWS 519: Negotiation, Persuasion, and Social Influence: Theory and Practice
- WWS 502: Psychology for Policy Analysis and Implementation
- WWS 515/PSY 529: Conceptions of the Human Agent: Implications for Policy

Representative publications:

- *Choices, Values and Frames*, New York: Cambridge University Press and the Russell Sage Foundation, summer 2000 (with A. Tversky).
- "Maps of Bounded Rationality: A Perspective on Intuitive Judgment and Choice," *Les Prix Nobel 2002*, T. Frangsmyr (ed.), 416-499.
- "A Perspective on Judgment and Choice: Mapping Bounded Rationality," *American Psychologist*, 58(9), 697-720, 2003.
- "Social Experiences of Research," *American Psychologist*, 58(9), 697-720, 2003.
- "Zeroing in on the Dark Side of the American Dream: A Closer Look at the Negative Consequences of the Goal for Financial Success." *Psychological Science*, 14(6), 531-536, 2003 (with C. Nickerson, N. Schwarz, and E. Diener).

Robert Kimmel received his Ph.D. in Finance from the University of Chicago, Graduate School of Business in 2001. Prior to that, he also received an M.B.A. from the University of Chicago, Graduate School of Business, concentrating in Analytic Finance and Econometrics; an M.S. in Computer Science from Columbia University; and a B.S.E. in Computer Science and Engineering from the University of Pennsylvania. His research interests are focused mainly on new approaches to term structure modeling and estimation of continuous time stochastic processes.

Courses taught:

- ECO 462/FIN 515: Portfolio Theory and Asset Management
- ECO 466/FIN 521: Fixed Income: Models and Applications
- FIN 502: Corporate Finance and Financial Accounting

Representative publications:

- “Modeling the Term Structure of Interest Rates: A New Approach,” *Journal of Financial Economics*, 2004.
-

Paul Krugman is the author or editor of dozens of books and several hundred articles, primarily about international trade and international finance. Krugman is also nationally known for his twice-weekly columns in *The New York Times*. He was the Ford International Professor of International Economics at the Massachusetts Institute of Technology and has served on the staff of the U.S. Council of Economic Advisers. He was the recipient of the 1991 John Bates Clark Medal, an award given every two years by the American Economic Association to an economist under 40. Krugman received his Ph.D. from the Massachusetts Institute of Technology. He holds a joint appointment with the Economics Department and the Woodrow Wilson School of Public and International Affairs.

Course taught:

- WWS 524: Advanced Macroeconomics: Domestic Policy Issues

Representative publications:

- *Currency Crises* (ed.), University of Chicago Press, 2000.
 - *The Return of Depression Economics*, Norton, 1999.
 - *The Spatial Economy*, MIT Press, 1999 (with M. Fujita and A. Venables).
-

Burton Malkiel has been the Chemical Bank Chairman’s Professor of Economics at Princeton since 1988. His research interests center on financial markets, asset pricing, and investment strategies. He is a regular op-ed page writer for *The Wall Street Journal*. He also serves on the boards of several financial and non-financial corporations. He has been awarded the Honorary Doctor of Humane Letters Degree from the University of Hartford (June 1971), Phi Beta Kappa, and the Harvard Business School Alumni Achievement Award for 1984. He received his Ph.D. from Princeton University.

Course taught:

- ECO 362: Financial Investments

Undergraduate students advised:

- Joanna Deitch, “Defining the Concept of the Value Stock: Book-to-market versus Price-to-earning, Dividend Yield, and Earnings Growth”
- Teong Jun, “Dynamic Indexing”

Representative publications:

- *A Random Walk Down Wall Street*, W. W. Norton & Co., New York, 8th edition paperback, January 2004.

- “Investigating the Behavior of Idiosyncratic Volatility,” *The Journal of Business*, 76(4), October 2003 (with Y. Xu).
- “Have Individual Stocks Become More Volatile?,” *Journal of Finance*, February 2001 (with J. Campbell, M. Lettau and Y. Xu). [First Prize paper for the Smith Breeden Prizes for 2002]
- “The Growth of Index Funds and the Pricing of Equity Securities,” *Journal of Portfolio Management*, 27(2), winter 2001 (with A. Radisich). [Best Article for the Third Annual Bernstein Fabozzi/Jacobs Levy Awards]
- *Global Bargain Hunting: The Investor’s Guide to Profits in Emerging Markets*, New York: Simon & Schuster, January 1998 (with J. Mei).

John Mulvey is Professor of Operations Research and Financial Engineering. His research interests center on designing integrated financial planning systems for institutions, primarily pension plans and hedge funds, and wealthy individuals; developing optimal hedge fund strategies; combining financial optimization and stochastic models; stochastic optimization algorithms; and decentralized risk management. He was a Finalist for the Edelman prize for Towers Perrin-Tillinghast investment system in 1999. He received his Ph.D. in Management from the University of California, Los Angeles.

Courses taught:

- ORF 523: Nonlinear Programming
- WWS 514: Strategic Planning and Financial Management Systems in the Public Sector

Undergraduate students advised:

- Karima Nigmatulina
- Kevin Wong
- Jack Studer

Graduate students advised:

- Batur Bicer, “Optimizing Merger and Acquisition Decisions”
- Hafize Erkan, “Decentralized Risk Management for Global Financial Companies”
- Ozughan Karakas, “Volatility Strategies for Hedge Funds”
- Jamey Thompson, “Optimizing Non-parametric Models for Hedge Funds”
- Cenk Ural, “Developing a Modeling Language for Optimizing a Multi-strategy Hedge Fund”
- Zhuojuan Zhang, “Stochastic Programming Models for the Defined Benefit Pension Industry”

- Hakan Kaya, “Modeling Options in a Dynamic Economy”
- Ronny Luss, “Optimizing a Defined Benefit Pension Plan in Conjunction with a Corporate Planning Model”

Representative publications:

- “Applying CVaR for Decentralized Risk Management,” *Journal of Banking and Finance*, 2005.
- “Applying Optimization Technology to Portfolio Management,” *Journal of Portfolio Management*, 30th Anniversary Issue 2004.
- “Evaluating a Trend Following Commodity Index for Multi-period Asset Allocation,” *Journal of Alternative Investments*, summer 2004.
- “The Role of Hedge Funds for Long Term Investors,” *Journal of Financial Transformations*, spring 2004.
- “Advantages of Multi-period Portfolio Models,” *Journal of Portfolio Management*, winter 2003.

Jonathan A. Parker is an Assistant Professor of Economics and Public Affairs at Princeton University where he is affiliated with the Department of Economics, the Bendheim Center for Finance, and the Woodrow Wilson School of Public and International Affairs. Dr. Parker received his Ph.D. in Economics from the Massachusetts Institute of Technology where he was awarded the Robert Solow Endowment Prize for excellence in research and teaching. Prior to his present position at Princeton, Dr. Parker held positions at the University of Michigan Business School, where he was a Society of Scholars Fellow, and at the Department of Economics at the University of Wisconsin, where he was the Maude P. and Milton J. Shoemaker Fellow. Since coming to Princeton, Professor Parker has been named an Alfred P. Sloan Research Fellow and a National Bureau of Economic Research Aging and Health Economics Fellow, and his research has received support from the National Science Foundation and the Sloan Foundation. He is also a National Bureau of Economic Research Faculty Research Fellow, an Associate Editor for the *Journal of Money, Credit and Banking*, and a member of the American Economic Association and Econometric Society. Professor Parker teaches macroeconomics, and his research has focused on: The risk of the stock market, optimism and portfolio choice, taxation and consumer spending, national saving, income risk and consumer demand, corporate profit taxes and investment, and how wages adjust in recessions.

Courses taught:

- ECO 503: Macroeconomic Theory I
- ECO 521: Advanced Macroeconomic Theory I
- ECO 562: Topics in Development
- WWS 512c: Macroeconomic Analysis Advanced

Representative publications:

- “Consumption Risk and the Cross-section of Expected Returns,” *Journal of Political Economy*, 113(1), 185-222, February 2005 (with C. Julliard).
- “Luxury Goods and the Equity Premium,” *Journal of Finance*, December 2004 (with Y. Aït-Sahalia and M. Yogo).
- “Consumption Over the Life Cycle,” *Econometrica*, 70(1), 47-89, January 2002 (with P. Gourinchas).
- “The Consumption Risk of the Stock Market,” *Brookings Papers on Economic Activity*, 2, 279-348, 2001.

Hélène Rey received her Ph.D. from the London School of Economics and from the École des Hautes Études en Sciences Sociales in 1998. She came to Princeton in 2000 as an Assistant Professor. She was awarded an Alfred P. Sloan Research Fellowship in 2005. She is currently a Faculty Research Fellow in International Finance and Macroeconomics for the National Bureau of Economic Research. She is also a Research Affiliate in International Macroeconomics for the Centre for Economic Policy Research. She is Associate Editor of the *Journal of the European Economic Association* and of the *Economic Journal*. Her research interests focus mainly on international capital flows, exchange rates and financial crises.

Courses taught:

- WWS 544: International Macroeconomics
- ECO 553: International Monetary Theory and Policy I
- ECO 554: International Monetary Theory and Policy II

Graduate students advised:

- Deniz Igan
- Jordi Mondria
- Thomas Wu

Representative publications:

- “PPP Strikes Back: Aggregation and the Real Exchange Rate,” *Quarterly Journal of Economics*, 120(1), 1-43, February 2005 (with J. Imbs, H. Mumtaz and M. Ravn).
- “The Determinants of Cross Border Equity Transaction Flows,” *Journal of International Economics*, 64(2), 269-296, March 2005 (with R. Portes).
- “Financial Super-markets: Size Matters for Asset Trade,” *Journal of International Economics*, 64(2), 335-361, December 2004 (with P. Martin).
- “Exchange Rates, Equity Prices and Capital Flows,” NBER Working Paper 9398, CEPR DP 3735, forthcoming *Review of Financial Studies* (with H. Hau).

- “International Trade and Currency Exchange,” *Review of Economic Studies*, 68(2), April 2001.
-

Ailsa Roell has been a Senior Research Economist in the Department of Economics at Princeton University since 1997. She received her Ph.D. in Political Economics from Johns Hopkins University. She was a postdoctoral associate at the Massachusetts Institute of Technology, a lecturer in economics at the London School of Economics, a chercheur FNRS and chargée de cours at Université Libre de Bruxelles, and a professor of finance at Tilburg University. She was awarded the BACOB prize for European research in finance (joint with Marco Pagano) in 1997. Her current research interests are the competition among exchanges in attracting listings and liquidity, and corporate governance issues.

Courses taught:

- ECO 461: Trading and Securities Markets
- ECO 416: Topics in Corporate Finance, Corporate Governance and Banking

Undergraduate students advised:

- Daniel Brand, “The Method of Payment in Mergers & Acquisitions: Determinants and Stock Price Impact”
- Christopher Jaeger, “Net Asset Value Predictability: The Stale-price Arbitrage of Open-End Mutual Funds”
- Katherine Kuga, “The Effects of Various Macroeconomic Variables on the Stock Market”
- Joy Nims, “Executive Compensation & Earnings Restatements: An Unintended Consequence of Equity-based Pay”

Representative publications:

- “Market Making with Costly Monitoring: An Analysis of the SOES Controversy,” *Review of Financial Studies*, 2003 (with T. Foucault and P. Sandas).
 - “Corporate Governance and Control,” in G. Constantinides, M. Harris and R. Stulz (eds.), *Handbook of the Economics of Finance*, North-Holland 2003 (co-authored with M. Becht and P. Bolton).
 - “The Geography of Equity Listing: Why Do European Companies List Abroad?,” *Journal of Finance* 57:6, December 2002 (with M. Pagano and J. Zechner).
 - “The Choice of Stock Ownership Structure: Agency Costs, Monitoring and Liquidity,” *Quarterly Journal of Economics*, 1998 (with M. Pagano).
 - “Blockholdings in Europe: An International Comparison,” *European Economic Review*, 1999 (with M. Becht).
-

José Scheinkman joined Princeton as the Theodore Wells '29 Professor of Economics in 1999. He received an M.S. in Mathematics from the Instituto de Matemática Pura e Aplicada, Brazil, and an M.A. and a Ph.D. in Economics from the University of Rochester. Scheinkman is a Research Associate of the National Bureau of Economic Research, a Fellow of the American Academy of Arts and Sciences and of the Econometric Society, and a "docteur honoris-causa" from the University of Paris-Dauphine. From 1973 to 1998 he taught at the University of Chicago, where he was from 1995 to 1998 the Chairman of the Economics Department, and since 1997 the Alvin H. Baum Distinguished Service Professor of Economics. From June 1987 to December 1988, Scheinkman was Vice President of the Financial Strategies Group at Goldman, Sachs & Co. He has been a visiting professor at Princeton University, University of Paris-Dauphine, E.H.E.S.S. (France), Instituto de Matemática Pura e Aplicada and E.P.G.E. (Brazil). During 2002, Scheinkman held a Blaise Pascal Research Chair (France). His current research interests are the study of asset-price bubbles, developing tools for empirical studies of asset markets, and the economics of social interactions.

Course taught:

- ECO 371/LAS 346 Topics in Country and Regional Economics: Latin American Economies
- ECO 502: Microeconomic Theory II
- ECO 525/FIN 595: Financial Economics I
- ECO 526: Finance Economics II

Representative publications:

- "Asset Float and Speculative Bubbles," *Journal of Finance*, to appear (with H. Hong and W. Xiong)
- "Overconfidence and Speculative Bubbles," *Journal of Political Economy*, 1183-1219, December 2003 (with W. Xiong).
- "Non-market Interactions," in *Advances in Economics and Econometrics: Theory and Applications*, Eighth World Congress, M. Dewatripont, L. P. Hansen, and S. Turnovsky (eds.), Cambridge University Press, 2002 (with E. Glaeser).
- "Financial Intermediation without Exclusivity," *American Economic Review*, May 2001 (with T. Santos).
- "Measuring Social Interactions," in *Social Dynamics*, S. Durlauf and P. Young, (eds.), MIT Press, Cambridge, 2001 (with E. Glaeser).

Christopher Sims has been Professor of Economics at Princeton University since 1999. He received his Ph.D. from Harvard University in 1968. He taught in the Economics Department of the University of Minnesota from 1969 to 1990, then moved to Yale University where he taught from 1990 to 1999. He is a member of the National Academy of Sciences and a Fellow of the Econometric Society, for which he has also served as president and as a co-editor of *Econometrica*. He has intermittently served as adviser, consultant, and visitor to several regional Federal

Reserve Banks. He has worked on econometric methods, economic theory, and empirical work, mostly related to macroeconomics and monetary policy.

Representative publications:

- “Implications of Rational Inattention,” *Journal of Monetary Economics*, 50(3), April 2003.
- “The Role of Models and Probabilities in the Monetary Policy Process,” *Brookings Papers on Economic Activity* 2, 1-60, 2002.
- “The Precarious Fiscal Foundations of EMU,” *De Economist* 147(4), 415-436, 1999.
- “Error Bands for Impulse Responses,” *Econometrica* 67(5), 1113-1156, 1999 (with T. Zha).
- “What Does Monetary Policy Do?,” *Brookings Papers on Economic Activity* 2, 1-63, 1996 (with E. Leeper and T. Zha).

Ronnie Sircar received his doctorate in 1997 from Stanford University. He taught for three years at the University of Michigan in the Department of Mathematics before coming to Princeton’s ORFE Department where he is an Associate Professor. He has been the recipient of National Science Foundation Research Grants during the period 1998-present. He was a recipient of the E-Council Excellence in Teaching Award for his teaching spring term 2002 and the Howard B. Wentz Jr. Junior Faculty Award in 2003. His research interests center on stochastic models in finance, particularly for market volatility and credit risk; optimal control and utility indifference pricing in incomplete markets; employee stock options; market microstructure models and long-range dependence in financial time series.

Courses taught:

- ORF 335/ECO 335: Introduction to Financial Engineering
- ORF 512: Stochastic Modeling
- ORF 515: Stochastic Calculus for Finance & Engineering
- ORF 575: Financial Engineering Seminar: Computational Finance (2003); Credit Risk (2004)

Graduate students advised:

- Dries Darius
- Aytac Ilhan
- Siu-Tang Leung
- Gokce Ozcan
- Evangelos Papageorgiou

- Antoine Toussaint

Representative publications:

- “Stochastic Volatility Corrections for Interest Rate Derivatives,” *Mathematical Finance*, 14(2), April 2004 (with P. Cotton, J.-P. Fouque and G. Papanicolaou).
- “A General Framework for Evaluating Executive Stock Options,” submitted for publication, 2005 (with W. Xiong).
- “Optimal Static-dynamic Hedges for Barrier Option,” to appear in *Mathematical Finance*, 2005 (with A. Ilhan).
- “Optimal Investment with Derivative Securities,” to appear in *Finance & Stochastics*, 2005 (with A. Ilhan and M. Jonsson).
- “Bounds & Asymptotic Approximations for Utility Prices when Volatility is Random,” *SIAM Journal on Control and Optimization* 43(4), 2005 (with T. Zariphopoulou).

Kenneth Steiglitz received his doctorate in 1963 from New York University and has been teaching at Princeton ever since. He was promoted to Associate Professor in 1967 and Professor in 1973. He is a Fellow of the IEEE (1981), a Fellow of the ACM (1997) and has been awarded the Technical Achievement Award of the Signal Processing Society (1981), the Signal Processing Society Award (1986), the IEEE Centennial Medal in 1984, the School of Engineering Distinguished Teacher Award in 1997, and the IEEE Third Millennium Medal in 2000. His research interests are in agent-based modeling of markets and auctions, and in computing using soliton collisions.

Courses taught:

- COS 323: Computing for the Physical and Social Sciences
- COS 444: Electronic Auctions
- COS 576: Nonstandard Computation

Undergraduate students advised:

- Eric Tonkyn, “Empirical Analysis of Sniping on eBay”

Representative publications:

- “Frugality in Path Auctions,” ACM-SIAM Symposium on Discrete Algorithms (SODA), New Orleans, January 11-13, 2004 (with E. Elkind and A. Sahai).
- “The Spite Motive and Equilibrium Behavior in Auctions,” *Contributions to Economic Analysis & Policy*, 2(1), Article 5, 2003 (with J. Morgan and G. Reis).
- “Effects of Price Signal Choices on Market Stability,” *Journal of Economic Behavior and Organization*, 52(2), 235-251, October 2003 (with H. Mizuta and E. Lirov).

- “Collisions of Two Solitons in an Arbitrary Number of Coupled Nonlinear Schroedinger Equations,” *Phys. Rev. Lett.*, 90, 25, 254102, June 26, 2003 (with M. Soljagic, S. Sears, M. Segev, M. Jakubowski, and R. Squier).
- “Computing with Solitons: A Review and Prospectus,” Chapter 10 in *Collision-Based Computing*, A. Adamatzky (ed.), Springer, 2002 (with M. H. Jakubowski and R. K. Squier).

Lars E. O. Svensson joined the Economics Department in the fall of 2001. He had been Professor of International Economics at the Institute for International Economic Studies, Stockholm University, since 1984. He has published extensively in scholarly journals on monetary economics and monetary policy, exchange rate theory and policy, and general international macroeconomics. He has lectured and visited at universities, central banks and international organizations in many countries. He is a member of the Royal Swedish Academy of Sciences, a member of Academia Europae, a foreign member of the Finnish Academy of Science and Letters, a foreign honorary member of the American Academy of Arts and Sciences, a Fellow of the Econometric Society, a research associate of the National Bureau of Economic Research, a research fellow of the Centre for Economic Policy Research, London, and a Fellow of the European Economic Association. He was a member of the Prize Committee for the Alfred Nobel Memorial Prize in Economic Sciences through 2002 and its chair during 1999-2001. He is active as advisor to Sveriges Riksbank (Bank of Sweden) and regularly consults for international, U.S. and Swedish agencies and organizations. In 2000-2001, he undertook a review of monetary policy in New Zealand, commissioned by the New Zealand government. In 2002, he chaired a committee evaluating monetary policy in Norway. He is a member of the Academic Advisory Board and the Monetary Policy Advisory Panel of the Federal Reserve Bank of New York. He received his Ph.D. in Economics from Stockholm University.

Courses taught:

- ECO 200: Advanced Principles of Economics: Concepts and Applications
- ECO 504: Macroeconomic Theory II
- ECO 554: International Monetary Theory and Policy II

Undergraduate students advised:

- Juan I. Bonifacino
- Grace M. Chang
- Daniel P. Ryan

Graduate students advised:

- Brad Strum
- Rujikorn Pavasuthipaisit

Representative publications:

- “Implementing Optimal Policy through Inflation-forecast Targeting,” in Ben S. Bernanke and Michael Woodford (eds.), *The Inflation-Targeting Debate*, University of Chicago Press, 19-83, 2005 (with M. Woodford).
- “Indicator Variables for Optimal Policy,” *Journal of Monetary Economics* 50, 691-720, 2003 (with M. Woodford).
- “What Is Wrong with Taylor Rules? Using Judgment in Monetary Policy through Targeting Rules,” *Journal of Economic Literature* 41, 426-477, 2003.
- “The Zero Bound in an Open-economy: A Foolproof Way of Escaping from a Liquidity Trap,” *Monetary and Economic Studies* 19(S-1), 277-312, February 2001.
- “Transparency and Credibility: Monetary Policy with Unobservable Goals,” *International Economic Review* 42, 369-397, 2001 (with J. Faust).

Robert Vanderbei is a Professor in Operations Research and Financial Engineering since 1999. Broadly viewed, his research interests are in algorithms for nonlinear optimization and their application to problems arising in engineering and science. Application areas of interest focus mainly on inverse Fourier transform optimization problems and action minimization problems with a special interest in applying these techniques to the design of NASA’s terrestrial planet finder space telescope. He is Associate Editor for *Optimization in Engineering and Mathematical Programming*. He is a member of the American Mathematical Society, Society for Industrial and Applied Mathematics, Institute for Operations Research and the Management Sciences, Mathematical Programming Society, SPIE, and American Astrophysical Society. He received his Ph.D. in Applied Mathematics from Cornell University in 1981.

Courses taught:

- ORF 307: Optimization
- ORF 522: Linear Optimization

Representative publications:

- “Interior-point Methods for Nonconvex Nonlinear Programming: Jamming and Numerical Testing,” *Mathematical Programming*, 2003 (with H. Benson and D. Shanno).
 - “Two-Mirror Apodization for High-contrast Imaging,” *Astrophysical Journal*, 599, 695-701, 2003 (with W. Traub).
 - “Circularly Symmetric Apodization via Starshaped Masks,” *Astrophysical Journal*, 590, 593-603, 2003 (with D. Spergel and N. Kasdin).
 - “Frontiers of Stochastically Nondominated Portfolio,” *Econometrica*, 71(4), 2003 (with A. Ruszczyński).
 - *Linear Programming: Foundations and Extensions*, Kluwer Academic Publishers, 2nd edition, 2001.
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Erik VanMarcke is Professor of Civil and Environmental Engineering. He was on the faculty of the Massachusetts Institute of Technology until 1985, since receiving his doctorate there in 1970. At MIT, he was the Gilbert W. Winslow Career Development Professor and served as Director of the Civil Engineering Systems Methodology Group. He held visiting appointments at Harvard University, the Technical University of Delft (The Netherlands), and the University of Leuven (Belgium), his undergraduate alma mater, and was the Shimizu Corporation Visiting Professor at Stanford University. His principal expertise is in risk assessment and applied systems science. He authored *Random Fields: Analysis and Synthesis*, published by the MIT Press, and extended this work to modeling space-time processes and complex systems. He won several research prizes of the American Society of Civil Engineers, was awarded a Senior Scientist Fellowship from the Japanese Society for the Promotion of Science, and is a foreign member of the Royal Academy of Arts and Sciences of Belgium.

Courses taught:

- CEE 360 & 548: Risk Assessment and Management
- CEE 558: Random Fields and Random Media

Undergraduate students advised:

- Rolando Amaya, "Assessing and Reducing the Risk of Terrorist Attacks on Municipal Water Distribution Systems"
- Lisa Kamran Bilir, "Comparing Costs under Uncertainty as a Guide for Public Policy: an Application of Markov Chains to Region-based Water Management in California"
- Geoffrey P. Adamson, "Catastrophic Risk of Florida Landfalling Hurricanes: The Effect of El Nino on Financial Engineering Applications"
- Allison L. Smitten, "Cost-Effectiveness Models and Decision Analysis in Health and Medicine"

Graduate student advised:

- Nan Ding, "Enterprise Risk Management: Applications in Software Development and Data Security"

Representative publications:

- *Acceptable Risk Processes: Lifelines and Natural Hazards*, Monograph No. 21, Council on Disaster Reduction and Technical Council on Lifeline Earthquake Engineering, Published by the American Society of Civil Engineers, March 2002 (with C. Taylor).
- "Evaluating Models of Risks from Natural Disasters for Insurance and Government," in *Paying the Price: The Status and Role of Insurance against Natural Hazards in the United States*, R. Roth & H. Kunreuther (eds.), Joseph Henry Press (N.A.S.), 239-249, 1999 (with C. Taylor and J. Davis).

- *Random Fields: Analysis and Synthesis*, The MIT Press, 1983; Second (Web) Edition by Rare Book Services, Princeton NJ, 1998.
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Mark Watson is Professor of Economics and Public Affairs in the Economics Department and the Woodrow Wilson School. His research interests include econometrics, macroeconomics and forecasting. He is a research associate at the National Bureau of Economic Research and a Fellow of the Econometric Society. He has been awarded National Science Foundation research grants from 1982-2005 and has received the Galbraith Award for Graduate Teaching in 1986. He holds a Ph.D. in Economics from the University of California, San Diego and his past credentials include posts at Northwestern University and Harvard University.

Courses taught:

WWS 507b: Quantitative Analysis

Economics 513: Advanced Econometrics: Time Series Models

Economics 518: Econometric Theory II

Undergraduate students advised:

- Luke Friedman , "An Evaluation of the Performance of Univariate Forecasting Models"
- Arthur Han, "The Socioeconomic Determinants of Specialty Choice by U.S. Medical Students"

Representative publications:

- "Forecasting Using Principal Components from a Large Number of Predictors," *Journal of the American Statistical Association*, 2002 (with J. Stock).
- "Forecasting Output and Inflation: The Role of Asset Prices," *Journal of Economic Literature*, 2003 (with J. Stock).
- "Understanding Changes in International Business Cycle Dynamics," *Journal of the European Economic Association*, 2005 (with J. Stock).

Wei Xiong is an Assistant Professor in the Economics Department. He received his Ph.D. from the Fuqua School of Business, Duke University, in 2001. His research interests center on speculative bubbles, financial market crisis, and behavioral finance. His recent papers provide a framework to analyze speculative behavior of investors and its implications for stock price dynamics and managerial incentives. His earlier papers analyze the contagion and market liquidity during the Long-Term Capital Management crisis. He is a faculty research fellow in the Asset Pricing Program of the National Bureau of Economic Research. He was invited by the *Review of Economic Studies* to present his research on its annual European tour in 2000.

Courses taught:

- ECO 465/FIN 522: Futures, Options and Financial Derivatives

- ECO 525/FIN 595: Financial Economics I
- ECO S500: Mathematics for Economists

Undergraduate students advised:

- Olga Zhilaev, "Valuation of Executive Stock Options: A Comparative Analysis"
- Sean Cameron, "Heterogeneity in Mortgage Refinancing: An Analysis of Homeowner Background Variables"
- Jeremy Fazli, "QQQ and the Nasdaq-100: Modeling Structural Differences in the Associated Options Markets"
- Brian Shiau, "Event Contracts: New Financial Applications and Implementation in Theory"

Representative publications:

- "Asset Float and Speculative Bubbles," *Journal of Finance*, 2005 (with H. Hong and J. Scheinkman).
- "Investor Attention, Overconfidence and Category Learning," *Journal of Financial Economics*, 2005 (with L. Peng).
- "Overconfidence and Speculative Bubbles," *Journal of Political Economy*, 2003 (with J. Scheinkman).
- "Contagion as a Wealth Effect," *Journal of Finance*, 2001 (with A. Kyle).
- "Convergence Trading with Wealth Effects," *Journal of Financial Economics*, 2001.

Visiting Faculty

During the academic year 2004-05, the BCF welcomed the following visiting faculty:

O. Griffith Sexton was, until 1995, a Managing Director of Morgan Stanley and Director of the Corporate Restructuring Group within the firm's Financing and Advisory Services Department. Mr. Sexton graduated from Princeton University in 1965. Following six years of service as an aviator in the U.S. Navy, he attended the Stanford Graduate School of Business where he received his MBA. He joined Morgan Stanley in 1973 and spent his career there involved in a broad range of the firm's financing and advisory activities. In May 1995, Mr. Sexton became an active Advisory Director of Morgan Stanley. In September 1995, Mr. Sexton became an Adjunct Professor at Columbia University's Graduate School of Business, teaching two courses in the subject of Corporate Finance. In the spring of 2000, he became a Visiting Lecturer at Princeton University. Mr. Sexton is a Director of Investor AB, a publicly traded company based in Stockholm, Sweden, and of two other privately held companies.

Course taught:

- ECO 464/FIN 519: Corporate Restructuring

Visiting Fellows

The Center welcomed the following visiting fellows during the academic year 2004-05:

Frank de Jong is Professor of Finance and Insurance at the University of Amsterdam. Before joining the UvA faculty, he was affiliated with Tilburg University, where he also obtained his Ph.D. His undergraduate education is econometrics at Erasmus University Rotterdam. He was a visiting assistant professor at the Anderson Graduate School of Management, University of California, Los Angeles, and a visiting researcher at the Swedish Institute for Financial Research and Princeton University.

He has published in many international journals, such as the *European Economic Review*, the *Journal of Business and Economics Statistics*, the *Journal of Empirical Finance*, the *Journal of International Money and Finance* and the *Journal of Financial Markets*, and is a regular referee for finance journals.

Frank's current research interests are in financial risk management, pensions, the term structure of interest rates, microstructure of financial markets, and international investments. He teaches a wide array of courses in Investments, Derivatives, Financial Markets and Asset Liability Management.

Selected publications:

- "Time-varying Market Integration and Expected Returns in Emerging Markets," forthcoming in *Journal of Financial Economics*. (with Frans de Roon).
- "Measures of Contributions to Price Discovery: A Comparison," *Journal of Financial Markets* 5(3), 323-328, 2002.

Jeremy Large worked on theoretical market microstructure and the analysis of high-frequency financial data and spent the academic year 2004-05 at the Bendheim Center. During his visit he wrote a paper titled "Estimating Quadratic Variation When Quoted Prices Jump by a Constant Increment." This paper gives a way to quantify the risk in past prices. For markets where financial assets' quoted prices almost always jump by the exchange's minimum price tick, the paper proposes a new statistic that is *ex post* consistent for the Quadratic Variation of prices. The statistic compares the number of alternations, where quotes are revised back to their previous price, to the number of other jumps. From October 2005, Jeremy will be a Post-Doctoral Research Fellow at All Souls College, University of Oxford.


Ulrike Malmendier is an Assistant Professor of Finance at Stanford University's Graduate School of Business. She visited us in January-February 2005. While at Princeton she worked on research in the area of behavioral corporate finance. Behavioral corporate finance analyzes the effect of biases in individual decision-making on corporate decision-making. The focus of her research is on biases affecting top executives. In two previous papers (joint with G. Tate, Wharton) she analyzed the impact on CEO overconfidence on merger decisions and on investment decisions. She is currently pursuing the analysis on the effect on financing decisions (joint with G. Tate and J. Yan). A related project ("Superstar CEOs") analyzes changes in corporate decisions and firm performance once the CEO becomes a "superstar," as measured by the accumulation of awards such as "CEO of the year," "Top 20 Managers" or *Business Week* and other top business journals.

Emmanuelle Walkowiak is associate researcher of the Centre d'Études de l'Emploi (Center for Employment Studies) and University Paris XI. She spent her academic year 2004-2005 at the Bendheim Center for Finance. Her research interests include the impact of firm technological and organizational changes on employment with an emphasis of the role of social interactions on productivity. She received her Ph.D. from the University Paris IX-Dauphine in 2004.

Publications:

- "Computerization, Work Organization and Social Interactions," *Working Paper of the Centre d'Etudes de l'Emploi*, no. 31, May 2004; forthcoming in *Economie et Statistique*, 2005 (with N. Greenan).
- "The Methods Used by Various Categories of Workers are Tending to Become More Uniform," *Formation Emploi*, no. 82, 2003.
- "Low Wages and High Unemployment: The Role of Social Interactions in Hiring Discriminations," *Working Paper of Eurisco*, no. 2005-7, 2005 (with J. F. Jacques).

Her thesis jointly analyzed two stylized facts. The first one is the technological and organizational modernization of firms. The second one is the evolution of inequality of access to employment linked to skills and personal characteristics of workers such as gender. In her approach, she considers that the modernization of firms generates a reconfiguration of interdependences in work, implying a transformation of social interactions between workers. The formalization of productive complementarities between tasks and social interactions between workers helps to understand why at a given level of skill, workers having the lowest wages also have the highest unemployment rate. In addition, her empirical tests highlight the inequality, linked to modernization, in the career path of workers after recruitment. Finally, during her post-doctoral research in Princeton, she has been analyzing the dynamics of the labor force renewal of firms undergoing modernization.



Graduating Ph.D. Students

Ph.D. students in the Bendheim Center for Finance are admitted through the Department of Economics, the Department of Operations Research and Financial Engineering or the Program in Applied and Computational Mathematics. Six Ph.D. students graduated in 2004-05.

- **Albina Danilova** graduated from the Department of Operations Research and Financial Engineering. Her thesis topic “Emergence of Stochastic Volatility from Informational Heterogeneity” was written under the supervision of René Carmona. She has accepted an Assistant Professor position in the Mathematical Finance group at Oxford University.
- **Brishti Guha** graduated from the Department of Economics. She wrote on the topic of “Malfeasance and the Market: Essays in Corporate Cheating” under the supervision of Avinash Dixit. She has accepted an Assistant Professor position at the Singapore Management University.
- **Christian Julliard** graduated from the Department of Economics. His thesis deals with the interaction of macroeconomic aggregates and financial market equilibria. In particular, his work analyzes the interaction between consumption risk and asset returns and the role of human capital for optimal portfolio choice and asset pricing. The thesis was written under the supervision of Jonathan Parker. He has accepted an Assistant Professor position at the London School of Economics.
- **Michael Ludkovski** graduated from the Department of Operations Research and Financial Engineering. His thesis deals with computational finance and pricing of managerial flexibility for energy derivatives. It was written under the supervision of René Carmona. He will be pursuing his career as an Assistant Professor in the Mathematics Department at the University of Michigan in Ann Arbor.
- **Áureo de Paula** graduated from the Department of Economics. His research deals with theoretical and empirical aspects of social interactions in many contexts. In his dissertation he uses techniques commonly used in finance to analyze a timing game which is applied to estimate the probability of desertion in the American Civil War and also investigates herding among financial analysts. His main supervisor was Professor José A. Scheinkman. He has accepted a position as an Assistant Professor in the Department of Economics at University of Pennsylvania.
- **Natalia Piqueira** graduated from the Department of Economics. Her dissertation is an empirical investigation of the importance of liquidity and trading activity for asset pricing written under the supervision of Harrison Hong. She has accepted an Assistant Professor position at the C. T. Bauer College of Business, University of Houston.

Finance Seminars

Each week, the Bendheim Center for Finance organizes a seminar where academics are invited to present their latest research to the faculty and Ph.D. students of the Center.

Civitas Foundation Finance Seminar Fall 2004

September 15	Vicky Henderson, Princeton University	Valuing the Option to Invest in an Incomplete Market
September 22	Bruno Biais, Toulouse University	Optimal Dynamic Security Design and Pricing
September 29	Christian Julliard, Princeton University	Labor Income Risk and Asset Returns
October 6	Natalia Piqueira, Princeton University	Stock Returns, Trading Activity and Illiquidity Costs
October 20	Deniz Igan, Princeton University	Liquidity and Dividend Policy
October 22	Frank de Jong, University of Amsterdam	Pseudo Market Timing: Fact or Fiction?
November 3	Peter Hansen, Stanford University	Realized Variance and Market Microstructure Noise
November 10	George Constantinides, University of Chicago	Mispricing of S&P 500 Index Options
November 17	Masahiko Egami, Princeton University	Solving Stochastic Impulse Control Problems via Optimal Stopping for One-dimensional Diffusions—Applications to Financial Engineering
November 24	Brishti Guha, Princeton University	Intermediation and Honesty: Corporate Cheating and Auditor Involvement
December 1	Harrison Hong, Princeton University	Gone Fishin': Seasonality in Speculative Trading and Asset Prices

December 8	Pierre Collin-Dufresne, University of California, Berkeley	Can Interest Rate Volatility be Extracted from the Cross Section of Bond Yields? An Investigation of Unspanned Stochastic Volatility
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Civitas Foundation Finance Seminar Spring 2005

February 23	Ulrike Malmendier, Stanford University	Superstar CEOs
March 2	Rene Stulz, Ohio State University	Do Acquirers with More Uncertain Growth Prospects Gain Less from Acquisitions?
March 23	Tobias Moskowitz, University of Chicago	Do Liquidation Values Affect Financial Contracts? Evidence from Commercial Loan Contracts and Zoning Regulation
March 30	Heitor Almeida, New York University	A Theory of Pyramidal Ownership and Family Business Groups
April 6	Allan Timmermann, University of California, San Diego	Optimal Asset Allocation under Structural Breaks
April 13	Martin Weitzman, Harvard University	A Unified Bayesian Theory of Equity 'Puzzles'
April 20	Francis Longstaff, University of California, Los Angeles	Asset Pricing in Markets with Illiquid Assets
April 22	Daniel Kahneman, Princeton University	Psychology for Behavioral Finance: Past and Future
April 27	Rossen Valkanov, University of California, Los Angeles	Parametric Portfolio Policies: Exploiting Characteristics in the Cross Section of Equity Returns

Conferences

During the past year, the Bendheim Center for Finance organized the following conferences and events on campus.

The Princeton Lectures in Finance

The BCF organizes each year a series of public lectures, The Princeton Lectures in Finance, delivered by a leader in the field of finance. The author is invited to the BCF to deliver the contents of his or her book in the form of three two-hour lectures to the Center's faculty and students. The lectures form the basis of a book to be subsequently published by Princeton University Press.

The 2005 *Princeton Lectures in Finance* were given by **Douglas Diamond**, Professor at the University of Chicago, on the topic of "Financial Intermediation and Financial Systems":

Wednesday, June 1, 2005, Lecture 1: Delegation and Incentives

Thursday, June 2, 2005, Lecture 2: Liquidity Creation and Commitment

Friday, June 3, 2005, Lecture 3: Financial Crises

In previous years, Professor **Stephen A. Ross**, the Franco Modigliani Professor of Financial Economics at the Massachusetts Institute of Technology, delivered the May 2001 lectures at the BCF on the theme of **Arbitrage and Finance**. These published lectures are now available from the Princeton University Press. The second lecturer and author was Professor **Myron Scholes**, Emeritus Professor at Stanford University and 1997 Nobel Laureate. He delivered his lectures at the BCF on the theme of **Liquidity and Finance** in May 2002. There were no lectures in 2003. In 2004, **William Sharpe**, Professor Emeritus at Stanford University delivered his lectures on **Asset Prices and Portfolio Choice**.

The **2006** *Princeton Lectures in Finance* will be given by **Hayne Leland** of the University of California at Berkeley.

Governance of Not-for-Profit Organizations Conference

Few public policy issues have taken center stage as quickly as governance. In the not-for-profit sector, investor-donors, regulators, tax authorities, and academics are examining the decision-making processes of organizations, and, in some cases, are proposing changes to governance structures to enhance efficiency and accountability.

Despite this recent attention, the effect of governance on the performance and overall health of firms in the not-for-profit sector has received less academic scrutiny than it has in the for-profit sector. Given the growing role of not-for-profits in the U.S. economy, a better understanding of sound governance practices in the sector is essential to all stakeholders. Moreover, to evaluate the effect of reforms on the governance of not-for-profit firms, it is also important to understand current governance practices as well as how governance differs between for-profit and not-for-profit firms.

This conference aimed to broaden the understanding of these and other key governance issues by presenting a wide range of distinguished, current research on the governance of not-for-profit organizations. It was jointly sponsored by the Federal Reserve Bank of New York, the Bendheim Center for Finance at Princeton University, and the *Journal of Accounting and Economics*, and took place on September 30-October 1, 2004, at the Federal Reserve Bank of New York. Patrick Bolton (Princeton University) and Hamid Mehran (Federal Reserve Bank of New York) organized the conference.

Thursday, September 30

8:15 a.m. Continental Breakfast

9:00 a.m. Welcoming Remarks:
Christine M. Cumming, First Vice President, Federal Reserve Bank of New York

Session 1: Management of Funds and Regulatory Issues in Not-for-Profits

Session Chair: **Henry Hansmann**, Law School, Yale University

9:15 a.m. **Investment Management of Charitable Funds**
Harvey Dale, Law School, New York University

Nonprofits under the Microscope: Current Regulatory Challenges and Practical Responses
James Schwartz, Manatt, Phelps & Phillips, LLP

10:30 a.m. Break

Session 2: The Role of Incentives and Ownership in Not-for-Profits

Session Chair: Michael Nelson, Federal Reserve Bank of New York

10:50 a.m. **Are the Incentives Right?**
Richard Steinberg, Department of Economics, Indiana University-Purdue University, Indianapolis

What Difference Does Sector Make? An Agenda for Research on Ownership Effects

Joseph Galaskiewicz, Department of Sociology, University of Arizona

12:15 p.m. Lunch
Speaker: Marion Fremont-Smith, Kennedy School of Government, Harvard University

Session 3: Incentives and Governance in Not-for-Profits

Session Chair: Patrick Bolton, Department of Economics, Princeton University

2:00 p.m. **Agency Problems of Excess Endowment Holdings in Not-for-Profit Firms**
John E. Core, Wharton School, University of Pennsylvania
Wayne R. Guay, Wharton School, University of Pennsylvania
Rodrigo S. Verdi, Wharton School, University of Pennsylvania
Discussant: Rajesh Aggarwal, McIntire School of Commerce, University of Virginia

3:00 p.m. **Are Nonprofits Efficient? A Test using Hospital Market Values**
Paul Gertler, Haas School of Business, University of California at Berkeley
Jennifer Kuan, Institute for Policy Research, Stanford University
Discussant: R. Lawrence Van Horn, Simon Graduate School of Business Administration, University of Rochester

4:00 p.m. Break

4:15 p.m. **Governance Mechanisms in Collaborative Relationships Involving Not-for-Profit Organizations**
Conrad S. Ciccotello, Georgia State University
Michael S. Piwowar, Iowa State University and U.S. Securities and Exchange Commission
Discussant: Gerry Wedig, Simon Graduate School of Business Administration, University of Rochester

Friday, October 1

8:15 a.m. Continental Breakfast

Session 4: Comparing For-Profit and Not-for-Profit Organizations

Session Chair: Hamid Mehran, Federal Reserve Bank of New York

8:45 a.m. **Incentive Differences of Public and Private Firms**
Fan Zhang, Department of Economics, Northwestern University
Discussant: Holger Mueller, Stern School of Business, New York University

9:45 a.m. **Are Nonprofit Firms Simply For-Profits in Disguise? Evidence from Executive Compensation in the Nursing Home Industry**
Anup Malani, Law School, University of Virginia
Albert Choi, Department of Economics, University of Virginia
Discussant: John E. Core, Wharton School, University of Pennsylvania

10:45 a.m. Break

11:00 a.m. **Governance Lessons from the Not-for-Profit World**
Paul Levy, Chief Executive Officer, Beth Israel Deaconess Medical Center

12:00 p.m. Lunch

SESSION 5: Performance Disclosure and Monitoring of Not-for-Profits

Session Chair: Ross Watts, Simon Graduate School of Business Administration University of Rochester

1:15 p.m. **Constraining Managers without Owners: Governance of the Not-for-Profit Enterprise**

Mihir Desai, Harvard Business School

Robert Yetman, School of Management, University of California at Davis

Discussant: Andrew Metrick, Wharton School, University of Pennsylvania

2:15 p.m. **Corporate-Sponsored Foundations and Earnings Management**

Christine Petrovits, Kenan-Flagler Business School, University of North Carolina at Chapel Hill

Discussant: Anne Beatty, School of Business, Ohio State University

3:15 p.m. Break

3:30 p.m. **The Effects of Governance on the Financial Reporting Quality of Nonprofit Organizations**

Michelle Yetman, School of Management, University of California at Davis

Robert Yetman, School of Management, University of California at Davis

Discussant: Richard Sansing, Tuck School of Business, Dartmouth College, and Tilburg University

4:30 p.m. Adjourn

Credit Risk Conference

The Bendheim Center for Finance organizes an annual conference on a particular topic in either financial mathematics or financial econometrics. The 2004 conference focused on the Mathematics of Credit Risk and was organized by **Yacine Ait-Sahalia** and **René Carmona**. It took place on **September 17-18, 2004**.

Financial support from **Moody's Corporation** and **Morgan Stanley** is gratefully acknowledged.

Friday, September 17

12:00 - 13:30 Registration and Lunch (Friend Center)

13:30 - 15:30 **Darrell Duffie**, Stanford University
An Overview of Credit Risk Modeling

15:30 - 16:00 Coffee Break

- 16:00 - 16:45 **Marek Rutkowski**, Warsaw University of Technology and University of New South Wales
Replication of Defaultable Claims within the Reduced-Form Framework
- 16:45 - 17:30 **Monique Jeanblanc**, Université d'Evry
Indifference Pricing and Hedging of Defaultable Claims
- 17:30 - 18:15 **Michael Gordy**, Board of Governors of the Federal Reserve
Default Probability and Dependence in Credit Rating Systems: Efficient Estimators for Cohort Performance Data
- 19:00 Conference Dinner and Speaker (Prospect House)
John Rutherford, CEO, Moody's Corporation

Saturday, September 18

- 8:30 - 9:00 Breakfast (Friend Center)
- 9:00 - 9:45 **Robert Jarrow**, Cornell University
The Valuation of a Firm's Investment Opportunities: A Reduced Form Credit Risk Perspective
- 9:45 - 10:30 **Mark Davis**, Imperial College
A Queuing Network Approach to Portfolio Credit Risk
- 10:30 - 11:00 Coffee Break
- 11:00 - 11:45 **Francis Longstaff**, UCLA
Corporate Yield Spreads: Default Risk or Liquidity? New Evidence from the Credit-Default Swap Market
- 11:45 - 12:30 **Tomasz Bielecki**, Illinois Institute of Technology
Mean-variance Hedging of Defaultable Claims
- 12:30 - 14:00 Lunch
- 14:00 - 14:45 **Kenneth Singleton**, Stanford University
Default and Recovery Implicit in the Term Structure of Sovereign CDS Spreads
- 14:45 - 15:30 **Philip Protter**, Cornell University
Filtration Shrinkage, Stopping Times and Compensators, and Credit Risk Models
- 15:30 - 16:00 Coffee Break
- 16:00 - 16:45 **Damir Filipović**, ETH Zurich
Credit Derivatives in an Affine Framework
- 16:45 - 17:30 **Philipp Schoenbucher**, ETH Zurich
Information-driven Default Contagion

Princeton-Chicago Conference on the Econometrics of High Frequency Financial Data

This 2005 conference was co-organized by the Bendheim Center for Finance and the University of Chicago's Financial Mathematics Program. The organizers were **Yacine Ait-Sahalia** and **René Carmona** (Princeton) and **Per Mykland** (Chicago). The conference took place on **June 23-25, 2005**.

Thursday, June 23

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| 12:00 - 14:00 | Registration and Lunch |
| 14:00 - 14:20 | Introductory Remarks |
| 14:20 - 14:40 | Eric Ghysels , University of North Carolina
Why Do Absolute Returns Predict Volatility So Well? |
| 14:40 - 15:00 | Paul Bennett , NYSE Research Department
Market Restructuring and Order Submission Strategies |
| 15:00 - 15:20 | Doyne Farmer , Santa Fe Institute
An Empirical Behavioral Model of Price Formation in the London Stock Exchange |
| 15:20 - 16:00 | Coffee Break |
| 16:00 - 16:20 | Lan Zhang , Carnegie-Mellon University
Efficient Estimation of Stochastic Volatility Using Noisy Observations: A Multi-Scale Approach |
| 16:20 - 16:40 | Peter Hansen , Stanford University
Realized Variance and Market Microstructure Noise |
| 16:40 - 17:00 | Per Mykland , University of Chicago
Ultra High Frequency Volatility Estimation with Dependent Microstructure Noise |
| 19:00 | Conference Dinner |

Friday, June 24

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|--------------|---|
| 9:00 - 9:20 | Albert Shiryaev , Steklov Mathematical Institute
Stochastic Analysis of Downfalls of Brownian Motion and Brownian Motion with Drift, and the Technical Analysis of Some Japanese Methods of Trading |
| 9:20 - 9:40 | Jean Jacod , Universite de Paris VI
Testing the Multiplicity of a Diffusion from High-Frequency Data |
| 9:40 - 10:00 | Michael Sorensen , University of Copenhagen
High Frequency Asymptotics for Martingale Estimating Functions |

- 10:00 - 10:20 **Yacine Ait-Sahalia**, Princeton University
Volatility Estimators for Discretely Sampled Levy Processes
- 10:20 - 11:00 Coffee Break
- 11:00 - 11:20 **Nour Meddahi**, Université de Montréal
Bootstrapping Realized Volatility
- 11:20 - 11:40 **Liuren Wu**, Baruch College
Variance Dynamics: Joint Evidence from Options and High-Frequency Returns
- 11:40 - 12:00 **Jeremy Large**, Oxford University
Estimating Quadratic Variation when Quoted Prices Jump by a Constant Increment
- 12:00 - 14:00 Lunch
- 14:00 - 14:20 **Eric Renault**, University of North Carolina
Stochastic Volatility Models with Transaction Time Risk
- 14:20 - 14:40 **Catherine Laredo**, INRA
Statistical Inference for Stochastic Volatility Models with Leverage
- 14:40 - 15:00 **Arnaud Gloter**, Université de Bordeaux IV
Parameter Estimation for Stochastic Volatility Models
- 15:00 - 15:20 Coffee Break
- 19:00 Conference Dinner
- Saturday, June 25**
- 9:00 - 9:20 **Takaki Hayashi**, Columbia University
On Covariance Estimation of Nonsynchronously Observed Diffusion Processes
- 9:20 - 9:40 **Tim Bollerslev**, Duke University
Some Like it Smooth, and Some Like it Rough: Untangling Continuous and Jump Components in Measuring, Modeling, and Forecasting Asset Return Volatility
- 9:40 - 10:00 **George Tauchen**, Duke University
The Relative Contribution of Jumps to Total Price Variance
- 10:00 - 10:20 **Claudia Klueppelberg**, Technical University of Munich
A New Continuous Time GARCH Model for High-Frequency Data
- 10:20 - 11:00 Coffee Break
- 11:00 - 11:20 **Rene Carmona**, Princeton University
Filtering Stochastic Volatility and Number and Volume of Transactions

11:20 - 11:40

Yazhen Wang, University of Connecticut
Wavelet Based Volatility Analysis for High-frequency Financial Data

11:40 - 12:00

Concluding Remarks

BCF Finance Industry Seminar Series

The Princeton Entrepreneurship Club and the Princeton Pre-Business Society assisted Swati Bhatt in organizing the following seminar series. Speakers for this seminar series were invited from the corporate world.

- September 13, 2004: Devin Dallaire of Citadel Investments (Director of Quantitative Long Short Equity Research) spoke on the topic of "Hedge Funds 101."
- September 20, 2004: David Gutstadt '98 (Vice President, Goldman Sachs) and Justin Doyle '01 (Associate, Goldman Sachs) spoke on the topic "Investment Banking 101 or A Day in the Life of a Banker."
- October 4, 2004: Ken Umezaki '86 (Head of Global Fixed Income at Lehman Brothers) spoke on "Business Strategy and Credit Derivatives." A financial derivative is an off balance sheet financial instrument whose value is derived from the price of another instrument. It is a bilateral contract that transfers risk. Product types: interest rates, foreign exchange, equity, commodity and credit markets all have derivative products such as swaps, options, caps/floors, forwards, exotic derivatives, etc. The use of these products in corporate business strategy was discussed.
- November 1, 2004: John Quigley kicked off the Business Plan Contest.
- November 5, 2004: Princeton Chapter of Broad2Be. 85Broads is a global women's network of former and current Goldman Sachs professionals. By forming undergraduate chapters called Broad2Be, they hope to form mentoring relationships between women who aspire to enter the business world and those who have already established their careers in that field. Janet Hanson, founder of the network, was the guest of honor.
- November 15, 2004: Scott Laughlin '90 (Senior Lecturer in Entrepreneurship at the University of Maryland's Hinman CEOs Program), presented a practical overview of the tools required for effectively communicating your business ideas to partners, investors, employees and even relatives and in-laws. Using an easy-to-follow guide to appropriate content, Scott shared several rules for the effective preparation and presentation of the four key communication tools every entrepreneur needs to be successful: the "Elevator Pitch," the "Executive Summary," the "Slide Show," and the "Business Plan."
- February 7, 2005: Dr. Hamid Biglari '87 spoke on the the topic "The Predator's Ball: Competition in Global Capital Markets." Dr. Biglari discussed how investors on the buy-side and intermediaries on the sell-side square off against each other in search for advantage in global capital markets. He described the state of the industry, its possible paths of evolution, and discussed winners and losers in the investment management and investment banking communities. Finally, he drew some implications for career decisions in these industries.
- February 8, 2005: Jack Kaplan, President and Founder of Datamark Technologies Inc. spoke on "Evaluation of an Early Stage Company: Datamark Technologies." Professor Kaplan is also an Adjunct Professor of Entrepreneurship at Columbia Business School.

He discussed how he raised capital for and launched his third venture, Datamark Technologies, and evaluated the company in its early growth stages.

- February 21, 2005: Tim Dowling (Managing Director and Head of North American Structuring for Deutsche Bank's Global Markets division in New York) and Matt Eastwick '87 (Director in Debt Capital Markets at Deutsche Bank in New York) spoke on the topic "Corporations Embrace Credit Risk Management." The focus was on the difference between the credit risks that corporations wish to manage and those captured in standardized credit default swap contracts.
- March 29, 2005: David Neeleman (JetBlue Founder and CEO) spoke about his JetBlue experiences. JetBlue survived vicious competition from the majors and rough economic times to become one of the most successful and beloved airlines in the country. He spoke about how he started, how he managed through the difficult early years, and what he sees as the future of the industry.
- May 27, 2005: Kelly Perdew, Executive Vice President of "Trump Ice" for the Trump Organization and winner of *The Apprentice* season two addressed students and alumni at the Princeton Entrepreneurs' Network's annual Conference on Entrepreneurship. The topic was "The 'E' Factor." This event was co-sponsored by the School of Engineering and Applied Science and the Bendheim Center for Finance.

Undergraduate Certificate in Finance

The BCF started offering in 1999 an Undergraduate Certificate in Finance to Princeton undergraduates. The certificate program in finance has four major components:

- First, there are prerequisites in mathematics, economics, and probability and statistics, as necessary for the study of finance at a sophisticated level. These prerequisite courses are to be completed during the freshman and sophomore years. Students then apply at the end of their sophomore year.
- Second, two required core courses, during the junior year, provide an integrated overview and background in modern finance.
- Third, students are required to take three elective courses.
- Fourth, a significant piece of independent work must relate to issues or methods of finance. This takes the form of a senior thesis, or for non-ECO or ORFE majors only, if there is no possibility of finance content in their senior thesis or junior paper, a separate, shorter piece of independent work is required instead.

Now in its seventh year, the Undergraduate Certificate in Finance continues to do extremely well, attracting record numbers of students. We expect to enroll over 160 juniors from the Class of 2007. In previous years, the numbers were as follows: Class of '00: 61, '01: 82, '02: 85, '03: 122, '04: 113, '05: 126, '06: 185. This brings our total number of undergraduate students in the program (juniors and seniors) to nearly 350 this coming year.

Students earning the Certificate are drawn from a wide cross-section of departments on campus, testifying both to the interdisciplinary flavor of the program and its wide appeal. The breakdown by major is given in the following two tables.

Class of '05

Total number of certificates awarded: 125 (42 to women or 34%)

Major	Number of Students
Chemistry	1
Computer Science (COS)	5
Economics	55
East Asian Studies	1
Engineering other than ORFE and COS	4
German	1
Mathematics	1
Molecular Biology	2
Operations Research & Financial Engineering (ORFE)	43
Politics	7
Woodrow Wilson School	5

Class of '06

Total expected number of certificates to be awarded: 185 (54 to women or 30%)

Major	Number of Students
Anthropology	1
Chemistry	1
Classics	1
Comparative Literature	1
Computer Science (COS)	8
Ecology & Evolutionary Biology	1
Economics	69
Engineering other than ORFE and COS	18
English	3
History	2
Mathematics	3
Molecular Biology	1
Operations Research and Financial Engineering (ORFE)	44
Philosophy	1
Physics	3
Politics	10
Psychology	4
Woodrow Wilson School	14

Departmental Prizes, Honors and Athletic Awards to UCF '05 Students

In addition, UCF students are an extremely talented subgroup of the already high-achieving Princeton classes. They continue to receive a high proportion of the prizes awarded by their respective departments:

Five UCF students received a combination of departmental prizes and honors and athletic awards:

- Megan Cunningham (Operations Research and Financial Engineering): summa cum laude, winner of *James Hayes-Edgar Palmer Prize in Engineering*; winner of *Dr. Frank S. Castellana Prize in Operations Research and Financial Engineering*; winner of *George B. Wood Legacy Junior Prize*; and elected to Phi Beta Kappa Society, Society of Sigma Xi and Tau Beta Pi National Engineering Society.
- Avery Kiser (Operations Research and Financial Engineering): co-winner of *C. Otto v. Kienbusch Sportswoman of the Year Award* and co-winner of the *Martin "Buff" Wohlforth Memorial Award*.
- Jesse Levinson (Computer Science): summa cum laude, co-winner of *George B. Wood Legacy Junior Prize*; winner of *Accenture Prize in Computer Science*; winner of *Phillip Y. Goldman '86 Prize in Computer Science*; and elected to Phi Beta Kappa Society, Society of Sigma Xi and Tau Beta Pi National Engineering Society.
- Mihai Manea (Economics): summa cum laude, winner of *Wolf Balleisen Memorial Prize*; winner of *Halbert White '72 Prize in Economics*; and received Class of 1939 Princeton Scholar Award.

- Neil Mehrotra (Economics): cum laude, winner of two Athletics Prizes, *The Class of 1916 Cup* and the *Bayard W. Read, Class of 1926, Lightweight Crew Award*.

14 UCF students received departmental prizes and honors:

- Clayton Bavor, Jr. (Computer Science): magna cum laude, winner of *Joseph Clifton Elgin Prize*, and elected to Phi Beta Kappa Society, Society of Sigma Xi, and Tau Beta Pi National Engineering Society.
- Elisa Cheung (Operations Research and Financial Engineering): summa cum laude, co-winner of *Kenneth H. Condit Prize*, and elected to Phi Beta Kappa Society, Society of Sigma Xi, and Tau Beta Pi National Engineering Society.
- Marylynne Hunt-Dorta (Economics): magna cum laude, co-winner of *Senior Thesis Prize in Economics*.
- Bruce Harbour, Jr. (Politics): magna cum laude, co-winner of *The New York Herald Prize*.
- Julie Kestenman (Operations Research and Financial Engineering): summa cum laude, co-winner of *Ahmet S. Cakmak Prize*, and elected to Society of Sigma Xi and Tau Beta Pi National Engineering Society.
- Christopher Kirk (Operations Research and Financial Engineering): summa cum laude, co-winner of *Kenneth H. Condit Prize*, and elected to Society of Sigma Xi.
- Kimberly Mattson (Operations Research and Financial Engineering): summa cum laude, co-winner of *Tau Beta Pi Prize*, and elected to Phi Beta Kappa Society.
- Joseph McConnell (Operations Research and Financial Engineering): summa cum laude, co-winner of *J. Rich Steers Award*.
- Megumi Nakamura (East Asian Studies): co-winner of the *Martin "Buff" Wohlforth Memorial Award*.
- Karima Nigmatulina (Operations Research and Financial Engineering): magna cum laude, co-winner of *Ahmet S. Cakmak Prize*, and elected to Society of Sigma Xi.
- Charles Smith (Economics): co-winner of *The Rosengarten Cross Country Award (varsity)*.
- James Stillwagon, Jr. (Economics): summa cum laude, co-winner of *Senior Thesis Prize in Finance*, and elected to Phi Beta Kappa Society.
- Vivian Weng (Electrical Engineering): magna cum laude, co-winner of *Charles Ira Young Memorial Tablet and Medal*.
- Olga Zhilaev (Economics): magna cum laude, co-winner of *Senior Thesis Prize in Finance*.

10 UCF students were elected to Phi Beta Kappa Society, among them (see above for others):

- Courney Armstrong (ECO), magna cum laude

- Sheila Arora (ECO), magna cum laude
- Dana Lime (ECO), magna cum laude
- Neil Mehrotra (ECO), cum laude

23 UCF students were elected to membership in Society of Sigma Xi (see above for others):

- Richard Apple (ORF), summa cum laude
- Scott Bynum (ORF), magna cum laude
- Cyrena Chih (ORF), cum laude
- Eric Czervionke (ORF), summa cum laude
- Patrick Gremblan (ORF)
- Leo Han (ORF), cum laude
- Andrew Klaber (ORF)
- Yana Krasteva (ORF), cum laude
- Tse-Jen Ku (ORF), cum laude
- Matthew Lauria (ORF), magna cum laude
- Andrea Leewong (ORF), magna cum laude and Tau Beta Pi National Engineering Society
- Arel Lidow (ORF)
- Jacob Thomas (MOL)
- Julie Toran (ORF), cum laude
- Jenny Tsai (ORF), magna cum laude and Tau Beta Pi National Engineering Society
- Matthew Wolf (ORF), magna cum laude and Tau Beta Pi National Engineering Society

7 UCF students received athletic awards:

- Adam Balkan (Economics): winner of the *Frederick W. Kafer Award*.
- Patrick Gremban (Operations Research and Financial Engineering): co-winner of the *Matthew R. Weiner, Class of 2002, C. Rob Orr Award*.
- Avery Kiser (Operations Research and Financial Engineering): co-winner of the *C. Otto v. Kienbusch Sportswoman of the Year Award*, and co-winner of the *Martin "Buff" Wohlforth Memorial Award*.

- Neil Mehrotra (Economics): winner of *The Class of 1916 Cup* and the *Bayard W. Read, Class of 1926, Lightweight Crew Award*.
- Megumi Nakamura (East Asian Studies): co-winner of the Martin “Buff” Wohlforth Memorial Award.
- Audrey Pang (Economics): co-winner of *The Treide Trophy*.
- Charles Smith (Economics): co-winner of *The Rosengarten Cross Country Award (varsity)*.

2 UCF students received U.S. Military Awards:

- Fernando Lulli (ORF): The American Legion Award and Department of the Army Distinguished Military Graduate.
- Joseph McConnell (ORF): Department of the Army Distinguished Military Graduate.

Finally, 32 UCF students received some form of honors (19 cum laude, 10 magna cum laude and 3 summa cum laude).

Senior Theses of the Class of '05

This table shows the senior thesis titles from the Undergraduate Certificate in Finance Class of 2005:

John Andrews (ORF)	<i>Approximate Dynamic Programming for Aerial Refueling</i>
Richard Apple (ORF)	<i>How Deep is the Hole? A Stochastic Analysis of the Pension Benefit Guaranty Corporation</i>
Courney Armstrong (ECO)	<i>Mutual Fund Performance. An Analysis of Sector Mutual Funds with Sector Specific Benchmarks</i>
Sheila Arora (ECO)	<i>Terrorism and Tobacco: Examining Relationships between Smoking and Stress</i>
Evan Baehr (WWS)	<i>Factors that Influence Relationship Decisions/Faith and Fatherhood: Religious Congregations, Father Involvement, and Child Wellbeing</i>
Adam Balkan (ECO)	<i>Pay Versus Play: An Economic Analysis of the Validity of Player Salaries and Leveling the Playing Field</i>
Alejandra Barbosa (ORF)	<i>Playing Games with the Environment: A Quantitative Analysis of CO2 Abatement Strategies</i>
Clayton Bavor (COS)	<i>Artificial Intelligence. A Learning System for the Fully Automated Prediction of Facial Attributes</i>
Jonathan Berger (ECO)	<i>Size Matters: Investigating the Effect of Fund Size on Hedge Fund Performance</i>
Juan Bonifacino (ECO)	<i>Tracing the Shadows: Taxation and the Informal Economies of Europe</i>
Maria Boserup (ECO)	<i>Estimation of ECN Impact on Competition among Security-Trading Markets</i>

John Brandtl (ECO)	<i>Commercial Banks and the Impact of Non-interest Income on Shareholder Returns</i>
John Brunger (POL)	<i>The Political Impact of Stock Ownership of Working Americans</i>
Jeffrey Bullian (ORF)	<i>The Wisdom of Gamblers? An Analysis of Efficiency in NFL Betting Markets and a Profitable Betting Algorithm</i>
Jonathan Bydlak (ECO)	<i>So You Want to be a Rock & Roll Star? An Application of the Superstar Hypothesis to the Popular Music Market</i>
Scott Bynum (ORF)	<i>Convertible Bond and Stock Option Markets: An Analysis of the Implied Equity Volatility Spread</i>
Sean Cameron (ECO)	<i>Heterogeneity in Mortgage Refinancing: An Analysis of Homeowner Background Variables</i>
Grace Chang (ECO)	<i>Age and Performance: A Multi-factor Study of the Long-run Performance of High-tech IPOs in the 1990s</i>
Elisa Cheung (ORF)	<i>Credit Spread Dynamics and the Macro-economy: An Empirical Investigation</i>
Cyrena Chih (ORF)	<i>An Analysis of the Practical Application of Pari-mutuel Pricing Systems</i>
Alidia Clagett (ECO)	<i>After the Fall: An Analysis of the Stock Market Bubbles of 1929, 1966-69, and 2000</i>
James Cong (ORF)	<i>U.S. Trust Fund Management: Federal Spending under the Influence of Trust Fund Surpluses</i>
Taylor Copus (ECO)	<i>The Effect of IPO Share Lock-up Expirations on Stock Returns in the Years after the DotCom Bubble</i>
Xiaolin Cui (ORF)	<i>Modeling the Spread of HIV-AIDS and the Financial Resource Needs in China</i>
Megal Cunningham (ORF)	<i>A Queuing Theory Analysis of the Princeton University Office of Information Technology Help Desk Center</i>
Eric Czervionke (ORF)	<i>Valuing Executive Stock Options with Blackout Periods</i>
Ceyda Dagdelen (ORF)	<i>Risk Measures and Capital Regulation</i>
Nicholas D'Amato (MOL)	<i>Analysis of a Link Between a Meiotic Checkpoint and Dorsoventral Axis Formation During Drosophila Oogenesis</i>
Victor Davis (ECO)	<i>Pay for Performance? An Analysis of Executive Compensation as a Consequence of Performance</i>
John Duffy (ECO)	<i>Cost Analysis of West Side Stadium in Manhattan</i>
Jeremy Fazli (ECO)	<i>The Nasdaq 100 ETF-QQQ: Modeling Structural Differences in the Associated Options Markets</i>
David Fernandez (ECO)	<i>Transparency on Latin American Interest Rate Margins</i>
Shern Frederick (ORF)	<i>Ideal Damping Factor for Simulating Portfolio Returns: A Market Representative Approach</i>
Renee Gardner (WWS)	<i>Religion in Post-cold War International Relations: The Influence of Personal Faith on the Policy of Individual World Leaders</i>
Andrew Geant (ECO)	<i>Ratings Agency Reform</i>
Jennifer Greenlief (GER)	<i>Mixing Business with Pleasure: The Inseparability of Finance and Family in Thomas Mann's Buddenbrooks</i>
Patrick Gremban (ORF)	<i>Neural Networks: Analysis of the Types of Networks to Use with Specific Stock Industries</i>
Haris Hadzimuratovic (ECO)	<i>Lost in Transition: History, Privatization, and Foreign Aid in Former</i>

	<i>Communist Economies</i>
Arthur Han (ECO)	<i>The Socioeconomic Determinants of Specialty Choice by U.S. Medical Students</i>
Leo Han (CHM)	<i>How Private Equity Can Add Value</i>
Aaron Herr (ECO)	<i>Closed End Mutual Funds: Trading at a Discount</i>
James Hoeland (ECO)	<i>Testing the Effects of Monetary Shocks on Aggregate Compensation and Discount Bond Yields</i>
Marylynn Hunt-Dorta (ECO)	<i>Cost Benefit Analysis of Truth Sentencing Legislation</i>
Mindy Jeng (WWS)	<i>Clinical Drug Trial Disclosure</i>
Fan Jin (ORF)	<i>Measuring the Relative Accessibility of the Princeton Campus for People with Disabilities</i>
Caroline Joei (ECO)	<i>The Benefits of Art as an Asset Class</i>
Joshua Johnson (ORF)	<i>Putting a Price on Performance: A Study of Risk Hedging in Major League Baseball</i>
Laura Jones (ECO)	<i>The Effects of Parents' Savings and Portfolio Allocation Behavior on that of their Children</i>
Jeong Jun (ECO)	<i>Predictability in Stock Markets</i>
Mina Kazanlieva (ECO)	<i>Budget Deficits and Medicaid Hospital Costs</i>
Julie Kestenman (ORF)	<i>An Investigation of Incomplete Information Models of Default: A Case Study of Enron's Collapse</i>
Christopher Kirk (ORF)	<i>A Method to March Madness: Logistic Regression and the NCAA Tournament</i>
Avery Kiser (ORF)	<i>Digital Options</i>
Andrew Klaber (ORF)	<i>Hello, Is Anybody in There? The Search for the Optimal Route-planning and Decision-making Methods for Autonomous Ground Vehicle Control</i>
Yesim Koman (COS)	<i>Decision Making in an AMPL Model</i>
Yana Krasteva (ORF)	<i>Interaction-induced Enhancement of Portfolio Credit Risk</i>
Ashleigh Kreider (ORF)	<i>Principal Component Analysis and Sparse Principal Component Analysis as Applied in Yield Curve Analysis and Handwritten Digit Recognition</i>
John Langford (ORF)	<i>The Washington Road Tunnel Project: Integrating the Campus of Princeton University</i>
Elizabeth Larkins (ORF)	<i>The Wealth of Nations: An Analysis to the Correlation between United States Economic Indicators and the Probability of Default of Emerging Market Countries</i>
Matthew Lauria (ORF)	<i>Describing the Dependence Structures between Temperature and Natural Gas Prices</i>
Lawrence Lawler (POL)	<i>Swiss Bank Finances and Switzerland's Relationship with Germany during WWII</i>
Jin Lee (ECO)	<i>The Impact of War on US Financial Markets: An Introspective Look at the Iraq War</i>
Andrea Leewong (ORF)	<i>The Stock Market Overreaction Mystery: Human Judgment Bias in Financial Decision-making</i>
Jesse Levinson (COS)	<i>Artificial Intelligence: A Learning System for the Fully Automated Prediction of Facial Attributes</i>
Todd Levy (ORF)	<i>Buying and Selling Movies: An Analysis of the Hollywood Stock</i>

	<i>Exchange</i>
Adam Levyn (ECO)	<i>Effect of Cable on Small Company Stocks</i>
Mark Lewko (MAT)	<i>Representation of Integers by Binary Quadratic Forms</i>
Arel Lidow (ELE)	<i>The END Tool: Optimizing Network Evolution</i>
Dana Lime (ECO)	<i>The Long-term Effects of Layoffs in Fortune 500 Companies: An Analysis of the Potential Benefits Hypothesis</i>
Fernando Lulli (ORF)	<i>Effects of Nonstationary Emergency Call Arrival Rates on an Ambulance Response System</i>
Bradford Lyman (ORF)	<i>Risk Assessment in the California Energy Crisis</i>
Eric Ma (ECO)	<i>Media Consolidation: Intra-industry Signals from the Stock Market</i>
Robert MacAskie (ORF)	<i>The Structure and Effectiveness of Price Hedging Contracts Implemented by Independent Oil and Gas Producers</i>
Ross Mandeville (POL)	<i>Effect of Institutional Regulations on the IPO Process/The Future of Corp. Governance in the US. Best Practices in the Wake of Enron and the New Reforms of 2002</i>
Mihai Manea (ECO)	<i>Induced Preferences, Portfolio Choice and Intertemporal Income Substitution</i>
Kimberly Mattson (ORF)	<i>Implied Volatility of Foreign Exchange Options as an Indicator of Currency Crisis Risk</i>
Luke Mawhinney (ECO)	<i>International Role of the Euro</i>
Joseph McConnell (POL)	<i>Optimal High School Sizes in Relation to School Demographics</i>
Neil Mehrotra (ECO)	<i>Evolution of the International Dollar Cartel</i>
Rodrigo Montoya (ORF)	<i>Stochastic Modeling of the PCS Loss Index: A Sensitivity Analysis and Its Implications for Catastrophe Bond Pricing Models</i>
Matthew Musa (WWS)	<i>A Decade of Amtrak Reform Failures and the Policy Implications for U.S. Intercity Passenger Rail</i>
Michael Nagelberg (ECO)	<i>Real Estate Bubble</i>
Megumi Nakamura (EAS)	<i>The Case for Privatization: Reforming the Japanese Postal Savings System</i>
Berke Nayman (ECO)	<i>Retail Banking and Same Store Sales Growth</i>
Caroline Nguyen (ECO)	<i>Informal Sectors in Developing Economies – Latin America</i>
Karima Nigmatulina (ORF)	<i>Managing Terrorist Risk at Sea Ports: A National Security Dilemma</i>
Amanda Noteware (ECO)	<i>Advertisers Anonymous: An Analysis of Advertising in the Alcohol Industry</i>
Adaora Okwo (ORF)	<i>Cities of Foam: Exploring Nigeria's Potential for Privatized, Low-cost Housing Development</i>
Michael Ortiz (ORF)	<i>Revenue Maximization for Software; Dynamically Solving the Versioning and Pricing Problems</i>
Mehmet Paksoy (ECO)	<i>Oil Prices and Stock Market Performance</i>
Richard Pan (POL)	<i>The Bipartisan Campaign Reform Act and Its Prospects for Success</i>
Audrey Pang (ECO)	<i>The Economics of Gender Discrimination among Top Corporate Executives and CEOs</i>
Neset Pirkul (ORF)	<i>Insights into the Nature of Successful Acquisitions: An Empirical Approach</i>
Matthew Portillo (ECO)	<i>Analysis of the Airline Industry</i>
Lauren Quinn (ECO)	<i>Comparative Event Studies in the Pharmaceutical and Automotive</i>

Industries

Erik Ramos (ECO)	<i>An Empirical Investigation in the Possibility for Reducing Free Riding Levels in Peer-to-peer Networks</i>
Maria Reimels (ECO)	<i>Euro, US Economic Indicators and the European Equity Markets</i>
Daniel Ryan (ECO)	<i>Microfinance and NGOs</i>
Troy Savage (CEE)	<i>Rural Village Infrastructure in Tanzania/The Mampando Water Roller</i>
Keith Schreer (ELE)	<i>Analysis of Dataflow Architectures; Multithreading and Chip Multiprocessors</i>
Ford Scudder (ECO)	<i>Applying Options Pricing to Wages in NFL</i>
Brian Shiau (ECO)	<i>Event Contracts: New Financial Applications and Implementation in Theory</i>
Nishani Sirwardane (ORF)	<i>Investment under Uncertainty: Optimal Strategies of CO2 Emitting Firms under the Kyoto Global Emissions Trading Market</i>
Charles Smith (ECO)	<i>Fractional Reserve Banking and OM Operations</i>
Christopher Steinbaugh (WWS)	<i>Jumpstarting Technological Innovations in Motor Vehicles: The Possibility for California's AB 1493</i>
James Stillwagon (ECO)	<i>Agency Costs and Reverse LBOs</i>
Zachary Surak (ECO)	<i>Lights Out: The Theory of Forward Premia Applied to the California Energy Crisis</i>
Emma Taylor (ORF)	<i>Google versus Goldman: Can Dutch Auctions Revolutionize Wall Street?</i>
Peter Tedesco (ECO)	<i>Cause of Dividend Fads</i>
Anna Thoman (ECO)	<i>Resolving the Industrial and Geographic Diversification Discounts in US Multinationals</i>
Jacob Thomas (MOL)	<i>Analysis of the Variability of Endowment Portfolio Returns</i>
Margaret Todd (ECO)	<i>Venture Capital Deal Terms and Financial Contracting Theory: An Analysis of External Risk Factors</i>
Julie Toran (ORF)	<i>A Model for the Dynamic Management of Power Transformers</i>
Jenny Tsai (ORF)	<i>Migration and Institutionalized Exclusion in Shanghai</i>
Nicholas Walters (ECO)	<i>The Digital Revolution: The Economic Implications of the Internet on the Music Market of the 21st Century</i>
Frank Walters (POL)	<i>Antitrust Legislation and Professional Sports/Congressional Motives and Public Policy Exploring Major League Baseball's Limited Antitrust Exemption</i>
Ryan Watson (ECO)	<i>Royalty Trusts Superiority over Public Oil Companies</i>
Michael Weishuhn (COS)	<i>Tracker: A Track Meet Manager</i>
Vivian Weng (ELE)	<i>Benefits of Adding Commodities to an Equity Portfolio via Sharpe Ratio</i>
Matthew Wolf (ORF)	<i>Below the Financial Mendoza Line: Identifying Relocation and Contraction Candidates in Major-League Baseball</i>
Kevin Wong (ORF)	<i>Optimization Strategies for Portfolios Containing Hedge Funds: An Investigation of Modern Portfolio Theory and the Effects of Regime Shifts</i>
Shirley Wu (ORF)	<i>Identity in Print: Authorship Attribution using Markov Chains of Liberal and Grammatical Components</i>

Daniel Yehuda (COS)

What Types of Traders cause Prices to Yield the Most Accurate Information the Fastest – Electronic Market

Olga Zhilaev (ECO)

Valuation of Executive Stock Options: A Comparative Analysis of Utility Based and Exogenous Exercise Models

Mini-Course on Financial Modeling, Valuation and Analysis Using Excel

This four-session, not-for-credit, mini-course, taught students the fundamentals of constructing financial models in Microsoft Excel. It was designed to provide real experience in applying financial concepts to valuation models, and to teach the basic mechanics involved in financial modeling. In the process, students should be better able to recognize the intuition behind financial concepts that they have already been taught in other finance courses.

Students gained a proficiency in Microsoft Excel and its use as a tool for rigorous financial analysis. They were also presented with certain commonly accepted methodologies of presentation in the areas of financial analysis and valuation. As a result of this class, students should be better able to construct a variety of financial analyses such as projections and valuations. This valuable skill will be applicable in areas as diverse as investment analysis, government service, and financial management of non-profit organizations.

All Undergraduate Certificate in Finance and Master in Finance students were strongly encouraged to attend.

The four lectures took place from 7:00pm until 8:30pm, in the Friend Center Room 101, on the following dates:

- Thursday September 23, 2004
- Thursday September 30, 2004
- Thursday October 7, 2004
- Thursday October 14, 2004

On-line tutorials in Microsoft Excel were provided to all students. The course was taught by Thayer Patterson with guest lecturers from investment banking, asset management, and private equity.

Master in Finance

The interdisciplinary Bendheim Center for Finance offers a Master in Finance degree. The distinctive feature of Princeton's Master in Finance program is its strong emphasis on financial economics in addition to financial engineering and computational methods. Graduates of our program have a solid understanding of the fundamental quantitative tools from economic theory, probability, statistics, optimization and computer science, all of which are becoming increasingly vital in the financial industry. To a greater degree than at any time in the past, there now exists a body of knowledge that is widely agreed to be essential for the proper analysis and management of financial securities, portfolios and the financial decisions of firms. A driving force behind these developments is a lively exchange of ideas between academia and the financial industry, a collaboration that is the closest parallel in the social sciences to the academic-private sector interactions routinely seen in engineering and the applied sciences.

The Master in Finance program is intended to prepare students for a wide range of careers both inside and outside the financial industry, including financial engineering and risk management, quantitative asset management, macroeconomic and financial forecasting, quantitative trading, and applied research. The program does not require prior work experience, although it can be a plus. The BCF provides extensive career assistance to students, including help with internships and job placement, through its own staff and our placement record has been excellent. The program does have a small number of merit-based fellowships (in the form of a fraction of the full-year's tuition cost) that we grant to our top applicants.

The curriculum is designed to be completed in four semesters. However, students with a high degree of preparation can complete the curriculum in two semesters. This flexible format allows exceptionally well-prepared students to complete the program in as little as one academic year.

Princeton's Master program draws upon the combined strength of a variety of departments at Princeton, including the Department of Economics, the Department of Operations Research and Financial Engineering, the Department of Computer Science, and others. The program has two major course components. First, required core courses will provide (1) the prerequisite skills in mathematics, economics, and probability and statistics necessary for the study of finance at a sophisticated level and (2) an integrated introduction to modern financial analysis. Second, a wide range of elective courses, drawn from many departments, will allow students to tailor the program to fit their own needs and interests. These courses will permit a range of opportunities for specialization and in-depth study of topics of interest to the student, along a number of coherent "tracks."

Admission Requirements

The Master in Finance program is designed both for students with mathematical (or physics and engineering) training, who want to make finance their main field of application, and for students with an economics (or business or social science) background, who want to acquire the quantitative skills essential for a well-rounded training in finance. In either case, students must have an interest in, and be able to handle the combination of economic analysis, mathematics, econometrics, and computer science that are pervasive in modern finance. An intensive two-week review course covering probability and topics in mathematics, as required for the core courses, will be offered to students prior to the beginning of classes in the fall. In addition, we

organize in September for every incoming class a three-day “boot camp” with industry professionals where various career issues are reviewed and help is provided (including resume-writing, one-on-one videotaped interview sessions, etc.).

Applicants must take either the GRE or the GMAT. Applicants whose native language is not English and who have not received their undergraduate education in a school where English is the language of instruction must take the TOEFL or the IELTS exam.

Statistics on the Admission Process

	Applications	Offers	Acceptances
January 01	126	29	15
May 01	91	13	10
January 02	194	14	8
May 02	105	4	2
January 03	202	13	8
May 03	41	0	0
January 04	200	19	9
January 05	296	31	19

Highest Degree Before Applying to Princeton’s M.Fin.

	Bachelor	Master	Ph.D.
January 01	76%	24%	1%
May 01	60%	36%	3%
January 02	89%	11%	1%
May 02	83%	15%	2%
January 03	78%	20%	1%
May 03	80%	17%	2%
January 04	85%	15%	1%

January 05	60%	35%	5%
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Applicant Profile: Gender & Age

	Female	Male	Median Age
January 01	30%	70%	25
May 01	20%	80%	27
January 02	29%	71%	25
May 02	27%	73%	25.5
January 03	32%	68%	25
May 03	32%	68%	27
January 04	29%	71%	24
January 05	26%	74%	26

Applicant Profile: GRE Scores Mean (Median)

	Analytical	Quantitative	Verbal
January 02 Applicants	721 (730)	783 (790)	775 (605)
May 02 Applicants	667 (700)	754 (770)	494 (460)
September 02 Entering Class	703 (710)	773 (780)	578 (595)
January 03 Applicants	721 (750)	774 (800)	569 (580)
May 03 Applicants	748 (760)	764 (775)	589 (580)
September 03 Entering Class	777 (780)	794 (820)	605 (615)
January 04 Applicants	714 (810)	776 (790)	554 (560)
September 04 Entering Class	768 (780)	786 (800)	609 (620)
January 05 Applicants	705 (745)	781 (800)	547 (580)

September 05 Entering Class	765 (765)	789 (800)	642 (640)
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Program Requirements

The program requirements consist of 6 core courses and 10 elective courses (see list below), with the following provisions:

- At least 5 of the elective courses must be at the level 500 or higher.
- At least 5 of the elective courses must be taken from List 1 below.
- The program can be completed in one or two years; most complete it in two. Admission letters will specify the expected length of study. Individual meetings between students admitted into the program and the Director of Graduate Studies will determine, on the basis of courses previously completed at Princeton or another institution, which courses need to be taken.
- Students must maintain an overall grade average of B or better as well as earn a passing grade in all core and elective courses.
- Audited courses cannot be used to fulfill the program's requirements.
- While no Master's thesis is required, students interested in independent research may work with a Bendheim Center-affiliated faculty member on a topic relevant to finance, and by enrolling in the appropriate courses (FIN 560/561), they can receive academic credit equivalent to one or two elective courses (thereby reducing the number of required electives).

Core Courses

The core courses of the Master in Finance program provide students with analytical fundamentals of modern finance, both theoretical and empirical. The organization of the core courses for students entering the program is:

- Financial Economics – ECO 362 (fall) and FIN 502 (spring)
- Asset Pricing – FIN 501/ORF 514 (fall) and ORF 515/FIN 503 (spring)
- Statistics and Econometrics – ORF 505/FIN 505 (fall) and ORF 504/FIN 504 (spring)

Elective Courses

In addition to core courses, which provide a broad survey of topics and techniques of modern finance, the program will offer students the opportunity to choose among a variety of elective courses. Some of these courses have prerequisites, or require permission of the respective instructors.

List 1: Finance Applications Courses

- FIN 512: Trading and Securities Markets

- FIN 515: Portfolio Theory and Asset Management
- FIN 516: Topics in Corporate Finance, Corporate Governance and Banking
- FIN 518: International Financial Markets
- FIN 519: Corporate Restructuring, Mergers and Acquisitions
- FIN 521: Fixed Income: Models and Applications
- FIN 522: Options, Futures and Financial Derivatives
- FIN 523: Forecasting and Time Series Analysis
- FIN 560: Master's Project I
- FIN 561: Master's Project II
- ECO 414: Introduction to Economic Dynamics
- ECO 525/FIN 595: Financial Economics I
- ECO 526/FIN 596: Financial Economics II
- ECO 575/FIN 575: Topics in Financial Economics
- ORF 335/ECO 364: Introduction to Financial Engineering
- ORF 524: Statistical Theory and Methods
- ORF 527: Stochastic Calculus and Finance
- ORF 530: Statistical Analysis of Large Financial Datasets
- ORF 531/FIN 531: Computational Finance in C++
- ORF 534/FIN 534: Financial Engineering
- ORF 535/FIN 535: Financial Risk Management
- ORF 555: Fixed Income Models
- ORF 574: Special Topics in Investment Science

List 2: General Methodology for Finance

- APC 350: Methods in Partial Differential Equations
- APC 503: Analytical Techniques in Differential Equations
- APC 518/ORF 518: Applied Stochastic Analysis and Methods
- CEE 513: Introduction to Finite-element Methods
- CEE 532: Advanced Finite-element Methods
- CEE 548: Risk Assessment and Management
- CHE 530: Numerical Methods for Engineers
- COS 318: Operating Systems
- COS 323: Computing for the Physical and Social Sciences
- COS 333: Advanced Programming Techniques
- COS 423: Theory of Algorithms
- COS 425: Database Systems
- COS 432: Information Security
- COS 436: Human-Computer Interface Technology
- COS 444/ECO 444: Electronic Auctions
- COS 461: Computer Networks
- ECO 418: Strategy and Information
- ECO 501: Microeconomic Theory I
- ECO 502: Microeconomic Theory II
- ECO 503: Macroeconomic Theory I
- ECO 504: Macroeconomic Theory II
- ECO 512: Advanced Economic Theory I
- ECO 513: Advanced Econometrics: Time Series Models
- ECO 517: Econometric Theory I
- ECO 518: Econometric Theory II
- ECO 519: Advanced Econometrics: Nonlinear Models
- ECO 521: Advanced Macroeconomic Theory I
- ECO 522: Advanced Macroeconomic Theory II
- ECO 523: Public Finance I

- ECO 524: Public Finance II
- ECO 531: Economics of Labor
- ECO 541: Industrial Organization and Public Policy
- ECO 551: International Trade I
- ECO 552: International Trade II
- ECO 553: International Monetary Theory and Policy I
- ECO 554: International Monetary Theory and Policy II
- ELE 491: High-tech Entrepreneurship
- MAE 503: Basic Numerical Methods for Ordinary and Partial Differential Equations
- MAT 301: Mathematics in Engineering I (ODE, PDE)
- MAT 302: Mathematics in Engineering II (PDE, complex variables)
- MAT 305: Mathematical Programming
- MAT 591 & MAT 592: Applied Partial Differential Equations
- MAT 594/APC 584: Applications of Wavelets in Mathematics and Other Fields
- ORF 307: Optimization
- ORF 311: Optimization under Uncertainty
- ORF 401: Electronic Commerce
- ORF 474: Special Topics in Operations Research and Financial Engineering
- ORF 522: Linear Optimization
- ORF 523: Nonlinear Optimization
- ORF 524: Statistical Theory and Methods
- ORF 526: Stochastic Modeling
- ORF 542: Controlled Markov Processes
- ORF 547: Dynamic Programming
- ORF 548: Large-scale Optimization
- ORF 549: Stochastic Programming
- ORF 551: Probability Theory
- ORF 553: Stochastic Differential Equations
- ORF 554: Markov Processes

Tracks

Elective courses can be chosen according to either individual needs and preferences, or to conform to one of the suggested tracks, listed below. It is not necessary for a student to designate or complete a particular track to satisfy the Master's requirements; the tracks listed below are merely illustrations of coherent courses of study that students might choose. Beyond the tracks listed below, we offer a number of electives in corporate finance, dealing with the choice and financing of investment projects, firms' determination of dividend policy, optimal capital structure, financial reorganization, mergers and acquisitions, start-up financing, deal structure, incentive design, valuation of high risk projects, initial public offerings, etc. However, we believe that our students' comparative advantage lies in other areas encompassed within the modern investment bank such as asset management, risk management, derivatives pricing and trading, fixed income analytics and other areas where a quantitative background in theoretical and practical aspects of modern finance is essential.

Financial Engineering and Risk Management

Financial engineers design and evaluate products that help organizations manage risk-return tradeoffs. Financial engineering is no longer limited to quantitative traders and derivatives specialists, but is now used widely throughout the private sector for purposes including hedging foreign currency exposures, financing real investment, and managing real and financial risks. The

aim of this track is to provide students with the background they need to be leaders and innovators in this growing field. The track includes courses in dynamic programming and stochastic control, financial economics, optimization under uncertainty, probability, and stochastic calculus and computational finance. Special attention is given to the development of the efficient computational techniques that are needed in “real-time” computing environments. In addition, students can elect to focus on the computer-based technologies that are becoming increasingly important in finance, such as the design of efficient trading systems, algorithms, interfaces, large databases, and the security of computer networks. Several courses provide students with the opportunity to acquire practical experience. In particular, full-time students will have the opportunity to work in a small group on actual financial engineering problems under the joint guidance of a faculty member and a high-level industry practitioner.

Quantitative Asset Management and Macroeconomic Forecasting

Highly trained financial specialists are increasingly utilized in the fields of portfolio management and macroeconomic forecasting. Among the quantitative tools used in this area are analysis of earnings revisions, “attribute” screening, and quantitative forecasting methods. Quantitative techniques are widely employed to control portfolio risk and to establish portfolios balanced with different assets (stocks, bonds, real estate, etc.) so as to minimize the variance of returns. Finally, major asset managers, commercial banks, life insurance companies, securities firms, etc., all employ financial economists to formulate strategies consistent with the expected performance of the macroeconomy; required skills include expertise in applied time series analysis and an understanding of the major statistical macro models.

Financial Technologies Track

Computer-based technologies are becoming increasingly important in finance, such as algorithms, efficient trading systems, large databases, multimedia and web interfaces, parallel processing and the security of computer networks. The continued development of e-commerce, the growth of computer-based trading and the renewed emphasis on risk management in all firms are creating a new competitive environment where increasing the speed and lowering the costs of trading and other financial operations become essential components of success. This track gives students access to the latest tools and techniques of computer science and computational methods applied to finance.

Seminars and Computing Environment

Students are involved in regular seminars offered by academic researchers and industry representatives, and they will have the opportunity to participate in collaborative projects in some of the elective courses. The Financial Engineering Laboratory (equipped with financial data feeds and personal computers, workstations) has been set up to facilitate such projects. The program provides a standardized computing environment based on Mathematica, Matlab, S-Plus and Microsoft Office. Computational skills are taught in a series of workshops and in a course on computational C++.

Some Course Descriptions

FIN 501: Asset Pricing I: Pricing Models and Derivatives

Provides an introduction to the modern theory of asset pricing. Topics include: (i) no arbitrage, Arrow-Debreu prices and equivalent martingale measures, (ii) security structure and market

completeness, (iii) mean-variance analysis, Beta-pricing, CAPM, and (iv) introduction to derivative pricing.

FIN 502: Corporate Finance and Financial Accounting

Covers the basics of financial statements, the analysis and recording of transactions, and the underlying concepts and procedures. In addition, a more detailed study of some aspects of financial accounting that have widespread significance is undertaken, such as inventories, long-term productive assets, bonds and other liabilities, stockholders equity, and the statement of changes in financial position. The course provides students the skills necessary to become informed users of financial statements.

FIN 503: Asset Pricing II: Stochastic Calculus and Advanced Derivatives

The uses of stochastic calculus in modeling and analysis of diverse phenomena in engineering and finance. It reviews Markov processes and Brownian motion, introduces martingales and stochastic differential equations, and concludes with applications to diffusions and financial engineering.

FIN 504: Financial Econometrics

This course covers econometric and statistical methods as applied to finance. Topics include measurement issues in finance, predictability of asset returns and volatilities, value at risk and extremal events, linear factor pricing and portfolio problems, intertemporal models of the Stochastic Discount Factor and Generalized Method of Moments, vector autoregressive and maximum likelihood methods in finance, risk neutral valuation in discrete time, estimation methods for continuous time models, volatility smiles and alternatives to Black-Scholes, and nonparametric statistical methods for option pricing.

FIN 512: Trading and Securities Markets

The organization and regulation of stock markets; price formation, volatility, and liquidity in the secondary market (market microstructure). The course will also focus on stock market crashes, Keynes beauty contest comparison, and herding behavior. The listing decision and the primary market for raising equity capital for firms.

FIN 515: Portfolio Theory and Asset Management

This course covers a number of advanced topics related to asset management and asset pricing. Topics include mean-variance analysis, CAPM, APT, market efficiency, delegated money management, stock return predictability, bubbles and crashes, social interaction and investor behavior, security analysts and investor relations, and mutual fund performance and organization.

FIN 516: Topics in Corporate Finance, Corporate Governance and Banking

The course covers agency and control issues in corporate finance such as managerial compensation, the role of corporate boards, takeovers, leveraged buyouts and bankruptcy. It also studies the role of banks and other intermediaries' activities in facilitating investment and promoting sound corporate governance.

FIN 518: International Financial Markets

This course studies the assets and institutions of international financial markets. A key difference between these markets and others is the role of exchange rates relating the value of two or more national currencies. The course studies the market-making institutions, the market conventions, and market practices. It also studies the interrelationships between different assets and their pricing, trading, and use by corporations.

FIN 519: Corporate Restructuring, Mergers and Acquisitions

This course examines some of the most popular restructuring options available to corporate managers and will construct a framework to evaluate the implications they may have to shareholder value.

FIN 521: Fixed Income: Models and Applications

This course deals with the valuation for fixed income securities. Topics include: (i) interest rate contracts: zero-coupon bonds, coupon bonds, floating rate notes, yields, forwards and futures, swaps, options, caps, swaptions; (ii) arbitrage free pricing in discrete time: Vasicek model, Ho-Lee model, Black-Derman-Toy model; (iii) introduction to continuous-time fixed income modeling: Black model, Heath-Jarrow-Morton; (iv) applications of arbitrage free models to pricing of interest rate contracts, (v) credit risk; (vi) mortgage-backed securities.

FIN 522: Options, Futures and Financial Derivatives

The objective of this course is to study the essential techniques of pricing financial derivatives. These techniques include the Black-Scholes formula (awarded 1997 Nobel prize in economics), binomial tree method and risk-neutral valuation method. We will also discuss extensively trading strategies associated with financial derivatives for different purposes, and potential problems that can arise in the application of financial derivatives. This course is technical by nature, and requires extensive use of calculus, statistics and Excel spreadsheet programming.

FIN 560/561: Master's Project I & II

Under the direction of a Bendheim affiliated faculty member, students carry out a Master's project, write a report, and present the results in the form of a poster or an oral presentation in front of an examining committee.

FIN 562: Extramural Summer Project

A summer research project designed in conjunction with the student's advisor and an industrial, or government sponsor that will provide practical experience relevant to the student's course of study.

ECO 525/FIN 595: Financial Economics I

Asset pricing in competitive markets where traders have homogeneous information. Empirical tests of asset-pricing models and associated "anomalies" are also surveyed. Measures of riskiness and risk aversion, intertemporal asset-pricing models, dynamic portfolio choice, option pricing and the term structure of interest rates, corporate investment and financing decisions, and taxation are studied.

ECO 526/FIN 596: Financial Economics II

Theories and empirical evidence regarding financial markets and institutions that focus on asymmetric information, transaction costs, or both; and rational expectation models of asset

pricing under asymmetric information, dynamic models of market making, portfolio manager performance evaluation, principal-agent models of firm managerial structure, takeover bids, capital structure, and regulation of financial markets are studied.

ECO 575/FIN 575: Topics in Financial Economics

This course is intended for Ph.D. students who have already completed the year-long Ph.D. sequence in finance (ECO 525 and 526) and who intend to write their dissertation in finance. Topics vary by year, focusing on recent developments in the field.

ORF 335: Introduction to Financial Engineering

Financial engineers design and analyze financial products. These products improve the efficiency of markets and create novel mechanisms for reducing risks. This course is an introduction to financial engineering.

ORF 505: Modern Regression and Time Series

Linear and mixed effect models. Nonlinear regression. Nonparametric regression and classification. Time series analysis: stationarity and classical linear models (AR, MA, ARMA, ..). Nonlinear and nonstationary time series models. State space systems, hidden Markov models and filtering.

ORF 531/FIN 531: Computational Finance in C++

The intent of this course is to introduce the student to the technical and algorithmic aspects of a wide spectrum of computer applications currently used in the financial industry, and to prepare the student for the development of new applications. The student will be introduced to C++, the weekly homework will involve writing C++ code, and the final project will also involve programming in the same environment.

ORF 534/FIN 534: Financial Engineering

A survey of central topics in the area of financial engineering and multi-period financial planning systems. Pricing methodologies integrated with financial planning systems. Linking asset and liability strategies to maximize surplus wealth over time. We model the organization as a multi-stage stochastic program with decision strategies.

ORF 535/FIN 535: Financial Risk Management

This course is about measuring, modeling and managing financial risks. It introduces the variety of instruments that are used to this effect and the methods of designing and evaluating such instruments. Topics covered include risk diversification, planning models, market and nonmarket risks, and portfolio effects.

ORF 555/FIN 555: Fixed Income Models

Introduction to continuous-time models for the arbitrage-free pricing of interest rate derivatives. Topics include primitives of the bond market and the relation between their dynamics, short rate models, the Heath-Jarrow-Morton methodology and related consistency problems, LIBOR market models, affine term structure models, risk of default.

Master in Finance Placement

Our program has continued to enjoy excellent success with virtually all of our graduates being placed in finance industry jobs or going on to Ph.D. programs. The candidates for the Master in Finance degree get support and assistance with their post-graduate career planning from a coordinated program of resources, including Princeton's Office of Career Services and the BCF's dedicated placement advisors, David H. Blair (Director of Corporate Relations) and Swati Bhatt (Director of Student Programs). They also benefit from support from our Corporate Affiliates and Advisory Council.

Our graduates will be pursuing their careers at:

Ph.D. Program	Oxford University
Merrill Lynch	Derivatives trading in Hong Kong
SembCorp Industries	Finance office of manufacturing corporation in Singapore

Our first year students have obtained summer internships as follows:

BlackRock	Quantitative asset management in New York
Calpine	Houston risk controls
Goldman Sachs	Risk management in New York
JP Morgan Chase	Fixed income trading in New York
	Credit Analytics in New York
Murex	Risk management in New York
Novahill Partners	Merger and acquisition analytics in Princeton

The previous year, 2004, our graduates found permanent employment as follows:

Ph.D. Programs	Princeton University
	Wharton School, University of Pennsylvania
JP Morgan Chase	Fixed income trading analyst in London
	Proprietary trading strategist/trader in New York
Dean & Company	Financial consulting analyst in Washington, DC
Goldman Sachs	Proprietary trading analyst in New York
Singapore Investment Co.	Private equity analyst in Singapore
McKinsey & Co.	Business consulting analyst in Paris
Mitsui Bank	Officer, commodities trading in New York

MFin Boot Camp

We continued our three-day "boot camp" program which we developed for the incoming students prior to the beginning of classes in September. The camp focuses on a refresher of various finance topics, the types of careers for which the MFin degree prepares students and some useful information on interviewing skills. The boot camp presenters came from both the BCF faculty and the financial services industry. This program was very well received by the incoming students, particularly those who would have to begin interviewing for permanent jobs

less than six weeks after starting the program. In September 2004, the program's agenda was as follows:

Tuesday, September 7

8:30 to 9:30 am Welcome – Continental Breakfast at Bendheim Center. Sign up for Resume writing sessions with Kathleen Mannheimer, Graduate Career Services and interviews with David Blair and Swati Bhatt

Tuesday-Thursday September 7-9

One-on-one scheduled sessions with Blair, Bhatt and Mannheimer

Friday, September 10

8:30 to 9:00am Continental Breakfast at Bendheim Center

9:00 to 10:00am Introduction – Yacine Aït-Sahalia, Reé Carmona

10:00 to 11:00am Structure of Modern Investment Bank – David Blair

11:00 to Noon Introduction to Fixed Income – Robert Kimmel

Noon to 1:00pm Lunch at Bendheim Center

1:00 to 2:00pm Behavioral Finance – Harrison Hong

2:00 to 3:15pm Fixed Income Asset Management: Current Issues and Careers – John Massad, Principal, BlackRock Inc.

3:15 to 3:30pm Coffee Break

3:30 to 4:00pm Introduction to Career Services and Placement Resources – Kathleen Mannheimer, Swati Bhatt, David Blair

4:00 to 5:15pm Issues and Careers in Risk Management – Brian Fullerton, Chief Risk Management Officer – Merrill Lynch Asset Management

7:00pm Dinner hosted by Yacine Aït-Sahalia and René Carmona

Saturday, September 11

9:00 to 10:30am Derivatives – Wei Xiong

10:30 to 10:45am Coffee Break

10:45am to 12:15pm Panel Discussion among recent graduates (Steckl, Shampine, Naud, Villani) on interviewing techniques and job search Methodology

12:15 to 1:15pm Lunch at Bendheim Center.

1:15 to 2:00pm	Do's and Don'ts—a short guide to employment etiquette— David Blair, Swati Bhatt, Kathleen Mannheimer
2:00 to 2:15pm	Coffee break
2:15 to 5:00pm	Interviewing Techniques—Syntaxis, http://www.syntaxis.com
6:30 to 10:00pm	Barbeque hosted by David Blair
Week of September 13	Appointment for videotape interview training with Kathleen Mannheimer and finalize resume as necessary
Monday, September 20	Final form of resumes submitted electronically to David Blair

Advisory Council

The Advisory Council for the Bendheim Center is comprised of a group of distinguished leaders in the financial industry. The Council meets on campus once a year. In 2005, the meeting took place on May 6.

Mr. Gerhard R. Andlinger

Chairman of the Board
Andlinger & Company, Inc.

Mr. John K. Hepburn

Vice Chairman
Morgan Stanley Group (Europe), P.L.C.

Mr. Hamid Biglari

Managing Director and Head Global Financial
Institutions Investment Banking
Citigroup Global Markets, Inc.

Mr. Kenneth Hersh

Managing Partner
Natural Gas Partners

Mr. John C. Bogle
President
Bogle Financial Markets Research Center,
The Vanguard Group

Mr. John L. Cecil
Senior Advisor
Lehman Brothers

Mr. Christopher A. Cole
Managing Director
Goldman Sachs & Co.

Mr. E. Robert Cotter, III
General Partner
Merritt Capital LP

Mr. Howard E. Cox, Jr.
General Partner
Greylock Management Corporation

Mr. David A. DeNunzio
Vice Chairman, Mergers and Acquisitions
Crédit Suisse First Boston, LLC

Mr. J. Michael Evans
Partner and Managing Director
Goldman Sachs & Co.

Mr. Benjamin Griswold
Senior Partner
Brown Advisory

Mr. William H. Heyman
Vice Chairman & Chief Investment Officer
The St. Paul Travelers Companies, Inc.

Mr. John A. Mayer, Jr.
Chief Financial Officer (Retired)
J.P. Morgan & Company

Mr. Michael McCaffery
President and Chief Executive Officer
Stanford Management Company

Ms. Heidi G. Miller
Executive Vice President & Chief Executive
Officer
JPMorgan Chase

Ms. Sharmin Mossavar-Rahmani
Managing Director
Goldman Sachs & Co.

Mr. Jeffrey M. Peek
Chairman and Chief Executive Officer
CIT Group, Inc.

Ms. Lynn Thoman
Managing Partner
Corporate Perspectives

Mr. Paul M. Wythes
Founding General Partner
Sutter Hill Ventures

Corporate Affiliates Program

The annual Corporate Affiliates Program offers companies an opportunity to build a significant relationship with the BCF faculty and students. Corporate affiliates gain a strong presence and visibility in the BCF, interact with faculty and students, learn about important faculty research, and secure a competitive recruiting advantage.

2004-05 Partners

Citadel Investments Group

Citigroup

Crédit Suisse First Boston

Deutsche Bank

Goldman Sachs

JP Morgan Chase

Lehman Brothers

Merrill Lynch

Moody's Corporation

Morgan Stanley

Benefits

- Annual Report of the BCF
- Opportunity to advertise internships and employment opportunities to both Undergraduate Certificate in Finance (almost 350 in 2005-06) and Master in Finance students (26 in 2005-06)
- Opportunity to use the BCF facilities to host recruiting events
- Access to the BCF Director of Corporate Relations as a resource for recruiting
- Recognition in the publicly disseminated materials of the BCF, including the Center's reports and web site which both list corporate affiliates and provide a hyperlink to each member's website
- Access to all research authored by the Center's affiliated faculty within the academic year
- Access to BCF faculty for internal or client presentations or for sponsored research
- Opportunity to work with BCF faculty and staff to create customized training programs and to design and access distance learning courses and events such as special lectures and conferences

- Invitation to deliver a guest lecture on campus or to participate as a presenter at BCF sponsored conferences
- Invitation and two reserved seats for all public events hosted by the Center

Gift Opportunities

Early in 1998, a \$10 million gift from the Lowenstein Foundation enabled Princeton to launch the Bendheim Center for Finance. To establish the University as a national resource for innovative thinking on finance and finance-related topics, the BCF brings together leading experts in teaching and scholarship in financial economics. But to realize this vision, significant support beyond the generous Bendheim gift is needed for faculty, curriculum development and facilities. True excellence in financial economics requires a critical mass of finance researchers, approaching the size of a finance department in a leading business school, as well as important educational initiatives in a state-of-the-art setting.

Physical Space

<i>Terrace</i>	\$250,000
<i>Director's Office</i>	\$100,000
<i>Graduate Student Suite</i>	\$100,000

Academic Personnel

<i>Senior Professorships (5 committed, 2 additional needed)</i>	\$3,000,000
<i>Senior Visiting Professorship (1 needed)</i>	\$1,500,000
<i>Postdoctoral Fellows (1 needed)</i>	\$1,000,000
<i>Junior Faculty Fellow (1 committed, 1 additional needed)</i>	\$1,000,000

Fellowships

<i>Graduate Fellowships (3 committed, 7 additional needed)</i>	\$250,000
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Support of Financial Research and Teaching

<i>Research and Course Development Funds</i>	\$2,500,000
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Acknowledgements 2004-05

Princeton University gratefully acknowledges those whose generosity continues to make the Bendheim Center for Finance possible.

Gerhard R. Andlinger '52

Chester Baylis, Jr. '29 (d)

Robert M. Baylis '60

Robert Bendheim '37

David H. Blair '67

Charles Brodbeck '71

David A. DeNunzio '78

The Family of Carl H. Donner '20

J. Michael Evans '80

Edward B. Goodnow '47

Mr. and Mrs. Randall A. Hack '69

John K. Hepburn '72

Robert R. Hermann, Jr. '75

Kenneth Hersh '85

Mrs. Stanley G. Ivins W34

William H. Janeway '65

Richard Korhammer '88

Oliver M. Langenberg '35

Edward E. Matthews '53

Susan Payne Madole '76

John Mayer '62

Reuben M. Morriss, III '58

Sharmin Mossavar-Rahmani '80

Robert B. Payne, Jr. '74

Robert B. Payne, Sr. '45

Jeffrey M. Peek '69

John G. Quigley

John H. Scully '66

Lynn Bendheim Thoman '77

Dario Villani *02

Evan A. Wyly '84

Mr. and Mrs. Paul M. Wythes '55

William T. Young, Jr. '70

Princeton Class of 1950
The Leon Lowenstein Foundation
The Civitas Foundation
The Starr Foundation